PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED NOV. 28/11
PROPOSED BLAST DATE Nov. 29/11
BLAST # ~~113~~ 114

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+45 – 126+60

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY Ø (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 8
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 156 (m)

PROPOSED APPROX. NO. OF HOLES 39 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 39
PROPOSED NUMBER OF DELAYS 39

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

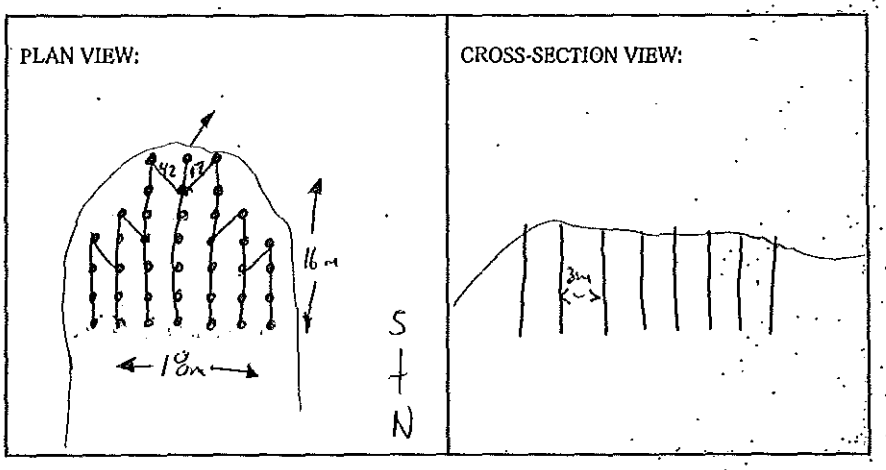
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 30/11
ACTUAL BLAST DATE Nov. 30/11
BLAST # 115

HIGHWAY# 97
BLAST LOCATION AT: STN # 112+95 - 112+65 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 18 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 20
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 350 (m)

TOTAL NUMBER OF HOLES 20 B/L / 29 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 49
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 675 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

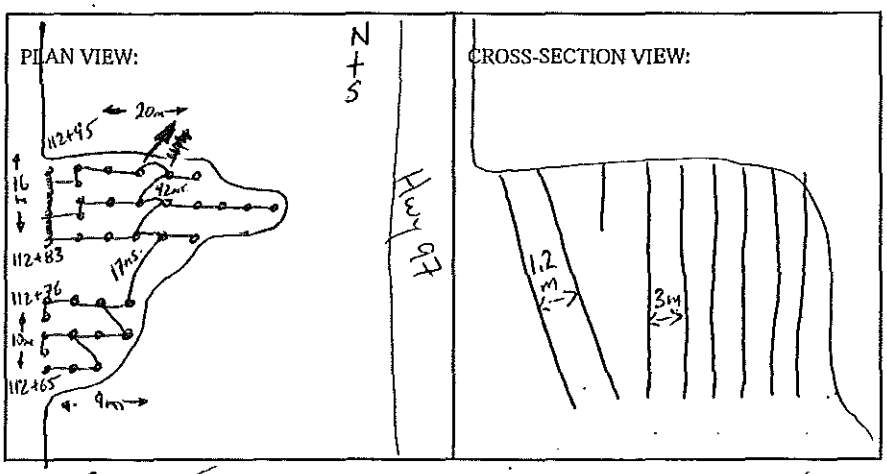
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 30/11
ACTUAL BLAST DATE Nov. 30/11
BLAST # 116 @ 16:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+90 – 126+70 RS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 4 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 262 (m)

TOTAL NUMBER OF HOLES 10 B/L / 65 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 825 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

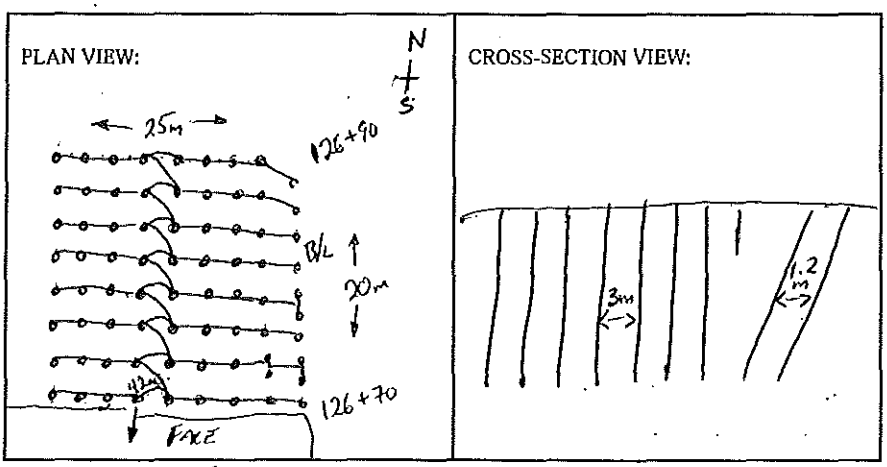
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME: SIERRA DRILLING + BLASTING
BLASTER'S NAME: JAMES MACKINNEY
BLASTER'S CERTIFICATE NUMBER: 554643

DATE PREPARED: NOV. 29/11
PROPOSED BLAST DATE: NOV. 30/11
BLAST #: 11.6

HIGHWAY #: 97
BLAST LOCATION AT: STN # 126+70 – 126+90 (RS 1 BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY: 23 (m) SLOPE ANGLE: 63 (°) SLOPE LENGTH: 20 (m)
ROCK TYPE: Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY): 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES: 20
PROPOSED AVG. DEPTH: 4 (m)
PROPOSED NO. OF ROWS: 5
PROPOSED MAXIMUM DEPTH: 5 (m)
PROPOSED TOTAL DEPTH: 280 (m)

PROPOSED APPROX. NO. OF HOLES: 20 B/L / 50 prod.
HOLE DIA.: 100 (mm)
APPROX. HOLE SPACING: 3 (m) BURDEN: 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL, HORIZ., VARIABLE
* Every 2nd B/L Hole Loaded w/ two grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE: 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES: 70
PROPOSED NUMBER OF DELAYS: 50

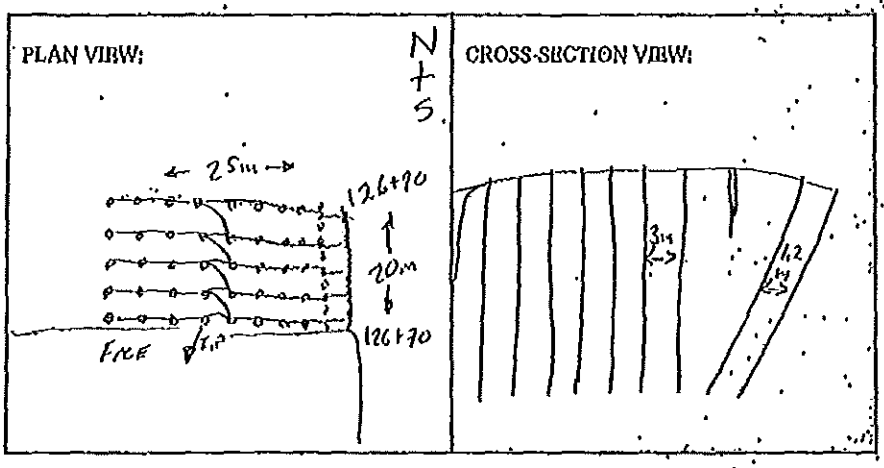
EXPLOSIVE SIZE: 50 mm by 400 mm
APPROX. TOTAL WEIGHT: 800 (kg)
DELAY TYPE AND LENGTH: 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY): EBC initiation of Nonel system
BLASTING MACHINE: TYPE: HB 320 CAPACITY: 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED: 2000 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME: D. Fieber SIGNATURE: COMPANY: Fieber Rock Eng.
BLASTER'S SIGNATURE: James MacKinney COMPANY: Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE):
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED NOV 30/11
ACTUAL BLAST DATE NOV 30/11 3:40 PM
BLAST # 117

HIGHWAY# 97
BLAST LOCATION AT: STN 147+25 - 147+90 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 55' (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

DRILLING DETAILS: * every 2nd hole located w/ 200 grain det. cord

NUMBER OF BACKLINE HOLES 74
AVERAGE DEPTH 9.5 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 1550 (m)

TOTAL NUMBER OF HOLES 74H/L 96 PROD.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 15# DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 133
TOTAL NUMBER OF DELAYS 110

EXPLOSIVE SIZE 46 mm by 400 mm
TOTAL WEIGHT 3725 (kg)
DELAY TYPE AND LENGTH 25 & 42 (ms)

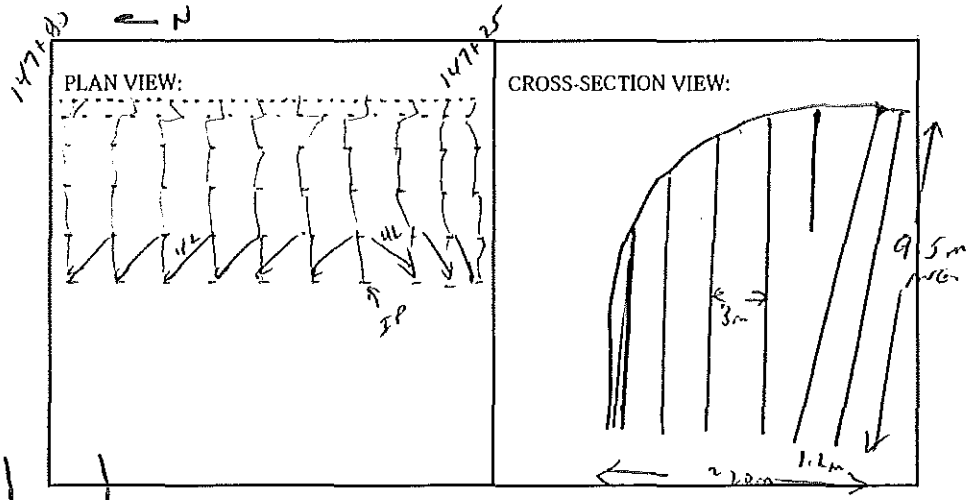
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 7,500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5133489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 11:44AM
BLAST # HW-0017

HIGHWAY# 97
BLAST LOCATION AT: 129+900 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) ; SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 5 4/1 + 5 Back
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

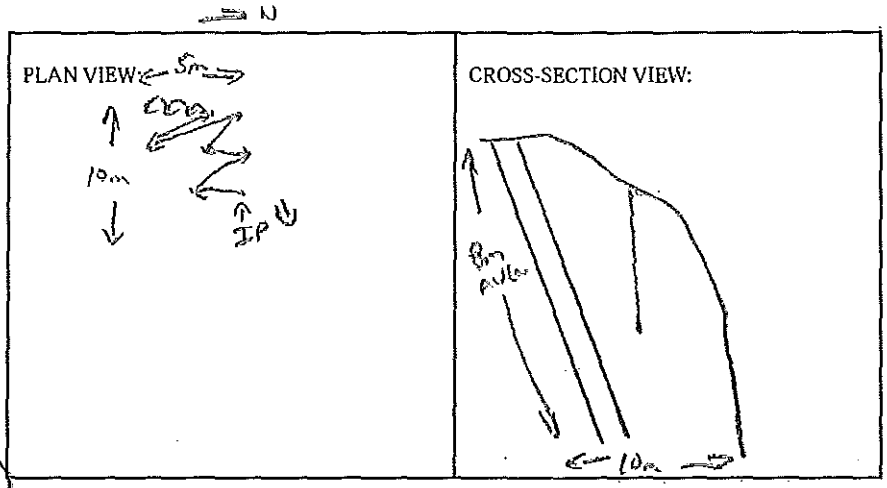
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffstone ext. 0.11 ips / 32Hz
@ 13167 cliffstone ext. 0.11 ips / 37Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 24/11
ACTUAL BLAST DATE Nov 24/11 1:23 PM
BLAST # MW-0018

HIGHWAY# 97
BLAST LOCATION AT: STN 1291 85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shotmarked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 1/4 (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Basalts
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

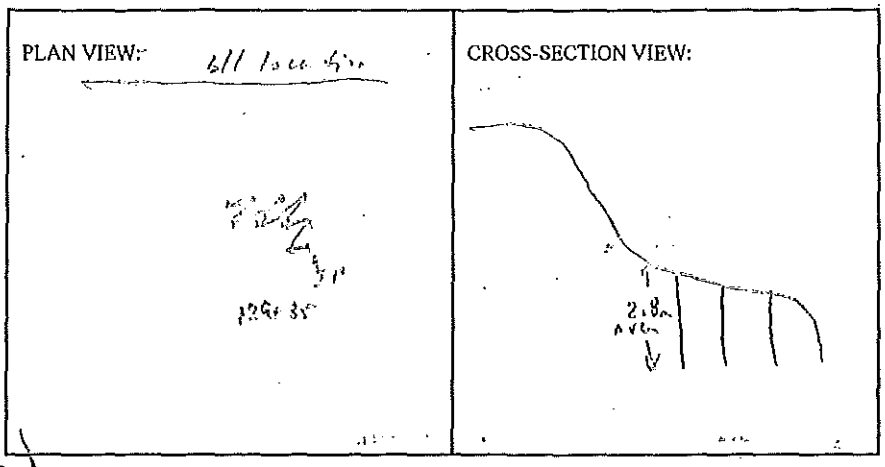
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13221 cliffstone ert - 0.12in/s 47 1/2
c 13167 cliffstone ert - 0.12in/s 43 1/2

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11
BLAST # Mud Creek 2:27pm

HIGHWAY# 97
BLAST LOCATION AT: Sand 129+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Sandstone Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 6.5 (m)

TOTAL NUMBER OF HOLES 8 prod / 5 ctl (3 cracked)
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

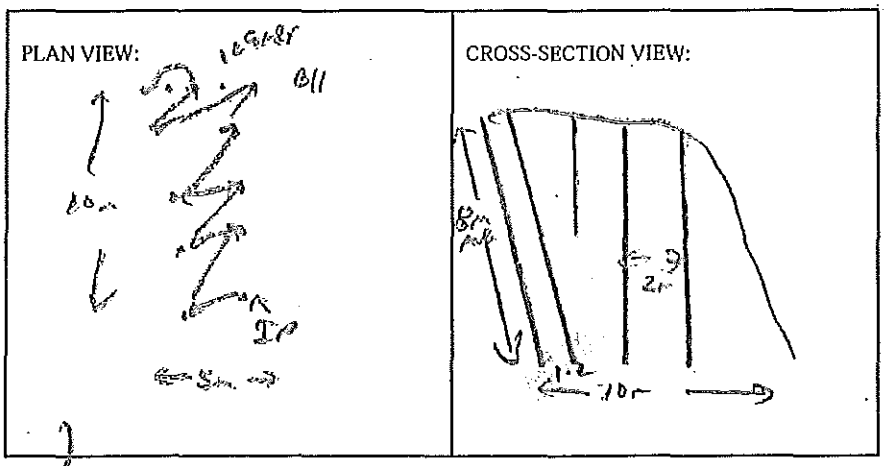
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1324 elevation ext - 0.24 ips / 39 Hz
@ 1317 elevation ext - 0.37 ips / 39 Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 3:38 PM
BLAST # MJ-0220

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

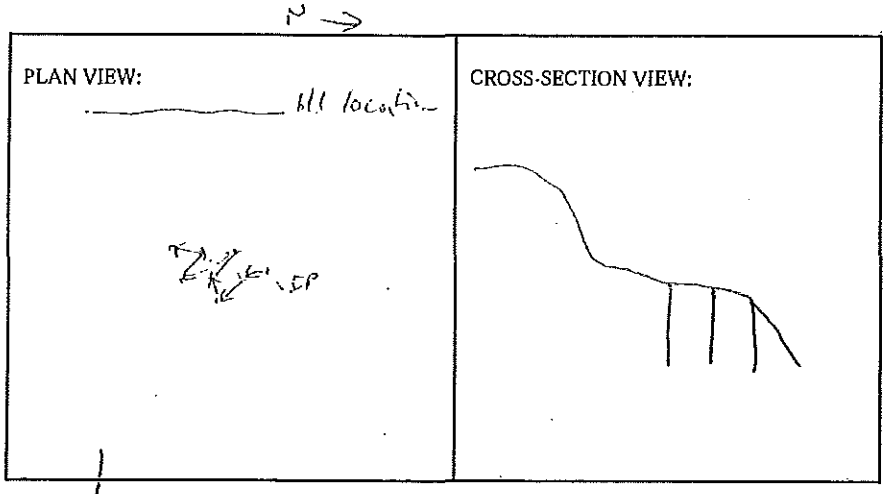
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

seismograph @ 13221 @ cliffstone ent. - 0.070 ips / 43Hz
@ 13167 cliffstone ent. 0.10 ips / 37Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 11:49 am
BLAST # MW-0081

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80 CS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * SHOT MATTED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 67 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd b/l hole loaded w/200 g min det. cord

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 36/1 / 8 PADS
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) 1/2 INTERVAL OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

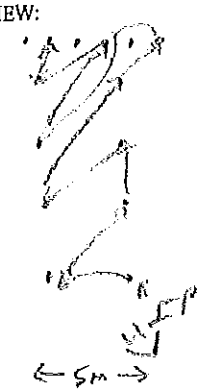
VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

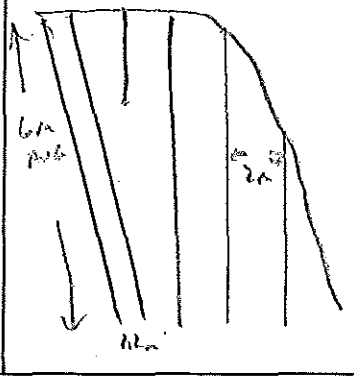
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 Cliffstone Crt - 0.14 ips / 37 Hz
@ 13167 Cliffstone Crt - 0.21 ips / 39 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 12:39 PM
BLAST # MW-0022

HIGHWAY# 97
BLAST LOCATION AT: 129k 90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot muddy

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 600 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 19 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

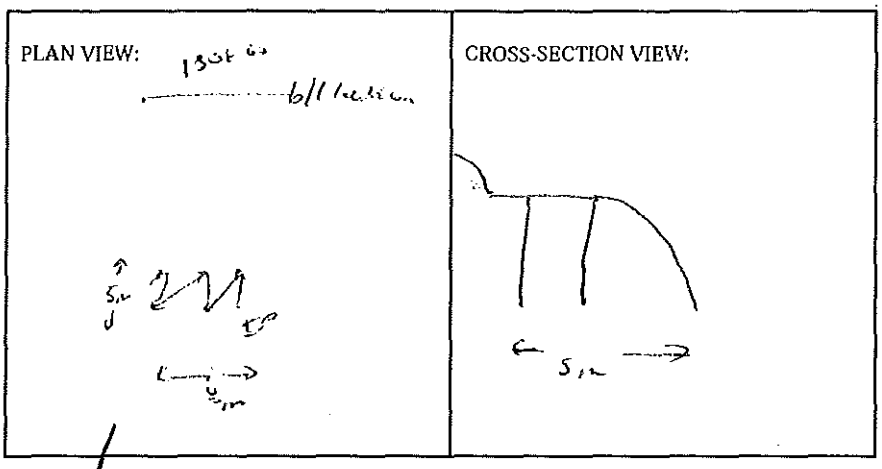
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 13 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13221 Client dat - 0.095 ips / 30 Hz
@ 13107 Client dat - 0.081 ips / 39 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 2:03 PM
BLAST # MW-0023

HIGHWAY# 97
BLAST LOCATION AT: STN 124+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 2 SHOT MISFED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 203 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

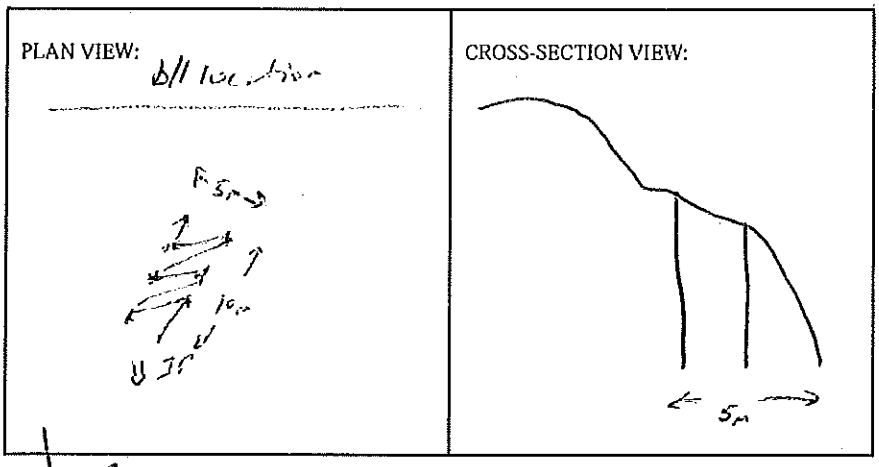
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBE INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1322' offset out - 0.11 ips/ 39Hz
@ 1310' offset out - 0.19 ips/ 30Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 2:55 PM
BLAST # MW-00244

HIGHWAY# 97 (Chetwynd)
BLAST LOCATION AT: 1294+75 - 1294+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE _____
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd b/l hole loaded w/ 200 gram det. cord

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 10 (m)

TOTAL NUMBER OF HOLES 36/1 / 8 Presp
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

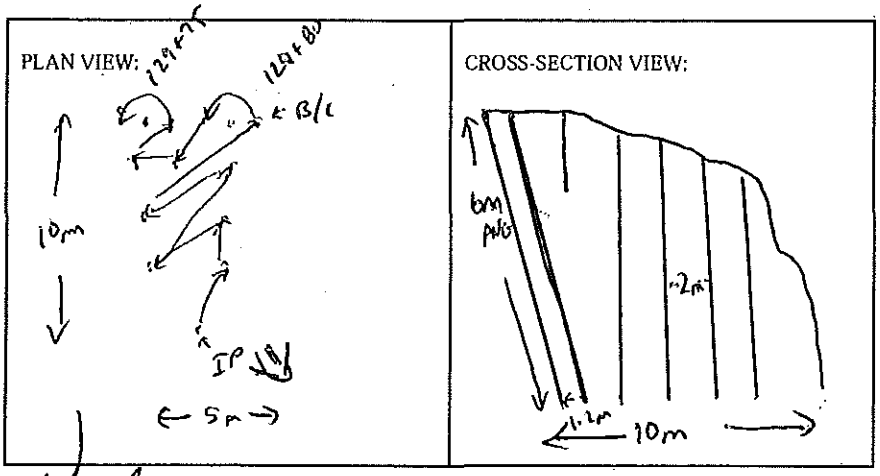
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13221 Cliffstone Crt - 0.12 ips / 37 Hz
@ 13167 Cliffstone Crt - 0.21 ips / 43 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Dec 2/4
ACTUAL BLAST DATE Dec 2/4 11:25AM
BLAST # MW-0025

HIGHWAY# 97
BLAST LOCATION AT: 129+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 36 11/18 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

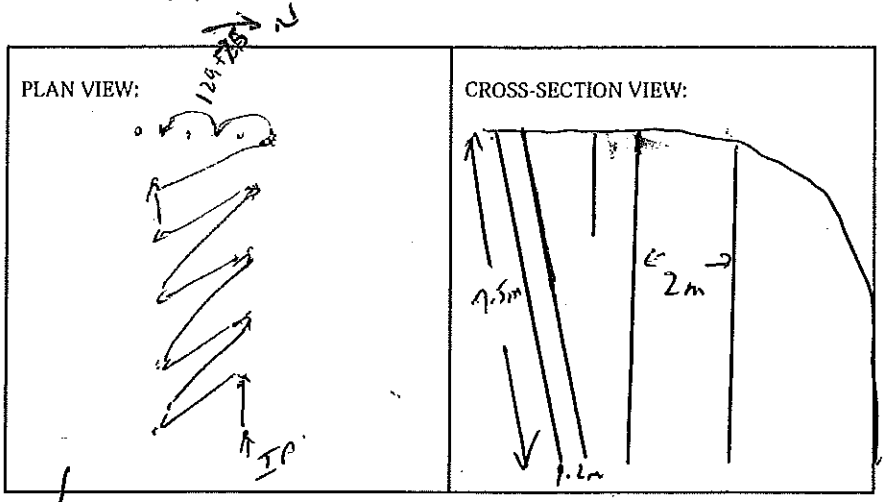
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL IN-DATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffside ent - 0.20 ips / 47Hz
@ 13093 Cliffside ent - 0.17 ips / 23Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Dec 2/11
ACTUAL BLAST DATE Dec 2/11 1:12 PM
BLAST # MW-0026

HIGHWAY# 97
BLAST LOCATION AT: 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

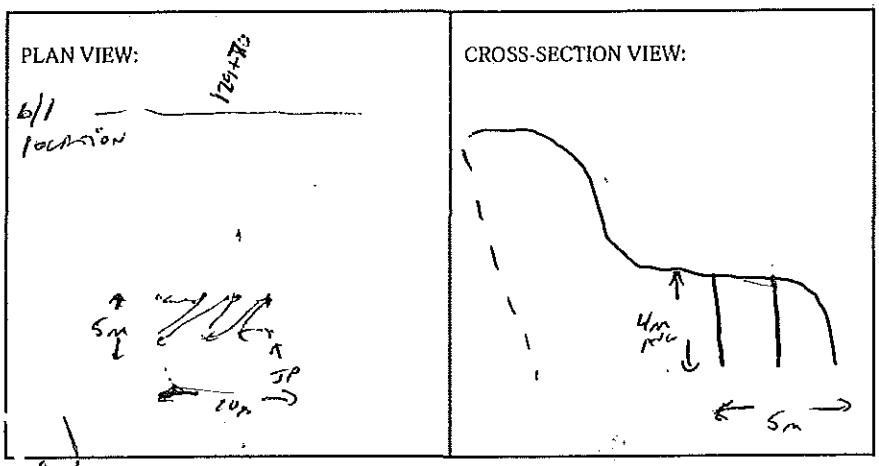
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3) → P

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffside cut - 0.19 ips / 39 Hz
@ 13093 cliffside cut - 0.15 ips / 32 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5334489

DATE PREPARED Dec 2/11
ACTUAL BLAST DATE Dec 2/11 2:54 PM
BLAST # MW-0027

HIGHWAY# 97
BLAST LOCATION AT: Stn 129+71

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 (3 loaded) TOTAL NUMBER OF HOLES 36/11 / 6 Presp.
AVERAGE DEPTH 6.5 (m) HOLE DIAMETER 76 (mm)
NUMBER OF ROWS 2 HOLE SPACING 2 (m) BURDEN 2 (m)
MAXIMUM DEPTH 6.6 (m) HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
TOTAL DEPTH 54 (m)

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL NUMBER OF CARTRIDGES 9 TOTAL WEIGHT 25 (kg)
TOTAL NUMBER OF DELAYS 9 DELAY TYPE AND LENGTH 25 (ms)

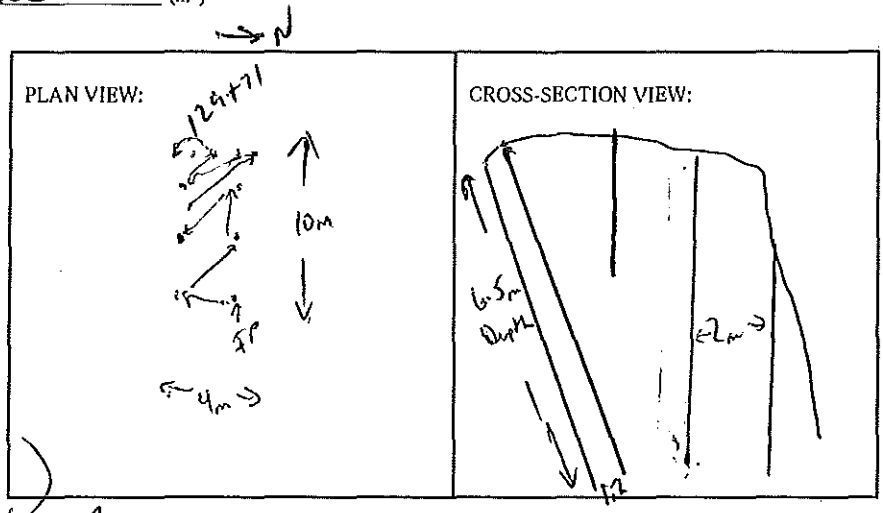
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESC Initiation by Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.151pc/47.1Hz
@ 13093 Cliffstone Crt - 0.171pc/23Hz

Windley Contracting (2010) Ltd.
3711 Shenton Road, Nanaimo, BC, V9T 2H1
Tel: 250 758-3411 Fax: 250 758-0917

Quality Inspection Checklist

Survey Layout

SP 1.26

project: Highway 97 Four Laning - Winfield to Oyama date: _____

location/ range: _____

Start-up, Hold Points

Hold points established when NO checked below.

description	*notes*	*compliance*		
		yes	*no*	*n/a*
type of survey task...				
necessary drawings and files obtained, current and correct				
previous task completed and ready for this work to proceed				
necessary parties reviewed, discussed and understand start-up/ hold points noted				

Execution

description	*notes*	*compliance*		
		yes	*no*	*n/a*
performed as per "Appendix - Survey Layout Services and Products"				
archaeological finds - stop, identify location, notify Archaeologist				
Archaeological sites to be located (Q1-00-082)				
Existing utilities to be located (Q1-00-084)				
ESAs to be located				
adjacent property have specific requirements to be performed?				
they are...				

production

layout completed	*MoTI control used*	*comments, notes, checks*

Close Out

description	*notes*	*compliance*		
		yes	*no*	*n/a*
was work performed within tolerances				

Name: _____ date: _____

Signed _____

Windley Contracting (2010) Ltd.
3711 Shenton Road, Nanaimo, BC, V9T 2H1
Tel: 250 758-3411 Fax: 250 758-0917

Quality Inspection Checklist

Survey Layout

SP 1.26

project: Highway 97 Four Laning - Winfield to Oyama date:

location/ range:

Start-up, Hold Points

Hold points established when NO checked below.

description	*notes*	*compliance*		
		yes	*no*	*n/a*
type of survey task...				
necessary drawings and files obtained, current and correct				
previous task completed and ready for this work to proceed				
necessary parties reviewed, discussed and understand start-up/ hold points noted				

Execution

description	*notes*	*compliance*		
		yes	*no*	*n/a*
performed as per "Appendix - Survey Layout Services and Products"				
archaeological finds - stop, identify location, notify Archaeologist				
Archaeological sites to be located (Q1-00-082)				
Existing utilities to be located (Q1-00-084)				
ESAs to be located adjacent property have specific requirements to be performed?				
they are...				

production

layout completed	*MoTI control used*	*comments, notes, checks*

Close Out

description	*notes*	*compliance*		
		yes	*no*	*n/a*
was work performed within tolerances				

Name: date:

Signed

Form No.: Q1-00-080

PROPOSED BLAST DESIGN
~~AS-BUILT~~ ~~BLASTING RECORD~~
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B34B9

DATE PREPARED Nov 30/11
PROPOSED ~~ACTUAL~~ BLAST DATE Nov 30/11
BLAST # 117

HIGHWAY# 97
BLAST LOCATION AT: 147+35 - 147+80 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 45 (m)
ROCK TYPE ALLEGED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 325 (m)

DRILLING DETAILS: * every 2nd 6/1 hole to be loaded w/200gr det-cord.

NUMBER OF BACKLINE HOLES 59
AVERAGE DEPTH 9.5 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 1350 (m)

TOTAL NUMBER OF HOLES 596/11 BY PROD.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 140
TOTAL NUMBER OF DELAYS 110

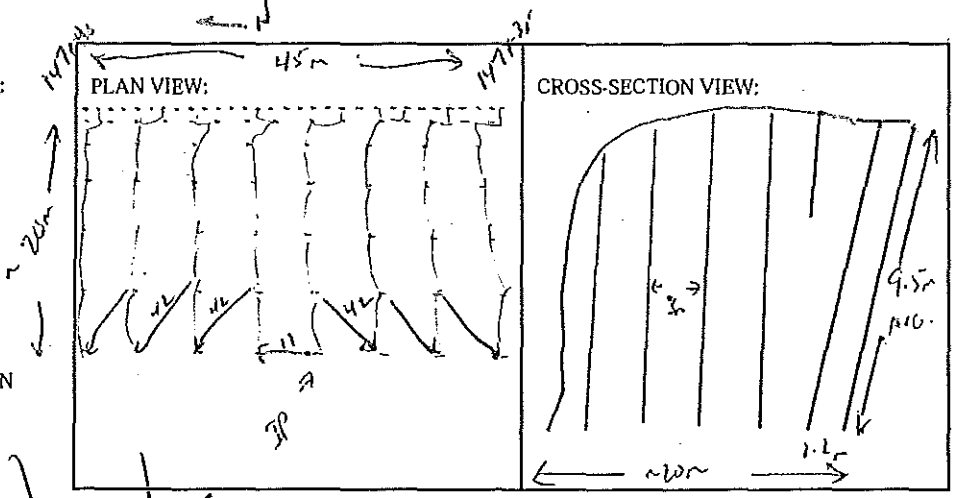
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 3500 (kg)
DELAY TYPE AND LENGTH _____ (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 7,000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

BLASTING CONSULTANT: D. FISHER, FISHER ROCK ENG.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED NOV 30/4
ACTUAL BLAST DATE NOV 30/4 3:40 PM
BLAST # 117

HIGHWAY# 97
BLAST LOCATION AT: STN 147+25 - 147+80 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 55' (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

DRILLING DETAILS: 4 every 2nd hole loaded w/200 grain det. cord

NUMBER OF BACKLINE HOLES 74
AVERAGE DEPTH 9.5 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 1550 (m)

TOTAL NUMBER OF HOLES 74H1+ 96P200.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 15° DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 133
TOTAL NUMBER OF DELAYS 110

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 3725 (kg)
DELAY TYPE AND LENGTH 25 & 42 (ms)

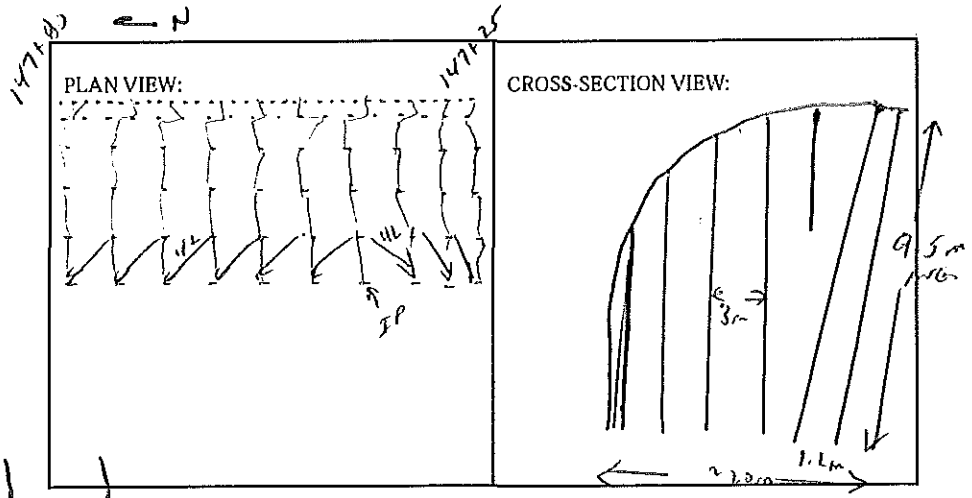
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 7,500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5334489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 11:44AM
BLAST # MW-0017

HIGHWAY# 97
BLAST LOCATION AT: 129+90 LT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notted

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 5 full + 5 Rmd
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

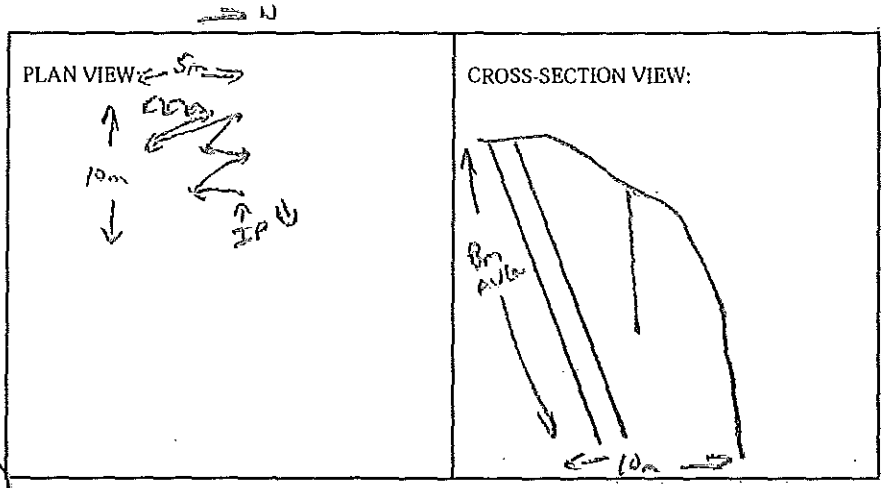
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffstone cnt. 0.11 ips / 32Hz
@ 13167 cliffstone cnt. 0.17 ips / 32Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/10
ACTUAL BLAST DATE Nov 29/10 1:23 PM
BLAST # MW-0018

HIGHWAY# 97
BLAST LOCATION AT: SPN 1291 85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ~~N/A~~ not noted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 1/4 (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 60 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

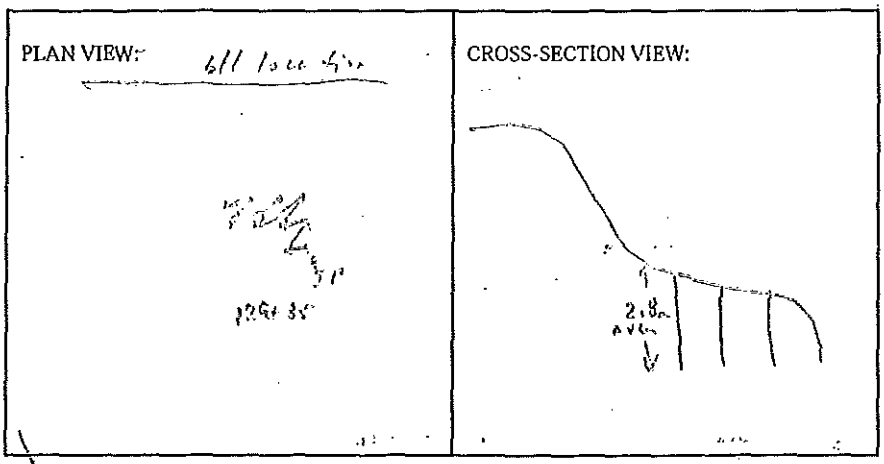
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13221 cliffstone crt - 0.12in/s 47 1/2
c 13157 cliffstone crt - 0.12in/s 43 1/2

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 03/11
PROPOSED BLAST DATE Dec. 05/11
BLAST # 122

HIGHWAY # 97
BLAST LOCATION AT: STN # 126+93 - 127+30 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 16 (m) SLOPE ANGLE 83 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 51
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 15
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 925 (m)

PROPOSED APPROX. NO. OF HOLES 51 B/L 134 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain Detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 185
PROPOSED NUMBER OF DELAYS 134

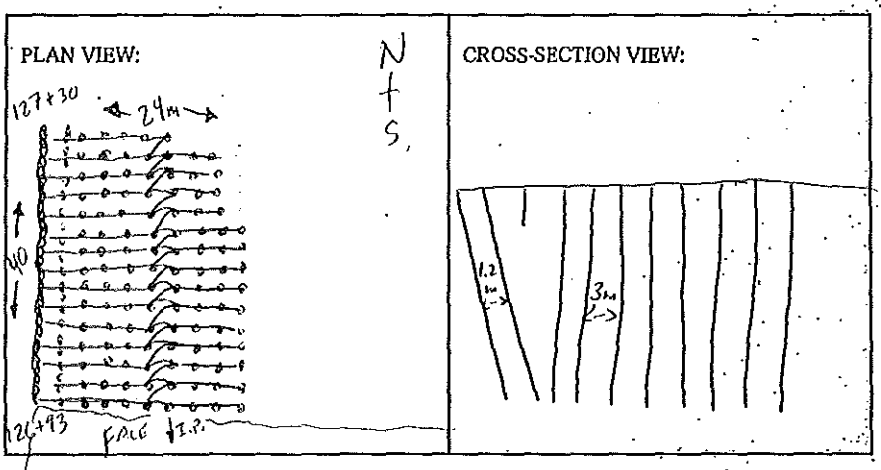
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4800 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 07/11
ACTUAL BLAST DATE Dec. 07/11
BLAST # 126

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+30 - 127+50 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 14 (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 260 (m)

TOTAL NUMBER OF HOLES 65 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

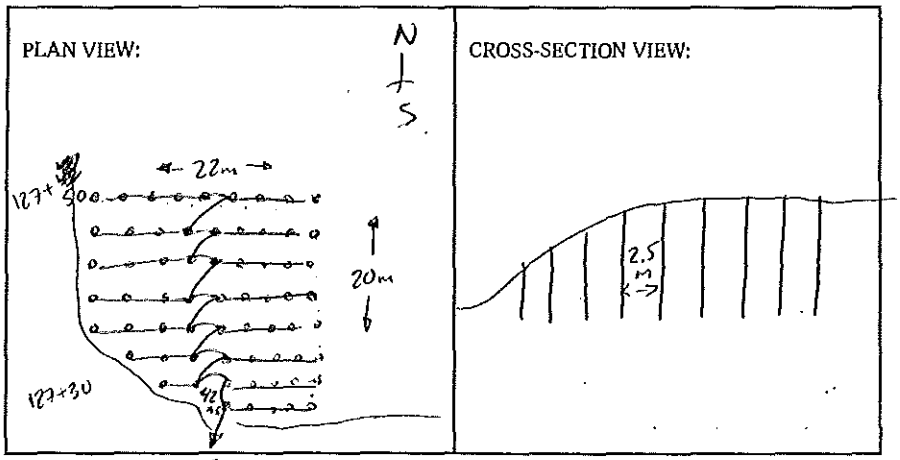
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1760 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 07/11
ACTUAL BLAST DATE Dec. 07/11
BLAST # 125

HIGHWAY# 97
BLAST LOCATION AT: STN # 114+00 - 113+70 LS (4th Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 6 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 28
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 380 (m)

TOTAL NUMBER OF HOLES 28 B/L / 48 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 76
TOTAL NUMBER OF DELAYS 48

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 625 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

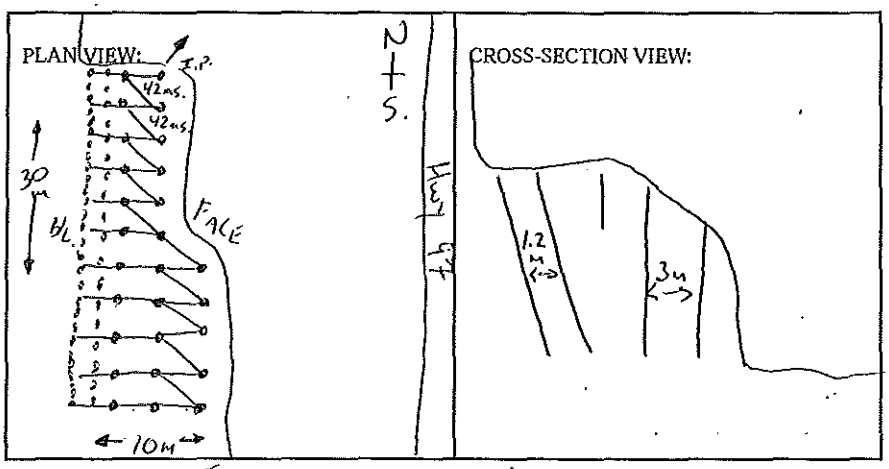
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 06/11
ACTUAL BLAST DATE Dec. 06/11
BLAST # 124

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+10 - 127+40 RS (1 Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY 8 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 29
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 760 (m)

TOTAL NUMBER OF HOLES 29 B/L / 72 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 101
TOTAL NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1800 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

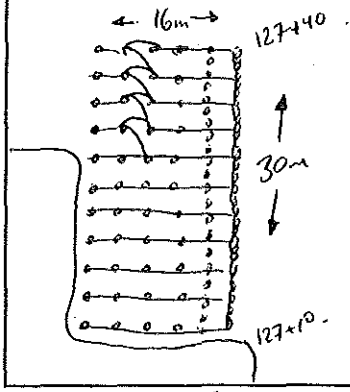
VOLUME OF ROCK BLASTED 3800 (m^3)

BLAST SKETCH:

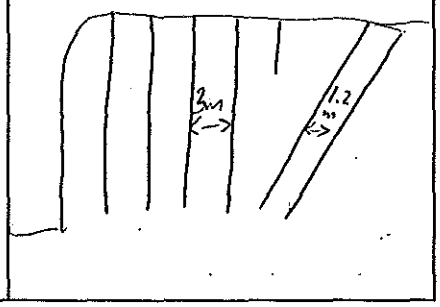
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 06/11
ACTUAL BLAST DATE Dec. 05/11
BLAST # 122

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+93 - 127+30 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 16 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 29
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 925 (m)

TOTAL NUMBER OF HOLES 29 B/L / 143 productions.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 172
TOTAL NUMBER OF DELAYS 143

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2150 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

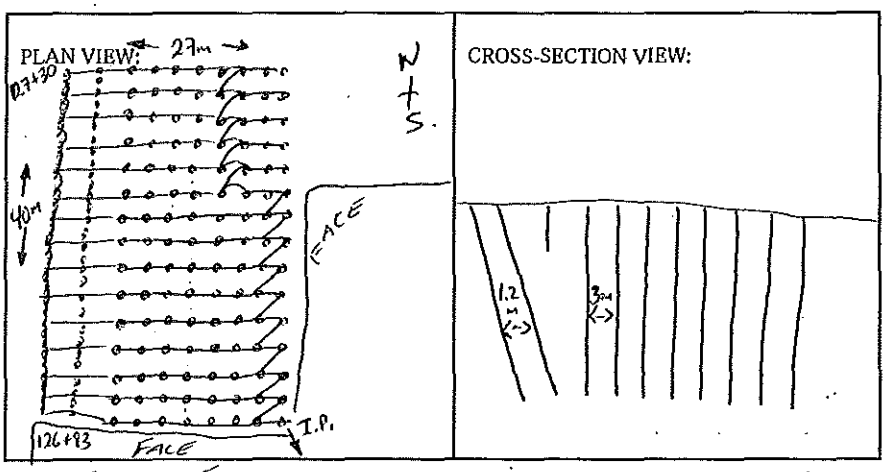
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 5200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 05/11
PROPOSED BLAST DATE Dec. 06/11
BLAST # 124

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+10 - 127+40 RS (1 Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 8 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 41
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 752 (m)

PROPOSED APPROX. NO. OF HOLES 41 B/L / 53 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 94
PROPOSED NUMBER OF DELAYS 53

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

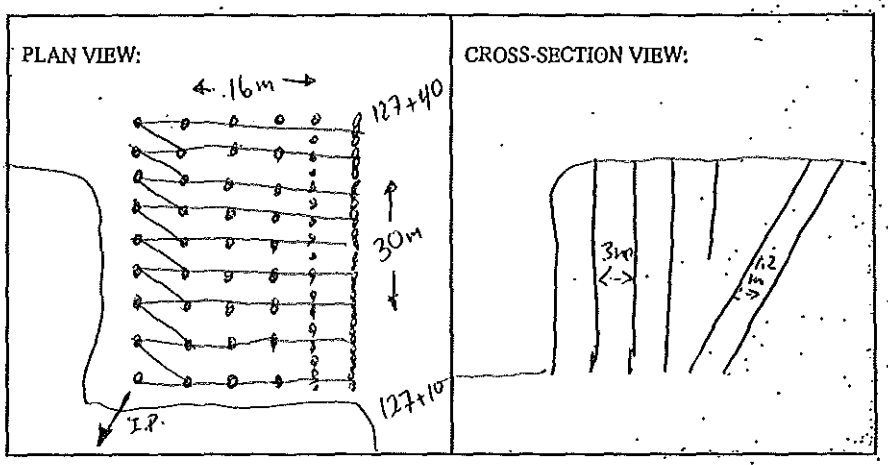
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 3800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mahoney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 06/11
PROPOSED BLAST DATE Dec. 07/11
BLAST # 125

HIGHWAY # 97
BLAST LOCATION AT: STN # 114+00 – 113+80 LS (4th Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 4 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 14
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 252 (m)

PROPOSED APPROX. NO. OF HOLES 28 production/14 B/L
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 42
PROPOSED NUMBER OF DELAYS 28

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

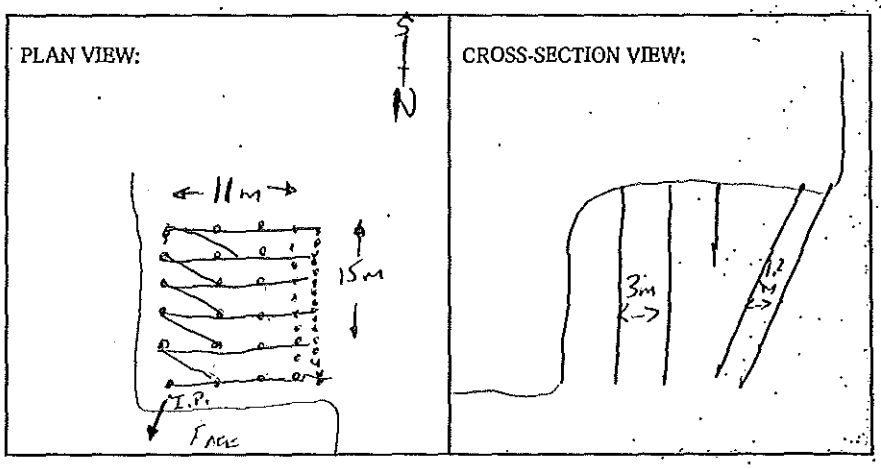
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mahoney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 06/11
PROPOSED BLAST DATE Dec. 07/11
BLAST # 126

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+30 - 127+50 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 14 (m) SLOPE ANGLE [illegible] (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 250. (m)

PROPOSED APPROX. NO. OF HOLES 50 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 50
PROPOSED NUMBER OF DELAYS 50

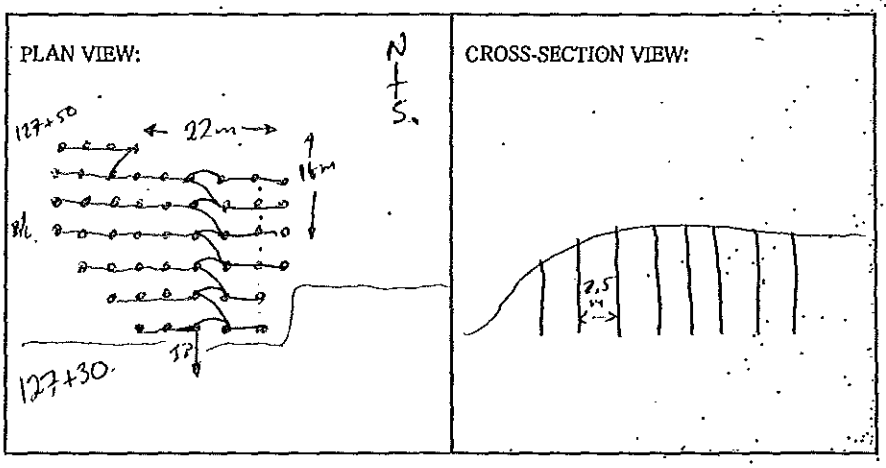
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1760 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 07/11
PROPOSED BLAST DATE Dec. 08/11
BLAST # 128

HIGHWAY# 97
BLAST LOCATION AT: STN # 113+70 - 113+50LS (4th Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 6 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 366 (m)

PROPOSED APPROX. NO. OF HOLES 25 B/L / 36 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 61
PROPOSED NUMBER OF DELAYS 36

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 600 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

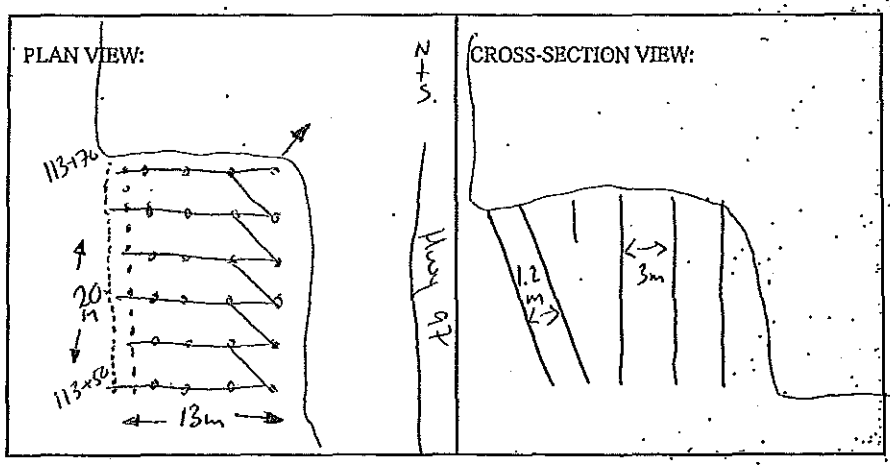
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1560 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James MacInney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 07/11
PROPOSED BLAST DATE Dec. 08/11
BLAST # 129

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+40 - 127+60 BS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY ~ (m) SLOPE ANGLE 0 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 200. (m)

PROPOSED APPROX. NO. OF HOLES 40
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 40
PROPOSED NUMBER OF DELAYS 40

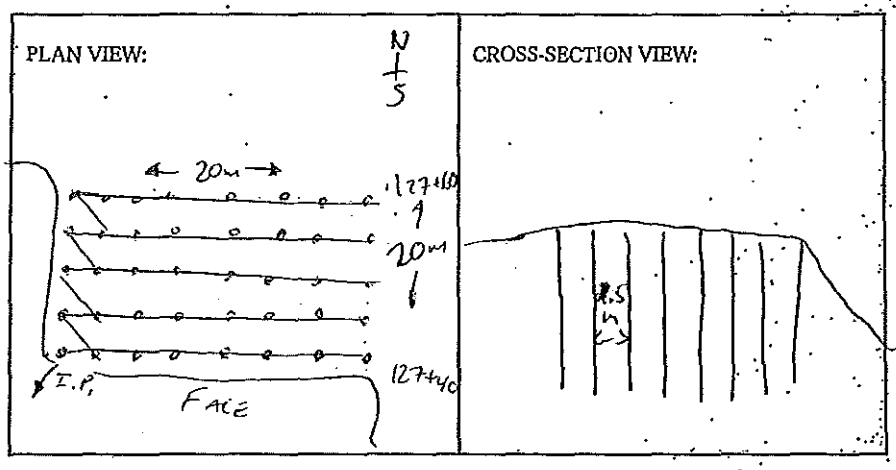
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 600 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Dec. 08/11
PROPOSED BLAST DATE Dec. 09/11
BLAST # 131

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 127+40-127+60 RS (1ST BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY ~ (m) SLOPE ANGLE ∅ (°) SLOPE LENGTH ∅ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6.
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 200. (m)
PROPOSED APPROX. NO. OF HOLES 40.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

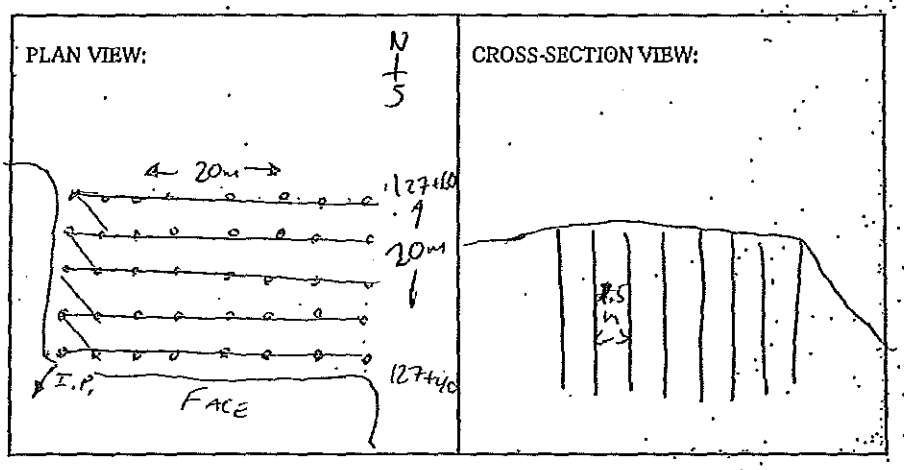
EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 40
PROPOSED NUMBER OF DELAYS 40
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 600 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mahoney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 12/11
ACTUAL BLAST DATE Dec. 12/11
BLAST # 133

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+40 - 127+65 RS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 306 (m)

TOTAL NUMBER OF HOLES 51 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 51
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 450 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

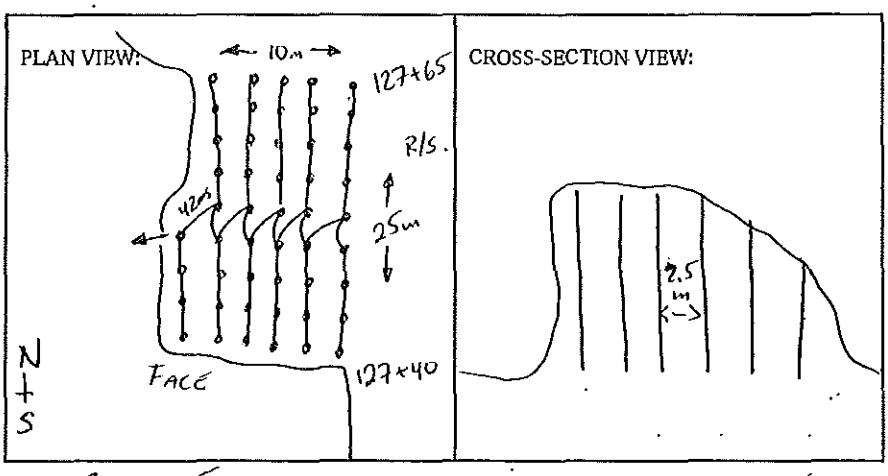
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 10/11
PROPOSED BLAST DATE Dec. 12/11
BLAST # 133

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+40 - 127+65 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 306 (m)

PROPOSED APPROX. NO. OF HOLES 51 Holes.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 51
PROPOSED NUMBER OF DELAYS 51

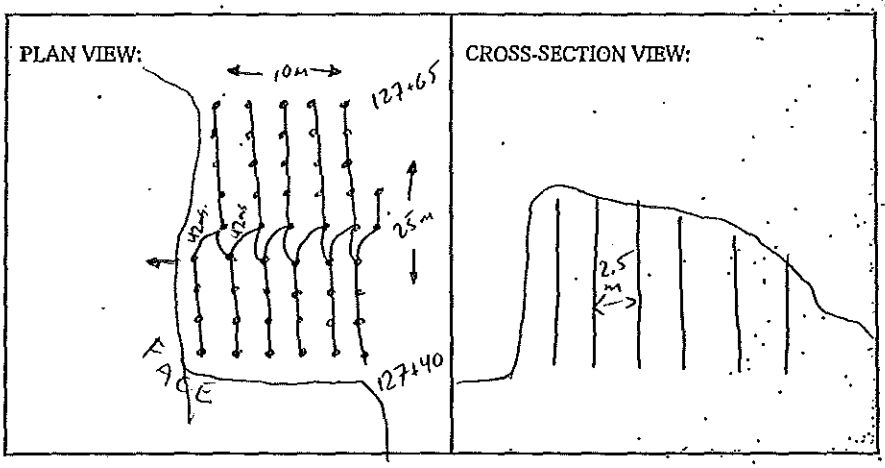
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 450 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1500. (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/11
ACTUAL BLAST DATE Dec. 12/11
BLAST # 134

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+65 – 127+85 RS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 35 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 35

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

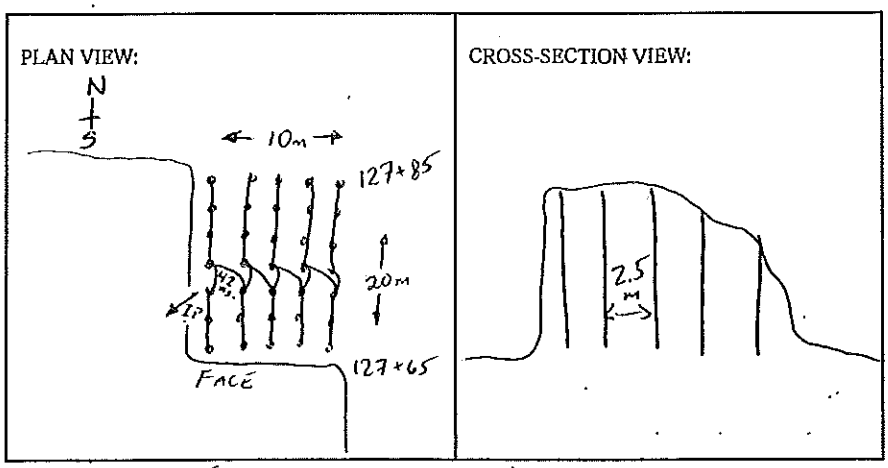
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Dec. 13/11
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE Dec. 13/11
BLAST # 135

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+90 – 128+00 (151 Beach) RS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE ~~65~~ 60 (°) SLOPE LENGTH 60 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH ~~110~~ 110 (m)

TOTAL NUMBER OF HOLES 40 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 40

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

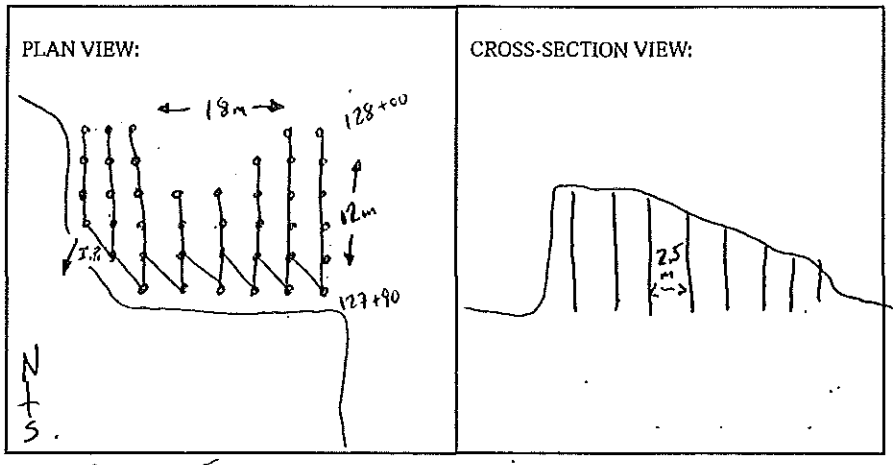
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 870 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/11
ACTUAL BLAST DATE Dec. 13/11
BLAST # 136

HIGHWAY# 97
BLAST LOCATION AT: STN # 113+10 - 113+30 RS (4th Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY 5 (m) · SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 350 (m)

TOTAL NUMBER OF HOLES 12 B/L / 47 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 59
TOTAL NUMBER OF DELAYS 47

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1375 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

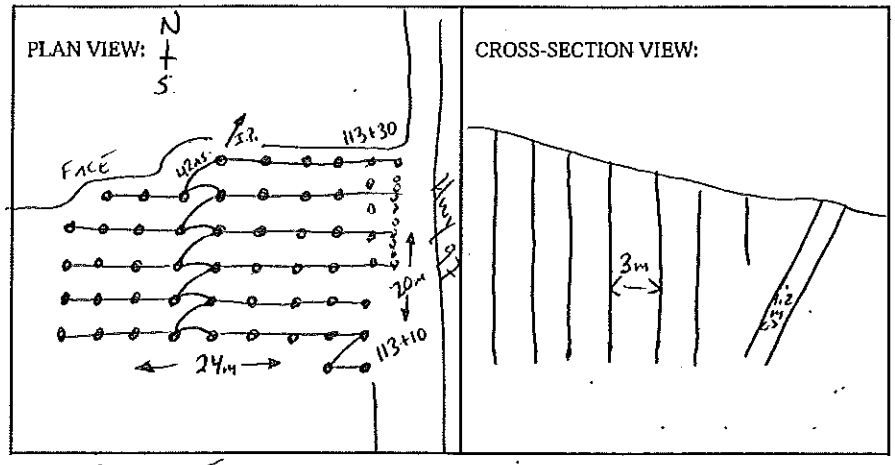
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 14/14
ACTUAL BLAST DATE Dec. 14/14
BLAST # 137

HIGHWAY# 97
BLAST LOCATION AT: STN # 147+80 - 148+10 RS (2nd Beach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 10 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 10.5 (m)
TOTAL DEPTH 620 (m)

TOTAL NUMBER OF HOLES 18 B/L / 51 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 69
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1850 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

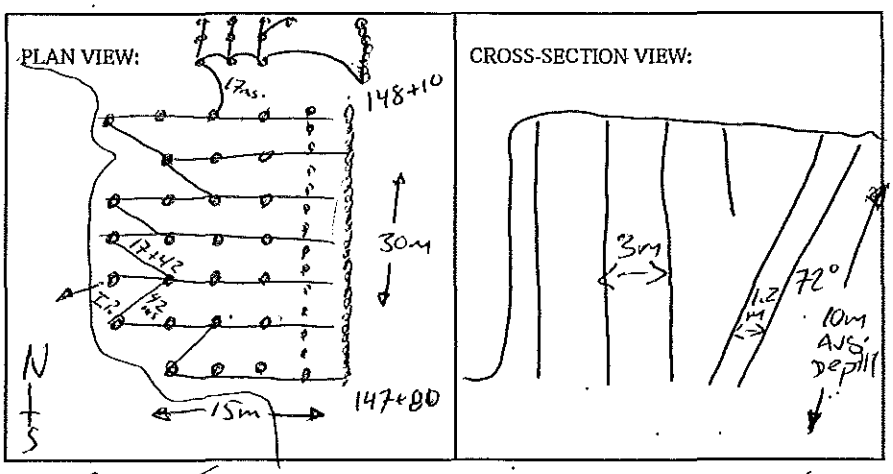
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 4500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Dec. 12/11
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE Dec 13/11
BLASTER'S NAME JAMES MALOHINNEY
BLAST # 135
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+90 - 128+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 222 (m)
PROPOSED APPROX. NO. OF HOLES 37 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 37
PROPOSED NUMBER OF DELAYS 37
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT — (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

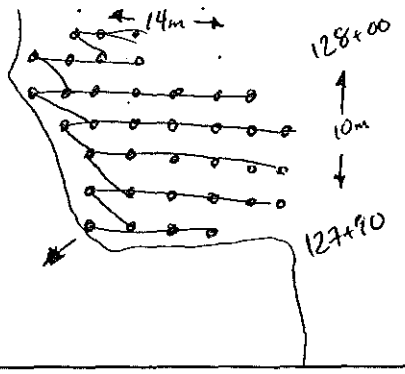
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 840 (m^3)

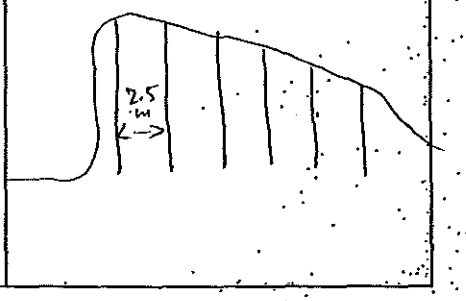
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 16/11
ACTUAL BLAST DATE Dec. 16/11
BLAST # 139

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+23 - 126+60 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 39 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) ~~800~~ 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 39
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 17
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 936 (m)

TOTAL NUMBER OF HOLES 101 production / 39 B/L
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 140
TOTAL NUMBER OF DELAYS 101

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

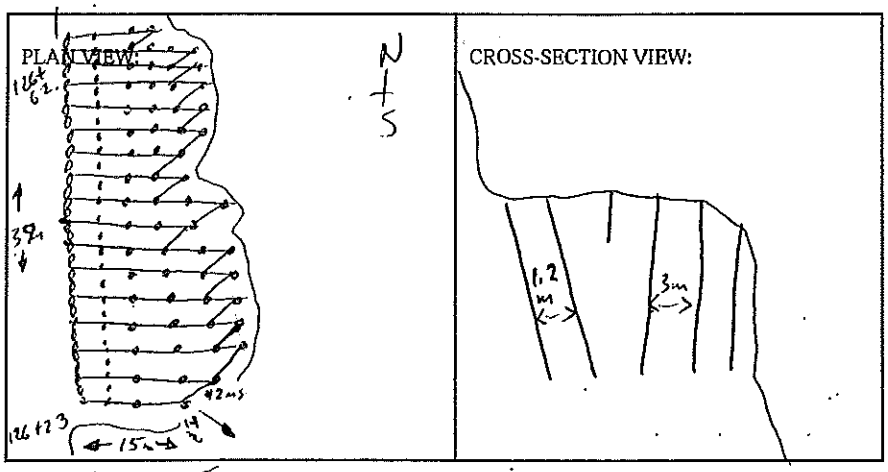
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED ~~4600~~ 4600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec 15/11
PROPOSED BLAST DATE Dec. 16/11
BLAST # 139

HIGHWAY # 97
BLAST LOCATION AT: STN # 126+23 – 126+60 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 37 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 50
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 15
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 736 (m)

PROPOSED APPROX. NO. OF HOLES 50 B/L / 67 production
HOLE DIA. 100 (min)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 417
PROPOSED NUMBER OF DELAYS 67

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

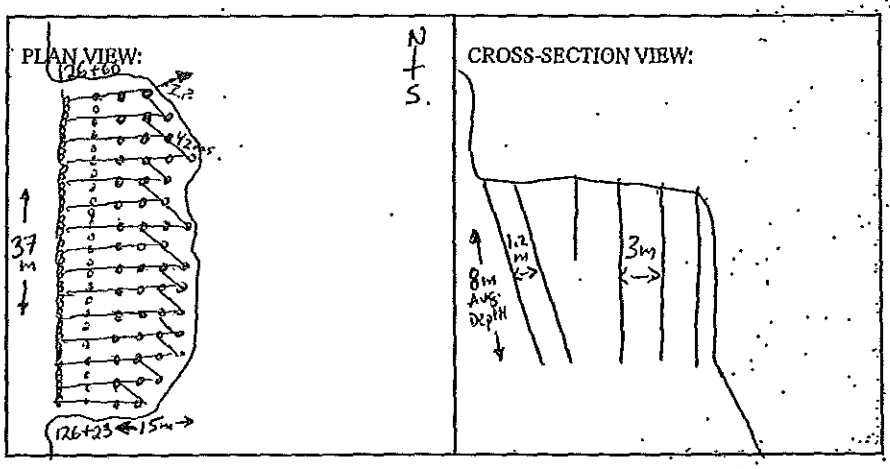
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Malohinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 19/11
PROPOSED BLAST DATE Dec. 20/11
BLAST # 142

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+80 - 127+10 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 284 (m)

PROPOSED APPROX. NO. OF HOLES 46 production/25 B/L.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 71
PROPOSED NUMBER OF DELAYS 46

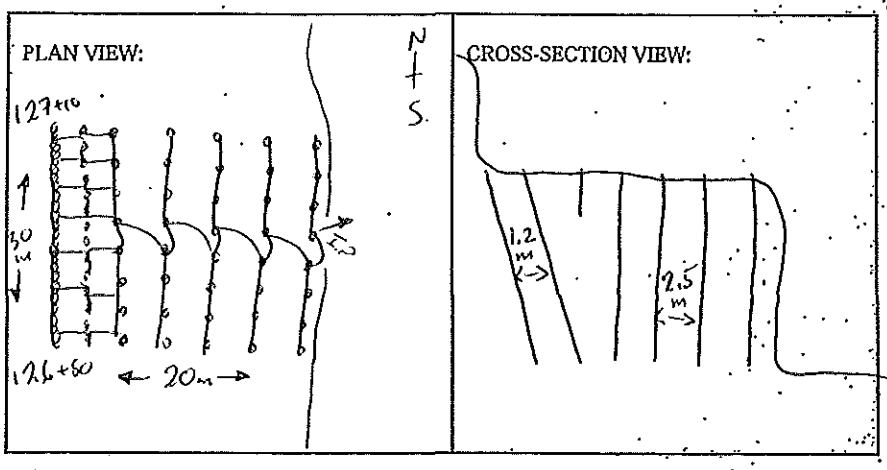
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Malohinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 3/12
ACTUAL BLAST DATE JAN. 3/12
BLAST # 146

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+35 - 127+45 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 234 (m)

TOTAL NUMBER OF HOLES 10 B/L / 29 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 39
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

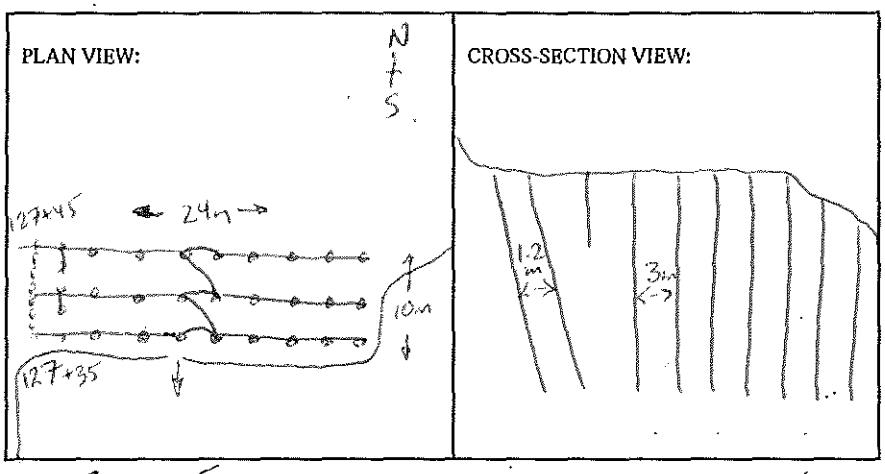
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Jan. 4/12
ACTUAL BLAST DATE Jan. 4/12
BLAST # 148

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+45 - 127+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 9 B/L / 21 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
~~* Every 2nd B/L Hole Loaded with 200 grain det cord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 525 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

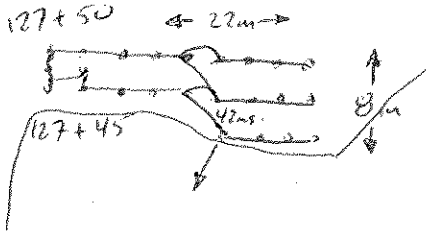
VOLUME OF ROCK BLASTED 1240 (m^3)

BLAST SKETCH:

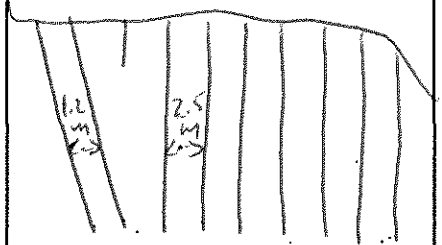
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 4/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE JAN 4/12
BLASTER'S NAME James MacWhinney
BLAST # 149
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+50 - 127+55 Ls (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 189 (m)

TOTAL NUMBER OF HOLES 9 B/L / 18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

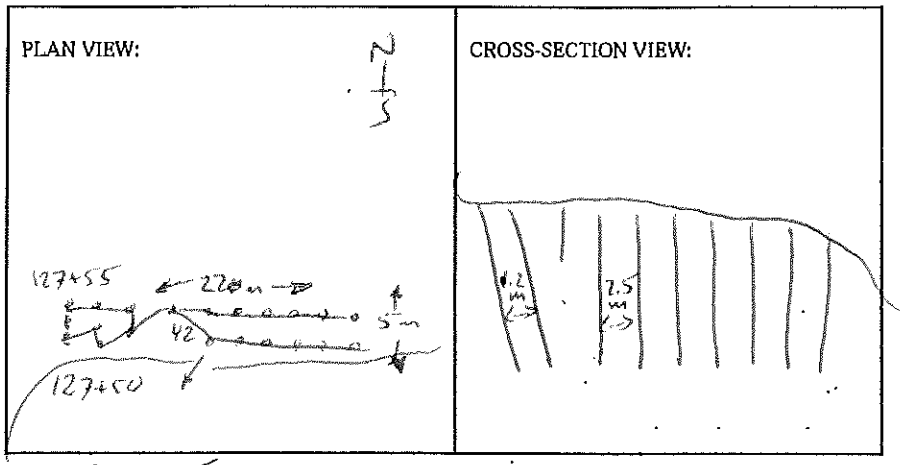
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 780 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAGHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 02/12
PROPOSED BLAST DATE JAN. 03/12
BLAST # ~~1218~~ 146

HIGHWAY# 97
BLAST LOCATION AT: STN# 127+35 - 127+45 (LS 2nd BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 234 (m)

PROPOSED APPROX. NO. OF HOLES 10 B/L / 29 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 39
PROPOSED NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

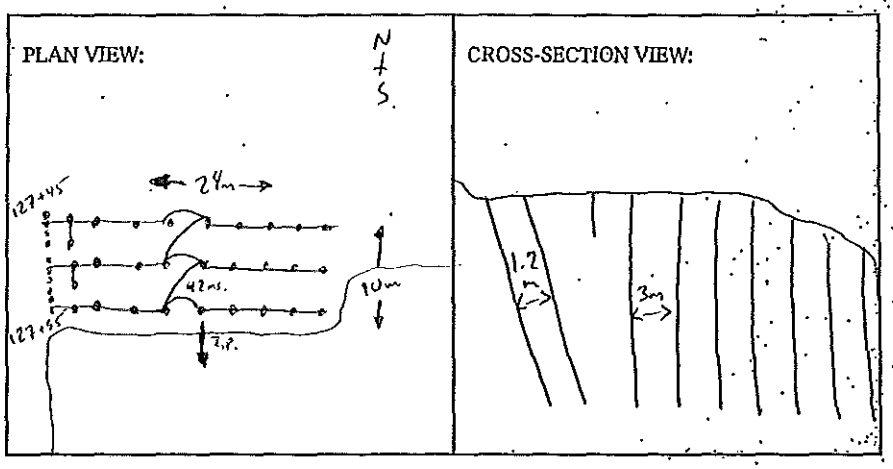
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1440 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Maghinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489
DATE PREPARED Jan 3/12
ACTUAL BLAST DATE Jan 3/12 2:39 PM
BLAST # 147

HIGHWAY # 97
BLAST LOCATION AT: L1400 SW 142+00 - 142+25

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 1.8 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 2.3 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 48 Prod
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.4 (m) BURDEN 2.4 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 48
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

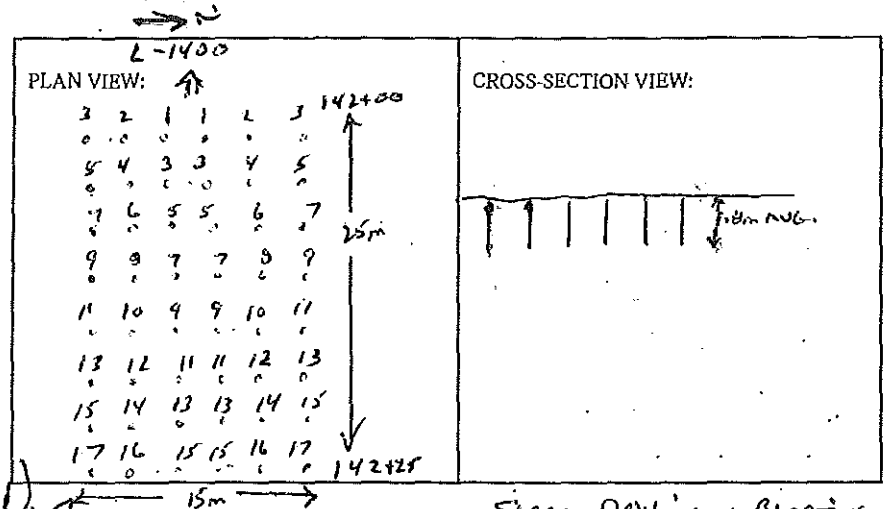
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 415-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 4/12
ACTUAL BLAST DATE Jan 4/12 12:02 PM
BLAST # 150

HIGHWAY# 97
BLAST LOCATION AT: Sta 149 - Blast for Fill Slope for Clearance.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION N/A Hwy Closure

SITE DETAILS:

HEIGHT ABOVE HWY 40 (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 165 (m)

TOTAL NUMBER OF HOLES 33
HOLE DIAMETER 89 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 33
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

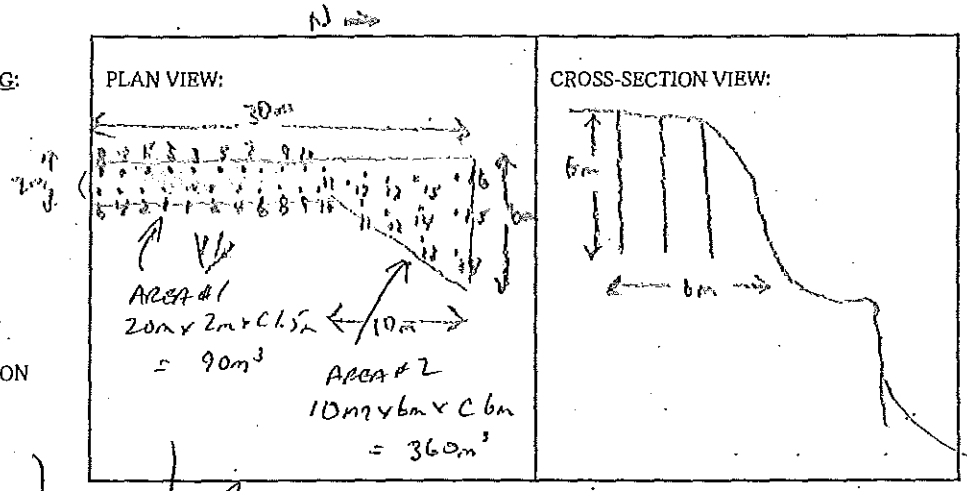
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 4/12
ACTUAL BLAST DATE Jan 14/12 4:29 PM
BLAST # 151

HIGHWAY# 97
BLAST LOCATION AT: 1400 SB 1402+40 - 1402+68

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Basalt Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 118 (m)

TOTAL NUMBER OF HOLES 84
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.3 (m) BURDEN 2.3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS 80

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 2000 (kg)
DELAY TYPE AND LENGTH 25 (ms)

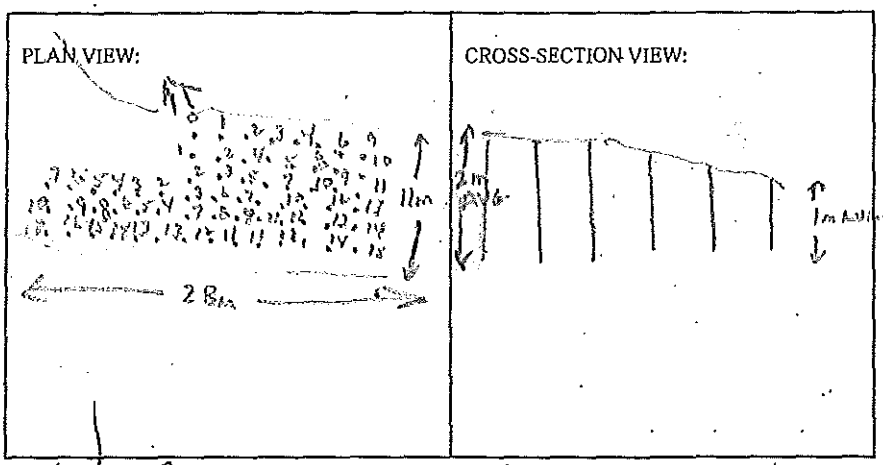
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 460 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 3/12
ACTUAL BLAST DATE JAN. 3/12
BLAST # 146

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+35 - 127+45 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 234 (m)

TOTAL NUMBER OF HOLES 10 B/L / 29 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 39
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

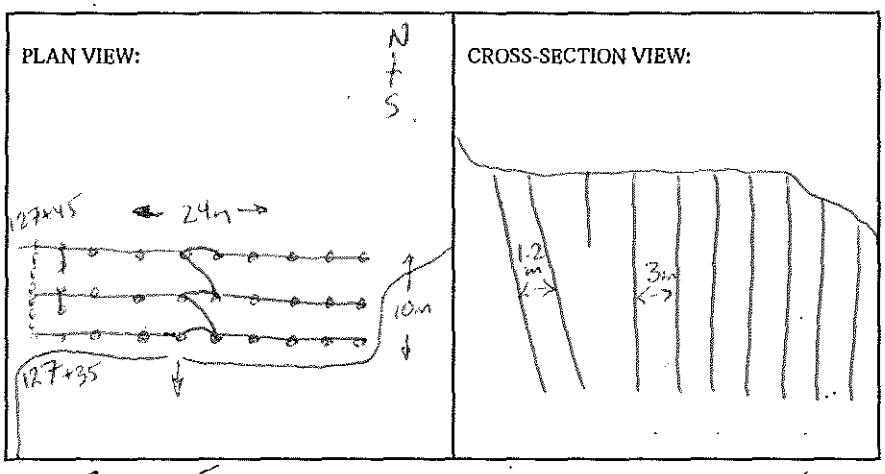
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Jan. 4/12
ACTUAL BLAST DATE Jan. 4/12
BLAST # 148

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+45 - 127+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 9 B/L / 21 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
~~* Every 2nd B/L Hole Loaded with 200 grain Det cord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 525 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

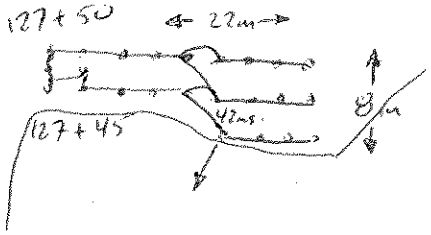
VOLUME OF ROCK BLASTED 1240 (m^3)

BLAST SKETCH:

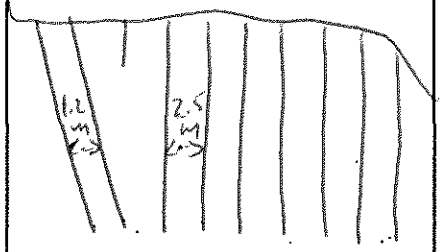
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 4/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE JAN 4/12
BLASTER'S NAME James MacWhinney
BLAST # 149
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+50 - 127+55 Ls (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 189 (m)

TOTAL NUMBER OF HOLES 9 B/L / 18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

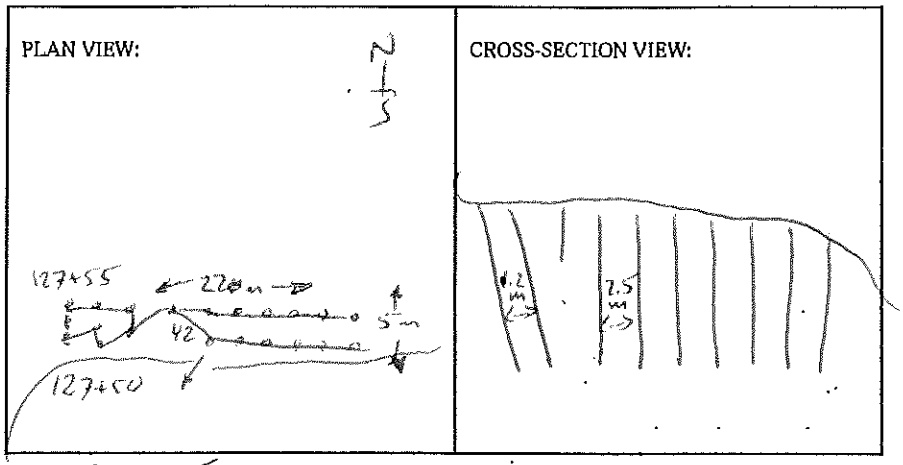
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 780 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOWINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan 4/12
PROPOSED BLAST DATE Jan. 4/12
BLAST # 149

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+50 - 127+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 189 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 18 production
HOLE DIA. 100 (min)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 27
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

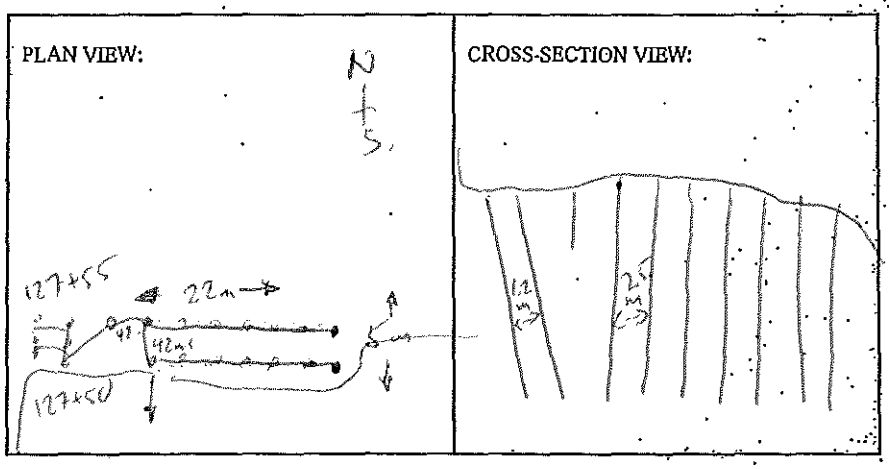
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 780 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malowinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 4/12
PROPOSED BLAST DATE Jan. 4/12
BLAST # 148

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+45 - 127+50 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9 B/L
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 210 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L/21 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/ two grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

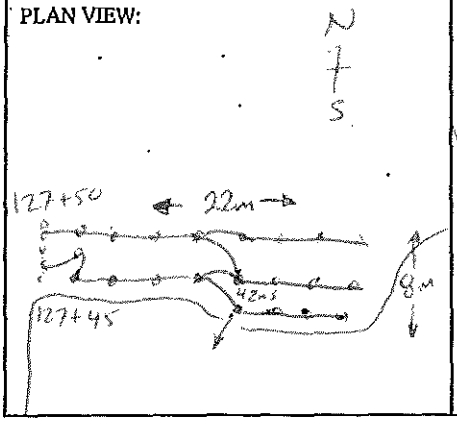
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1240 (m^3)

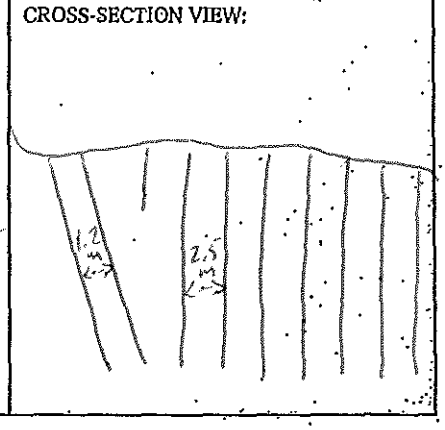
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 3/12
ACTUAL BLAST DATE JAN. 3/12
BLAST # 146

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+35 - 127+45 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 234 (m)

TOTAL NUMBER OF HOLES 10 B/L / 29 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 39
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

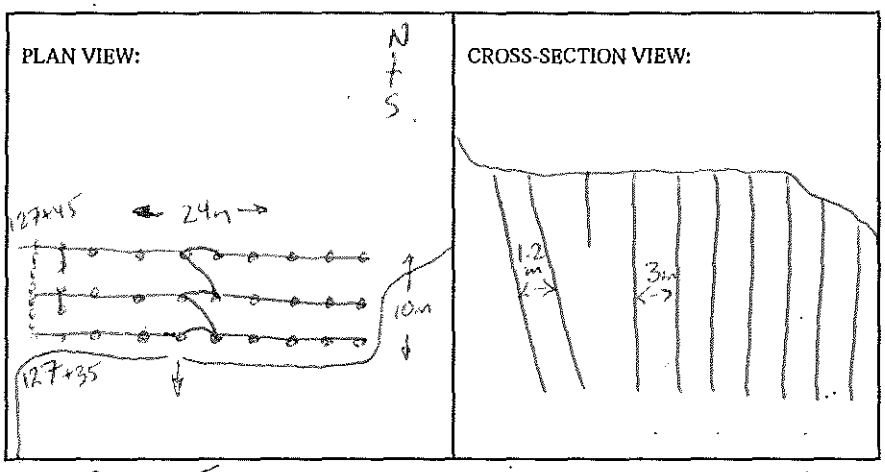
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Jan. 4/12
ACTUAL BLAST DATE Jan. 4/12
BLAST # 148

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+45 - 127+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 9 B/L / 21 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
~~* Every 2nd B/L Hole Loaded with 200 grain det cord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 525 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

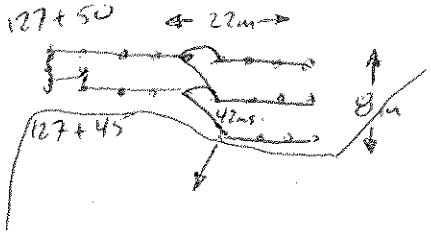
VOLUME OF ROCK BLASTED 1240 (m^3)

BLAST SKETCH:

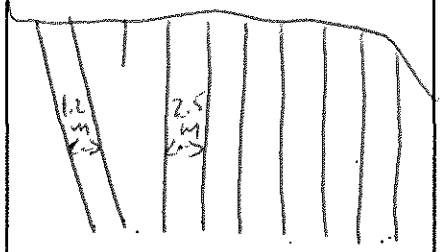
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 4/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE JAN 4/12
BLASTER'S NAME James MacWhinney
BLAST # 149
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+50 - 127+55 Ls (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 189 (m)

TOTAL NUMBER OF HOLES 9 B/L / 18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

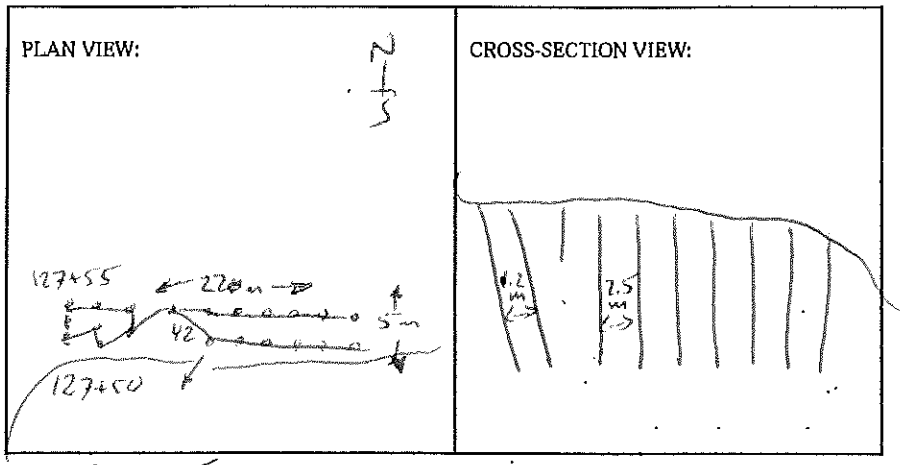
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 780 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOWINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan 4/12
PROPOSED BLAST DATE Jan. 4/12
BLAST # 149

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+50 - 127+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 189 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 18 production
HOLE DIA. 100 (min)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 27
PROPOSED NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

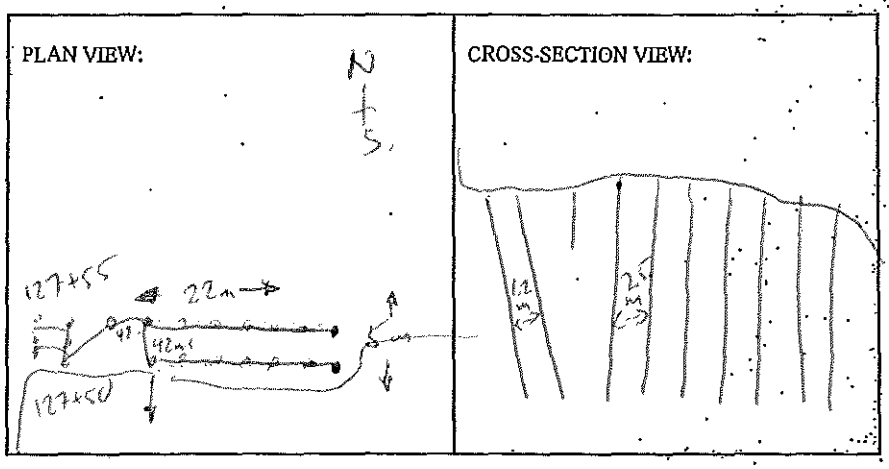
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 780 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malowinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 4/12
PROPOSED BLAST DATE Jan. 4/12
BLAST # 148

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+45 - 127+50 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9 B/L
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 210 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L/21 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/two grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

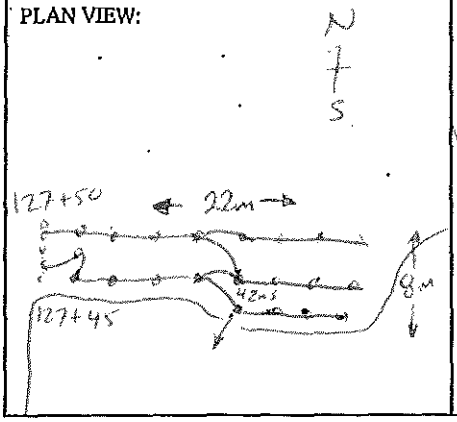
APPROX. VOLUME OF ROCK TO BE BLASTED 1240 (m^3)

PROPOSED BLAST SKETCH:

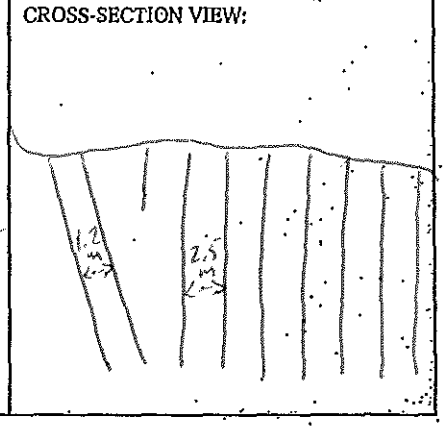
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 3/11
ACTUAL BLAST DATE Nov 3/11
BLAST # 83

HIGHWAY# 97
BLAST LOCATION AT: STN 125+80 - 126+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 26 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 25
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 8.8 (m)
TOTAL DEPTH 580 (m)

TOTAL NUMBER OF HOLES 25 blk + 35 Prod
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

4 every 2nd B/l hole loaded w/ Nonel det. cord,

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 50

EXPLOSIVE SIZE 58 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

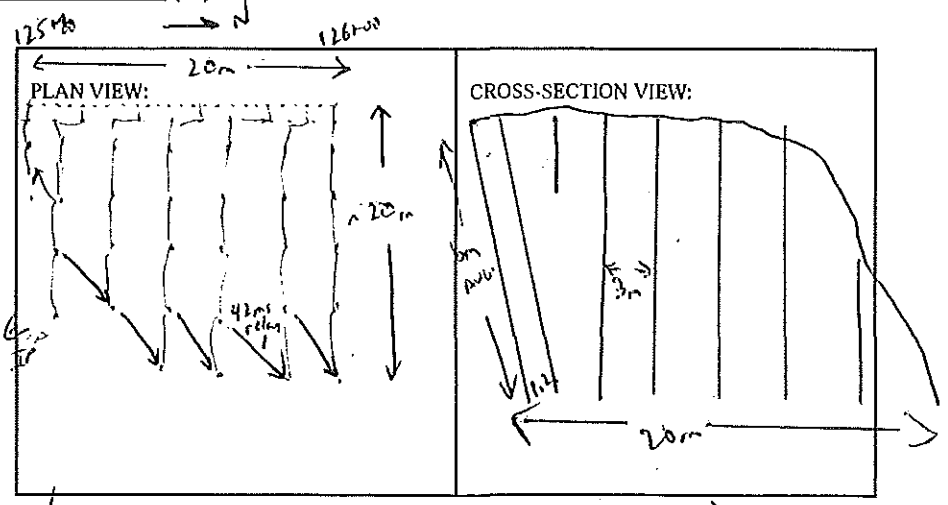
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HP320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21247-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Jeney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 2/11
PROPOSED BLAST DATE Nov 3/11
BLAST # #3

HIGHWAY # 97
BLAST LOCATION AT: STN 125+80 - 126+00 S TO NORTH

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 8.8 (m)
PROPOSED TOTAL DEPTH 580 (m)

PROPOSED APPROX. NO. OF HOLES 25 b/h 72 max.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

* every 2nd & 11 hole to be loaded w/ 1 emulsion cart. & cord.

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 100
PROPOSED NUMBER OF DELAYS 80

EXPLOSIVE SIZE 56 mm by 400 mm
APPROX. TOTAL WEIGHT 1,000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

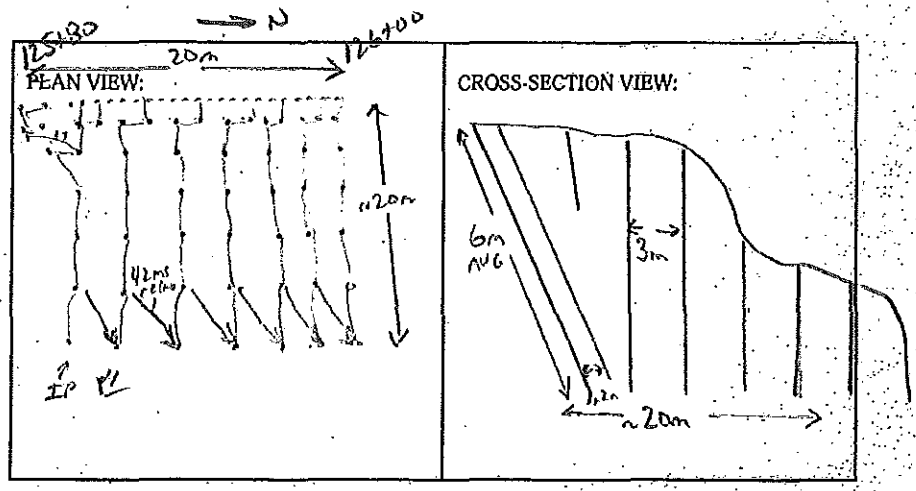
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EDC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 32a CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2,000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fiegen SIGNATURE _____ COMPANY Fiegen Rock Eng.

BLASTER'S SIGNATURE Wayne Jeney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vokey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 4/11
ACTUAL BLAST DATE Nov 4/11
BLAST # 85

HIGHWAY # 97
BLAST LOCATION AT: STN 126+80 - 126+20 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS: + every 2nd hole loaded w/ 20 grain det. cord.

NUMBER OF BACKLINE HOLES 26
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 165 (m)

TOTAL NUMBER OF HOLES 26 h/l + 30/row
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 56
TOTAL NUMBER OF DELAYS 45

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

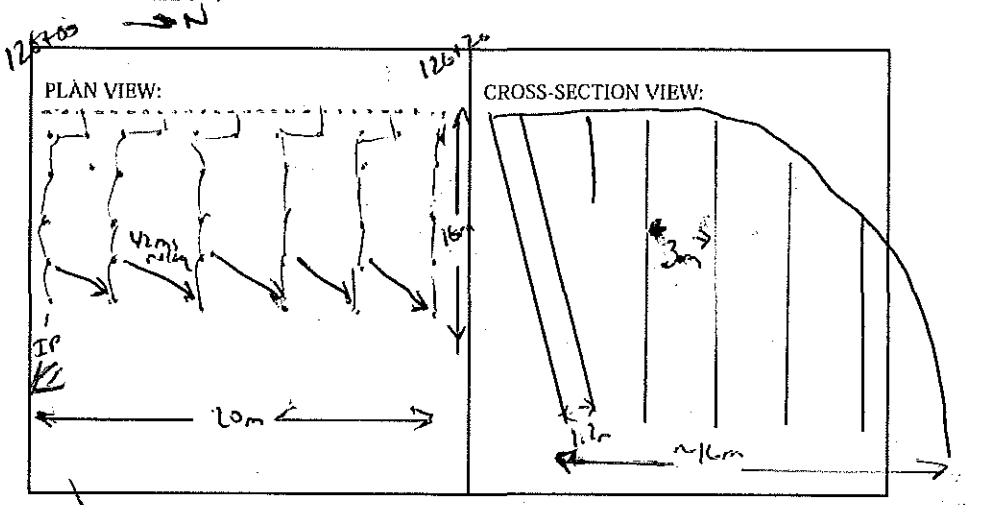
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESC Initiation of Nonel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 1300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vokey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21647-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vasseur
BLASTER'S CERTIFICATE NUMBER 5834987

DATE PREPARED Nov 3/11
PROPOSED BLAST DATE Nov 4/11
BLAST # 88

HIGHWAY # 97
BLAST LOCATION AT: STN 126+00 - 126+20 Lt (Top Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE altered granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS: * every 2nd hole to be loaded w/200 grain det. cord

PROPOSED NO. OF BACKLINE HOLES 24 PROPOSED APPROX. NO. OF HOLES 24 + 34 Perc
PROPOSED AVG. DEPTH 5 (m) HOLE DIA. 100 (mm)
PROPOSED NO. OF ROWS 6 APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED MAXIMUM DEPTH 6.5 (m) PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 210 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 58
PROPOSED NUMBER OF DELAYS 46

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

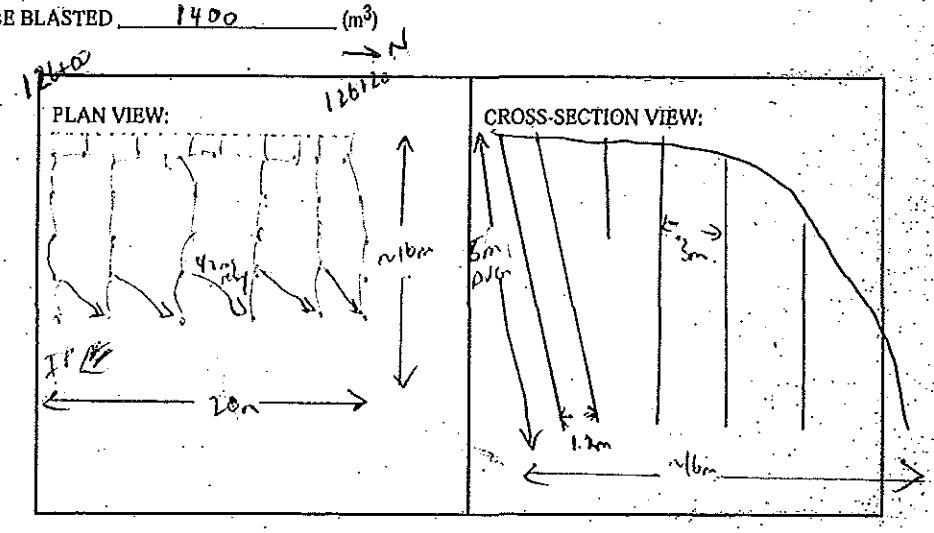
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fraser SIGNATURE _____ COMPANY Fraser Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 7/11
ACTUAL BLAST DATE Nov. 05/11
BLAST # 87

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+20 - 126+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300+ (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 156 (m)

TOTAL NUMBER OF HOLES ~~10~~ 10 B/L. /16 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/200 grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

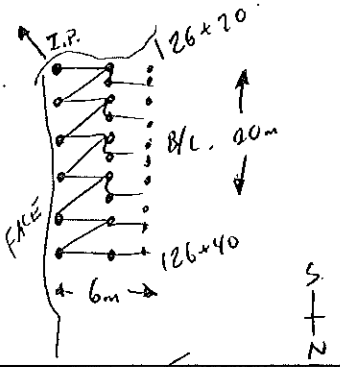
VOLUME OF ROCK BLASTED 720. (m^3)

BLAST SKETCH:

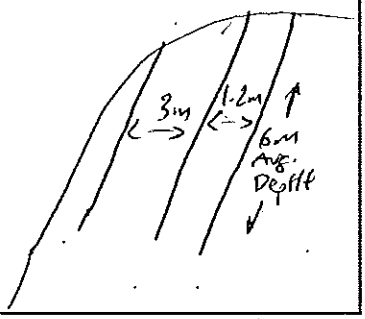
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED
~~AS-BUILT~~ BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 04/11
ACTUAL BLAST DATE Nov. 05/11
BLAST # 87

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+20 - 126+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 22
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 216 (m)

TOTAL NUMBER OF HOLES 22 B/L /16 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/ 200 grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 38
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 Caps

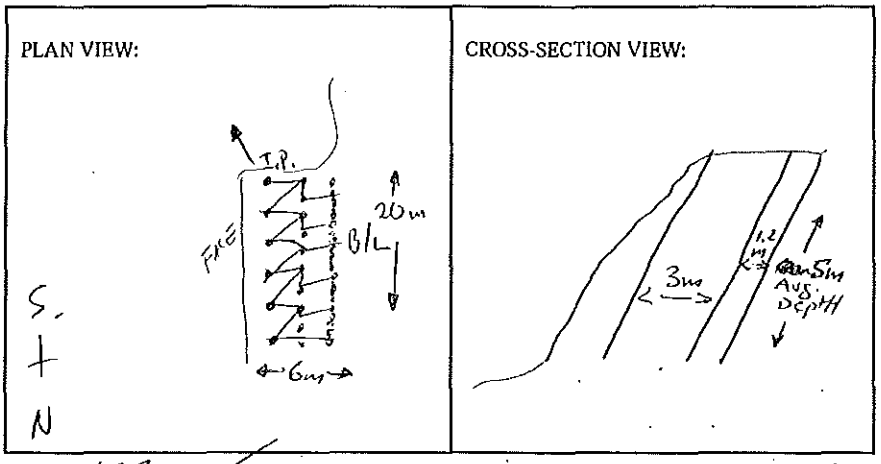
VOLUME OF ROCK BLASTED 720 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 8/11
ACTUAL BLAST DATE Nov. 7/11
BLAST # 89

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+48 - 126+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 22. (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 14 B/L / 31 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/200 grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 31

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

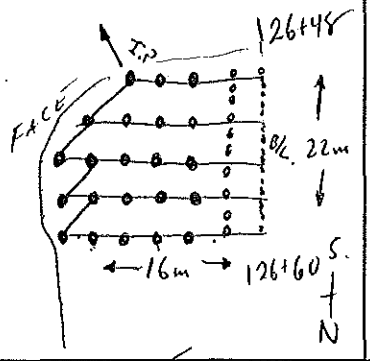
VOLUME OF ROCK BLASTED 2100 (m^3)

BLAST SKETCH:

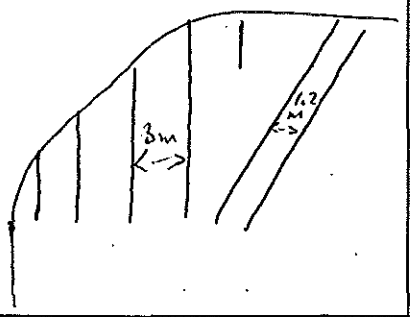
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 5/11
PROPOSED BLAST DATE Nov. 7/11
BLAST # 89

HIGHWAY# 97
BLAST LOCATION AT: STN# 126+45 - 126+55

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 16
PROPOSED AVG. DEPTH 6.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 240 (m)

PROPOSED APPROX. NO. OF HOLES 16 B/L / 21 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

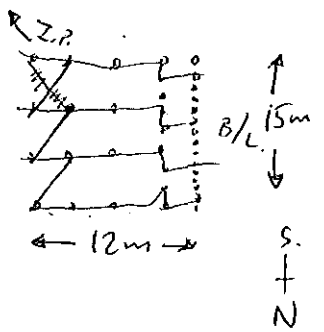
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1000 (m^3)

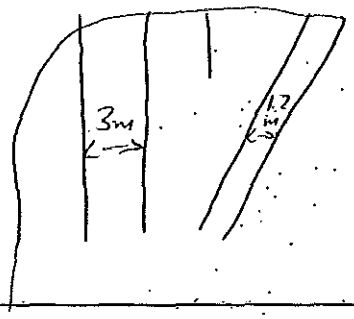
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 2.3497-00001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sloan Drilling + Blasting
BLASTER'S NAME Wayne Vedoy
BLASTER'S CERTIFICATE NUMBER 5837489

DATE PREPARED Nov 10/ 20
ACTUAL BLAST DATE Nov 10th 12:22 PM
BLAST # 34

HIGHWAY# 97
BLAST LOCATION AT: STN 126+60 - 126+90 LT (TOP Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 38
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 650 (m)

TOTAL NUMBER OF HOLES 384 / 156 holes / 9 rows / 36 Rem.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 90
TOTAL NUMBER OF DELAYS 85

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 652 (kg)
DELAY TYPE AND LENGTH 25 - 42 (ms)

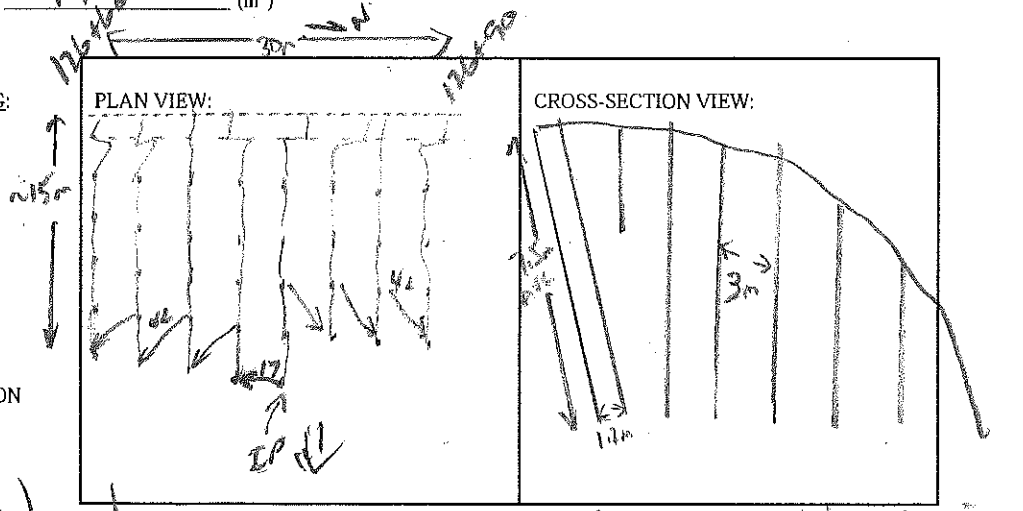
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) PBL Initiation of Nonel System
BLASTING MACHINE: TYPE HD 32 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 1900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW


126+60
30m
126+90
PLAN VIEW:
CROSS-SECTION VIEW:
45m
42
42
42

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Dewsnap
BLASTER'S CERTIFICATE NUMBER 5933489

DATE PREPARED Nov 9/11
PROPOSED BLAST DATE Nov 10/11
BLAST # 94

HIGHWAY# 97
BLAST LOCATION AT: 126+60 — 126+90 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Quartzite Granite Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 38
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 650 (m)

PROPOSED APPROX. NO. OF HOLES 38 BL / 15 BUFFER / 9 STAB / 36 PROD
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* every 2nd drill hole to be loaded w/ orange det. cord.

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamex ME Emulsion
APPROX. NUMBER OF CARTRIDGES 100
PROPOSED NUMBER OF DELAYS 85

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1200 (kg)
DELAY TYPE AND LENGTH 42 + 25 (ms)

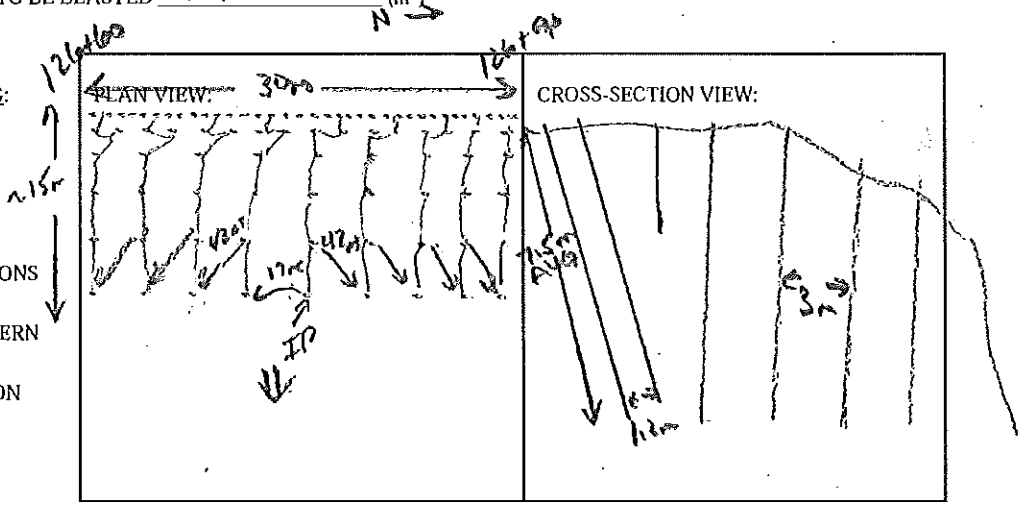
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation w/ Nonel connectors
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Holes

APPROX. VOLUME OF ROCK TO BE BLASTED 2400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME D. Fiesen SIGNATURE _____ COMPANY Fiesen Rock Eng.
BLASTER'S SIGNATURE Wayne Dewsnap COMPANY Sierra D+B
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 24/12
PROPOSED BLAST DATE Jul 24/12
BLAST # MW-0294

HIGHWAY # 97
BLAST LOCATION AT: SB 128+30 - 128+38 LS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 14 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 7.5 (m)
PROPOSED TOTAL DEPTH 126 (m)

PROPOSED APPROX. NO. OF HOLES 9B/L / 4 Buffer / 3 SMAB
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

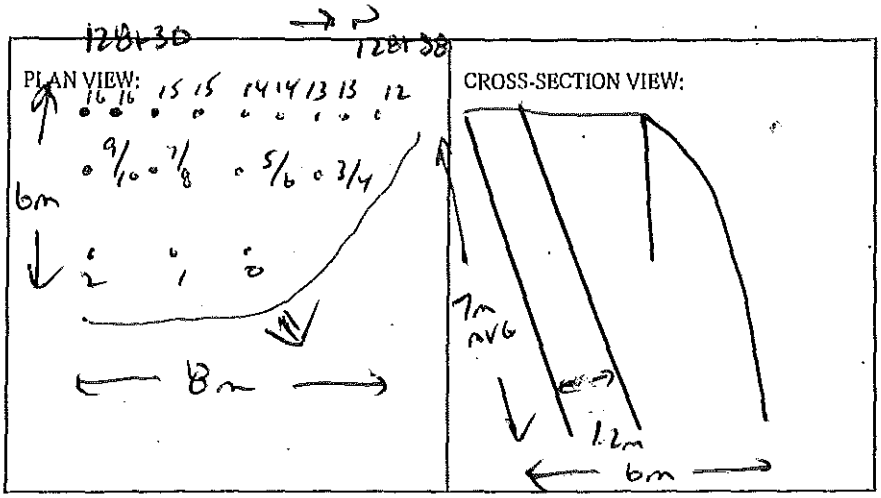
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-T-S 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED July 25/12
ACTUAL BLAST DATE July 25/12 10:30AM
BLAST # MW-0295

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+22 - 128+30 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 D/L/3 Buffer/3 smb
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE MV Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 13

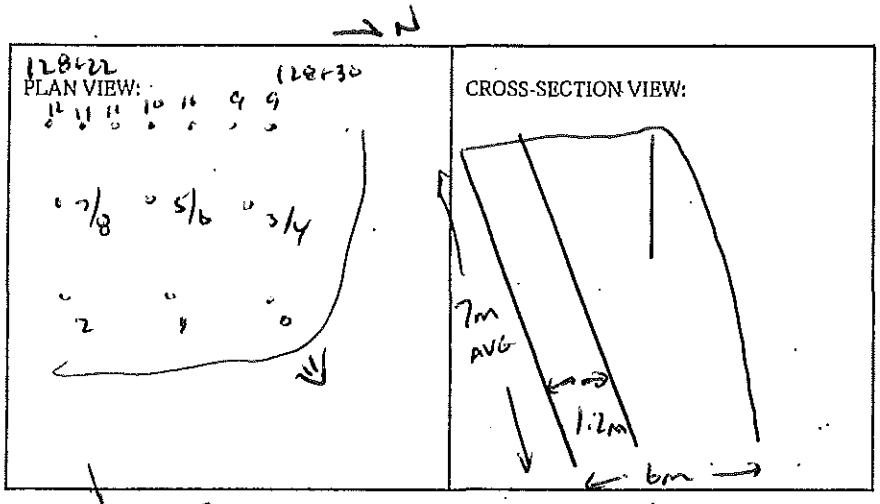
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 325 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD MISSION Rd - 0.14 ips / 39Hz
" @ 13167 C1: Offstore ent. - 0.060 ips / 37Hz
" @ 15073 C1: Offstore ent. 0.51 ips / 47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SR3480

DATE PREPARED Jan 6/12
PROPOSED BLAST DATE Jan 7/12
BLAST # 152

HIGHWAY# 97
BLAST LOCATION AT: L-1400 Stn 1402+70 = 1103+20

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS: * every 2nd b/l hole to be loaded w/200 grain det. cord

PROPOSED NO. OF BACKLINE HOLES 100 (50 to be loaded) PROPOSED APPROX. NO. OF HOLES 100 B/L / 76 PROD
PROPOSED AVG. DEPTH 7 (m) HOLE DIA. 150 (mm)
PROPOSED NO. OF ROWS 14 APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED MAXIMUM DEPTH 10 (m) PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 1200 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 130
PROPOSED NUMBER OF DELAYS 100

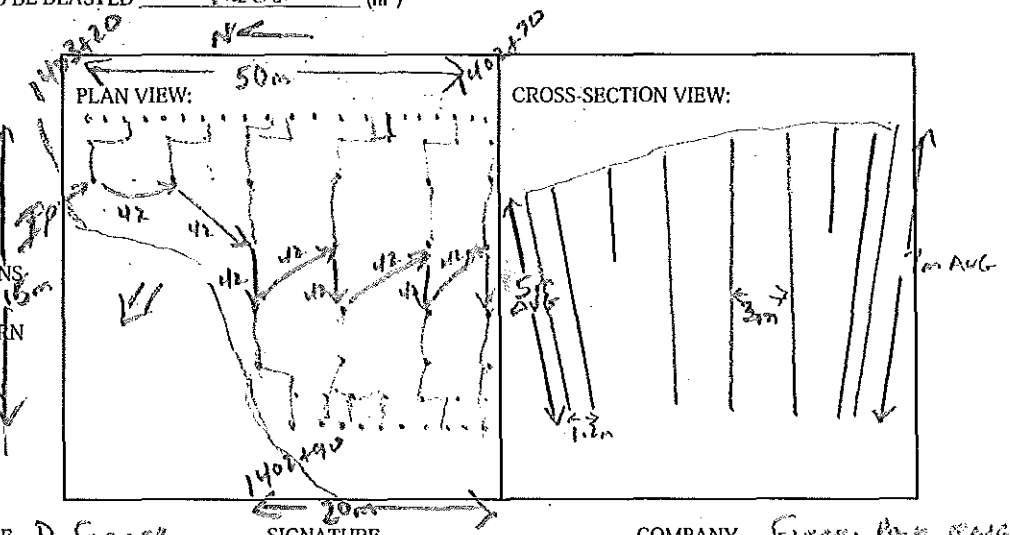
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 2100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME D. Fraser SIGNATURE _____ COMPANY Fraser Rock Eng.
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 7/2012
ACTUAL BLAST DATE JAN 7/2012 2:35 PM
BLAST # 152

HIGHWAY # 97
BLAST LOCATION AT: 7-1400 SW 140+720 - 140+820

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE ALASKA GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 107 (581 to 688) TOTAL NUMBER OF HOLES 107 611 / 81 (581 to 688)
AVERAGE DEPTH 7 (m) HOLE DIAMETER 100 (mm)
NUMBER OF ROWS 15 HOLE SPACING 3 (m) BURDEN 3 (m)
MAXIMUM DEPTH 10 (m) HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
TOTAL DEPTH 1300 (m)

BLAST DETAILS:

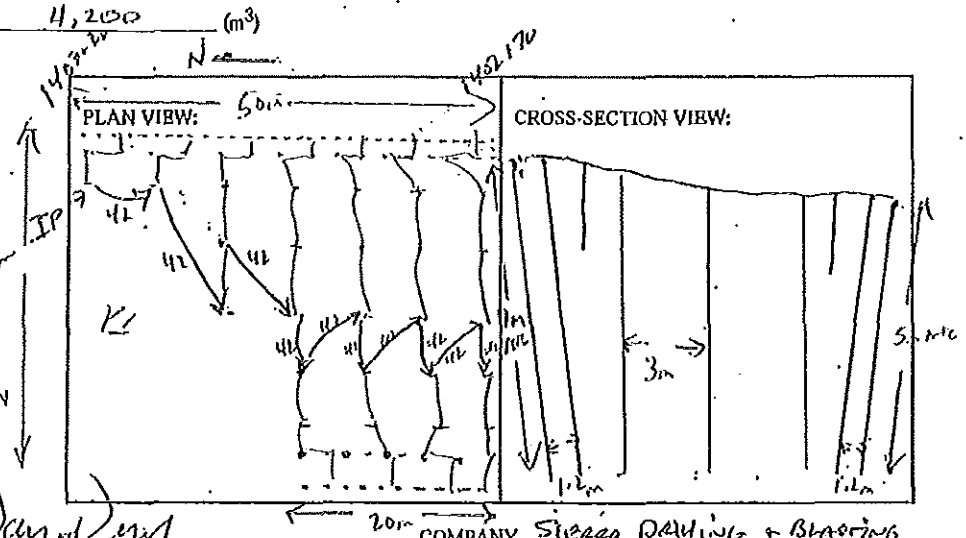
EXPLOSIVE TYPE 2" DYNAMITE FANFO EXPLOSIVE SIZE 50 mm by 410 mm
TOTAL NUMBER OF CARTRIDGES 139 TOTAL WEIGHT 1880 (kg)
TOTAL NUMBER OF DELAYS 105 DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC 10 (MAKERS OF NONEL SYSTEM)
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 CAPS

VOLUME OF ROCK BLASTED 4,200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 10/12
ACTUAL BLAST DATE JAN. 09/12
BLAST # 153

HIGHWAY# 97
BLAST LOCATION AT: STN # 112+20 - 112+40 - LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 22
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 144 (m)

TOTAL NUMBER OF HOLES 22 B/L / 11 Buffer / 41 productions.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 74
TOTAL NUMBER OF DELAYS 52

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 825 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

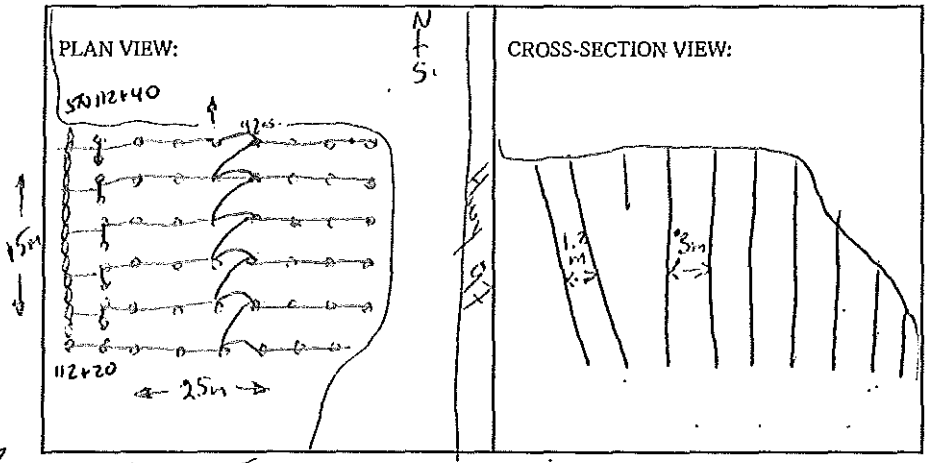
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED JAN 9/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesney
BLASTER'S CERTIFICATE NUMBER 583489
PROPOSED BLAST DATE JAN 9/12
BLAST # 153

HIGHWAY# 97
BLAST LOCATION AT: 112 + 52 - 112+60 LS (Bridlebrook)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Alaskite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS: * every 2nd b/l hole to be loaded w/200 g min det. cord

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 250 (m)
PROPOSED APPROX. NO. OF HOLES 126 b/l / 65 buffer / 17 room
HOLE DIA. 140 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE EMULS
APPROX. NUMBER OF CARTRIDGES 35
PROPOSED NUMBER OF DELAYS 26
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

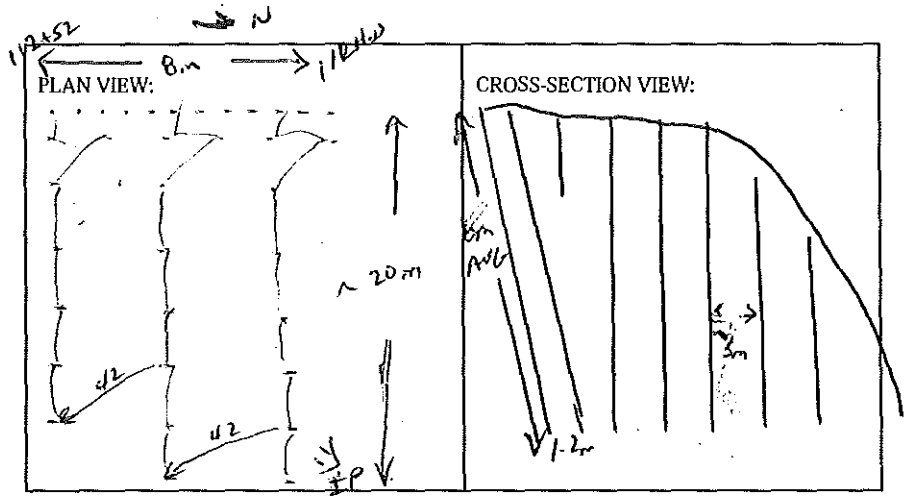
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) BSC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 ents

APPROX. VOLUME OF ROCK TO BE BLASTED 1200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fisher SIGNATURE _____ COMPANY Fisher Rock Eng.

BLASTER'S SIGNATURE Wayne Vesney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 10/12
ACTUAL BLAST DATE JAN 10/12
BLAST # 154

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+90 - 126+65 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 438 (m)

TOTAL NUMBER OF HOLES 18 B/L / 12 Buffer / 43 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 73
TOTAL NUMBER OF DELAYS 55

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1550 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

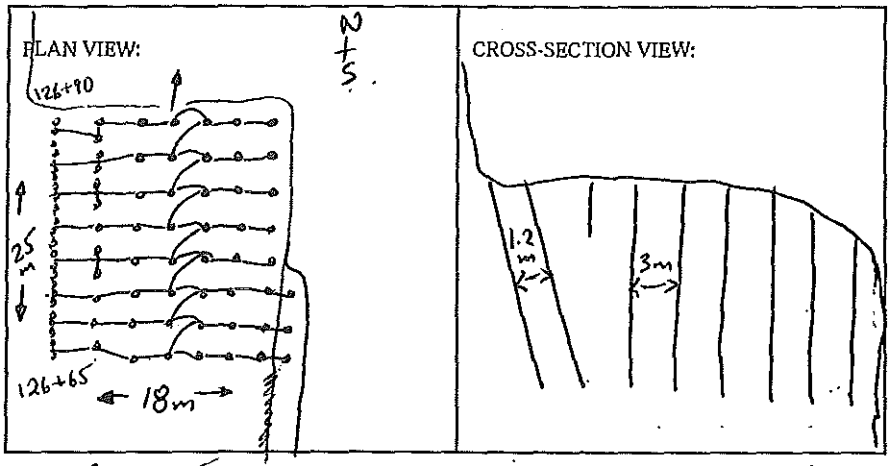
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2700 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALAHINEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN 10/12
PROPOSED BLAST DATE JAN 11/12
BLAST # 155

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+20 - 112+10 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 600 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 15 B/L
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 165 (m)

PROPOSED APPROX. NO. OF HOLES 15 B/L / 8 Buffer / 10 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 33
PROPOSED NUMBER OF DELAYS 18

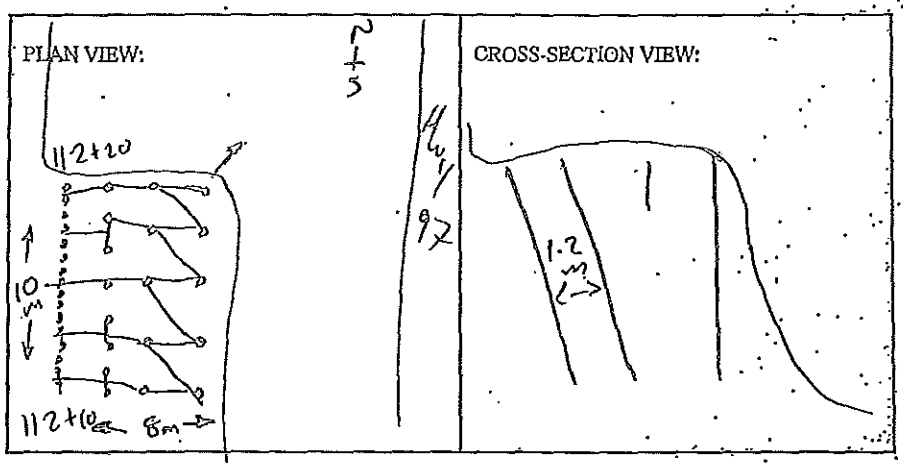
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mahoney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 13/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE JAN. 13/12
BLASTER'S NAME James Mawhinney
BLAST # 159 @ 14:15
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 135+25 - 135+69 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 44m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 450 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 30
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 30 B/L / 32 Buffer / 40 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 102
TOTAL NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

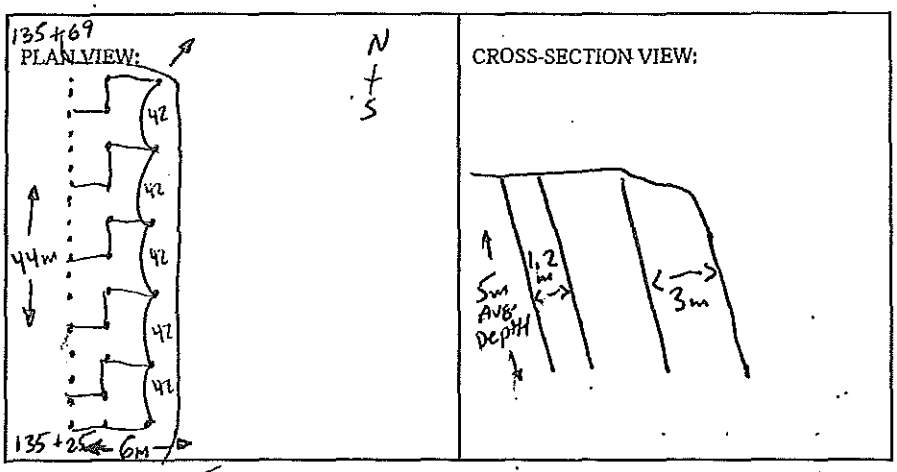
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 12/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE JAN. 12/12
BLASTER'S NAME James MacWhinney
BLAST # 158
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 126+45 – 126+05 LS (2nd Beach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 63 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 39
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 822 (m)

TOTAL NUMBER OF HOLES 39 B/L / 23 Buffer / 75 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 137
TOTAL NUMBER OF DELAYS 98

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

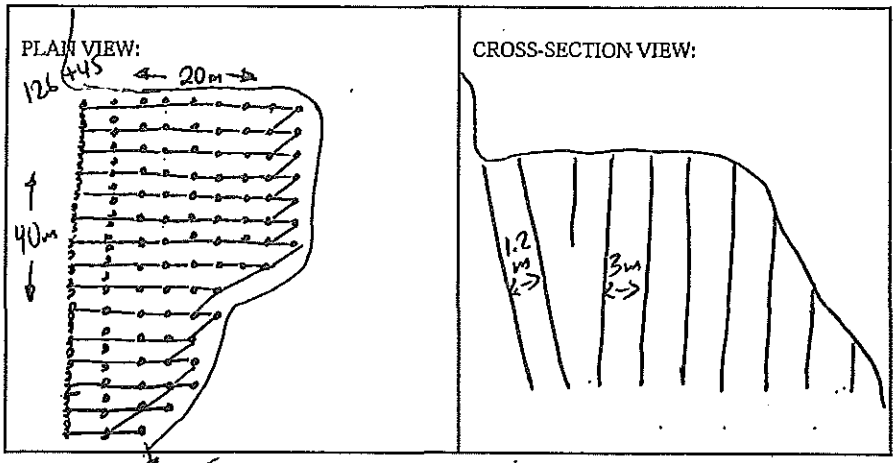
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 4800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Dec. 11/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE Dec. 11/12.
BLASTER'S NAME James MacWhinney
BLAST # 157
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+65 - 126+45 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20. (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) _____ (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 396 (m)

TOTAL NUMBER OF HOLES 18 B/L/11 Buffer/37 prod
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 66
TOTAL NUMBER OF DELAYS 48

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 875 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

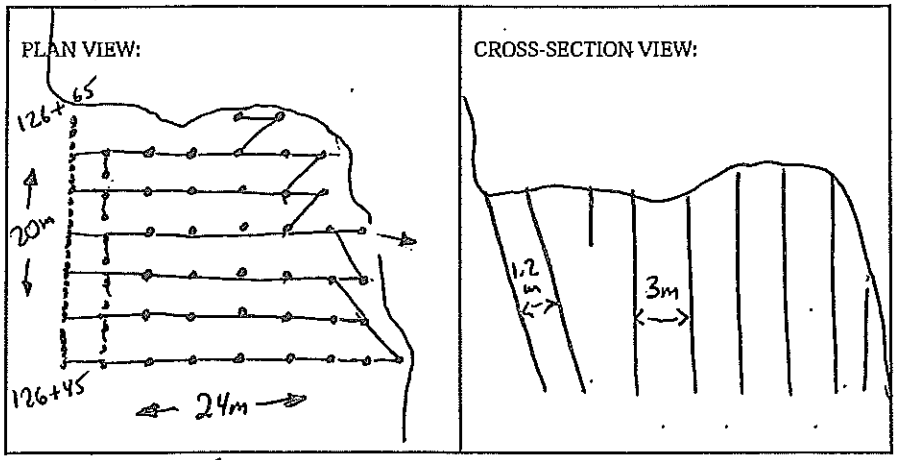
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 11/12
ACTUAL BLAST DATE JAN. 11/12
BLAST # 15.5

HIGHWAY# 97
BLAST LOCATION AT: STN # 112+20 - 112+10 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 225 (m)

TOTAL NUMBER OF HOLES 15 B/L / 9 Buffer / 21 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 30

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

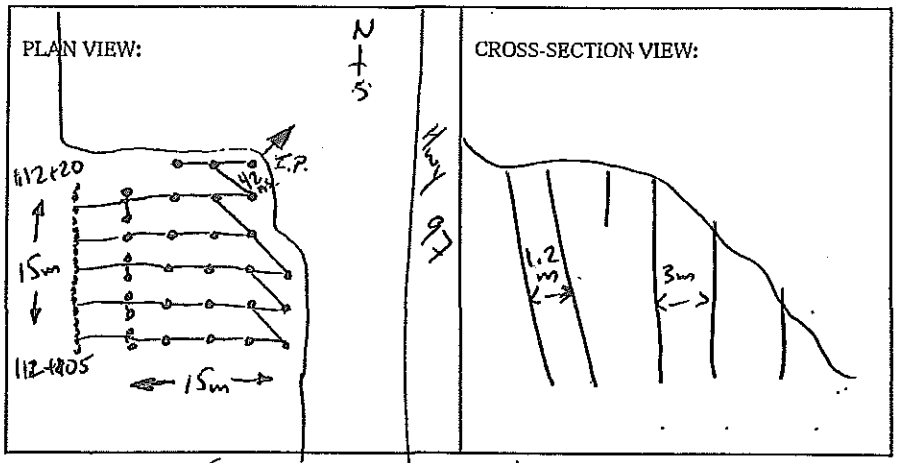
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1125 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 12/11
PROPOSED BLAST DATE Jan 13/11
BLAST # 159

HIGHWAY# 97
BLAST LOCATION AT: 135+25 – 135+69 LS (to Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 44m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 450 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 60
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 14
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH _____ (m)
PROPOSED APPROX. NO. OF HOLES 14 PRESP / 28 BURDEN / 60 B/L
HOLE DIA. _____ (mm)
APPROX. HOLE SPACING _____ (m) BURDEN _____ (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
@ every 2nd BH hole to be loaded w/ 100 grain det. cord.

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 75
PROPOSED NUMBER OF DELAYS 60
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 650 (kg)
DELAY TYPE AND LENGTH 25 L 42 (ms)

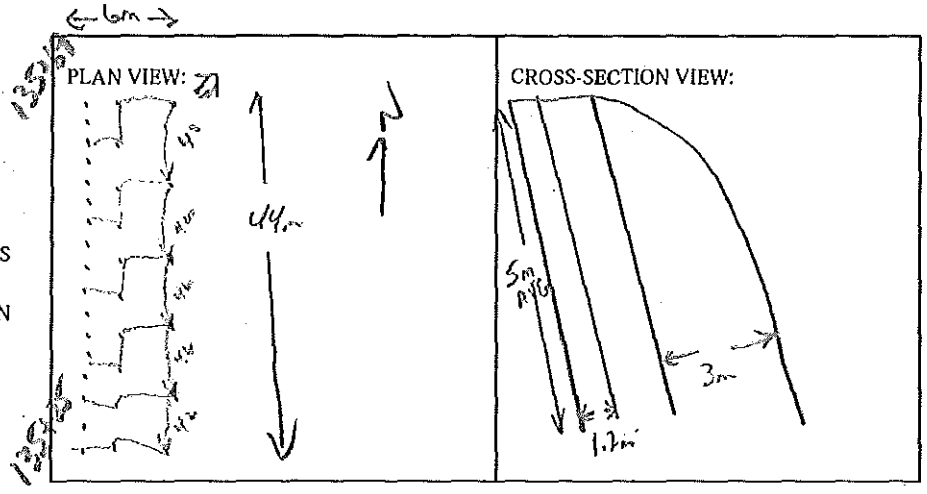
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Hose initiation NONEL system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1350 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 12/12
PROPOSED BLAST DATE Jan 13/12
BLAST # 160

HIGHWAY# 97
BLAST LOCATION AT: 127+56 - 127+62 LS (To Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 10m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 0
PROPOSED AVG. DEPTH 6.6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH 120 (m)

PROPOSED APPROX. NO. OF HOLES 84/1/3 buffer/2 slab/16 Pond
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 17, 25 & 42 (ms)

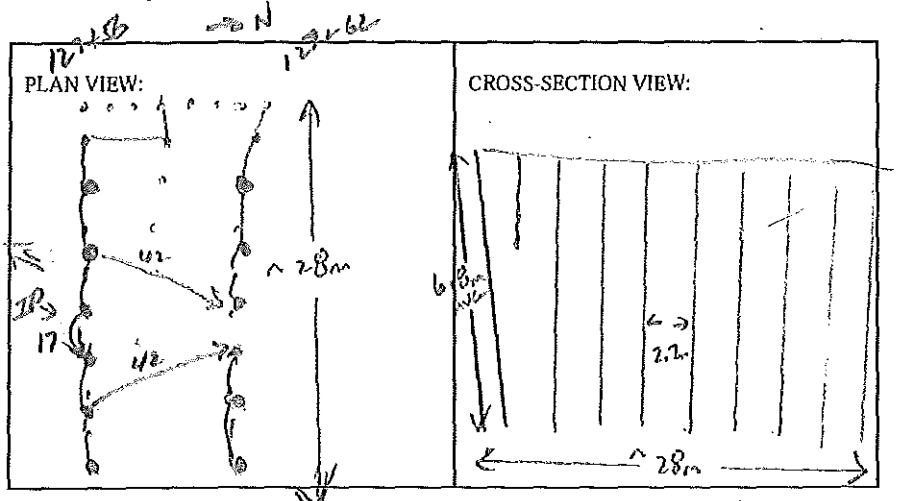
INITIATION DEVICE: (CIRCLE) (EBW CAPS) SAFETY FUSE OTHER (SPECIFY) EBW Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1,000 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne V COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME: SIERRA DRILLING + BLASTING
BLASTER'S NAME: WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER: 5034B9

DATE PREPARED: JAN 13/12
ACTUAL BLAST DATE: JAN 13/12 2:05 PM
BLAST #: 160

HIGHWAY#: 97
BLAST LOCATION AT: STN 127+56 - 127+62 LS (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY: N/A (m) SLOPE ANGLE: 63 (°) SLOPE LENGTH: 6 (m)
ROCK TYPE: ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY): 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES: 8 (7 loaded)
AVERAGE DEPTH: 6.8 (m)
NUMBER OF ROWS: 3
MAXIMUM DEPTH: 7.2 (m)
TOTAL DEPTH: _____ (m)

TOTAL NUMBER OF HOLES: 8 6 1/2 / 36 buffer / 2 stab / 20 PROD
HOLE DIAMETER: 89 (mm)
HOLE SPACING: 2.7 (m) BURDEN: 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE: 1½" DYNAMITE FANGO
TOTAL NUMBER OF CARTRIDGES: 36
TOTAL NUMBER OF DELAYS: 29

EXPLOSIVE SIZE: 40 mm by 400 mm
TOTAL WEIGHT: 350 (kg)
DELAY TYPE AND LENGTH: 17, 25, 42 (ms)

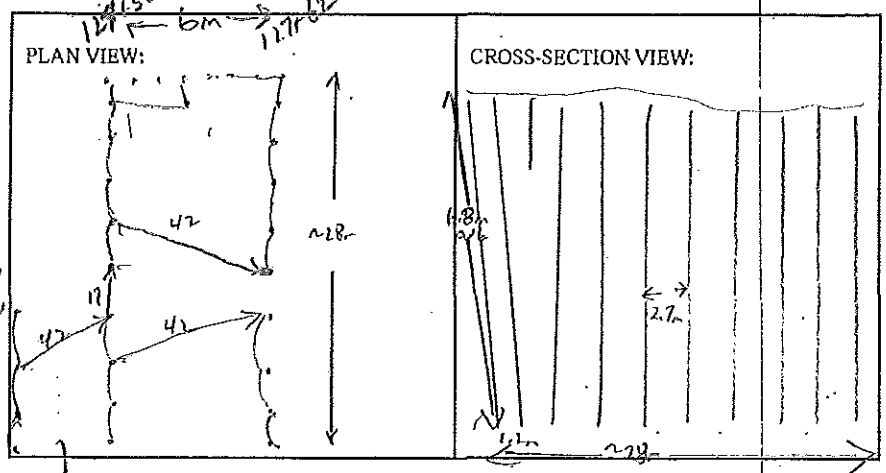
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY): EBC INITIATION OF POWER SYSTEM
BLASTING MACHINE: TYPE: HB320 CAPACITY: 80 CAPS

VOLUME OF ROCK BLASTED: 1100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE: Wayne Verwey COMPANY: Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Old Stone Cut - 0.36 in/s / 32Hz
@ 13050 Old Mission Road - 0.51 in/s / 37Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 12/11
PROPOSED BLAST DATE Jan 13/11
BLAST # 159

HIGHWAY# 97
BLAST LOCATION AT: 135+25 – 135+69 LS (to Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 44m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 450 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 60
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 14
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH _____ (m)
PROPOSED APPROX. NO. OF HOLES 14 PRESP/ 28 BURDEN / 60 0/1
HOLE DIA. _____ (mm)
APPROX. HOLE SPACING _____ (m) BURDEN _____ (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
@ every 2nd 0/1 hole to be loaded w/ 100 grain det. cord.

PROPOSED BLAST DETAILS:

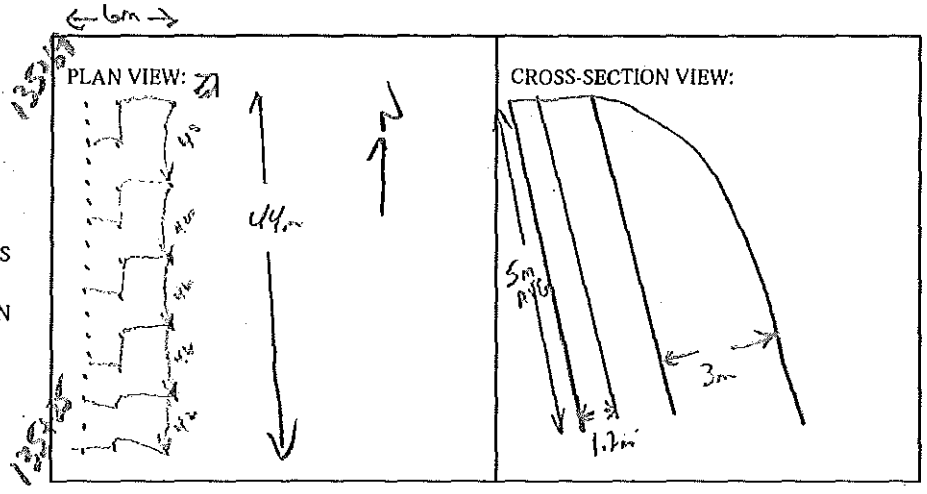
EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 75
PROPOSED NUMBER OF DELAYS 60
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 650 (kg)
DELAY TYPE AND LENGTH 25 L 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Hose initiated NONEL system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1350 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 12/12
PROPOSED BLAST DATE Jan 13/12
BLAST # 160

HIGHWAY # 97
BLAST LOCATION AT: 127+56 - 127+62 LS (To Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 10m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 6.6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH 120 (m)

PROPOSED APPROX. NO. OF HOLES 84/1/3 buffer/2 slab/16 Pond
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 17, 25, 42 (ms)

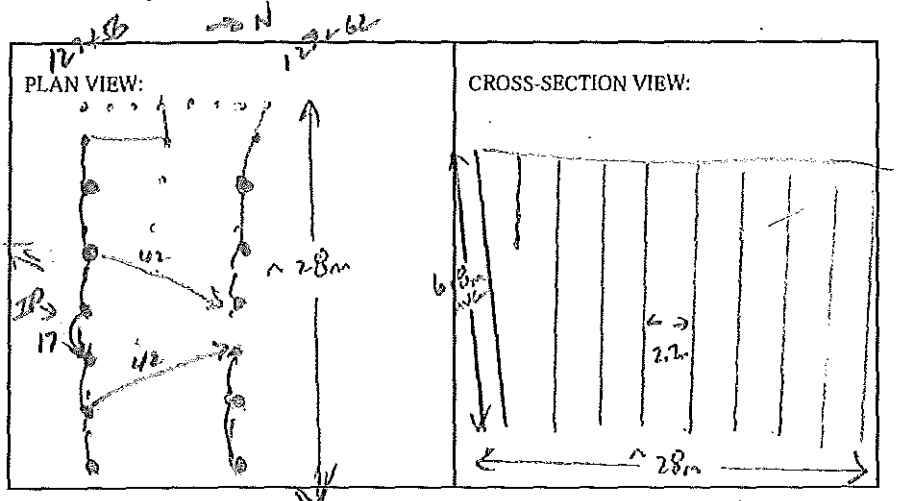
INITIATION DEVICE: (CIRCLE) (EB) CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation Non-Electric System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1,000 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne V COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 16/12
ACTUAL BLAST DATE JAN. 16/12
BLAST # 161 @ 11:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+62 - 127+68 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 216 (m)

TOTAL NUMBER OF HOLES 10 B/L/3 Buffer/14 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

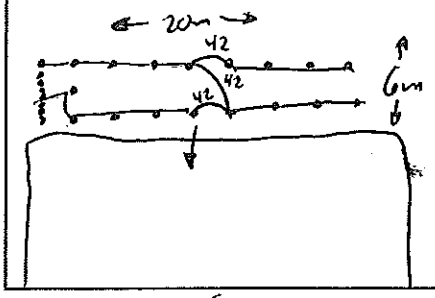
VOLUME OF ROCK BLASTED 960 (m^3)

BLAST SKETCH:

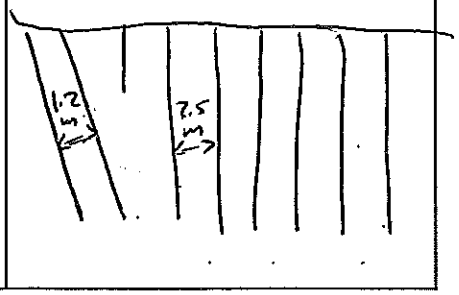
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B34B9

DATE PREPARED Jan 16/12
PROPOSED BLAST DATE Jan 16/12
BLAST # 16/

HIGHWAY# 97
BLAST LOCATION AT: Stn R127+62 - 127+68 LS (to submit)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 216 (m)

PROPOSED APPROX. NO. OF HOLES 16/11/17 road
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 27
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

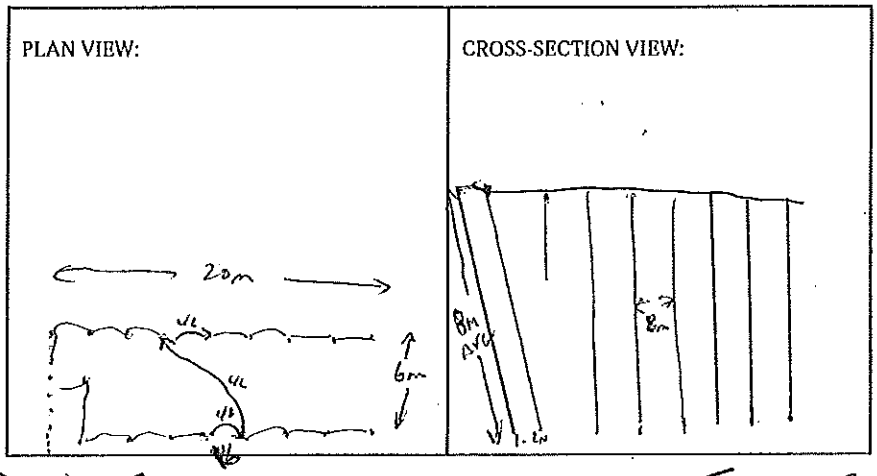
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC 10 Range of Nitrel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 960 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 16/12
ACTUAL BLAST DATE Jan 16/12
BLAST # 162. @ 2:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+74 - 127+68 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 85 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2.
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 165 (m)

TOTAL NUMBER OF HOLES 8 B/L / 3 Buffer / 12 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

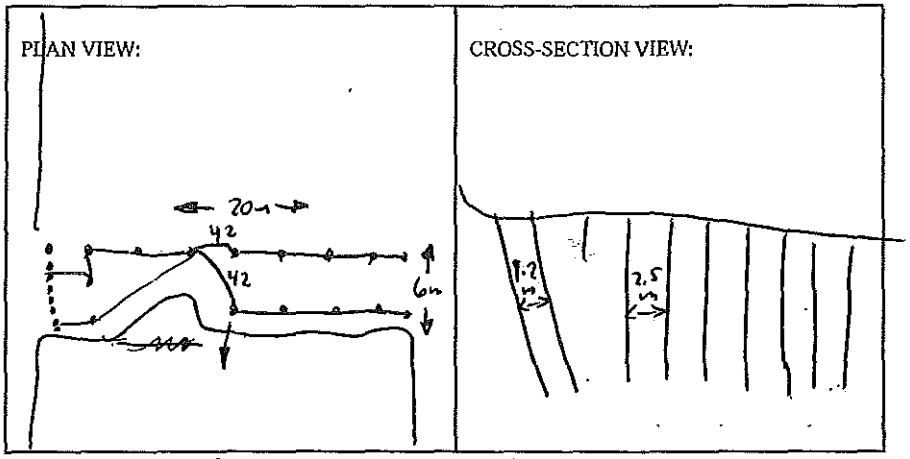
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 16/12
PROPOSED BLAST DATE Jan 16/12
BLAST # 16-2

HIGHWAY# 97
BLAST LOCATION AT: STA 127+74 - 127+68 LT (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY 9/0 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Alberta Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 85 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 165 (m)
PROPOSED APPROX. NO. OF HOLES 8 bkl / 15 Prod
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 23
PROPOSED NUMBER OF DELAYS 15
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

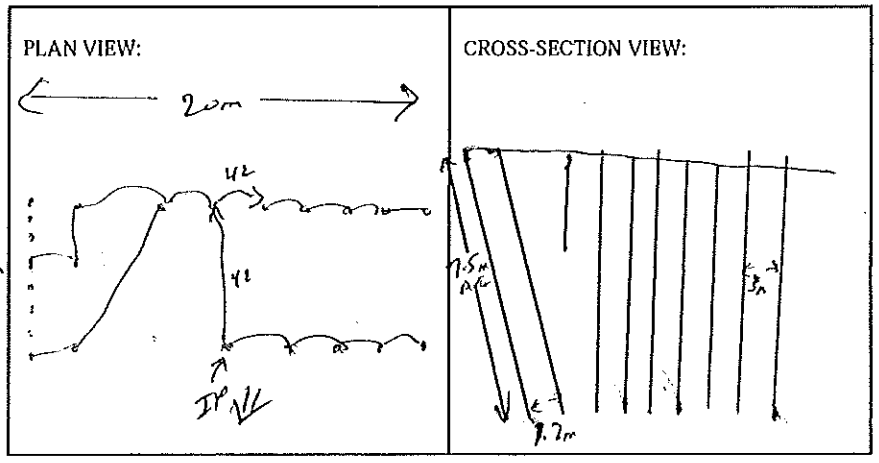
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Exc. Initiation or Nonel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 900 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiber SIGNATURE _____ COMPANY Fleiber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 17/12
ACTUAL BLAST DATE JAN 17/12 @ 12:00
BLAST # 163

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+74 - 127+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 180 (m)

TOTAL NUMBER OF HOLES 7 B/L / 3 Buffer / 14 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

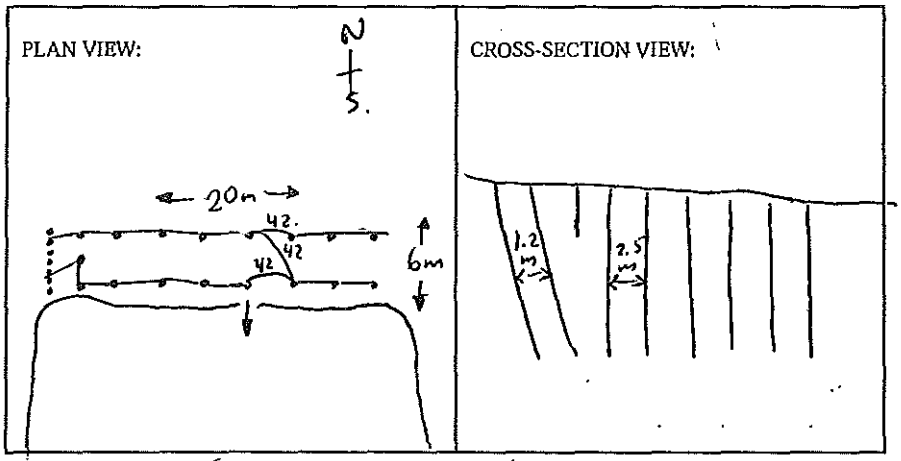
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 17/12
PROPOSED BLAST DATE Jan 17/12
BLAST # 163

HIGHWAY# 97
BLAST LOCATION AT: Sta 127+74 – 127+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 180 (m)
PROPOSED APPROX. NO. OF HOLES 7411/17 total
HOLE DIA. 80 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 24
PROPOSED NUMBER OF DELAYS 17
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

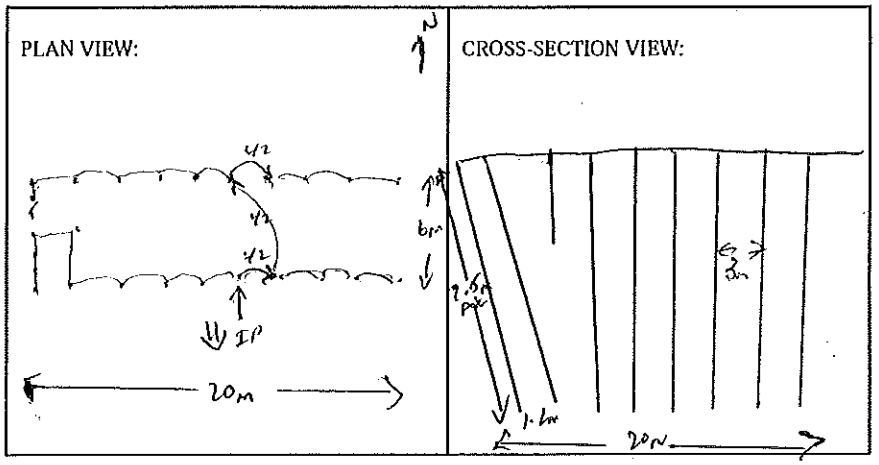
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ENC initiation of power system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 900 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 17/12
ACTUAL BLAST DATE JAN 17/12
BLAST # 164 @ 1530

HIGHWAY# 97
BLAST LOCATION AT: STN # 127 + 80 - 127 + 86 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY. Ø (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 98 (m)

TOTAL NUMBER OF HOLES 14 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 425 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

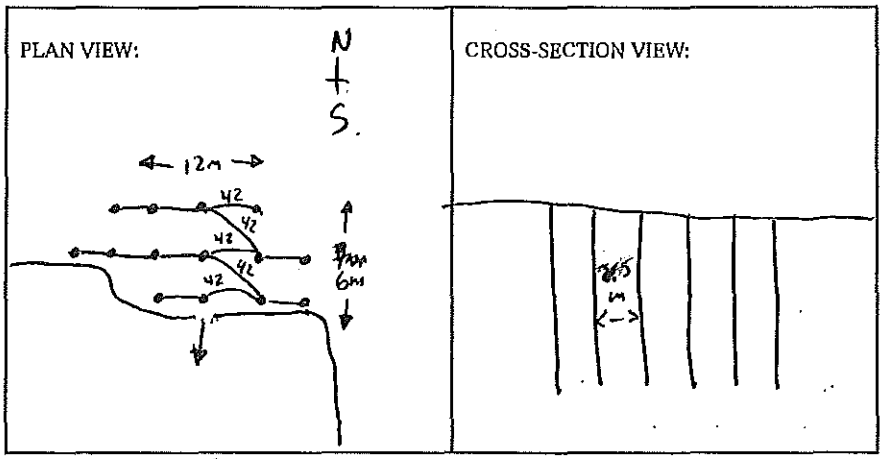
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 504 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN 14/12
PROPOSED BLAST DATE JAN 16/12
BLAST # 164

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+80 - 127+86 L/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 6 (m) SLOPE ANGLE 6 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 90 (m)

PROPOSED APPROX. NO. OF HOLES 14 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

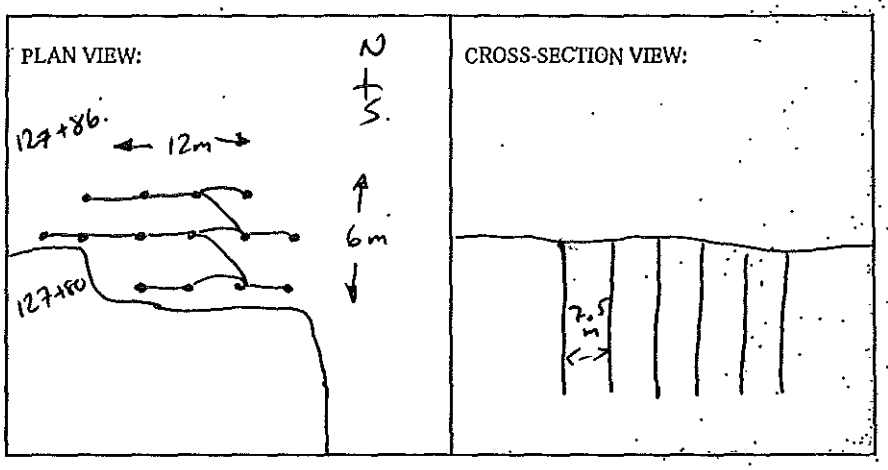
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 425 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 504 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinnon
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 20/12
ACTUAL BLAST DATE JAN. 20/12
BLAST # 165

HIGHWAY # 97
BLAST LOCATION AT: STN # 111+83 — 112+05 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 11.15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 22
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 455 (m)

TOTAL NUMBER OF HOLES 22 B/L / 15 Buffer / 54 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 91
TOTAL NUMBER OF DELAYS 69

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

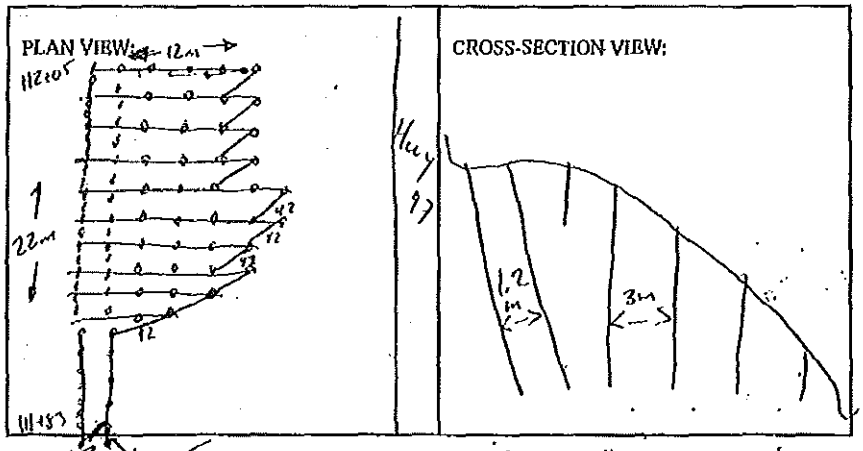
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinnon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 17/12
PROPOSED BLAST DATE JAN 18/12
BLAST # 165

HIGHWAY# 97
BLAST LOCATION AT: STN # 111+80 - 112+00 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 14
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 210 (m)

PROPOSED APPROX. NO. OF HOLES 148/L/6 Bufka/22 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 42
PROPOSED NUMBER OF DELAYS 28

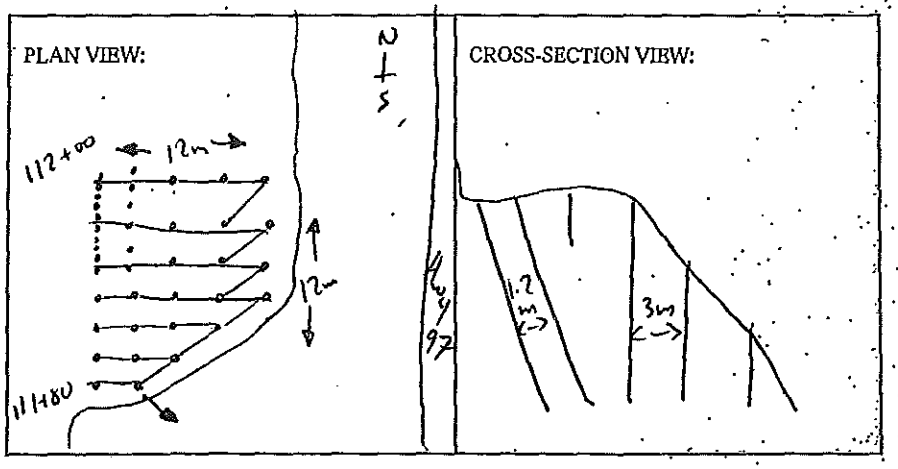
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 720 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-Built

~~PROPOSED~~ BLAST DESIGN

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 18/12
PROPOSED BLAST DATE Jan 18/12
BLAST # 166

HIGHWAY# 97
BLAST LOCATION AT: STN# 127+86 - 128+02 (To subgrade) LS

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

~~PROPOSED~~ NO. OF BACKLINE HOLES 10
~~PROPOSED~~ AVG. DEPTH 7 (m)
~~PROPOSED~~ NO. OF ROWS 3
~~PROPOSED~~ MAXIMUM DEPTH 8 (m)
~~PROPOSED~~ TOTAL DEPTH 3@47 (m)

~~PROPOSED~~ APPROX. NO. OF HOLES 5 Buffer / 6 prod. / 10 B/L
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
~~APPROX.~~ NUMBER OF CARTRIDGES 21
~~PROPOSED~~ NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

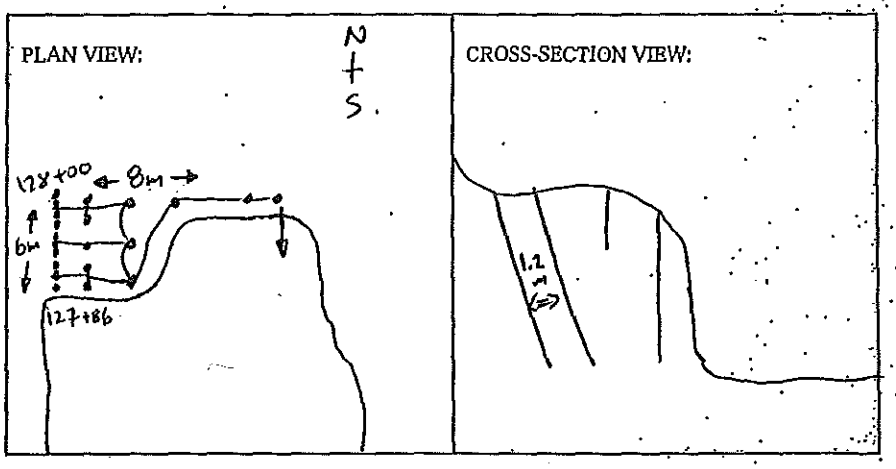
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

~~APPROX.~~ VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Jan 18/12
CONTRACTOR'S NAME Sierra Drilling & Blasting
PROPOSED BLAST DATE Jan 18/12
BLASTER'S NAME Wayne Verweij
BLAST # 166
BLASTER'S CERTIFICATE NUMBER 583489

HIGHWAY# 97
BLAST LOCATION AT: Sta 127+86 - 128+02 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 142 (m)
PROPOSED APPROX. NO. OF HOLES 60 Prod / 5 backup / 10 bl
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 21
PROPOSED NUMBER OF DELAYS 11
EXPLOSIVE SIZE 50 mm by 406 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 ms / 42 (ms)

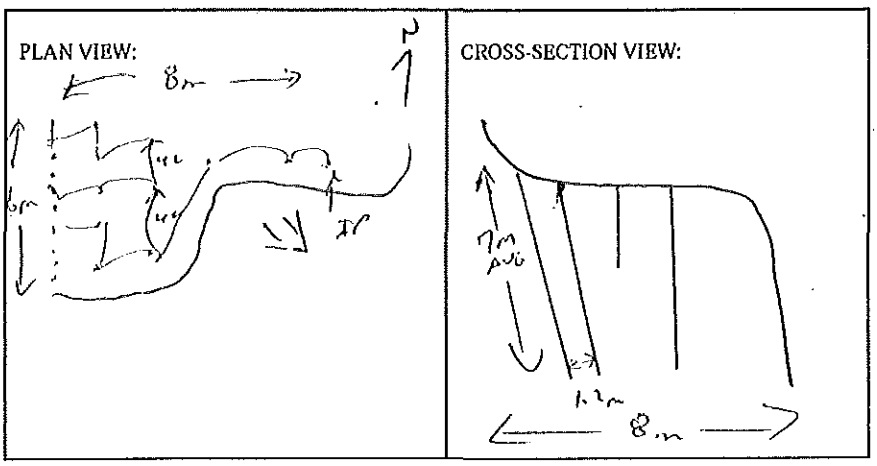
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 3200 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
ACTUAL BLAST DATE JAN 18/12
BLAST # 167

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+70 – 127+60 RS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH ϕ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ϕ
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

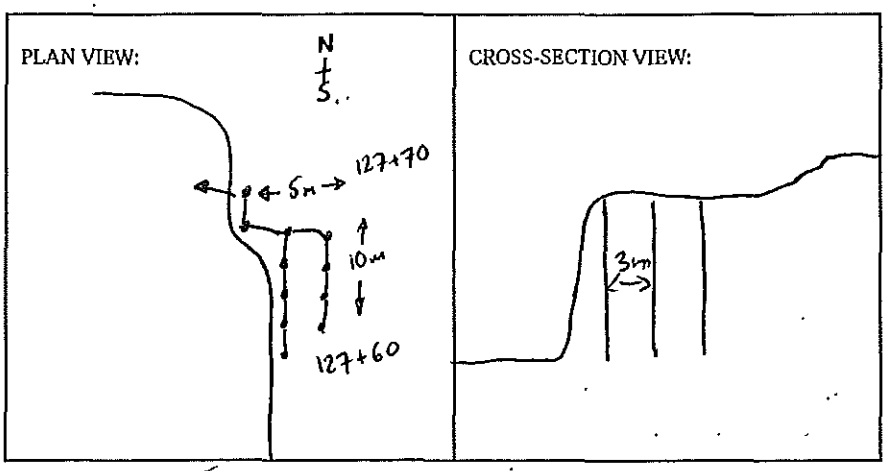
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 18/12
PROPOSED BLAST DATE JAN 18/12
BLAST # 167

HIGHWAY# 97
BLAST LOCATION AT: 127+70 ~ 127+60 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED SEDIMENTS
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 66 (m)

PROPOSED APPROX. NO. OF HOLES 11 Prod
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 3" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 11
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25/42 (ms)

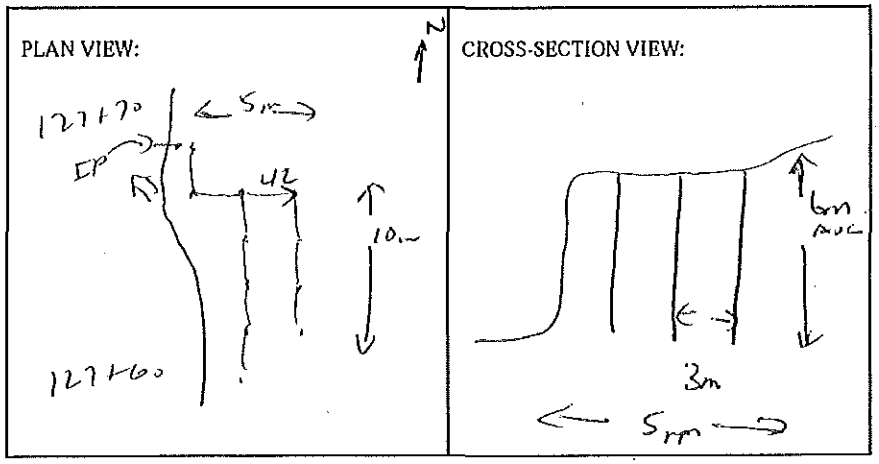
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF POWER SYSTEM
BLASTING MACHINE: TYPE HB 380 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 22/12
ACTUAL BLAST DATE Jan 19/12
BLAST # 168

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+60 - 127+52 RS (Toeslope)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE ϕ (°) SLOPE LENGTH ϕ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ϕ
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain DET cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

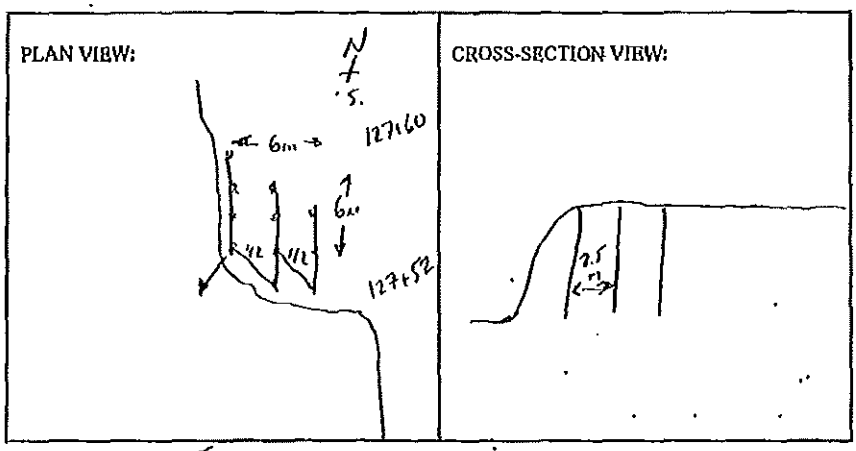
INITIATION DEVICE: (CIRCLE) B.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 216 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
PROPOSED BLAST DATE JAN 19/12
BLAST # 168

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+60 - 127+52 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 66 (m)

PROPOSED APPROX. NO. OF HOLES 11 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Except for 6m hole to subgrade record

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 11
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

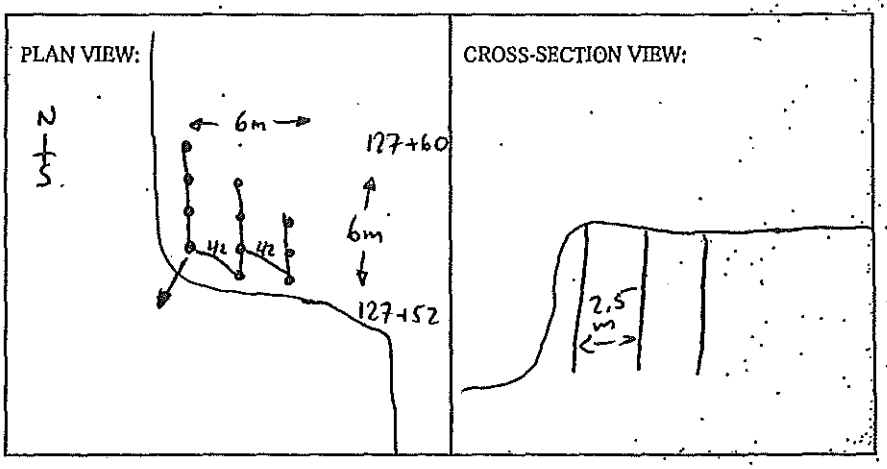
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 216 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 19/12
ACTUAL BLAST DATE JAN. 19/12
BLAST # 169

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+50 - 127+40 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 147 (m)

TOTAL NUMBER OF HOLES 5 stab/6 Buffer/10 B/L
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

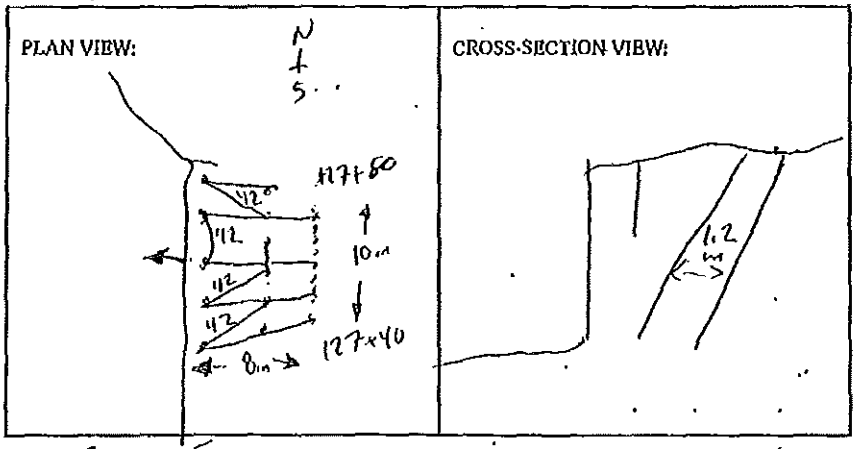
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 560 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
PROPOSED BLAST DATE JAN 19/12
BLAST # 169

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+50 - 127+40 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 147 (m)

PROPOSED APPROX. NO. OF HOLES 5 STAB/6 Buffer/10 B/L
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 21
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

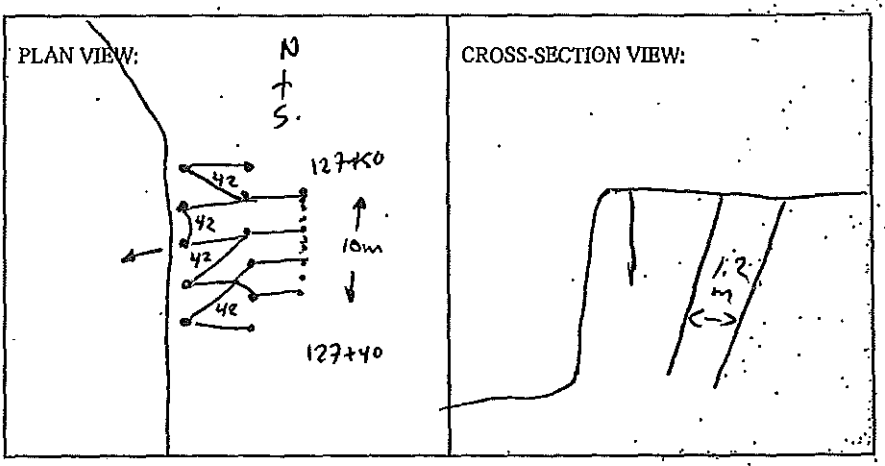
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 560 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 19/12
ACTUAL BLAST DATE JAN. 19/12
BLAST # 170

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+40 - 127+35 RS (to 50)% side)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5M (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 119 (m)

TOTAL NUMBER OF HOLES 10 B/L / 3 B. Offset / 4 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

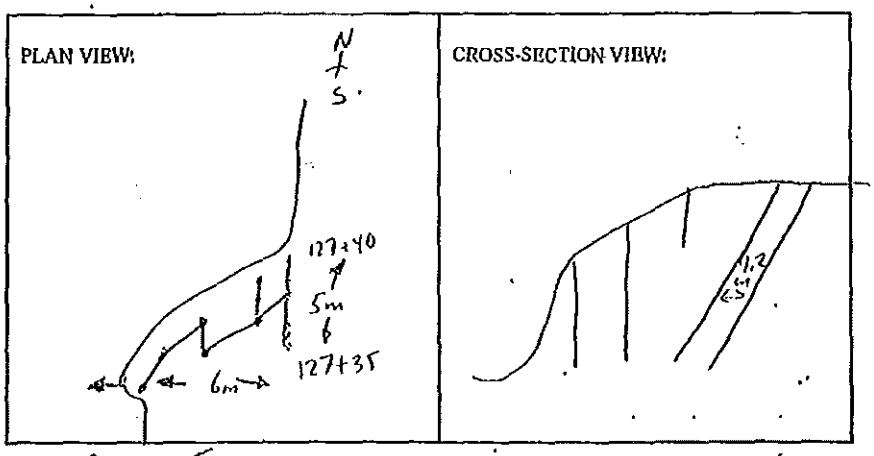
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
PROPOSED BLAST DATE JAN 19/12
BLAST # 170

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+40 - 127+35 RS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 119 (m)

PROPOSED APPROX. NO. OF HOLES 10 B/L / 3 Buffer / 4 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 17
PROPOSED NUMBER OF DELAYS 7

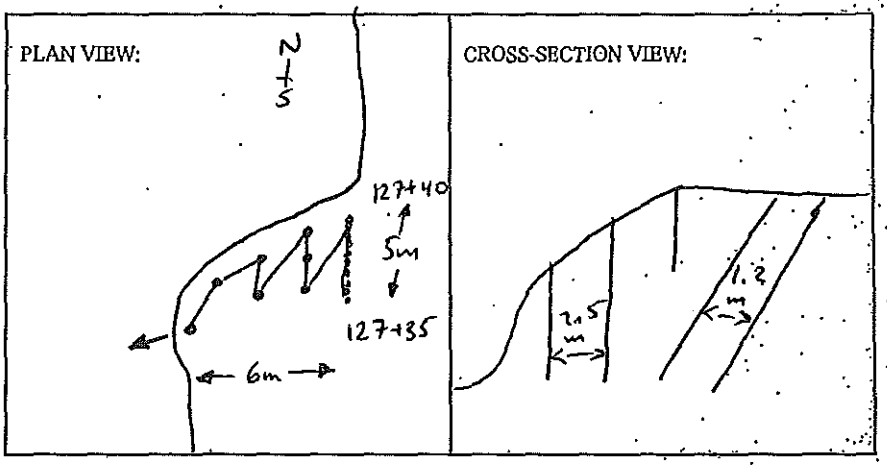
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 210 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 24/12
ACTUAL BLAST DATE JAN. 24/12
BLAST # 172

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+86 - 112+60 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) . SLOPE ANGLE 63 (°) SLOPE LENGTH 26 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 27
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 572 (m)

TOTAL NUMBER OF HOLES 27 B/L / 15 Buffer / 62 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 104
TOTAL NUMBER OF DELAYS 77

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1925 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

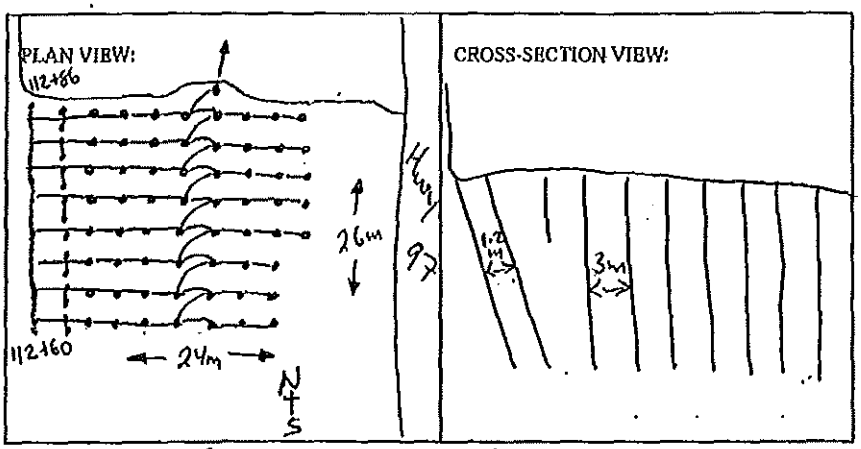
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 3400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mauhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 23/12
PROPOSED BLAST DATE Jan. 24/12
BLAST # 172

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+86 - 112+60 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 26 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 27
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 8
PROPOSED MAXIMUM DEPTH 6.5 (m)
PROPOSED TOTAL DEPTH 572 (m)

PROPOSED APPROX. NO. OF HOLES 27 B/L / 15 Buffer / 62 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 104
PROPOSED NUMBER OF DELAYS 77

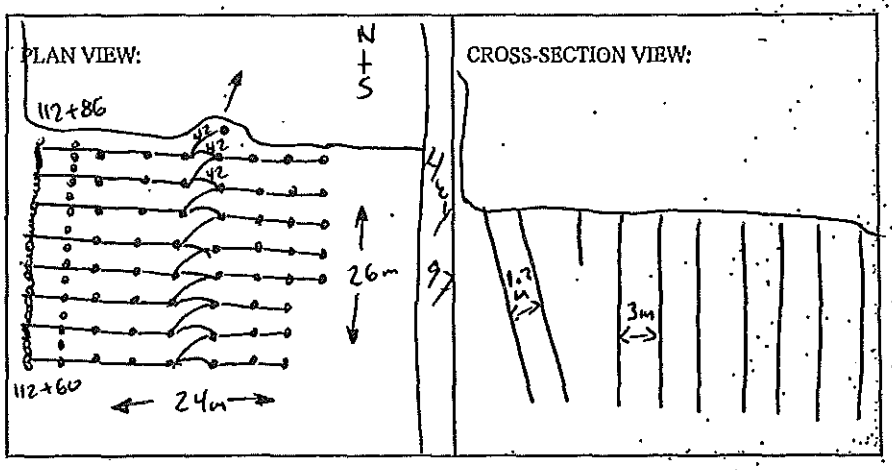
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1900 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 3400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mauhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sicamous Quality Blasting
BLASTER'S NAME Wayne Wenzel
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Tuesday
ACTUAL BLAST DATE Tuesday 2:30pm
BLAST # 173

HIGHWAY # 97
BLAST LOCATION AT: 1484.00 to 1484.40 RS (Lane #2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY 11.0 (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40.0 (m)
ROCK TYPE Granite Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

DRILLING DETAILS: 4th row, 2nd drill hole located 1/2m south east of

NUMBER OF BACKLINE HOLES 54
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 504 (m)

TOTAL NUMBER OF HOLES 504 / 28 new
HOLE DIAMETER 203 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite 3000 EXPLOSIVE SIZE 410 mm by 410 mm
TOTAL NUMBER OF CARTRIDGES 576 TOTAL WEIGHT 2250 (kg)
TOTAL NUMBER OF DELAYS 178 DELAY TYPE AND LENGTH 25 x 42 (ms)

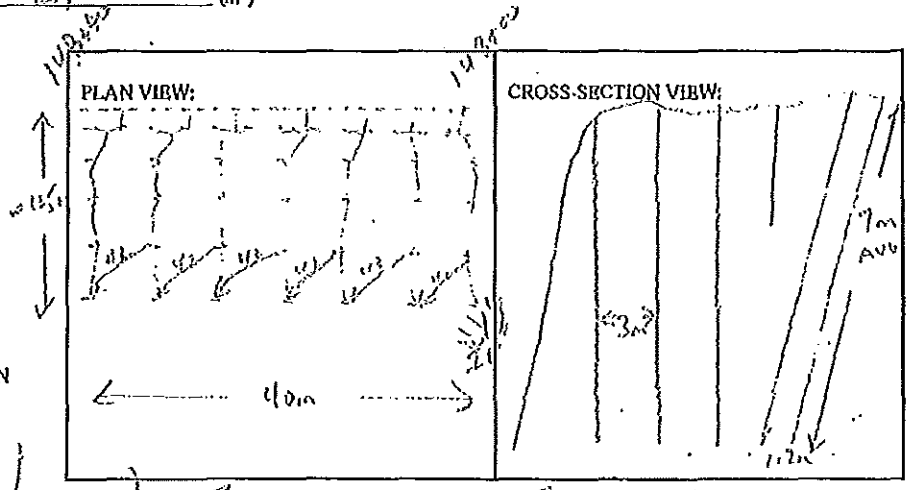
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ABC Initiation of Power Primer
BLASTING MACHINE: TYPE HB 420 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 8,000 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sicamous Quality Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Janzen
BLASTER'S CERTIFICATE NUMBER 583469

DATE PREPARED Jan 24/12
PROPOSED BLAST DATE Jan 26/12
BLAST # 173

HIGHWAY# 97
BLAST LOCATION AT: 148+00 - 148+40 RS

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO) ± HWY TRAFFIC STOPPAGE REQ'D. ✓

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 350 (m)

ANTICIPATED DRILLING DETAILS: + every 2nd 6/1 hole to be loaded w/wooden dist. board.

PROPOSED NO. OF BACKLINE HOLES 54
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 738 (m)

PROPOSED APPROX. NO. OF HOLES 54611/28 Prod
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamidon Hango
APPROX. NUMBER OF CARTRIDGES 55
PROPOSED NUMBER OF DELAYS 45

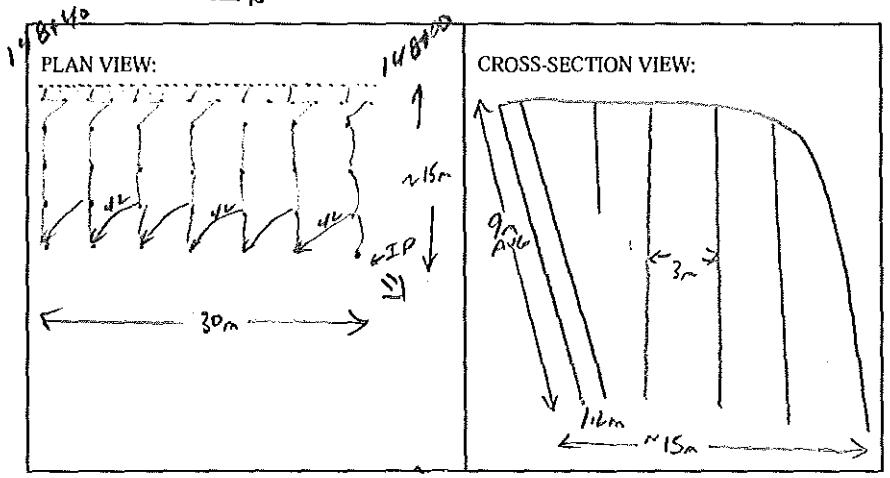
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 2,000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 760 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4,000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME D Fleeton SIGNATURE _____ COMPANY Fleeton Rock Engg.
BLASTER'S SIGNATURE Wayne Janzen COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 25/12
ACTUAL BLAST DATE JAN. 25/12
BLAST # 174

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+35 - 112+60 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 25
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 7m (m)
TOTAL DEPTH 642 (m)

TOTAL NUMBER OF HOLES 25 B/L / 17 Buffer / 65 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 104
TOTAL NUMBER OF DELAYS 79

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1425 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

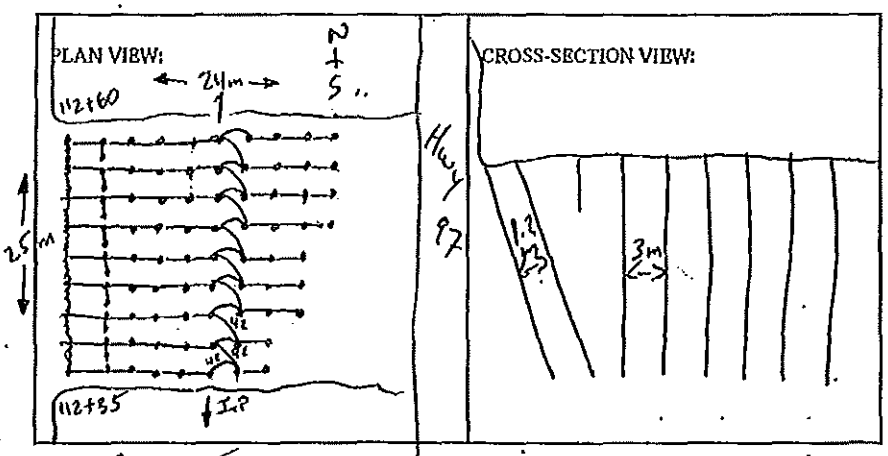
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 3200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 24/12
PROPOSED BLAST DATE Jan. 25/12
BLAST # 174

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+35 - 112+60 LS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 642 (m)

PROPOSED APPROX. NO. OF HOLES 25 B/L / 17 Buffer / 65 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 104
PROPOSED NUMBER OF DELAYS 79

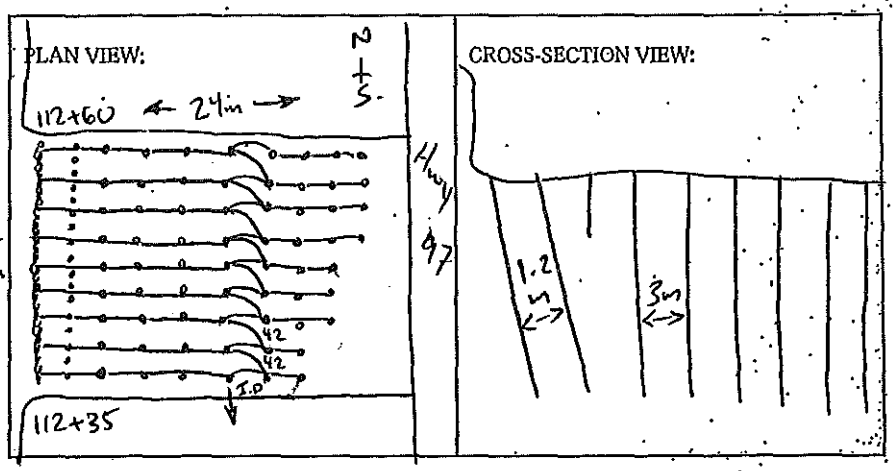
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 3200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James MacInnney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 26/12
ACTUAL BLAST DATE Jan 26/12
BLAST # 175

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+45 - 155+55 RS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72. (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 165 (m)

TOTAL NUMBER OF HOLES 10 B/L / 5 Buffer / 18 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain DET cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 33

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

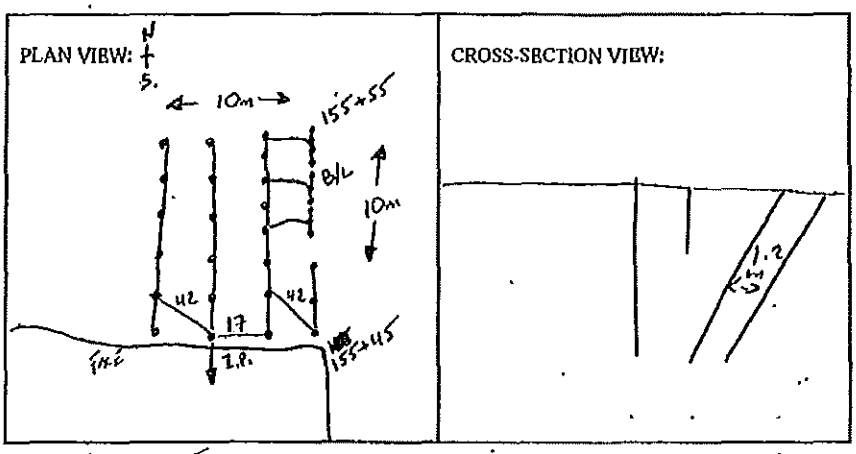
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALAHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 25/12
PROPOSED BLAST DATE JAN. 26/12
BLAST # 175

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+45 - 155+55 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 165 (m)

PROPOSED APPROX. NO. OF HOLES 10 B/L / 5 Buffer / 18 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DETcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 23
PROPOSED NUMBER OF DELAYS 33

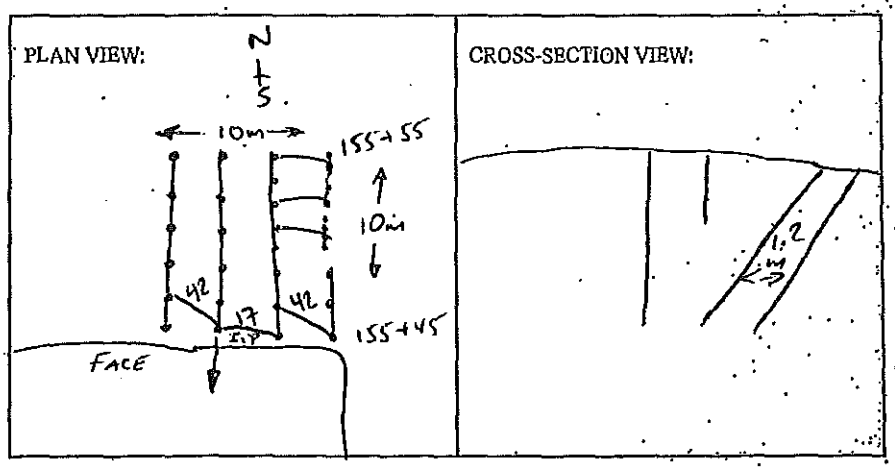
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malahinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 26/12
ACTUAL BLAST DATE JAN. 26/12
BLAST # 176

HIGHWAY# 97
BLAST LOCATION AT: STN # 155+55 – 155+45 C/L (To subgrade.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 128 (m)

TOTAL NUMBER OF HOLES 16 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 925 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

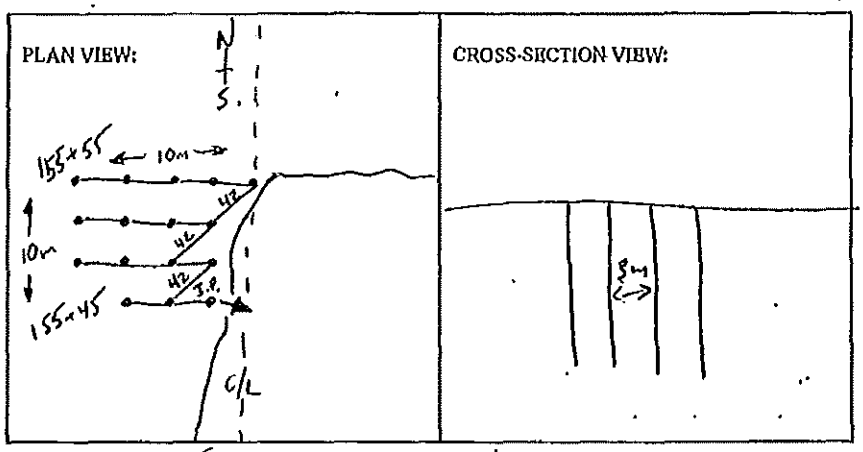
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 25/12
PROPOSED BLAST DATE JAN 26/12
BLAST # 176

HIGHWAY# 97
BLAST LOCATION AT: STN # 155+55 - 155+45 C/L (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH ∅ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ∅
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 128 (m)

PROPOSED APPROX. NO. OF HOLES 16 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16

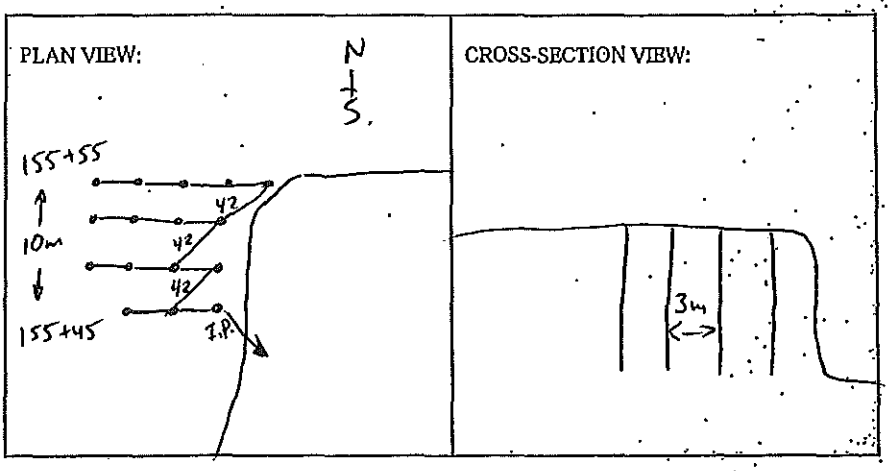
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 9(20) (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Maloney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 27/12.
ACTUAL BLAST DATE Jan. 27/12
BLAST # 177

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+55 – 155+60 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.5 (m)
TOTAL DEPTH 240 (m)

TOTAL NUMBER OF HOLES 10 B/L / 5 Buffers / 15 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 875 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

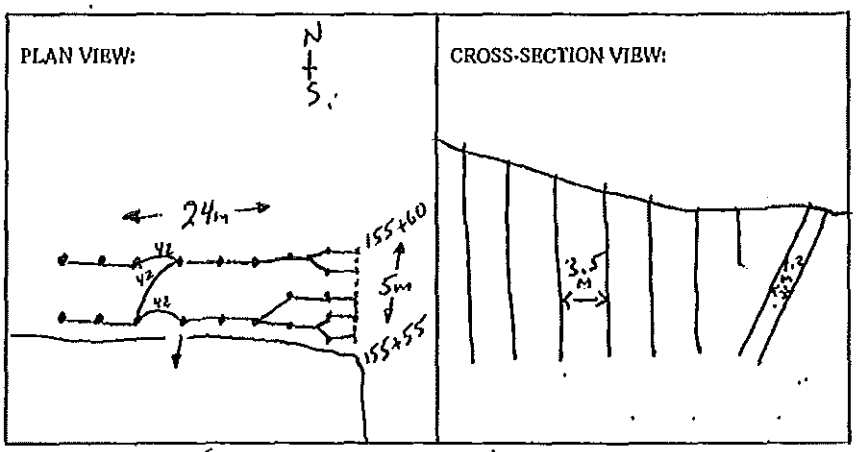
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 960 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 27/12
ACTUAL BLAST DATE JAN. 27/12
BLAST # 178

HIGHWAY # 97
BLAST LOCATION AT: STN # 155 + 60 - 155 + 65 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8 B/L
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.0 (m)
TOTAL DEPTH 216 (m)

TOTAL NUMBER OF HOLES 8 B/L / 4 Buffer / 15 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 800 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

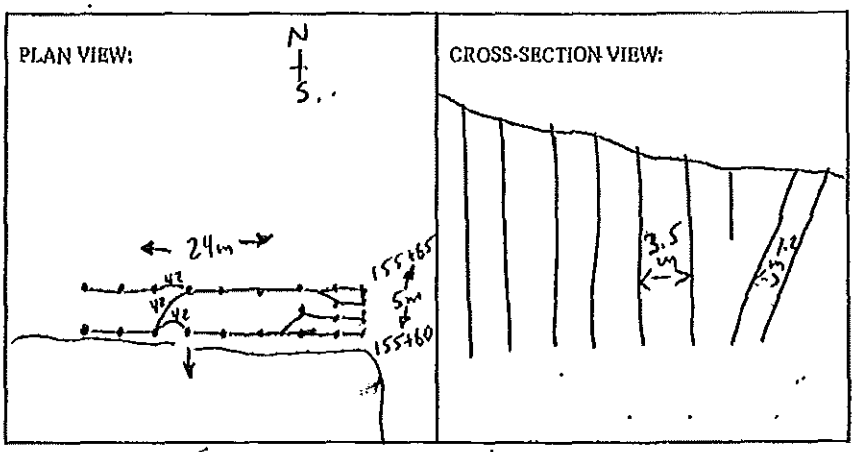
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 960 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAUHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 26/12
PROPOSED BLAST DATE JAN. 27/12
BLAST # 178

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+60 - 155+65 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9.0 (m)
PROPOSED TOTAL DEPTH 216 (m)

PROPOSED APPROX. NO. OF HOLES 8 B/L / 4 Buffer / 15 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 27
PROPOSED NUMBER OF DELAYS 19

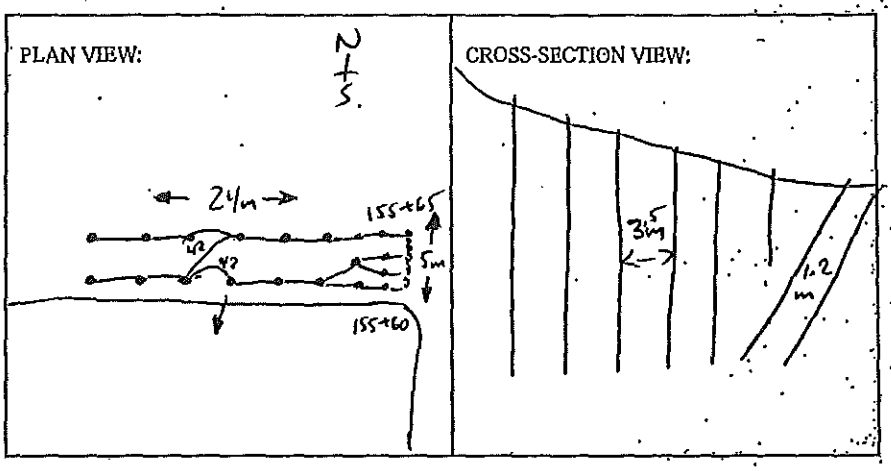
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 750 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 960 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mauhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 2/12
ACTUAL BLAST DATE Feb. 2/12
BLAST # 179

HIGHWAY # 97
BLAST LOCATION AT: STN # 112 + 90 - 112 + 30 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 78
AVERAGE DEPTH 1.0 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 1.5 (m)
TOTAL DEPTH 78 (m)

TOTAL NUMBER OF HOLES 78 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 78
TOTAL NUMBER OF DELAYS 78

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 275 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

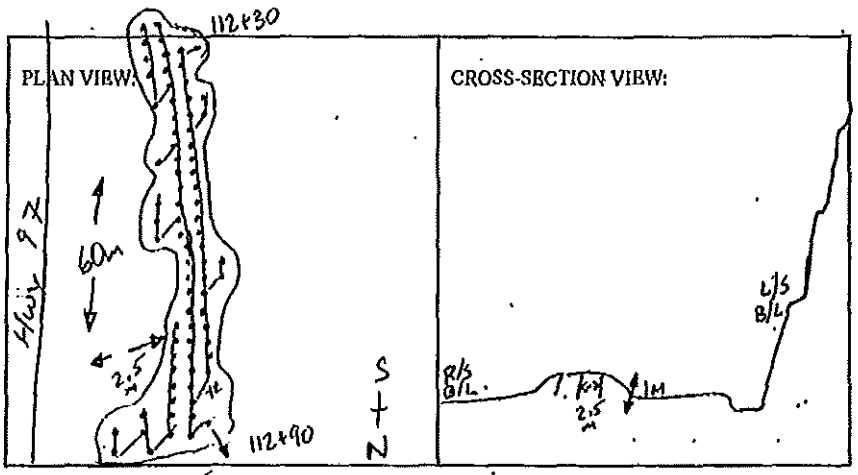
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 01/12
PROPOSED BLAST DATE Feb. 02/12
BLAST # 179

HIGHWAY # 97
BLAST LOCATION AT: STN # 112+90 – 112+30 R/S (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 1.0 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 1.5 (m)
PROPOSED TOTAL DEPTH 78 (m)

PROPOSED APPROX. NO. OF HOLES 78 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 78
PROPOSED NUMBER OF DELAYS 78

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

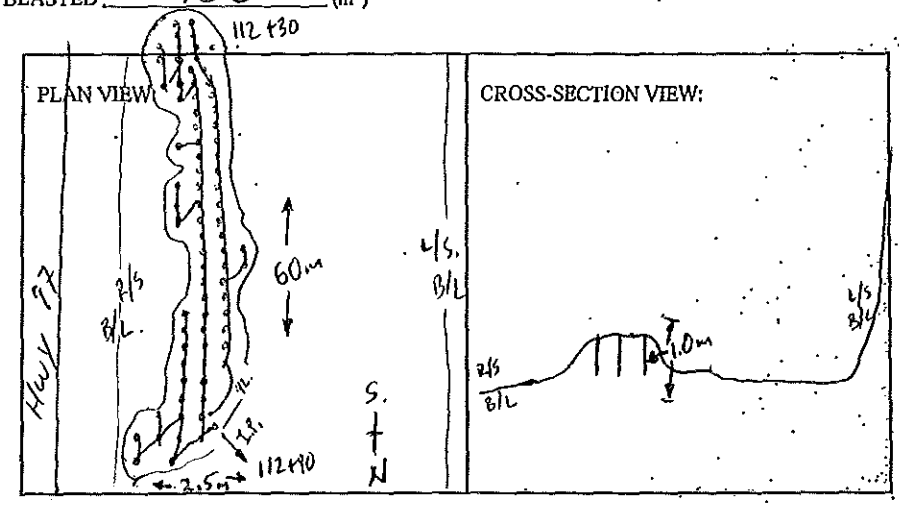
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 1/12
ACTUAL BLAST DATE Feb. 1/12
BLAST # 180

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+65 - 155+80 (to subgrade) RS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 32.8 (m)

TOTAL NUMBER OF HOLES 13 B/L / 7 Buffer / 21 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 41
TOTAL NUMBER OF DELAYS 28

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1025 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

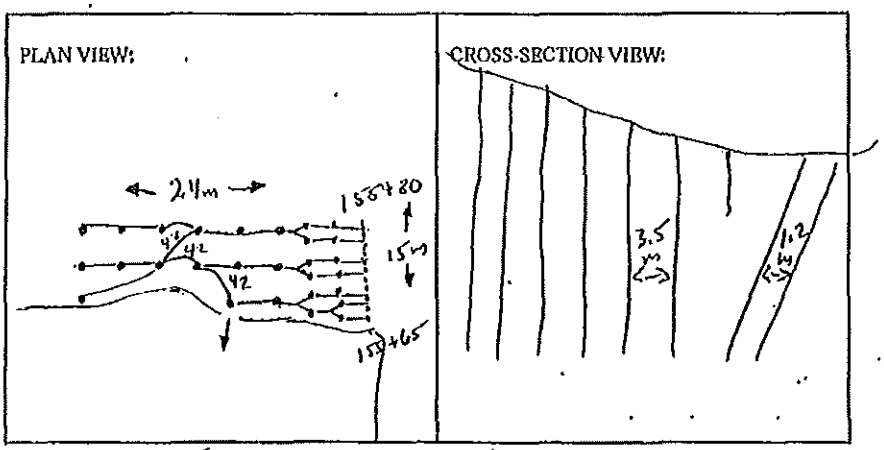
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 31/12
PROPOSED BLAST DATE Feb. 1/12
BLAST # 180

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+65 - 155+80 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 13
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED APPROX. NO. OF HOLES 13 B/L / 7 Buffer / 21 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 41
PROPOSED NUMBER OF DELAYS 28

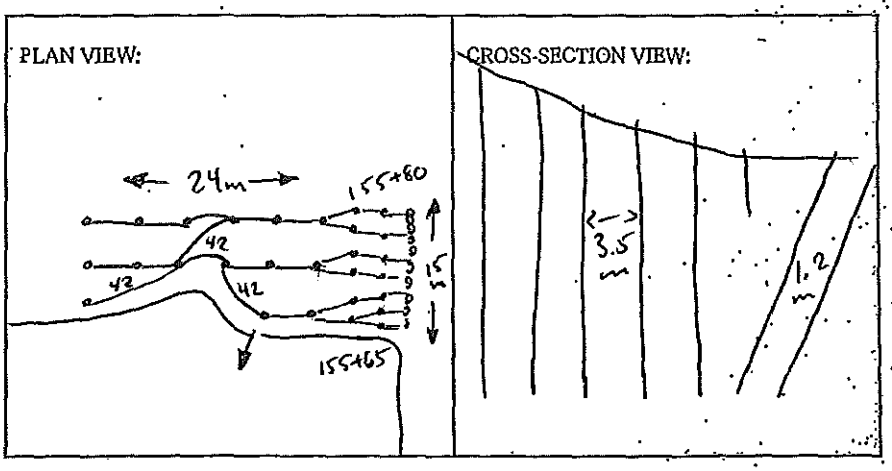
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1000 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 2/12
ACTUAL BLAST DATE Feb. 2/12
BLAST # 181

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+80 – 155+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 340 (m)

TOTAL NUMBER OF HOLES 12 B/L / 5 Buffer / 23 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 28

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1400 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

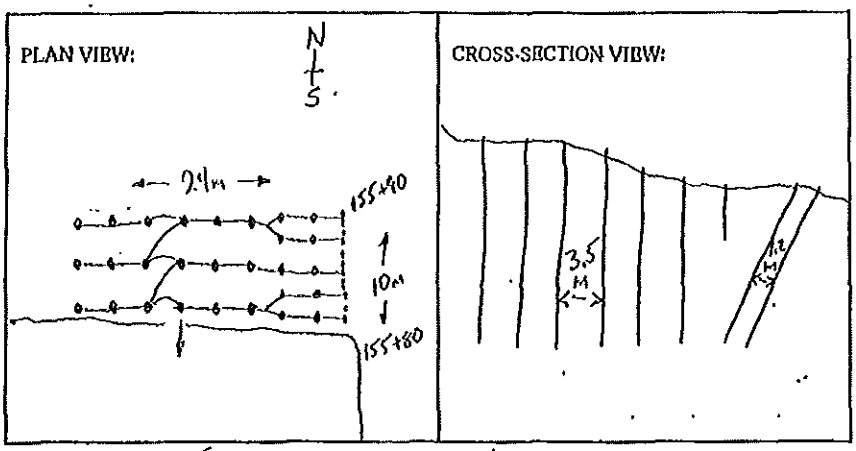
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2040 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 593409

DATE PREPARED Feb 1/12
PROPOSED BLAST DATE Feb 2/12
BLAST # 181

HIGHWAY# 97
BLAST LOCATION AT: Stn 155+80 - 155+90 Rs (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 8.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 340 (m)
PROPOSED APPROX. NO. OF HOLES 12bll/56bfro/23prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3.5 (m), BURDEN 3.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* every 2nd bll hole to be loaded w/ 200g primer cord, typ.

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 40
PROPOSED NUMBER OF DELAYS 28
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

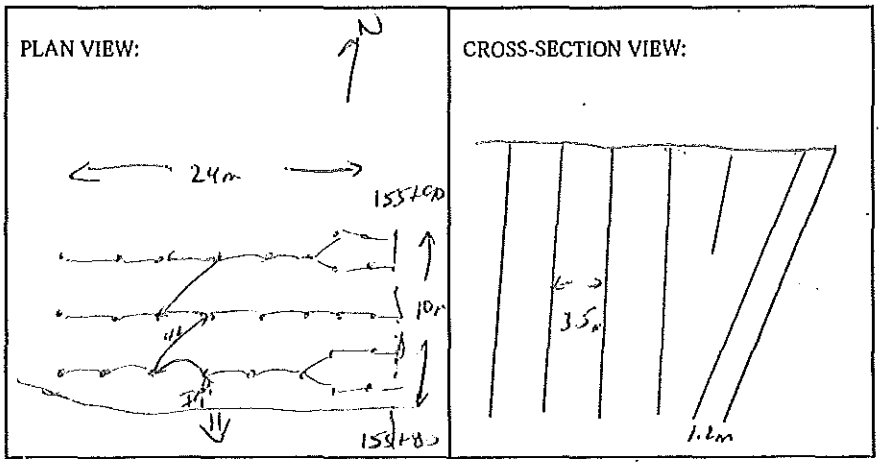
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 21000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 3/12
ACTUAL BLAST DATE Feb. 3/12
BLAST # 182

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+90 - 156+00 RS (to sub grade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 284 (m)

TOTAL NUMBER OF HOLES 10 B/L / 4 Buffer / 20 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 24

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

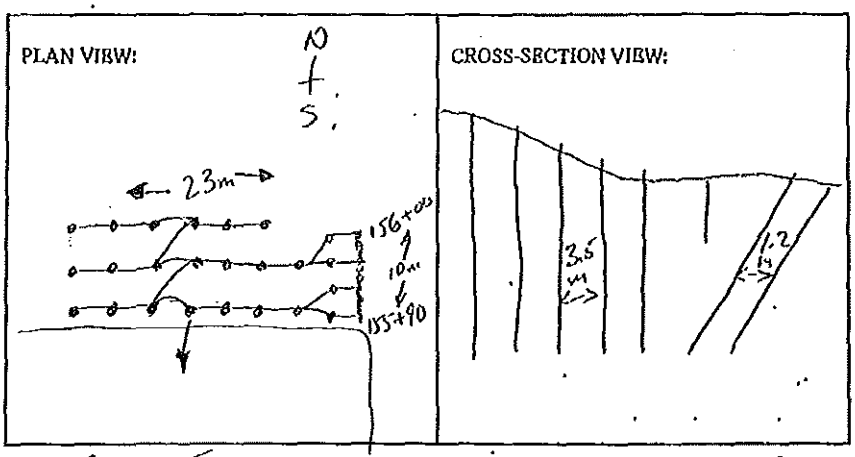
INITIATION DEVICE: (CIRCLE) B.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1950 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME DAVID VERSEY
BLASTER'S CERTIFICATE NUMBER 503489

DATE PREPARED FEB 2/12
ACTUAL BLAST DATE FEB 3/12
BLAST # 182

HIGHWAY# 97
BLAST LOCATION AT: STA 155+90 - 156.100 RS (No Substitute)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 16 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 289 (m)

TOTAL NUMBER OF HOLES 10x11 (4 Buffer) 20 Presp
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 24

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

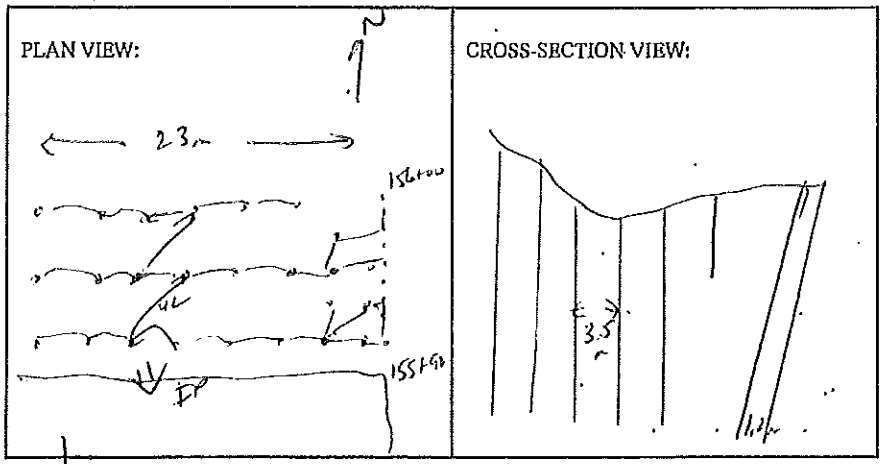
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 2000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinnon
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 04/12.
ACTUAL BLAST DATE [illegible] Feb. 03/12
BLAST # [illegible] 183

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+10 - 156+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 204 (m)

TOTAL NUMBER OF HOLES 51 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 51
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT [illegible] (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

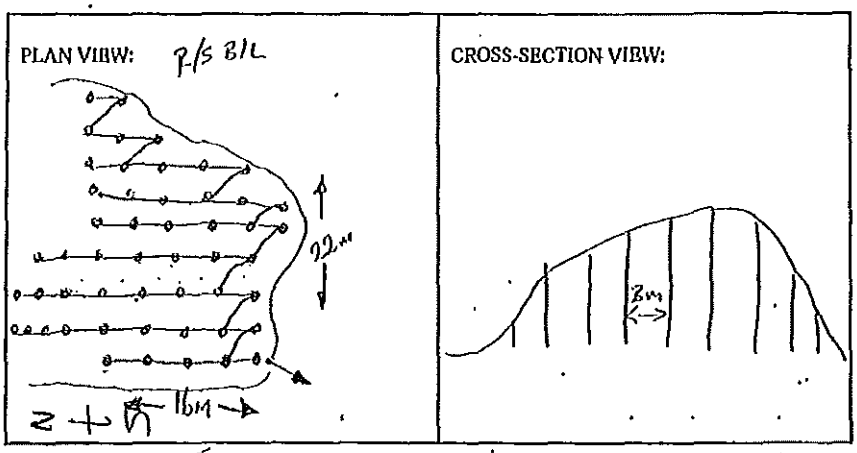
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinnon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 2/12
PROPOSED BLAST DATE Feb 3/12
BLAST # 183

HIGHWAY# 97
BLAST LOCATION AT: SPP 156 +10 - 156+30

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Gabbro
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 204 (m)
PROPOSED APPROX. NO. OF HOLES 51 Pers
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* every 2nd

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 51
PROPOSED NUMBER OF DELAYS 51
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 650 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

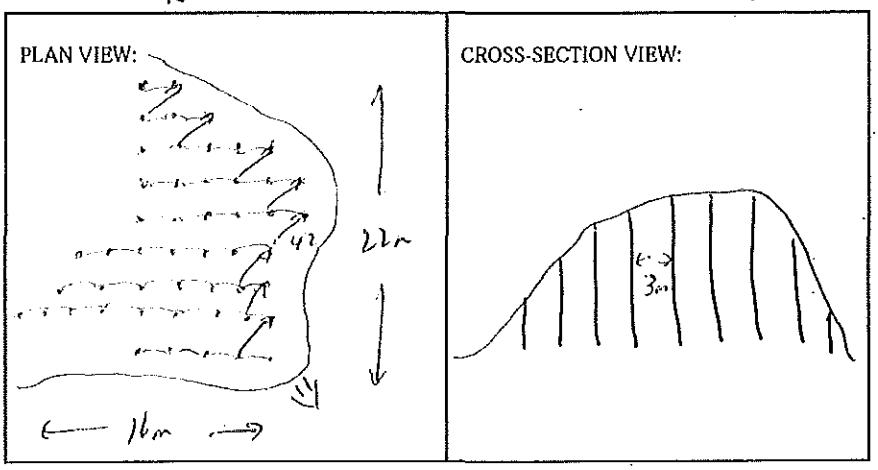
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Feb. 4/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE Feb. 4/12
BLAST # 184

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+30 - 156+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY Ø (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 352 (m)

TOTAL NUMBER OF HOLES 64 Holes production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 64
TOTAL NUMBER OF DELAYS 64

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 350 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

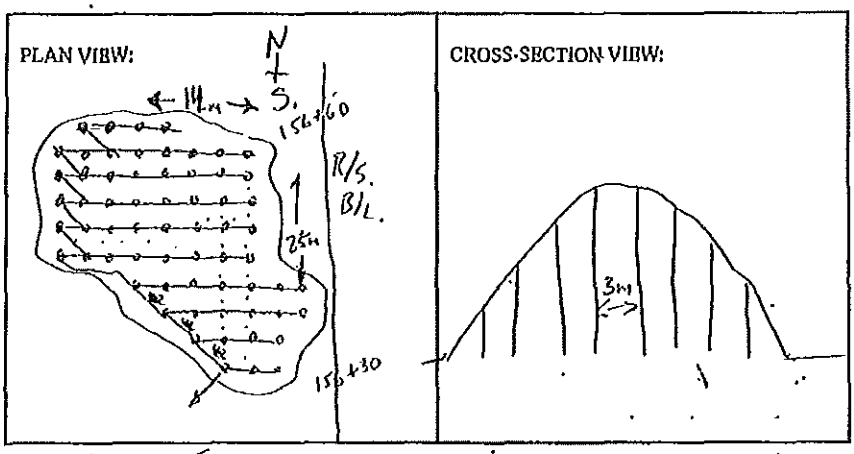
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1900 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 4/11
PROPOSED BLAST DATE Feb 4/11
BLAST # 184

HIGHWAY# 97
BLAST LOCATION AT: Sta 156+30 - 156+60

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 10
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 352 (m)
PROPOSED APPROX. NO. OF HOLES 64 Pre-D
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 64
PROPOSED NUMBER OF DELAYS 64
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 ± 42 (ms)

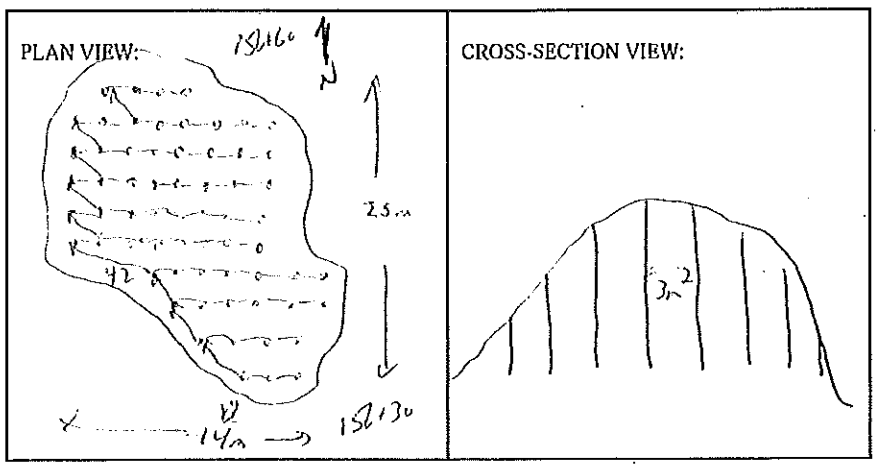
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) CAP INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1900 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 06/12
ACTUAL BLAST DATE Feb. 06/12
BLAST # 185

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+75 - 162+85 (LS 1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 9 B/L / 6 Buffer / 1 production
HOLE DIAMETER 100 (mm)
HOLE SPACING B 2.5 (m) BURDEN B 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 2.5 + 42 (ms)

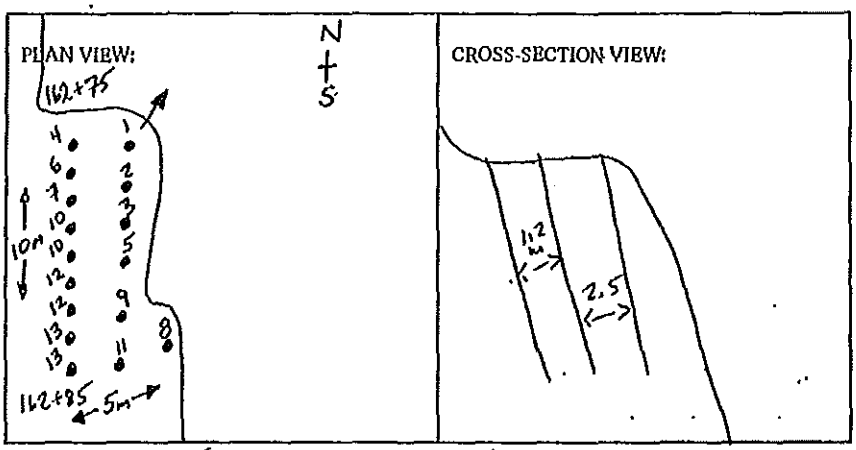
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 225 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 07/12
ACTUAL BLAST DATE Feb. 07/12
BLAST # 186

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+70 - 162+60 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 105 (m)

TOTAL NUMBER OF HOLES 10 B/L / 4 Buffer / 5 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

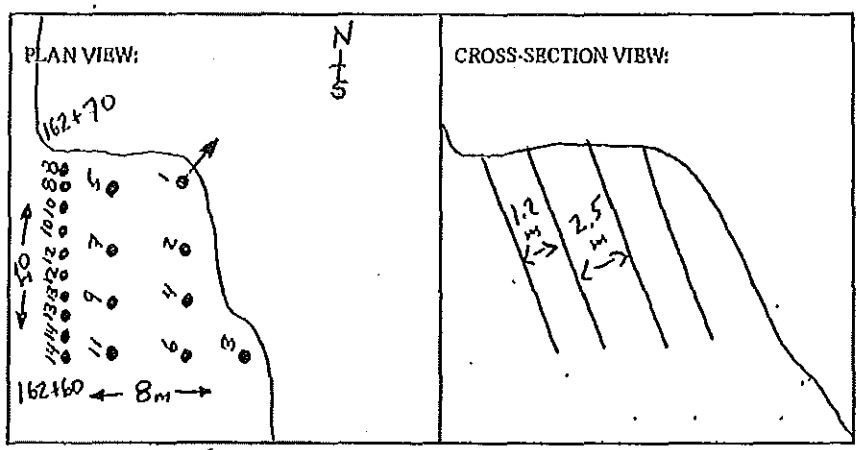
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 440 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 07/12
ACTUAL BLAST DATE Feb. 07/12
BLAST # 187

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+60 – 162+52 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 138 (m)

TOTAL NUMBER OF HOLES 11 B/L / 4 Buffer / 8 production
HOLE DIAMETER 100 (mm)
HOLE SPACING Ø 2.5 (m) BURDEN Ø 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 23

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

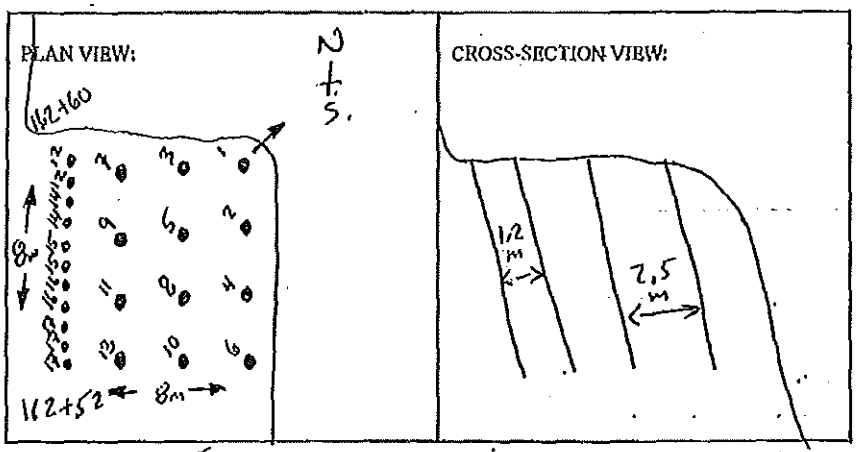
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 384 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 07/12
ACTUAL BLAST DATE Feb 07/12
BLAST # 188

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+52 — 162+45 (LS 1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 150 (m)

TOTAL NUMBER OF HOLES 12 B/L / 5 Buffer / 8 production
HOLE DIAMETER 100 (mm)
HOLE SPACING Ø 2.5 (m) BURDEN Ø 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 gr/m Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 25

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75. (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

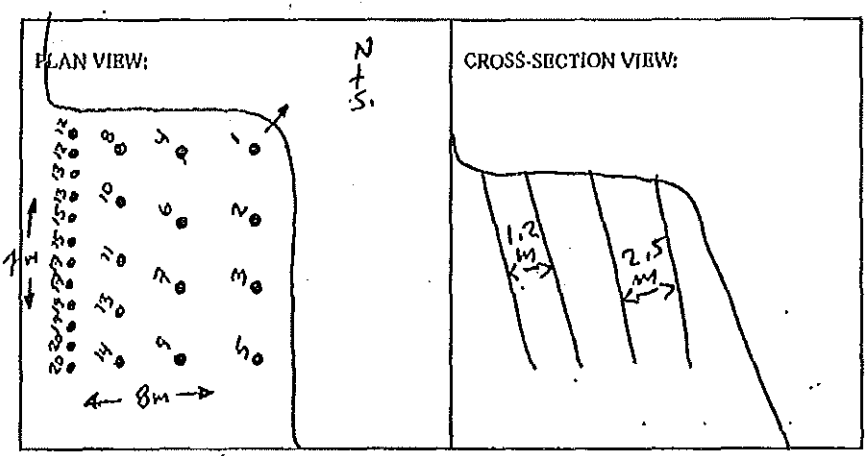
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 336 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 07/12.
ACTUAL BLAST DATE Feb. 07/12
BLAST # 189

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+45 - 162+40 (LS 1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 90 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 132 (m)

TOTAL NUMBER OF HOLES 12 B/L/5 Buffer/5 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 22

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

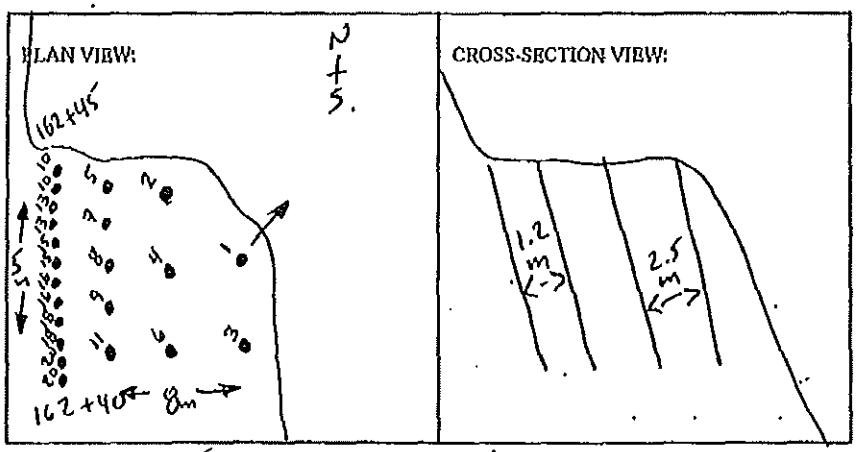
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 08/12
ACTUAL BLAST DATE Feb. 08/12
BLAST # 190 @ 10:33

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+40 - 162+32 (LS 1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 144 (m)

TOTAL NUMBER OF HOLES 11 BL/5 Buffer/8 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Buffer holes drilled vertical.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

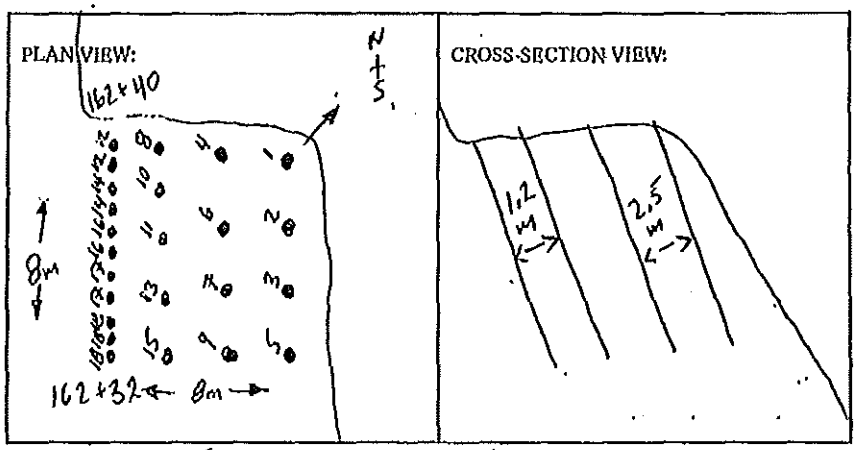
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 384 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

old Mission Rd 0.1 IN/S 34 Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 08/12
ACTUAL BLAST DATE Feb. 08/12
BLAST # 191 @ 12:34 pm.

HIGHWAY # 97
BLAST LOCATION AT: STN # 162 + 32 - 162 + 25 (LS 1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 138 (m)

TOTAL NUMBER OF HOLES 12 B/L / 5 Buffer / 7 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 23

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

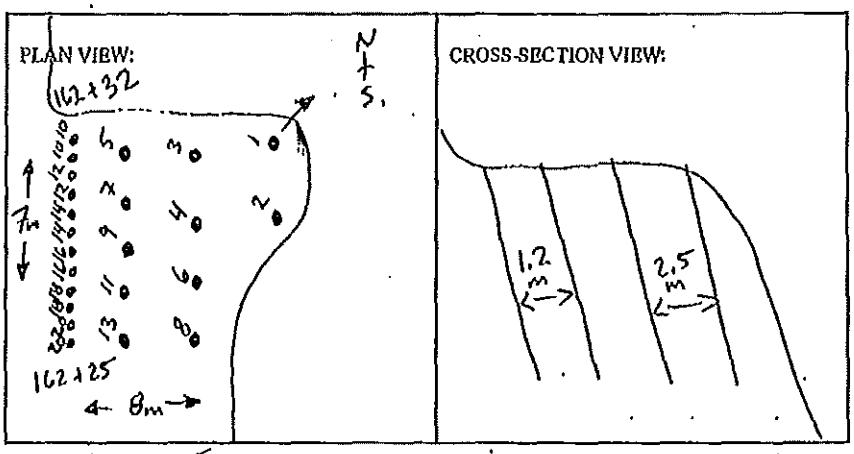
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 336 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

old mission Rd - 0.095 in/s - 30 Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 08/12
ACTUAL BLAST DATE Feb. 08/12
BLAST # 192 @ 15:45

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+25 — 162+10 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 80 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 17
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 156 (m)

TOTAL NUMBER OF HOLES 17 BL / 7 Buffer / 2 production
HOLE DIAMETER 100 (mm)
HOLE SPACING Ø 2.5 (m) BURDEN Ø 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 26

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

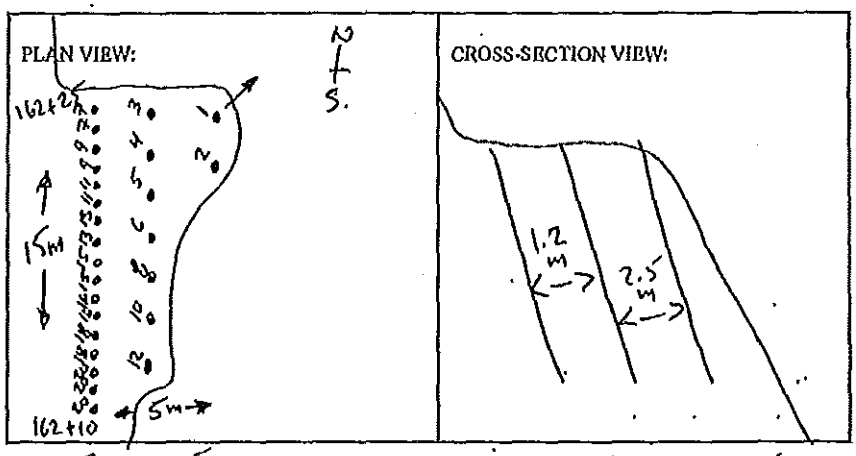
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

old Mission Rd. — No Trigger

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinnon
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 09/12
ACTUAL BLAST DATE Feb. 09/12
BLAST # 193

HIGHWAY # 97
BLAST LOCATION AT: STN # 155+50 – 154+00 L/S (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 46
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 19
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 630 (m)

TOTAL NUMBER OF HOLES 46 B/L / 26 Buffer / 54 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole. Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 126
TOTAL NUMBER OF DELAYS 80

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 750 (kg)
DELAY TYPE AND LENGTH 2.5 +42 (ms)

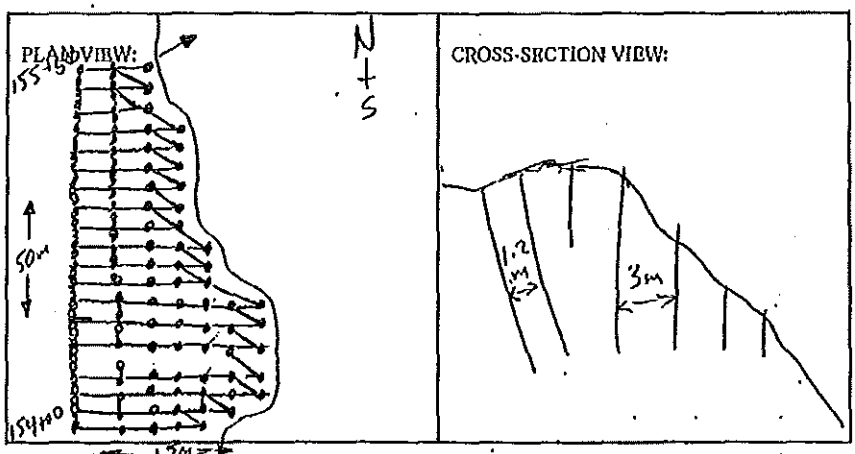
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 3750 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinnon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12
BLAST # 194 @ 10:05

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+04 - 161+95 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 9m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 16
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 138 (m)

TOTAL NUMBER OF HOLES 16 B/L / 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 1.2 (m) BURDEN @ 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 18

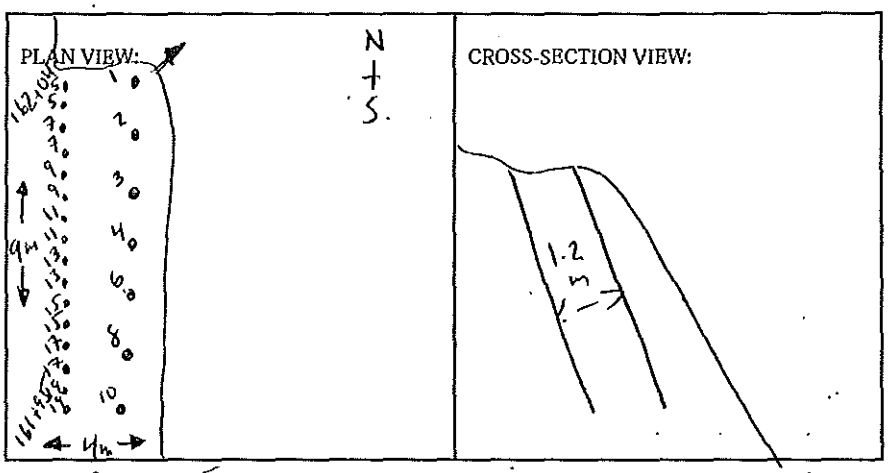
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 216 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12
BLAST # 194 @ 10:05

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+04 - 161+95 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 9m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 16
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 138 (m)

TOTAL NUMBER OF HOLES 16 B/L / 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 1.2 (m) BURDEN @ 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 18

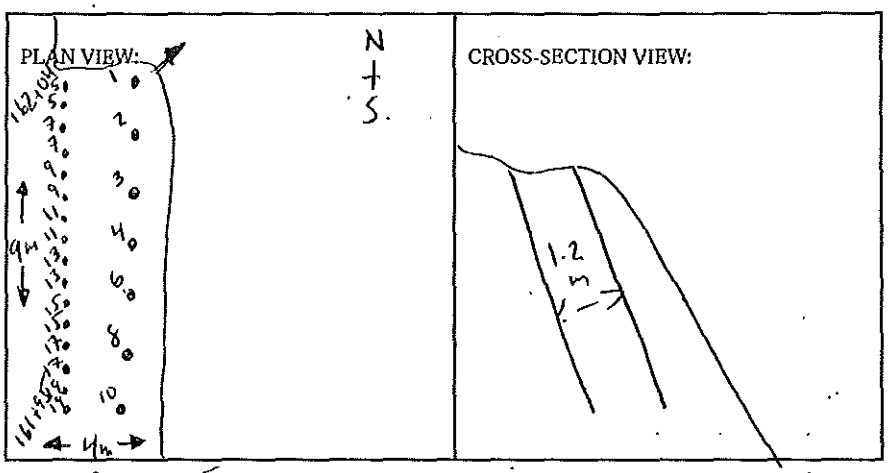
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 216 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12 @ 11:46 am
BLAST # 195

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+95 – 161+87 - LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 90 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 19
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 114 (m)

TOTAL NUMBER OF HOLES 19 B/L - 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Buffer holes horizontal

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

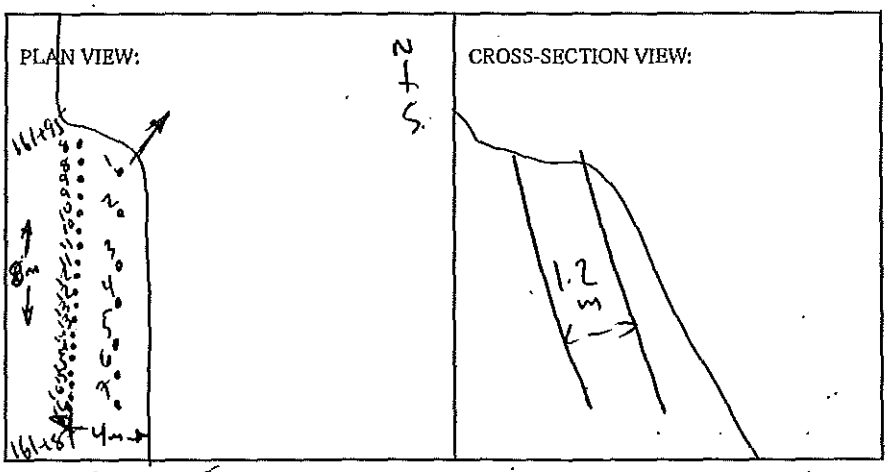
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 192 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12 @ 11:46 am
BLAST # 195

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+95 – 161+87 - LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 90 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 19
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 114 (m)

TOTAL NUMBER OF HOLES 19 B/L - 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Buffer holes horizontal

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

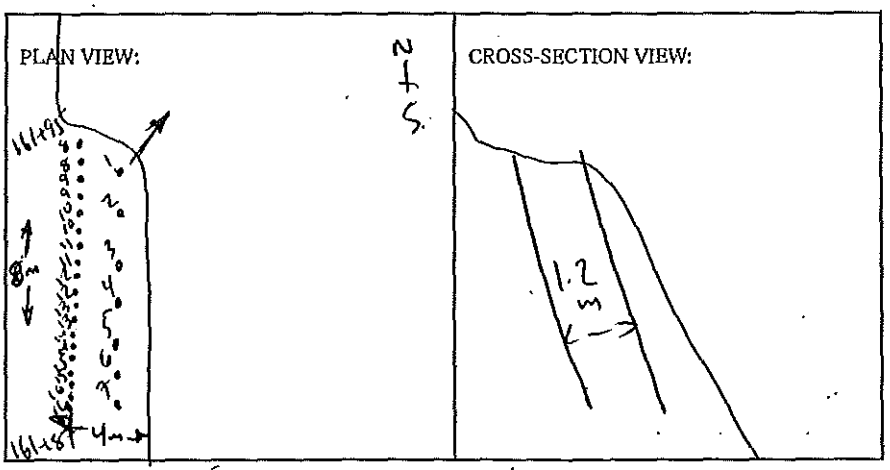
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 192 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12
BLAST # 196 @ 13:00

HIGHWAY# 97
BLAST LOCATION AT: STN # 161 +87 – 161+75 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 12 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 132 (m)

TOTAL NUMBER OF HOLES 15 B/L / 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 1.2 (m) BURDEN @ 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* [illegible]

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 9, 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

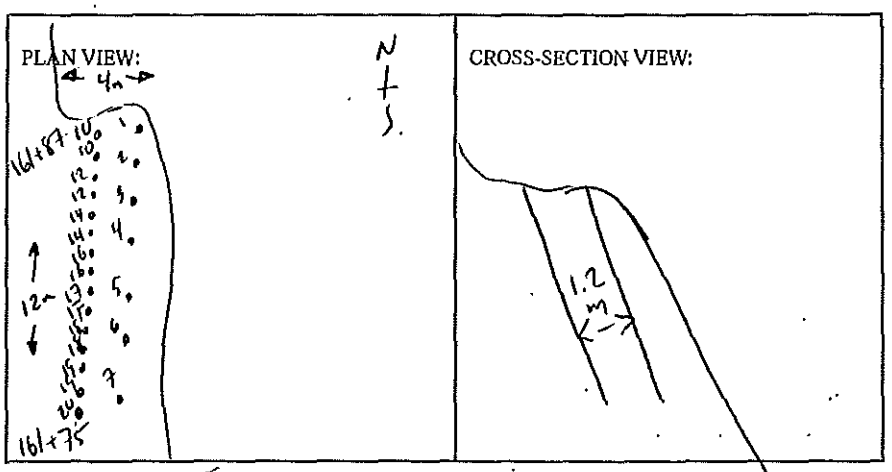
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 230 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12 @ 13:00
BLAST # 196

HIGHWAY# 97
BLAST LOCATION AT: STN # 161 +87 – 161+75 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 12 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 132 (m)

TOTAL NUMBER OF HOLES 15 B/L / 7 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 1.2 (m) BURDEN @ 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* [illegible]

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 9, 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

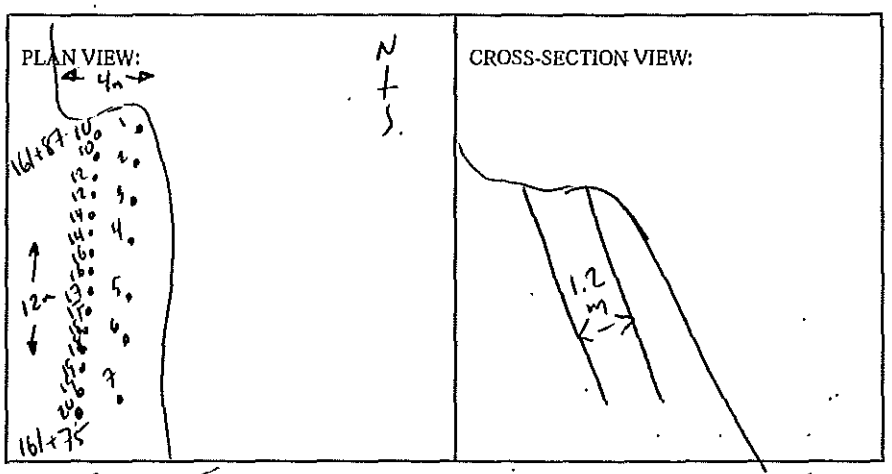
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 230 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



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(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12 @ 14:40
BLAST # 197

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+75 - 161+65 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 90 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 114 (m)

TOTAL NUMBER OF HOLES 14 B/L / 5 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

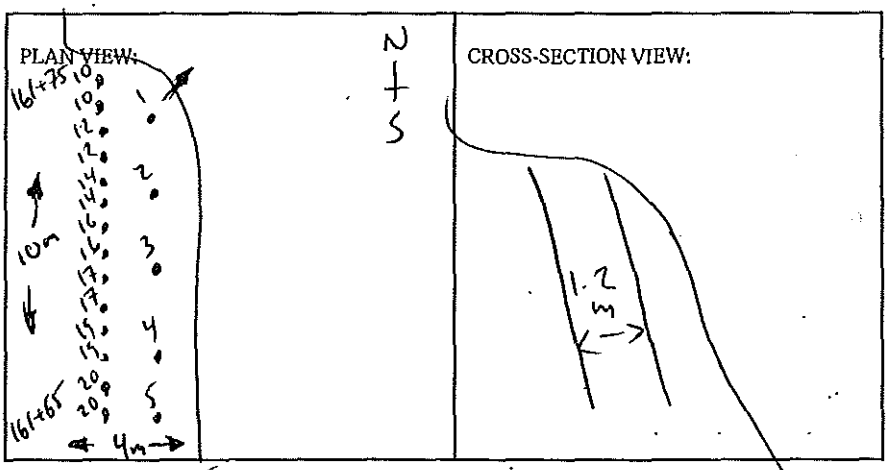
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 10/12
ACTUAL BLAST DATE Feb. 10/12 @ 14:40
BLAST # 197

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+75 - 161+65 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 90 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 114 (m)

TOTAL NUMBER OF HOLES 14 B/L / 5 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

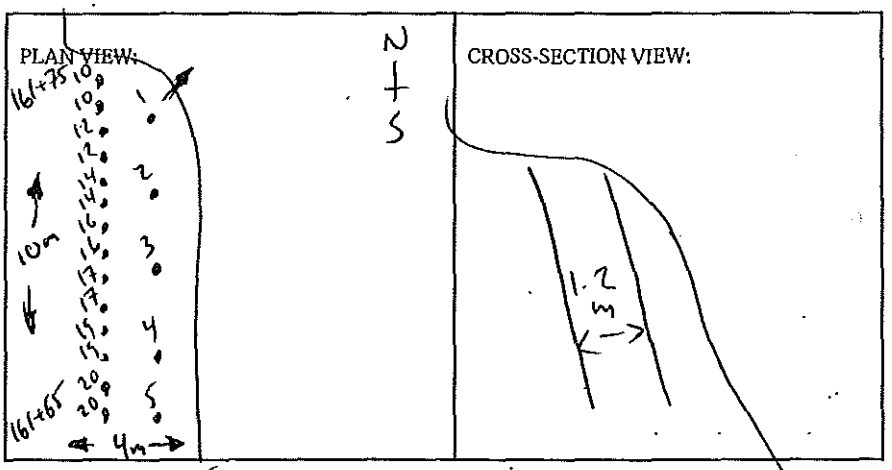
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 11/12
ACTUAL BLAST DATE Feb. 11/12.
BLAST # 198 @ 14:10

HIGHWAY # 97
BLAST LOCATION AT: STN # 154+60 - 154+90 Lts (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 072 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 30
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 714 (m)

TOTAL NUMBER OF HOLES 30 B/L/20 Buffer/65 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 122
TOTAL NUMBER OF DELAYS 85

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1075 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

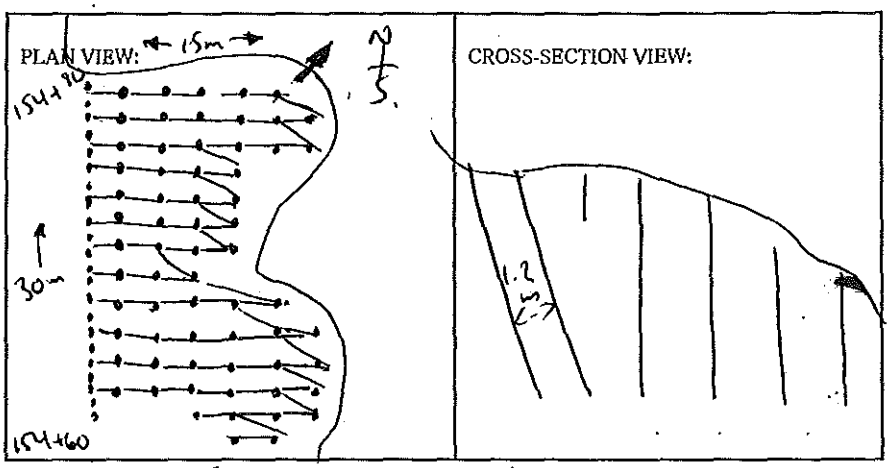
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2700 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



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AS-BUILT BLASTING RECORD
File #:
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GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 11/12
ACTUAL BLAST DATE Feb. 11/12.
BLAST # 198 @ 14:10

HIGHWAY # 97
BLAST LOCATION AT: STN # 154+60 - 154+90 Lts (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 072 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 30
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 714 (m)

TOTAL NUMBER OF HOLES 30 B/L/20 Buffer/65 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 122
TOTAL NUMBER OF DELAYS 85

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1075 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

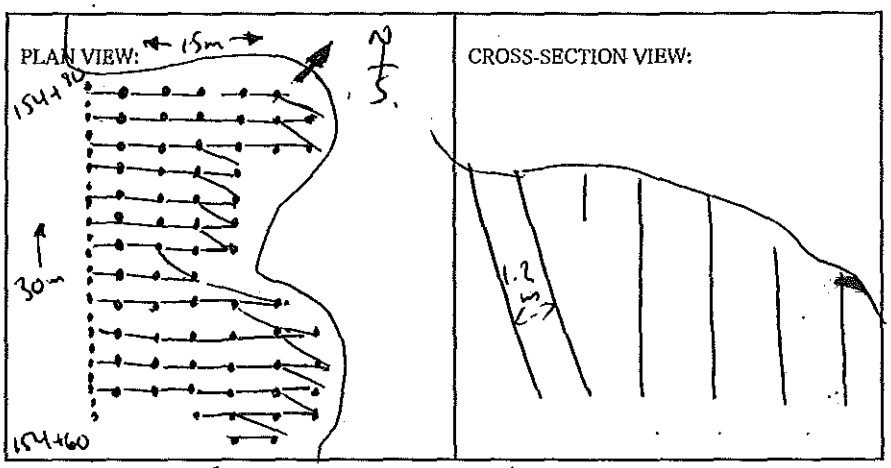
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2700 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 13/12
ACTUAL BLAST DATE Feb 13/12
BLAST # 199 @ 12:25

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+50 - 163+55 (To subgrade) L/S.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH @ 195 (m)

TOTAL NUMBER OF HOLES @ 8 BL / 4 Buffer / 17 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 29
TOTAL NUMBER OF DELAYS @ 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 160. (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

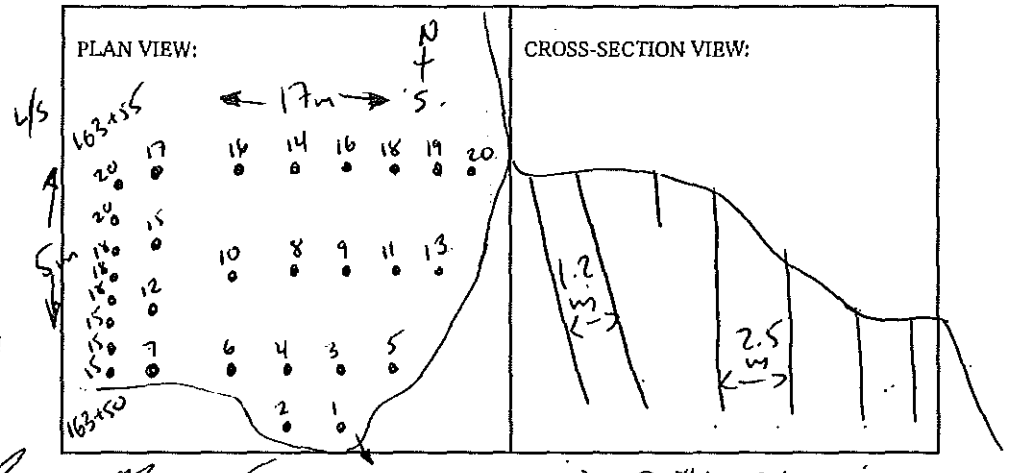
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 425 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



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CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 13/12
ACTUAL BLAST DATE Feb 13/12
BLAST # 199 @ 12:25

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+50 - 163+55 (To subgrade) L/S.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH @ 195 (m)

TOTAL NUMBER OF HOLES @ 8 BL / 4 Buffer / 17 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 29
TOTAL NUMBER OF DELAYS @ 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 160. (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

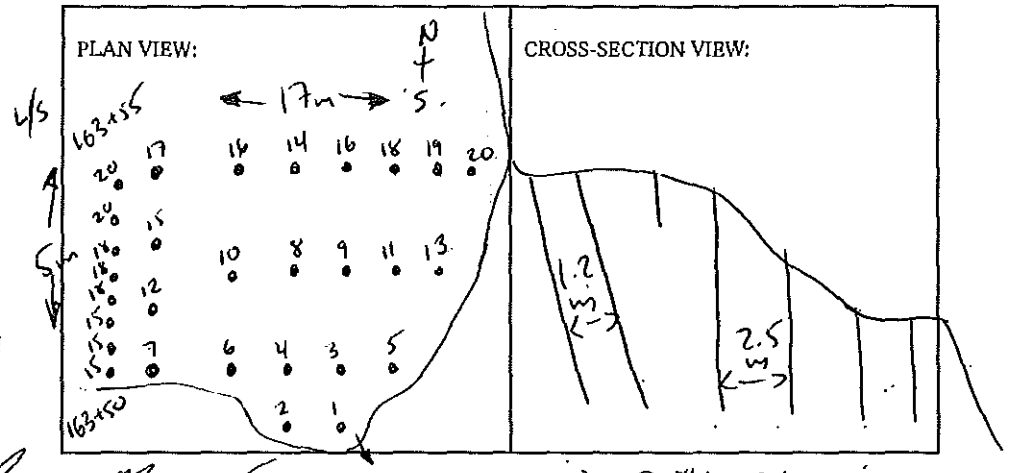
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 425 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 13/12
ACTUAL BLAST DATE Feb. 13/12
BLAST # 200 @13:25

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+60 - 163+65 (to subgrade L/S)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 51 (m)

TOTAL NUMBER OF HOLES Ø 17 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

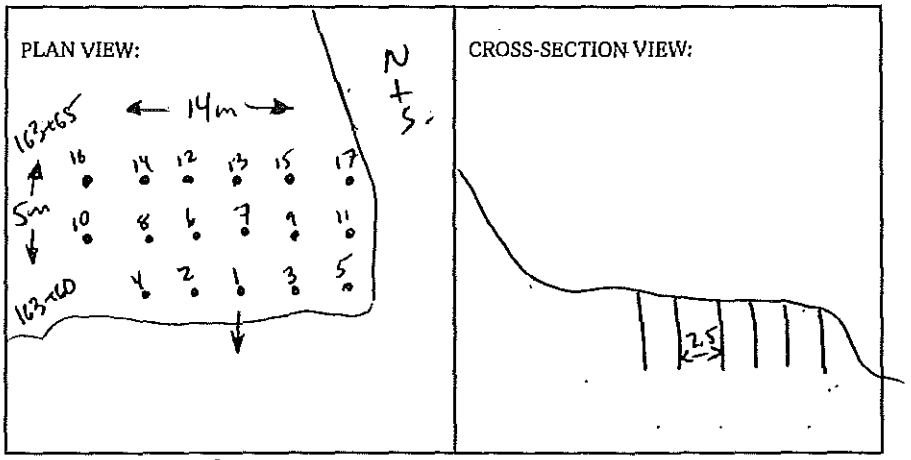
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 13/12
ACTUAL BLAST DATE Feb. 13/12
BLAST # 200 @13:25

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+60 - 163+65 (to subgrade L/S)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 51 (m)

TOTAL NUMBER OF HOLES Ø 17 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

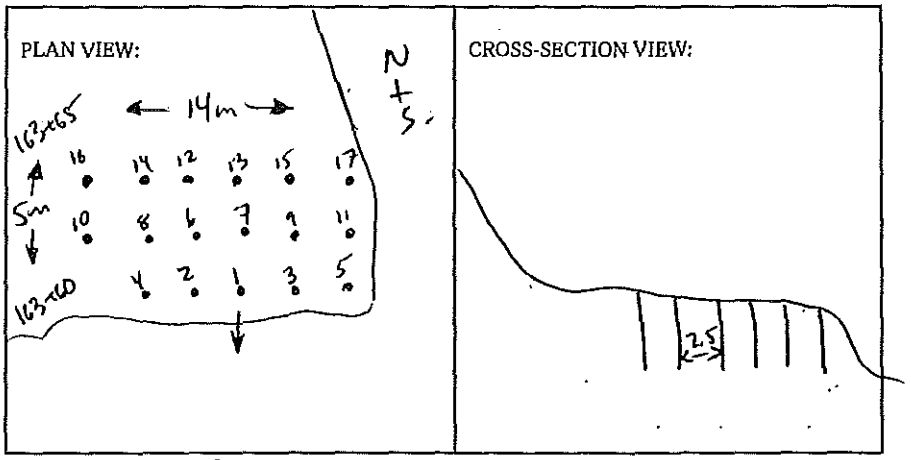
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 14/12
ACTUAL BLAST DATE Feb. 14/12
BLAST # 202

HIGHWAY# 97
BLAST LOCATION AT: STN # 154+10 - 154+65 (L/S To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 55 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ~~50~~
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 16
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 1038 (m)

TOTAL NUMBER OF HOLES ~~50~~ B/L/32 Buffer/66 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 148
TOTAL NUMBER OF DELAYS 98

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1550 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

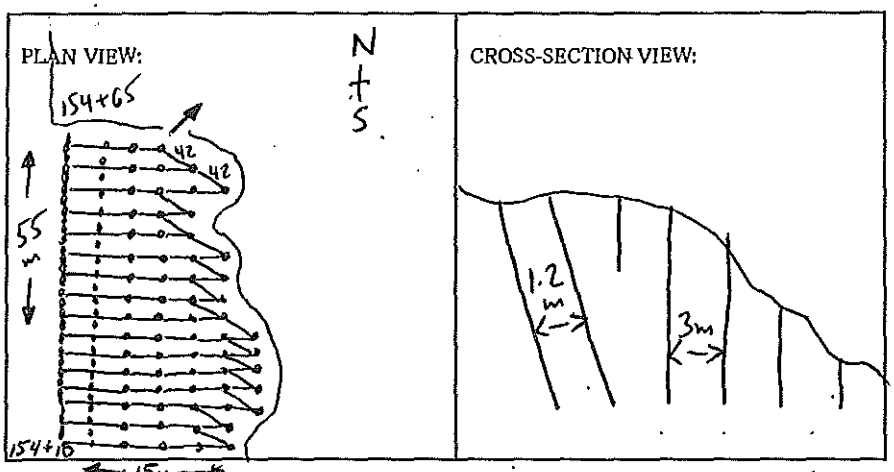
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 4950 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 13/12
PROPOSED BLAST DATE Feb. 14/12
BLAST # 202

HIGHWAY # 97
BLAST LOCATION AT: STN # 154+10 - 154+65 (L/S Tosubgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 55 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 75
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 16
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 1038 (m)

PROPOSED APPROX. NO. OF HOLES 75 B/L/32 Buffer/66 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES
PROPOSED NUMBER OF DELAYS

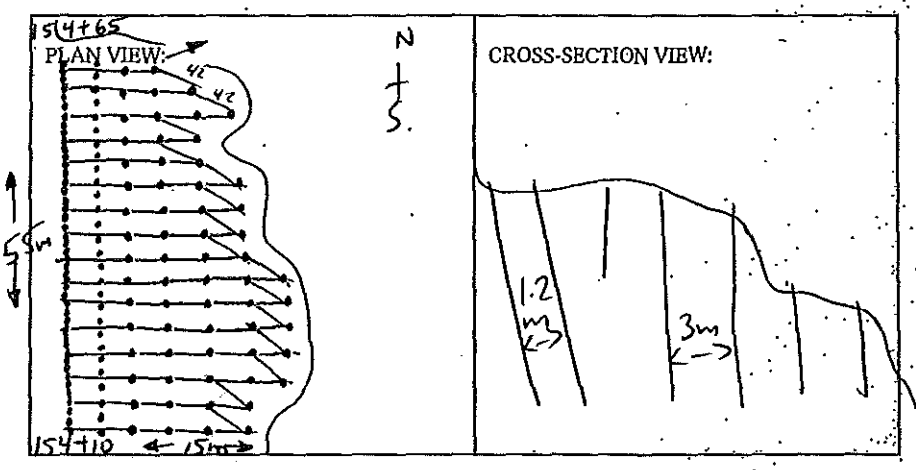
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1000 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4950 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mal COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Feb. 15/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE Feb. 15/12
BLAST # 0303 @ 10:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+35 - 163+50 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 160 (m)

TOTAL NUMBER OF HOLES 5 Buffer/12 B/L/15 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 32
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

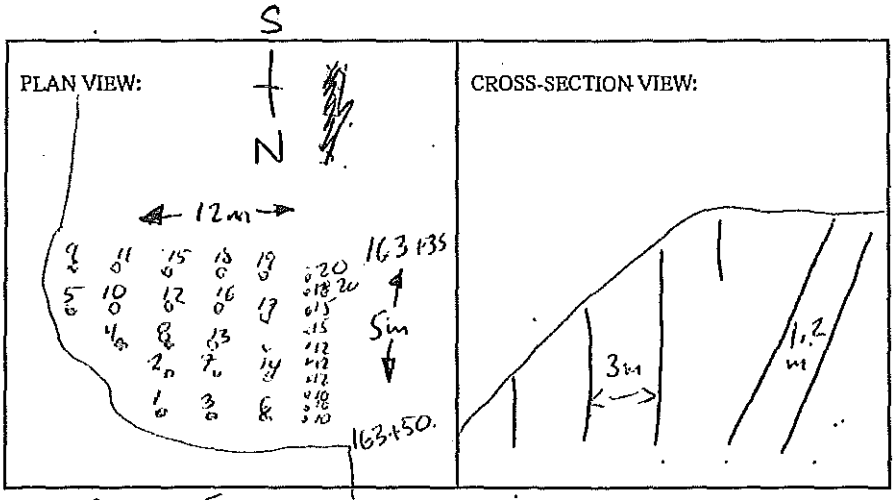
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 300 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALOHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 15/12
PROPOSED BLAST DATE Feb. 15/12
BLAST # 203

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+35 - 163+50 LS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 160 (m)

PROPOSED APPROX. NO. OF HOLES 5 Buffer / 12 B/L / 15 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 32
PROPOSED NUMBER OF DELAYS 20

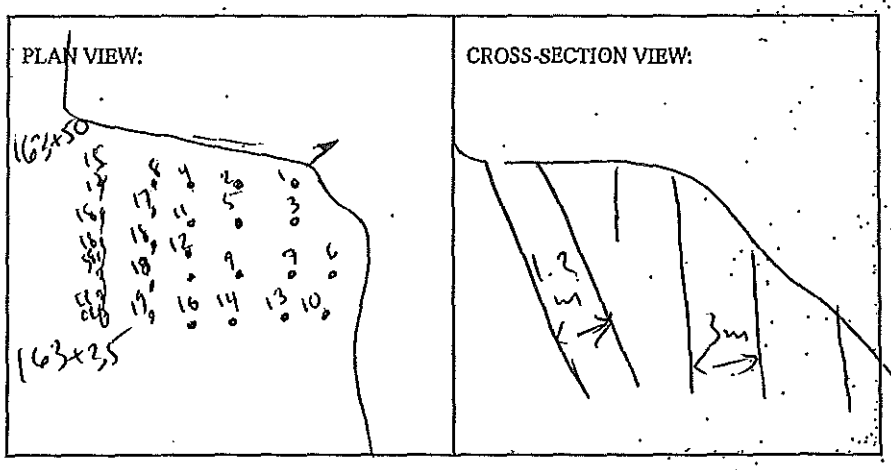
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 15/12
ACTUAL BLAST DATE Feb. 15/12
BLAST # 204 @ 13:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 136+25 - 136+35 LS (to subs rate)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 150 (m)

TOTAL NUMBER OF HOLES 9 B/L / 5 Buffer / 11 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

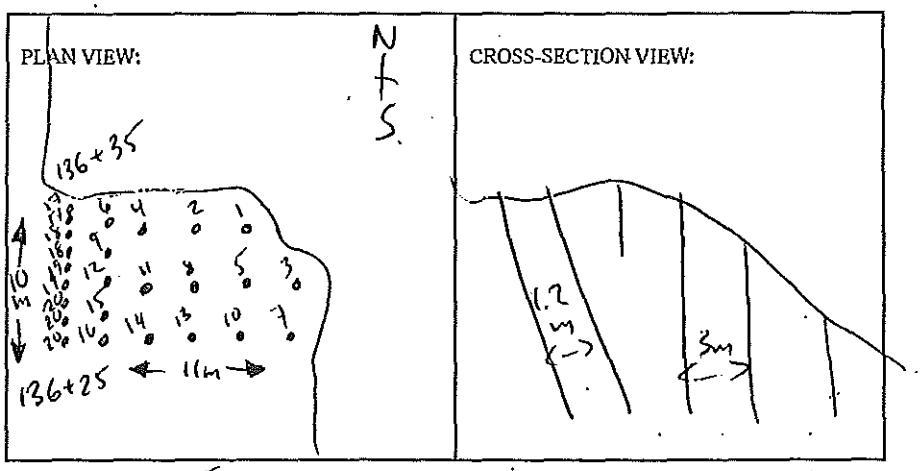
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 660 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MALAHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 15/12
PROPOSED BLAST DATE Feb. 15/12
BLAST # 204

HIGHWAY# 97
BLAST LOCATION AT: STN # 163 136+25 - 163 136+35 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 77 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 150. (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 5 Buffer / 11 prod
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain per cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 25
PROPOSED NUMBER OF DELAYS 16

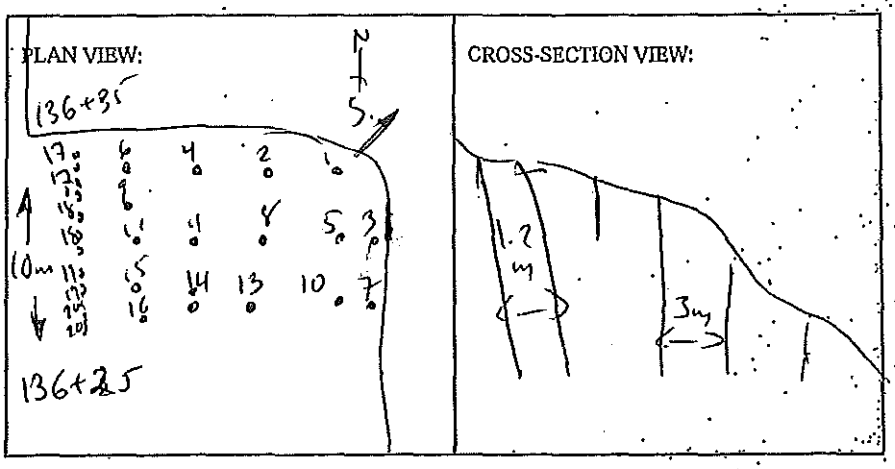
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malahinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 15/12
ACTUAL BLAST DATE Feb 15/12
BLAST # 205 @ 15:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+70 - 163+60 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 13 B/L / 6 Buffer / 8 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

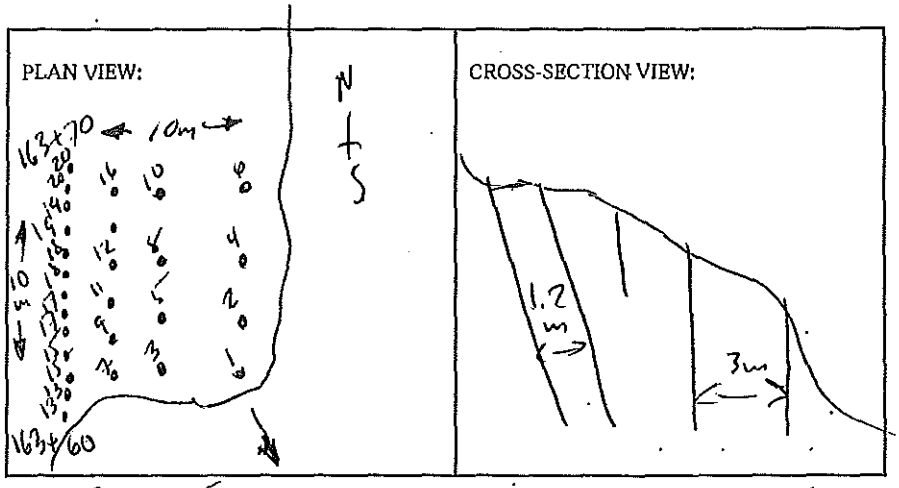
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 15/12
PROPOSED BLAST DATE Feb. 15/12
BLAST # 205

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+70 - 163+60LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 13
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED APPROX. NO. OF HOLES 13 B/L/6 Buffer/8 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 27
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

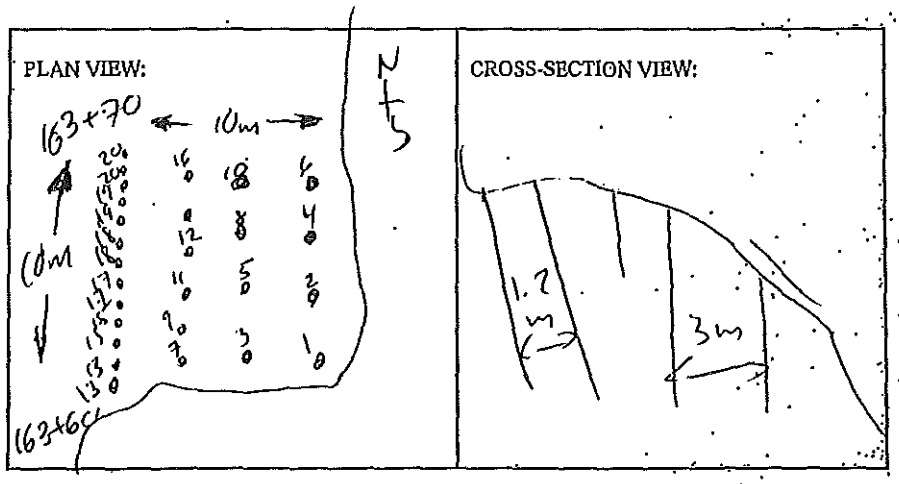
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 16/12
ACTUAL BLAST DATE Feb. 16/12 @ 11:30
BLAST # 206

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+70 - 163+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 7.0 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 196.00 (m)

TOTAL NUMBER OF HOLES 15 B/L / 7 Buffer / 6 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 28
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

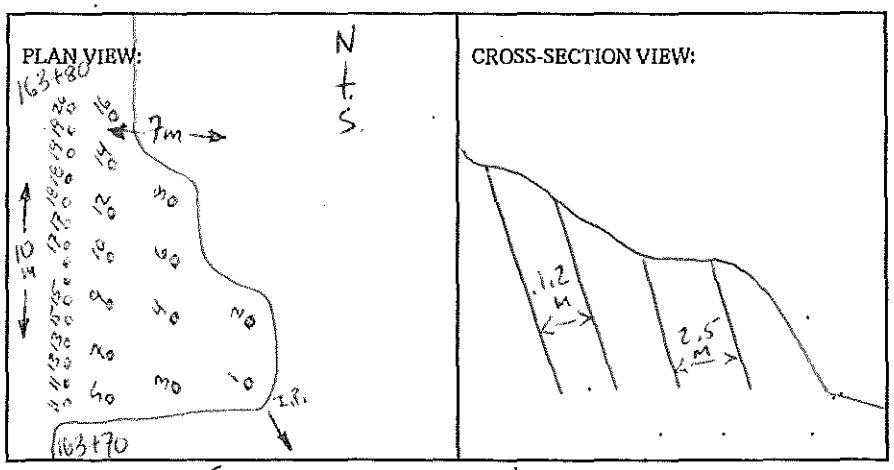
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 490 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 5546.3

DATE PREPARED Feb. 16/12
PROPOSED BLAST DATE Feb. 16/12
BLAST # 206

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+70 - 163+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 15
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 196 (m)

PROPOSED APPROX. NO. OF HOLES 15 B/L / 7 Buffer / 6 pad
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain Detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 28
PROPOSED NUMBER OF DELAYS 20

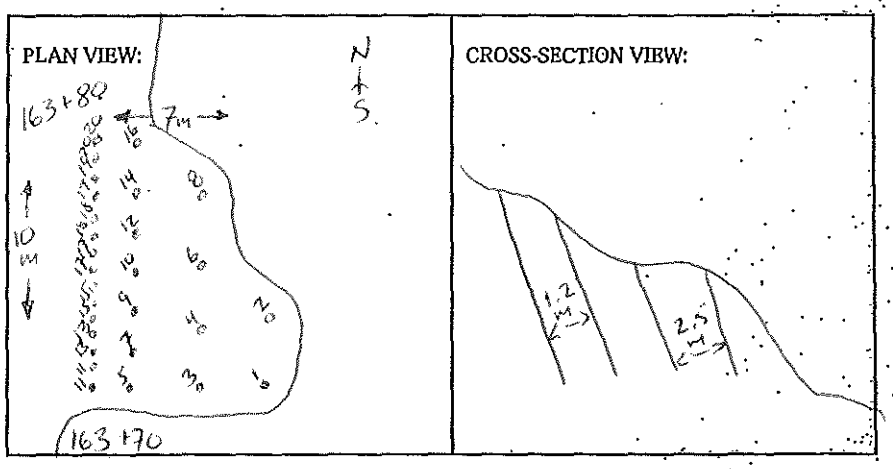
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 490 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 16/12
ACTUAL BLAST DATE Feb. 16/12 @ 15:05
BLAST # 207

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+80 — 163+95 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 20
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 136 (m)

TOTAL NUMBER OF HOLES 20 B/L / 10 Buffer / 9 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 39
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

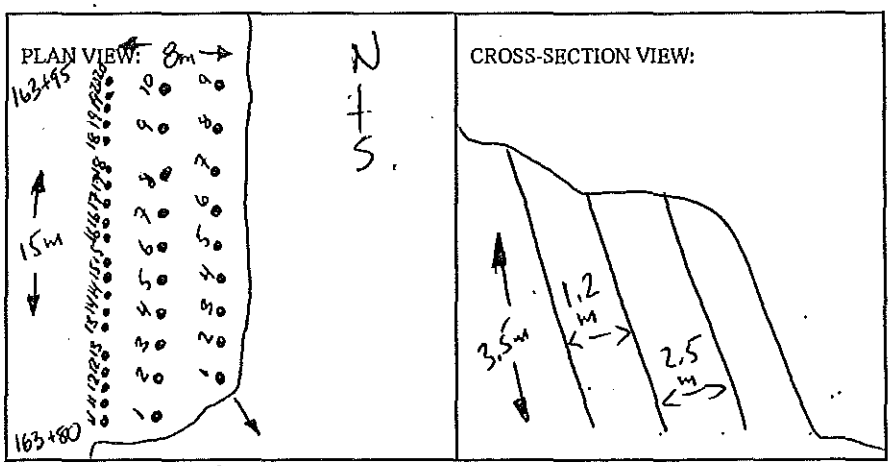
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 420 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Feb. 16/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE Feb. 16/12
BLASTER'S NAME JAMES MALOHINNEY
BLAST # 207
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+80 - 163+95 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 20
PROPOSED AVG. DEPTH 3.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 136 (m)
PROPOSED APPROX. NO. OF HOLES 20 B/L / 10 Buffer / 9 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 39
PROPOSED NUMBER OF DELAYS 20
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

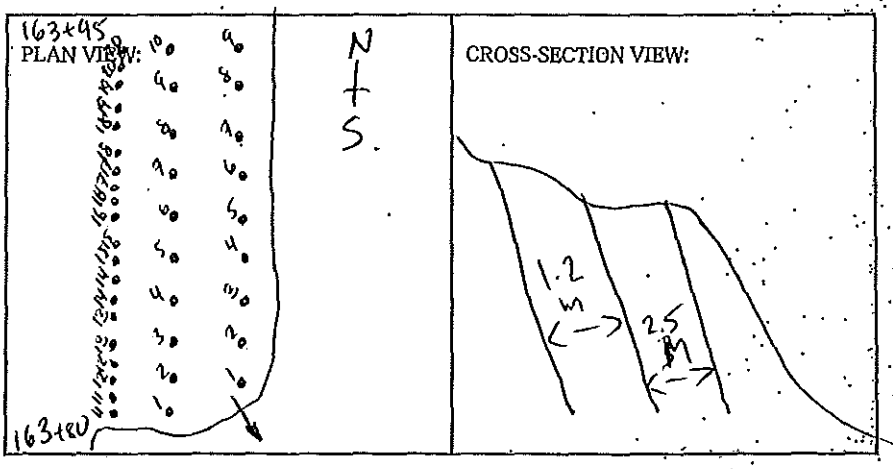
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 17/12
ACTUAL BLAST DATE Feb. 17/12
BLAST # 208 @ 15:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+80 - 164+10 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 37
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 13
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 496 (m)

TOTAL NUMBER OF HOLES 37 B/L / 15 Buffer / 20 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 62
TOTAL NUMBER OF DELAYS 25

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 420 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

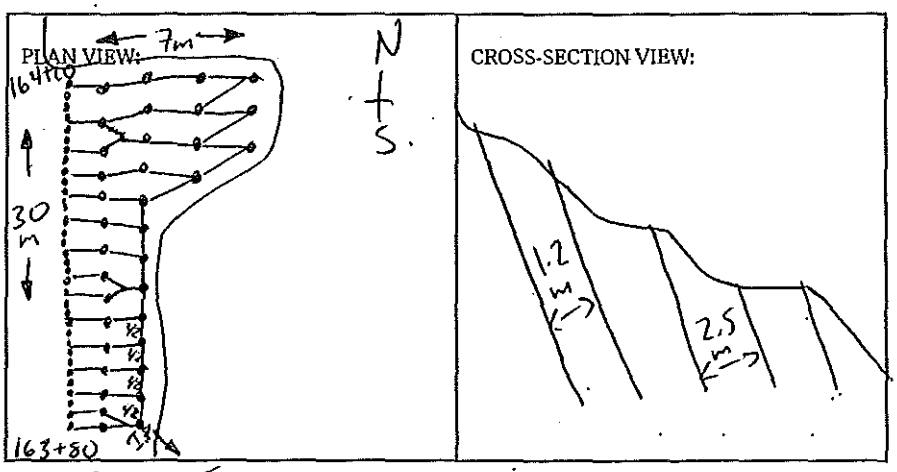
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1680 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 17/12
PROPOSED BLAST DATE Feb. 17/12
BLAST # 208

HIGHWAY# 97
BLAST LOCATION AT: STN # 163+80 - 164+10 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 37
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 13
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 496 (m)

PROPOSED APPROX. NO. OF HOLES 37 B/L / 15 Buffer / 20 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 62
PROPOSED NUMBER OF DELAYS 25

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

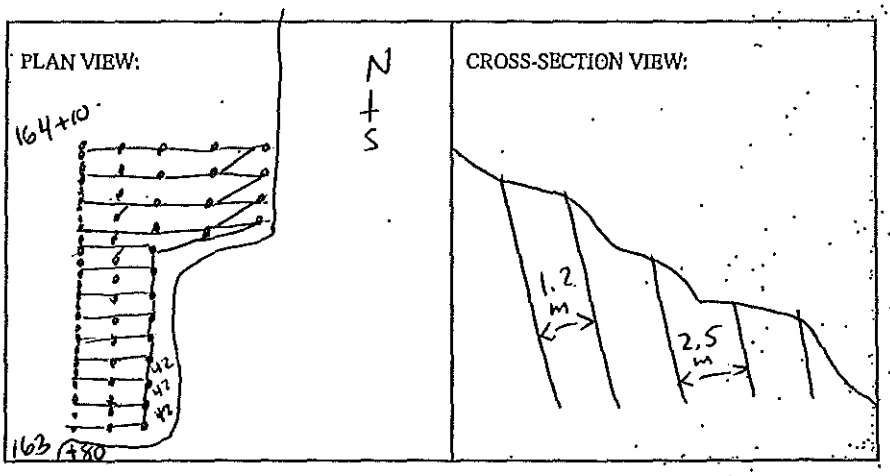
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1680 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 18/12
ACTUAL BLAST DATE Feb. 18/12
BLAST # 209

HIGHWAY # 97
BLAST LOCATION AT: STN # 163+15 - 163+25 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 238 (m)

TOTAL NUMBER OF HOLES 15 B/L / 7 Buffer / 12 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

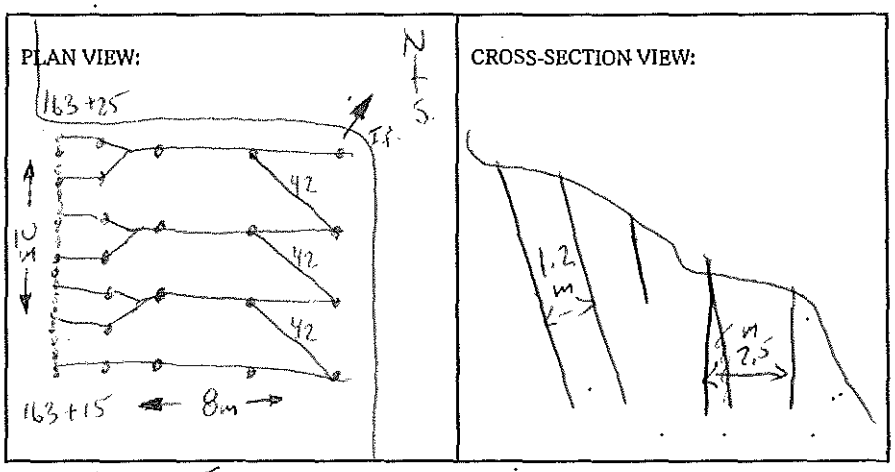
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 560 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Malohinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 18/12
PROPOSED BLAST DATE Feb. 18/12
BLAST # 209

HIGHWAY # 97
BLAST LOCATION AT: STN # 163 + 15 - 163 + 25 (45 to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 30 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 15
PROPOSED AVG. DEPTH 9.7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 238 (m)

PROPOSED APPROX. NO. OF HOLES 15 B/L / 7 Buffer / 12 prods
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 34
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

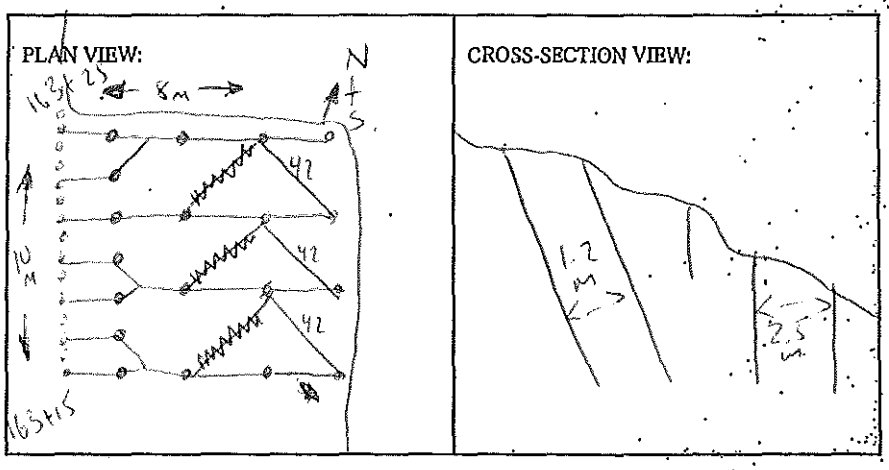
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 560 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Malohinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 21/12
ACTUAL BLAST DATE Feb. 21/12
BLAST # 212 @ 15:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 164+30 - 164+65 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 28
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 17
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 468 (m)

TOTAL NUMBER OF HOLES 28 B/L / 9 Buffer / 41 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
~~* Every 2nd B/L Hole LOADED with 200 grain Det cord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 78
TOTAL NUMBER OF DELAYS 50

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 375 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

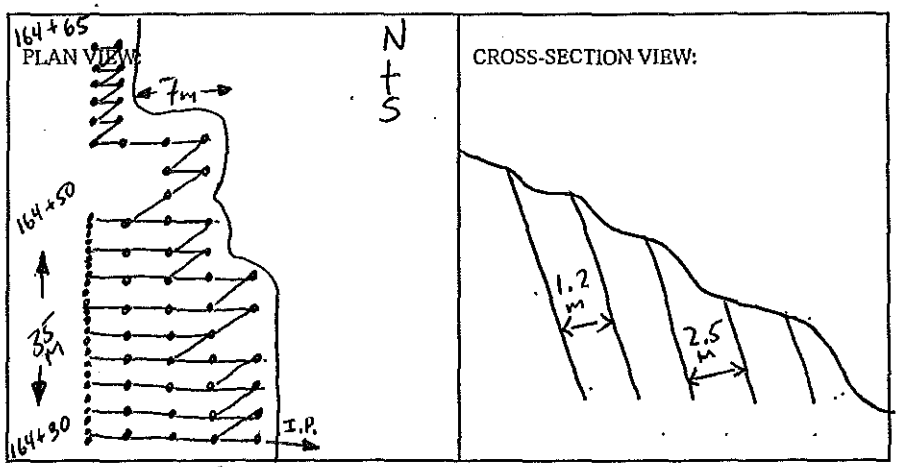
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1470 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Feb. 20/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE Feb. 21/12
BLASTER'S NAME JAMES MALOHINNEY
BLAST # 212
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 164+30 - 164+65 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 28
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 17
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 468 (m)

PROPOSED APPROX. NO. OF HOLES 28 B/L/9 Buffer/41 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 78
PROPOSED NUMBER OF DELAYS 50

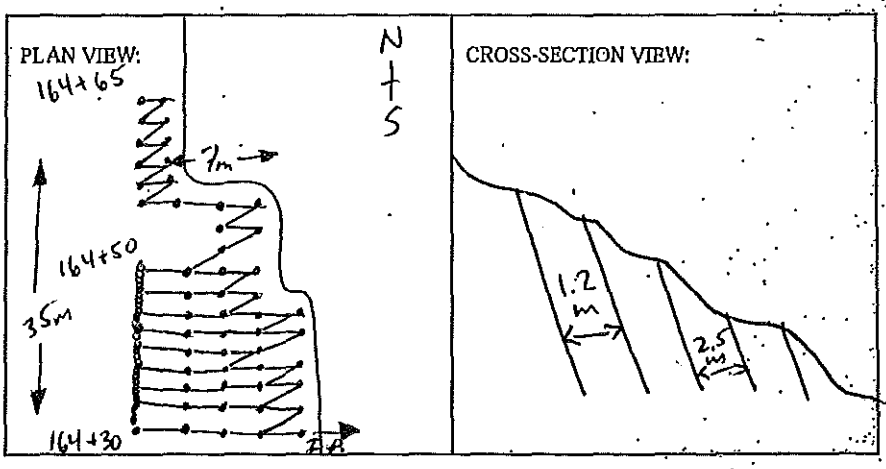
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1470 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mahoney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 22/12
ACTUAL BLAST DATE Feb. 22/12
BLAST # 213 @ 15:00

HIGHWAY # 97
BLAST LOCATION AT: STN # 163+80 - 164+15 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 38
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 492 (m)

TOTAL NUMBER OF HOLES 38 BL / 16 Buffer / 28 - production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
~~* Every 2nd Hole Lower Drill Engineer Record.~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 82
TOTAL NUMBER OF DELAYS 44

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 575 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

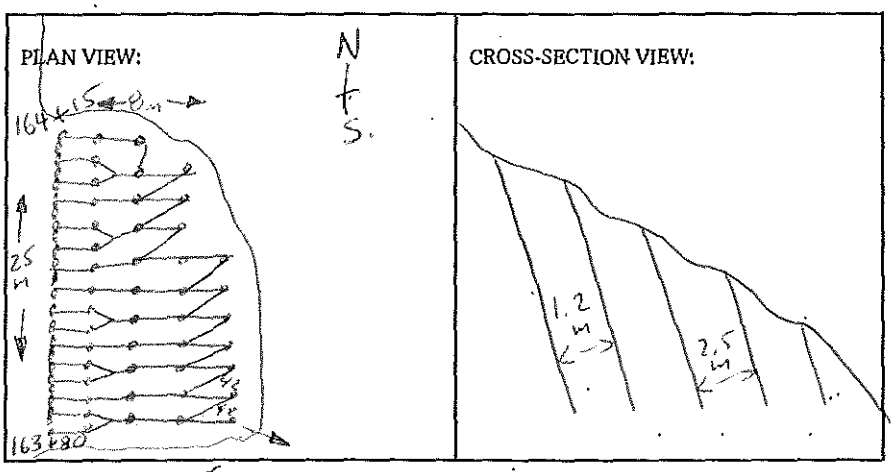
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 21/12
PROPOSED BLAST DATE Feb. 22/12
BLAST # 213

HIGHWAY # 97
BLAST LOCATION AT: STN # 163+80 - 164+15 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 38
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 11
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 442 (m)

PROPOSED APPROX. NO. OF HOLES 38 BL/16 Buffer/28 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 88
PROPOSED NUMBER OF DELAYS 44

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

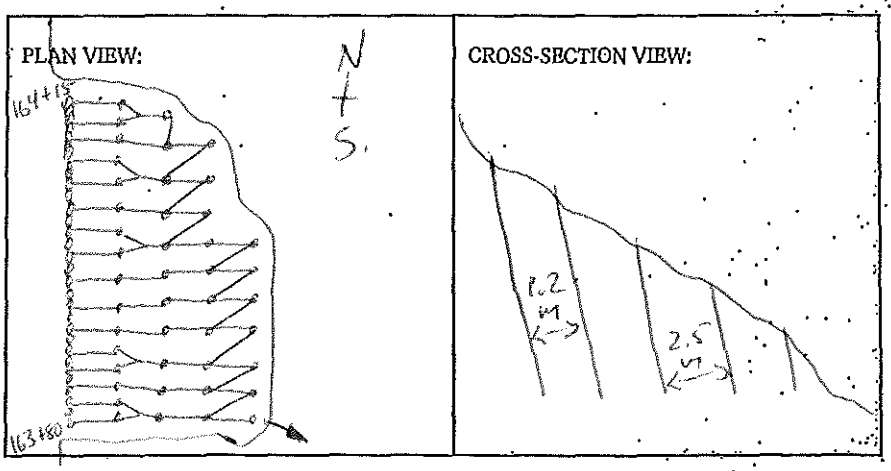
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James McKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb 27/12
ACTUAL BLAST DATE Feb. 27/12
BLAST # 214 @ 12:35

HIGHWAY# 97
BLAST LOCATION AT: STN # 162 + 10 — 162 + 00 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 16 Holes
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 Kg. (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

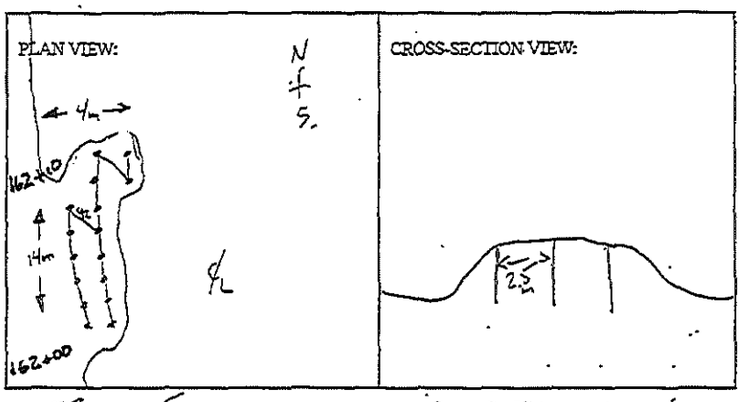
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James McKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 27/12
PROPOSED BLAST DATE Feb. 27/12
BLAST # 214

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+100 - 162+00 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 3.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 56 (m)

PROPOSED APPROX. NO. OF HOLES 16 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16

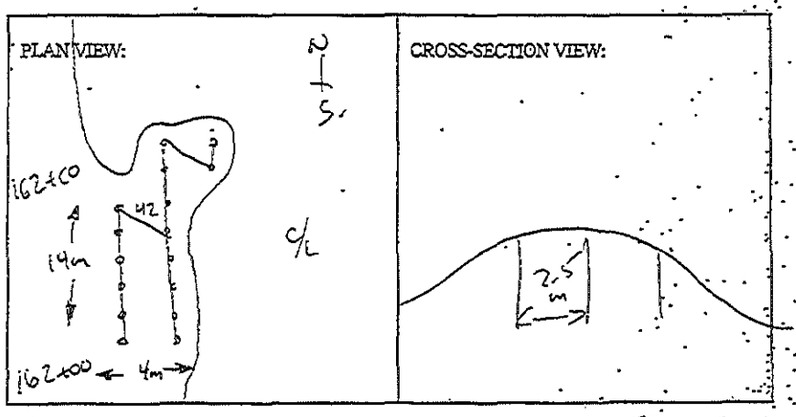
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 27/12
ACTUAL BLAST DATE Feb 27/12
BLAST # 215 @ 16:40

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+10 - 161+90 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 24
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 344 (m)

TOTAL NUMBER OF HOLES 24 B/L / 10 Buffer / 9 prod
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 3rd B/L Hole Loaded with 200 grain detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 43
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 275 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

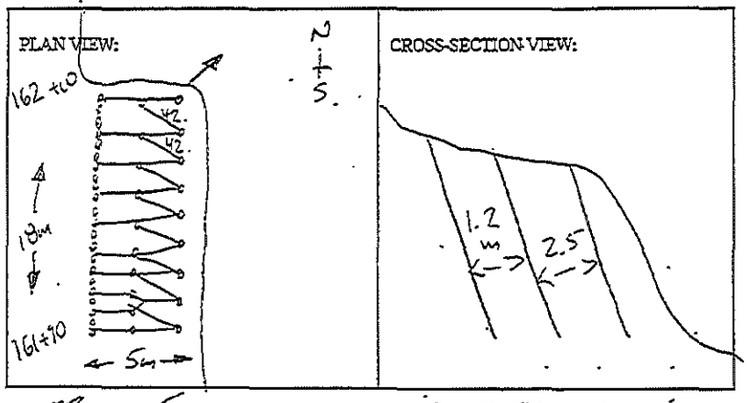
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 720 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 27/12
PROPOSED BLAST DATE Feb 27/12
BLAST # 215

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+10 - 161+90 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 24
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 344 (m)

PROPOSED APPROX. NO. OF HOLES 24 B/L / 10 Buffer / 9 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every @ B/L Hole Loaded w/ 210 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 43
PROPOSED NUMBER OF DELAYS 19

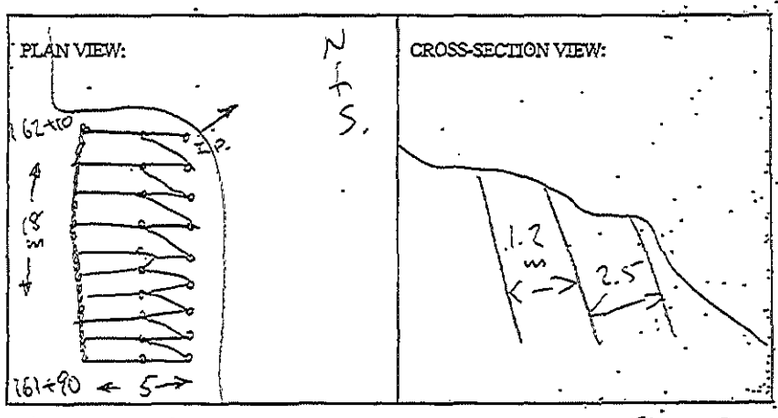
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 720 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James McSwinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 28/12
ACTUAL BLAST DATE Feb. 28/12
BLAST # 216 @ 11:15

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+10 - 161+30 LS (to Subgrade).

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 23
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 364 (m)

TOTAL NUMBER OF HOLES 23 BL / 8 buffer / 21 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every @ B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 52
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

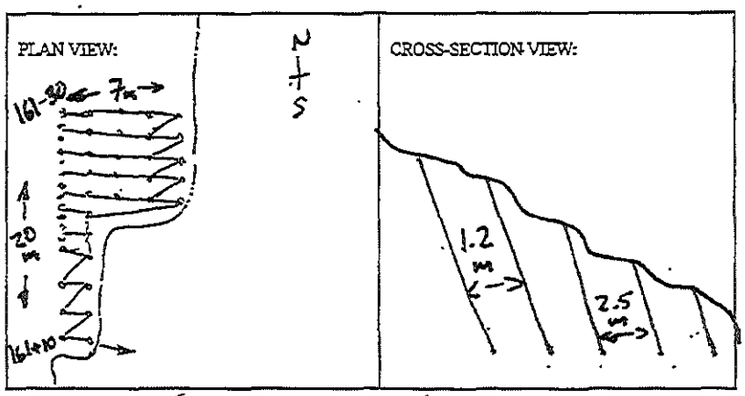
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 980 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James McSwinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mahoney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 28/12
PROPOSED BLAST DATE Feb-28/12
BLAST # 216

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+10 - 161+30LS (to subside)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 23
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 364 (m)

PROPOSED APPROX. NO. OF HOLES 23 B/L / 8 Buffer / 21 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 52
PROPOSED NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

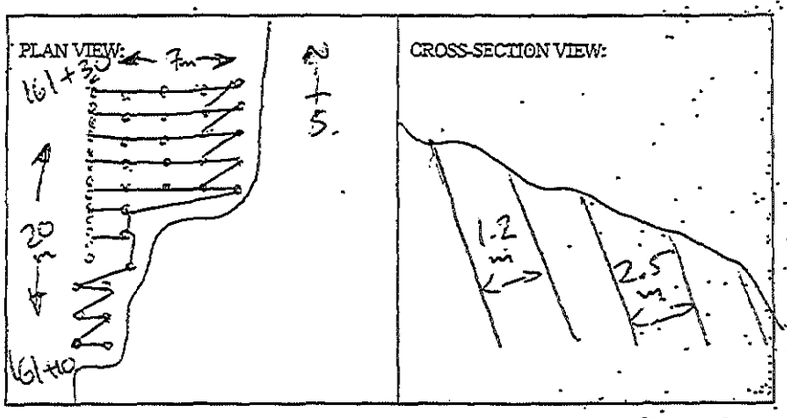
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 980 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fiebee Rock Eng.

BLASTER'S SIGNATURE James Mahoney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME JAMES MCWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb 28/12
ACTUAL BLAST DATE Feb 28/12
BLAST # 217 @ 13:40

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+30 - 161+40 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 231 (m)

TOTAL NUMBER OF HOLES 14 B/L / 6 Buffer / 13 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every @ B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 33
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

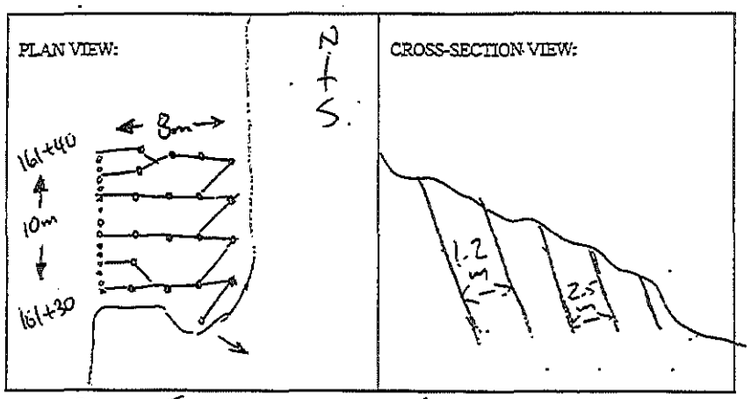
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 560 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James McWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 28/12
PROPOSED BLAST DATE Feb. 29/12
BLAST # 217

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+30 - 161+40 LS (to scale)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 14
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 231 (m)

PROPOSED APPROX. NO. OF HOLES 14 B/L / 6 Buffer / 13 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 33
PROPOSED NUMBER OF DELAYS 19

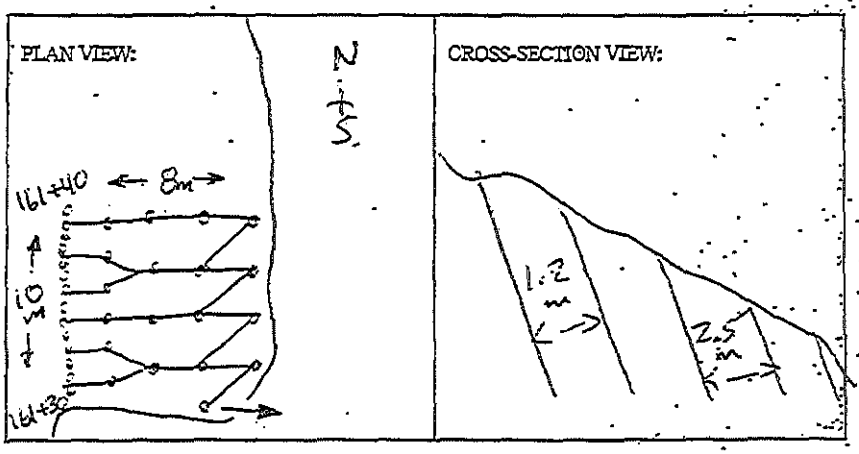
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.E. CAPS - SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 560 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James McWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 29/12
ACTUAL BLAST DATE Feb 29/12
BLAST # 218 @ 15:10

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+40 - 161+50 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 168 (m)

TOTAL NUMBER OF HOLES 8 BL / 4 Buffer / 9 pad
HOLE DIAMETER 100 (mm)
HOLE SPACING ~~3~~ 2.5 (m) BURDEN ~~3~~ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every ~~3rd~~ BL Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

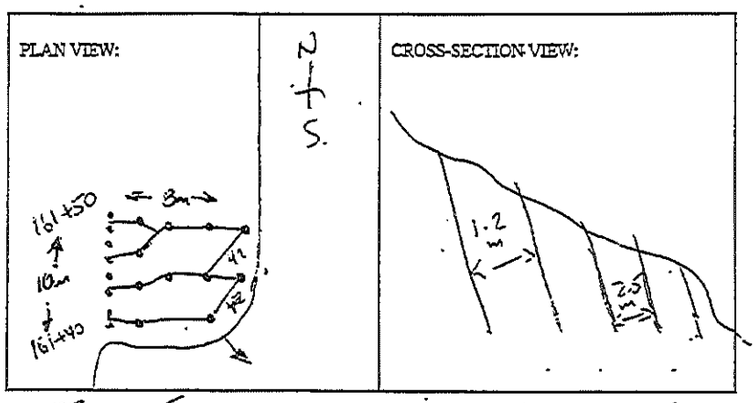
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 640 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James McWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 28/12
PROPOSED BLAST DATE Feb 29/12
BLAST # 2:9

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+40 - 161+50 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 168 (m)

PROPOSED APPROX. NO. OF HOLES 8 B/L / 4 Buffer / 9 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HOREZ. VARIABLE
*Every B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 21
PROPOSED NUMBER OF DELAYS 13

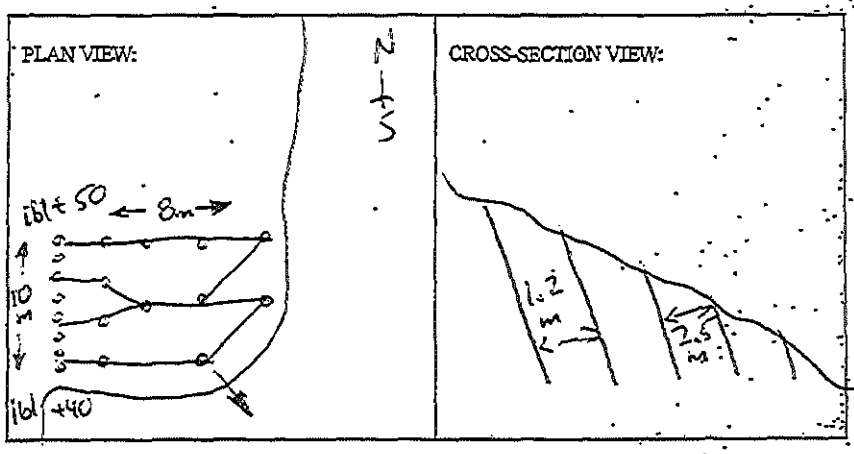
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 640 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fiebee RockEng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 29/12
ACTUAL BLAST DATE Feb 29/12
BLAST # 219 @15:18

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+10 - 156+35 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 159 (m)

TOTAL NUMBER OF HOLES 53 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 53
TOTAL NUMBER OF DELAYS 53

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

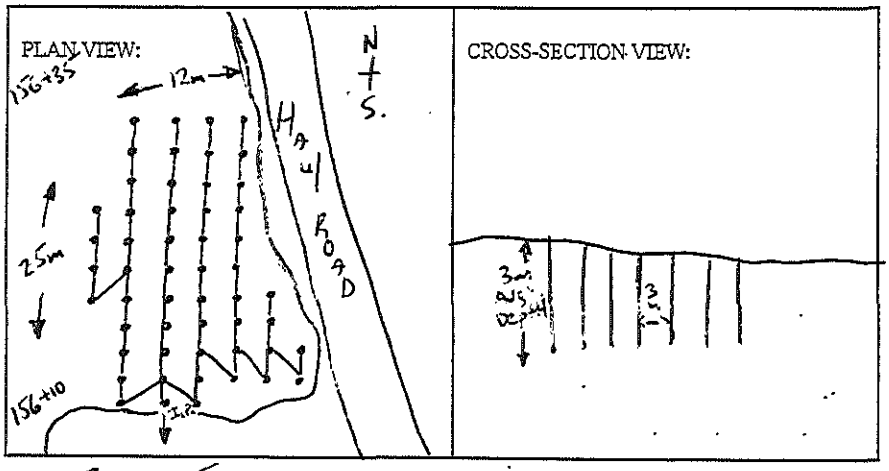
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Feb. 29/12
PROPOSED BLAST DATE Feb 29/12
BLAST # 219

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+10 - 156+35 (LS 1ST Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 159 (m)

PROPOSED APPROX. NO. OF HOLES 53 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 53
PROPOSED NUMBER OF DELAYS 53

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

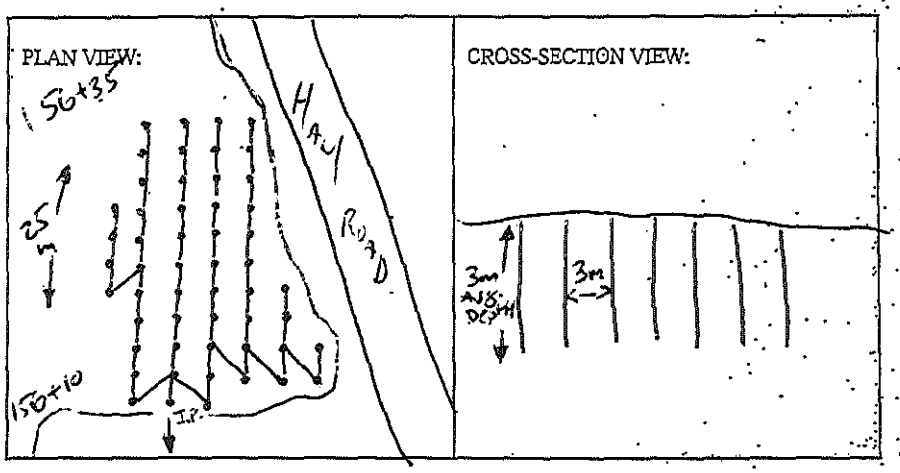
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 900 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 29/12
PROPOSED BLAST DATE Mar 1/12
BLAST # 220

HIGHWAY # 97
BLAST LOCATION AT: STN # 153+60 – 154+10 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 57
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 17
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 732 (m)

PROPOSED APPROX. NO. OF HOLES 57 B/L / 25 Buffer / 40 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 122
PROPOSED NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1200 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

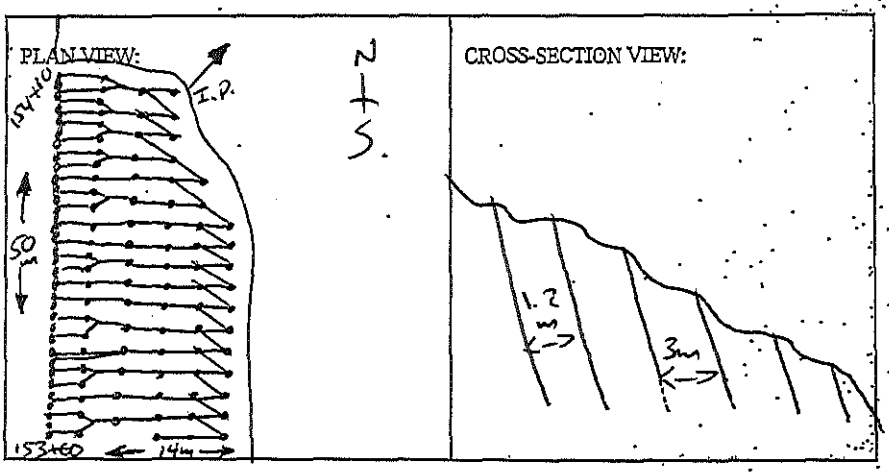
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED MAR. 1/12
ACTUAL BLAST DATE MARCH 1/12
BLAST # 220 @ 17:28

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 153+60 - 154+100 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 57
AVERAGE DEPTH 6m (m)
NUMBER OF ROWS 17
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 732 (m)

TOTAL NUMBER OF HOLES 57 B/L / 25 Buffer / 40 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 122
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1225 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

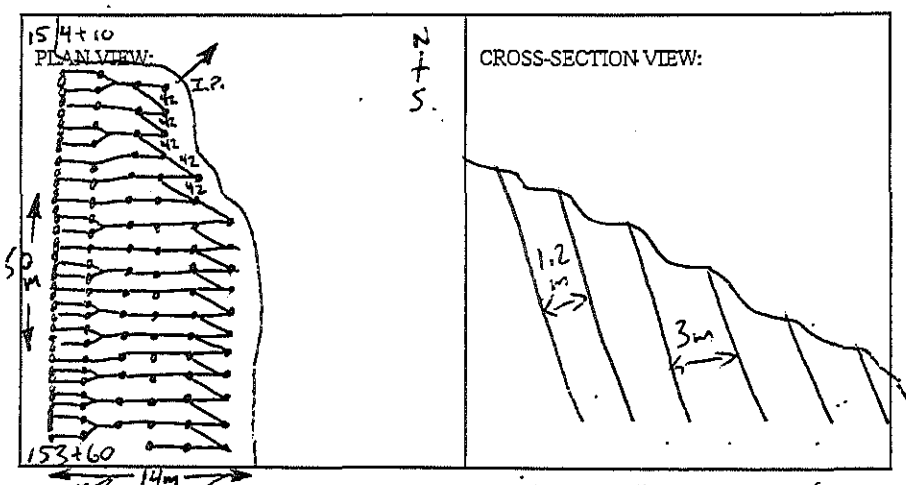
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 4200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED MAR. 1/12
ACTUAL BLAST DATE MARCH 1/12
BLAST # 220 @ 17:28

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 153+60 - 154+100 @ LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 57
AVERAGE DEPTH 6m (m)
NUMBER OF ROWS 17
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 732 (m)

TOTAL NUMBER OF HOLES 57 B/L / 25 Buffer / 40 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 122
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1225 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

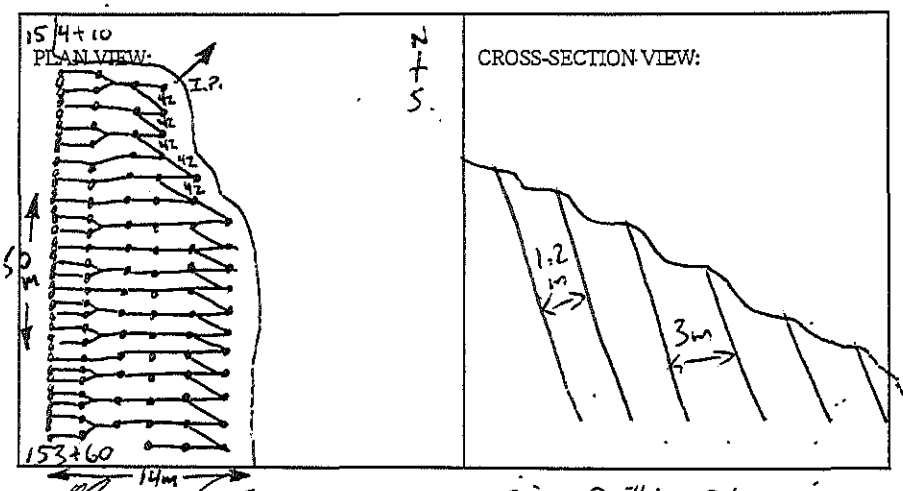
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 4200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mahoney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 29/12
PROPOSED BLAST DATE Mar 1/12
BLAST # 220

HIGHWAY # 97
BLAST LOCATION AT: STN # 153+60 – 154+10 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 57
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 17
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 732 (m)

PROPOSED APPROX. NO. OF HOLES 57 B/L / 25 Buffer / 40 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded w/ 200 grain Detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 122
PROPOSED NUMBER OF DELAYS 65

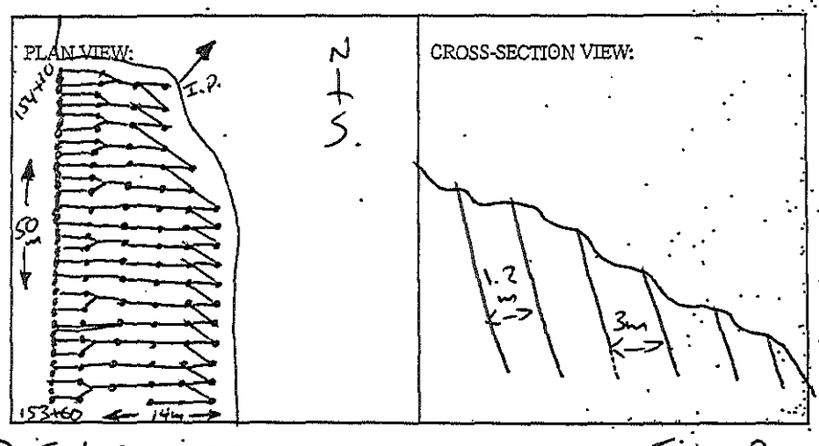
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1200 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 4000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mahoney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 1/12.
ACTUAL BLAST DATE MARCH 2/12
BLAST # 221

HIGHWAY# 97
BLAST LOCATION AT: STN #164+67 - 164+95 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 40
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 304 (m)

TOTAL NUMBER OF HOLES 40 B/L / 16 Buffer / 20 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @2.5 (m) BURDEN @2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every @ B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 76
TOTAL NUMBER OF DELAYS 36

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

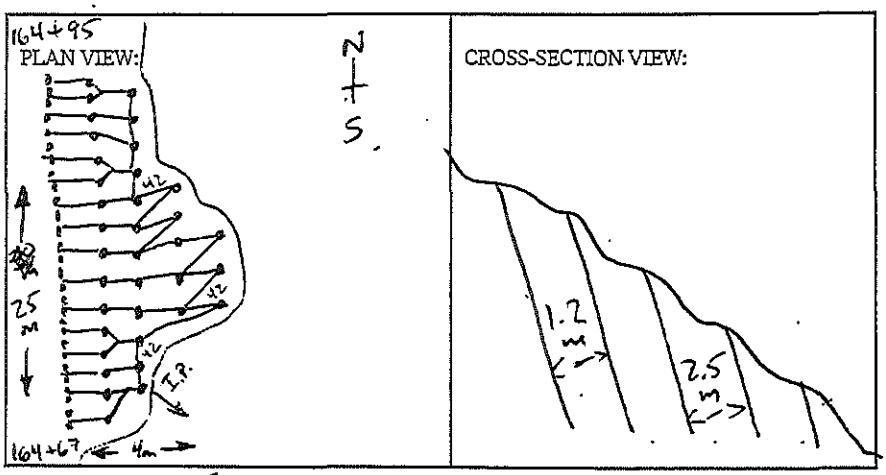
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MAR 1/12
PROPOSED BLAST DATE MAR 2/12
BLAST # 221

HIGHWAY# 97
BLAST LOCATION AT: STN # 164+67 - 164+95 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 40
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 304 (m)

PROPOSED APPROX. NO. OF HOLES 40 B/L / 16 Buffer / 20 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every @ B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 76
PROPOSED NUMBER OF DELAYS 30

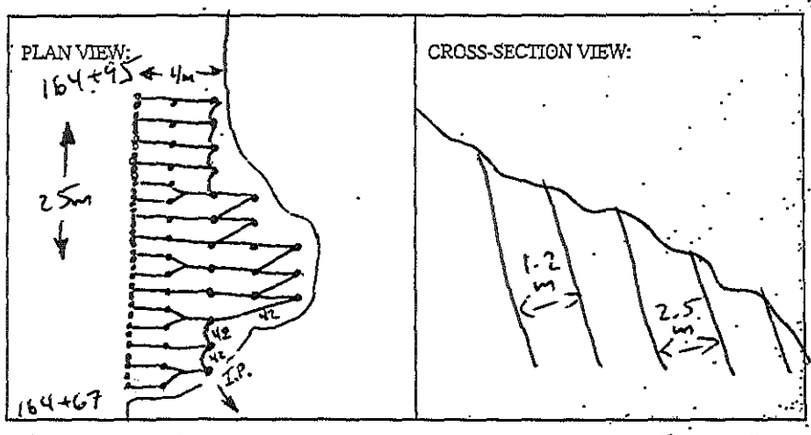
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED MARCH 1/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE MARCH 2/12
BLASTER'S NAME JAMES MAWHINNEY
BLAST # 222.
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 164+95 - 165+30 LS (Tosobs creek)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 47
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 252 (m)

TOTAL NUMBER OF HOLES 47 B/L / 19 Buffer / 1 Sprod.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 84
TOTAL NUMBER OF DELAYS 37

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 275 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

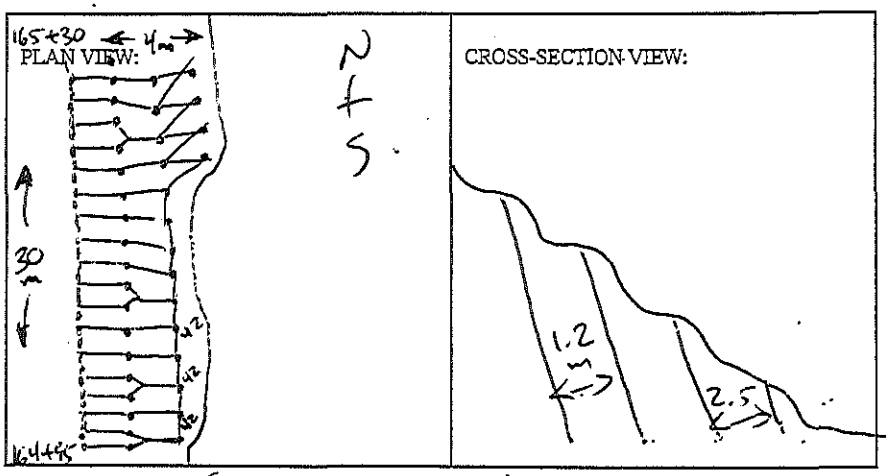
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Mar. 1/12
PROPOSED BLAST DATE Mar 2/12
BLAST # 222

HIGHWAY # 97
BLAST LOCATION AT: STN # 164+95 - 165+30 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 47
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 14
PROPOSED MAXIMUM DEPTH 4.5 (m)
PROPOSED TOTAL DEPTH 252 (m)

PROPOSED APPROX. NO. OF HOLES 47 B/L / 19 Buffer / 18 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING ~~B~~ 2.5 (m) BURDEN ~~B~~ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every ~~B~~ B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 89
PROPOSED NUMBER OF DELAYS 37

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 275 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

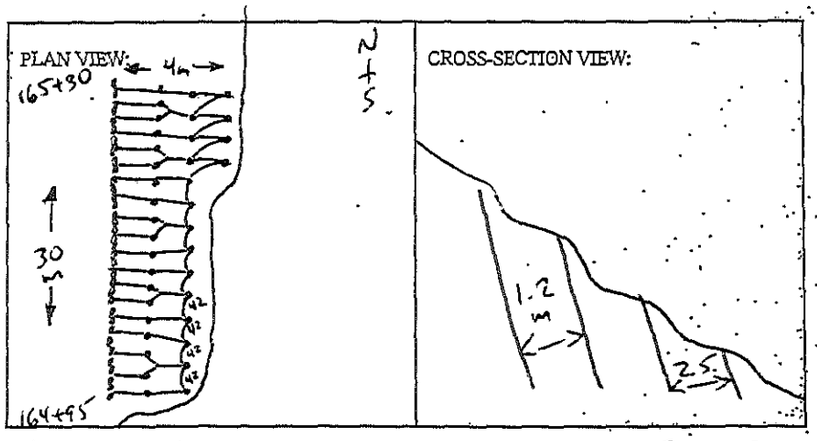
INITIATION DEVICE: (CIRCLE) E.E. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 360 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED MARCH 2/12
ACTUAL BLAST DATE MARCH 3/12
BLAST # 223

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+60 - 161+50 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 16
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 205 (m)

TOTAL NUMBER OF HOLES 16 B/L / 6 Buffer / 19 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 41
TOTAL NUMBER OF DELAYS 25

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250. (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

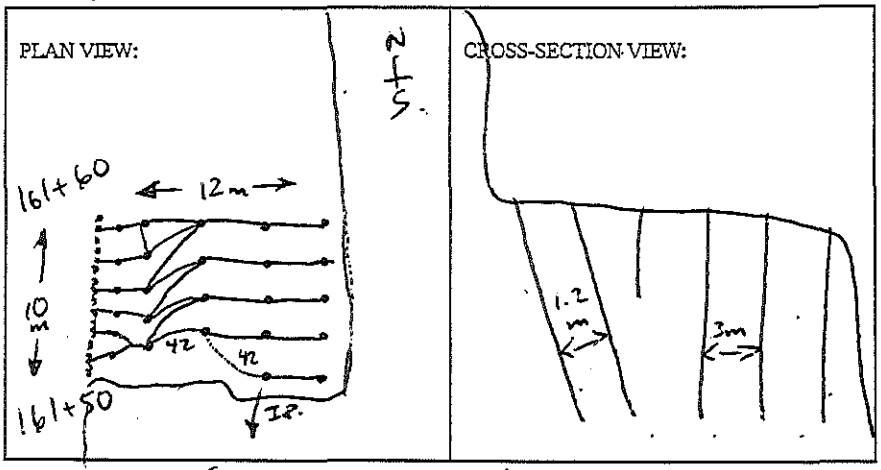
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 2/12
PROPOSED BLAST DATE March 3/12
BLAST # 223

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+60 – 161+50 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 16
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 6.5 (m)
PROPOSED TOTAL DEPTH 205 (m)

PROPOSED APPROX. NO. OF HOLES 16 B/L / 6 Buffer / 19 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 41
PROPOSED NUMBER OF DELAYS 25

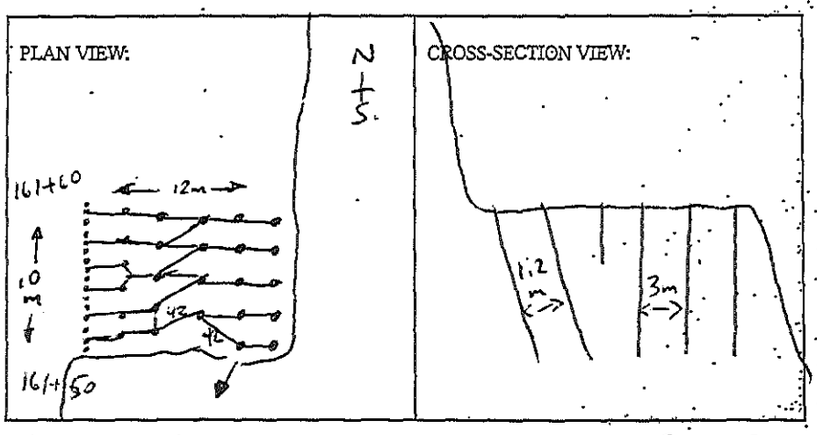
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Mar 5/12.
ACTUAL BLAST DATE Mar 5/12
BLAST # 224

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+60 - 161+70 (to subgrade) LS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 200 (m)

TOTAL NUMBER OF HOLES 14 B/L/6 Buffer/20 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 26

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 350 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

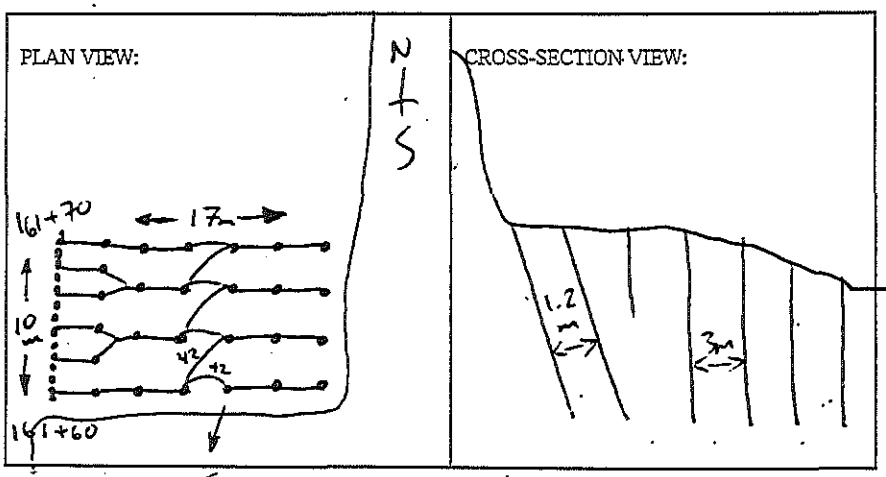
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 950 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 3/17
PROPOSED BLAST DATE March 5/17
BLAST # 224

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+60 - 161+70 (to subgrade) LS.

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 14
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 20U (m)

PROPOSED APPROX. NO. OF HOLES 14 B/L / 6 buffer / 20 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 40
PROPOSED NUMBER OF DELAYS 26

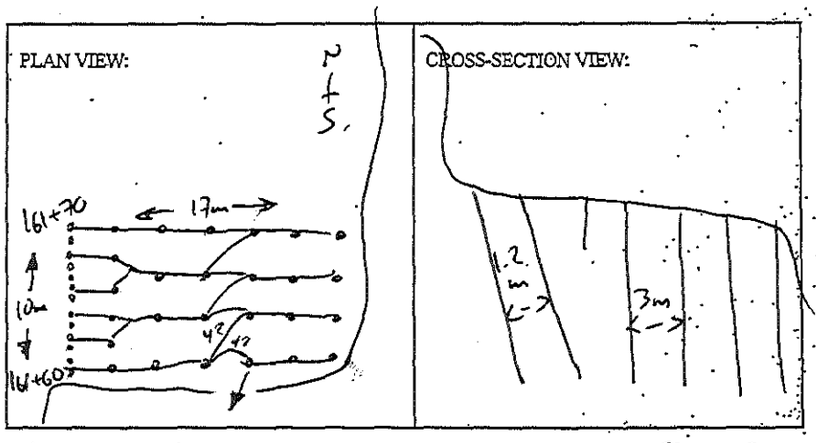
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 850 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Mar. 5/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE Mar 5/12
BLAST # 225

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+70 - 161+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 193 (m)

TOTAL NUMBER OF HOLES 13 B/L. / 4 Buffer / 18 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every ~~2nd~~ B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 22

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

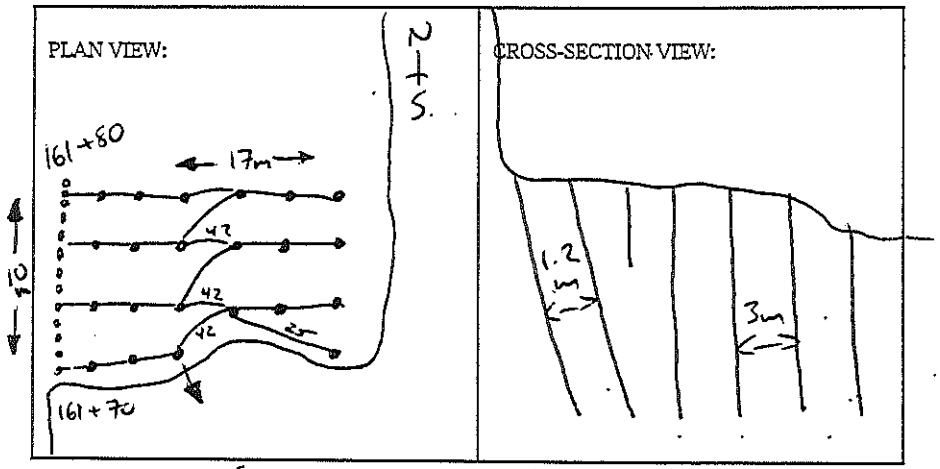
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 935 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Mar. 3/12
PROPOSED BLAST DATE Mar 5/12
BLAST # 225

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+70 - 161+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 13
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 193 (m)

PROPOSED APPROX. NO. OF HOLES 13 B/L / 4 Buffer/Presplit
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 35
PROPOSED NUMBER OF DELAYS 22

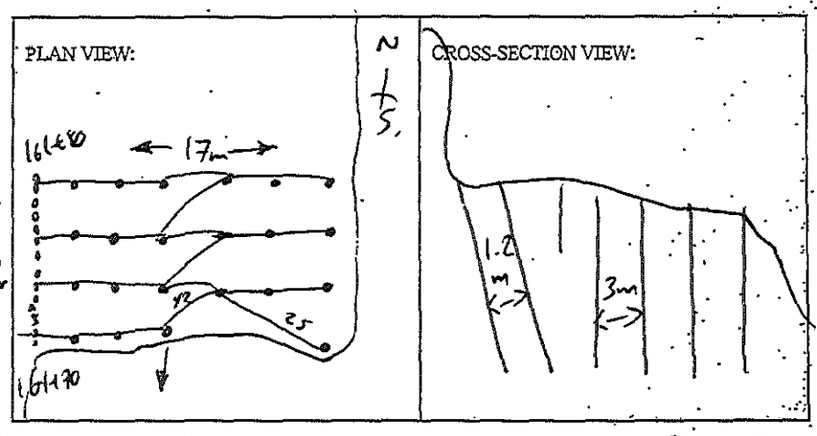
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 935 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Mar. 5/12
ACTUAL BLAST DATE Mar 5/12
BLAST # 226

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+90 - 161+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 186 (m)

TOTAL NUMBER OF HOLES 11 B/L / 5 buffer / 15 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 31
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 375 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

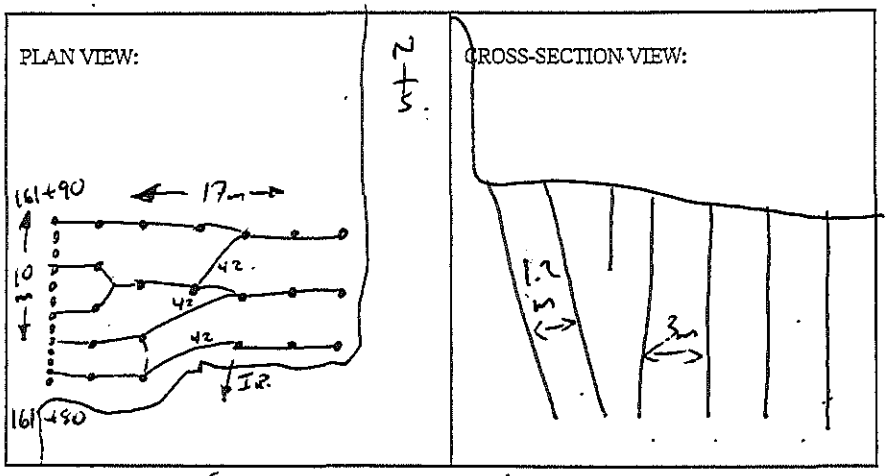
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1020 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 5/12
PROPOSED BLAST DATE Mar 5/12
BLAST # 226

HIGHWAY # 97
BLAST LOCATION AT: STN # 161+90 - 161+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 11
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 186 (m)

PROPOSED APPROX. NO. OF HOLES 11 B/L / 5 Buffer / 15 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded w/ 200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 31
PROPOSED NUMBER OF DELAYS 20

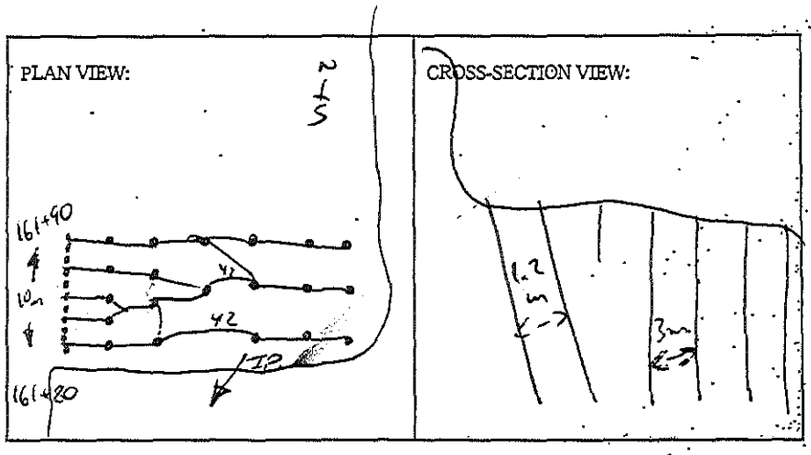
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1020 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 6/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE March 6/12
BLASTER'S NAME James MacKinney
BLAST # [redacted] 227 @ 11:45
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+00 - 161+90 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 174 (m)

TOTAL NUMBER OF HOLES 10 B/L/4 Buffer/15 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 29
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 350 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

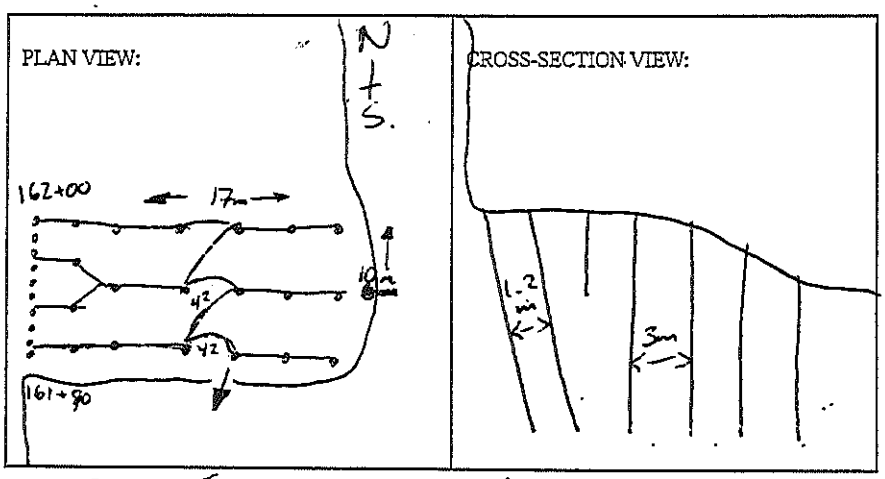
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1020 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 5/12
PROPOSED BLAST DATE March 6/12
BLAST # 227

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+00 - 161+90 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 174 (m)

PROPOSED APPROX. NO. OF HOLES 10 B/L / 4 Buffer / 15 prod.
HOLE DIA. 100 (min)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded w/200 grain DetCord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 24
PROPOSED NUMBER OF DELAYS 19

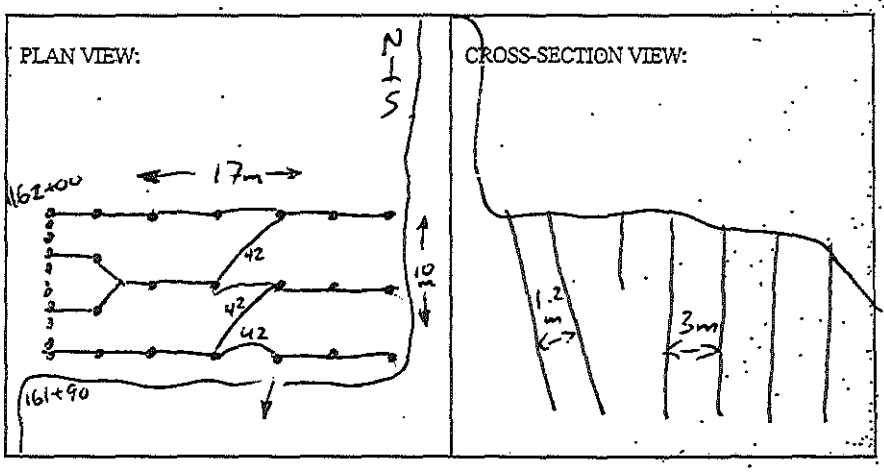
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.E. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1020 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 6/12
ACTUAL BLAST DATE March 6/12.
BLAST # 228 @ 14.24

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+00 – 162+05 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A.
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 14 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

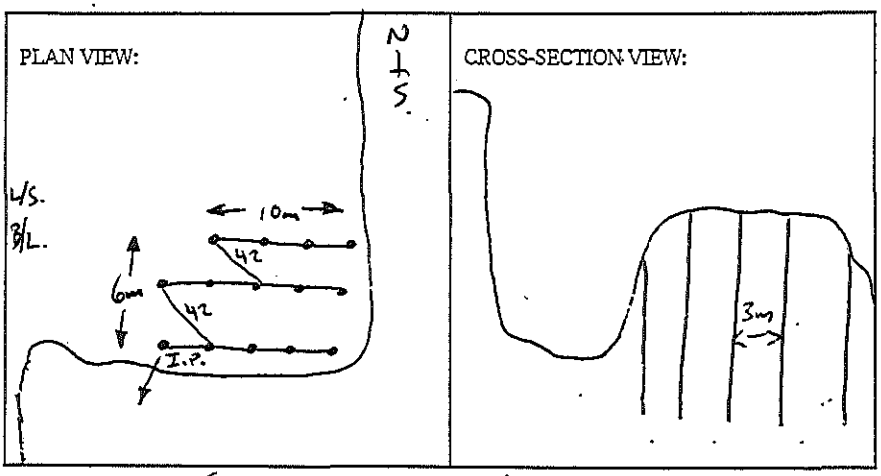
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 420. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 5/12
PROPOSED BLAST DATE March 6/12
BLAST # 228

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+00 - 162+05 c/L (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 98 (m)

PROPOSED APPROX. NO. OF HOLES 14 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

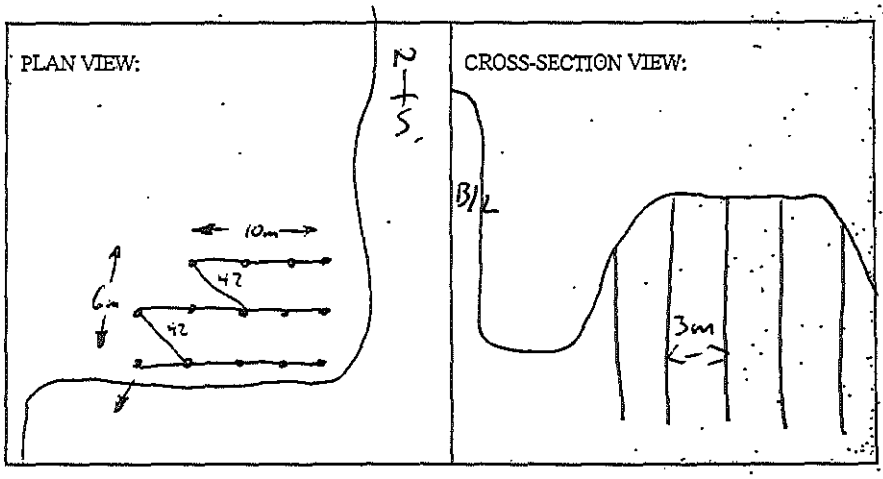
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 420 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James McWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 7/12
ACTUAL BLAST DATE March 7/12 @ 12:24
BLAST # 229

HIGHWAY# 97
BLAST LOCATION AT: STN # 167+00 - 167+65 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 65 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 87
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 34
MAXIMUM DEPTH 10.5 (m)
TOTAL DEPTH 1089 (m)

TOTAL NUMBER OF HOLES 87 B/L / 34 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING ~~3~~ 1.2 (m) BURDEN ~~3~~ 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every ~~3~~ B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 121
TOTAL NUMBER OF DELAYS 34

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 850 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

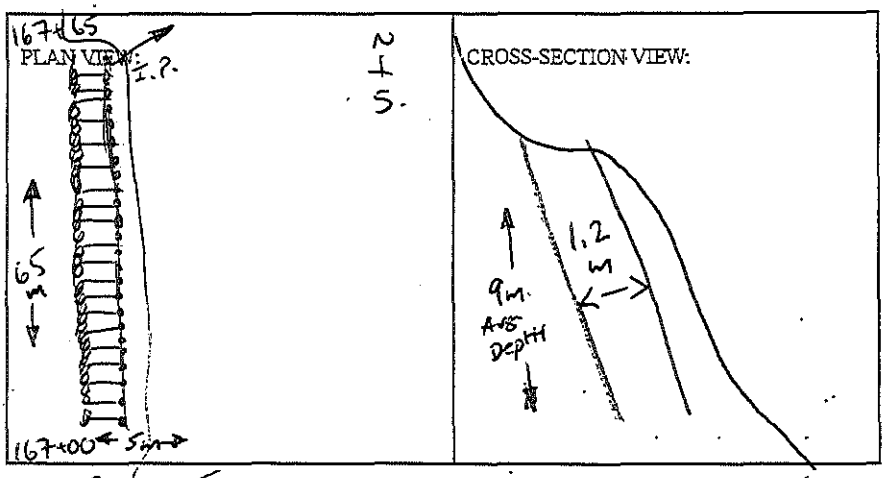
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2925 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James McWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mahoney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 6/12
PROPOSED BLAST DATE March 7/12
BLAST # 229

HIGHWAY # 97
BLAST LOCATION AT: STN # 167+00 - 167+65 LS (10 Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 65 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 87
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 34
PROPOSED MAXIMUM DEPTH 10.5 (m)
PROPOSED TOTAL DEPTH 1089 (m)

PROPOSED APPROX. NO. OF HOLES 87 B/L / 34 Buffer.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3@1.2 (m) BURDEN 3@1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 121
PROPOSED NUMBER OF DELAYS 34

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 800 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

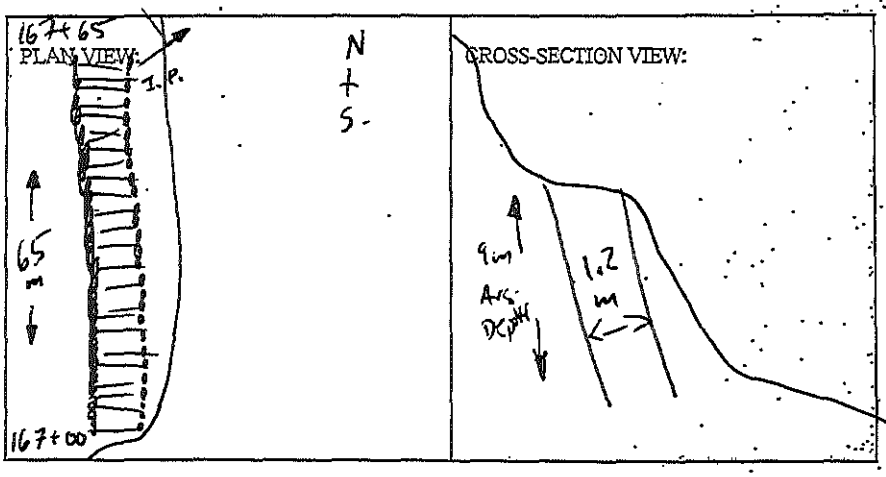
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2925 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mahoney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 7/12
ACTUAL BLAST DATE March 7/12.
BLAST # 230 @ 15:3

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+50 – 156+25 CL (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 195 (m)

TOTAL NUMBER OF HOLES 65 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500. (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

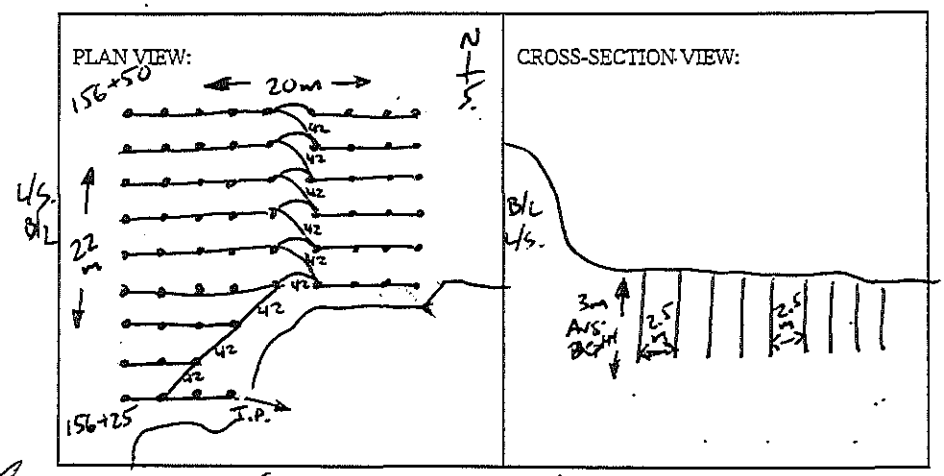
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1320 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MARCH 6/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE MARCH 6/12
BLASTER'S NAME JAMES MACDONNEY
BLAST # 230
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+50 - 156+25 C/L (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 195 (m)
PROPOSED APPROX. NO. OF HOLES 65 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain DET cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 65
PROPOSED NUMBER OF DELAYS 65
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

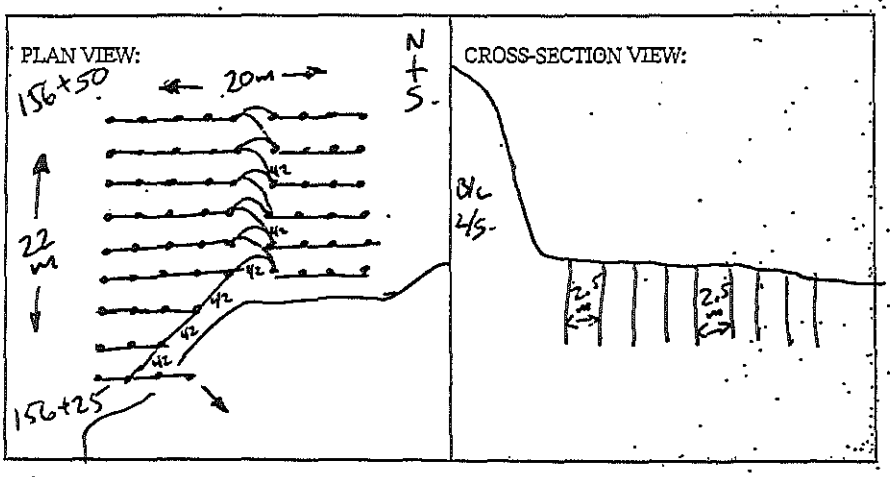
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1320 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacDonnell COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 8/12
ACTUAL BLAST DATE March 8/12
BLAST # 231 @ 12:02

HIGHWAY# 97
BLAST LOCATION AT: STN # 110 + 00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 142 (m)

TOTAL NUMBER OF HOLES 71 production
HOLE DIAMETER 100 (mm)
HOLE SPACING ~~3~~ 2 (m) BURDEN ~~3~~ 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 71
TOTAL NUMBER OF DELAYS 71

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

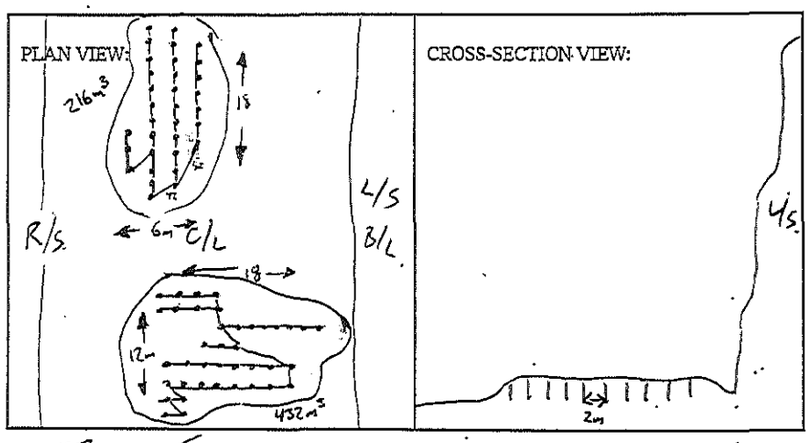
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 648 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 7/12
PROPOSED BLAST DATE March 8/12
BLAST # 231

HIGHWAY # 97
BLAST LOCATION AT: STN # 110+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 2 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 142 (m)

PROPOSED APPROX. NO. OF HOLES 71 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 71
PROPOSED NUMBER OF DELAYS 71

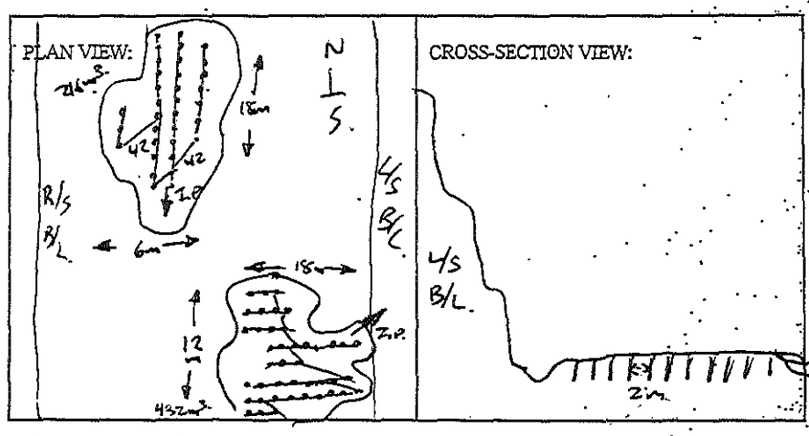
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 8/12
ACTUAL BLAST DATE March 8/12
BLAST # 232 @ 15:50

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+50 - 156+70 (1ST Bench) C/L

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 237 (m)

TOTAL NUMBER OF HOLES 79 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 79
TOTAL NUMBER OF DELAYS 79

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 675 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

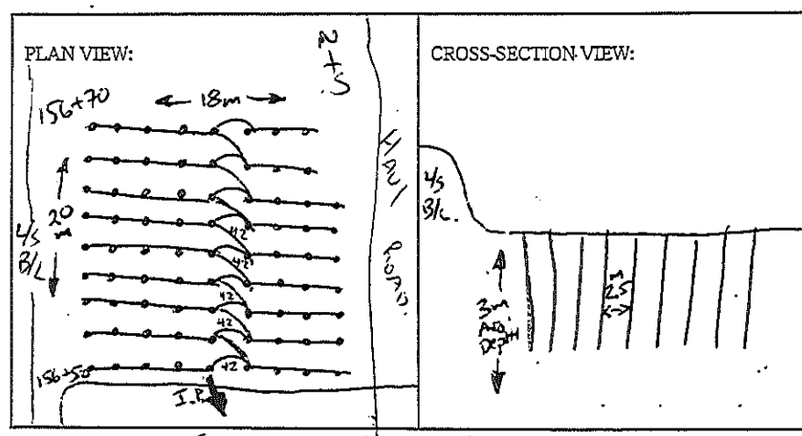
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1080 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 7/12
PROPOSED BLAST DATE March 8/12
BLAST # 232

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+50 – 156+70 (1st Bench) c/l

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 237 (m)

PROPOSED APPROX. NO. OF HOLES 79 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 79
PROPOSED NUMBER OF DELAYS 79

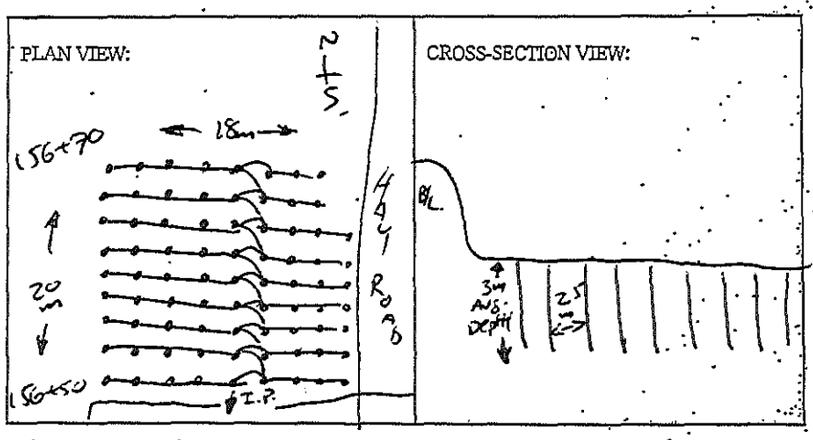
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 600 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 10/12
ACTUAL BLAST DATE March 10/12
BLAST # 233 @ 9:35

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+80 – 162+70 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 95 (m)

TOTAL NUMBER OF HOLES 9 B/L / 4 Buffer / 7 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 209
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

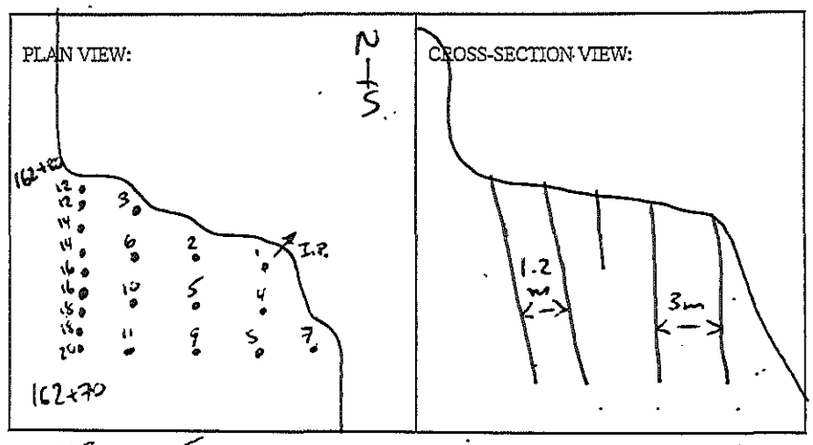
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 500. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mashinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 09/12
PROPOSED BLAST DATE March 10/12
BLAST # 233 @ 9:35

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+80 - 162+70

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH ~~80~~ 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) ~~80~~ (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 95 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 4 Buffer / 7 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every ~~B~~ B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

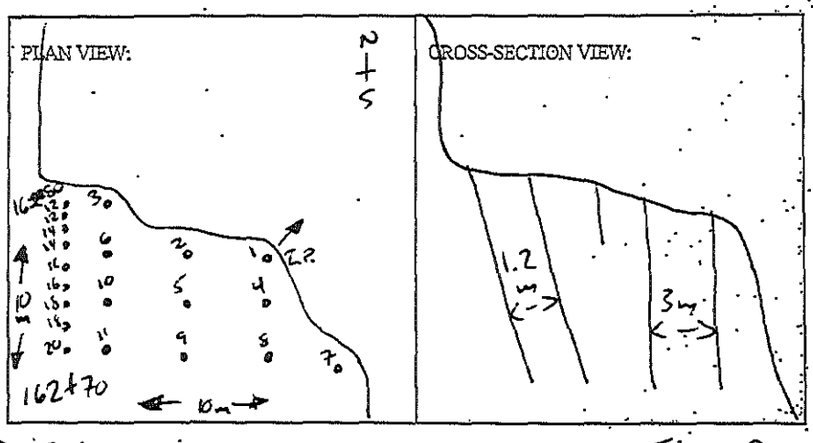
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mashinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 10/12
ACTUAL BLAST DATE March 10/12
BLAST # 234 @ 11.45

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+70 - 162+60 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72. (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 144 (m)

TOTAL NUMBER OF HOLES 9 B/L / 4 Buffer / 11 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

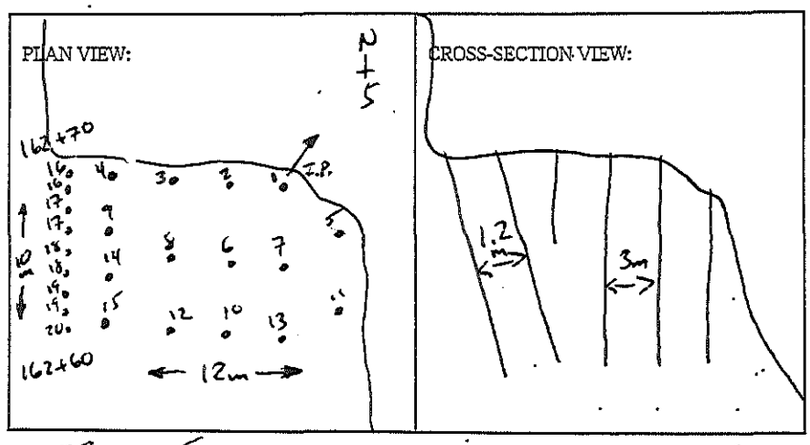
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 720 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 9/12
PROPOSED BLAST DATE March 10/12
BLAST # 234

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+70 - 162+60

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 144 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 4 Buffer / 11 pcd.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 24
PROPOSED NUMBER OF DELAYS 20

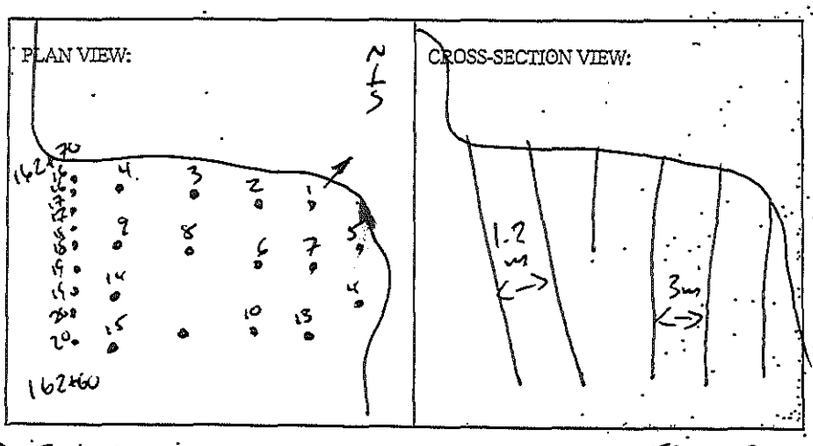
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 720 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 10/12.
ACTUAL BLAST DATE March 10/12
BLAST # 235 @ 13:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 162 + 60 – 162 + 50 LS (2nd Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 114 (m)

TOTAL NUMBER OF HOLES 6 B/L / 4 Buffer / 9 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 220. (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

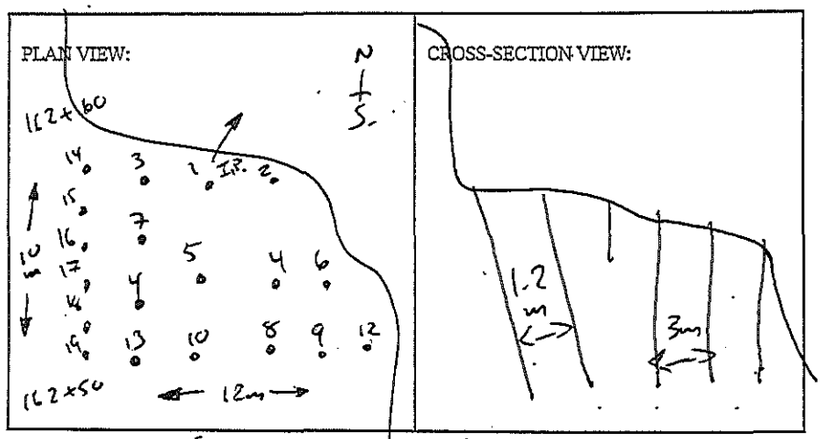
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 720 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 09/12
PROPOSED BLAST DATE March 10/12
BLAST # 235

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+60 – 162+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 114 (m)

PROPOSED APPROX. NO. OF HOLES 6 B/L / 4 Buffer / 9 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every B/L Hole Loaded w/200 grain Detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 19

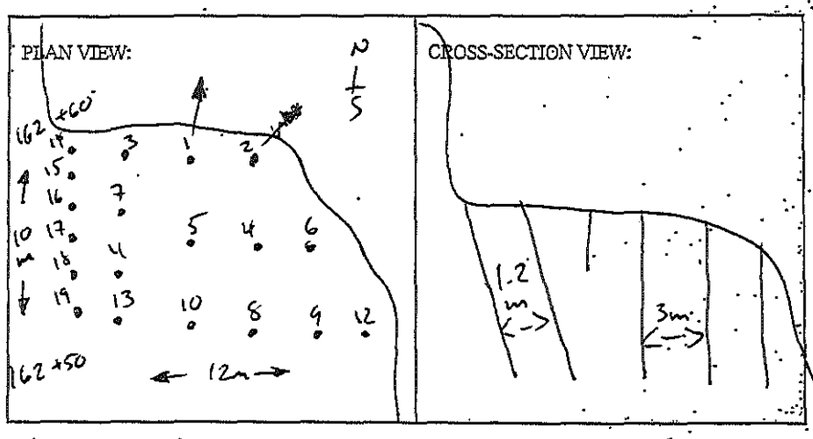
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 220 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 720 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 12/12
ACTUAL BLAST DATE March 12/12
BLAST # 236 @ 13:28

HIGHWAY# 97
BLAST LOCATION AT: STN # 166+20 - 166+50 (LS to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 42
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 380 (m)

TOTAL NUMBER OF HOLES 42 B/L / 13 Buffer / 21 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 76
TOTAL NUMBER OF DELAYS 34

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

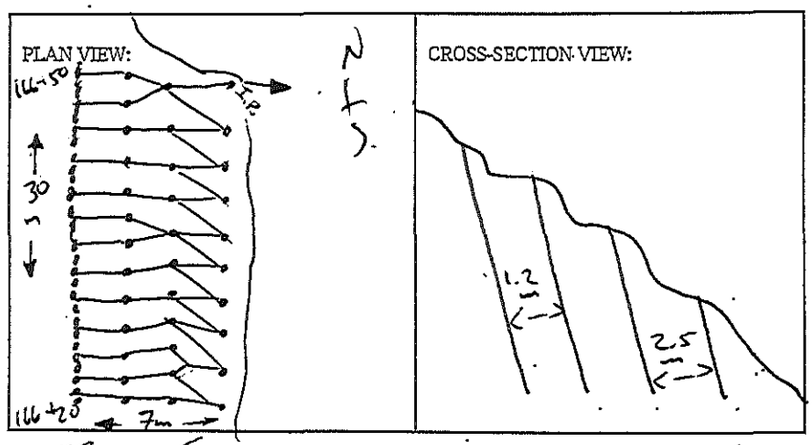
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1050 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 10/12
PROPOSED BLAST DATE March 12/12
BLAST # 236

HIGHWAY # 97
BLAST LOCATION AT: STN # 166+20 - 166+50 (LS to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 77 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 42
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 10
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 330 (m)

PROPOSED APPROX. NO. OF HOLES 42 B/L / 13 Buffer / 21 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every @ B/L Hole Loaded w/200 grain detcord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2nd Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 76
PROPOSED NUMBER OF DELAYS 34

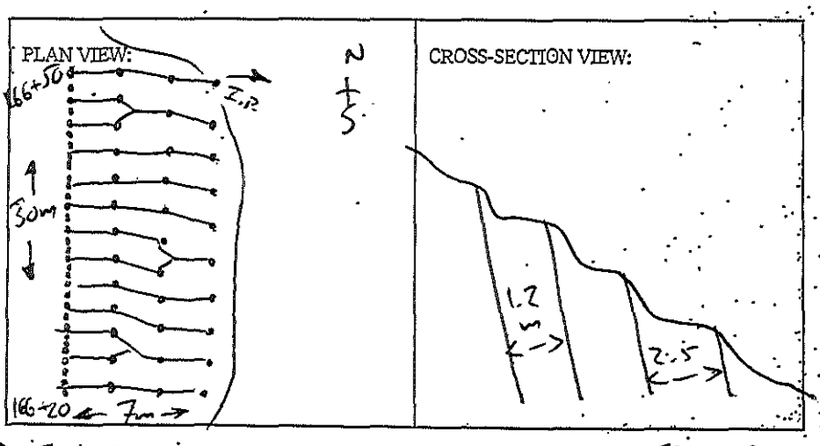
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James MacWinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 13/12
ACTUAL BLAST DATE March 13/12.
BLAST # 237 @ 11:45

HIGHWAY# 97
BLAST LOCATION AT: STN # 165+62 - 166+25 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 71
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 515 (m)

TOTAL NUMBER OF HOLES 71 B/L / 21 Buffer / 11 production
HOLE DIAMETER 100 (mm)
HOLE SPACING @ 2.5 (m) BURDEN @ 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every @ B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 103
TOTAL NUMBER OF DELAYS 32

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

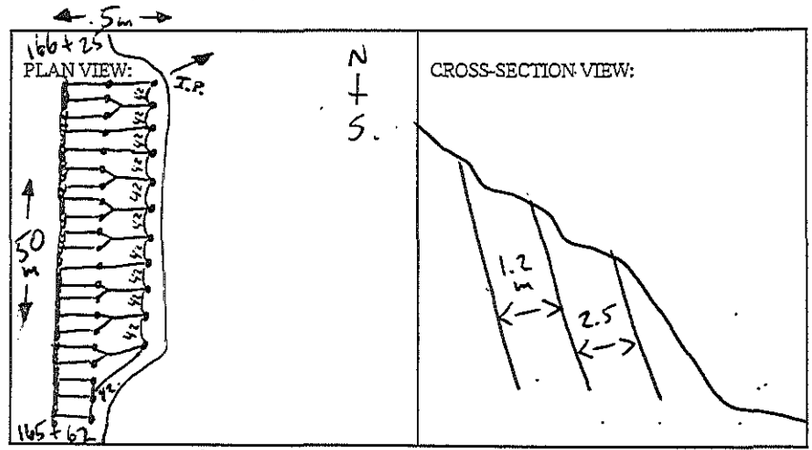
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 12/12
PROPOSED BLAST DATE March 13/12
BLAST # 237

HIGHWAY # 97
BLAST LOCATION AT: STN # 165+62 - 166+25 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 71
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 11
PROPOSED MAXIMUM DEPTH 6.5 (m)
PROPOSED TOTAL DEPTH 515 (m)

PROPOSED APPROX. NO. OF HOLES 71 B/L / 21 Buffer / 11 production
HOLE DIA. 100 (min)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 103
PROPOSED NUMBER OF DELAYS 32

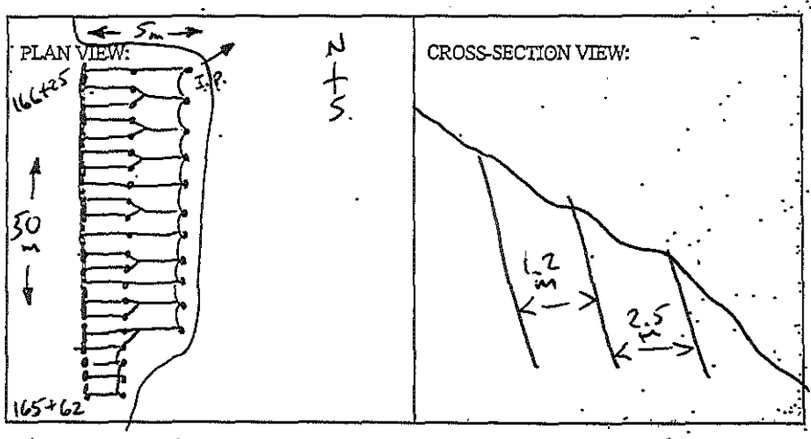
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 350 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 1200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 13/12
ACTUAL BLAST DATE March 13/12.
BLAST # 238 @15:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+50 - 162+45 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 154 (m)

TOTAL NUMBER OF HOLES 10 B/L/4 Buffer/8 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 180 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

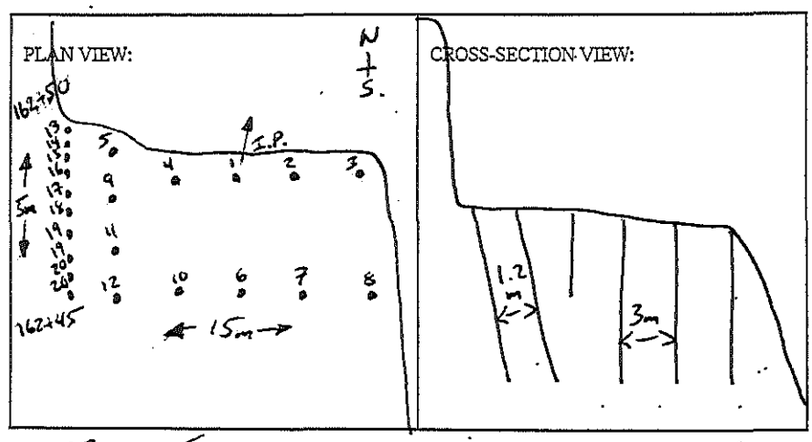
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 525 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 12/12
PROPOSED BLAST DATE March 13/12
BLAST # 238

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+50 – 162+45 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.5 (m)
PROPOSED TOTAL DEPTH 154 (m)

PROPOSED APPROX. NO. OF HOLES 10 B/L / 4 Buffer / 8 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
*Every 2nd B/L Hole Loaded w/200 grain det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 22
PROPOSED NUMBER OF DELAYS 20

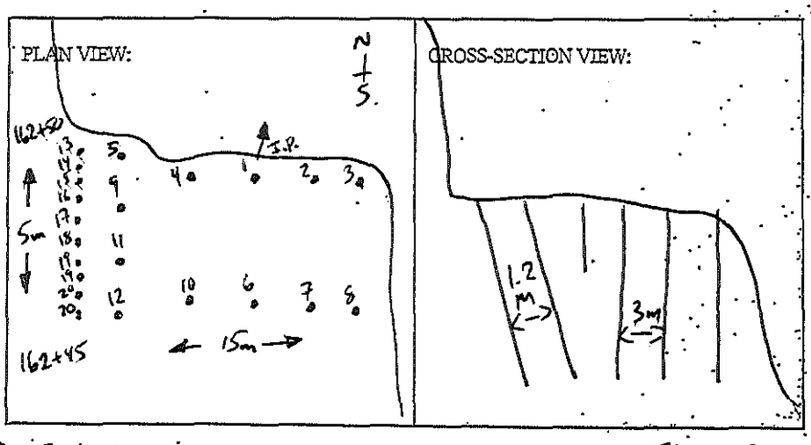
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 156 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 14/12
ACTUAL BLAST DATE March 14/12 @ 9:57
BLAST # 239

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+45 - 162+40 LS (2nd Beach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 96 (m)

TOTAL NUMBER OF HOLES 4 B/L / 3 Buffer / 9 production
HOLE DIAMETER [redacted] (mm) 89mm
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] B/L Hole LOADED with 200 grain DET cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

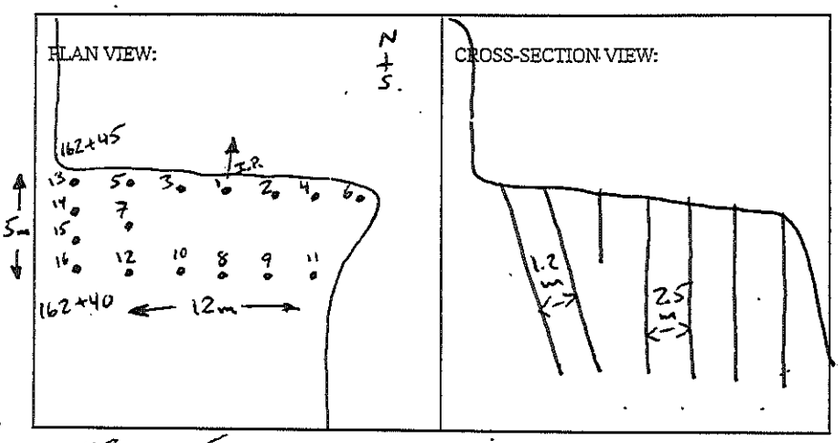
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 [redacted] (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation [redacted]
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 14/12
ACTUAL BLAST DATE March 14/12
BLAST # 240 @ 11:14

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+40 - 162+35 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 108 (m)

TOTAL NUMBER OF HOLES 7 B/L / 3 buffer / 8 production
HOLE DIAMETER [redacted] (mm) 89mm
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 [redacted] (ms)

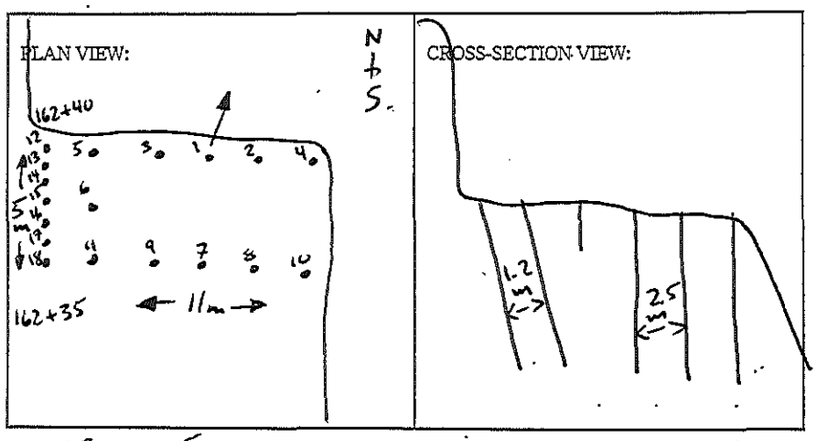
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of [redacted]
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 330 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 14/12
ACTUAL BLAST DATE March 14/12.
BLAST # 241 @12:48

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+35 - 162+30 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 108 (m)

TOTAL NUMBER OF HOLES 7 B/L / 3 Buffer / 8 production
HOLE DIAMETER [redacted] (mm) 89mm
HOLE SPACING ~2.5 (m) BURDEN ~2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every [redacted] B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 + [redacted] (ms)

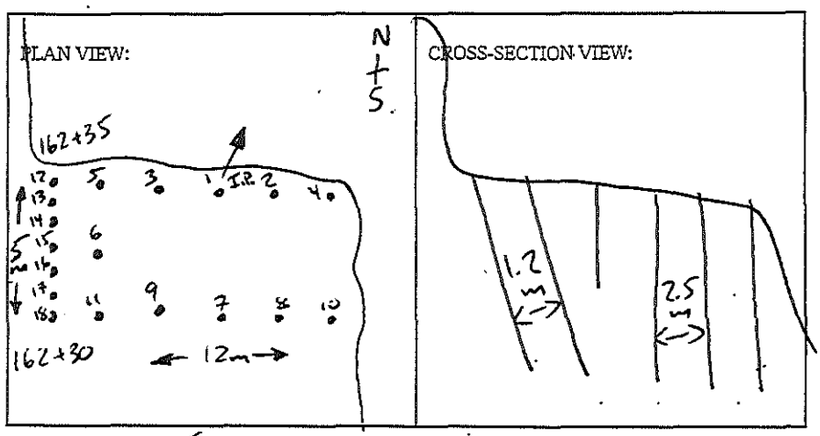
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation [redacted]
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 14/12
ACTUAL BLAST DATE March 14/12
BLAST # 242. @13:59

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+30 – 162+25 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 108 (m)

TOTAL NUMBER OF HOLES 7 B/L / 3 Buffer / 8 production
HOLE DIAMETER [redacted] (mm) 89mm
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] Bk Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 + [redacted] (ms)

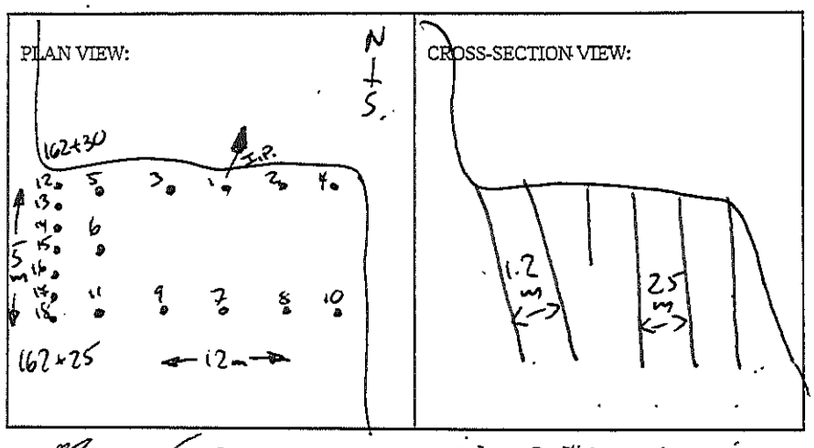
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation [redacted]
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 14/12
ACTUAL BLAST DATE March 12/12.
BLAST # 243 @ 15:48

HIGHWAY# 97
BLAST LOCATION AT: STN # 162 + 20 - 162 + 10 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 144 (m)

TOTAL NUMBER OF HOLES 13 B/L/5 Buffer/6 production.
HOLE DIAMETER [redacted] (mm) 89mm
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every [redacted] B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 [redacted] (ms)

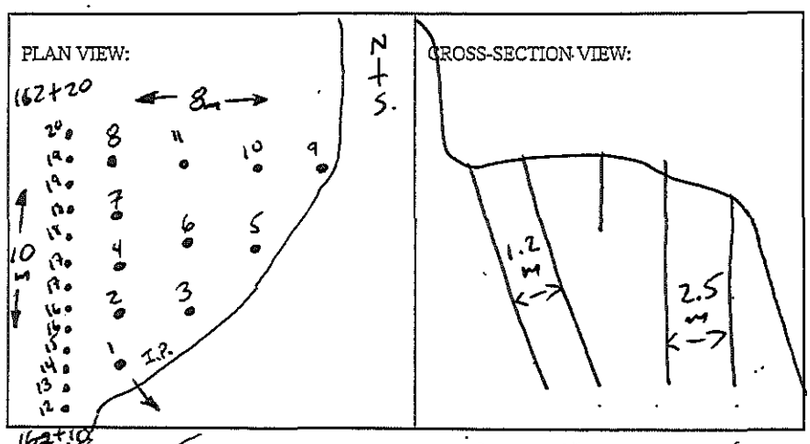
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation [redacted]
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 480 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 15/12
ACTUAL BLAST DATE March 15/12
BLAST # 244 @ 12:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+20 + 162+30 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 174 (m)

TOTAL NUMBER OF HOLES 12 B/L / 5 Buffer / 12 production.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 29
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 (ms)

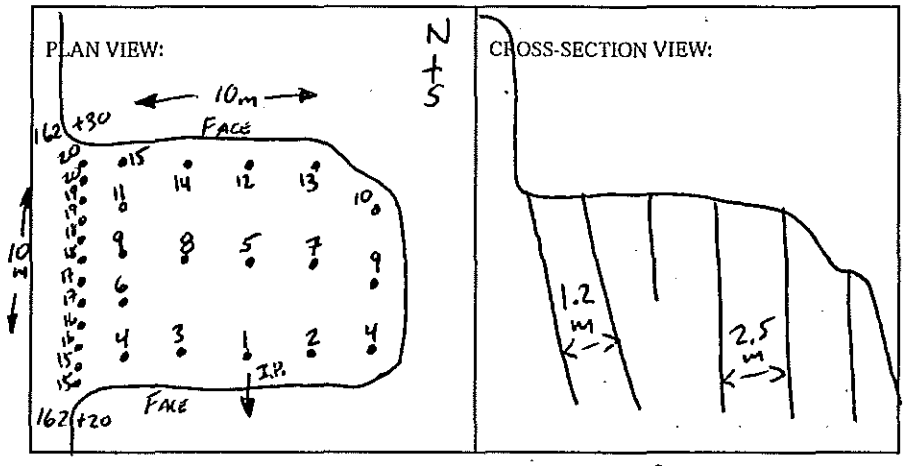
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 15/12
PROPOSED BLAST DATE MARCH 15/12
BLAST # 244

HIGHWAY # 97
BLAST LOCATION AT: STN# 162+20 – 162+30LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 174 (m)

PROPOSED APPROX. NO. OF HOLES 12 BL/5 Buffer/12 production
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 29
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

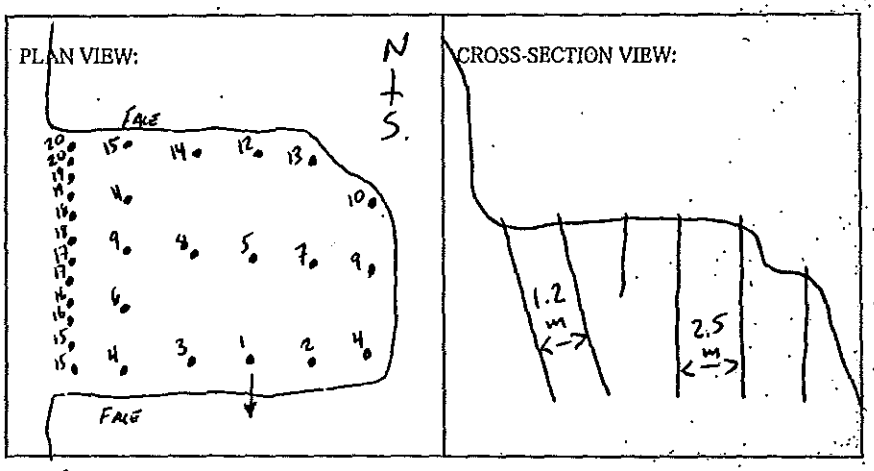
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 15/12
ACTUAL BLAST DATE March 15/12
BLAST # 245 @ 16:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+00 - 156+30 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 32
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 390 (m)

TOTAL NUMBER OF HOLES 32 B/L / 15 Buffer / 18 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 33

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 525 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

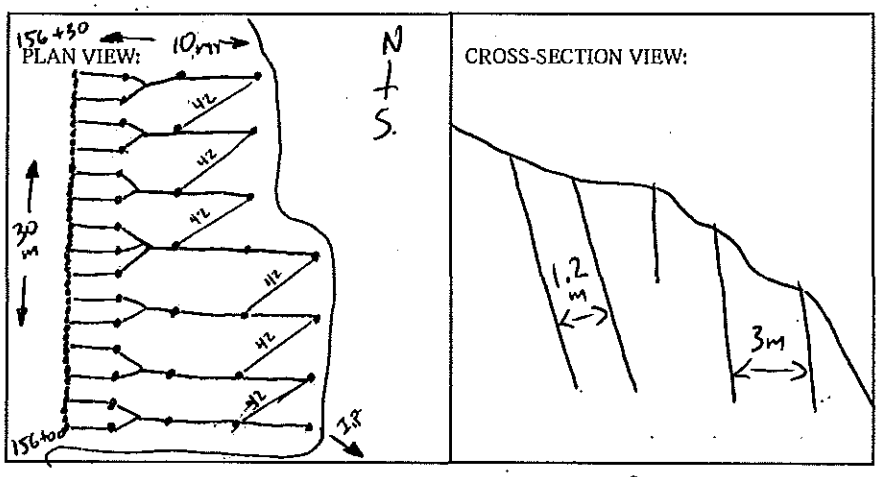
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 1800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 15/12
PROPOSED BLAST DATE March 15/12
BLAST # 245

HIGHWAY # 97
BLAST LOCATION AT: STN# 156+00 - 156+30 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 32
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 390 (m)

PROPOSED APPROX. NO. OF HOLES 32 B/L/15 Buffer/18 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 65
PROPOSED NUMBER OF DELAYS 33

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

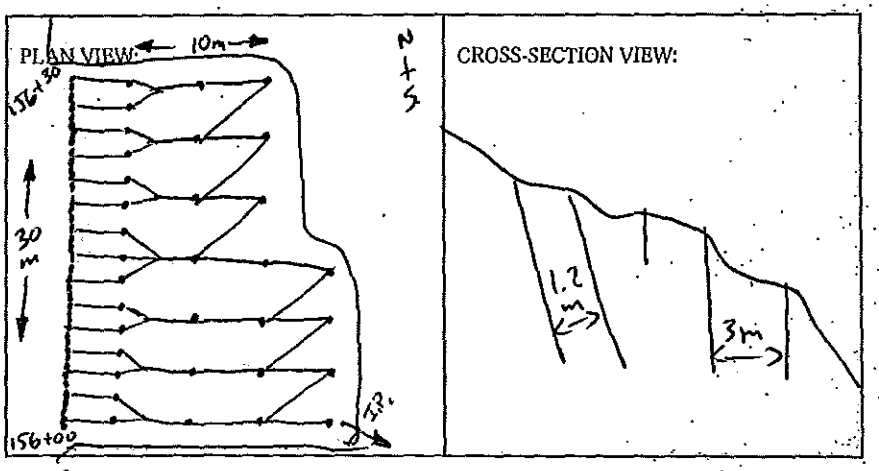
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 16/12
ACTUAL BLAST DATE March 16/12
BLAST # 246 @ 14:00

HIGHWAY # 97
BLAST LOCATION AT: STN # 148+00 - 148+45 RS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 45 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 43
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 389 (m)

TOTAL NUMBER OF HOLES 43 BL/18 Buffer/66 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 127
TOTAL NUMBER OF DELAYS 84

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2025 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

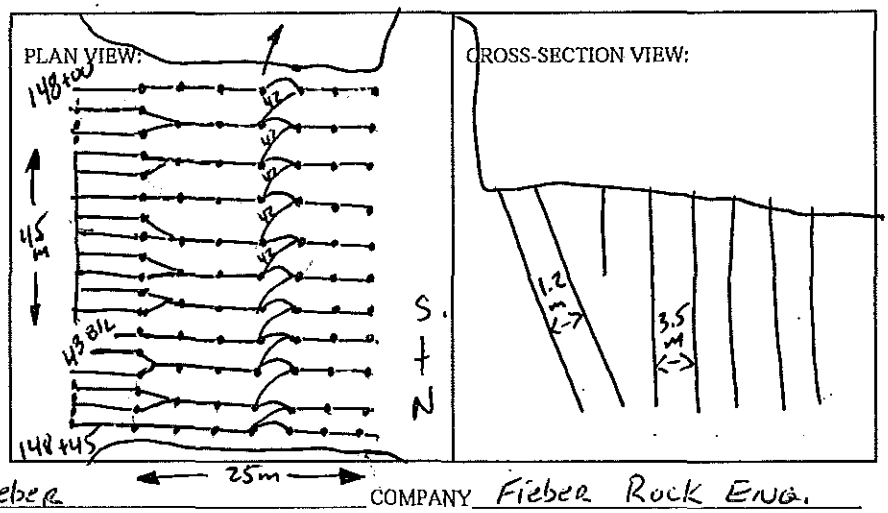
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 7875 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 15/12
PROPOSED BLAST DATE March 16/12
BLAST # ~~245~~ 246

HIGHWAY# 97
BLAST LOCATION AT: STN# 148+00 - 148+45 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 45 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 43
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 11
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 889 (m)

PROPOSED APPROX. NO. OF HOLES 43 Blk/18 Buffer/66 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3.5 (m) BURDEN 3.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 127
PROPOSED NUMBER OF DELAYS 84

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 2000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

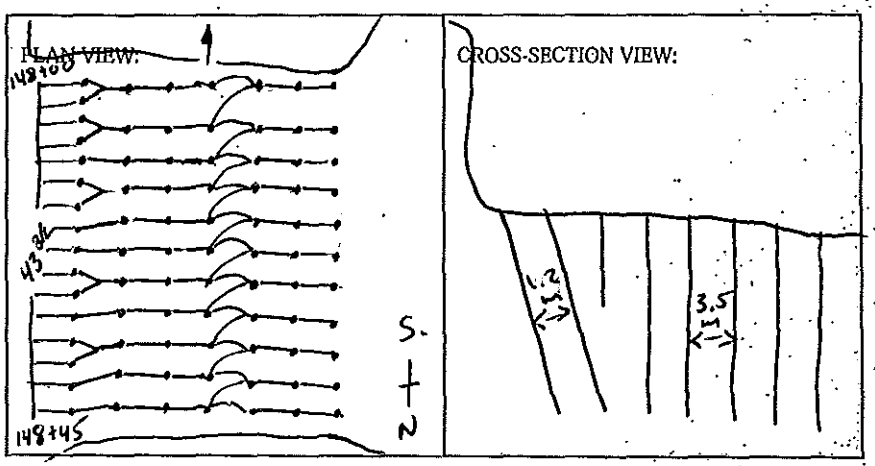
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 7800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED March 17/12
ACTUAL BLAST DATE March 17/12
BLAST # 247

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+30 - 156+90 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 60 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 57
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 32
MAXIMUM DEPTH 5.0 (m)
TOTAL DEPTH 440 (m)

TOTAL NUMBER OF HOLES 57 B/L / 32 Buffer / 21 production.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 110
TOTAL NUMBER OF DELAYS 53

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500. (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

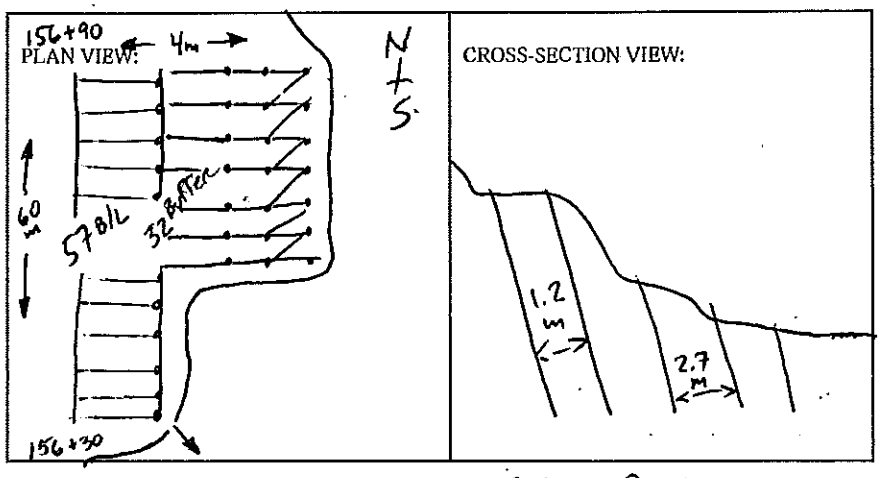
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 960 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 16/12
PROPOSED BLAST DATE MARCH 17/12
BLAST # 247

HIGHWAY # 97
BLAST LOCATION AT: STN# 156+30 - 156+90 LS (1ST BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 60 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) ∞ (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 57
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 32
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 440 (m)

PROPOSED APPROX. NO. OF HOLES 57 BL/32 Buffer/21 production
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 110
PROPOSED NUMBER OF DELAYS 53

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

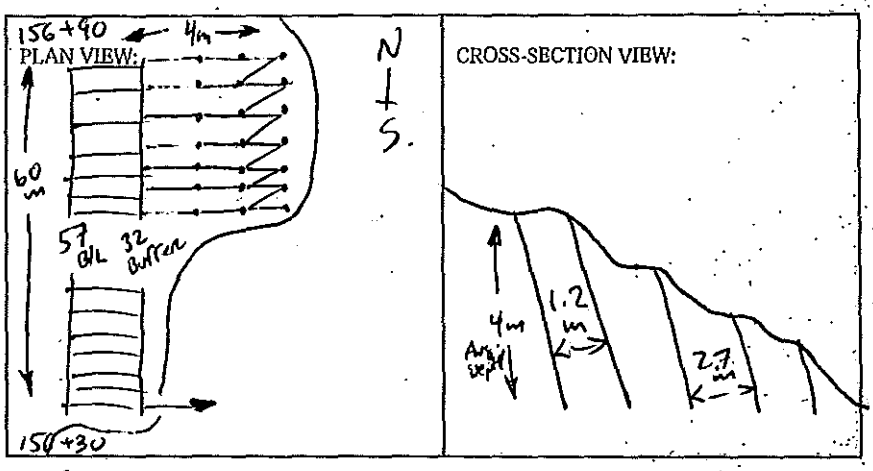
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 960 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 20/12
ACTUAL BLAST DATE March 20/12
BLAST # 248

HIGHWAY# 97
BLAST LOCATION AT: STN # 154+85 - 155+00 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 25
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 744 (m)

TOTAL NUMBER OF HOLES 25 Bk/10 Buffer/58 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 93
TOTAL NUMBER OF DELAYS 68

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1675 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

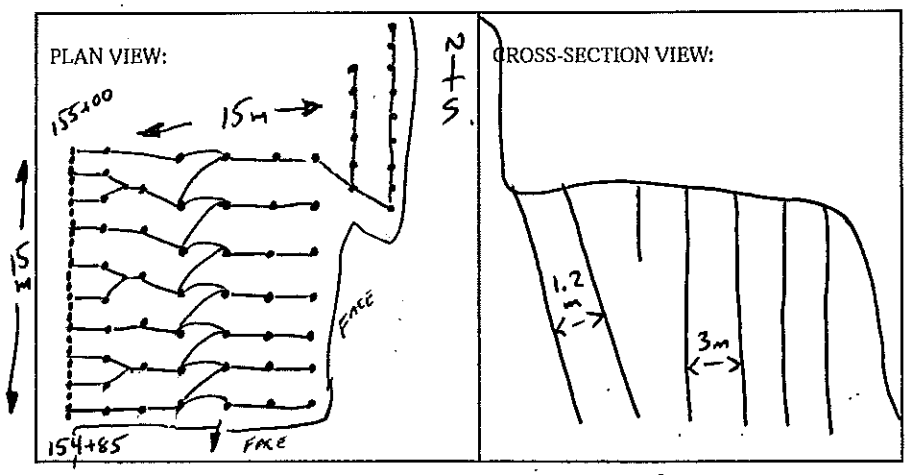
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 17/12
PROPOSED BLAST DATE March 20/12
BLAST # 248

HIGHWAY # 97
BLAST LOCATION AT: STN# 154+85 - 155+00 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 744 (m)

PROPOSED APPROX. NO. OF HOLES 25 BL/10 Buffer/50 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 93
PROPOSED NUMBER OF DELAYS 68

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1675 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

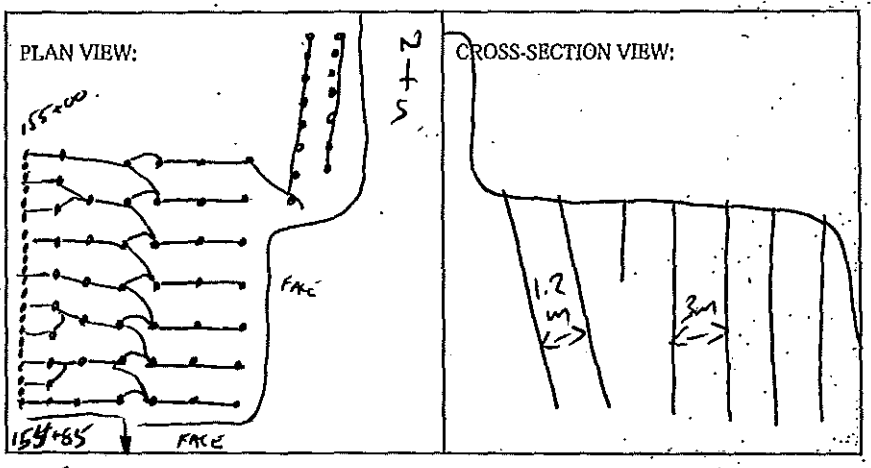
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 23/12
ACTUAL BLAST DATE March 23/12
BLAST # 251 @ 9:15

HIGHWAY# 97
BLAST LOCATION AT: STN # 146 Trench up from Swiss village Hwy 97

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ϕ (°) SLOPE LENGTH ϕ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ϕ
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 87 (m)

TOTAL NUMBER OF HOLES 29 Production
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite Nfo.
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

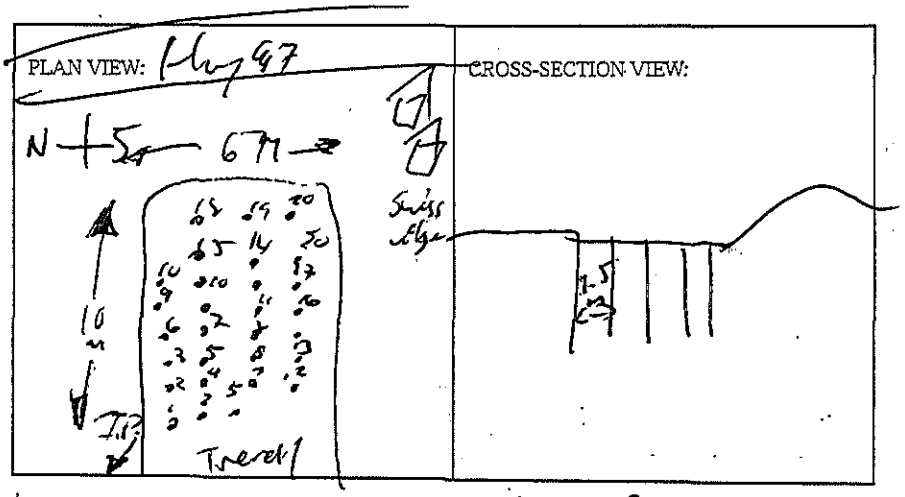
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Electric
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 180. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 22/12
PROPOSED BLAST DATE March 23/12
BLAST # 251

HIGHWAY # 97
BLAST LOCATION AT: STN # 146 Trench up from Swics village

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 0 (°) SLOPE LENGTH 0 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 0
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 87 (m)

PROPOSED APPROX. NO. OF HOLES 29
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 29
PROPOSED NUMBER OF DELAYS 20

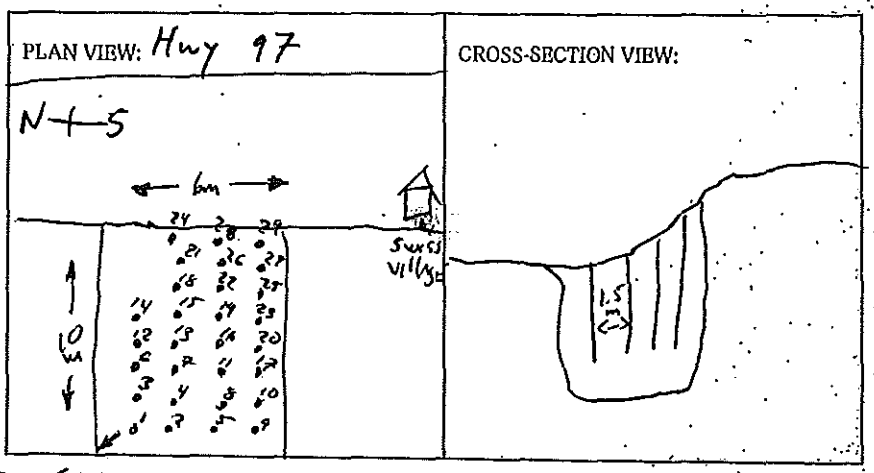
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 180 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 23/12

CONTRACTOR'S NAME Sierra Drilling + Blasting

ACTUAL BLAST DATE March 23/12.

BLASTER'S NAME James Mawhinney

BLAST # 252

BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY# 97

BLAST LOCATION AT: STN # 137+000

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)

ROCK TYPE Altered Granite

DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø

TOTAL NUMBER OF HOLES 29 Holes.

AVERAGE DEPTH 2m (m)

HOLE DIAMETER 13/4" (mm)

NUMBER OF ROWS 2

HOLE SPACING 4' (m) BURDEN 4' (m)

MAXIMUM DEPTH 3m (m)

HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

TOTAL DEPTH 24 (m)

BLAST DETAILS:

EXPLOSIVE TYPE 1" x 8" Dynamic

EXPLOSIVE SIZE 1" by 8"

TOTAL NUMBER OF CARTRIDGES 40

TOTAL WEIGHT 21 pds.

TOTAL NUMBER OF DELAYS 18

DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Electric

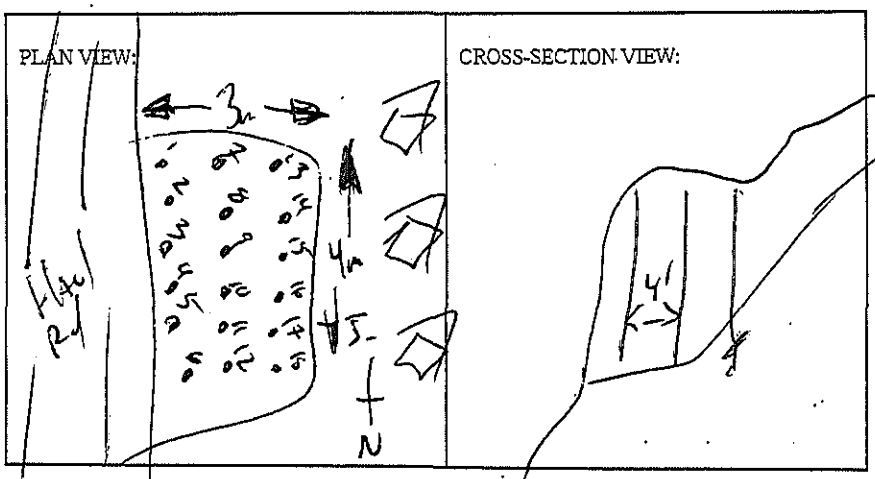
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 24 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MARCH 22/12
PROPOSED BLAST DATE MARCH 23/12
BLAST # 252

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN# 137+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 2 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 24 (m)

PROPOSED APPROX. NO. OF HOLES 29 Holes.
HOLE DIA. 13/4" (mm)
APPROX. HOLE SPACING 4' (m) BURDEN 4' (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" x 8" Dynamite
APPROX. NUMBER OF CARTRIDGES 40
PROPOSED NUMBER OF DELAYS 18

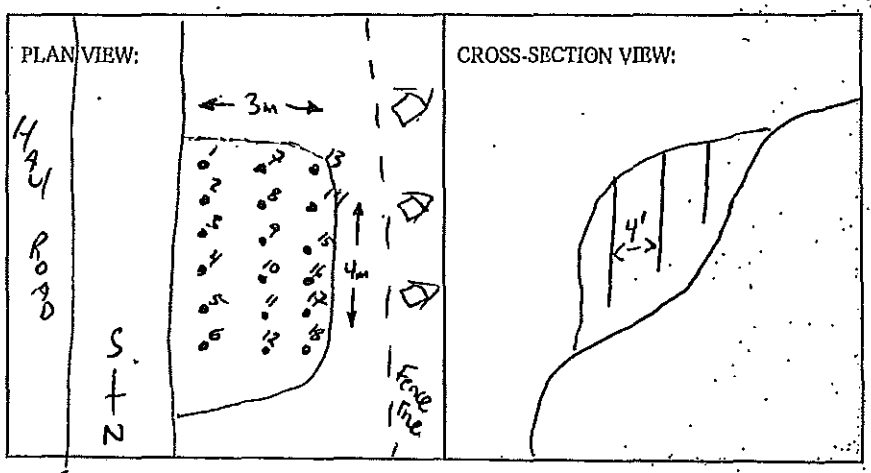
EXPLOSIVE SIZE 1" mm by 8" mm
APPROX. TOTAL WEIGHT 21 pds. (kg)
DELAY TYPE AND LENGTH (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 24 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED MARCH 23/12
ACTUAL BLAST DATE MARCH 23/12
BLAST # 253 @15:22

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+95 - 157+30 (to subs rele)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 35 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 392 (m)

TOTAL NUMBER OF HOLES 18 13 1/2/13 Buffer / 18 production
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) ~~BURDEN~~ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 49
TOTAL NUMBER OF DELAYS 31

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 70C (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

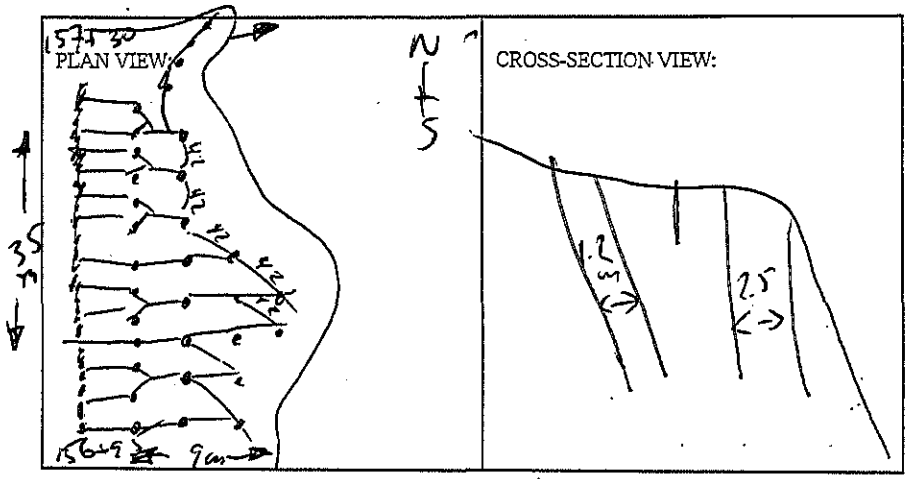
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation w/ Hound system
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 1080 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 22/12
PROPOSED BLAST DATE March 23/12
BLAST # 253

HIGHWAY# 97
BLAST LOCATION AT: STN# 156+95 – 157+30 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 35 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 18
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 8
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 392 (m)

PROPOSED APPROX. NO. OF HOLES 18 B/L / 13 Buffer / 18 production
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 49
PROPOSED NUMBER OF DELAYS 31

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 700 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

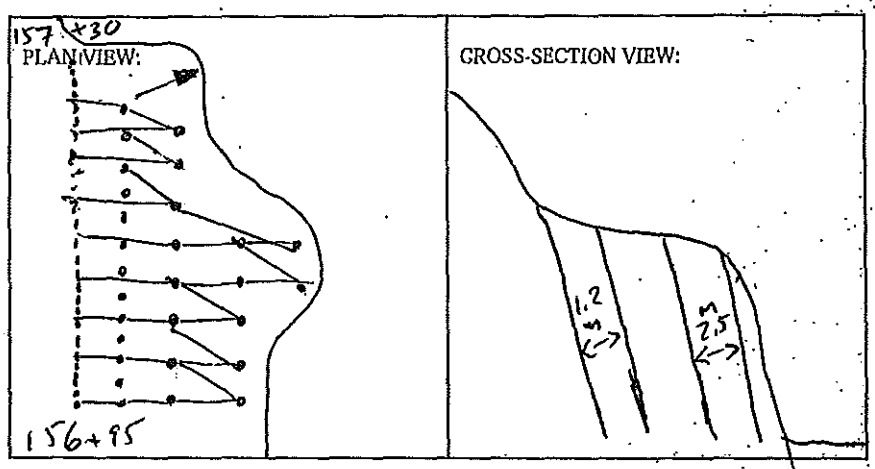
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1080 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 24/12.

CONTRACTOR'S NAME Sierra Drilling + Blasting

ACTUAL BLAST DATE March 24/12

BLASTER'S NAME James Mawhinney

BLAST # 254 (E) 12:03

BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY# 97

BLAST LOCATION AT: STN # 146 Trenchline Swiss Village

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)

ROCK TYPE Altered Granite

DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —

AVERAGE DEPTH 4.5 (m)

NUMBER OF ROWS 4

MAXIMUM DEPTH 5 (m)

TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 12

HOLE DIAMETER 76 (mm)

HOLE SPACING 1.2 (m) BURDEN 1.2 (m)

HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½"x16" Dynamite + Anfo

EXPLOSIVE SIZE 40 mm by 400 mm

TOTAL NUMBER OF CARTRIDGES 12

TOTAL WEIGHT 75 (kg)

TOTAL NUMBER OF DELAYS 12

DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____

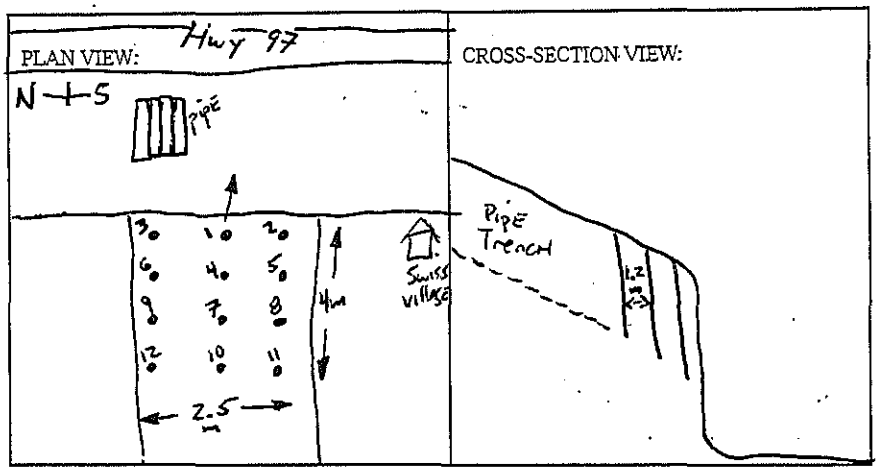
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 45 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 23/12
PROPOSED BLAST DATE March 24/12
BLAST # 254

HIGHWAY # 97
BLAST LOCATION AT: STN# 146 Trenchline swiss village

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 4.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 54 (m)

PROPOSED APPROX. NO. OF HOLES 12
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½"x16" Dynamite + Anfo.
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 12.

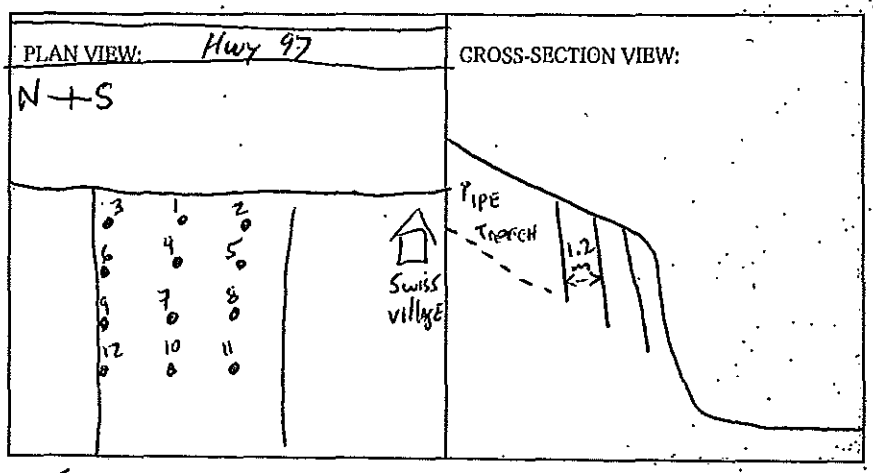
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 45 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) —
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 26/12
ACTUAL BLAST DATE March 26/12. @ 15:45
BLAST # 255

HIGHWAY# 97
BLAST LOCATION AT: STN # 167+10 - 167+40 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 50
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 160 (m)

TOTAL NUMBER OF HOLES 50 BL / 18 buffer / 45 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 113
TOTAL NUMBER OF DELAYS 63

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1950 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

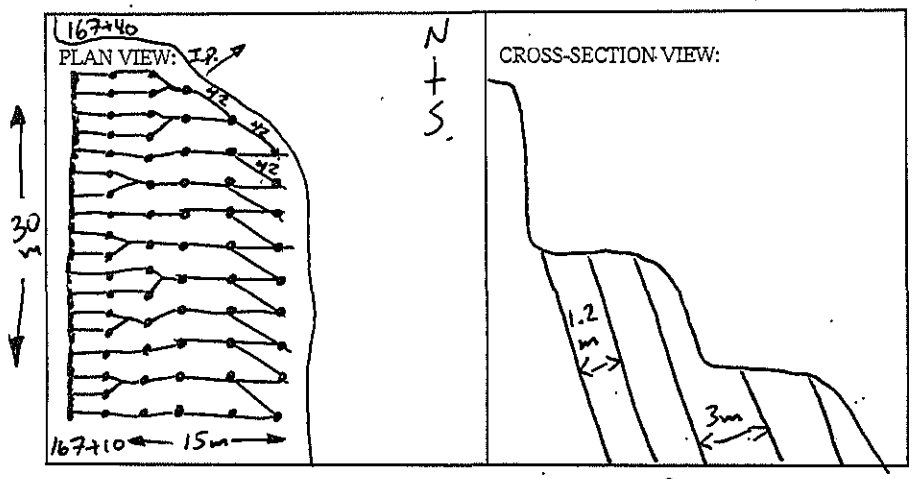
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 3825 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 24/12
PROPOSED BLAST DATE MARCH 26/12
BLAST # 255

HIGHWAY # 97
BLAST LOCATION AT: STN# 167+10 - 167+40 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 50
PROPOSED AVG. DEPTH 8.5 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 960 (m)

PROPOSED APPROX. NO. OF HOLES 50 BL / 18 Buffer / 45 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 113
PROPOSED NUMBER OF DELAYS 63

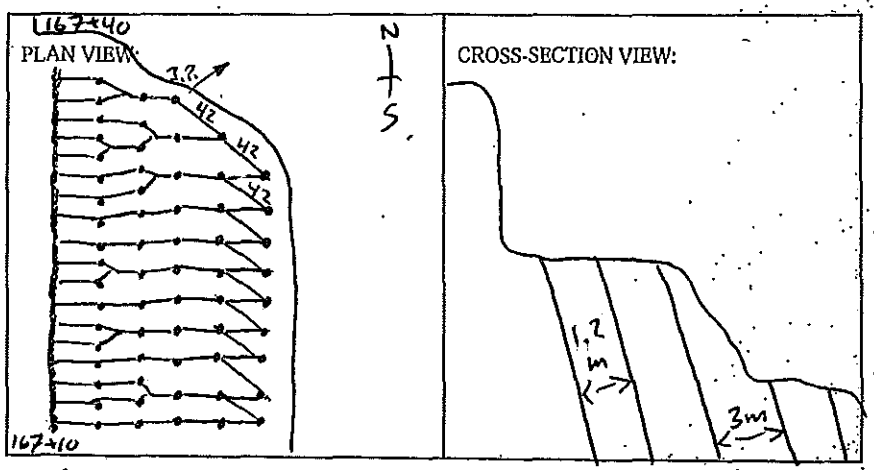
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1950 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 3800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 27/12
ACTUAL BLAST DATE March 27/12
BLAST # 256 @ 9:15

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY # 97
BLAST LOCATION AT: STN # 129 +00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES /
AVERAGE DEPTH 6' (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 10' (m)
TOTAL DEPTH 36' (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 13/4" (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 1" by 8"
TOTAL WEIGHT 5 lbs. (kg)
DELAY TYPE AND LENGTH 25 (ms)

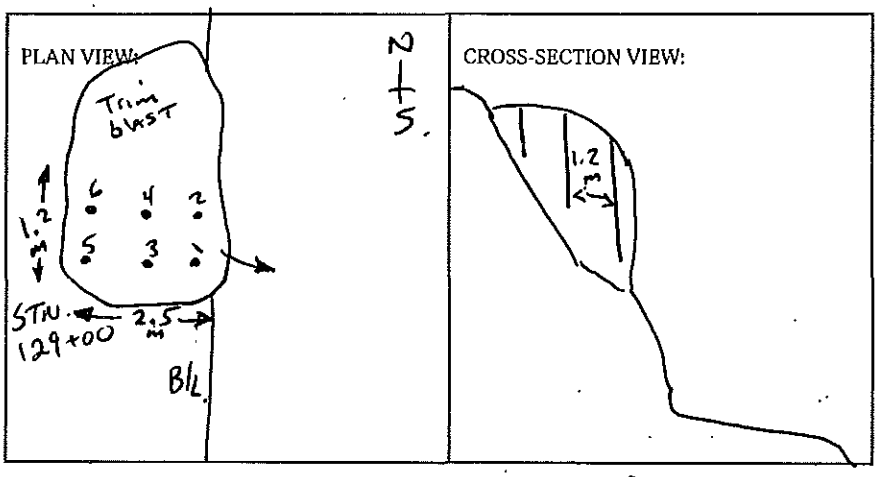
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4.0 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MARCH 26/12
PROPOSED BLAST DATE MARCH 27/12
BLAST # 256

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 129+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 6' (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 10' (m)
PROPOSED TOTAL DEPTH 36' (m)

PROPOSED APPROX. NO. OF HOLES 6
HOLE DIA. 13/4" (mm)
APPROX. HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 6

EXPLOSIVE SIZE 1" by 8" (mm)
APPROX. TOTAL WEIGHT 5 lbs (kg)
DELAY TYPE AND LENGTH 25 (ms)

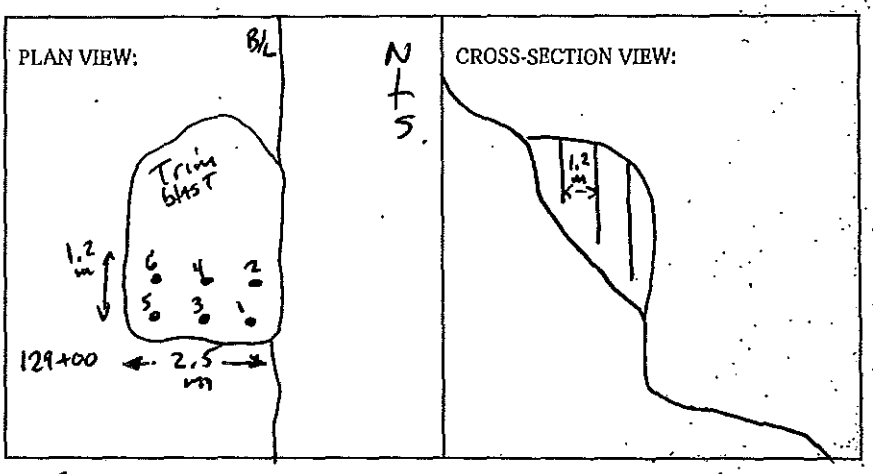
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4.0 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED March 27/12
ACTUAL BLAST DATE March 27/12
BLAST # 257 @ 15:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 166+60 — 167+10 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 68
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 904 (m)

TOTAL NUMBER OF HOLES 68 BL/17 Buffer/28 production.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 113
TOTAL NUMBER OF DELAYS 45

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1250 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

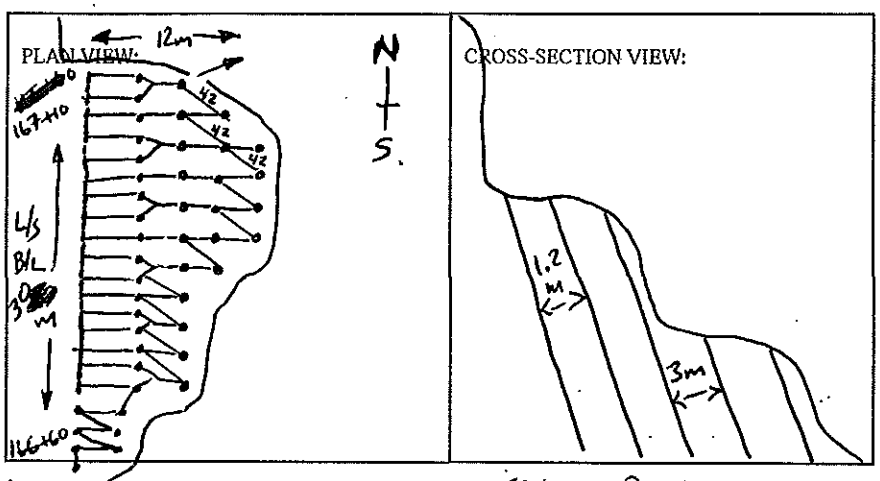
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 3800 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 26/12
PROPOSED BLAST DATE March 27/12
BLAST # 257

HIGHWAY # 97
BLAST LOCATION AT: STN# 166+60 - 167+10 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 140 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 68
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 11
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 904 (m)

PROPOSED APPROX. NO. OF HOLES 68 BL/17 Buffer/28 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 113
PROPOSED NUMBER OF DELAYS 45

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1200 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

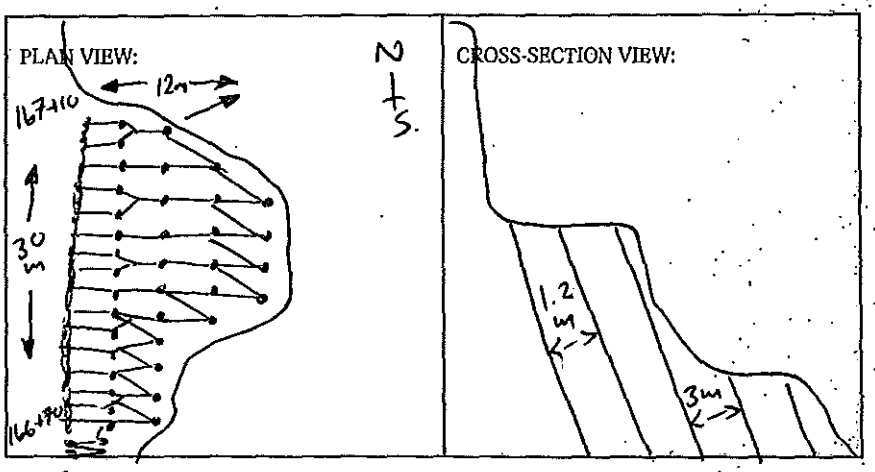
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 27/10
ACTUAL BLAST DATE March 27/10
BLAST # 258 @16:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 6.5'
NUMBER OF ROWS 3
MAXIMUM DEPTH 10'
TOTAL DEPTH 60'

TOTAL NUMBER OF HOLES 20
HOLE DIAMETER 1 3/4"
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
TOTAL NUMBER OF CARTRIDGES 60
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 1" by 8"
TOTAL WEIGHT 20 lbs.
DELAY TYPE AND LENGTH 25 (ms)

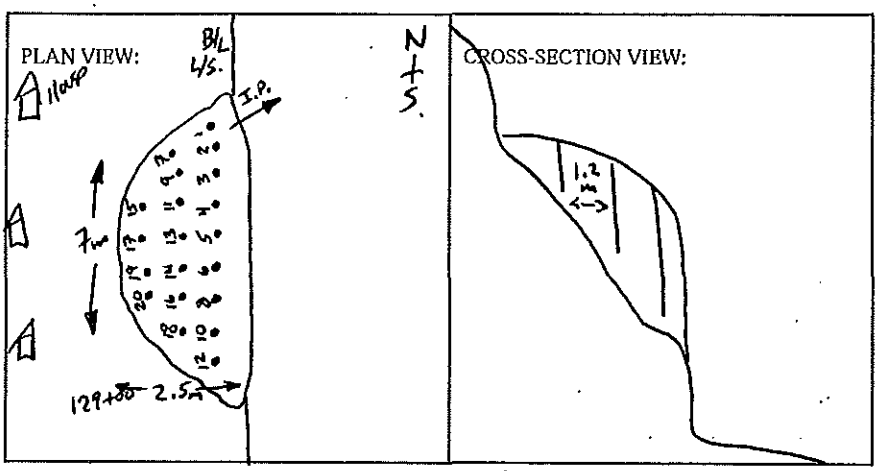
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 35 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 27/10
PROPOSED BLAST DATE March 27/10
BLAST # 258

HIGHWAY# 97
BLAST LOCATION AT: STN# 129+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ___ (°) SLOPE LENGTH ___ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ___
PROPOSED AVG. DEPTH 6.5' (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 10' (m)
PROPOSED TOTAL DEPTH 60' (m)

PROPOSED APPROX. NO. OF HOLES 20
HOLE DIA. 1 3/4" (mm)
APPROX. HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
APPROX. NUMBER OF CARTRIDGES 60
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 1" by 8" (mm)
APPROX. TOTAL WEIGHT 20 lbs. (kg)
DELAY TYPE AND LENGTH 25 (ms)

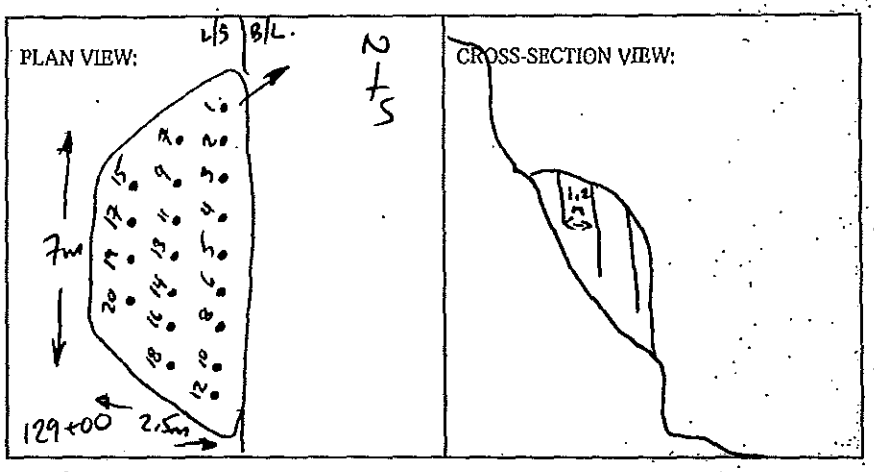
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 30 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE ___ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) ___
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhiney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 28/12
ACTUAL BLAST DATE March 28/12.
BLAST # 259 @ 12:11

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+75-162+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72. (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 240 (m)

TOTAL NUMBER OF HOLES 10 BL / 3 Buffer / 17 production
HOLE DIAMETER 89 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO.
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

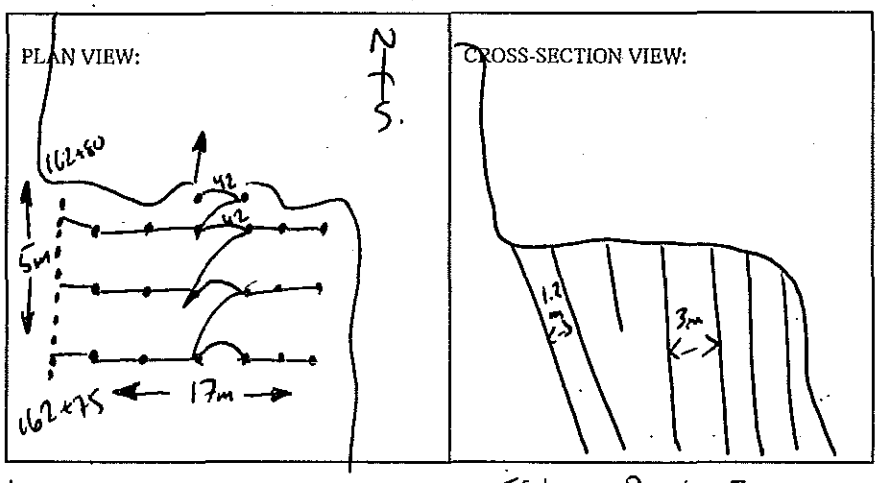
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 680. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 28/12
PROPOSED BLAST DATE March 28/12.
BLAST # [redacted] 259

HIGHWAY # 97
BLAST LOCATION AT: STN# 162+75-162+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 240 (m)

PROPOSED APPROX. NO. OF HOLES 10/3 L / 5 Buffer / 17 production
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

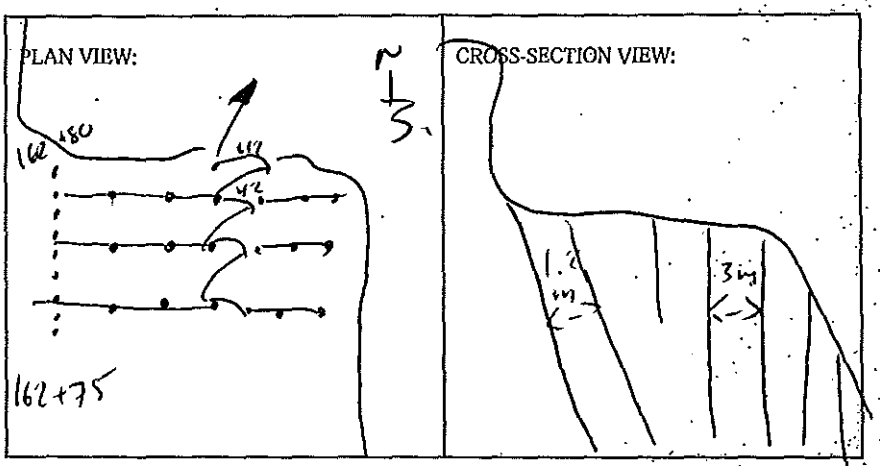
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 28/12
ACTUAL BLAST DATE March 28/12
BLAST # ~~2859~~ 260 @ 13:40

HIGHWAY# 97
BLAST LOCATION AT: STN # 167+70 - 167+75 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH ~~680~~ (m) 208.

TOTAL NUMBER OF HOLES 10 B1C/4 Buffer /12 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 275 (kg)
DELAY TYPE AND LENGTH 25 +42. (ms)

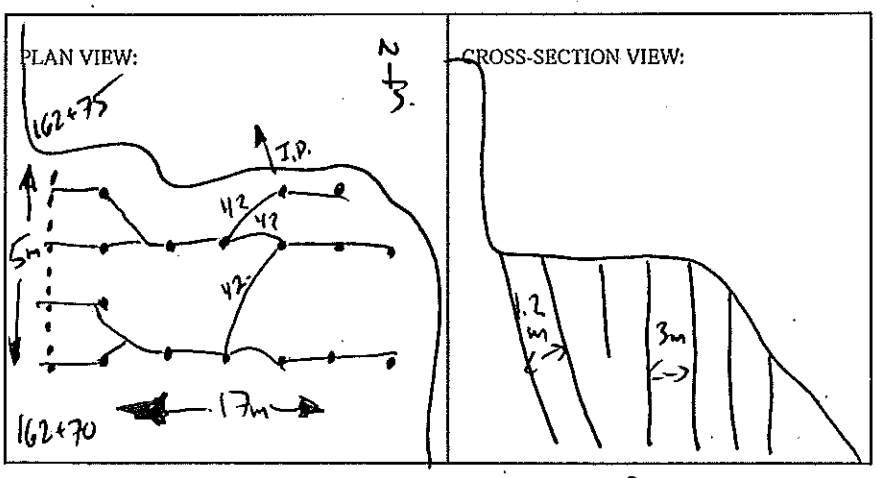
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiating Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 680. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 28/12
PROPOSED BLAST DATE MARCH 28/12
BLAST # ~~25~~ 260

HIGHWAY # 97
BLAST LOCATION AT: STN# 167+70-167+75 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 208 (m)

PROPOSED APPROX. NO. OF HOLES 10 BL / 4 Buffer / 12 prod.
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 26
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25+42. (ms)

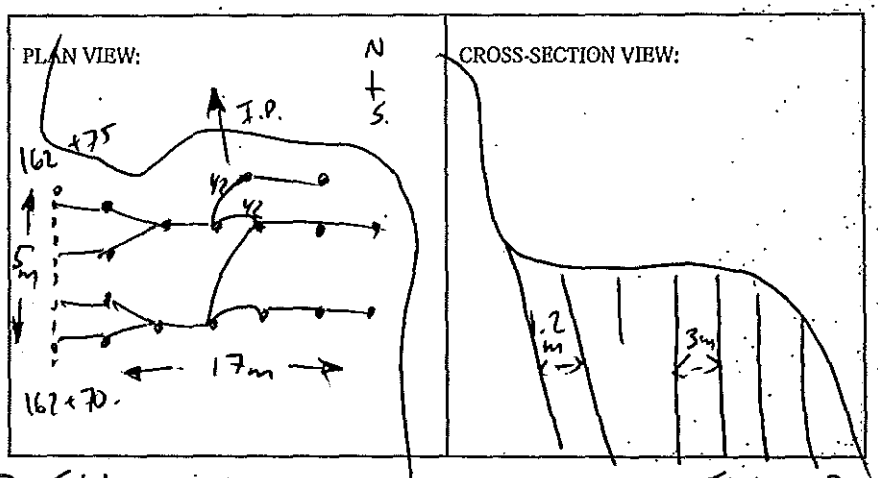
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 28/12.
ACTUAL BLAST DATE March 28/12
BLAST # [redacted] 261 @ 15:46

HIGHWAY# 97
BLAST LOCATION AT: STN # 162 + 65 - 162 + 70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 232. (m)

TOTAL NUMBER OF HOLES 11 BL/5 Buffer/13 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 29
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300. (kg)
DELAY TYPE AND LENGTH 25+42. (ms)

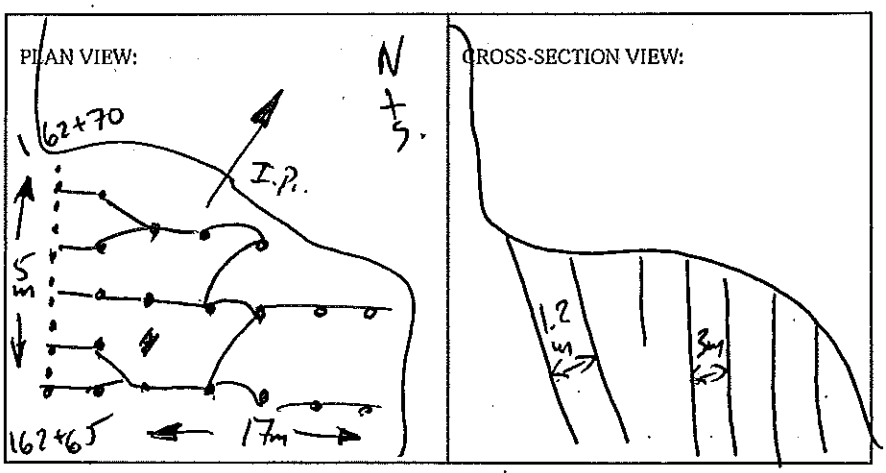
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 680. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 28/12
PROPOSED BLAST DATE MARCH 28/12
BLAST # [redacted] 261

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+65 - 162+70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 77 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 11
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 232 (m)

PROPOSED APPROX. NO. OF HOLES 11 BL/5 Buffer/13 prod.
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 29
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

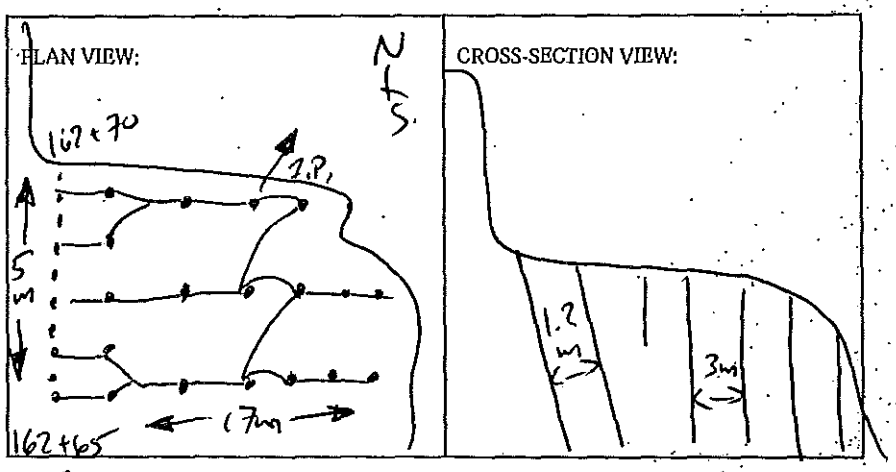
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 600 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 29/12
ACTUAL BLAST DATE March 29/12.
BLAST # 262 @13:21

HIGHWAY# 97
BLAST LOCATION AT: STN #156+95 - 156+70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 30
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 608 (m)

TOTAL NUMBER OF HOLES 30 BL/11 Buffer/35 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 76
TOTAL NUMBER OF DELAYS 46

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1625 (kg)
DELAY TYPE AND LENGTH 25 +42. (ms)

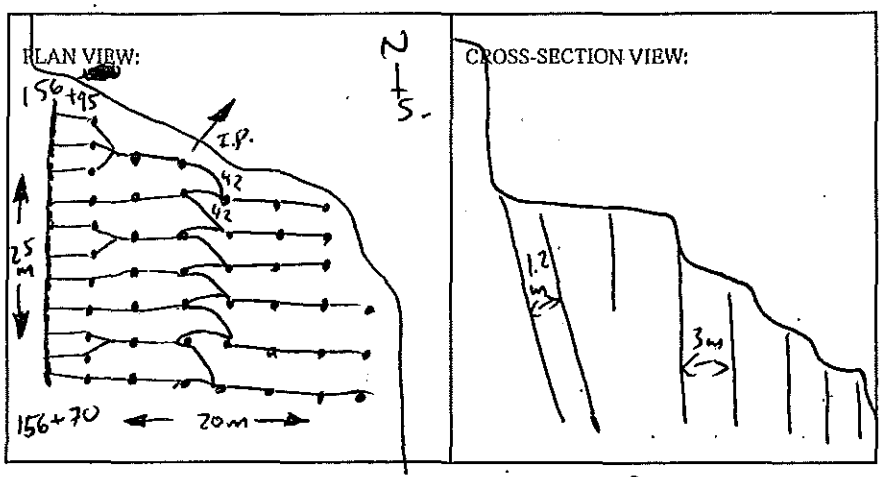
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 28/12
PROPOSED BLAST DATE March 28/12
BLAST # 262

HIGHWAY # 97
BLAST LOCATION AT: STN # 156+95 - 156+70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 30
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 7
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 608 (m)

PROPOSED APPROX. NO. OF HOLES 30 BL / 11 Buffer / 35 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 76
PROPOSED NUMBER OF DELAYS 46

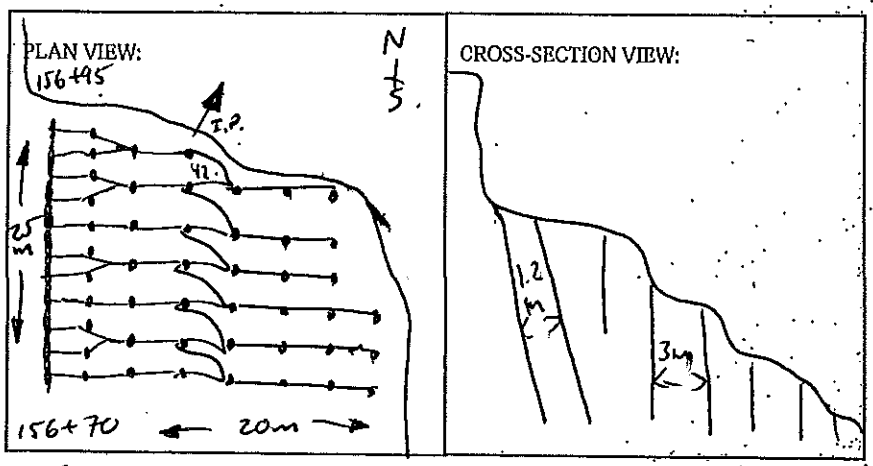
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1625 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 29/12
ACTUAL BLAST DATE March 29/12 @ 15:17
BLAST # 263

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+55 - 162+60 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 264 (m)

TOTAL NUMBER OF HOLES 10 B/L / 4 Buffer / 19 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 33
TOTAL NUMBER OF DELAYS 23

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

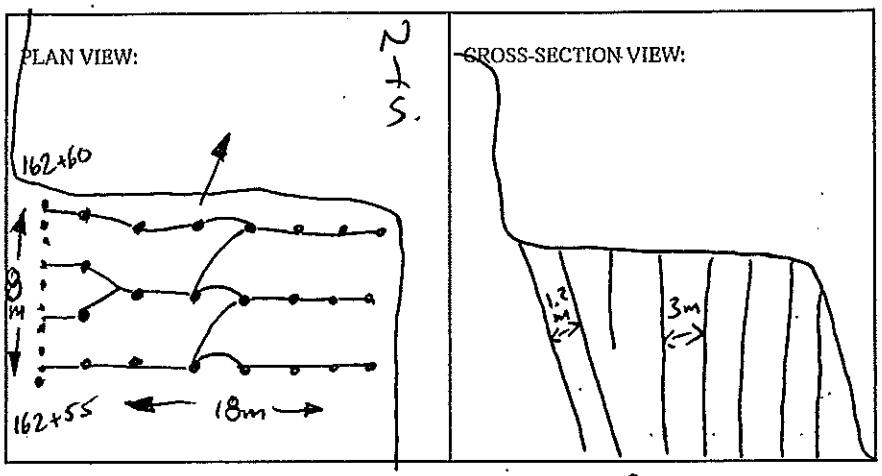
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 1152. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 28/12
PROPOSED BLAST DATE MARCH 29/12
BLAST # 263

HIGHWAY # 97
BLAST LOCATION AT: STN# 162+55 - 162+60 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 264 (m)

PROPOSED APPROX. NO. OF HOLES 10 BL/4 Buffer/19 prod.
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 33
PROPOSED NUMBER OF DELAYS 23

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

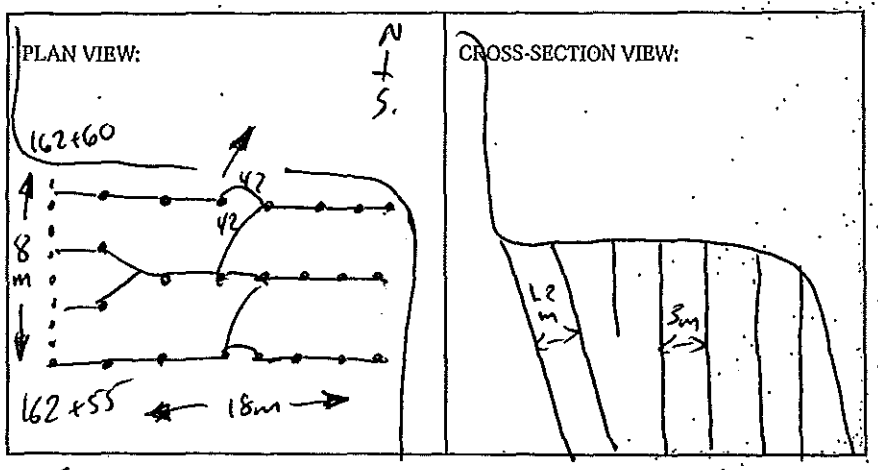
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1152. (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED March 30/12
ACTUAL BLAST DATE March 30/12.
BLAST # 764 @ 10:35

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+40 - 162+45 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72. (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 256 (m)

TOTAL NUMBER OF HOLES 10 B/L / 4 Buffer / 18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 32
TOTAL NUMBER OF DELAYS 22

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25+42. (ms)

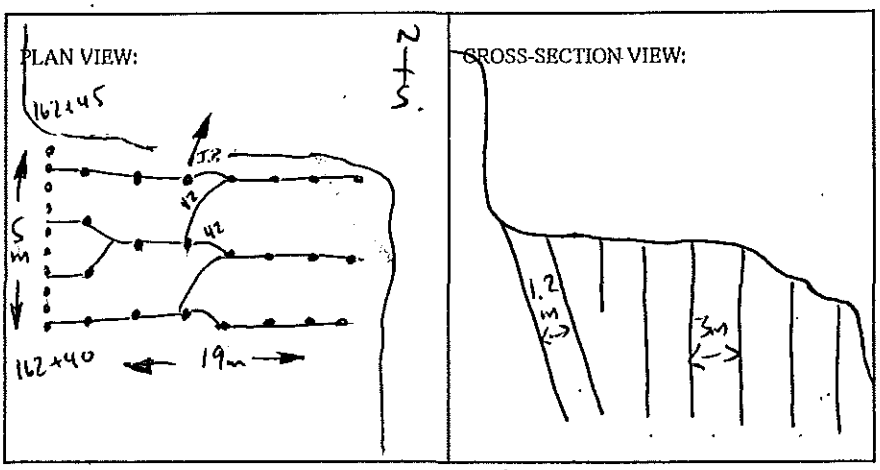
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 760 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MARCH 29/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE MARCH 30/12
BLASTER'S NAME JAMES MAWHINNEY
BLAST # 264
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+40 - 162+45 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 250 (m)
PROPOSED APPROX. NO. OF HOLES 10 BL / 4 Buffer / 18 production
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 32
PROPOSED NUMBER OF DELAYS 22
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 470 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

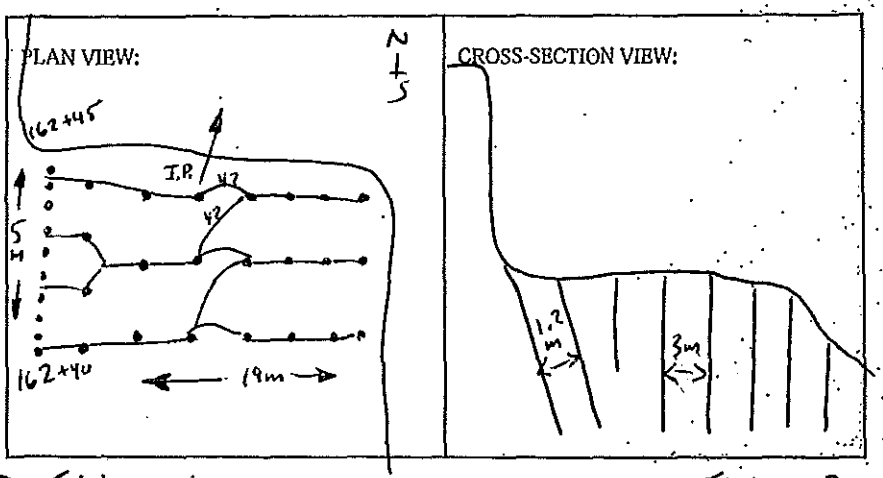
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 700 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhiney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED March 30/12
ACTUAL BLAST DATE March 30/12.
BLAST # 265 @ 13:35

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+40 - 162+35LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 272 (m)

TOTAL NUMBER OF HOLES 12 B/L / 4 Buffer / 18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 22

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 450 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

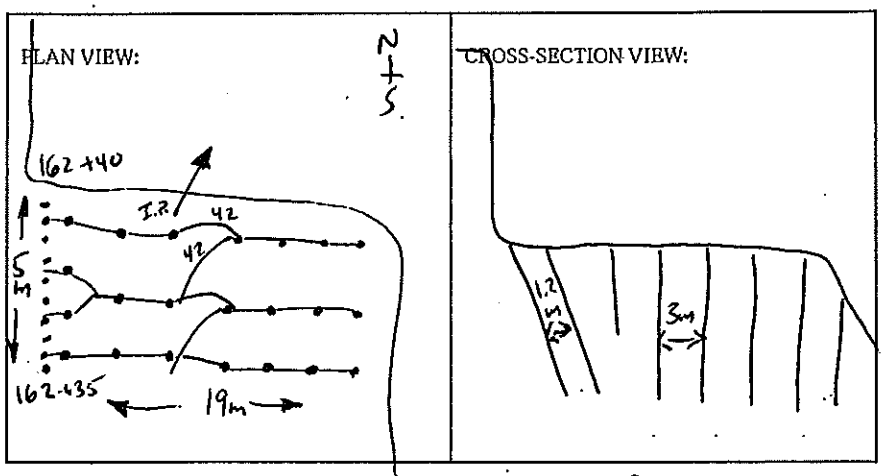
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 760 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 29/12
PROPOSED BLAST DATE MARCH 30/12
BLAST # 265

HIGHWAY # 97
BLAST LOCATION AT: STN# 162+40 - 162+35 LS (Ush/grade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 270 (m)

PROPOSED APPROX. NO. OF HOLES 12 B/L / 4 Buffer / 18 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 34
PROPOSED NUMBER OF DELAYS 22

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 450 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

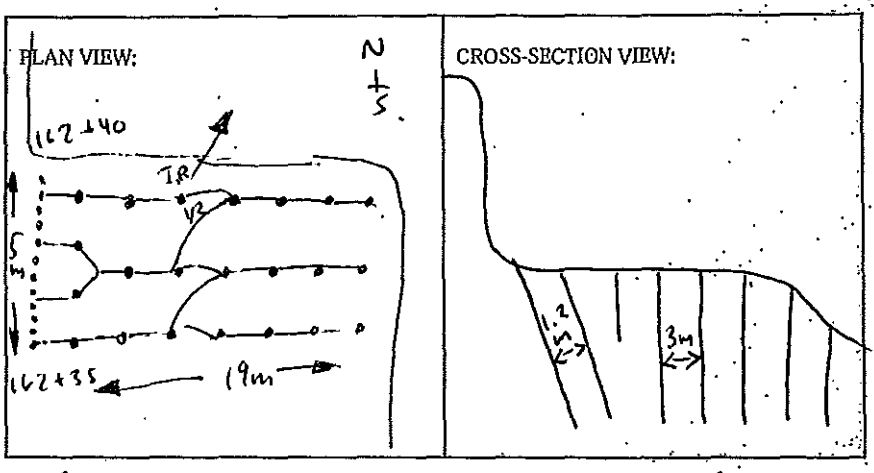
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 760 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED March 30/12
ACTUAL BLAST DATE March 30/12.
BLAST # ~~226~~ 266 @ 15:08

HIGHWAY# 97
BLAST LOCATION AT: STN # 162 + 30 – 162 + 35 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 248 (m)

TOTAL NUMBER OF HOLES 14 B/L/5 Buffer/12 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 31
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 375 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

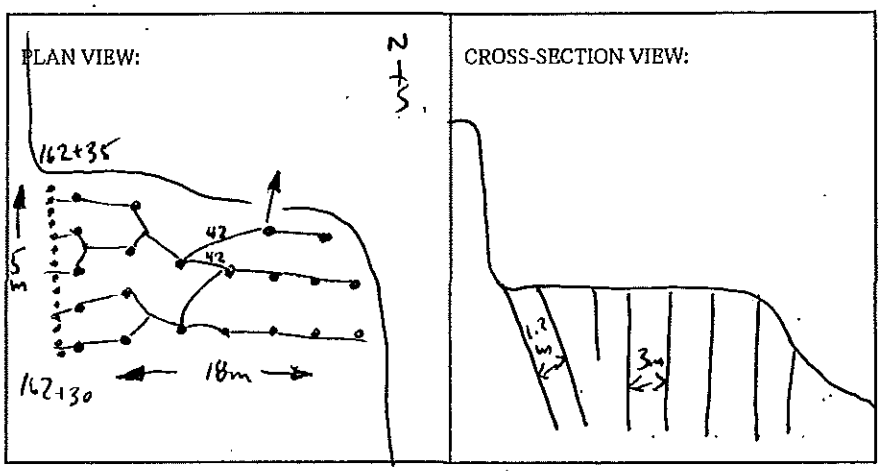
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 720 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED MARCH 30/12
PROPOSED BLAST DATE MARCH 30/12
BLAST # 266

HIGHWAY # 97
BLAST LOCATION AT: STN # 162+30 - 162+355 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 14
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 248 (m)

PROPOSED APPROX. NO. OF HOLES 14 BL/5 Buffer/12 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 31
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

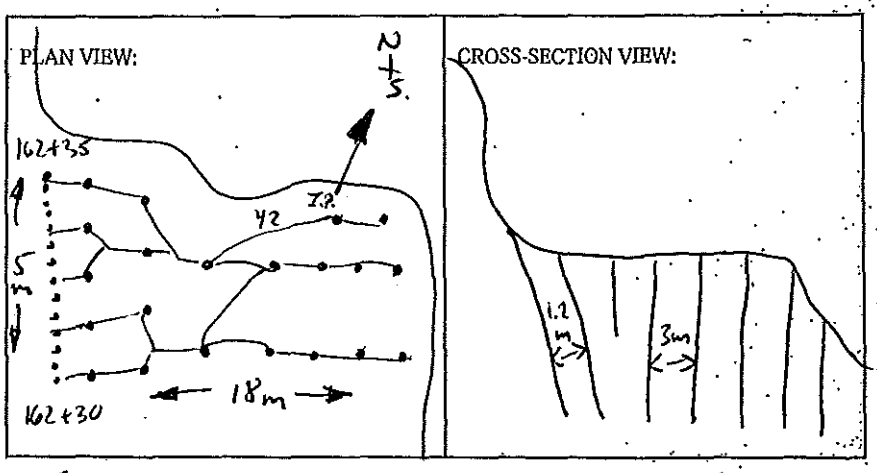
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system.
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 720 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

PROPOSED.
~~AS BUILT~~ BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 30/12
ACTUAL BLAST DATE April 02/12
BLAST # 267.

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhiney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY# 97
BLAST LOCATION AT: STN #151+90 - 151+95 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 10 BL / 3 production
HOLE DIAMETER 89 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 3

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

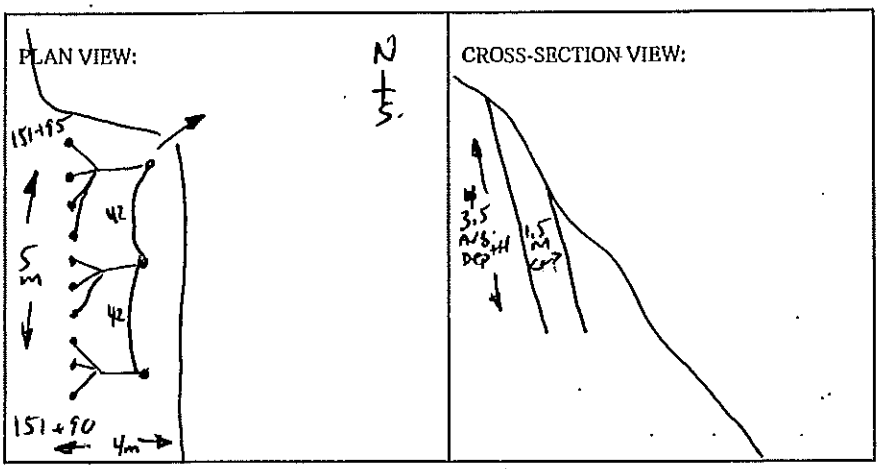
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 70. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 02/12
ACTUAL BLAST DATE April 02/12.
BLAST # 268 @ 13:12

HIGHWAY # 97
BLAST LOCATION AT: STN #162+28 - 162+18 LS (10 subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 225 (m)

TOTAL NUMBER OF HOLES 9 B/L / 4 Buffer / 17 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

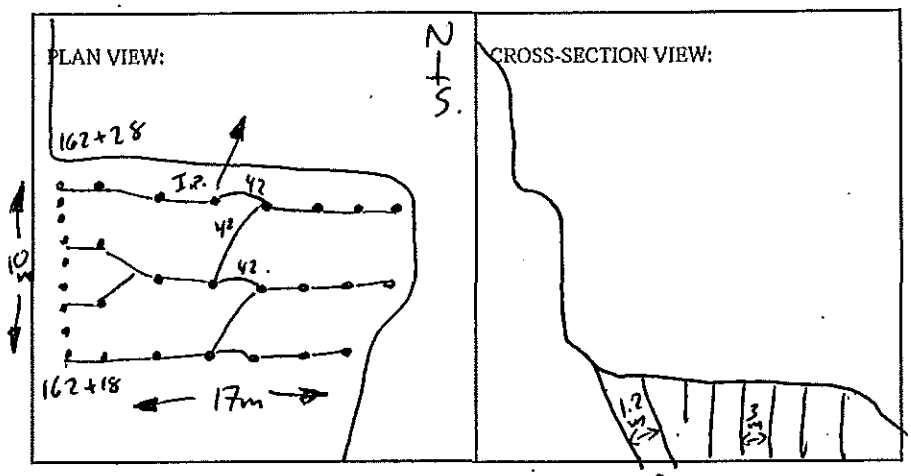
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 1275 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED March 30/12
PROPOSED BLAST DATE April 02/12
BLAST # 268

HIGHWAY # 97
BLAST LOCATION AT: STN#162+28 - 162+18 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 225 (m)

PROPOSED APPROX. NO. OF HOLES 9 BL / 4 Buffer / 17 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 21

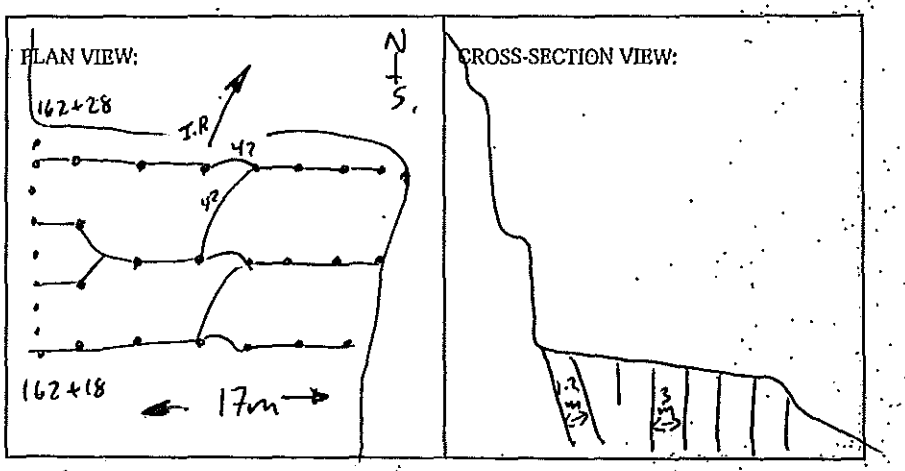
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 1275 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 02/12
ACTUAL BLAST DATE April 02/12
BLAST # 269 @ 15:36

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+00 - 162+18 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 18 (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 17
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 246 (m)

TOTAL NUMBER OF HOLES 17 BL/6 Buffer/18 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 41
TOTAL NUMBER OF DELAYS 24

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 375 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

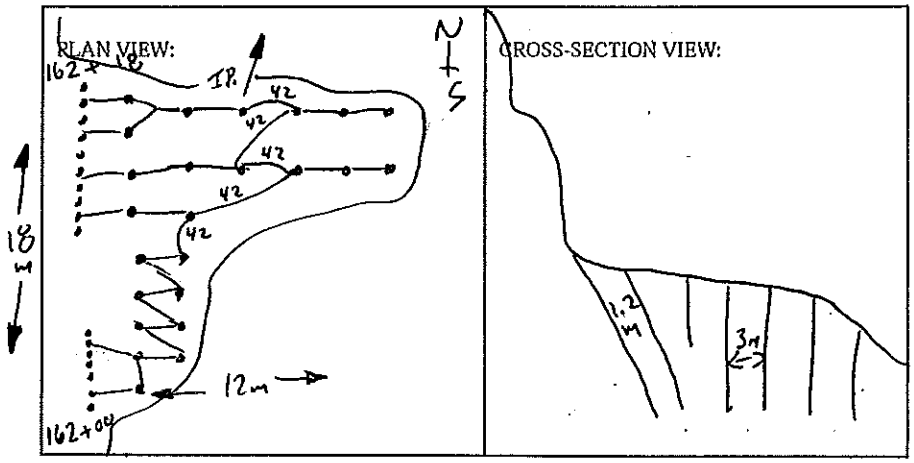
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 1296 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MARCH 30/12
PROPOSED BLAST DATE April 02/12
BLAST # 269

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+00 - 162+18 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 18 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 17
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 246 (m)

PROPOSED APPROX. NO. OF HOLES 17 BL/6 Buffer/18 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 41
PROPOSED NUMBER OF DELAYS 24

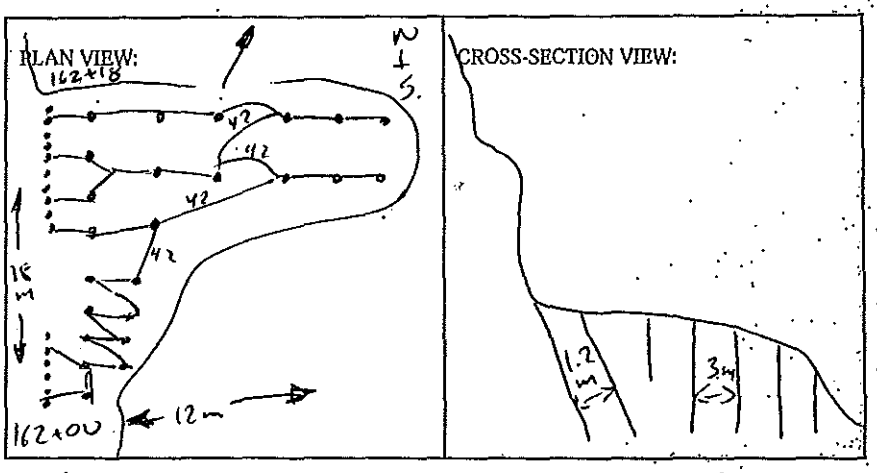
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 375 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF Nonel system.
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 1296 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 03/12
ACTUAL BLAST DATE April 03/12.
BLAST # 270 @ 10:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+90 - 151+85 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 220 (°) SLOPE LENGTH 0 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 0
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10 Holes.
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2¾" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

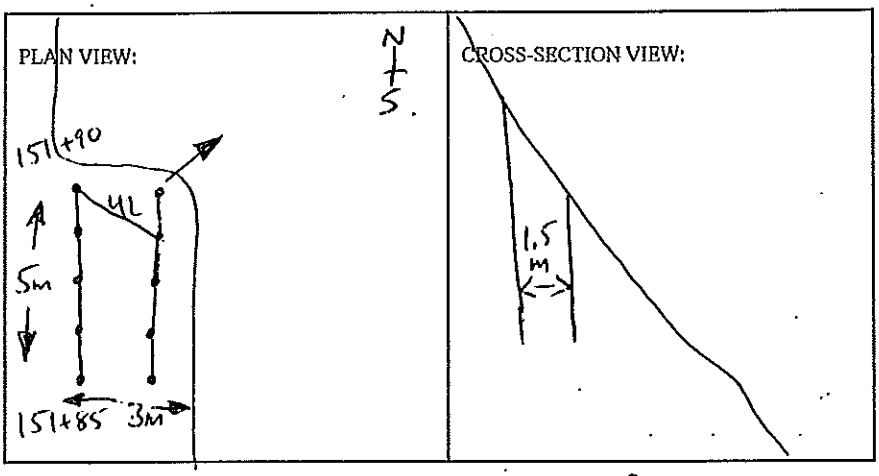
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 45 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED April 02/12
PROPOSED BLAST DATE April 03/12
BLAST # 270

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN# 151+90 - 151+85 LS (1st Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3.5 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 10 Holes.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

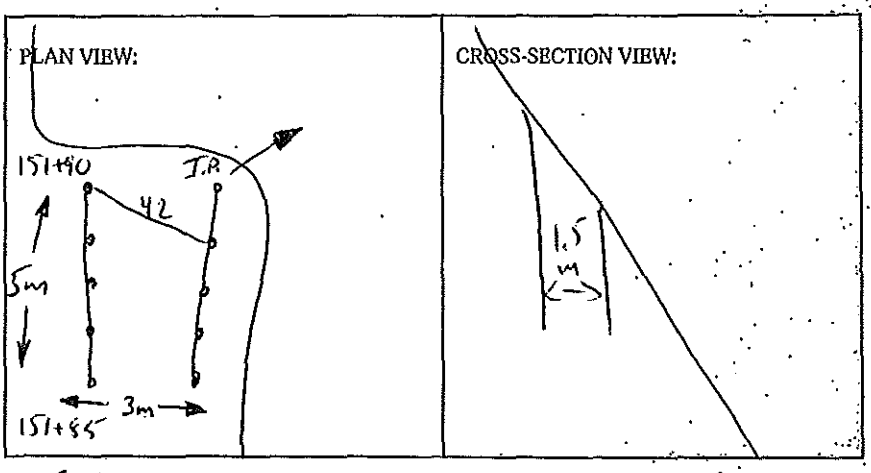
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 45 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhiney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 03/12
ACTUAL BLAST DATE April 03/12
BLAST # 271 @ 12:08

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+00 - 161+80 (to subgrade) c/L

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE _____ (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES _____
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 224 (m)

TOTAL NUMBER OF HOLES 56
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 56
TOTAL NUMBER OF DELAYS 56

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

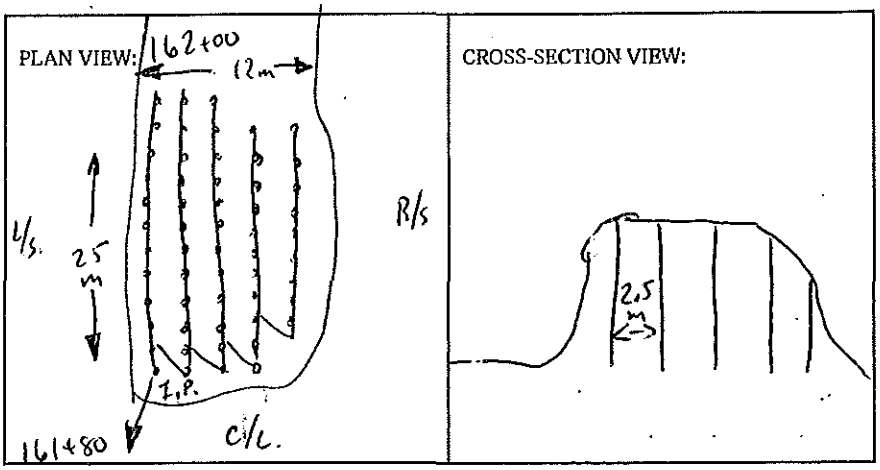
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 02/12
PROPOSED BLAST DATE April 03/12
BLAST # 271

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+00 - 161+80 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~~~ (°) SLOPE LENGTH ~~~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~~~
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 224 (m)
PROPOSED APPROX. NO. OF HOLES 56
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 56
PROPOSED NUMBER OF DELAYS 56
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

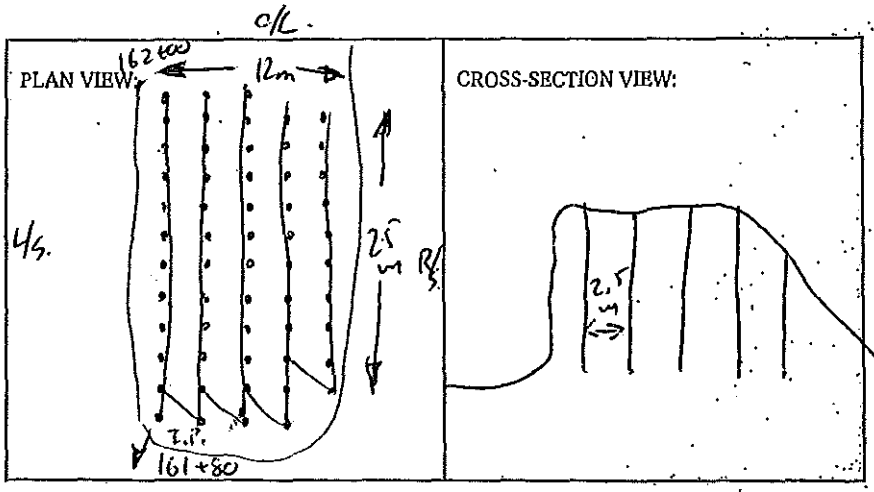
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 1200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE ~~~ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) ~~~

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 03/12
ACTUAL BLAST DATE April 03/12
BLAST # 272 @16:00

HIGHWAY# 97
BLAST LOCATION AT: STN # 161+50 - 161+40 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE _____ (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES _____
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 30
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½"x16" + Anfo
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 30

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

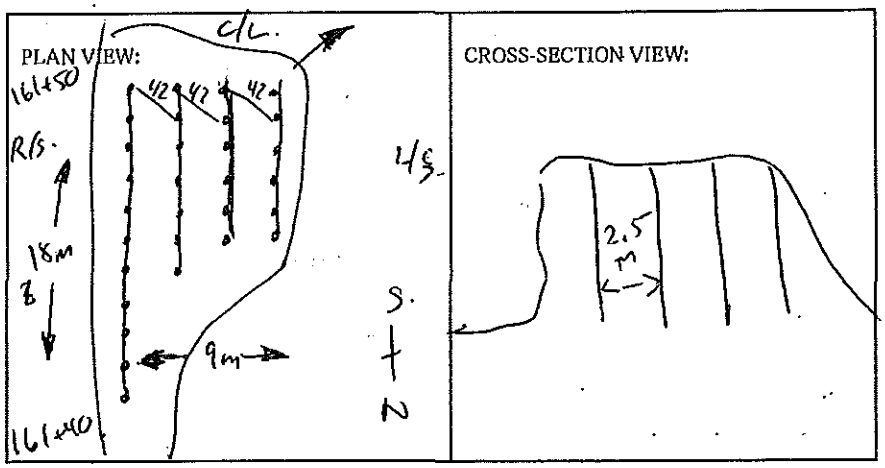
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 405 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 02/12
PROPOSED BLAST DATE April 03/12
BLAST # 272

HIGHWAY # 97
BLAST LOCATION AT: STN #161+50 - 161+40 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 75 (m)
PROPOSED APPROX. NO. OF HOLES 30
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2 Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 30
PROPOSED NUMBER OF DELAYS 30
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

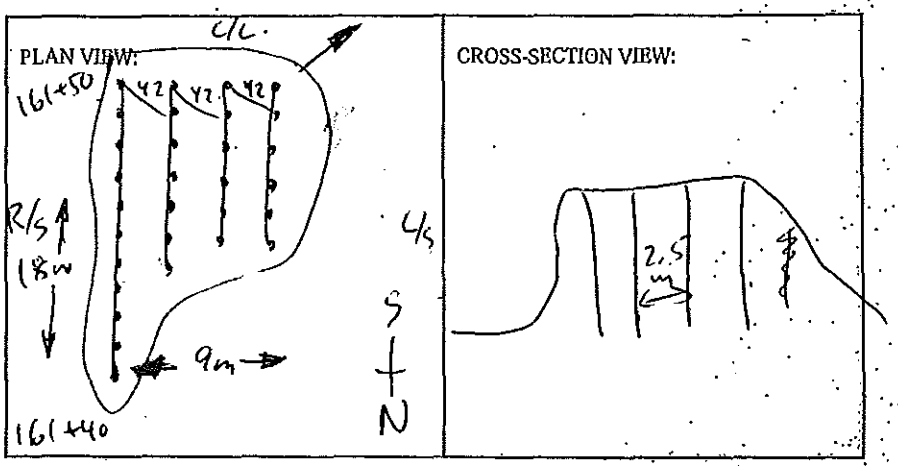
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 4/12.
ACTUAL BLAST DATE April 4/12.
BLAST # 273 @ 10:15

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+85 - 151+80 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ~
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynanite + Anfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 +42. (ms)

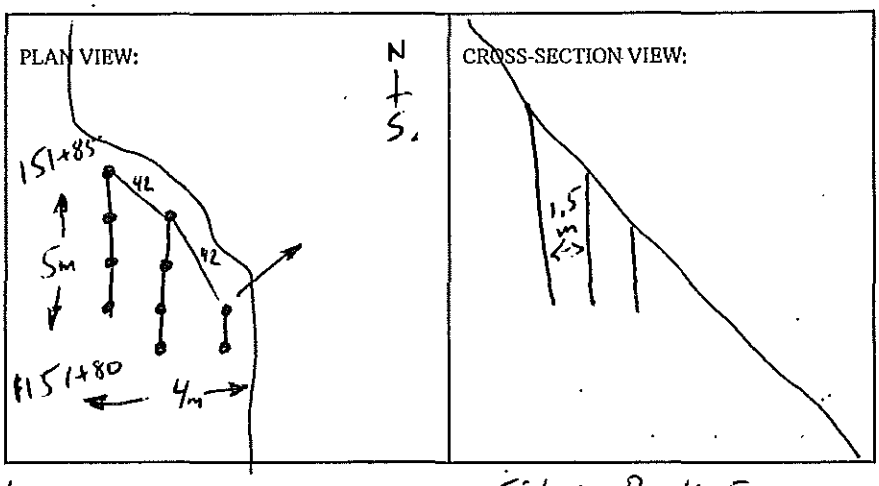
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED April 3/12
PROPOSED BLAST DATE April 4/12
BLAST # 273

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 151+85 - 151+80 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 10
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

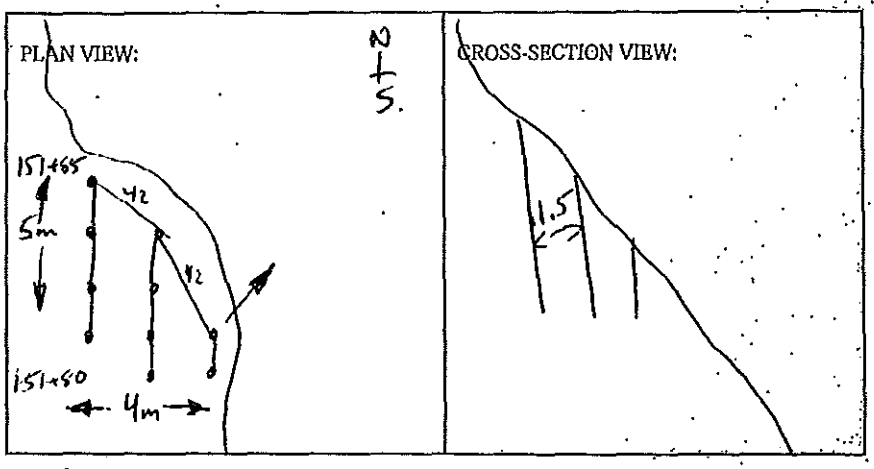
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 60 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) —
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 4/12
ACTUAL BLAST DATE April 4/12
BLAST # 274 @15:56

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+45 - 156+70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 35
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 65.1 (m)

TOTAL NUMBER OF HOLES 35 BL/16 Buffer/42 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 93
TOTAL NUMBER OF DELAYS 58

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1575 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

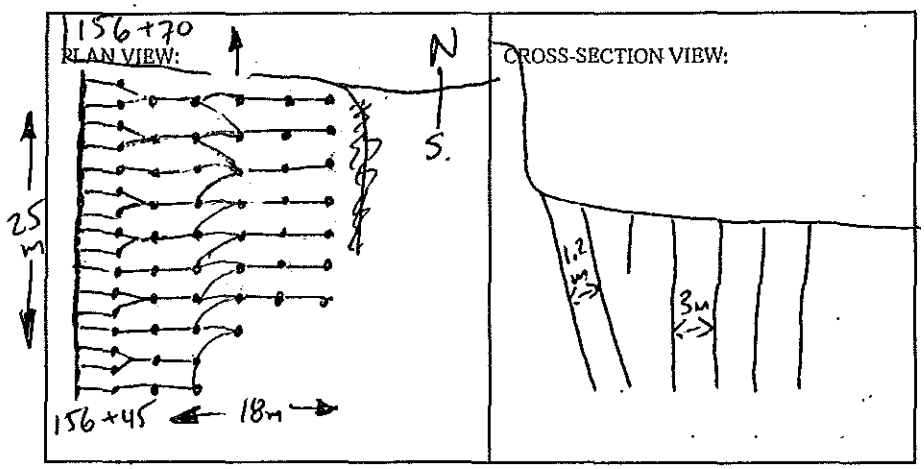
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 3150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED April 3/12
PROPOSED BLAST DATE April 4/12
BLAST # 274

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 156+45 - 156+70 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 35
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 10
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 65.1 (m)

PROPOSED APPROX. NO. OF HOLES 35 B/L/16 Buffer/42 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 93
PROPOSED NUMBER OF DELAYS 58

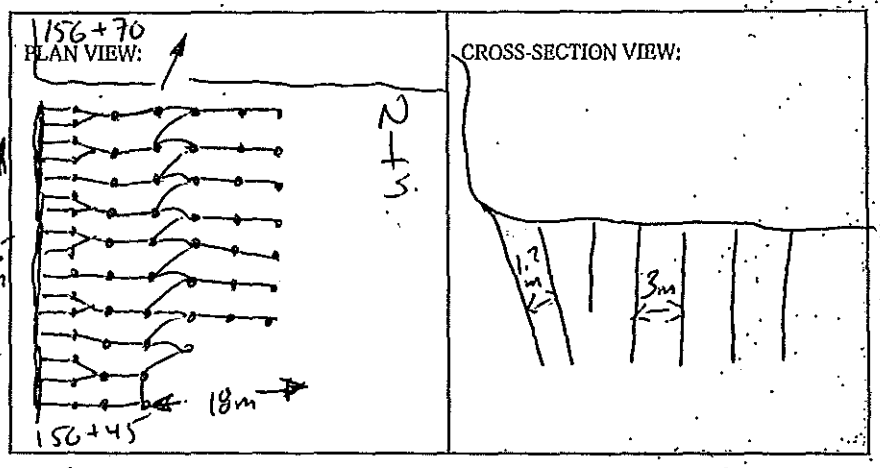
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1375 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system.
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 3150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 5/12
ACTUAL BLAST DATE Apr. 5/12 @ 10:10 Am
BLAST # 275

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+80 - 151+76 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

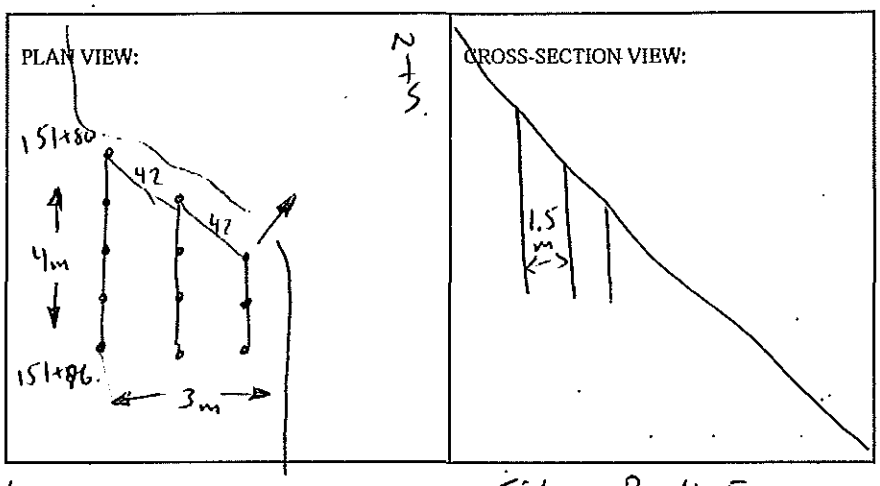
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 30 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 5/12
PROPOSED BLAST DATE Apr. 5/12
BLAST # 275

HIGHWAY# 97
BLAST LOCATION AT: STN# 151+80 - 151+76 LS (pioneering Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.2 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 12
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

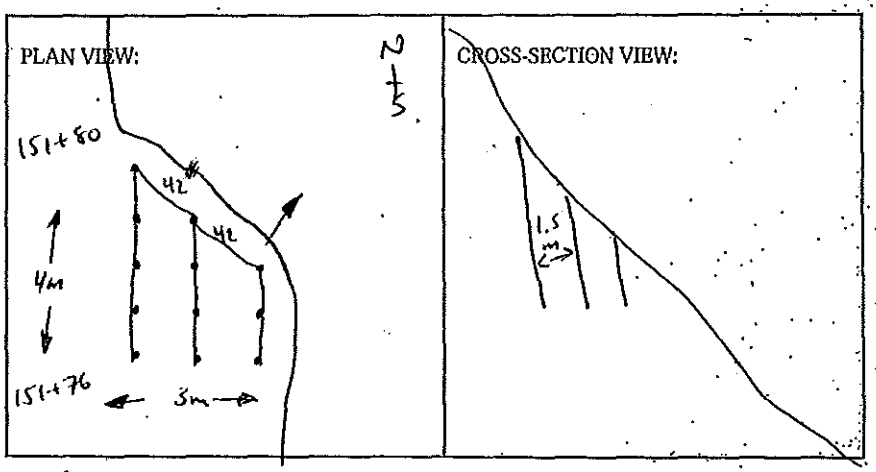
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 30 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE ~ COMPANY Fieber Rock ENG.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) ~
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 5/12
ACTUAL BLAST DATE Apr. 5/12
BLAST # 276 @ 11:45

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+00 – 162+10 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 69 (m)

TOTAL NUMBER OF HOLES 23
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE ~~#1½" Dynamite~~ + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 23

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

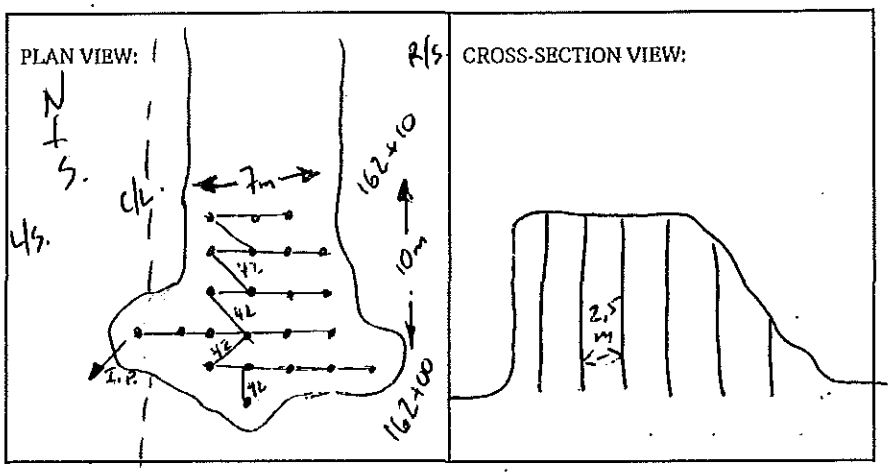
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Apr. 5/12
PROPOSED BLAST DATE Apr. 5/12
BLAST # 276

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+00 – 162+10 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 4.5 (m)
PROPOSED TOTAL DEPTH 69 (m)

PROPOSED APPROX. NO. OF HOLES 23
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 23
PROPOSED NUMBER OF DELAYS 23

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

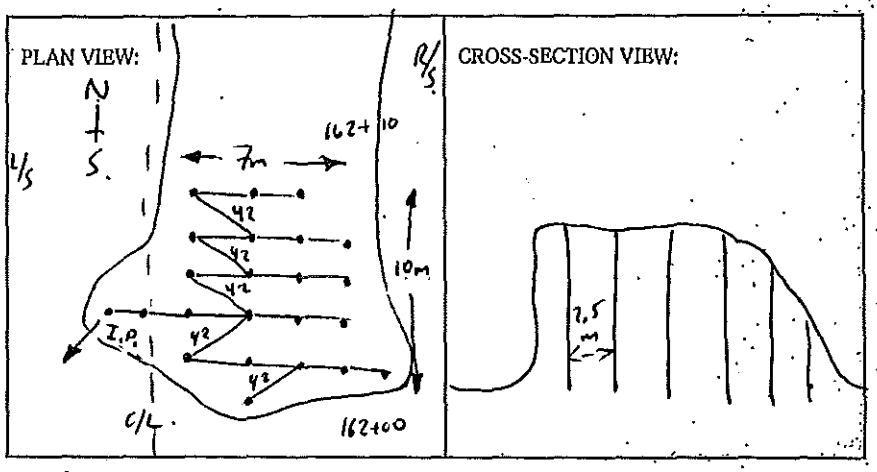
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 210 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 5/12
ACTUAL BLAST DATE April 5/12
BLAST # 277 @ 12:14

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+10 - 162+20 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 63 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 37.5 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

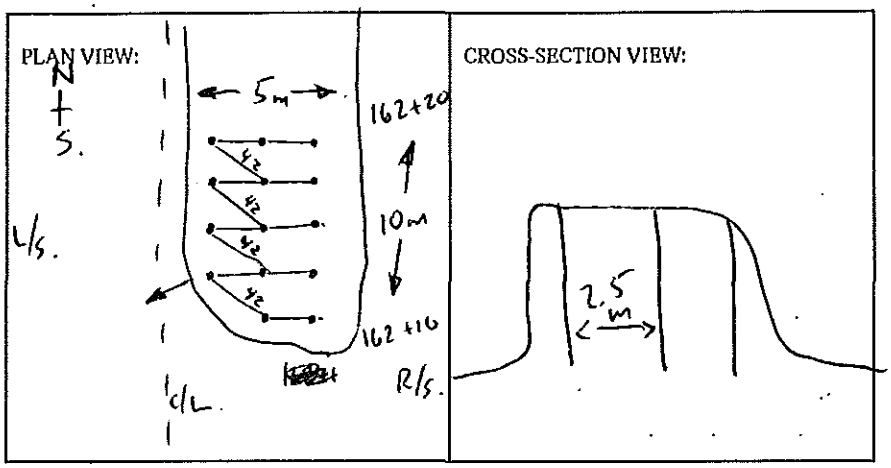
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 225 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 5/12
PROPOSED BLAST DATE Apr. 5/12
BLAST # 277

HIGHWAY# 97
BLAST LOCATION AT: STN# 162+10 – 162+20 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 4.5 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 63 (m)

PROPOSED APPROX. NO. OF HOLES 14
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

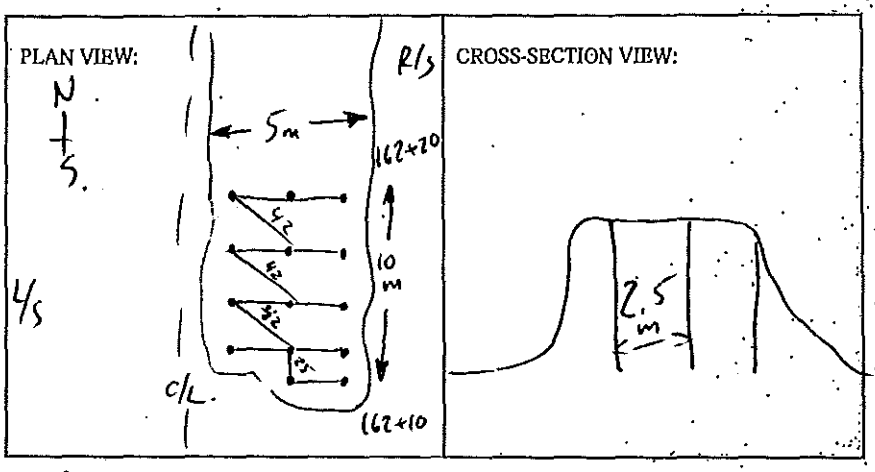
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 225 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED April 5/12
ACTUAL BLAST DATE Apr. 5/12.
BLAST # 278 @ 13:00

HIGHWAY# 97
BLAST LOCATION AT: STN # 162+20 - 162+30 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 4.0 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 5.0 (m)
TOTAL DEPTH 76 (m)

TOTAL NUMBER OF HOLES 19
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

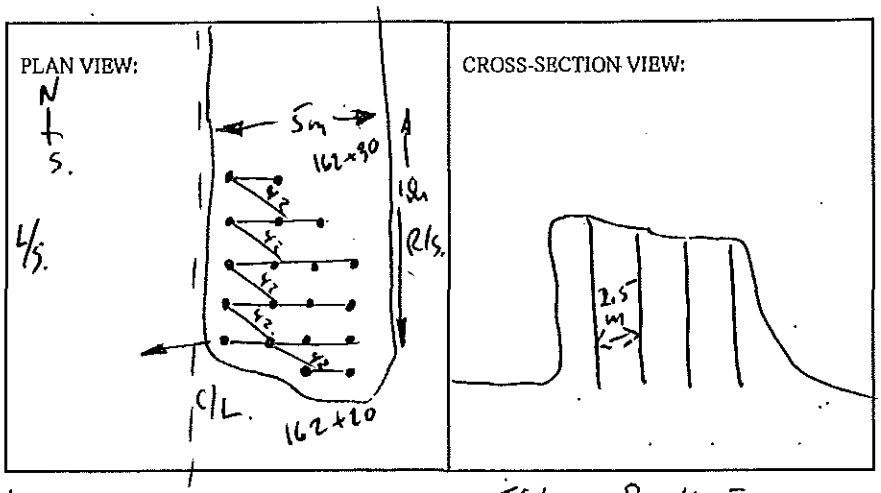
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 200. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 5/12
PROPOSED BLAST DATE Apr. 5/12
BLAST # 278

HIGHWAY # 97
BLAST LOCATION AT: STN# 162+20 – 162+30 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 4.0 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 5.0 (m)
PROPOSED TOTAL DEPTH 76 (m)

PROPOSED APPROX. NO. OF HOLES 19
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

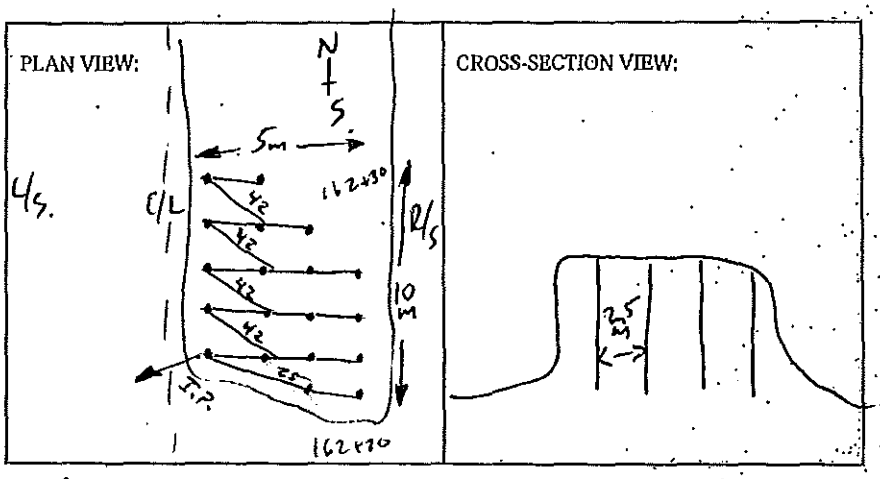
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 10/12
ACTUAL BLAST DATE Apr. 10/12
BLAST # 280. @ 12:05

HIGHWAY # 97
BLAST LOCATION AT: STN # 151+76 – 151+70 (pioneering) LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE _____ (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES _____
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 51 (m)

TOTAL NUMBER OF HOLES 17
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) ~~BURDEN~~ 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

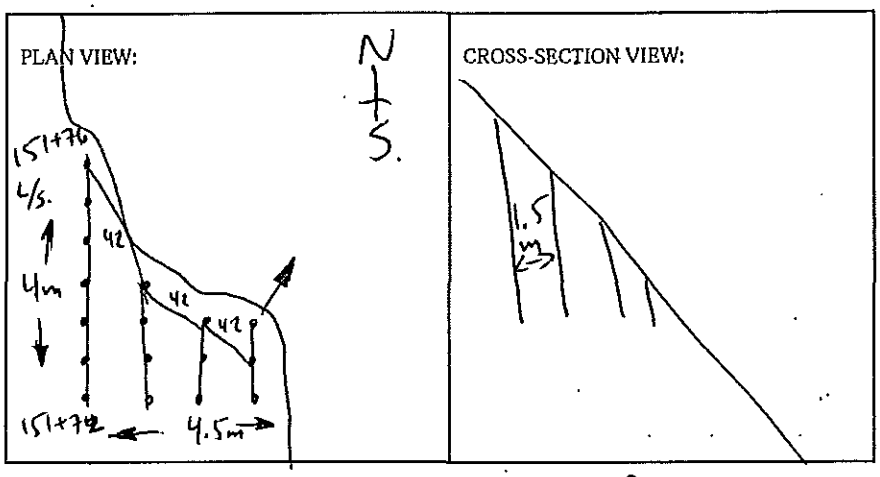
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 54 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 10/12
PROPOSED BLAST DATE Apr. 10/12
BLAST # 280

HIGHWAY # 97
BLAST LOCATION AT: STN# 151+76 - 151+70 LS (pioneering)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3.5 (m)
PROPOSED TOTAL DEPTH 51 (m)

PROPOSED APPROX. NO. OF HOLES 17
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 17
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

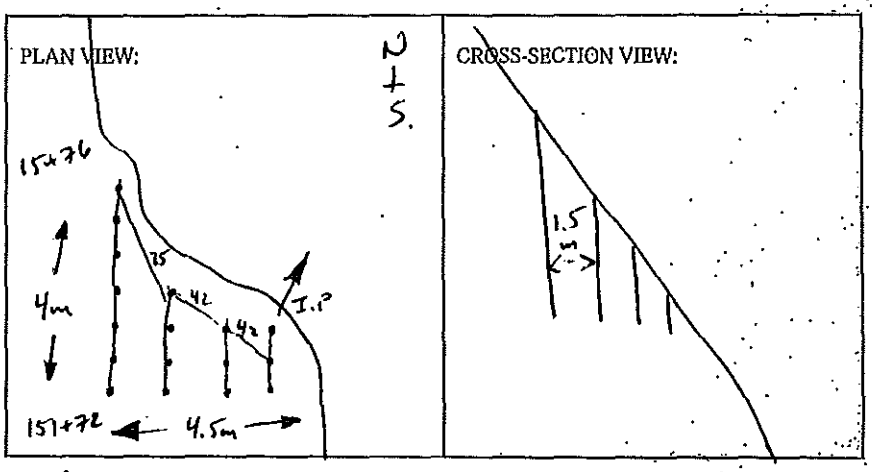
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 54 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 10/12
ACTUAL BLAST DATE Apr. 10/12
BLAST # 281 @ 14:55

HIGHWAY# 97
BLAST LOCATION AT: STN # 155+20 - 155+45 (to subgrade) LS - Test blast for 74°

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 74 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) ~~8~~ 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 16
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 9.0 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 16 B/L / 7 Buffer / 25 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES ~~288~~ 48
TOTAL NUMBER OF DELAYS 32

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 97.5 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

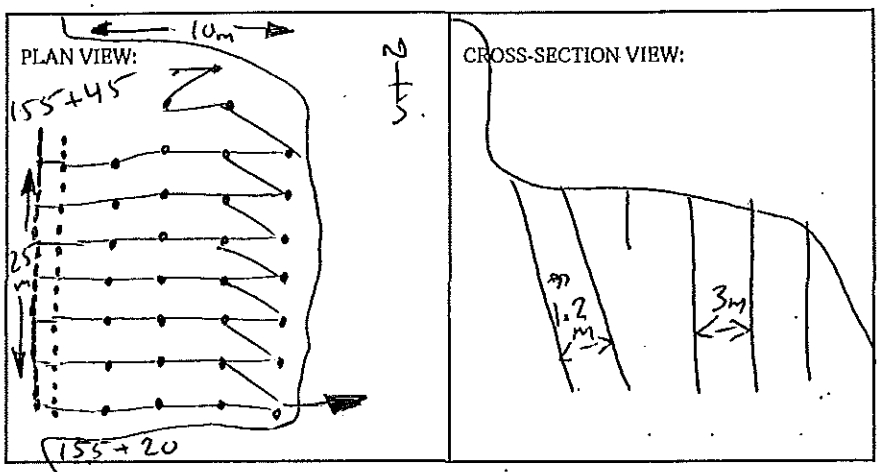
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of None (System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 09/12
PROPOSED BLAST DATE Apr. 10/12
BLAST # 281

HIGHWAY# 97
BLAST LOCATION AT: STN# 155+20 - 155+45 LS (to subgrade) TEST BLAST FOR 74° VARIANCE.

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 74 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 16
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 9
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED APPROX. NO. OF HOLES 16 B/L / 7 Buffer / 25 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 48
PROPOSED NUMBER OF DELAYS 32

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 975 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

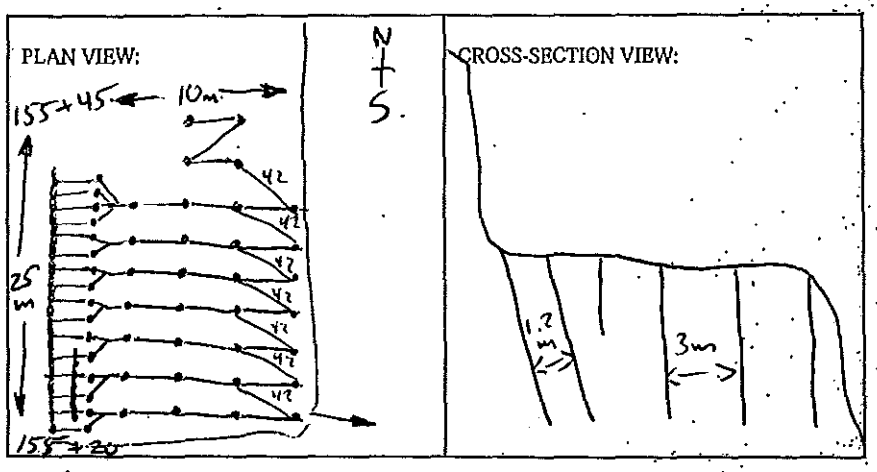
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 2000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED Apr. 11/12
ACTUAL BLAST DATE Apr. 11/12 @ 14:20
BLAST # 282.

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+70 — [redacted] (pioneering bench) LS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 16
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT ~~25~~ 40 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

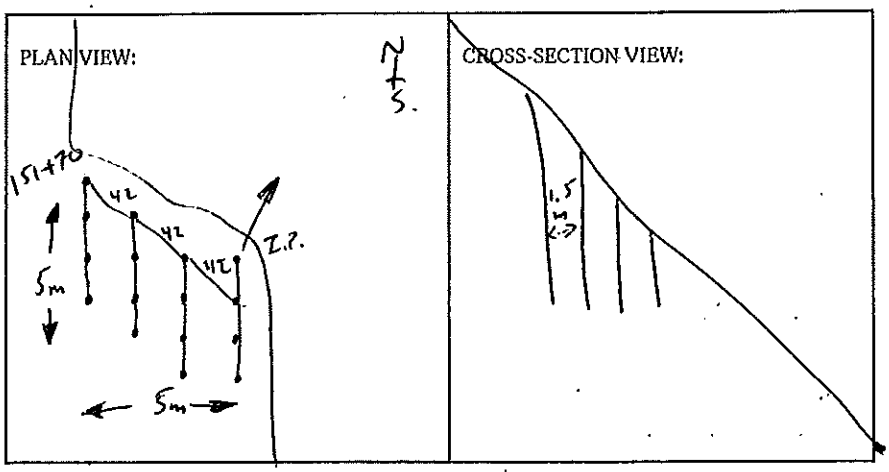
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Apr. 10/12
PROPOSED BLAST DATE Apr. 11/12
BLAST # 282

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 151 + 70 (pioneering Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 48 (m)
PROPOSED APPROX. NO. OF HOLES 16
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

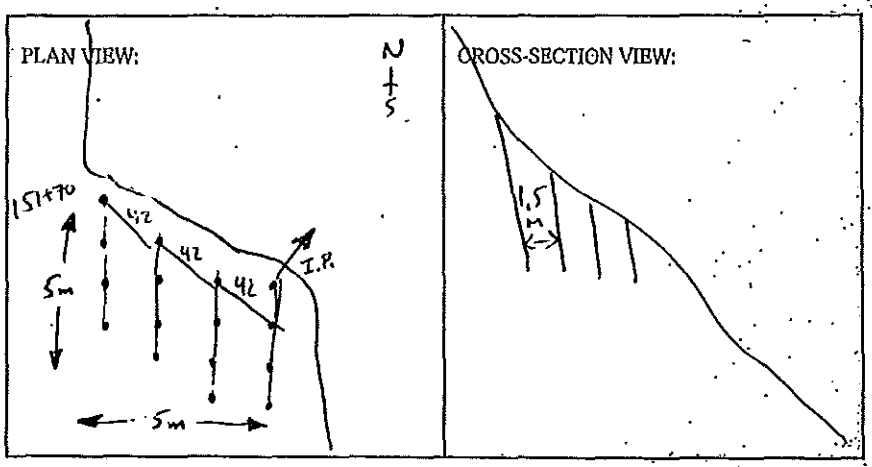
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Novel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 11@12
ACTUAL BLAST DATE Apr. 11 '12
BLAST # 283 @ 14:00

HIGHWAY # 97
BLAST LOCATION AT: STN # 148+10 - 148+60 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 48
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 833 (m)

TOTAL NUMBER OF HOLES 48 B/L / 24 Buffer / 47 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 13 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 119
TOTAL NUMBER OF DELAYS 71

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1825 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

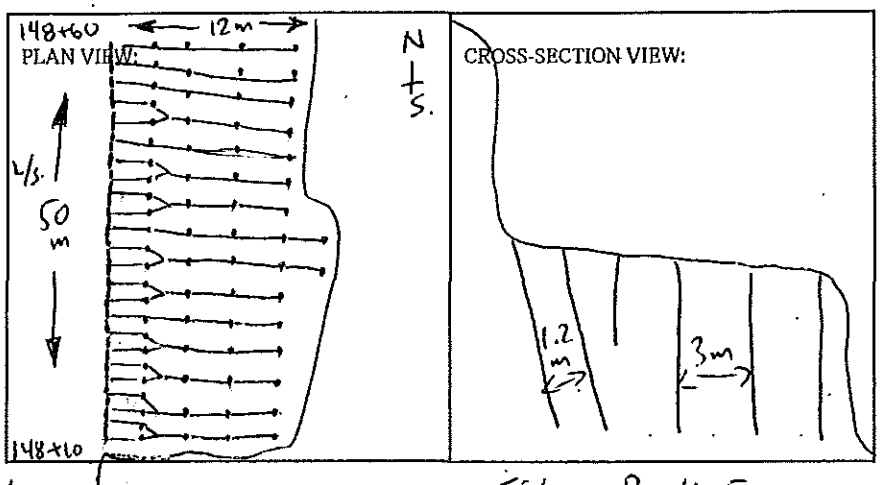
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 10/12
PROPOSED BLAST DATE Apr. 11/12
BLAST # 283

HIGHWAY # 97
BLAST LOCATION AT: STN # 148+10 - 148+60 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 48
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 15
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 833 (m)

PROPOSED APPROX. NO. OF HOLES 48 BL / 24 Buffer / 47 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 119
PROPOSED NUMBER OF DELAYS 71

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1800 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

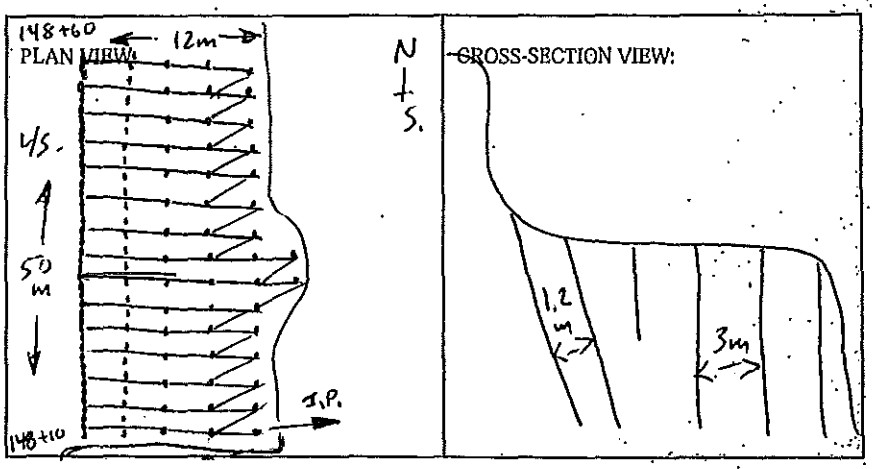
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 4200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED Apr. 12/12.
ACTUAL BLAST DATE Apr. 12/12 10:00
BLAST # 284

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+70 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

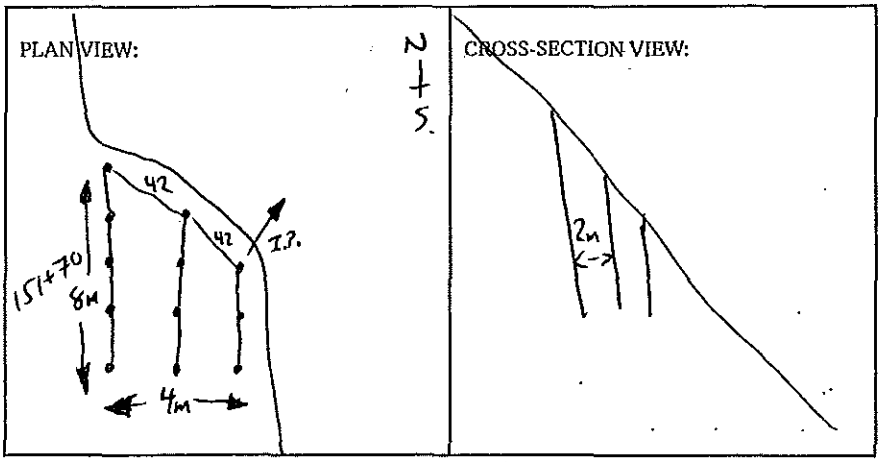
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nitrel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 11/12
PROPOSED BLAST DATE Apr. 12/12.
BLAST # 284

HIGHWAY # 97
BLAST LOCATION AT: STN# 151+70 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.5 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 12
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

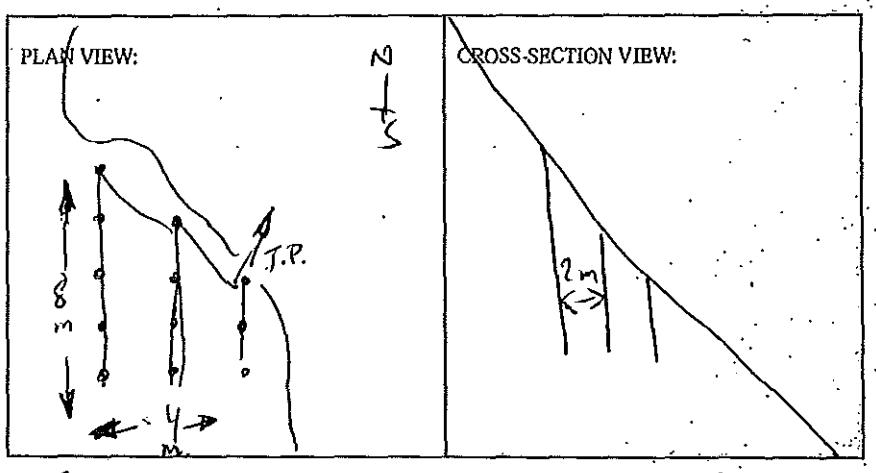
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 60 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED Apr. 12/12
ACTUAL BLAST DATE Apr. 12/12
BLAST # 285 (2)

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+80 - 156+55 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72. (°) SLOPE LENGTH ~~25~~ 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 24
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 8m (m)
TOTAL DEPTH 481 (m)

TOTAL NUMBER OF HOLES 24 B/L / 9 Buffer / 41 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 74
TOTAL NUMBER OF DELAYS 50

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1050 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

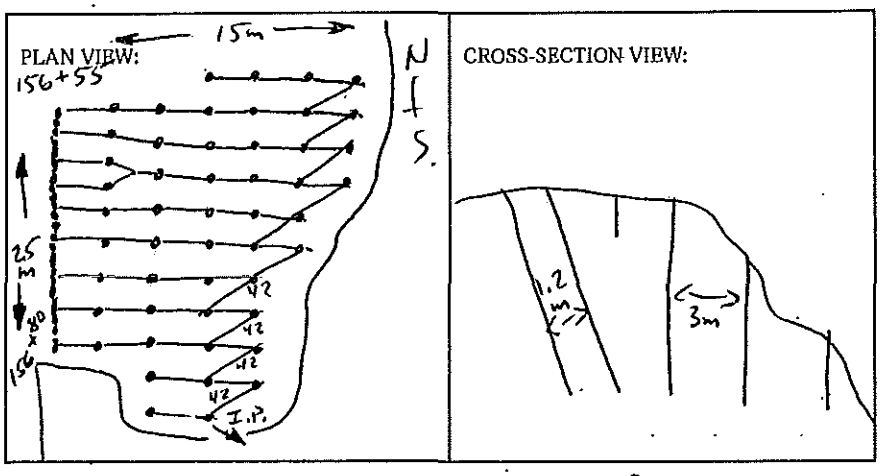
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 11/12
PROPOSED BLAST DATE Apr. 12/12
BLAST # 285

HIGHWAY# 97
BLAST LOCATION AT: STN# 156+80 - 156+55 RS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 24
PROPOSED AVG. DEPTH 6.5 (m)
PROPOSED NO. OF ROWS 11
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 41 (m)

PROPOSED APPROX. NO. OF HOLES 24 B/L / 9 Buffer / 41 prod
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 74
PROPOSED NUMBER OF DELAYS 50

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

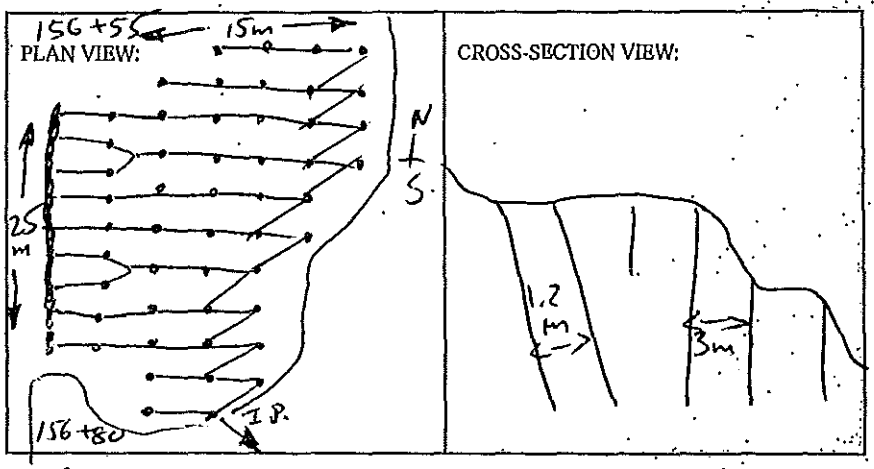
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 2400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Apr. [redacted] 13/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE Apr. [redacted] Apr. 13/12
BLASTER'S NAME James Mawhinney
BLAST # [redacted] 286 @ 14:05
BLASTER'S CERTIFICATE NUMBER 554 6431

HIGHWAY# 97
BLAST LOCATION AT: STN # 151 + 60 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ~
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 20
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

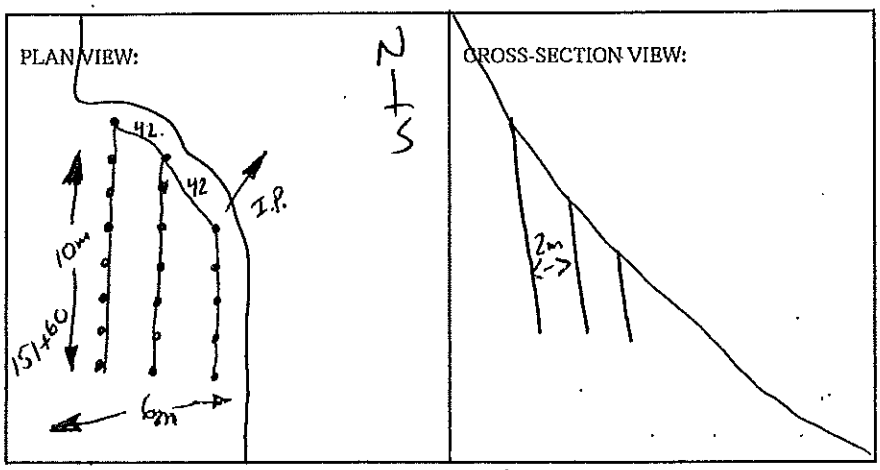
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 150. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Apr. [redacted] 13/12
PROPOSED BLAST DATE Apr. [redacted] 13/12
BLAST # [redacted] 286

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY# 97
BLAST LOCATION AT: STN# 151 + 60 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED APPROX. NO. OF HOLES 20
PROPOSED AVG. DEPTH 2.5 (m)
HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 3
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 50. (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamik + Anfo.
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. NUMBER OF CARTRIDGES 20
APPROX. TOTAL WEIGHT 25 (kg)
PROPOSED NUMBER OF DELAYS 20
DELAY TYPE AND LENGTH 25 + 42 (ms)

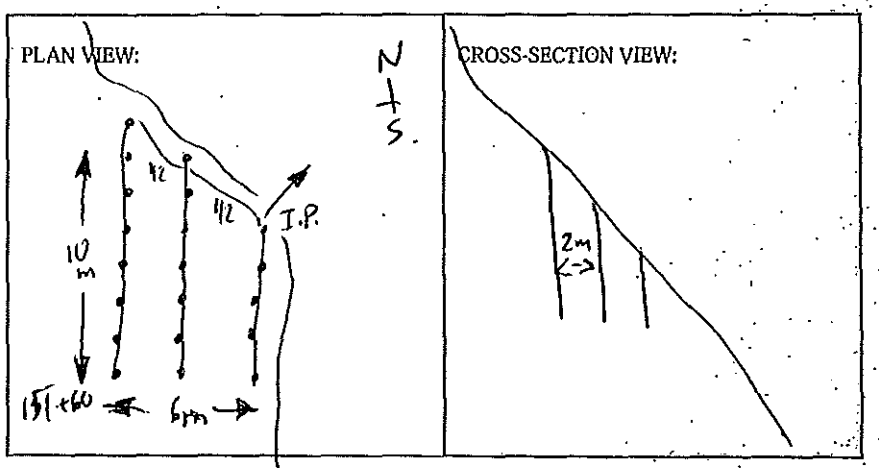
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED Apr. 13/12
ACTUAL BLAST DATE Apr. 13/12.
BLAST # 287 @ 14:07

HIGHWAY # 97
BLAST LOCATION AT: STN # 150 + 10 – 150 + 20 (pioneering Bench) L/S.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

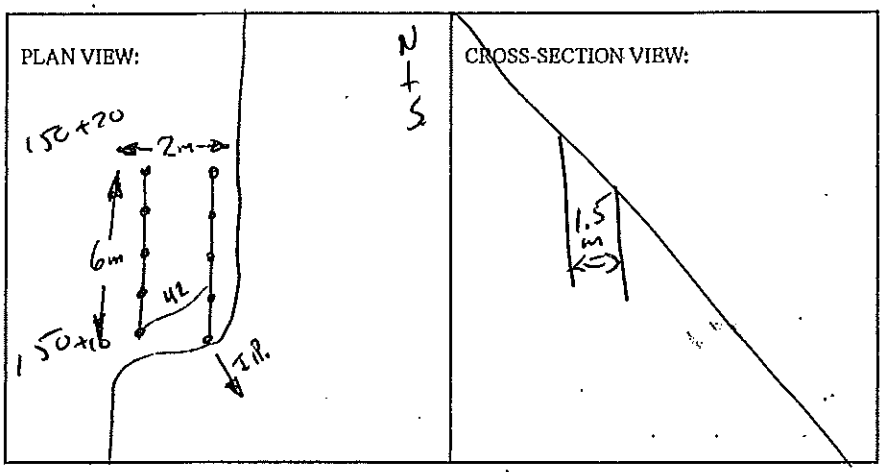
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Abrel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 30. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 13/12
PROPOSED BLAST DATE Apr. 13/12
BLAST # 207

HIGHWAY # 97
BLAST LOCATION AT: STN# 150+10 - 150+20 (pioneer's Bench) L/S.

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 25 (m)

PROPOSED APPROX. NO. OF HOLES 10
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

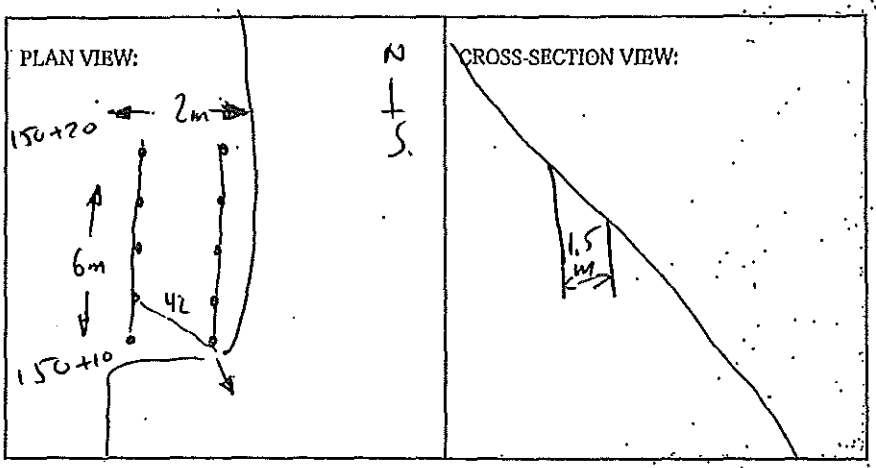
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 30 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 13/12
ACTUAL BLAST DATE Apr. 13/12
BLAST # 288 @ 14:20

HIGHWAY # 97
BLAST LOCATION AT: STN # 148+60 — 149+00 L/S (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 47
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 642 (m)

TOTAL NUMBER OF HOLES 47 B/L/22 Buffer/38 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 107
TOTAL NUMBER OF DELAYS 60

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1575 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

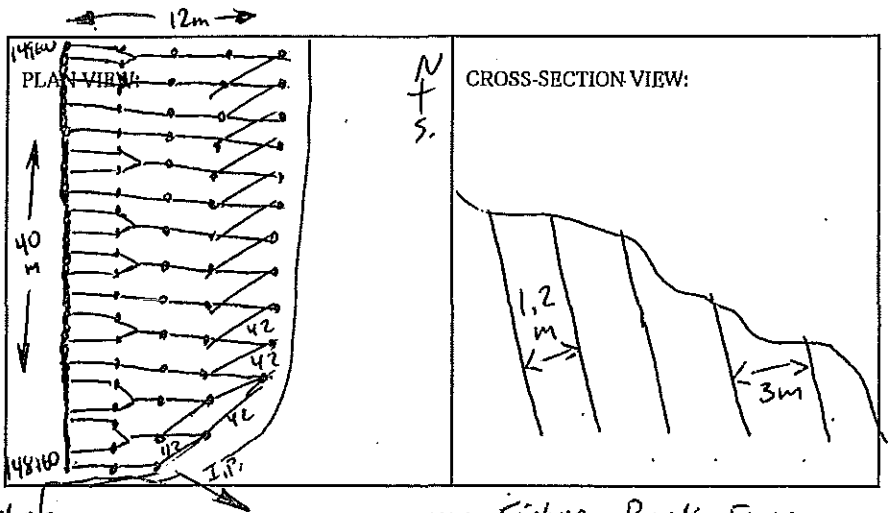
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2880 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Apr. 12/13
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE Apr. 13/13
BLASTER'S NAME James Mawhinney
BLAST # 288
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN# 148+60 -149+00 L/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 47
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 14
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 642 (m)

PROPOSED APPROX. NO. OF HOLES 47 BL/22 Buffer/38 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 107
PROPOSED NUMBER OF DELAYS 60

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

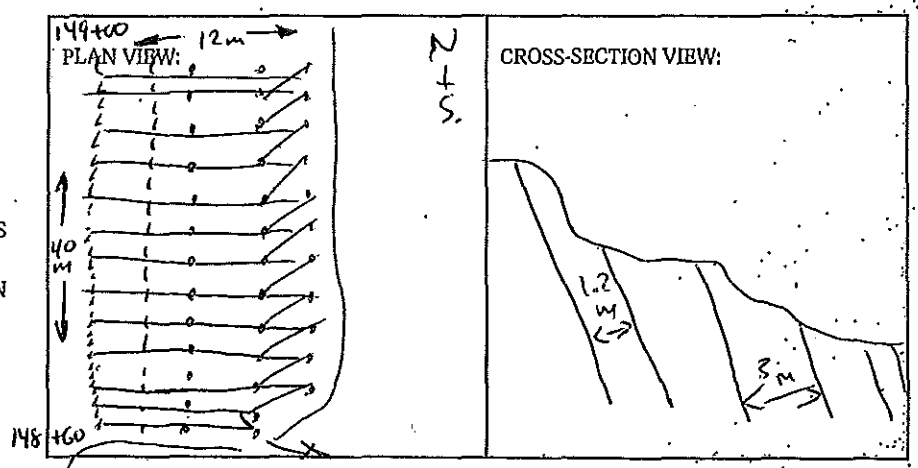
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 2800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED April 14/12
ACTUAL BLAST DATE April 14/12
BLAST # 289

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+55 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 12. (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 25
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 9.5 (m)
TOTAL DEPTH 576 (m)

TOTAL NUMBER OF HOLES 25 BL/11 Buffer/36 - prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 72
TOTAL NUMBER OF DELAYS 47

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1500 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

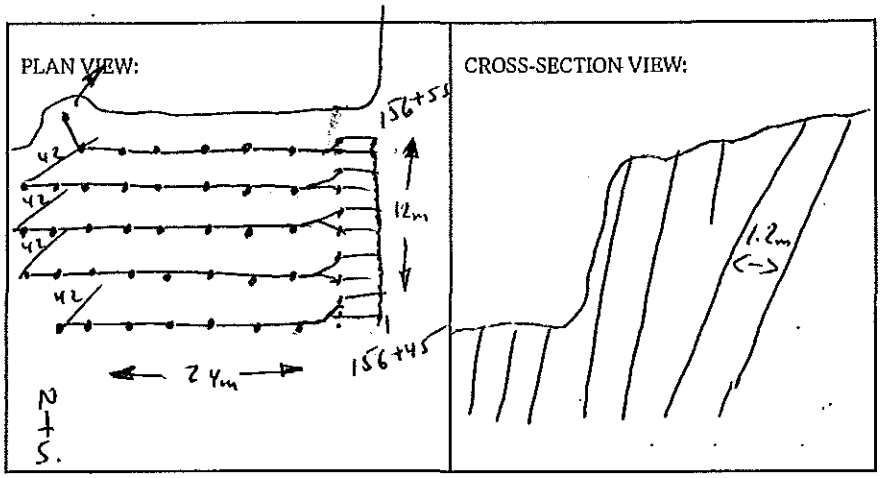
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2305 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fiebea Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 14/12
PROPOSED BLAST DATE Apr. 13/12
BLAST # 289

HIGHWAY # 97
BLAST LOCATION AT: STN# 156+55 RS. (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 12. (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 25
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 9.5 (m)
PROPOSED TOTAL DEPTH 576 (m)

PROPOSED APPROX. NO. OF HOLES 25 B/C/11 Buffer/36 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
APPROX. NUMBER OF CARTRIDGES 72
PROPOSED NUMBER OF DELAYS 47

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1500 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

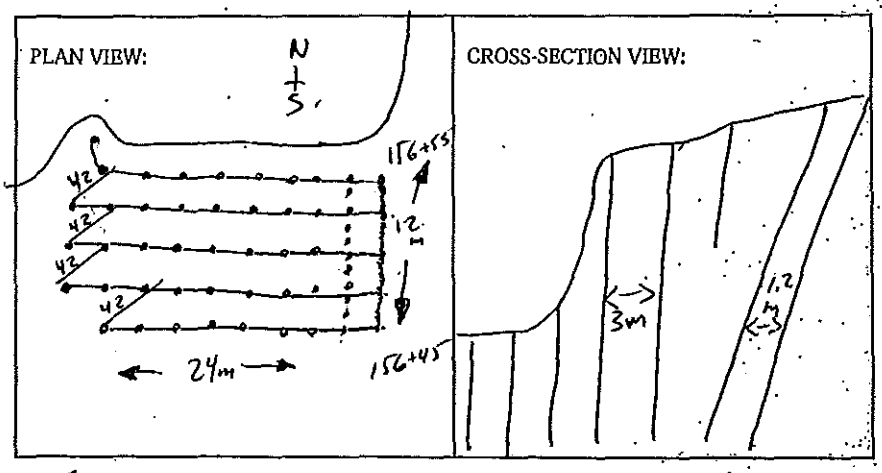
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 2305. (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED April 14/12
ACTUAL BLAST DATE Apr. 14/12
BLAST # 290 @ 14:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 150+00 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.3 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 16
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

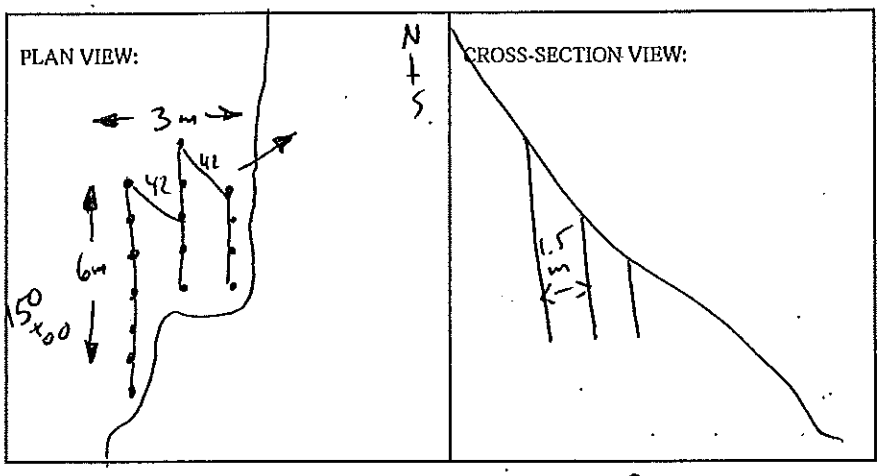
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 45 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 14/12
PROPOSED BLAST DATE Apr. 13/12
BLAST # 290

HIGHWAY # 97
BLAST LOCATION AT: STN# 150+00 LS (pioneering Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 40 (m)

PROPOSED APPROX. NO. OF HOLES 16
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

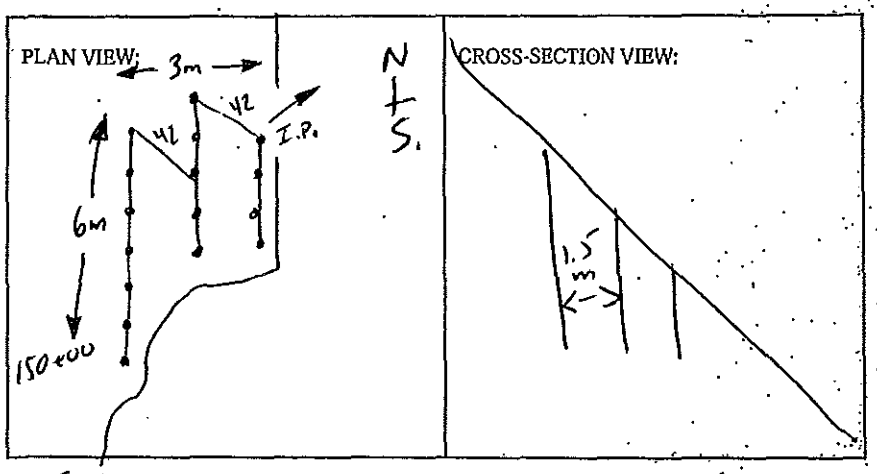
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 45 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 14/12
ACTUAL BLAST DATE Apr. 14/12
BLAST # 291 @ 14:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 151+50 LS (pioneering bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 16
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

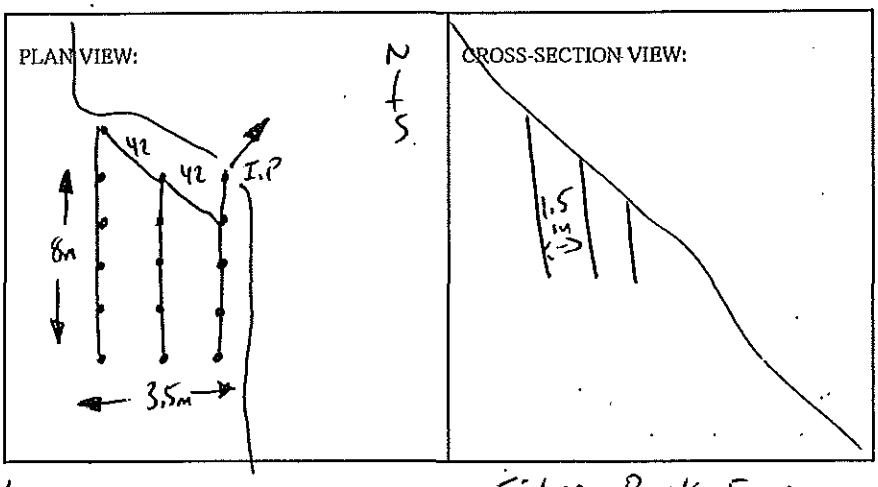
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 70. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 14/12
PROPOSED BLAST DATE Apr. 13/12
BLAST # 291

HIGHWAY # 97
BLAST LOCATION AT: STN# 151 +50 LS (pioneering Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.5 (m)
PROPOSED TOTAL DEPTH 40 (m)

PROPOSED APPROX. NO. OF HOLES 16
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

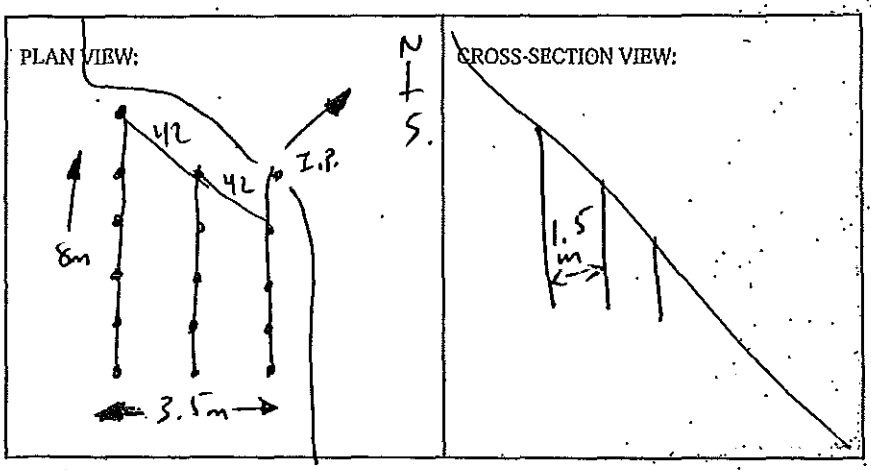
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 70 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED April 16/12
ACTUAL BLAST DATE Apr. 16/12 @ 14:10.
BLAST # 292.

HIGHWAY # 97
BLAST LOCATION AT: STN # 153+00. RS (to subgrade).

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 44
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 570 (m)

TOTAL NUMBER OF HOLES 44 B/L/21 Buffer/30 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 95
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 975 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

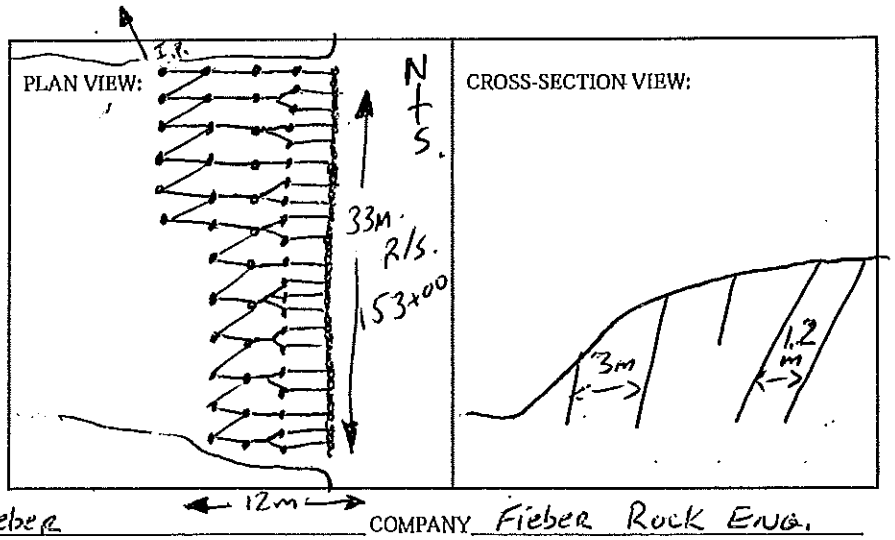
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 2376 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED Apr. 17/12
ACTUAL BLAST DATE Apr. 17/12.
BLAST # 293 @ 14:05

HIGHWAY# 97
BLAST LOCATION AT: STN # 148+99 – 149+40 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 49
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 13
MAXIMUM DEPTH 11.0 (m)
TOTAL DEPTH 1144 (m)

TOTAL NUMBER OF HOLES 49 BL/21 Buffer/73 prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 143
TOTAL NUMBER OF DELAYS 94

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2100 (kg)
DELAY TYPE AND LENGTH 25 + 42. (ms)

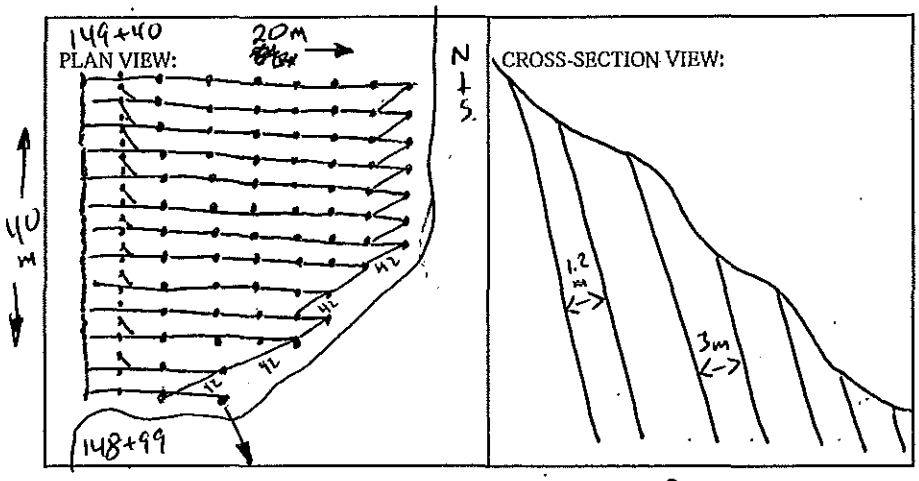
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 6000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 16/12
PROPOSED BLAST DATE Apr. 17/12
BLAST # 293

HIGHWAY# 97
BLAST LOCATION AT: STN# 148+99 - 149+40 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 49
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 13
PROPOSED MAXIMUM DEPTH 11 (m)
PROPOSED TOTAL DEPTH 1144 (m)

PROPOSED APPROX. NO. OF HOLES 49 B/L/21 Buffer/73 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 143
PROPOSED NUMBER OF DELAYS 94

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 2000 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

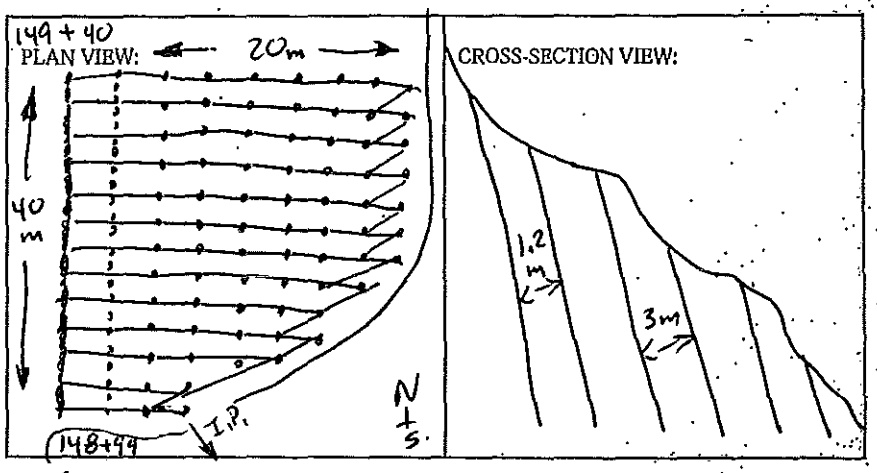
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 6000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED Apr. 17/12
ACTUAL BLAST DATE Apr. 17/12 @ 16:40.
BLAST # 294

HIGHWAY# 97
BLAST LOCATION AT: STN #147+00 - 147+30 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 1 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 2 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 90
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 90
TOTAL NUMBER OF DELAYS 90

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 + (ms)

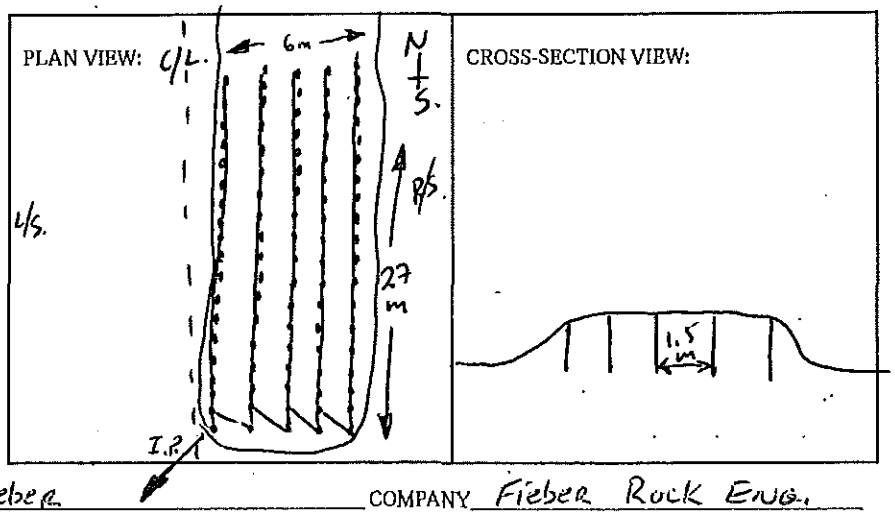
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 162. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Apr. 17/12
PROPOSED BLAST DATE Apr. 17/12
BLAST # 294

HIGHWAY# 97
BLAST LOCATION AT: STN# 147+00 - 147+30 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 1 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 2 (m)
PROPOSED TOTAL DEPTH 90 (m)

PROPOSED APPROX. NO. OF HOLES 90
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 7.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 90
PROPOSED NUMBER OF DELAYS 90

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

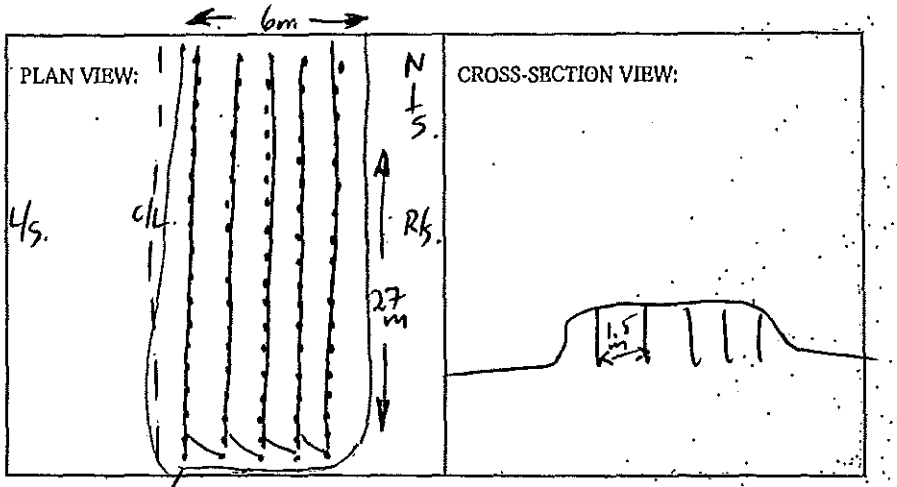
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 162. (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) —

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED April 18/12
ACTUAL BLAST DATE April 18/12 @ 14:25
BLAST # 295

HIGHWAY# 97
BLAST LOCATION AT: STN # 154+10 - 153+30 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 18 (m)
NUMBER OF ROWS 20
MAXIMUM DEPTH 12 (m)
TOTAL DEPTH 576 (m)

TOTAL NUMBER OF HOLES 72.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 72
TOTAL NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1775 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

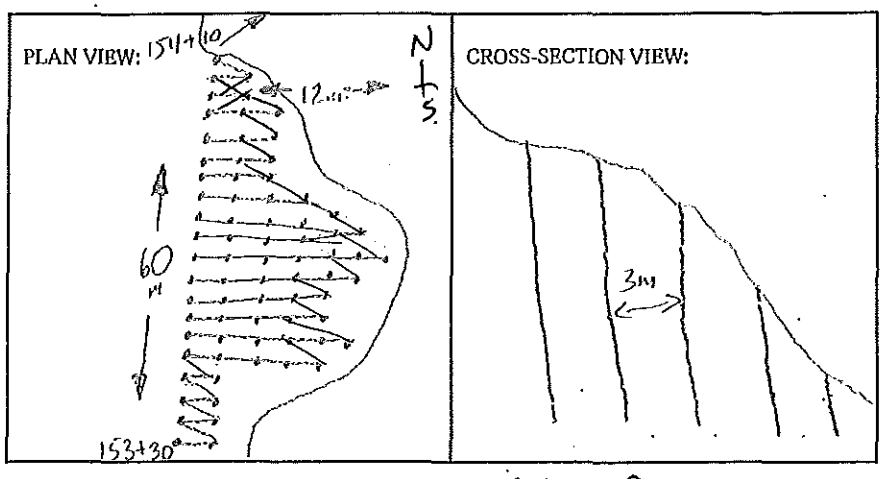
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 5760 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Apr. 17/12
PROPOSED BLAST DATE Apr. 18/12
BLAST # 295

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN# 154+10 — 153+30 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 20
PROPOSED MAXIMUM DEPTH 12 (m)
PROPOSED TOTAL DEPTH 576 (m)

PROPOSED APPROX. NO. OF HOLES 72
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 72
PROPOSED NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1775 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

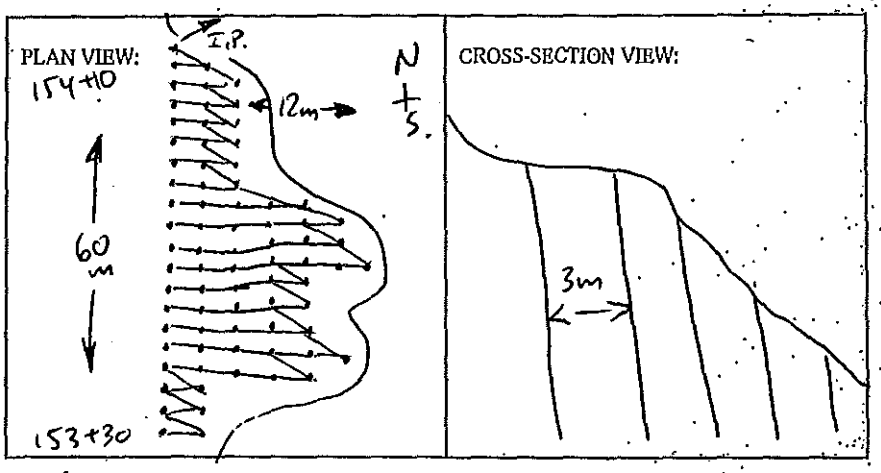
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 5760 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE / COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) /

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED April 19 12
ACTUAL BLAST DATE April 19/12
BLAST # 296 @ 10:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 150+80 - 150+50 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 39
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 18
MAXIMUM DEPTH 12 (m)
TOTAL DEPTH 513 (m)

TOTAL NUMBER OF HOLES 39 BL / 18 Buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

17
39
15
57

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + AnCo
TOTAL NUMBER OF CARTRIDGES 57
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

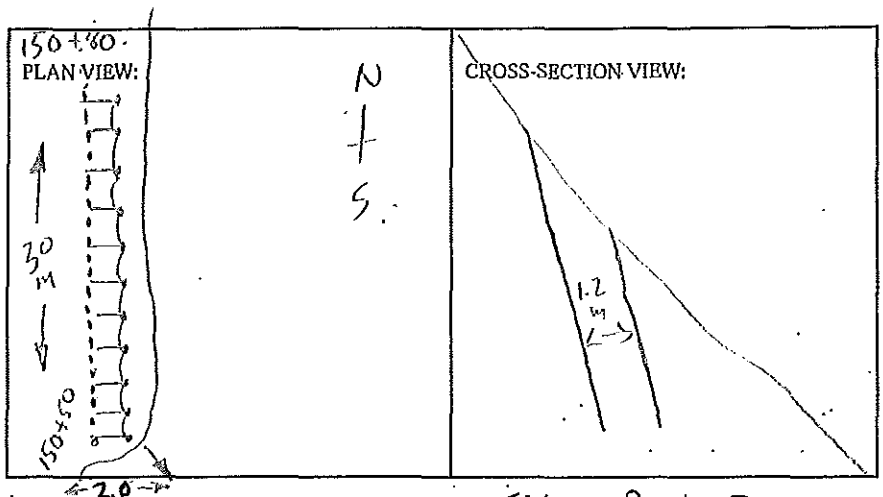
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED ~~300~~ 540 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 18/12
PROPOSED BLAST DATE April 19/12
BLAST # 296

HIGHWAY # 97
BLAST LOCATION AT: STN# 150+80 - 150+50 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 39
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 18
PROPOSED MAXIMUM DEPTH 12 (m)
PROPOSED TOTAL DEPTH 513 (m)

PROPOSED APPROX. NO. OF HOLES 39 BL / 18 Buffer
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 57
PROPOSED NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

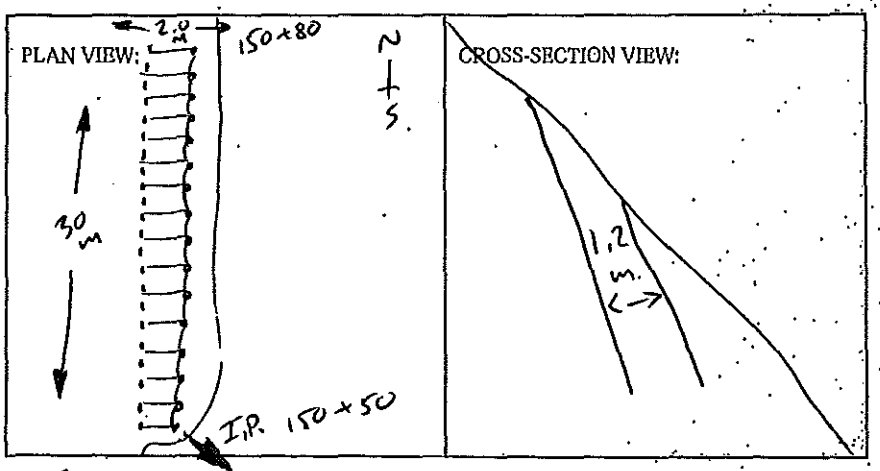
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 540 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED April 19/12
ACTUAL BLAST DATE April 19/12
BLAST # 297 @ 4:30pm

HIGHWAY# 97
BLAST LOCATION AT: STN # 156+55 - 156+85 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 40
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 10.5 (m)
TOTAL DEPTH 1098 (m)

TOTAL NUMBER OF HOLES 40 B/L / 19 Buffer / 63 presp.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 122
TOTAL NUMBER OF DELAYS 82

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 3750 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

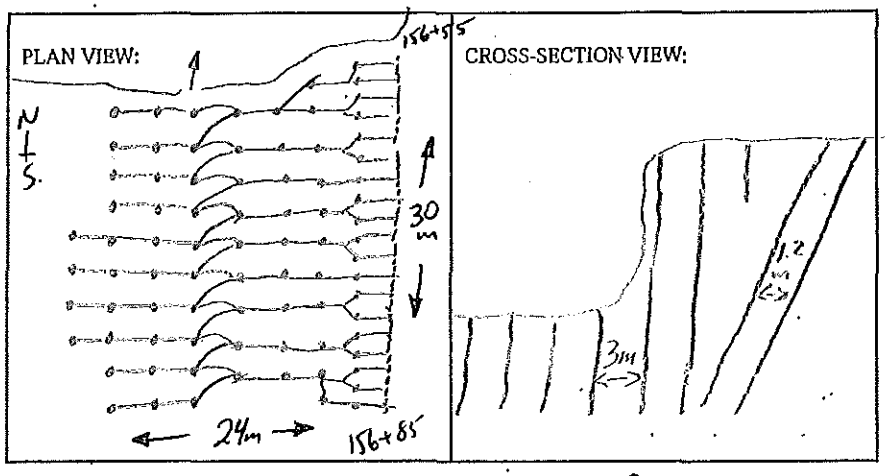
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 6480 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 18/12
PROPOSED BLAST DATE April 19/12
BLAST # 297

HIGHWAY # 97
BLAST LOCATION AT: STN# 156+55 – 156+85 R/S (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 40
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 10
PROPOSED MAXIMUM DEPTH 10.5 (m)
PROPOSED TOTAL DEPTH 1098 (m)

PROPOSED APPROX. NO. OF HOLES 40 BL / 19 Buffer / 63 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 122
PROPOSED NUMBER OF DELAYS 82

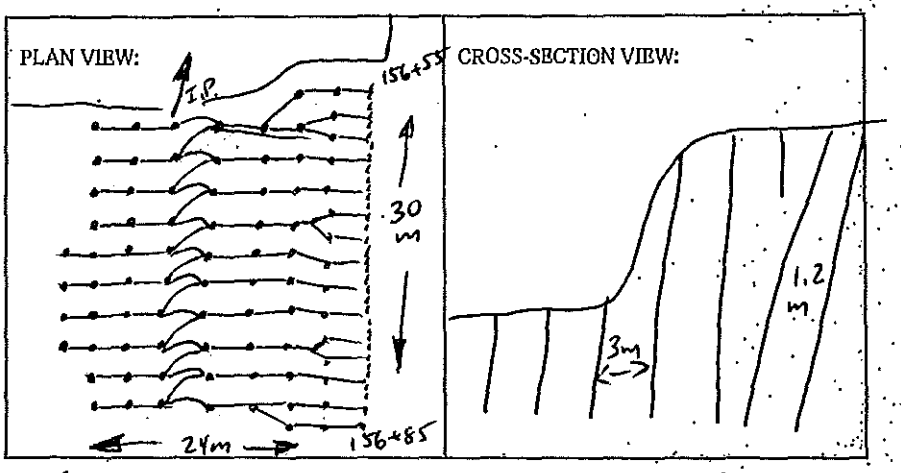
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 3600 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 6480 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED Apr. 20/12
ACTUAL BLAST DATE Apr. 20/12
BLAST # 298 @ 15:20

HIGHWAY# 97
BLAST LOCATION AT: STN # 149+40 - 149+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 45
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 11 (m)
TOTAL DEPTH 936 (m)

TOTAL NUMBER OF HOLES 45 B/L / 19 Buffer / 53 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 117
TOTAL NUMBER OF DELAYS 72

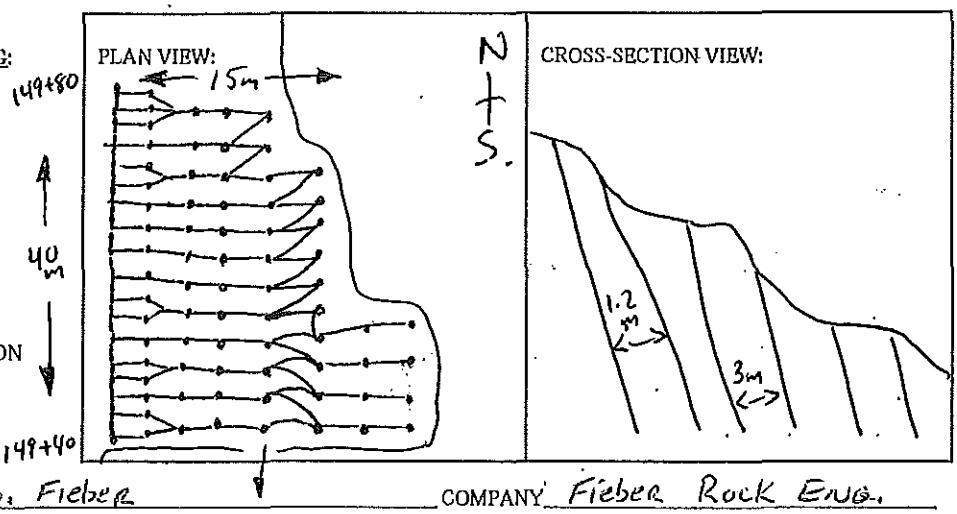
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1950. (kg)
DELAY TYPE AND LENGTH 25 +42. (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 19/12
PROPOSED BLAST DATE April 20/12
BLAST # 298

HIGHWAY # 97
BLAST LOCATION AT: STN# 149+40 - 149+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 45
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 11 (m)
PROPOSED TOTAL DEPTH 936 (m)

PROPOSED APPROX. NO. OF HOLES 45 B/L / 19 Buffer / 53 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 117
PROPOSED NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 1950 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

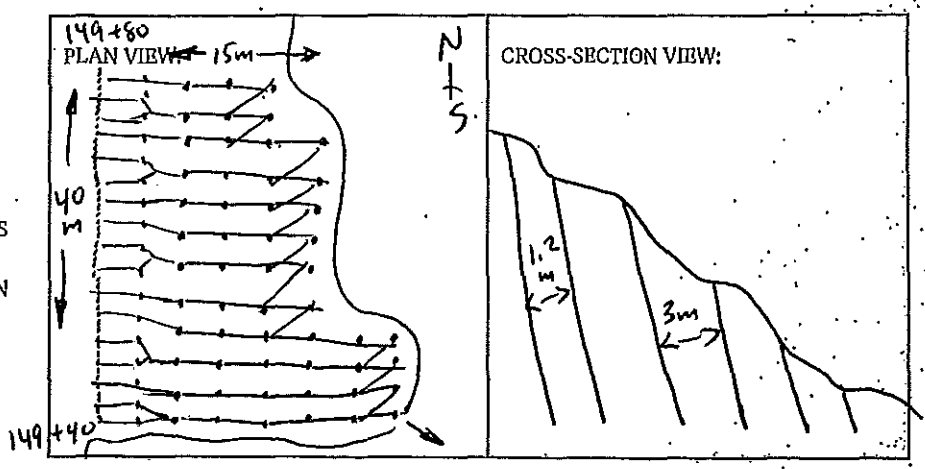
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4800 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED Apr. 23/12
ACTUAL BLAST DATE Apr. 23/12 @ 14:10
BLAST # 299

HIGHWAY # 97
BLAST LOCATION AT: STN # 153+~~80~~ 40 – 153+00 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 10 (m)
NUMBER OF ROWS 14
MAXIMUM DEPTH 14 (m)
TOTAL DEPTH 410 (m)

TOTAL NUMBER OF HOLES 41
HOLE DIAMETER 100 (mm)
HOLE SPACING 3.2 (m) BURDEN 3.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 41
TOTAL NUMBER OF DELAYS 41

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2350 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

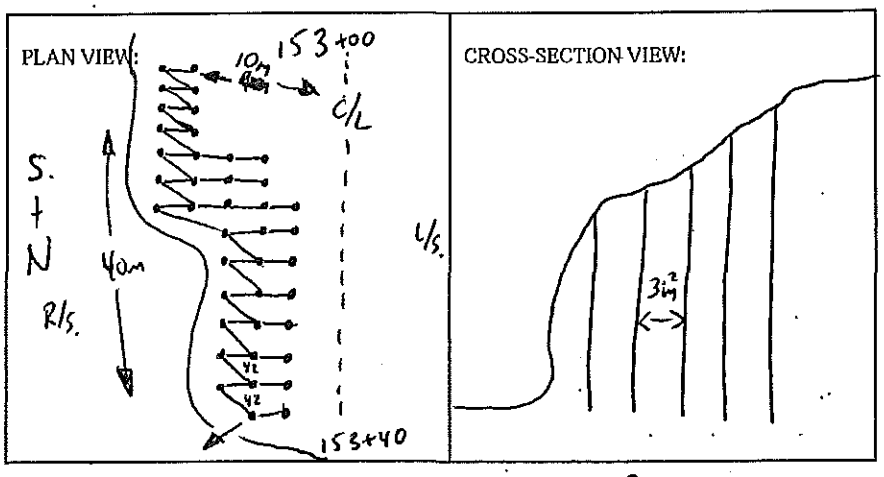
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED April 20/12
PROPOSED BLAST DATE April 23/12
BLAST # 299

HIGHWAY # 97
BLAST LOCATION AT: STN# 153+40 - 153+00 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 10 (m)
PROPOSED NO. OF ROWS 14
PROPOSED MAXIMUM DEPTH 14 (m)
PROPOSED TOTAL DEPTH 410 (m)

PROPOSED APPROX. NO. OF HOLES 41
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3.2 (m) BURDEN 3.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 41
PROPOSED NUMBER OF DELAYS 41

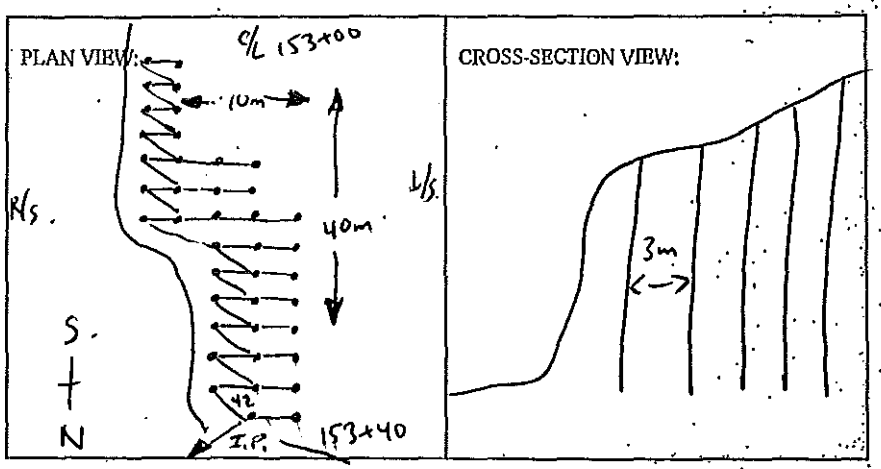
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 2350 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 4000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 03/12
ACTUAL BLAST DATE July 03/12
BLAST # 385 @11:22

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+15 - 128+25 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 152 (m)

TOTAL NUMBER OF HOLES 13 BL/4 Buffer/2 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 ms (ms)

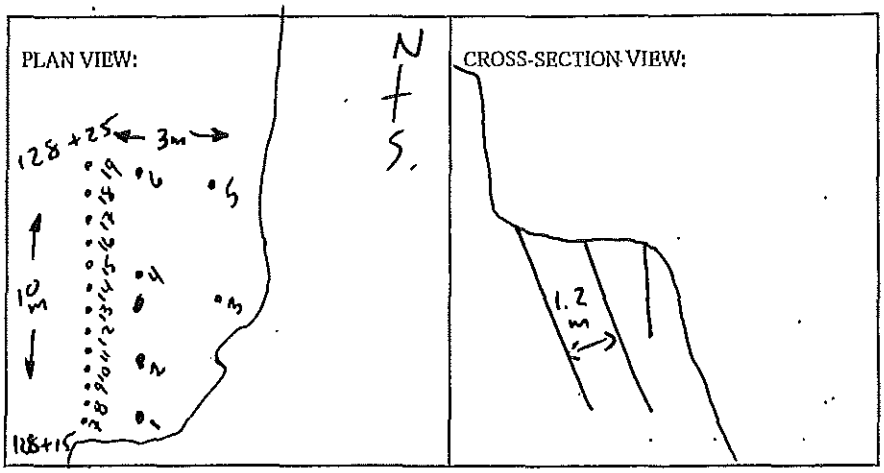
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 03/12
PROPOSED BLAST DATE July 03/12
BLAST # 385

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+15 - 128+25 LS (2nd Beach)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 13
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 152 (m)

PROPOSED APPROX. NO. OF HOLES 13 BL / 4 Buffer / 2 prod,
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 19

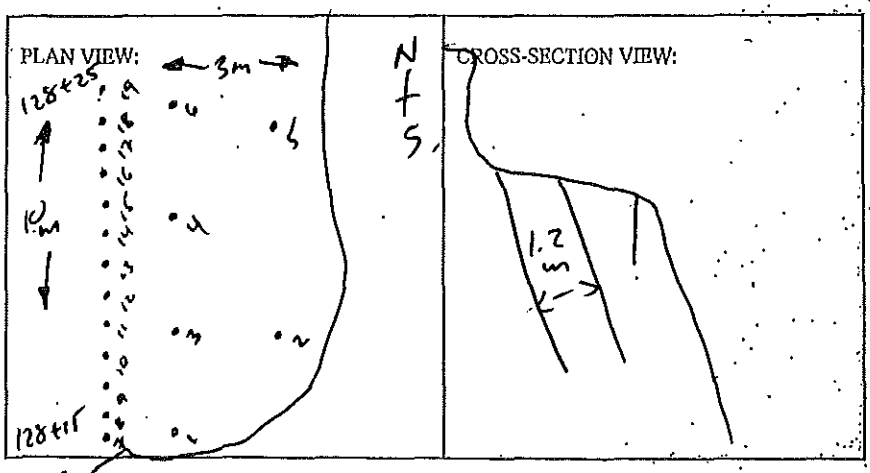
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 3/12
ACTUAL BLAST DATE July 3/12
BLAST # 386 @13:42

HIGHWAY# 97
BLAST LOCATION AT: STN #128+25 - 128+30 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 B/L / 2 Buffer / 1 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dymmite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

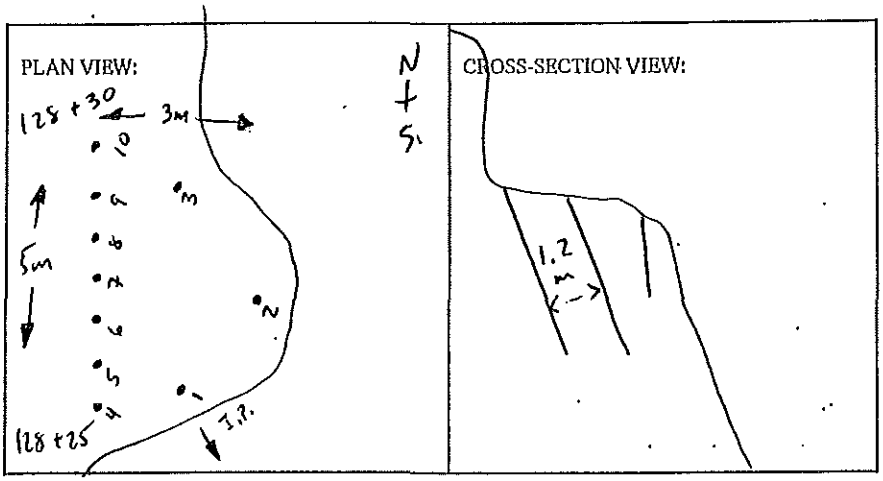
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 3/12
PROPOSED BLAST DATE July 3/12
BLAST # 386 (A)

HIGHWAY # 97
BLAST LOCATION AT: STN# 128+25 - 128+30 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 80 (m)

PROPOSED APPROX. NO. OF HOLES 7 B/L / 2 Buffer / 1 prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

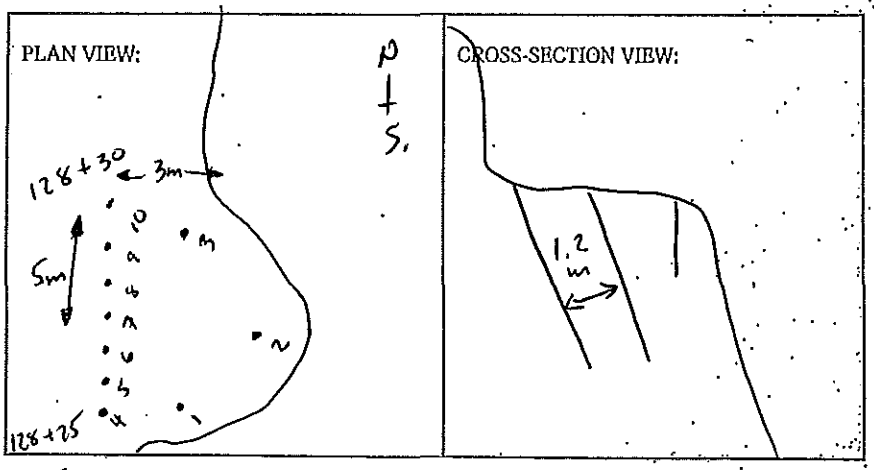
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 3/12
ACTUAL BLAST DATE July 3/12
BLAST # 387 @ 14:42

HIGHWAY # 97
BLAST LOCATION AT: STN #128 + 30 - 128 + 35 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 7 B/L / 2 Buffer.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite & Anfo
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

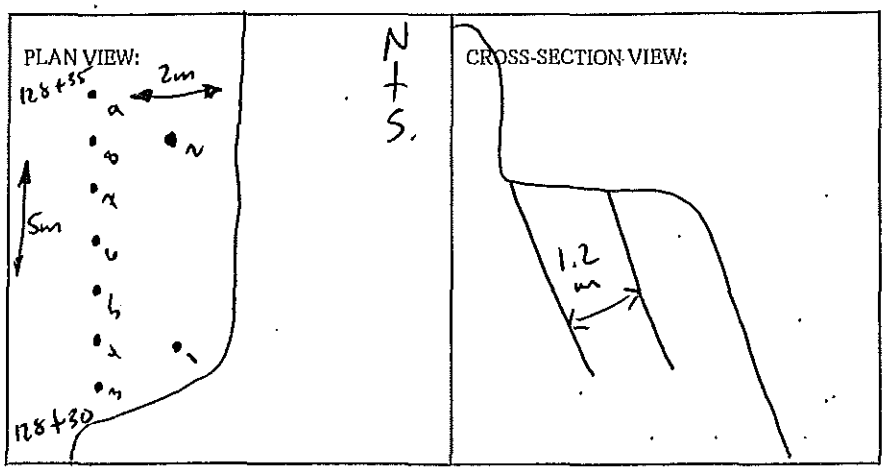
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enos.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

SECTION 204 ROCK CUTS

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 3/12
PROPOSED BLAST DATE July 3/12
BLAST # 387

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+30 - 128+35 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 72 (m)

PROPOSED APPROX. NO. OF HOLES 7 B/L / 2 Buffer
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

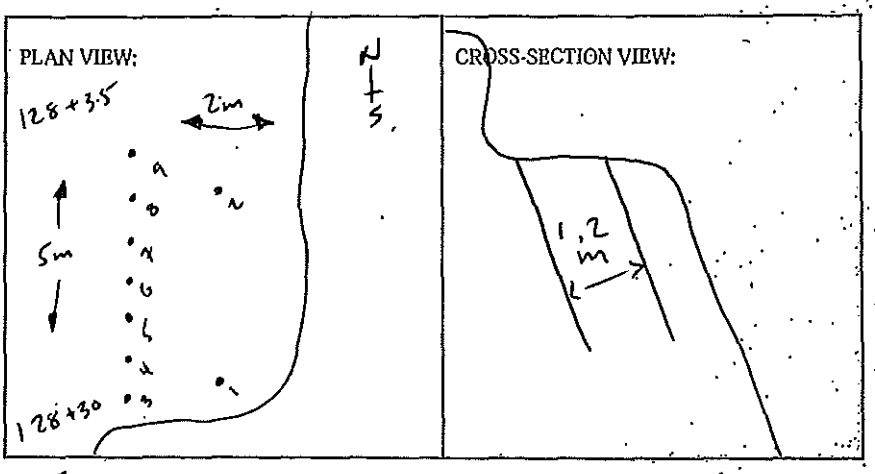
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 80 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 4/12
ACTUAL BLAST DATE July 4/12
BLAST # 389 @ 11:30

HIGHWAY # 97
BLAST LOCATION AT: STN # 128 +80 – 128 +85 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 60 (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

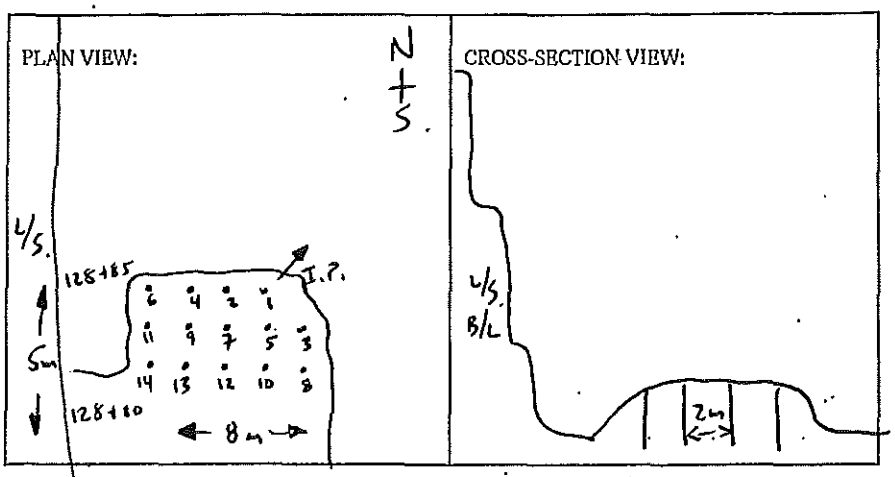
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 4/12
PROPOSED BLAST DATE July 4/12
BLAST # 389

HIGHWAY # 97
BLAST LOCATION AT: STN# 128+80 - 128+85 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Ø
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 56 (m)

PROPOSED APPROX. NO. OF HOLES 14
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

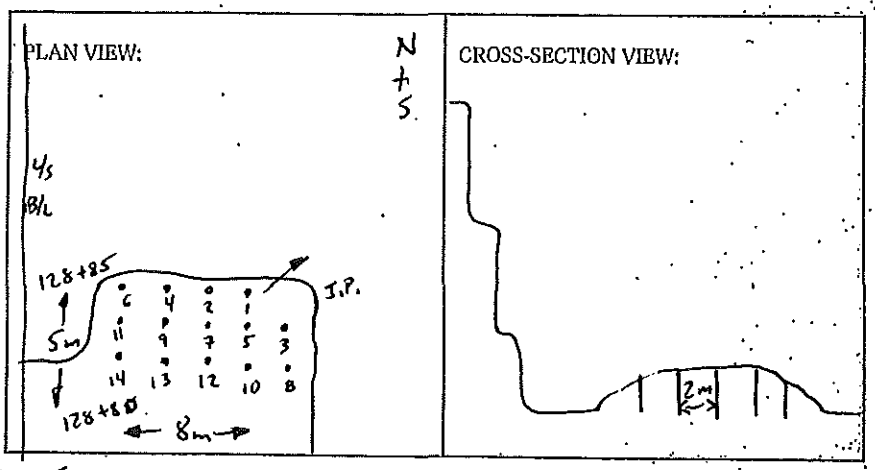
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 160 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 4/12
ACTUAL BLAST DATE July 4/12
BLAST # 390 @14:06

HIGHWAY# 97
BLAST LOCATION AT: STN # 128 + 75 – 128 + 80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 105 (m)

TOTAL NUMBER OF HOLES 15 6 B/L / 3 Buffer / 6 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

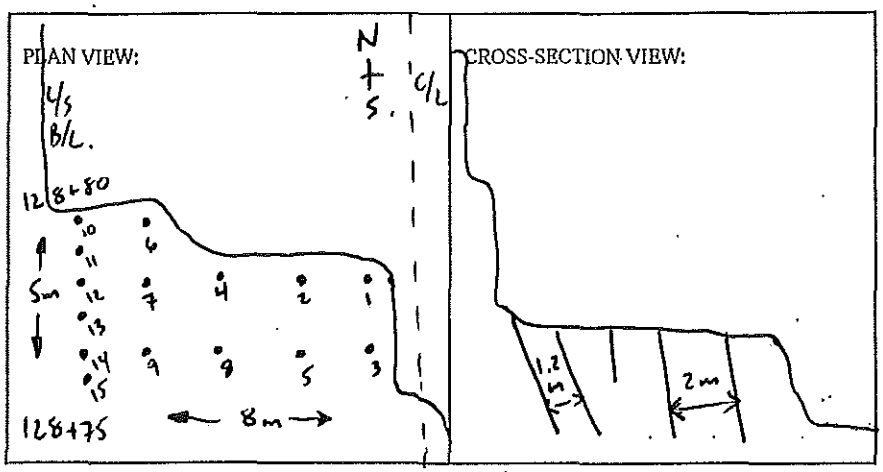
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 4/12
PROPOSED BLAST DATE July 4/12
BLAST # 390

HIGHWAY # 97
BLAST LOCATION AT: STN# 128+75 - 128+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 105 (m)

PROPOSED APPROX. NO. OF HOLES 6 B/L / 3 Buffer / 6 prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

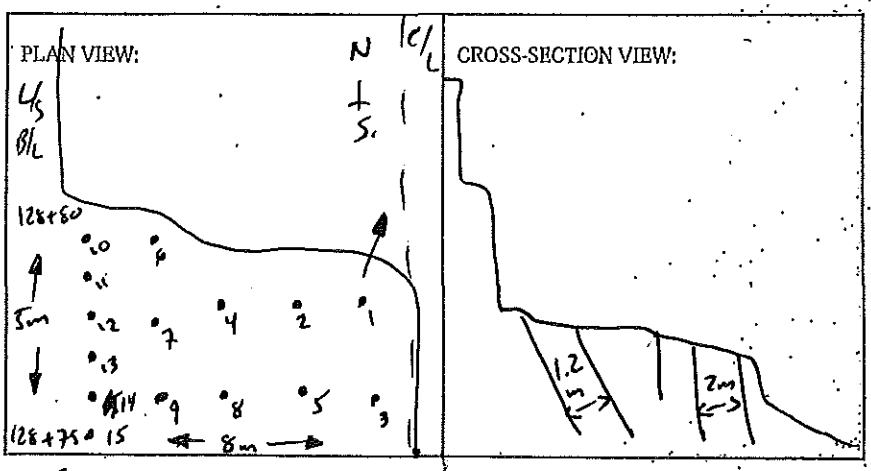
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 260 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12
BLAST # 391 ©

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+50 - 128+55 c/L (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

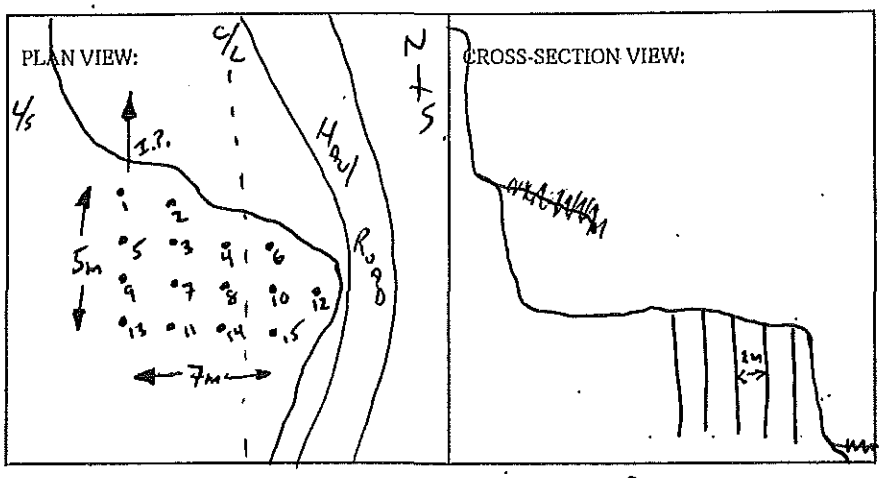
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 105 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enc.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 4/12
PROPOSED BLAST DATE July 5/12
BLAST # 391

HIGHWAY # 97
BLAST LOCATION AT: STN# 128+50 - 128+55 C/L (3rd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 45 (m)

PROPOSED APPROX. NO. OF HOLES 15
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 15

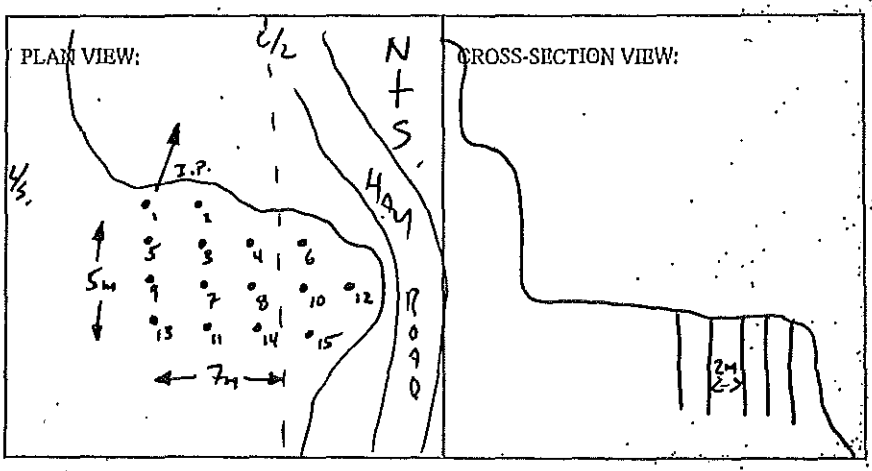
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12
BLAST # 392

HIGHWAY # 97
BLAST LOCATION AT: STN #128+50 - 128+40 C/L (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

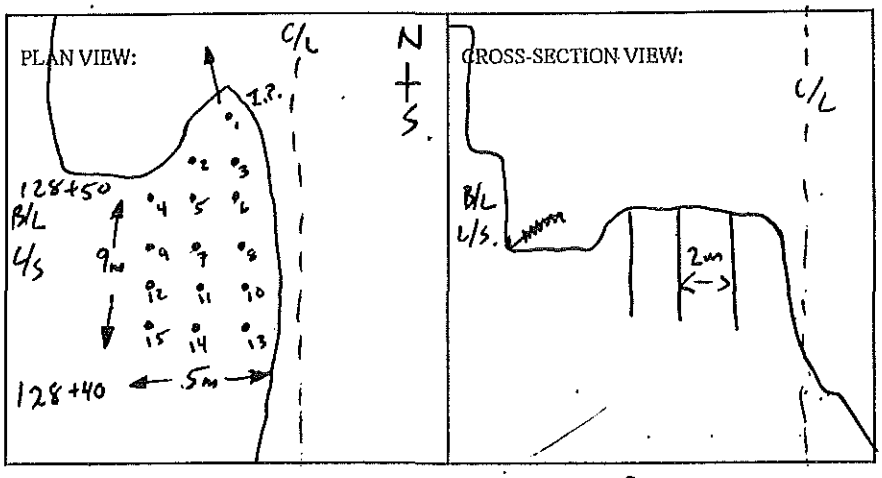
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 135 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 5/12
PROPOSED BLAST DATE July 5/12
BLAST # 392

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+50 – 128+40 c/l (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 45 (m)

PROPOSED APPROX. NO. OF HOLES 15
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

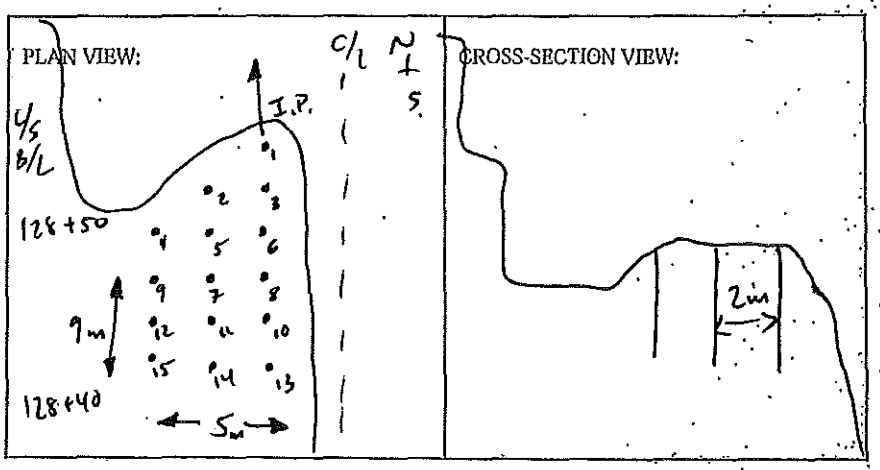
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 130 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12.
BLAST # 393

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+~~50~~ - 128+~~45~~ C/L (2nd Beach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ____
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

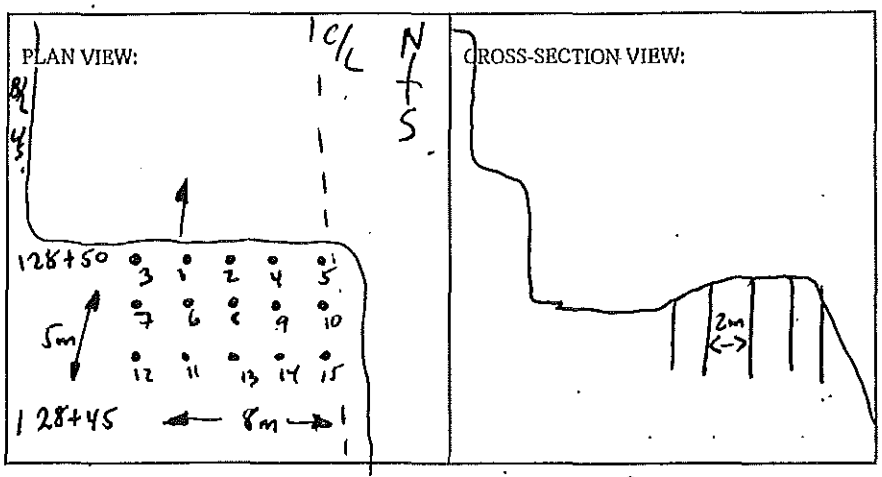
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 5/12
PROPOSED BLAST DATE July 5/12
BLAST # 393

HIGHWAY # 97
BLAST LOCATION AT: STN # 128 + 50 - 128 + 45 c/L (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES /
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 45 (m)

PROPOSED APPROX. NO. OF HOLES 15
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 15

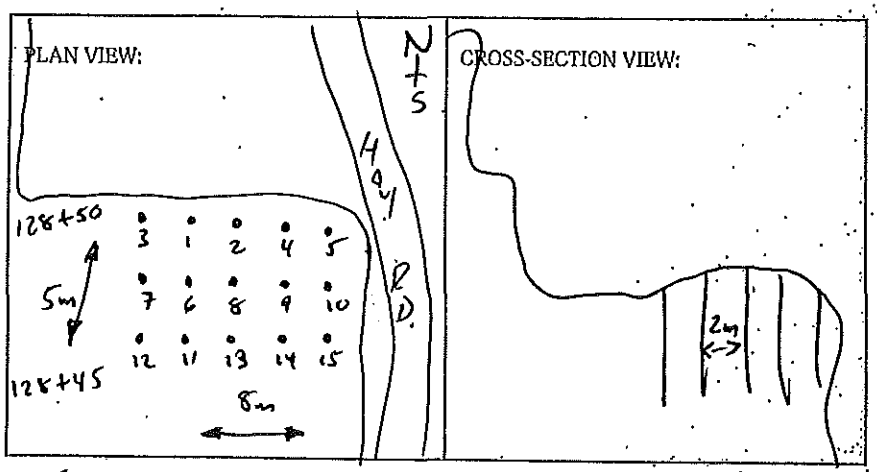
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE / COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mowhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12
BLAST # 394

HIGHWAY# 97
BLAST LOCATION AT: STN # 128+45 - 128+35 c/l (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE _____ (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18, 0
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 18
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

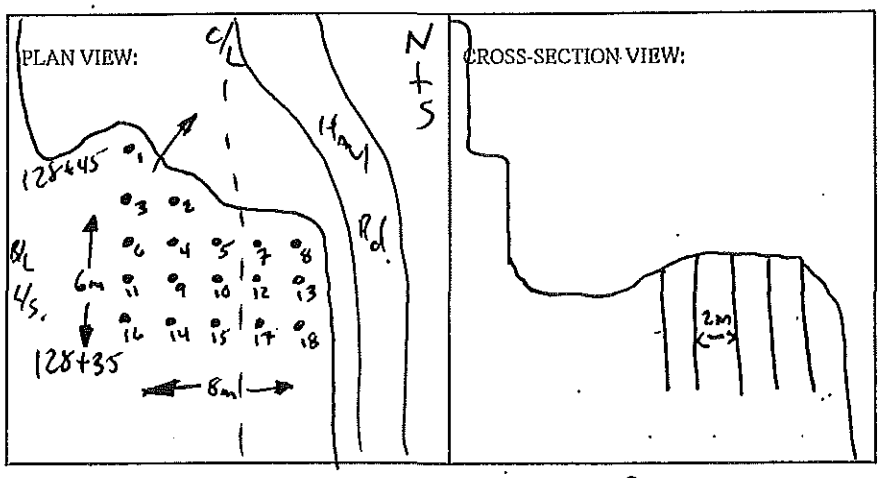
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 144 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 5/12
PROPOSED BLAST DATE July 6/12
BLAST # 394

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+45 - 128+35 c/l (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 0
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 54 (m)

PROPOSED APPROX. NO. OF HOLES 18
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 18

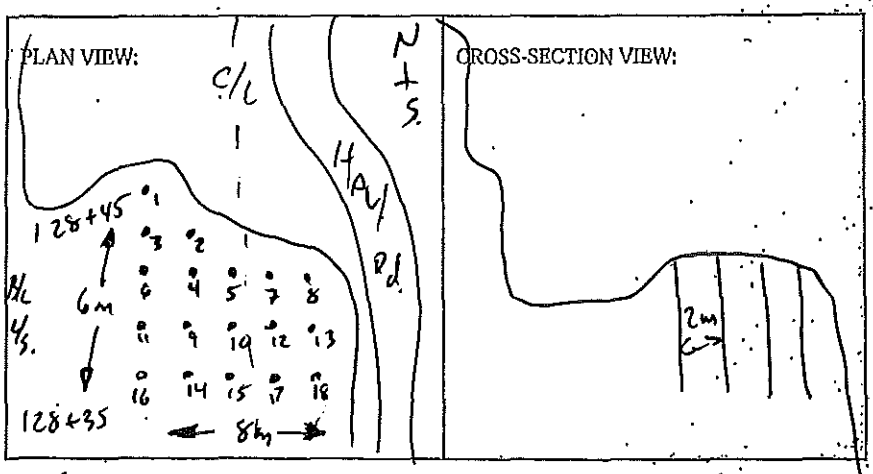
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC initiation
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 144 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12
BLAST # 395

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+50 - 128+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

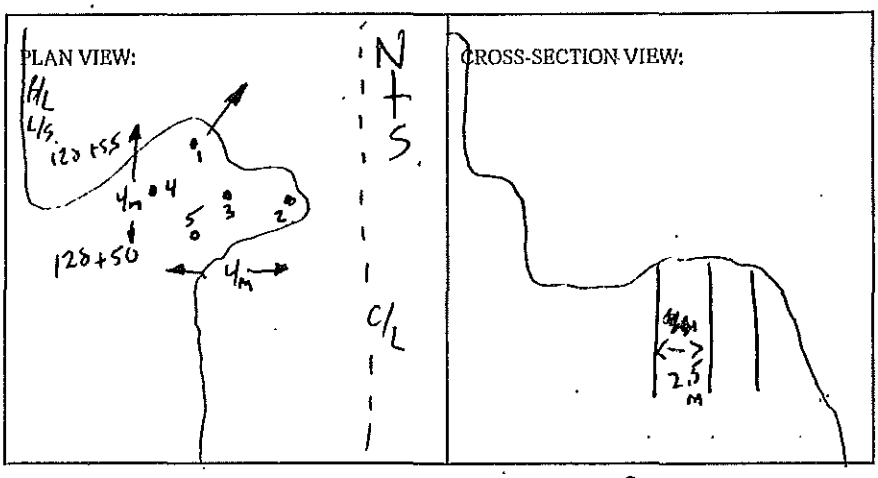
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED July 6/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE July 6/12
BLASTER'S NAME James Mawhinney
BLAST # 395
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+50 - 128+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ✓
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 25 (m)
PROPOSED APPROX. NO. OF HOLES 5
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 5
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

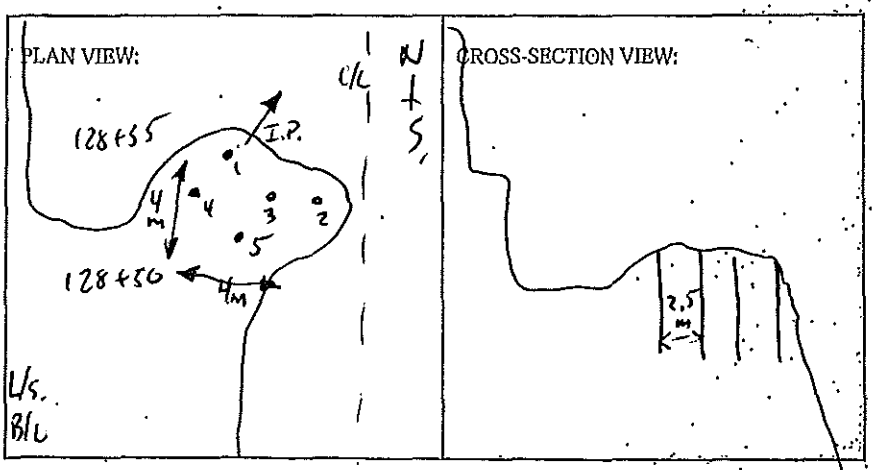
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS.

APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12
BLAST # 396

HIGHWAY # 97
BLAST LOCATION AT: STN #128+30 - 128+40 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 128 (m)

TOTAL NUMBER OF HOLES ~~16~~ 8 - B/L / 5 Buffer / 3 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE ~~2"~~ 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

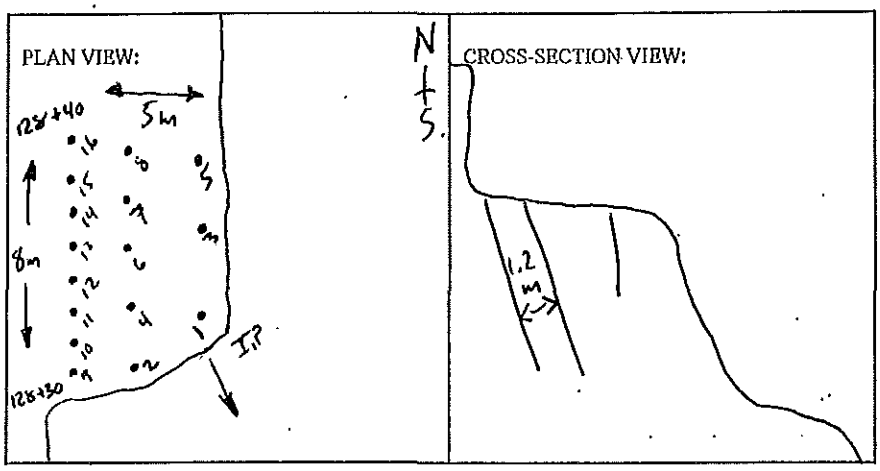
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 320 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 6/12
PROPOSED BLAST DATE July 6/12
BLAST # 396

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+30 - 128+40 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 128 (m)

PROPOSED APPROX. NO. OF HOLES 8 BL / 5 Buffer / 3 prod.
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16

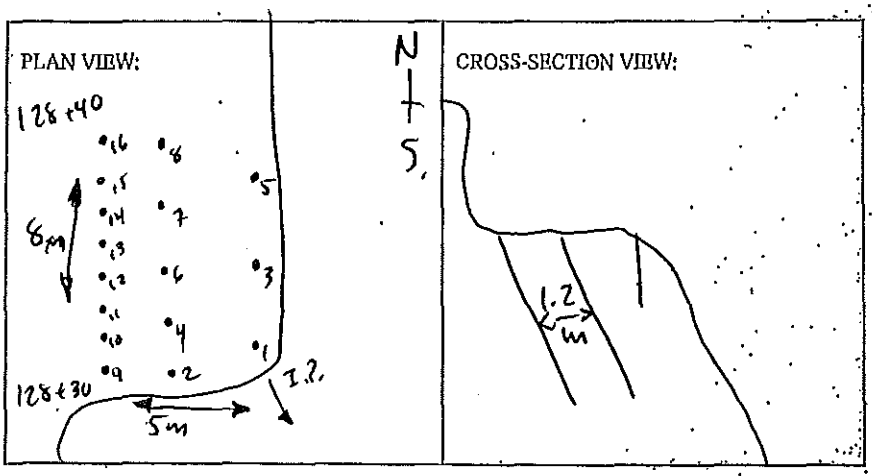
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps.

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12
BLAST # 397

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+40 - 128+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 112 (m)

TOTAL NUMBER OF HOLES 7/B/L / 4 Buffer / 3 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

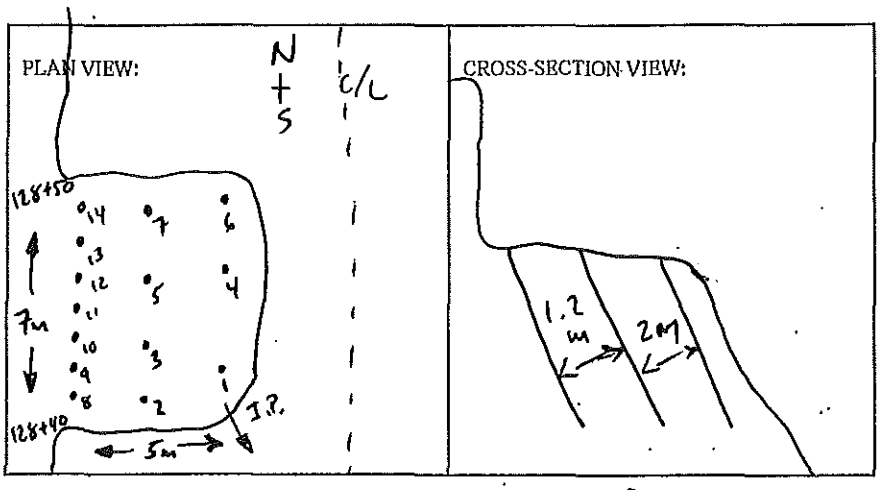
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 280. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED July 6/12
PROPOSED BLAST DATE July 6/12
BLAST # 397

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+40 - 128+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 112 (m)

PROPOSED APPROX. NO. OF HOLES 7 BL / 4 Buffer / 3 prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + Anfo
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

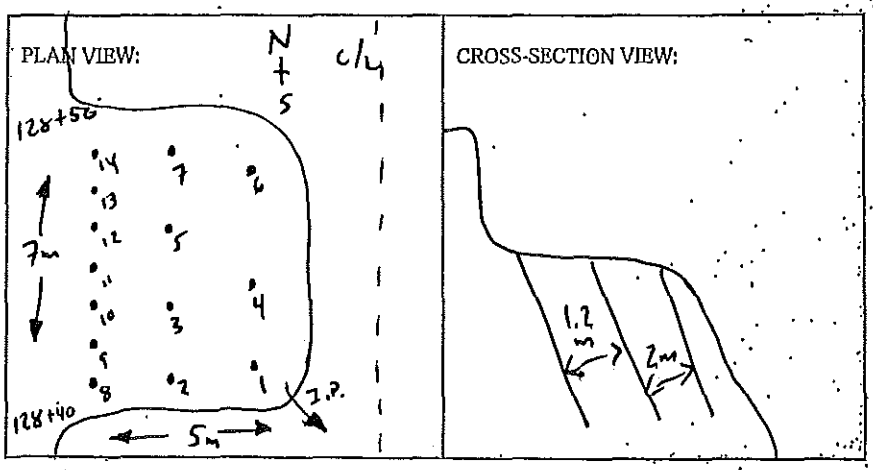
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 260 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Sept. 10/12
ACTUAL BLAST DATE Sept. 10/12
BLAST # 434 @ 13:00

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY # 97
BLAST LOCATION AT: STN # 129+40 – 129+20 LS (Tosubgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 1.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.2 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 20
HOLE DIAMETER 76 (mm)
HOLE SPACING 1 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

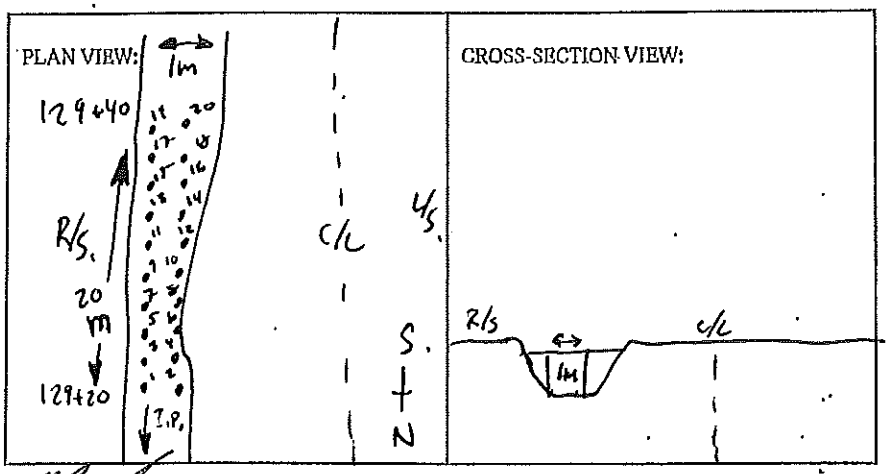
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Sept. 10/12
PROPOSED BLAST DATE Sept. 10/12
BLAST # 434

HIGHWAY # 97
BLAST LOCATION AT: STN# 129+40 - 129+20 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 1 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 1.2 (m)
PROPOSED TOTAL DEPTH 20. (m)

PROPOSED APPROX. NO. OF HOLES 20
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1 (m) BURDEN 1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 20

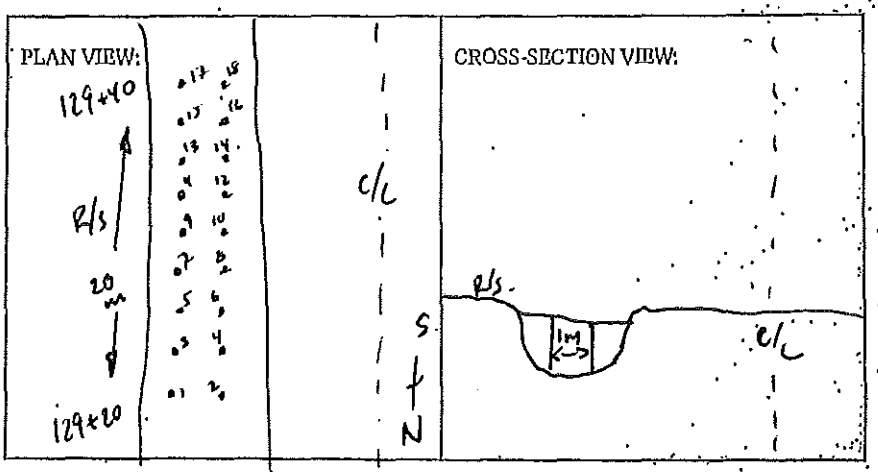
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 15 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 1

DATE PREPARED Sept. 14/12
ACTUAL BLAST DATE Sept. 14/12
BLAST # 440

HIGHWAY# 97
BLAST LOCATION AT: STN # 129+00 (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 1.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.5 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 25
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 25

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

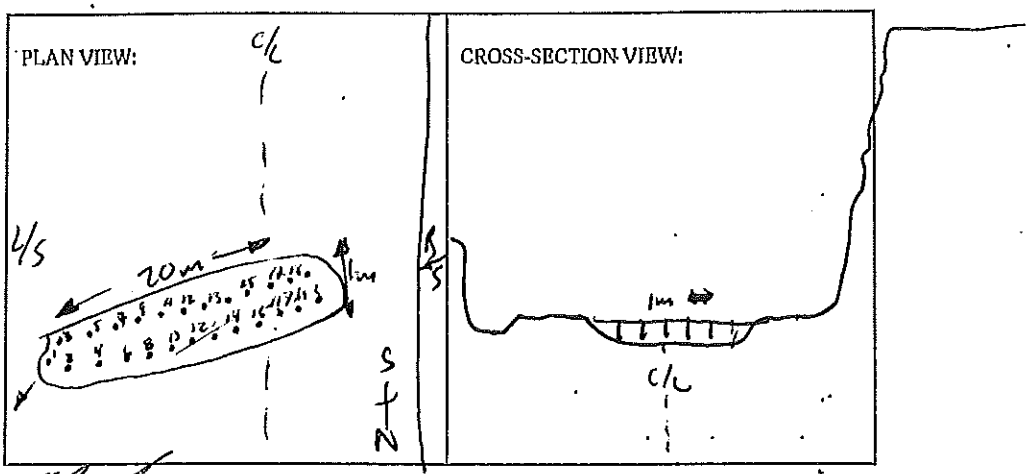
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED Sept. 14/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
PROPOSED BLAST DATE Sept. 14/12
BLASTER'S NAME James Mawhinney
BLAST # 440 @ 11:00
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN# 129+00 (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES —
PROPOSED AVG. DEPTH 1.0 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 1.5 (m)
PROPOSED TOTAL DEPTH 25 (m)
PROPOSED APPROX. NO. OF HOLES 25
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

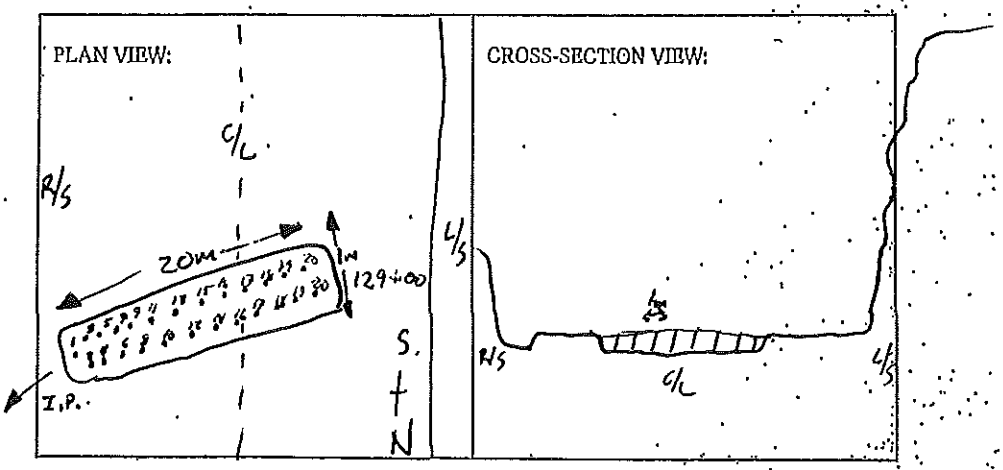
EXPLOSIVE TYPE 1½" DYNAMITE + Anfo
APPROX. NUMBER OF CARTRIDGES 25
PROPOSED NUMBER OF DELAYS 25
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) E.B. INITIATION
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 20 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE — COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 8/12
ACTUAL BLAST DATE MAR 8/12 12:14 PM
BLAST # MW-0148

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE MASSIVE GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 9 PCOD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMINE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 56 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HG320 CAPACITY 80 CAPS

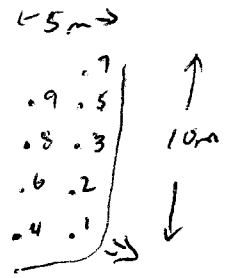
VOLUME OF ROCK BLASTED 175 (m^3)

BLAST SKETCH:

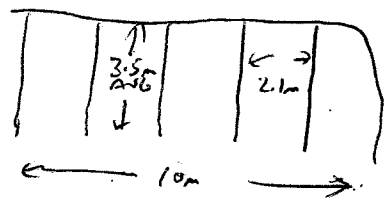
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.115 ips/ 32Hz
" @ 13117 Cliffstone Crt - 0.165 ips/ 39Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 8/12
PROPOSED BLAST DATE MAR 8/12
BLAST # MW-Di48

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 3.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED APPROX. NO. OF HOLES 9 PLUS
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

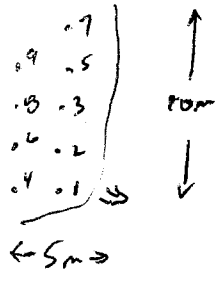
APPROX. VOLUME OF ROCK TO BE BLASTED 175 (m^3)

PROPOSED BLAST SKETCH:

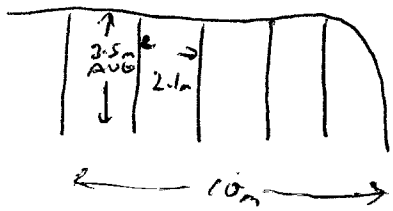
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 8/12
ACTUAL BLAST DATE MAR 8/12 1:44 PM
BLAST # MW-0149

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE MIXED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 38 (m)

TOTAL NUMBER OF HOLES 10 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT [redacted] 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

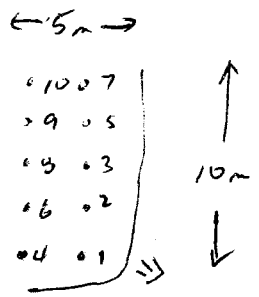
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 190 (m^3)

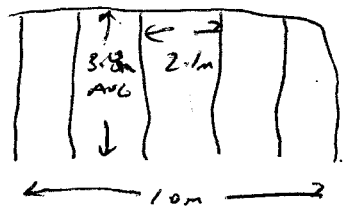
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.10 ips/19Hz
" @ 13117 Cliffstone Crt - 0.20 ips/43Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME WAYNE JENSEN
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 8/12
PROPOSED BLAST DATE MAR 8/12 1:44PM
BLAST # MW-0419

HIGHWAY# 97
BLAST LOCATION AT: 129+00 ~ 129+05

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE BLOCKED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 3.8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 4.2 (m)
PROPOSED TOTAL DEPTH 38 (m)

PROPOSED APPROX. NO. OF HOLES 10 PER
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT ~~70~~ 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

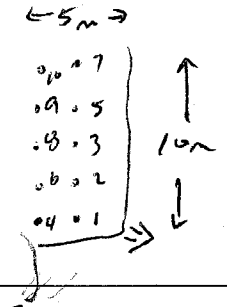
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB350 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 190 (m^3)

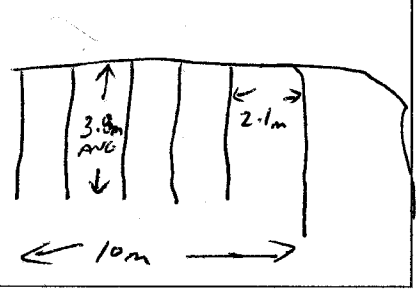
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME D. FRASER SIGNATURE _____ COMPANY FRASER LAKE ENG.
BLASTER'S SIGNATURE _____ COMPANY _____
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 8/12
ACTUAL BLAST DATE Mar 8/12 3:18 PM
BLAST # MW-0150

HIGHWAY# 97
BLAST LOCATION AT: SW 128+92 - 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
+ shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamine + Anfo
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

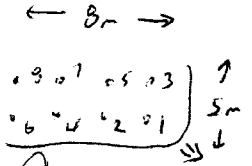
NITIATION DEVICE: (CIRCLE) E.D. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 160 (m^3)

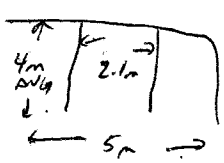
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cl; AA Stone Cnt - 0.117 ips/23Hz
" @ 13117 Cl; AA Stone Cnt - 0.230 ips/43Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 8/12
PROPOSED BLAST DATE MAR 8/12
BLAST # MW - 0150

HIGHWAY# 97
BLAST LOCATION AT: SW 128+92 - 129+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE FLORED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 4.5 (m)
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED APPROX. NO. OF HOLES 8 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2-1 (m) BURDEN 2/1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 160 (m^3)

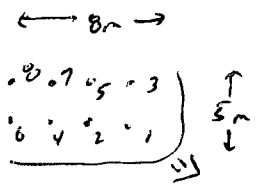
PROPOSED BLAST SKETCH:

P →

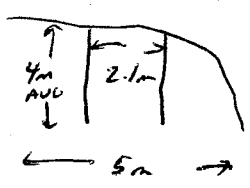
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERSEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 12/12
ACTUAL BLAST DATE Mar 12/12 3:07 PM
BLAST # MW-0151

HIGHWAY# 97
BLAST LOCATION AT: STN 129+08 - 129+152.5

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Diorite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.7 (m)
TOTAL DEPTH 82 (m)

TOTAL NUMBER OF HOLES 10U/15 Backfill
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Blasters
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

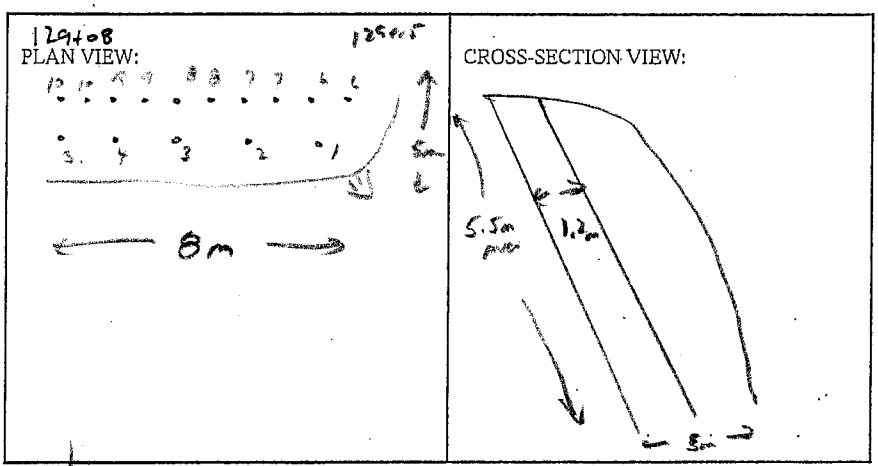
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Cliffside.dat - 0.085 ips / 39 Hz
@ 13117 Cliffside.dat 0.17 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 12/12
PROPOSED BLAST DATE MAR 12/12
BLAST # MW-0151

HIGHWAY# 97
BLAST LOCATION AT: STN 129+08 - 129+15 LS

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 67 (°) SLOPE LENGTH 7 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 10
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.7 (m)
PROPOSED TOTAL DEPTH 82 (m)

PROPOSED APPROX. NO. OF HOLES 10611 5 b. dm
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ~~ANFO~~ 50mm Powder Blasters
APPROX. NUMBER OF CARTRIDGES 35
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

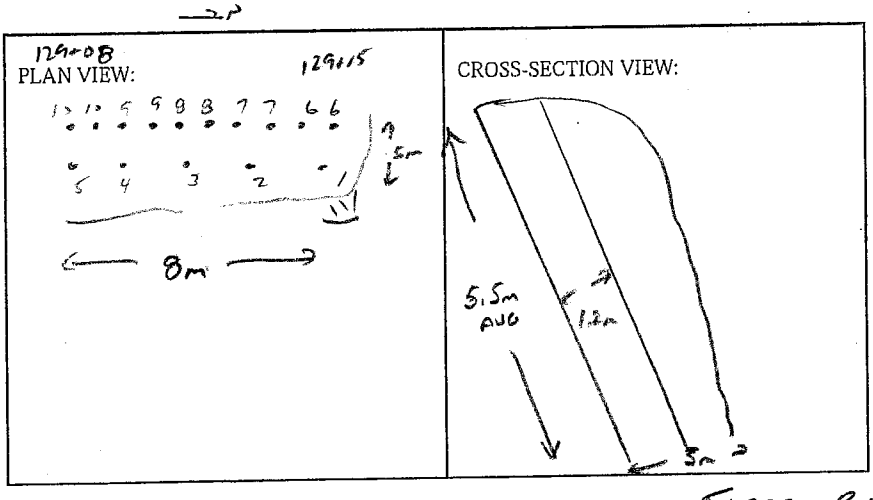
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 220 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 10:32AM
BLAST # MW-0152

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05 2ND BENCH

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 6 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 7.5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

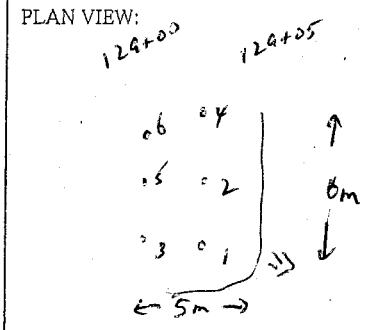
VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

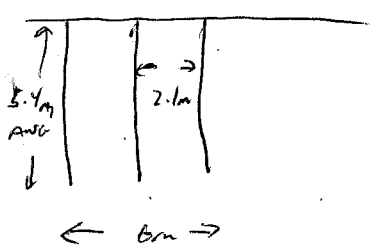
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.11 ips / 32 Hz
" @ 13117 Cliffstone Cut - 0.22 ips / 51 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED MAR 13/12
PROPOSED BLAST DATE MAR 13/12
BLAST # MW-0152

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05 2ND BENCH

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED BROWN
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 5.4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.6 (m)
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED APPROX. NO. OF HOLES 6 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 6
PROPOSED NUMBER OF DELAYS 6

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 60 CAPS

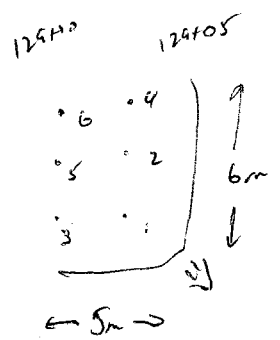
APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

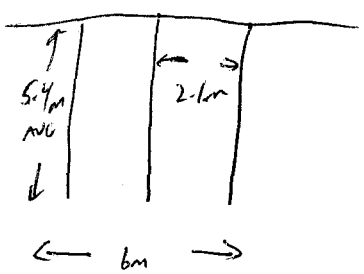
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 13/12
ACTUAL BLAST DATE Mar 13/12 11:51 AM
BLAST # MW-0153

HIGHWAY# 97
BLAST LOCATION AT: SB 129+00 - 129+08

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.9 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 76 11/46 offset / 15 stab / 1 Reno
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Blaster
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

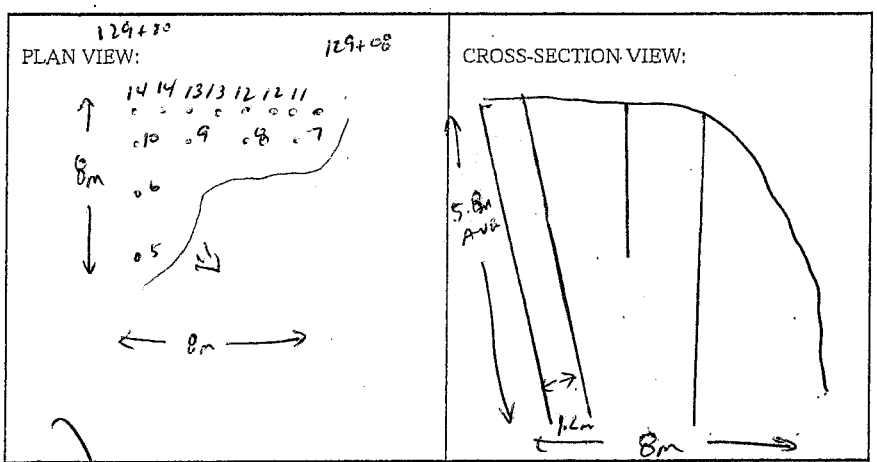
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.093 ips / 26 Hz
@ 13117 Cliffstone Cut - 0.27 ips / 5 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED Mar 13/12
PROPOSED BLAST DATE Mar 13/12
BLAST # MW-015B

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+08

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 45 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 5.8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 5.9 (m)
PROPOSED TOTAL DEPTH 72 (m)

PROPOSED APPROX. NO. OF HOLES 76/1/4 buffer/ 1 stab/ 1 Proof
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + 2"x16" Blastex
APPROX. NUMBER OF CARTRIDGES 13
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

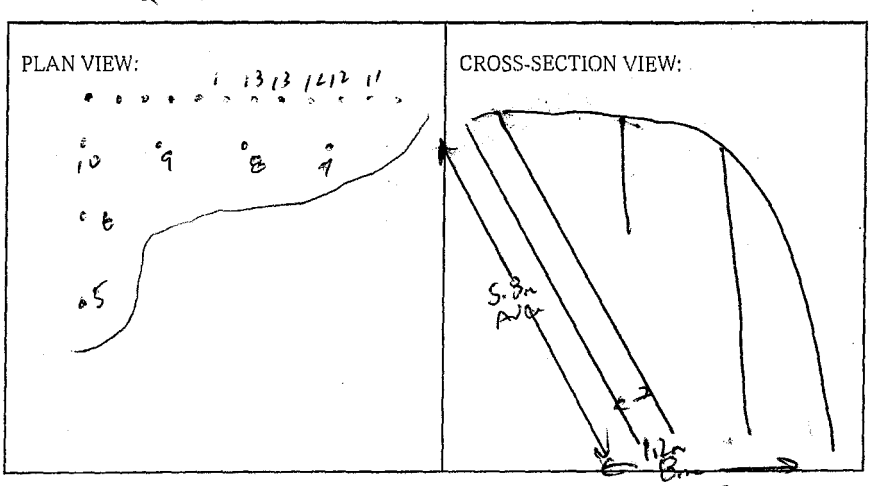
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 1:44PM
BLAST # MW-0154

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 – 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GREENSTONE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 95 (kg)
DELAY TYPE AND LENGTH 25 (ms)

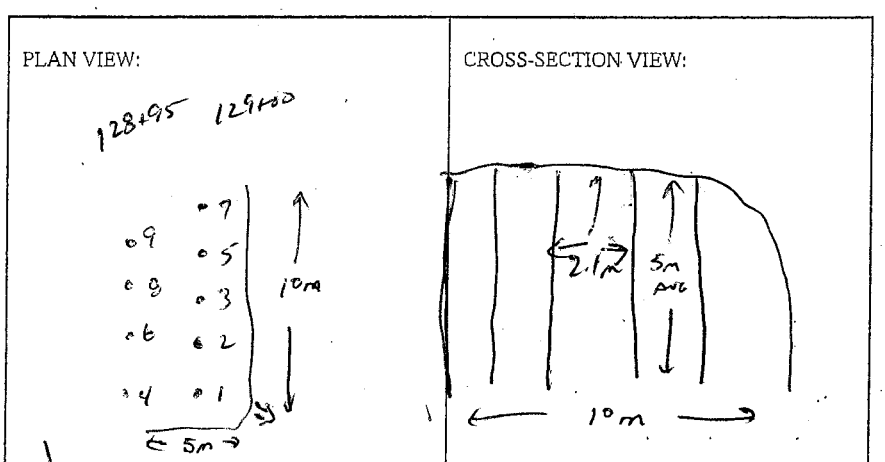
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HASCO CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismographs @ 13167 cliffstone crt . 0.10 ips / 39 Hz
& @ 13117 cliffstone crt . 0.18 ips / 37 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAR 13/12
PROPOSED BLAST DATE MAR 13/12
BLAST # MW-0154

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.2 (m)
PROPOSED TOTAL DEPTH 40 (m)

PROPOSED APPROX. NO. OF HOLES 9
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 95 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 60 CAPS

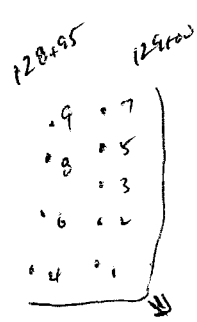
APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

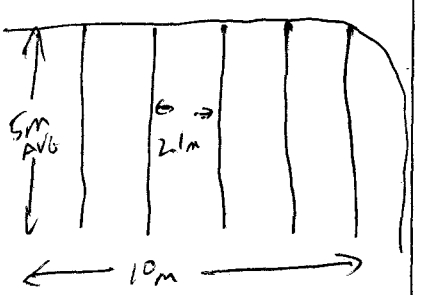
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARRYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 2:53 PM
BLAST # MW-0155

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 68 (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6a
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.9 (m)
TOTAL DEPTH 63 (m)

TOTAL NUMBER OF HOLES 66 / 36 buffer / 1st 6 / 2 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO + 2x16 BLASTEX
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

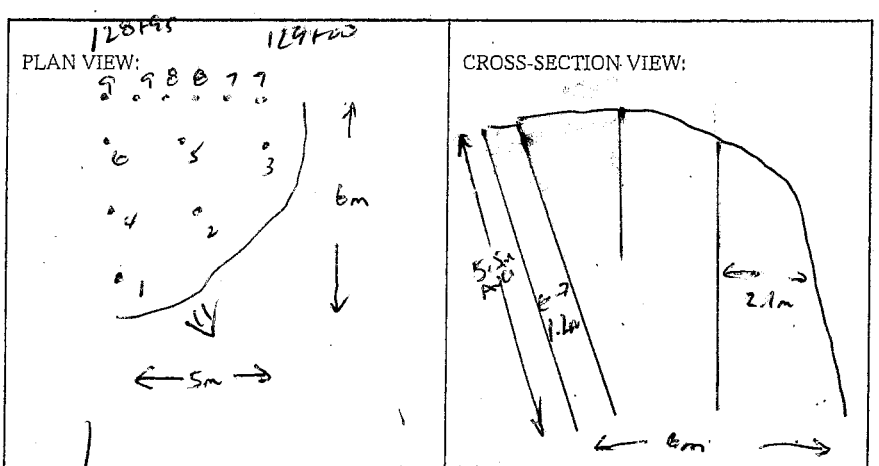
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Cliffstream - 0.097 ips/39 Hz
" @ 13117 Cliffstream - 0.26 ips/47 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 13/12
PROPOSED BLAST DATE Mar 13/12
BLAST # MW-0155

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 5.9 (m)
PROPOSED TOTAL DEPTH 6.3 (m)

PROPOSED APPROX. NO. OF HOLES 66 #1 / 36 buffer / ~~Slab~~ / 2 Precon
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) ~~BURDEN~~ 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL ~~HORIZ.~~ VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO + 2"x16 BLASTCAST
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

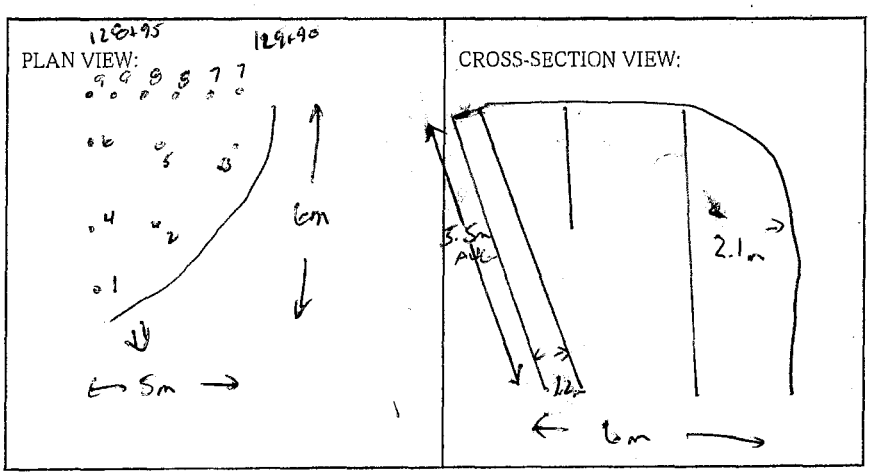
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 14/12
ACTUAL BLAST DATE ~~March~~ March 14/12 1:39 PM
BLAST # MW-C156

HIGHWAY# 97
BLAST LOCATION AT: SW 128+610 - 128+695

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 8 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2-1 (m) BURDEN 2-1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

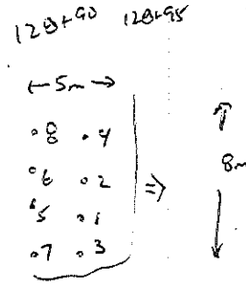
VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

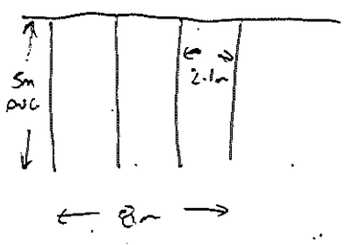
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Siesmograph @ 13167 Cliffstone Crt - 0.093 ips / 34Hz
" @ 13117 Cliffstone Crt - 0.17 ips / 43Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 14/12
PROPOSED BLAST DATE Mar 14/12
BLAST # MW-0156

HIGHWAY# 97
BLAST LOCATION AT: STN 128+90 - 128+95

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS _____
PROPOSED MAXIMUM DEPTH 5.5 (m)
PROPOSED TOTAL DEPTH 40 (m)

PROPOSED APPROX. NO. OF HOLES 8 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 6
PROPOSED NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

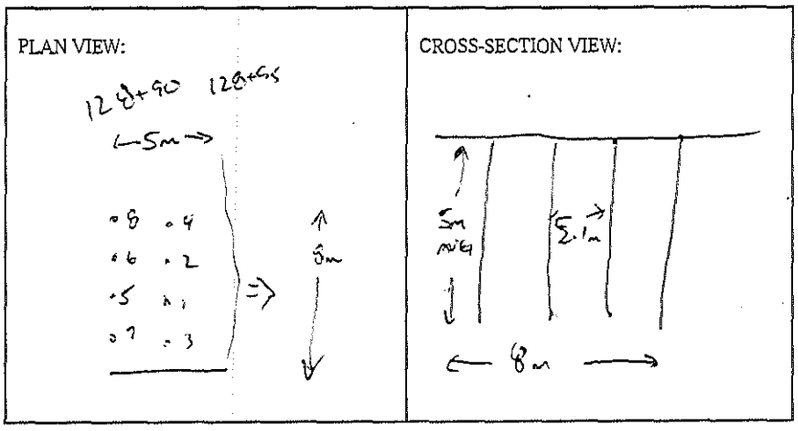
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 14/12
ACTUAL BLAST DATE Mar 14/12 2:59 PM
BLAST # MW-0157

HIGHWAY# 97
BLAST LOCATION AT: STN 128+99 - 128+95 LS Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5.4 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 66ll / 30 offset / 2 stab / 3 relief
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

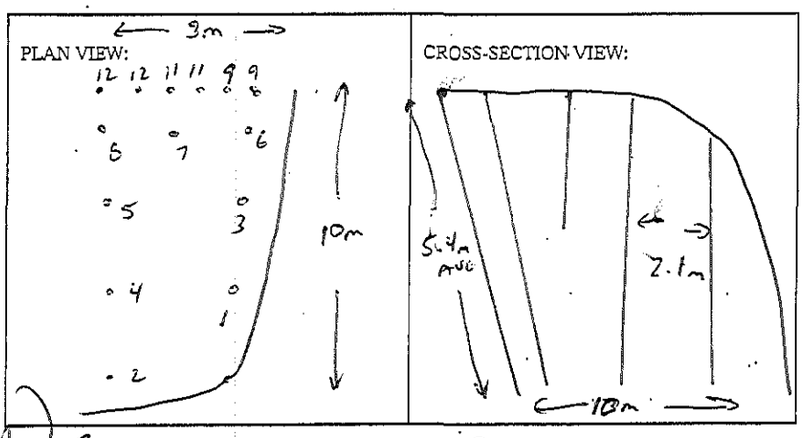
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Siesmograph 13167 Cliffstone ert - 0.14 ips / 37 Hz
@ 13117 Cliffstone ert - 0.22 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vergeer
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED Mar 14/12
PROPOSED BLAST DATE Mar 14/12
BLAST # MW-0157

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+93 - 128+95 LS (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 5.4 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 5.5 (m)
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED APPROX. NO. OF HOLES 66 II / 36 buffer / 24 cb / 3 road
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

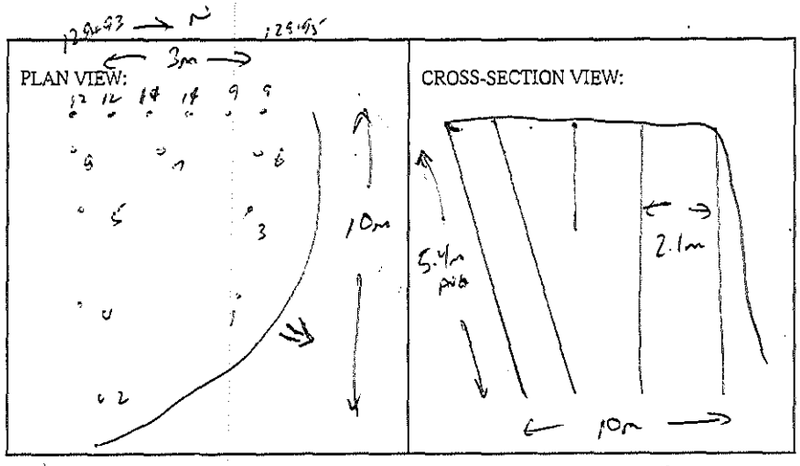
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieger SIGNATURE _____ COMPANY Fieger Rock Eng.
BLASTER'S SIGNATURE Wayne Vergeer COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERSEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 15/12
ACTUAL BLAST DATE Mar 15/12 11:30AM
BLAST # MW-0158

HIGHWAY# 97
BLAST LOCATION AT: 128+85 - 128+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slate material

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.1 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 10 Proposed
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Ancos
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

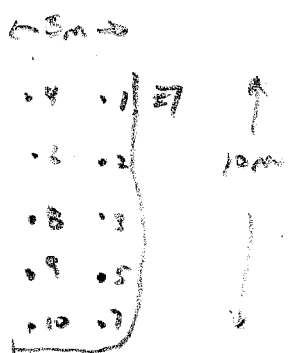
VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

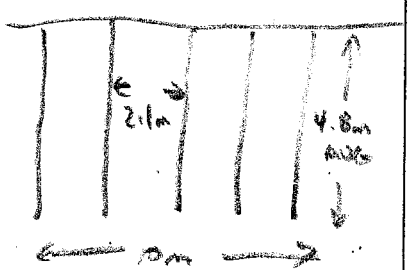
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.082 ips / 34 Hz
@ 13117 Cliffstone Crt - 0.12 ips / 39 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 15/12
PROPOSED BLAST DATE Mar 16/12
BLAST # MW-015B

HIGHWAY# 97
BLAST LOCATION AT: 128+85 - 128+90

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 25 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 4.8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.1 (m)
PROPOSED TOTAL DEPTH 48 (m)

PROPOSED APPROX. NO. OF HOLES 10 Pond.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 60 CAPS

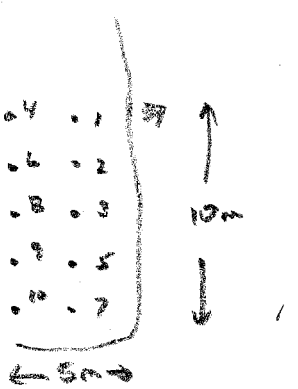
APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

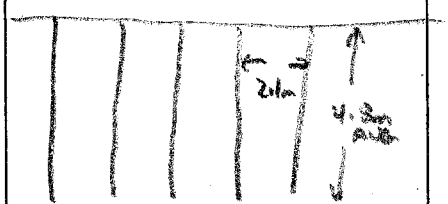
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleiber SIGNATURE _____ COMPANY Fleiber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary) Seismograph @ 13167 Cliffstone Crt.
" @ 13117 Cliffstone Crt.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED MAY 10/12
ACTUAL BLAST DATE MAY 10/12 12:00PM
BLAST # MW-0194

HIGHWAY# 97
BLAST LOCATION AT: 129+105 - 129+110

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.4 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 10 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

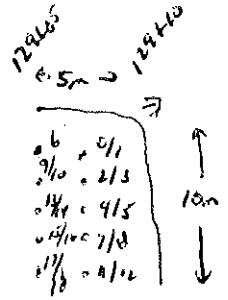
VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

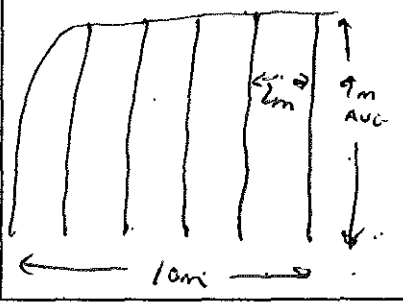
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.13 ips / 39 Hz
Seismograph @ 13117 Cliffstone Cut - 0.26 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 10/12
PROPOSED BLAST DATE May 10/12
BLAST # MW-0194

HIGHWAY # 97
BLAST LOCATION AT: STA 129+05 - 129+10

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/L
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9.4 (m)
PROPOSED TOTAL DEPTH 90 (m)

PROPOSED APPROX. NO. OF HOLES 10 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 3280 CAPACITY 60 caps

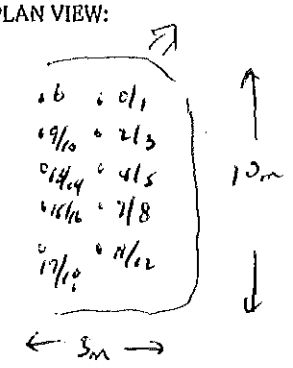
APPROX. VOLUME OF ROCK TO BE BLASTED 450 (m^3)

PROPOSED BLAST SKETCH:

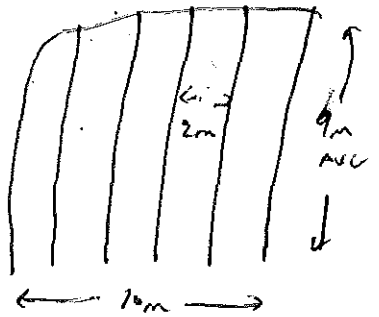
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darin Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAY 11/12
ACTUAL BLAST DATE MAY 11/12 11:27 AM
BLAST # MW3-0195

HIGHWAY # 97
BLAST LOCATION AT: SW 129+00-129+05 C/L

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 9.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.7 (m)
TOTAL DEPTH 92 (m)

TOTAL NUMBER OF HOLES 10 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 (ms)

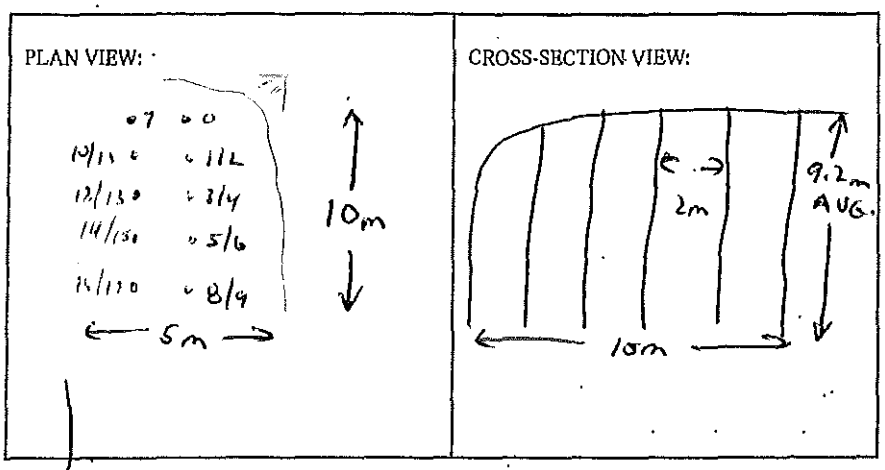
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.14 ips / 39 Hz
" @ 13117 Cliffstone Crt - 0.32 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED May 11/12
PROPOSED BLAST DATE May 11/12
BLAST # MW-0195

HIGHWAY # 97
BLAST LOCATION AT: STN 129+00 to 129+05 C/L

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 9.2 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9.4 (m)
PROPOSED TOTAL DEPTH 92 (m)
PROPOSED APPROX. NO. OF HOLES 10 Pend
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 18
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 (ms)

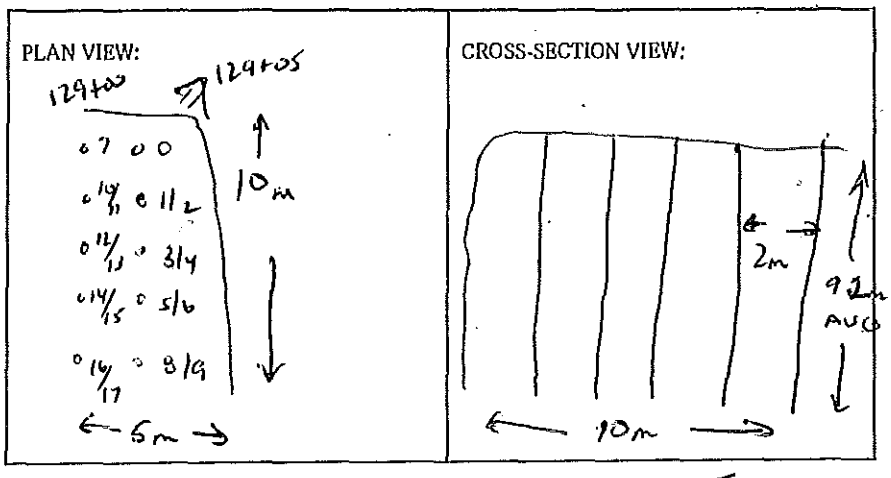
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 50 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834187

DATE PREPARED MAY 14/12
ACTUAL BLAST DATE MAY 14/12 12:05 PM
BLAST # MW-0196

HIGHWAY# 97
BLAST LOCATION AT: STA 128+95 - 129+00 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shotmarked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 10. (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10.5 (m)
TOTAL DEPTH 110 (m)

TOTAL NUMBER OF HOLES 11 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

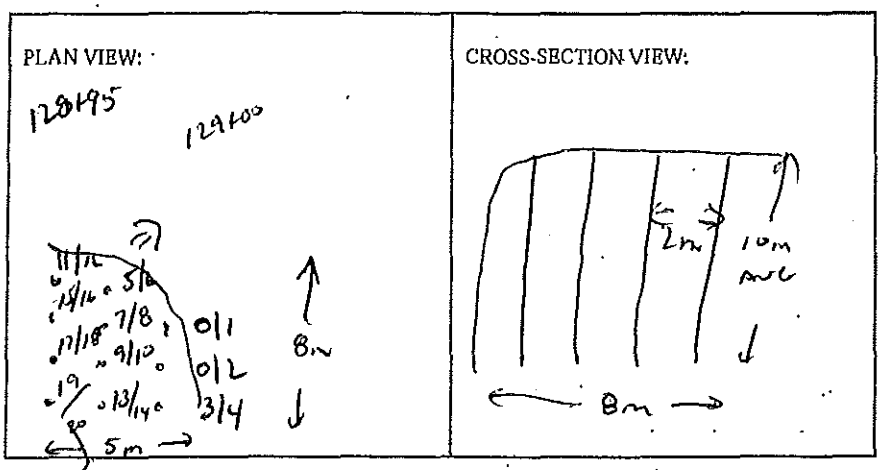
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.29 ips 37Hz
@ 13117 cliffstone crt - 0.32 ips/51Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593409

DATE PREPARED May 14/12
PROPOSED BLAST DATE May 14/12
BLAST # MW-0196

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00 c/l

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 10 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 10.5 (m)
PROPOSED TOTAL DEPTH 3 (m)
PROPOSED APPROX. NO. OF HOLES 11 Per o.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 22
PROPOSED NUMBER OF DELAYS 4
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

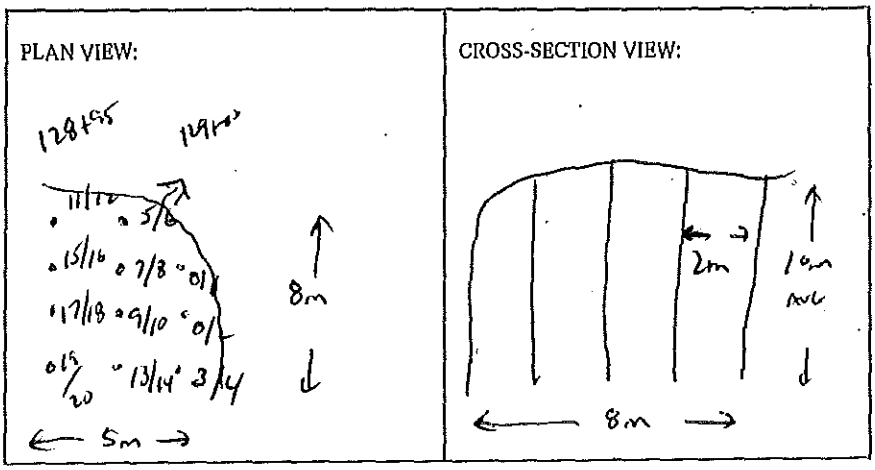
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiger SIGNATURE COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED May 15/11
ACTUAL BLAST DATE May 15/11 11:12 AM
BLAST # MW-0197

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+90 - 128+95 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 10.6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 11.2 (m)
TOTAL DEPTH 116 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

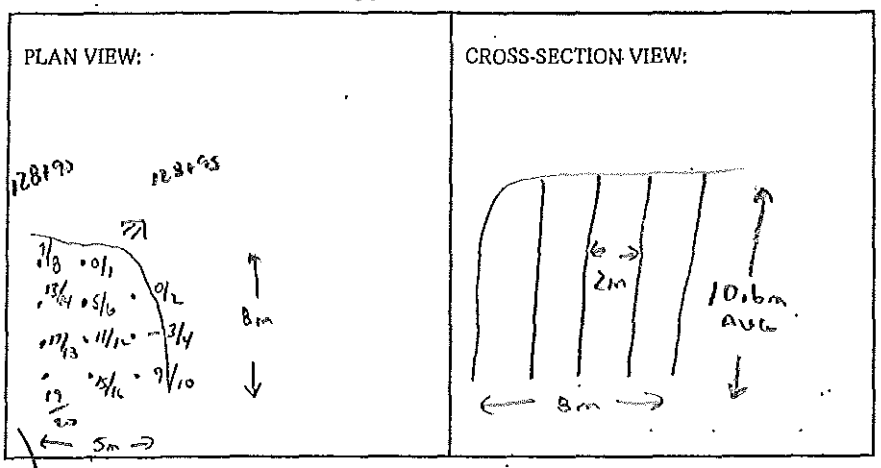
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 425 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.26 ips / 32 Hz
" @ 13177 Cliffstone Crt - 0.40 ips / 57 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934 89

DATE PREPARED May 15/12
PROPOSED BLAST DATE May 15/12
BLAST # MW - 0197

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+90 - 128+95 e/l

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 10.6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 11.2 (m)
PROPOSED TOTAL DEPTH 11.6 (m)

PROPOSED APPROX. NO. OF HOLES 11 Pano
HOLE DIA. 96 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 22
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25" (ms)

INITIATION DEVICE: (CIRCLE) B.P. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

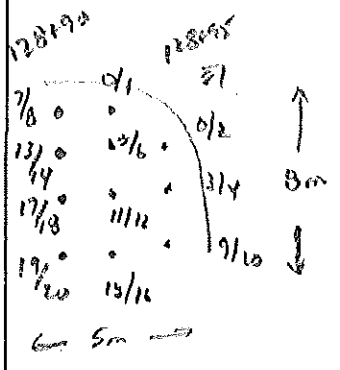
APPROX. VOLUME OF ROCK TO BE BLASTED 425 (m^3)

PROPOSED BLAST SKETCH:

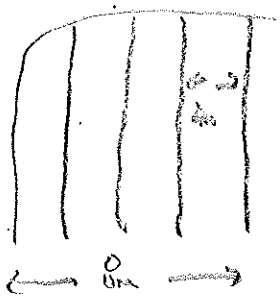
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED May 15/11
ACTUAL BLAST DATE May 15/11 2:10 PM
BLAST # May - 0198

HIGHWAY# 97
BLAST LOCATION AT: 128+90 - 128+95

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/a
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 10 Pcs 0.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 180 (kg)
DELAY TYPE AND LENGTH 25 (ms)

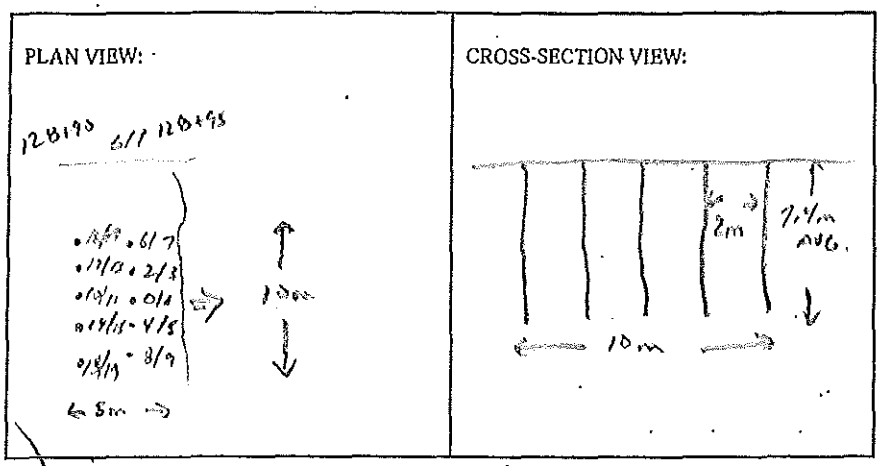
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 c1: Ddston Cnt - 0.19 ips/ 34Hz
@ 13111 c1: Ddston Cnt - 0.67 ips/ 73Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 15/11
PROPOSED BLAST DATE May 15/11
BLAST # MW-0198

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+90 - 128+95

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE 1/4 (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 7.4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.6 (m)
PROPOSED TOTAL DEPTH 74 (m)

PROPOSED APPROX. NO. OF HOLES 10 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 20

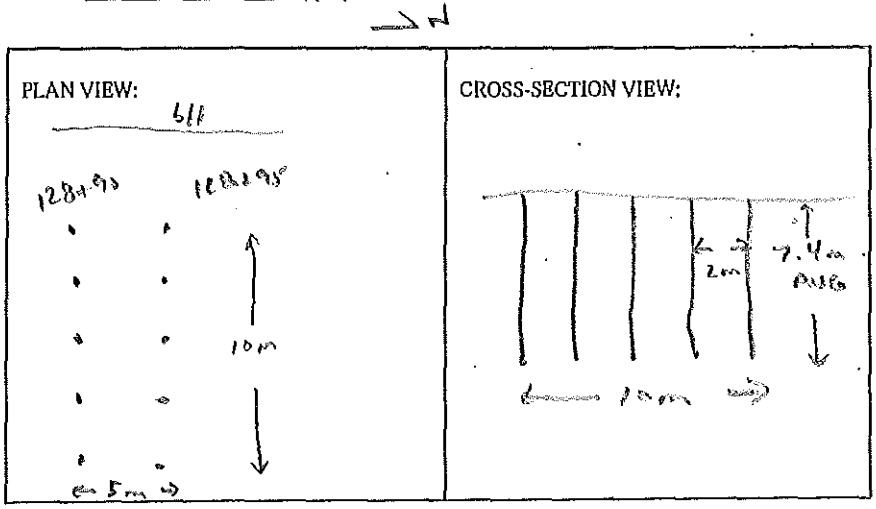
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 180 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 360 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834187

DATE PREPARED May 16/12
ACTUAL BLAST DATE May 16/12 10:55 AM
BLAST # MW-0199

HIGHWAY# 97
BLAST LOCATION AT: SB 128+40 - 128+95 LS (73 subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Alkali Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 3 Buffer 1 5 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 6/11 holes - 1-2 emer 2x16 Dynamite + 200 g det. cord to 4' collar

EXPLOSIVE TYPE 1" DYNAMITE + 2x16 Blast EX EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 9
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

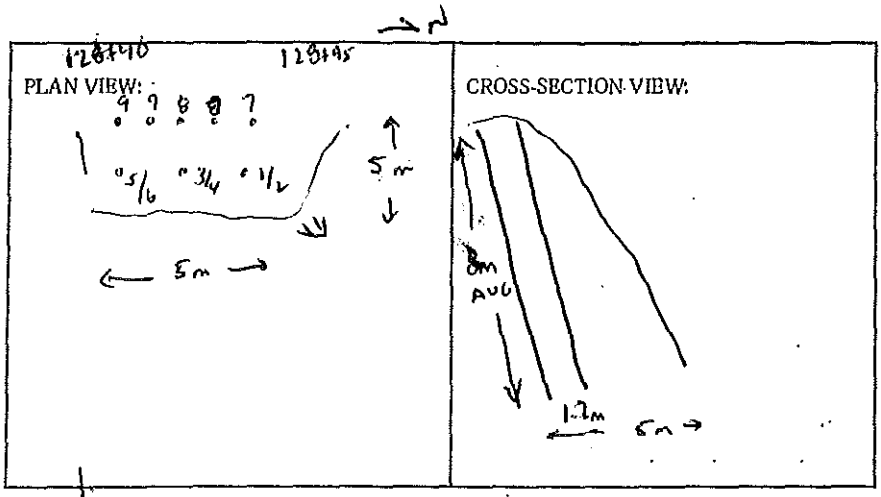
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt. 0.075 ips/34 Hz
" @ 13117 cliffstone crt - 0.23 ips/57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 16/12
PROPOSED BLAST DATE May 16/12
BLAST # MW-0199

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+90 - 128+95 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 5
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8.6 (m)
PROPOSED TOTAL DEPTH 64 (m)
PROPOSED APPROX. NO. OF HOLES 36 buffer / 5 6/1
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS: 6/1 holes - 1-2 cartridges of 2x16 Dynamite + 200 gr det cord to 4' collar

EXPLOSIVE TYPE 1" DYNAMITE + 2x16 Blasex
APPROX. NUMBER OF CARTRIDGES 36
PROPOSED NUMBER OF DELAYS 9
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

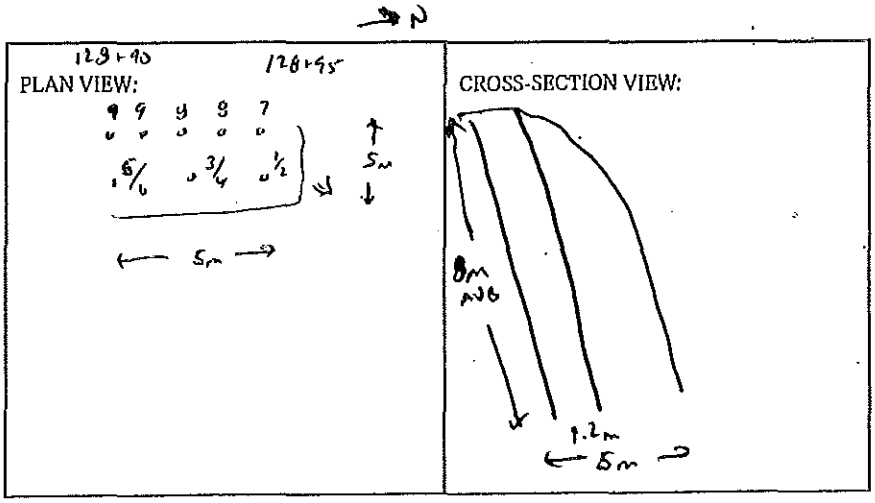
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-115 SSD CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED May 16/12
ACTUAL BLAST DATE May 16/12 12:55 PM
BLAST # MW-0200

HIGHWAY# 97
BLAST LOCATION AT: 128+86 - 128+90 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 11 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 11.3 (m)
TOTAL DEPTH 88 (m)

TOTAL NUMBER OF HOLES 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 (ms)

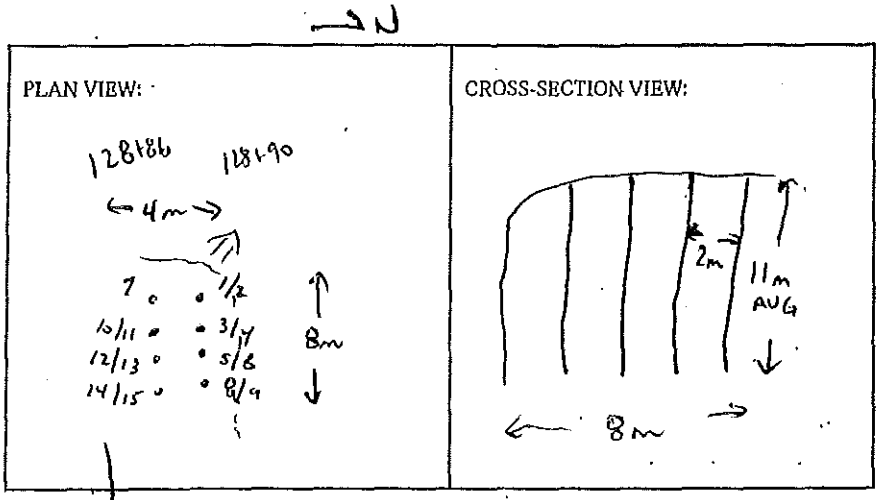
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 C1: Fastar cut - 0.21 ips/37 Hz
@ 13117 C1: Fastar cut - 0.41 ips/57 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 16/12
PROPOSED BLAST DATE May 16/12
BLAST # MJ-0200

HIGHWAY # 97
BLAST LOCATION AT: STN 128+86 - 128+90 c/l

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 11 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 11.3 (m)
PROPOSED TOTAL DEPTH 88 (m)
PROPOSED APPROX. NO. OF HOLES 8 P200
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 15
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 (ms)

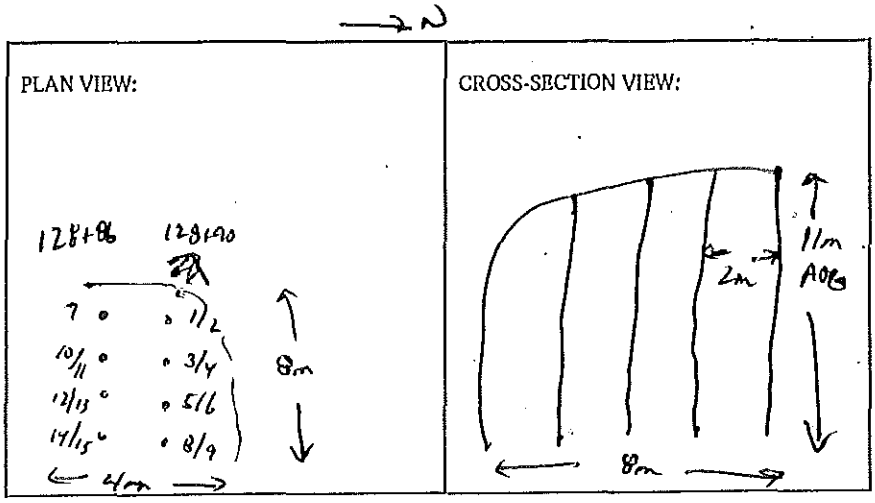
INITIATION DEVICE: (CIRCLE) EB. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rolic Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 1:01 PM
BLAST # MW-0202

HIGHWAY# 97
BLAST LOCATION AT: STN 128+86 - 128+96 CS (no submode)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot noticed

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 8.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.9 (m)
TOTAL DEPTH 63 (m)

TOTAL NUMBER OF HOLES 36/1/2 bs ffer/2 skh/2 read
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS: 2x16" Dynamine + 200gr det cord to 4' collar in 6//
2x16" Bronex in Buffer holes

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 80
TOTAL NUMBER OF DELAYS 12

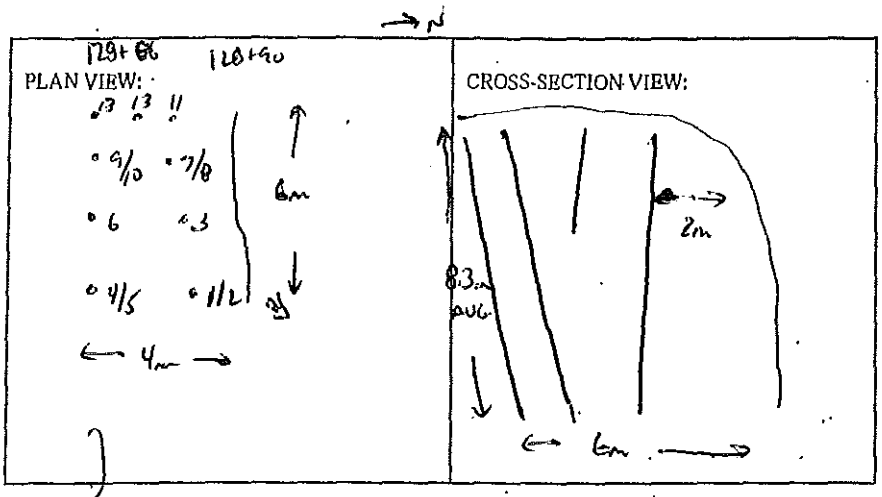
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Clifton Ct. 0.12 ips / 24 1/2
@ 13117 Clifton Ct. 0.43 ips / 51 1/2

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED May 22/12
PROPOSED BLAST DATE May 22/12
BLAST # MW-0202

HIGHWAY# 97
BLAST LOCATION AT: STN 128+86 - 128+90 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 68 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 3
PROPOSED AVG. DEPTH 8.3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8.9 (m)
PROPOSED TOTAL DEPTH 63 (m)
PROPOSED APPROX. NO. OF HOLES 3 bll / 2 buffer / 2 sub b / 2 Reno
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS: 2x16 Dynamite + 200gm det. cord to 4' collar in bll
2x10 Blasters in buffer holes

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 12
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

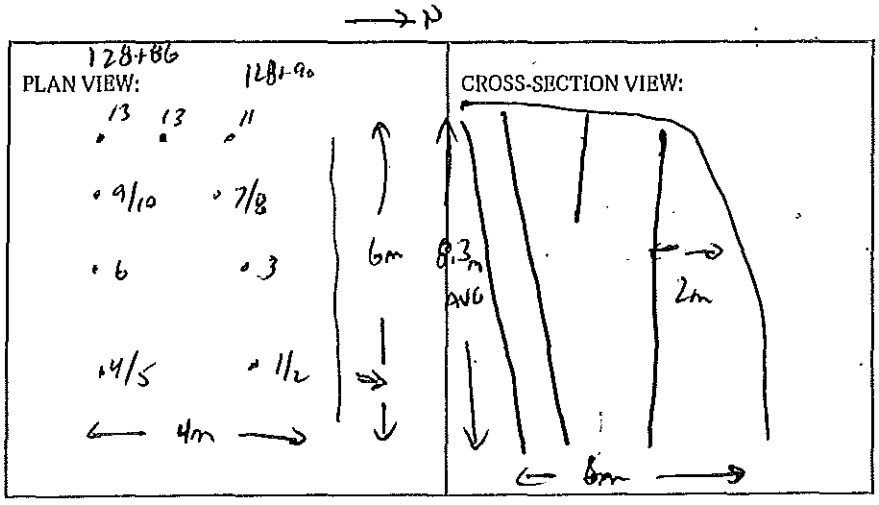
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-H S 580 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834487

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 2:16PM
BLAST # MJ-0203

HIGHWAY# 97
BLAST LOCATION AT: 128+74-128+80 Blast to Level Bench.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Augen Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 22 (m)

TOTAL NUMBER OF HOLES 10 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

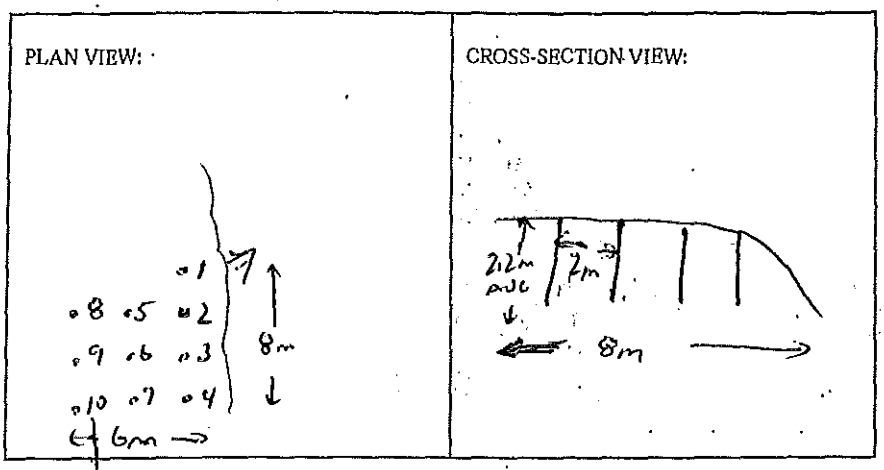
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Clifftop Crt - No trigger (< 0.04 ips)
@ 13117 Clifftop Crt - 0.087 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED May 22/12
PROPOSED BLAST DATE May 22/12
BLAST # MW-0203

HIGHWAY # 97
BLAST LOCATION AT: 128+74 - 128+80 Blast to Level Bench

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 2.2 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.5 (m)
PROPOSED TOTAL DEPTH 22 (m)
PROPOSED APPROX. NO. OF HOLES 10 Per
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

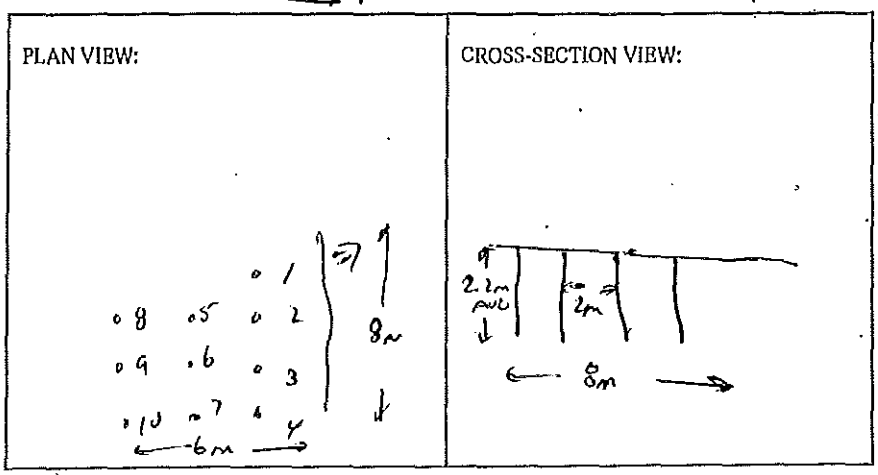
EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 50 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 11/12 3:19 PM
BLAST # NW-0204

HIGHWAY # 97
BLAST LOCATION AT: 128+70 - 129+74 Blast To Level Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: We shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 41 (m)

TOTAL NUMBER OF HOLES 17 Proo
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

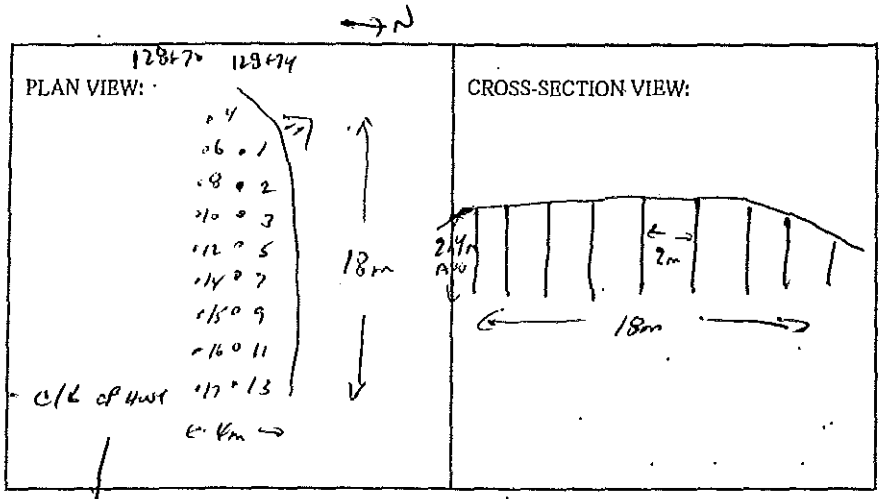
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Ct - No Trigger (< 0.04 ips)
@ 13117 Cliffstone Ct - 0.079 ips / 57 Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 22/12
PROPOSED BLAST DATE May 22/12
BLAST # MW-0204

HIGHWAY # 97
BLAST LOCATION AT: STN 128+70 - 128+74 - Blast to Level Bench

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 2.4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 2.5 (m)
PROPOSED TOTAL DEPTH 41 (m)

PROPOSED APPROX. NO. OF HOLES 17 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 17
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 203 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

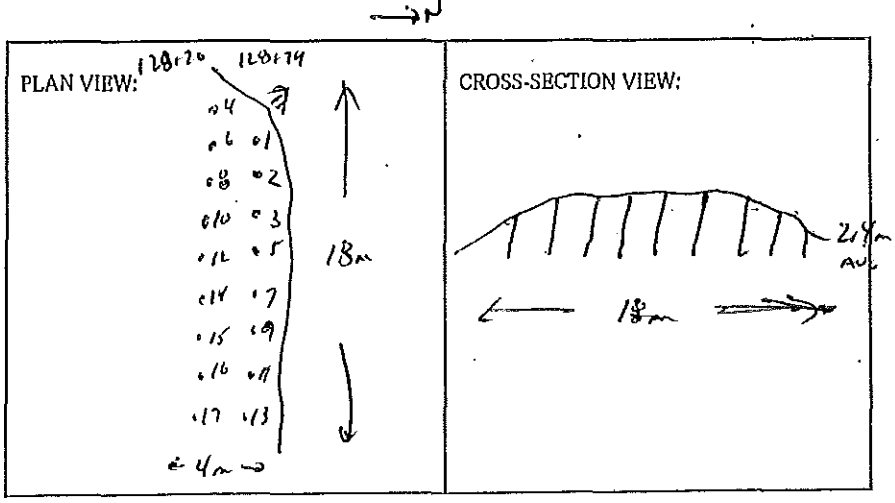
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP5380 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED May 23/12
ACTUAL BLAST DATE May 23/12 10:09 AM
BLAST # MW-0205

HIGHWAY# 97
BLAST LOCATION AT: 128+66 to #128+70 (Blast to Lower Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shotcrete

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alaska Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ALL
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 12 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

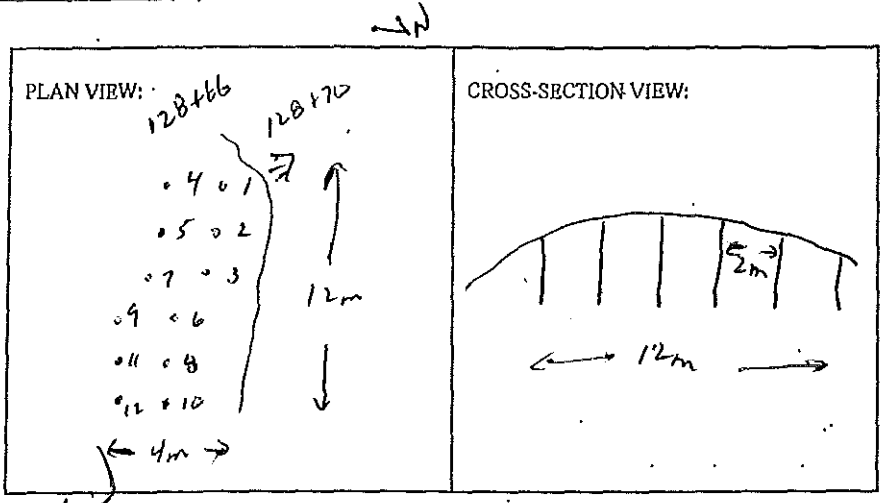
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 C1; ffstone cut - 0.055 ips/ 39Hz
@ 13117 C1; ffstone cut - 0.070 ips/ 43Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED May 23/12
PROPOSED BLAST DATE May 23/12
BLAST # MW-0205

HIGHWAY # 97
BLAST LOCATION AT: 128+66 - 128+70 (Blast to Lower Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 2.7 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 12 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 80 caps

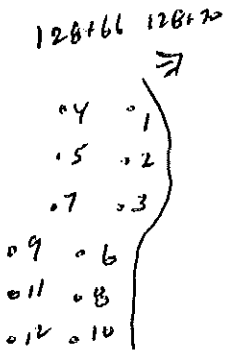
APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

PROPOSED BLAST SKETCH:

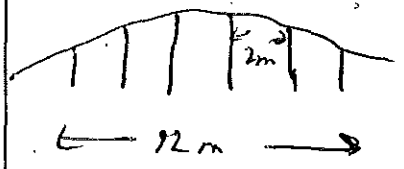
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED MAY 23/12
ACTUAL BLAST DATE MAY 23/12 11:18AM
BLAST # MW-02c16

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128+66 (Blast to Level Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 16 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

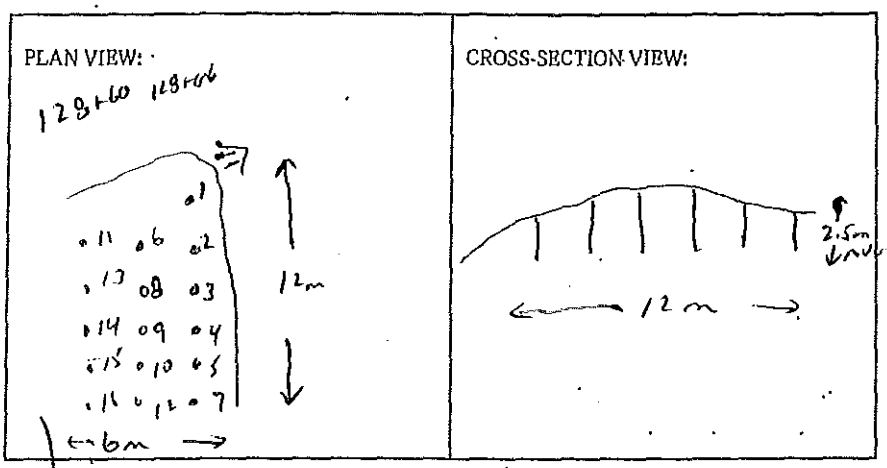
INITIATION DEVICE: (CIRCLE) ~~EB CAPS~~ SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - No trig (< 0.04 ips)
" @ 13117 Cliffstone Cut - 0.066 ips 57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3409

DATE PREPARED MAY 23/12
PROPOSED BLAST DATE MAY 23/12
BLAST # MW-0206

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128+66 (Blast to Level Berm)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.7 (m)
PROPOSED TOTAL DEPTH 40 (m)
PROPOSED APPROX. NO. OF HOLES 16 Proa.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 16
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

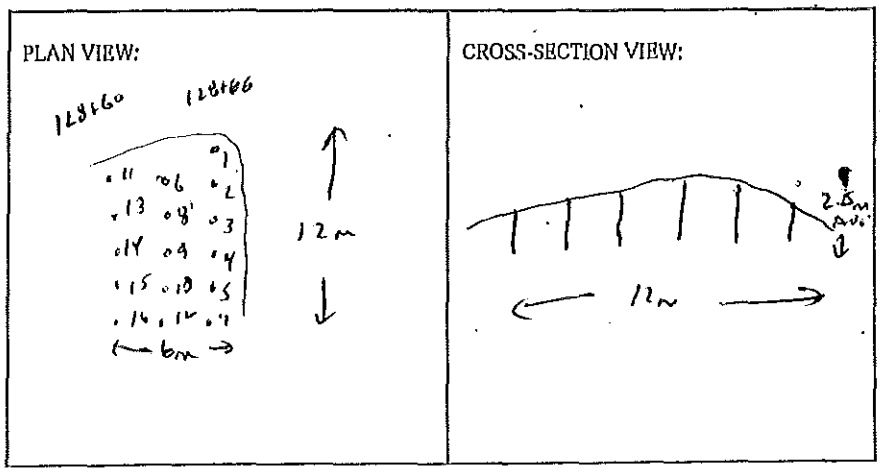
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-B330 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAY 23/12
PROPOSED BLAST DATE MAY 23/12
BLAST # NW-0207

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128+46 Blast to Level Bench

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 2.7 (m)
PROPOSED TOTAL DEPTH 50 (m)

PROPOSED APPROX. NO. OF HOLES 20 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

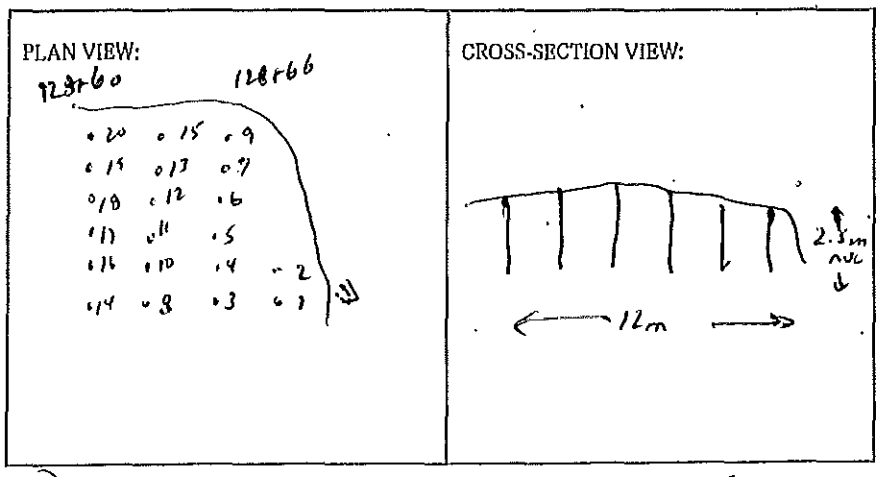
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-T5320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 160 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darrell Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 24/12
ACTUAL BLAST DATE May 24/12
BLAST # MW-0208

HIGHWAY # 97
BLAST LOCATION AT: 128+34 - 128+60 (Blast to Lever Board)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 43 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

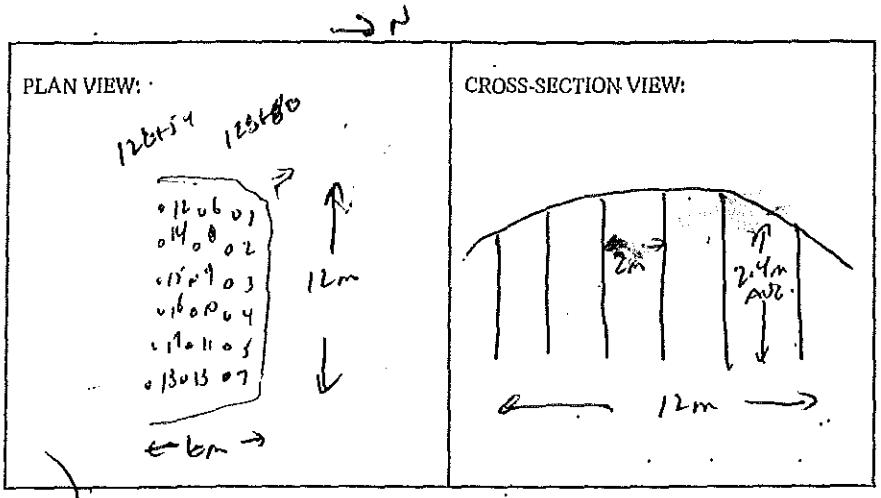
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt.
" @ 13117 Cliffstone Crt.

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 24/12
PROPOSED BLAST DATE May 24/12
BLAST # MW-0208

HIGHWAY # 97
BLAST LOCATION AT: STN 128+54 - 128+60 (Bench to Lower Bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 2.4 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.6 (m)
PROPOSED TOTAL DEPTH 43 (m)
PROPOSED APPROX. NO. OF HOLES 18 Proo
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 18
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

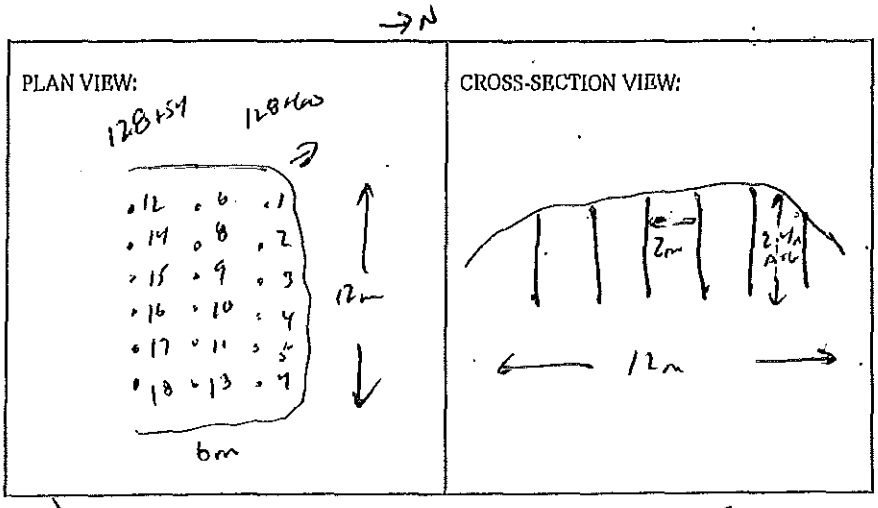
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HPS 810 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED May 24/12
ACTUAL BLAST DATE May 24/12
BLAST # MW-0209

HIGHWAY # 97
BLAST LOCATION AT: 128+36 - 128+42

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shotcrete

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.8 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 26 mm by 200 mm
TOTAL WEIGHT 48 (kg)
DELAY TYPE AND LENGTH _____ (ms)

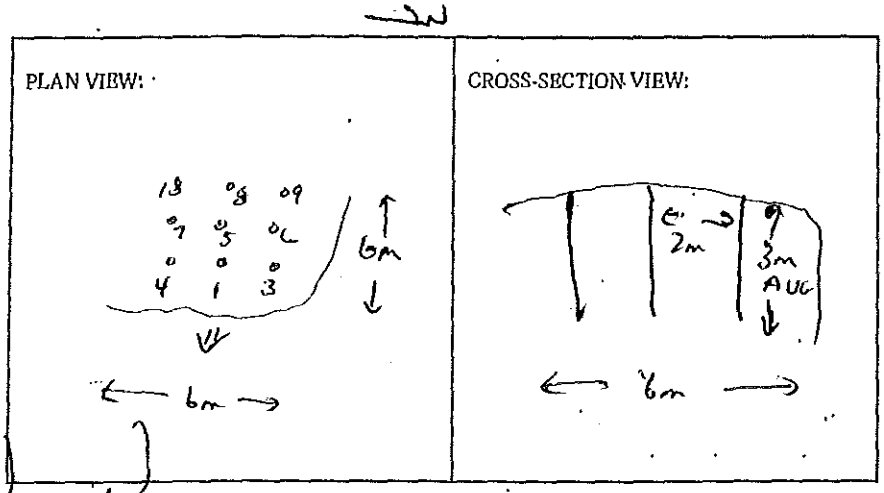
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone cut -
@ 13117 Cliffstone cut -

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 24/12
PROPOSED BLAST DATE May 24/12
BLAST # MW-0209

HIGHWAY # 97
BLAST LOCATION AT: STN 126+38 – 128+42

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.8 (m)
PROPOSED TOTAL DEPTH 27 (m)

PROPOSED APPROX. NO. OF HOLES 9,900.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 48 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-I-B 500 CAPACITY 500 CAPS

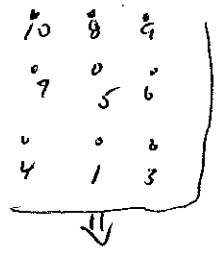
APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

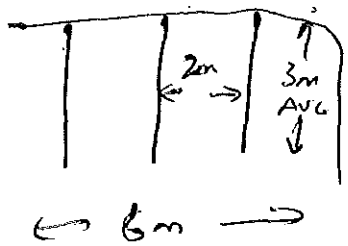
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FLEGER SIGNATURE _____ COMPANY FLEGER ROCK ENG.

BLASTER'S SIGNATURE _____ COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 25/12
ACTUAL BLAST DATE May 25/12 10:09 AM
BLAST # MW-0410

HIGHWAY # 97
BLAST LOCATION AT: 128+30 - 128+36

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alaskan Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 6 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

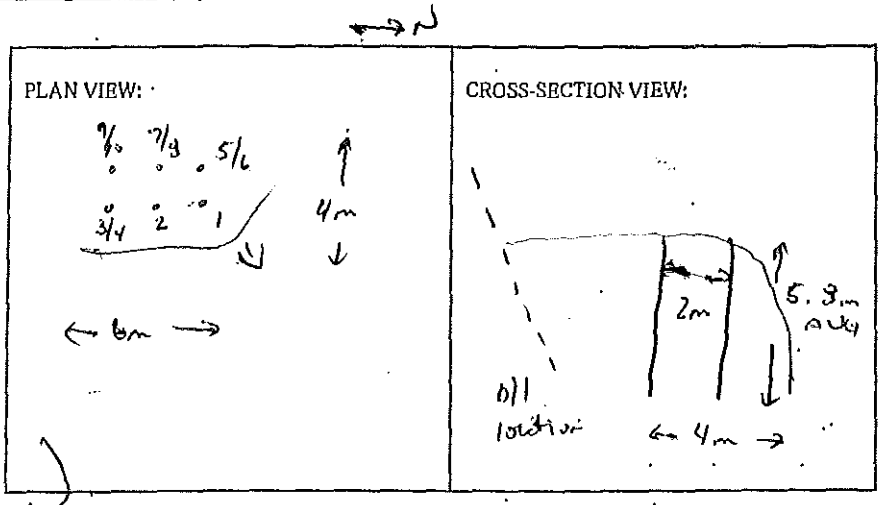
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 125 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone crt. 0.61 ips / 5 Hz
" @ 13117 Cliffstone crt. 0.21 ips / 34 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834 09

DATE PREPARED May 25/12
PROPOSED BLAST DATE May 25/12
BLAST # MW-0210

HIGHWAY # 97
BLAST LOCATION AT: 128+30 - 128+36

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 5.8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.2 (m)
PROPOSED TOTAL DEPTH 35 (m)

PROPOSED APPROX. NO. OF HOLES 6 Proo.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

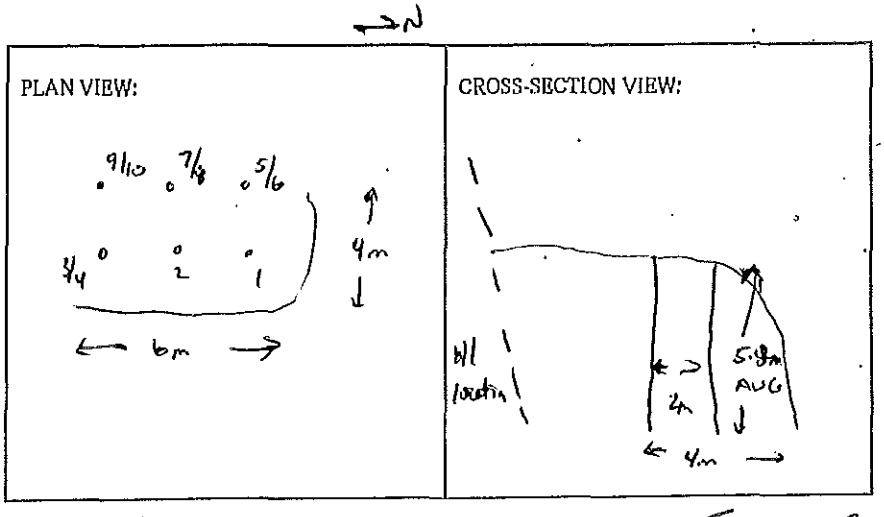
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HIS 50 CAPACITY 50 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 125 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED MAY 25/12
ACTUAL BLAST DATE MAY 26/12 12:46 PM
BLAST # MW-0211

HIGHWAY # 97
BLAST LOCATION AT: STA 1281+80 - 1281+86

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 12 Reqd.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

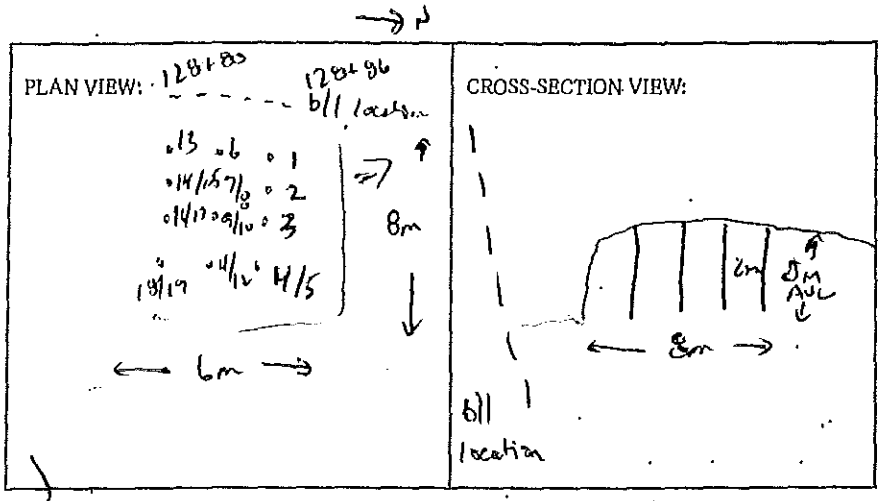
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13187 Cliffstone Crt 0.22 ips / 30 Hz
" 13167 Cliffstone Crt 0.090 ips / 23 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED May 25/12
PROPOSED BLAST DATE May 25/12
BLAST # MLW-0211

HIGHWAY# 97
BLAST LOCATION AT: SBD 128+80 - 128+86

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5.2 (m)
PROPOSED TOTAL DEPTH 60 (m)

PROPOSED APPROX. NO. OF HOLES 12 Proo.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 19

EXPLOSIVE SIZE 25 mm by 250 mm
APPROX. TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

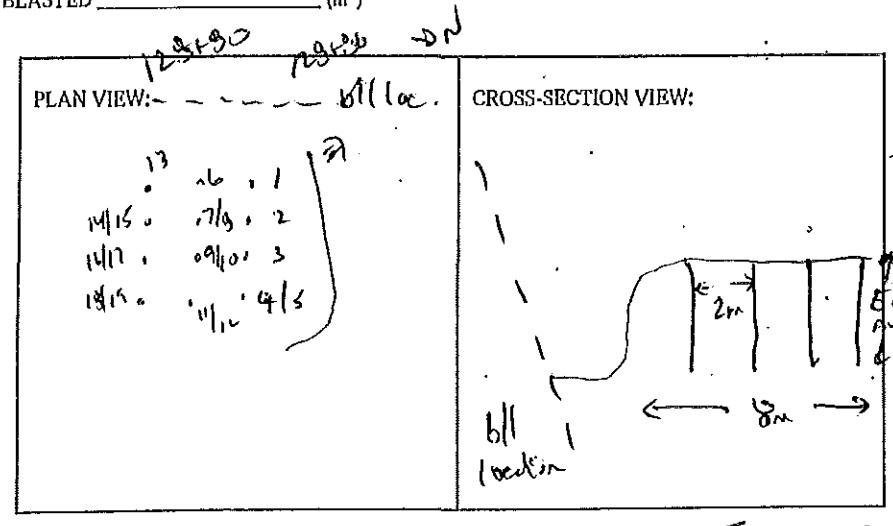
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE LIBS 810 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 28/12
ACTUAL BLAST DATE May 28/12 1:04PM
BLAST # MW-0212

HIGHWAY # 97
BLAST LOCATION AT: 128+76 - 128+80 2nd Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 8 per / 2 strs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

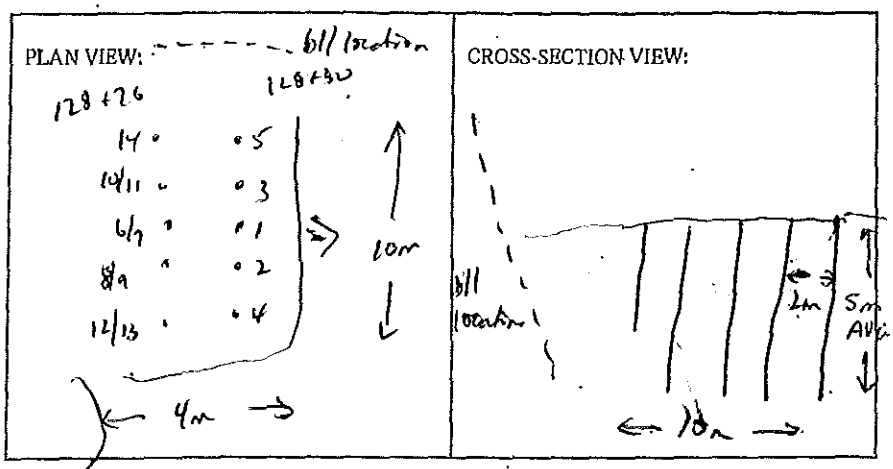
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~HB320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs 13167 Cliffston Ct - NOT RECORDED (< 0.09 ips)
@ 13117 Cliffston Ct - 0.18 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED May 28/12
PROPOSED BLAST DATE May 28/12
BLAST # MW-0212

HIGHWAY # 97
BLAST LOCATION AT: SB 128+76 - 128+80

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.3 (m)
PROPOSED TOTAL DEPTH 46 (m)
PROPOSED APPROX. NO. OF HOLES 8 Pcs / 2 Sets
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14
EXPLOSIVE SIZE 25 mm by 203 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

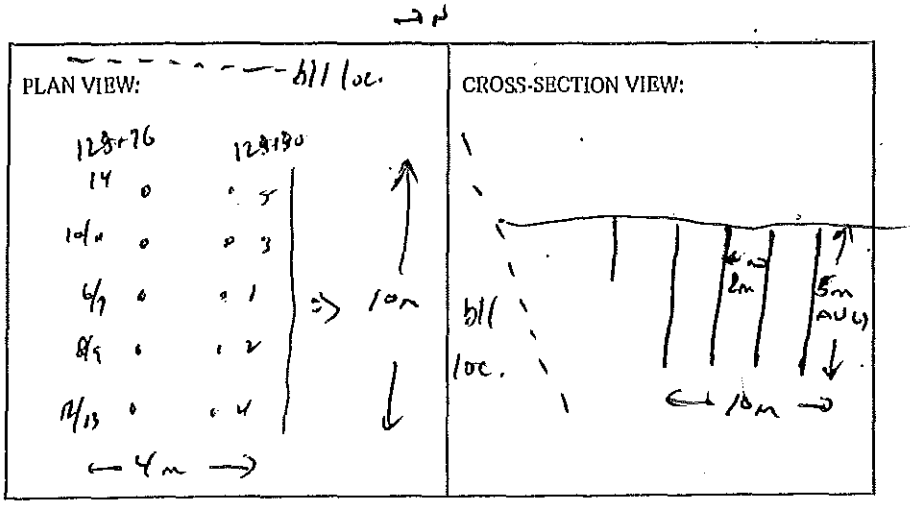
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-330 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darin Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sterritt Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 553489

DATE PREPARED May 28/12
ACTUAL BLAST DATE May 28/12 11:30AM
BLAST # MW-0213

HIGHWAY# 97
BLAST LOCATION AT: 128+76 - 128+30 LS Bench #2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
up slot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 6 bll / 5 buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 2" DYNAMITE + 200gr det cord to 4' collar in bll

EXPLOSIVE TYPE 1" DYNAMITE + 2"x16" BLASTEX EXPLOSIVE SIZE 50 mm by 408 mm
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 9
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

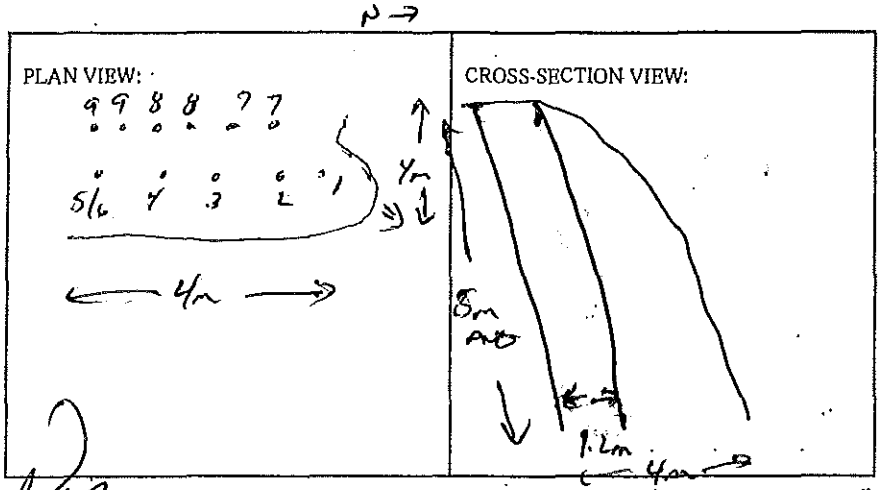
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sterritt Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Clifton Ck - 0.11 ips / 34 Hz
@ 13117 Clifton Ck - 0.25 ips / 5 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 28/12
PROPOSED BLAST DATE May 29/12
BLAST # MW-0213

HIGHWAY# 97
BLAST LOCATION AT: SW 128+76 - 128+80 LS (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.2 (m)
PROPOSED TOTAL DEPTH 55 (m)
PROPOSED APPROX. NO. OF HOLES 66/11 + 5 buffer
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 Case 2x16 Dynamite + 200gr det cord 64' collar in 61/

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + 2x16" Blasters
APPROX. NUMBER OF CARTRIDGES 34
PROPOSED NUMBER OF DELAYS _____
EXPLOSIVE SIZE 50 mm by 408 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

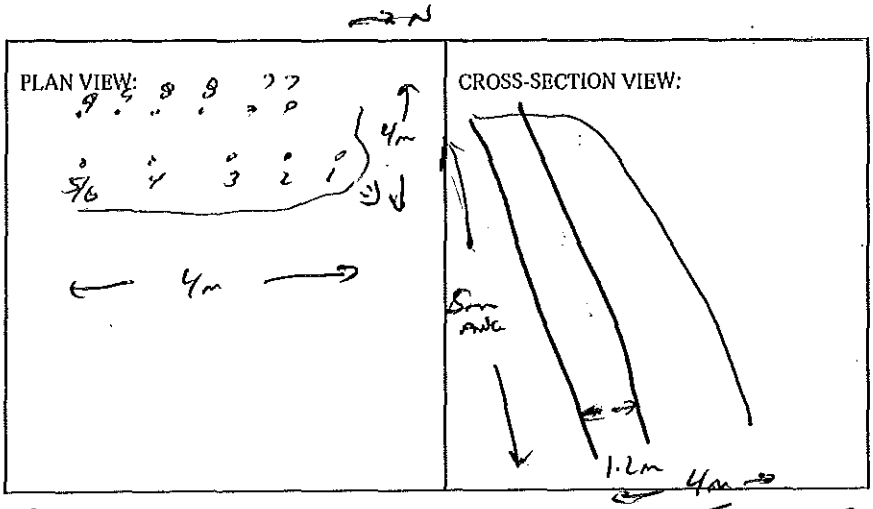
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 580 CAPACITY 50 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED May 20/12
ACTUAL BLAST DATE May 24/12 10:05 AM
BLAST # MW-024

HIGHWAY# 97
BLAST LOCATION AT: 128+70 - 128+76 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: N/A Not notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 59 (m)

TOTAL NUMBER OF HOLES 12 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

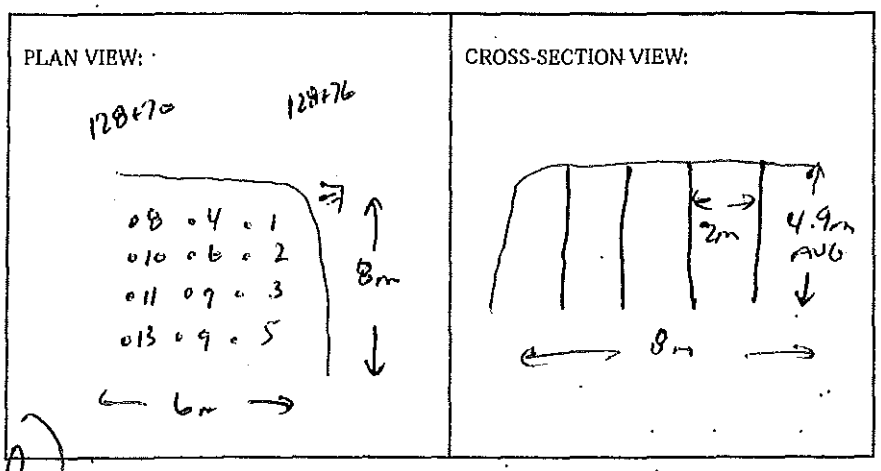
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 225 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Ctr. - NO Reading - Seismograph Turned off.
" @ 13117 Cliffstone Ctr - 0.181 ips / 57Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5934189

DATE PREPARED May 29/12
PROPOSED BLAST DATE May 29/12
BLAST # MW-0214

HIGHWAY # 97
BLAST LOCATION AT: STN 128+70 - 128+76 Bench 2

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/C
PROPOSED AVG. DEPTH 4.9 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 59 (m)

PROPOSED APPROX. NO. OF HOLES 12 Prop.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Pumalite + ANFO
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 60 CAPS

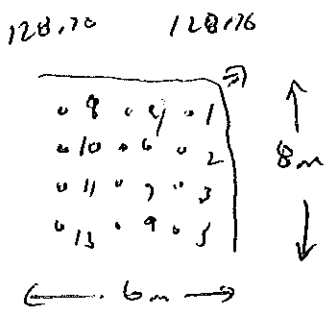
APPROX. VOLUME OF ROCK TO BE BLASTED 225 (m^3)

PROPOSED BLAST SKETCH:

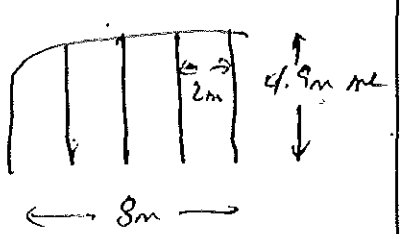
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 29/12
ACTUAL BLAST DATE May 29/12 12:05PM
BLAST # MW-D125

HIGHWAY# 97
BLAST LOCATION AT: STN 128+70 - 128+76 LS Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 93 (m)

TOTAL NUMBER OF HOLES 5 Prod / 3 Stabs / 3 Buffer / 6 B/L
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 2x16 Blasters in Buffer Holes / 2x16 Dynamite + 200gr. cut around to 4' collar in B/L

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

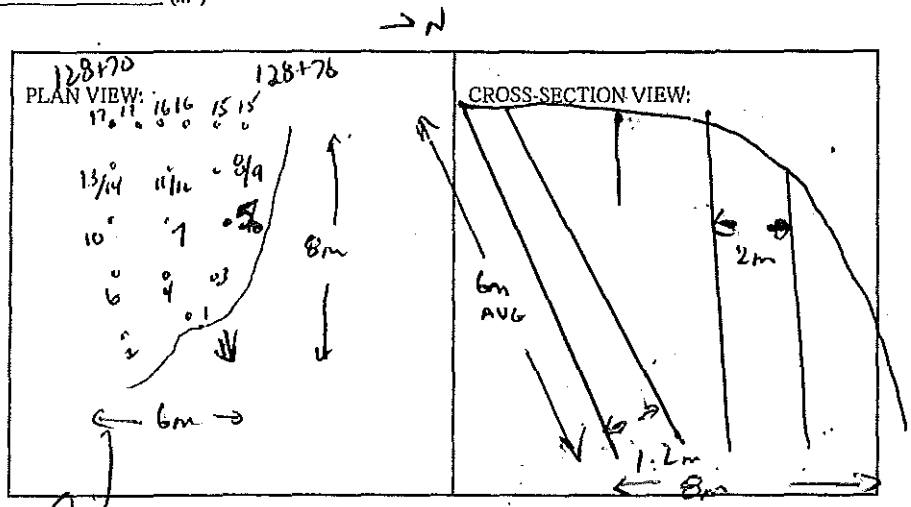
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffside Crt - No Reading - Seismograph turned off.
" @ 13117 Cliffside Crt - 0.44 ips / 57 1/2

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934 09

DATE PREPARED May 29/12
PROPOSED BLAST DATE May 29/12 12:55 PM
BLAST # MW-0125

HIGHWAY# 97
BLAST LOCATION AT: STN 128+70 - 128+76 LS BENCH 2

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES ~~NIL~~ 6
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 6.4 (m)
PROPOSED TOTAL DEPTH 93 (m)

PROPOSED APPROX. NO. OF HOLES 5 PROD / 35 STMD / 3 BUFFER / 6 B/L
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ ~~HORIZ.~~ VARIABLE

PROPOSED BLAST DETAILS: 2X16" BLASTER IN BUFFER HOLES / 2X16 DYNAMITE + 200g + cut down to 4' collar in B/L.

EXPLOSIVE TYPE 1/4 DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 17
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

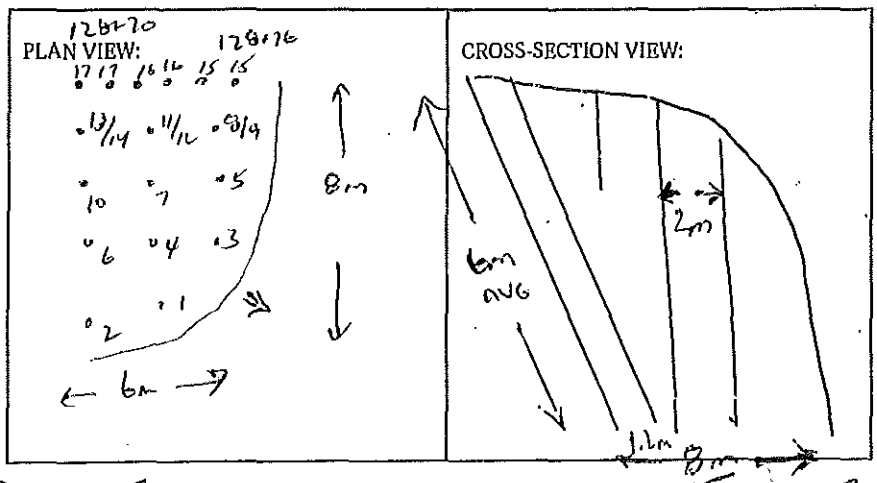
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-15320 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5837489

DATE PREPARED May 29/12
ACTUAL BLAST DATE May 29/12 3:39 PM
BLAST # MW-0126

HIGHWAY # 97
BLAST LOCATION AT: Stn 12864 - 12870 c/l Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 160 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.4 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 12 Pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 12

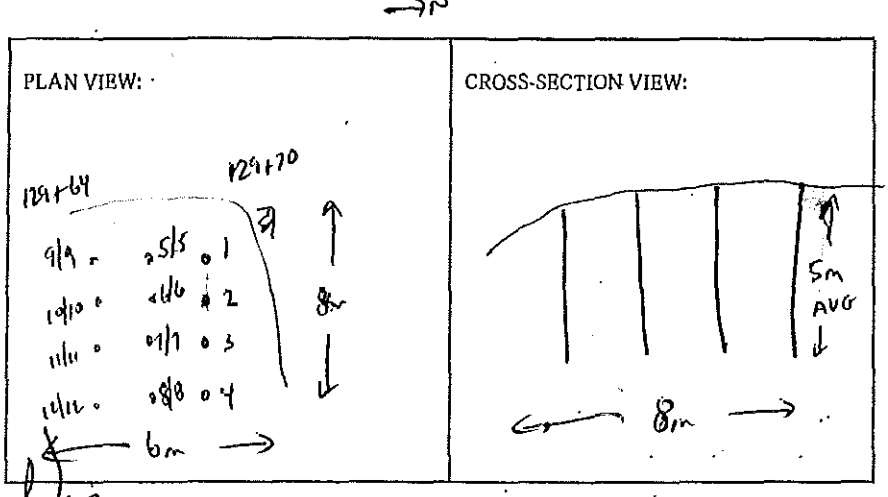
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 C/L ffStone Crt - No Reading - Seismograph turned off
@ 13817 C/L ffStone Crt. 0.34 ips/64 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B34B9

DATE PREPARED MAY 29/12
PROPOSED BLAST DATE May 29/12
BLAST # MW-0126

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+64 - 128+70 c/L 2nd Bench

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5.4 (m)
PROPOSED TOTAL DEPTH 60 (m)

PROPOSED APPROX. NO. OF HOLES 12 Per R.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE _____ mm by _____ mm
APPROX. TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

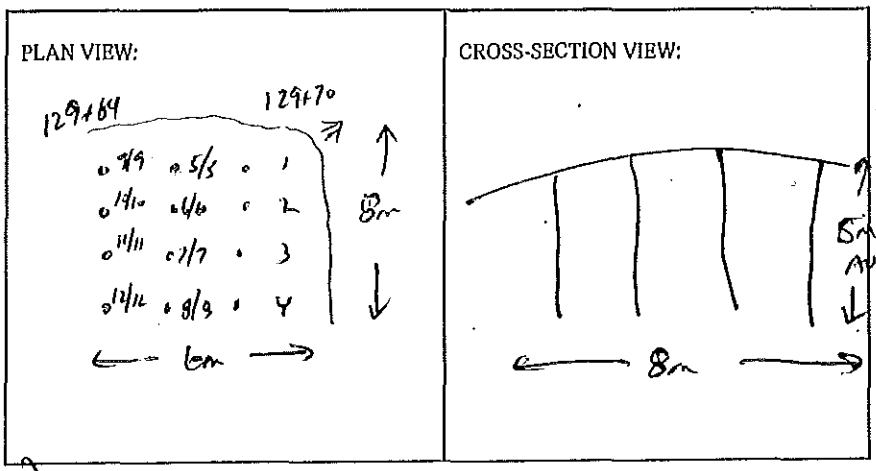
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 240 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 10:52 AM
BLAST # MW-0217

HIGHWAY# 97
BLAST LOCATION AT: Sta 127+85 (High spot in SG)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 1.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.8 (m)
TOTAL DEPTH 14.4 (m)

TOTAL NUMBER OF HOLES 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 4 (8 x .5)
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

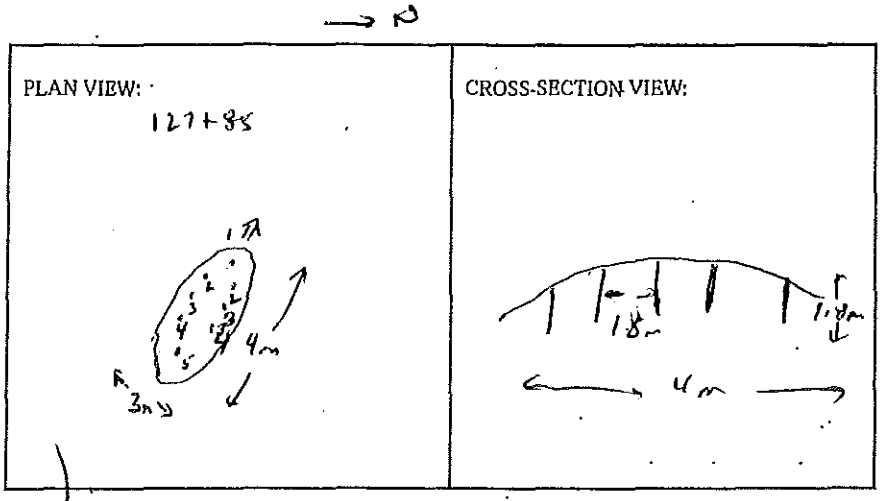
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HH320 CAPACITY: 80 Caps

VOLUME OF ROCK BLASTED 2 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt. - 0.100 ips/5 Hz
@ 13117 Cliffstone Crt - No Trig (< 0.04 ips)

* Seismograph at 13073 was located approx mid-way to structure from blast area. - Landscapers working @ 13073 w/ Bobcat & Labourers - Geo-Phone sandbagged on bedrock about 30m SE of structure

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED May 30/12
PROPOSED BLAST DATE May 30/12
BLAST # MW-0217

HIGHWAY# 97
BLAST LOCATION AT: STA 127+85 (High spot 1050)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 1.8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 1.8 (m)
PROPOSED TOTAL DEPTH 14.4 (m)

PROPOSED APPROX. NO. OF HOLES 8 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 4 (8 x 0.5)
PROPOSED NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

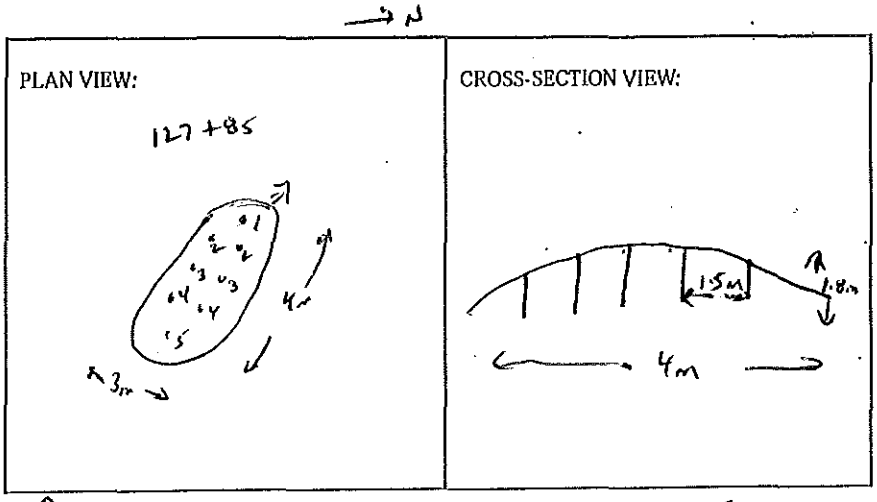
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328@ CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 2 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED MAY 30/12
ACTUAL BLAST DATE MAY 30/12 11:08 AM
BLAST # NW-0218

HIGHWAY # 97
BLAST LOCATION AT: SW 127+95 - 128+05 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 45 (9 x 0.5)
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

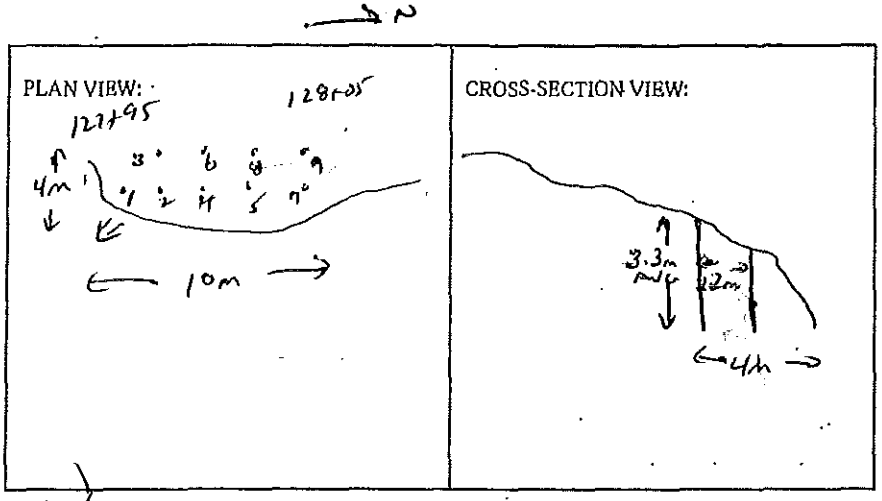
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.94 ips/64 Hz *
" @ 13117 Cliffstone Crt - 0.12 ips/47 Hz

* Seismograph @ 13073 located as per previous shot *

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 30/12
PROPOSED BLAST DATE MAY 31/12
BLAST # MW-0218

HIGHWAY # 97
BLAST LOCATION AT: SW 127+95 - 128+05 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3.3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3.5 (m)
PROPOSED TOTAL DEPTH 30 (m)
PROPOSED APPROX. NO. OF HOLES 9 Pass.
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumalite & ANFO
APPROX. NUMBER OF CARTRIDGES 4.5 (9 x 0.5)
PROPOSED NUMBER OF DELAYS 9
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

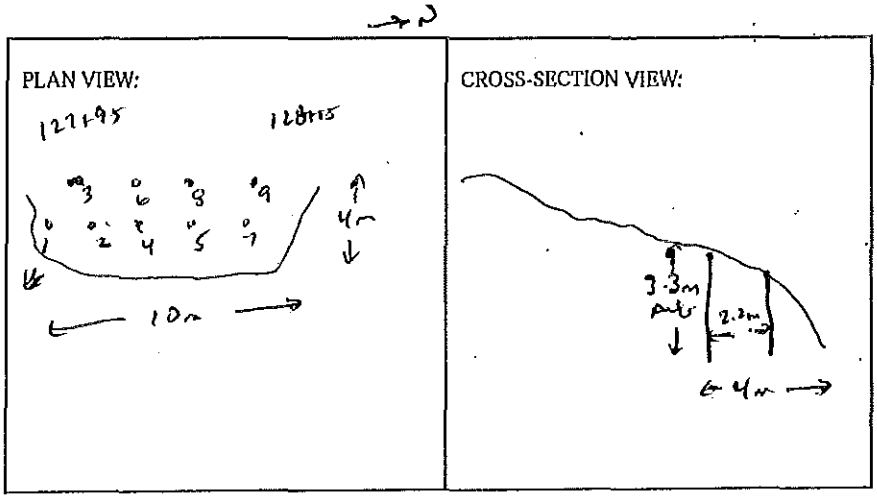
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrell Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne V COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831/89

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 12:27 PM
BLAST # MW-0219

HIGHWAY# 97
BLAST LOCATION AT: SB 128+05 - 128+15 to subgrade

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 4.0 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 44 (m)

TOTAL NUMBER OF HOLES 11 PROD
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5.5 (11 x 0.5)
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

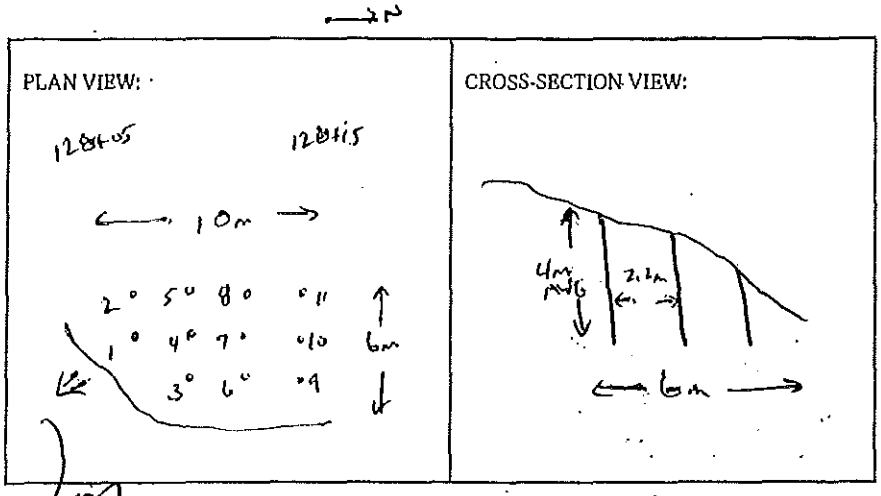
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 1.02 ips / 47 Hz *
@ 13117 Cliffstone Crt - 0.14 ips / 47 Hz

* Seismograph @ 13073 located as per previous shot *

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 30/12
PROPOSED BLAST DATE May 30/12
BLAST # MW-0219

HIGHWAY # 97
BLAST LOCATION AT: 128+05 - 129+15 TO Subgrade

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4.5 (m)
PROPOSED TOTAL DEPTH 44 (m)

PROPOSED APPROX. NO. OF HOLES 11 Prod
HOLE DIA. 89 (mm)
APPROX. HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 5.5 (Hydro)
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 450 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 520 CAPACITY 80 caps

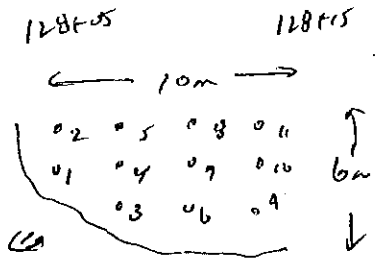
APPROX. VOLUME OF ROCK TO BE BLASTED 240 (m^3)

PROPOSED BLAST SKETCH:

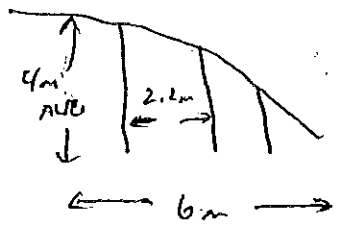
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 11:53 AM
BLAST # MW-0201

HIGHWAY # 97
BLAST LOCATION AT: 128+82 - 128+86

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 8.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

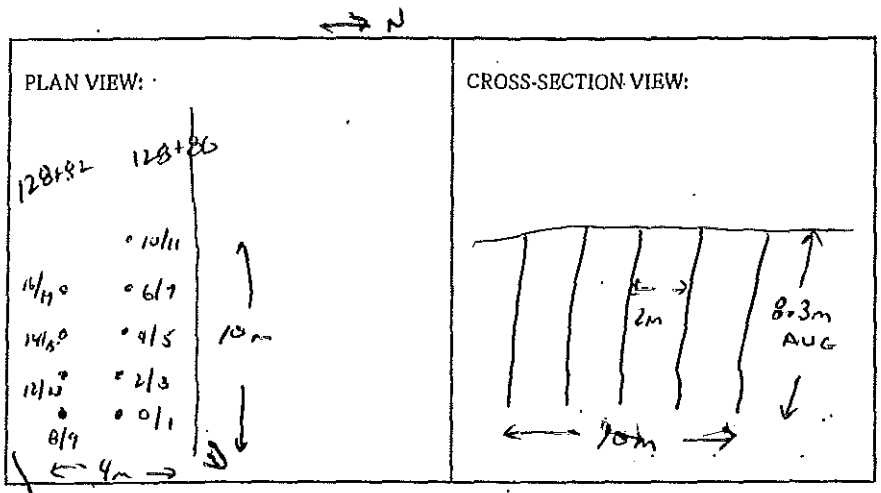
INITIATION DEVICE: (CIRCLE) (E.B. CAP) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1316 Cliffstone Crt - 0.22 ips / 32 Hz
@ 1811 Cliffstone Crt - 0.48 ips / 57 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED May 22/12
PROPOSED BLAST DATE May 22/12
BLAST # MW-0201

HIGHWAY# 97
BLAST LOCATION AT: 128+82 - 128+86

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 8.3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 30 (m)
PROPOSED APPROX. NO. OF HOLES 9 Proposed
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL. (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 18
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

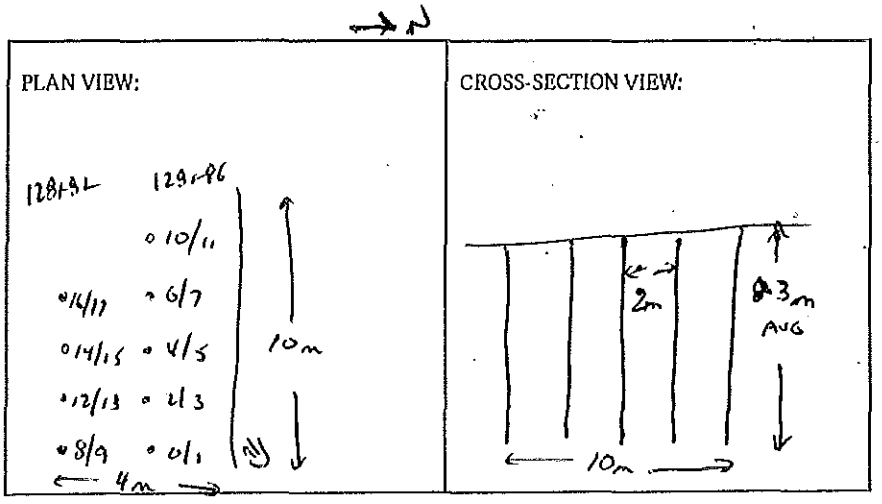
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED May 22/12
PROPOSED BLAST DATE May 22/12
BLAST # MW-0202

HIGHWAY# 97
BLAST LOCATION AT: STN 128+86 - 128+90 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 68 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 3
PROPOSED AVG. DEPTH 8.3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8.9 (m)
PROPOSED TOTAL DEPTH 63 (m)
PROPOSED APPROX. NO. OF HOLES 3 bll / 2 buffer / 2 sub b / 2 Reno
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS: 2x16 Dynamite + 200gm det. cord to 4' collar in bll
2x10 Blasticy in buffer holes

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 12
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

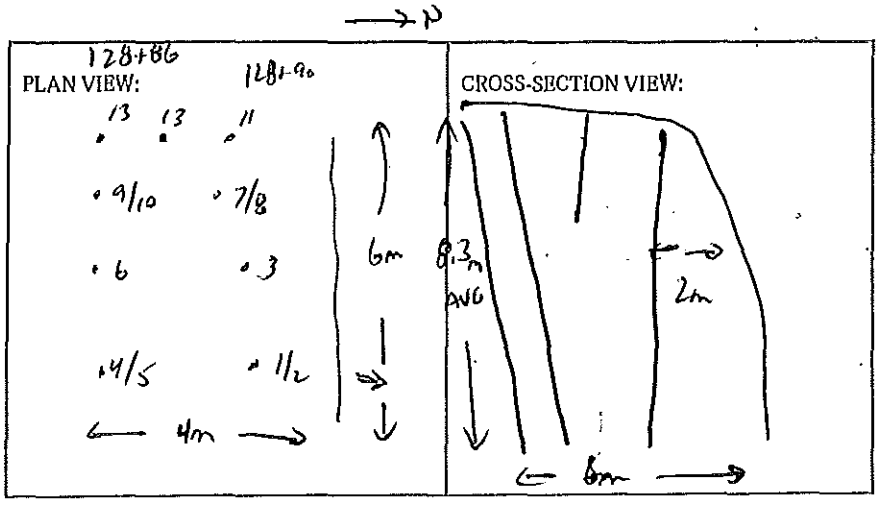
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-H S 580 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 1:43 PM
BLAST # MW-0220

HIGHWAY# 97
BLAST LOCATION AT: 127+90 - 127+95 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 3 Backrow / 7 Btm
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 2" Blasting EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 155
TOTAL NUMBER OF DELAYS 8
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

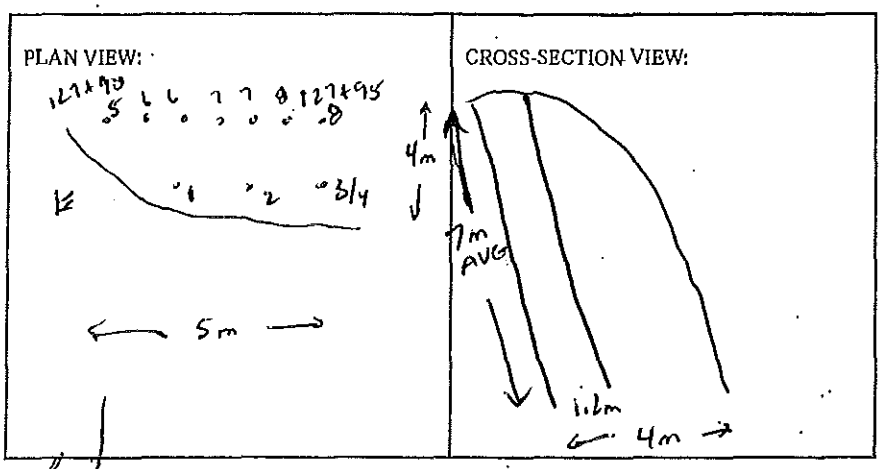
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 140 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Cnt. - 0.30 ips/43Hz *
" @ 13117 Cliffstone Cnt. - 0.067 ips/27Hz

* Seismograph @ 13073 located as per previous shot.

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3409

DATE PREPARED May 30/12
PROPOSED BLAST DATE May 31/12
BLAST # MW-0220

HIGHWAY# 97
BLAST LOCATION AT: SW 127+920 - 127+945 (To Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 58 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH 70 (m)

PROPOSED APPROX. NO. OF HOLES 3 Buffer / 7 B/L
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 3" Dynamite + 2" Binary
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 8

EXPLOSIVE SIZE 50 mm by 450 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

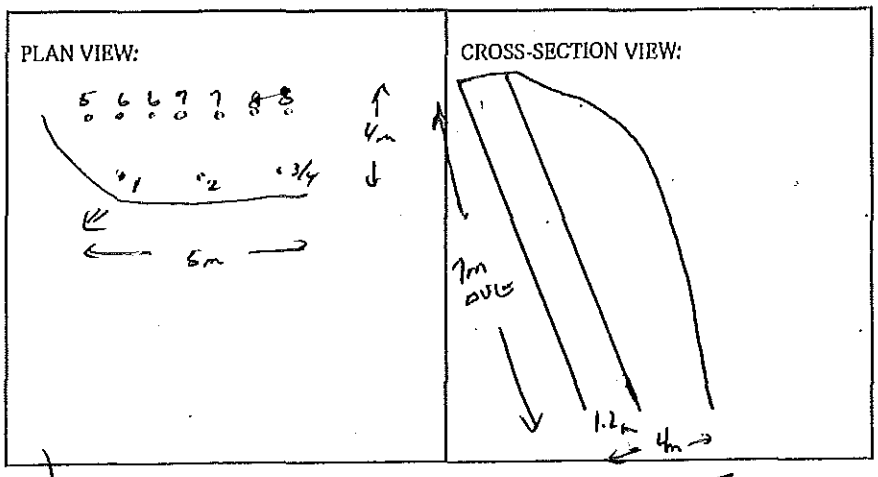
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 140 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 2:54 PM
BLAST # MW-0221

HIGHWAY # 97
BLAST LOCATION AT: Sta 127+95 - 128+00 US to Subgrade

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: *Shot notified

HEIGHT ABOVE HWY NA (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 1 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 1.3 (m)
TOTAL DEPTH 7.5 (m)

TOTAL NUMBER OF HOLES 7BL / 3 Buffer / 2 Stnd
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Magnum Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 0
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

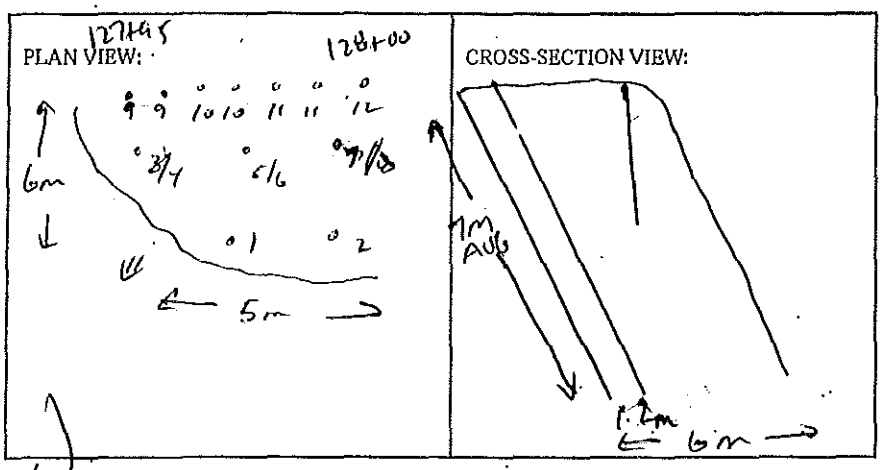
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HH5320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crk - 0.55 ips / 43Hz *
" @ 13111 Cliffstone Crk - 0.086 ips / 26Hz

Seismograph @ 13073 located as per previous shot*

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 593409

DATE PREPARED MAY 30/12
PROPOSED BLAST DATE MAY 31/12
BLAST # MW-0221

HIGHWAY # 97
BLAST LOCATION AT: STN 127+95 - 128+00 LS to Subgrade

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7.3 (m)
PROPOSED TOTAL DEPTH 75 (m)

PROPOSED APPROX. NO. OF HOLES 7BL / 3Buffer / 2STAB
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

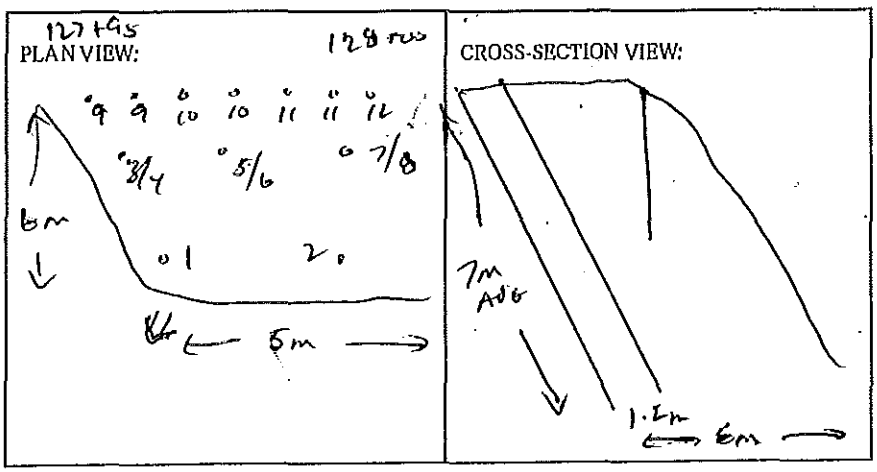
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 210 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 3:50 PM
BLAST # MW-0222

HIGHWAY# 97
BLAST LOCATION AT: STN 128+00 - 128+07 LS (10 Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 10m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 5.0 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.4 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 96/1 3BS Add/ 2 stmb
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75* (kg)
DELAY TYPE AND LENGTH 25 (ms)

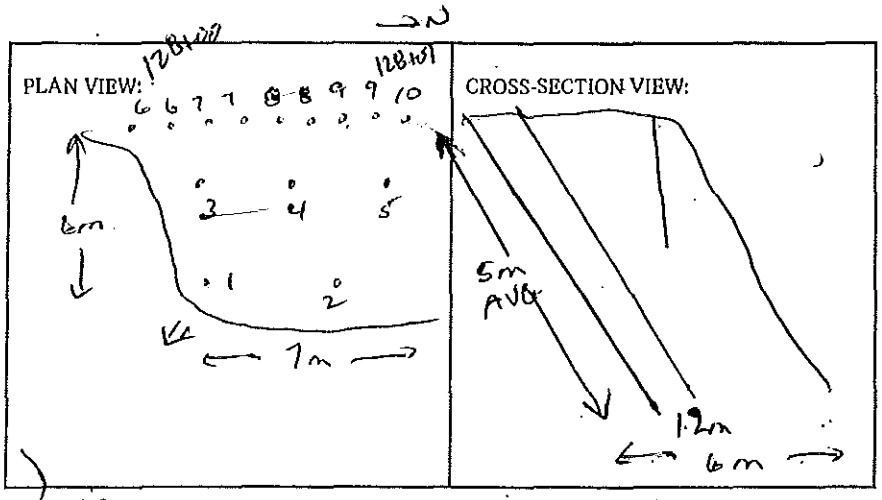
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HPB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.65 ips / 64 Hz *
@ 13117 Cliffstone Crt - 0.073 ips / 47 Hz

* Seismograph @ 13073 Located as per previous shot

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 30/11
PROPOSED BLAST DATE May 30/11
BLAST # MW-BL22

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+05 - 128+07 LS (to Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5.4 (m)
PROPOSED TOTAL DEPTH 65 (m)

PROPOSED APPROX. NO. OF HOLES 9 B/L / 3 BUFFER / 25 TAG
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

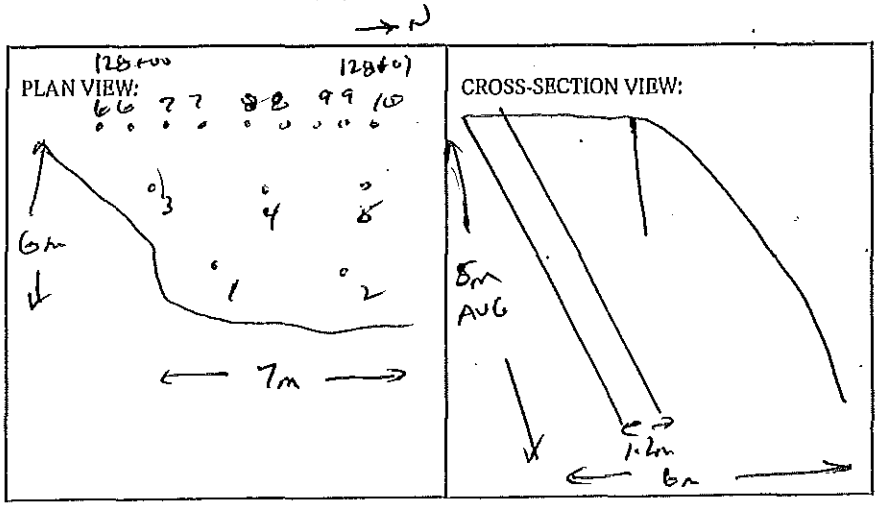
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Flieger SIGNATURE _____ COMPANY Flieger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3189

DATE PREPARED MAY 31/12
ACTUAL BLAST DATE MAY 31/12 9:44 AM
BLAST # MW-0223

HIGHWAY# 97
BLAST LOCATION AT: 128+60 - 128+64 Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shut matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 12 Proj
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 14

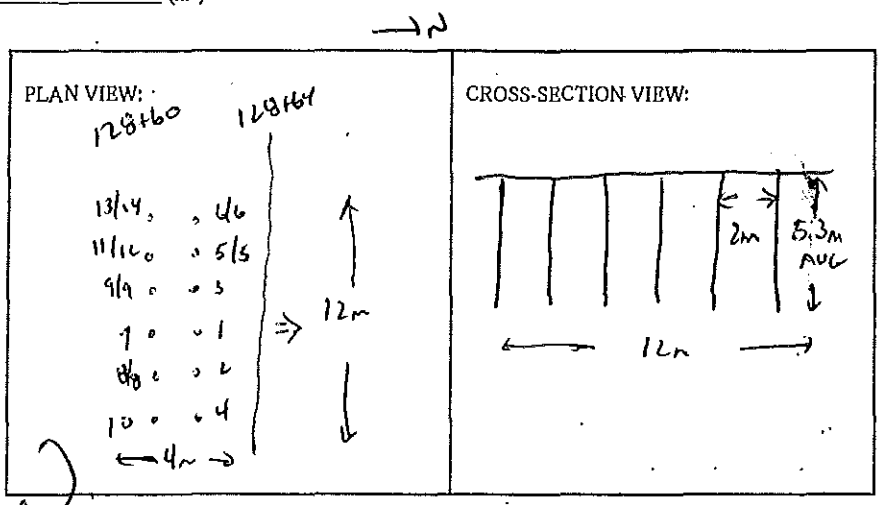
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.481 ips/ 57 Hz
& @ 13117 Cliffstone Crt - 0.29 ips/ 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED MAY 31/11
PROPOSED BLAST DATE MAY 31/11
BLAST # MW-0223

HIGHWAY # 97
BLAST LOCATION AT: STA 128+60 - 128+64

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 25 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.6 (m)
PROPOSED TOTAL DEPTH 164 (m)
PROPOSED APPROX. NO. OF HOLES 12 Peo.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

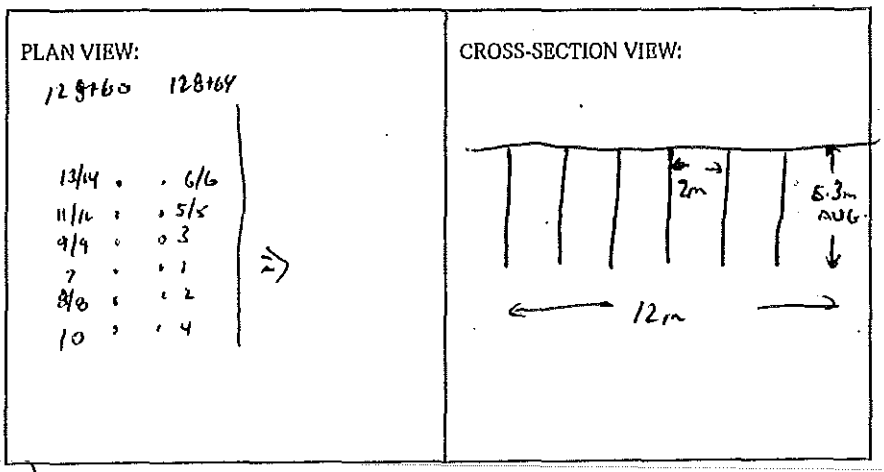
EXPLOSIVE TYPE 1" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 14
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-RS 810 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darul Flieger SIGNATURE _____ COMPANY Flieger Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAY 31/12
ACTUAL BLAST DATE MAY 31/12 11:03 AM
BLAST # MW-0224

HIGHWAY# 97
BLAST LOCATION AT: STN 128+64 - 128+70 LS BENCH 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 61 (m)

TOTAL NUMBER OF HOLES 8 BL / 40 BUFFER / 5 m²
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + 2X16 BLASTRITE
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 025 (ms)

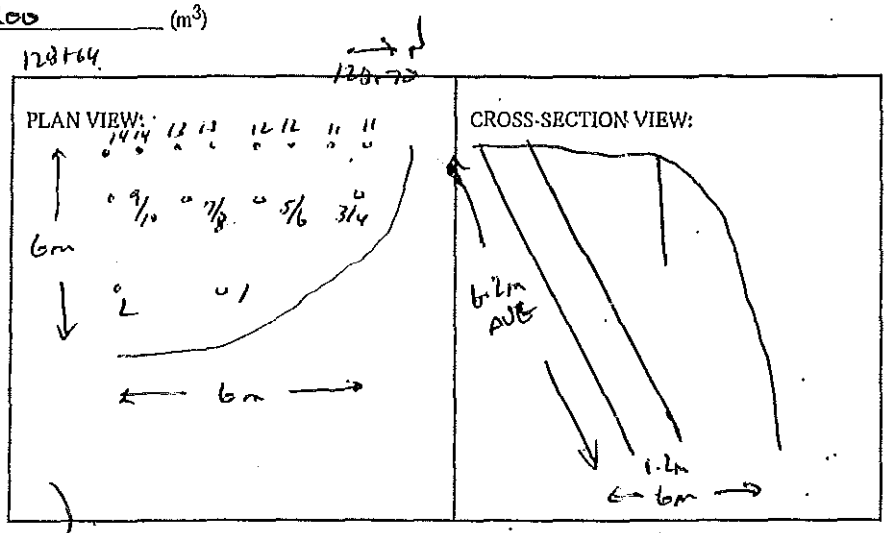
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HI 520 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.401 ips / 47 Hz
@ 13117 Cliffstone Crt - 0.21 ips / 51 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED May 31/12
PROPOSED BLAST DATE May 31/12
BLAST # MW-022-12

HIGHWAY# 97
BLAST LOCATION AT: STA 128+64 - 128+70 LS Bench 2

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 6.2 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.4 (m)
PROPOSED TOTAL DEPTH 81 (m)

PROPOSED APPROX. NO. OF HOLES 8 BL/L / 4 Bottom / 2 Stmp
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Blasty
APPROX. NUMBER OF CARTRIDGES 36
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

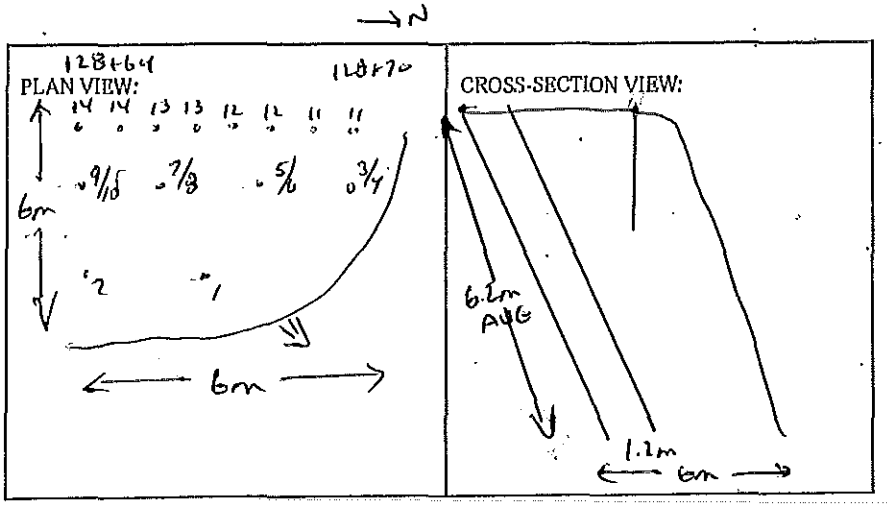
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 90 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834187

DATE PREPARED MAY 31/12
ACTUAL BLAST DATE MAY 31/12 12:53 PM
BLAST # MW-0225

HIGHWAY# 97
BLAST LOCATION AT: STA 1291+17 - 1291+25 RS (N Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

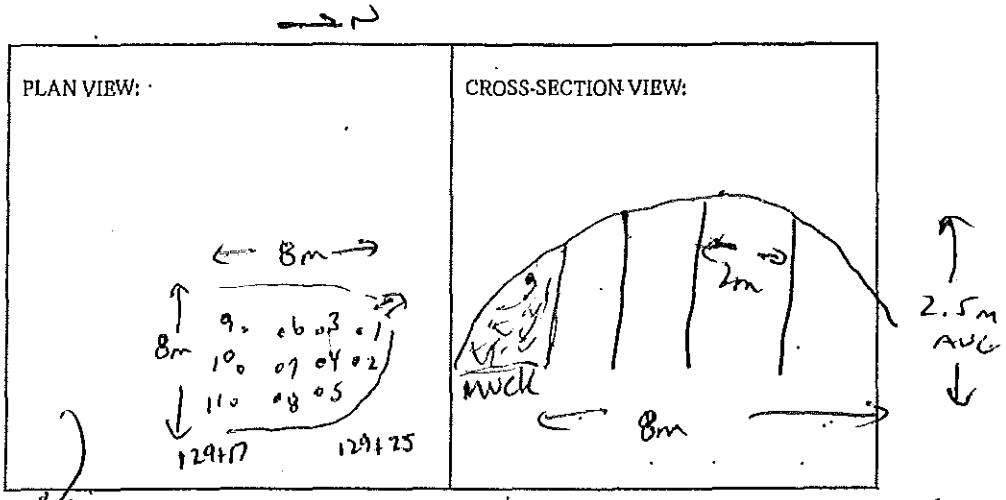
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 175 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffston Cst - No Trigger (< 0.07 ips)
" @ 13117 Cliffston Cst - 0.11 ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED MAY 31/12
PROPOSED BLAST DATE MAY 31/12
BLAST # MW-0225

HIGHWAY # 97
BLAST LOCATION AT: SW 129+17 - 129+25 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 28 (m)

PROPOSED APPROX. NO. OF HOLES 11 Proo
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 11
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

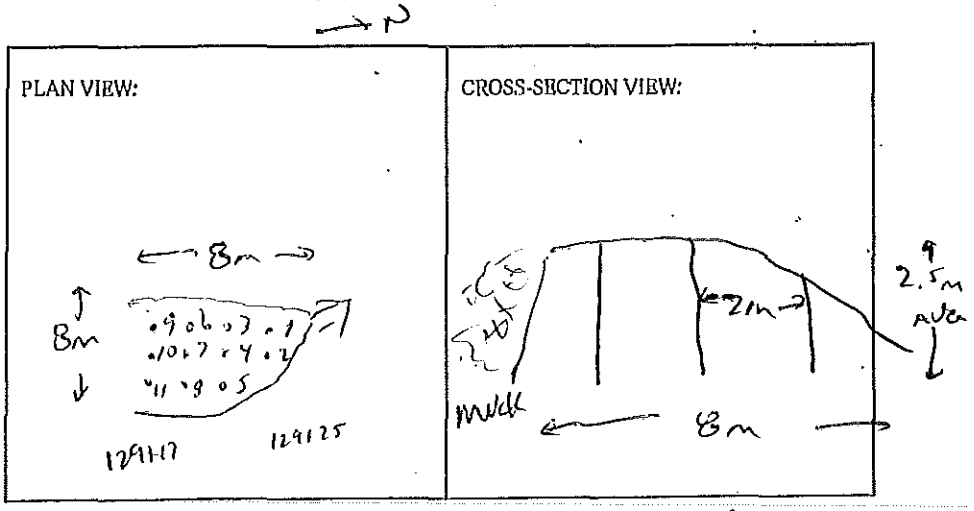
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 175 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 31/12
ACTUAL BLAST DATE May 31/12 1:59 PM
BLAST # MW2216

HIGHWAY # 97
BLAST LOCATION AT: 129+11 – 129+17 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

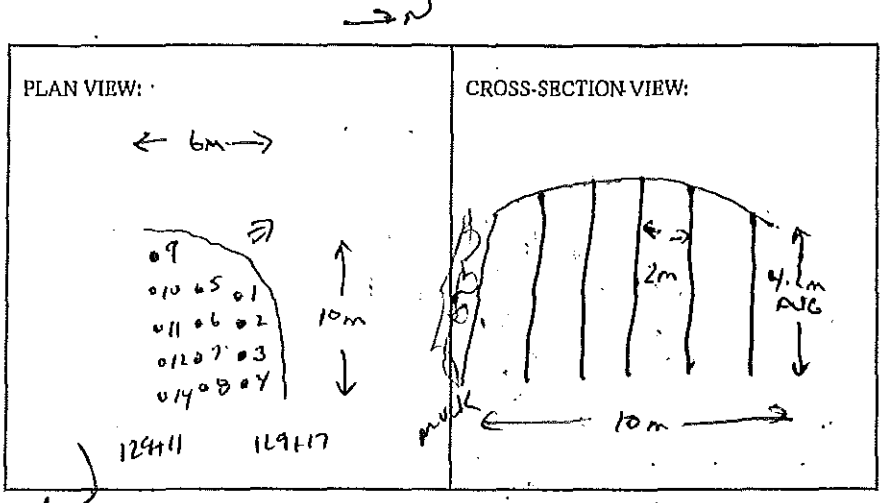
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone cnt. 0.070 ips/ 39 Hz
" @ 13117 cliffstone cnt. 0.10 ips/ 47 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 31/12
ACTUAL BLAST DATE May 31/12 1:59 PM
BLAST # MW2216

HIGHWAY # 97
BLAST LOCATION AT: 129+11 – 129+17 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

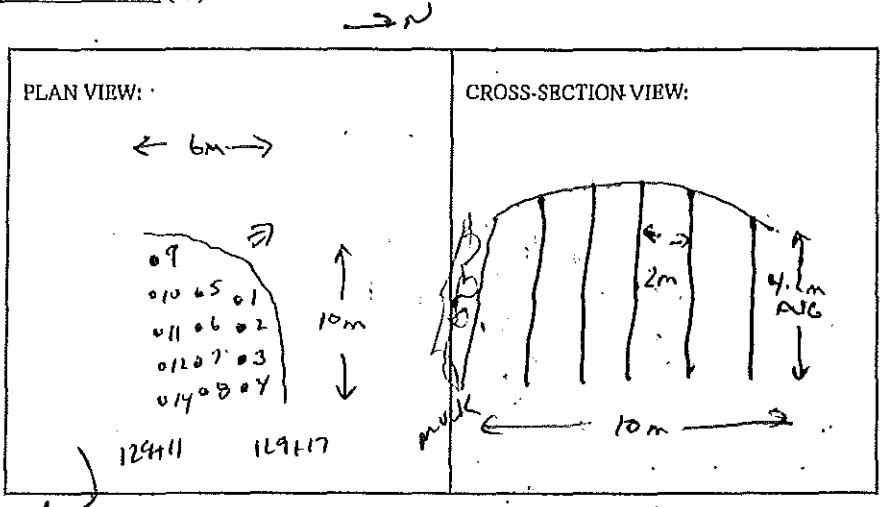
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone cnt. 0.070 ips / 39 Hz
" @ 13117 cliffstone cnt. 0.10 ips / 47 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED May 31/11
ACTUAL BLAST DATE May 31/11 3:42PM
BLAST # MW-0228

HIGHWAY# 97
BLAST LOCATION AT: STA 1291+06 - 1291+11 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slotmatted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 91 (m)

TOTAL NUMBER OF HOLES 13 PROD. / 2 STEMS
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

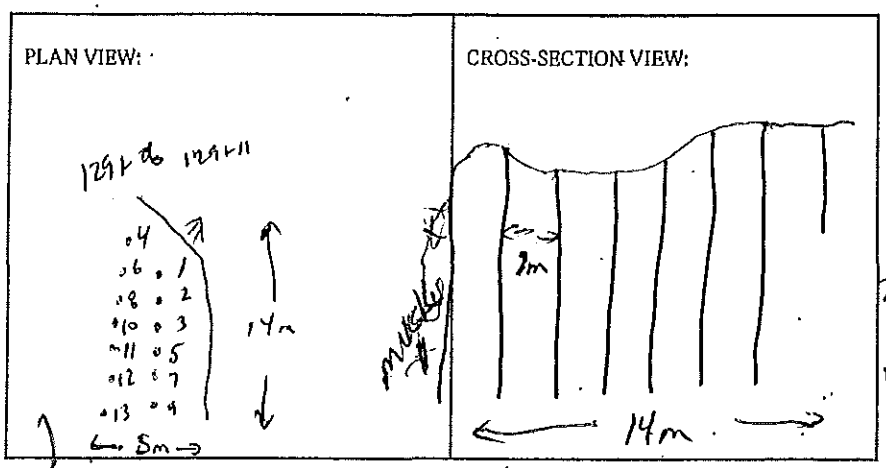
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.13 ips | 48 Hz
" @ 13117 Cliffstone Crt - 0.16 ips | 5 | 11 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 31/12
PROPOSED BLAST DATE May 31/12
BLAST # MW-0227

HIGHWAY # 97
BLAST LOCATION AT: SB 129+06 - 129+11 RS (To Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 91 (m)

PROPOSED APPROX. NO. OF HOLES 11 Pesd / 2 smd
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Pumalite & ANFO
APPROX. NUMBER OF CARTRIDGES 13
PROPOSED NUMBER OF DELAYS 13

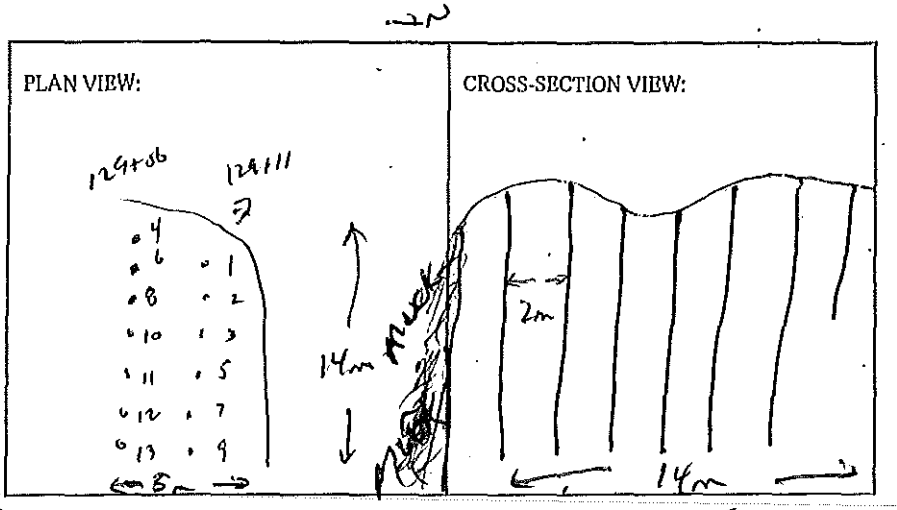
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 450 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583487

DATE PREPARED June 11/12
ACTUAL BLAST DATE June 7/12 10:24 AM
BLAST # MW-0228

HIGHWAY # 97
BLAST LOCATION AT: STN 129+02 — 129+06 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 8.2 (m)

TOTAL NUMBER OF HOLES 11 Prod / 2 stems
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

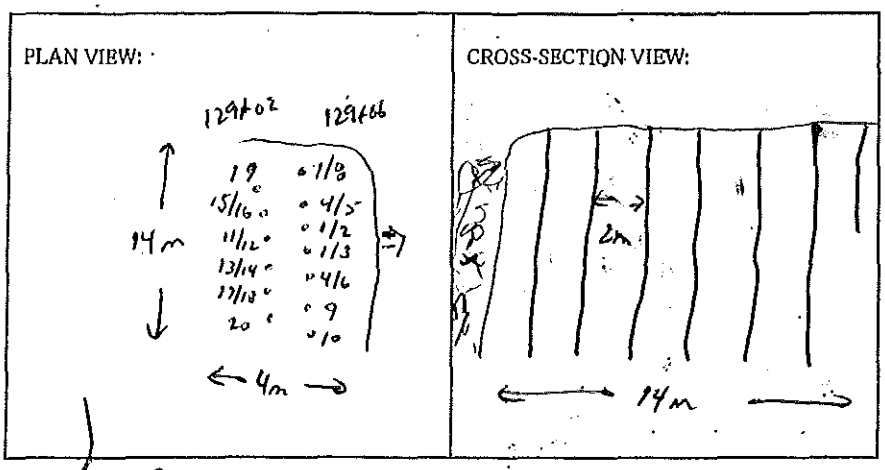
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 375 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone crt - 0.11 ips / 43 Hz
" @ 13117 Cliffstone crt - 0.18 ips / 51 Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vergeer
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 11/12
PROPOSED BLAST DATE June 11/12
BLAST # MW-0228

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+02 – 129+06 (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES n/a
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.6 (m)
PROPOSED TOTAL DEPTH 82 (m)
PROPOSED APPROX. NO. OF HOLES 11 (10/1 2 STAB
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN — (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 22
PROPOSED NUMBER OF DELAYS 20
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

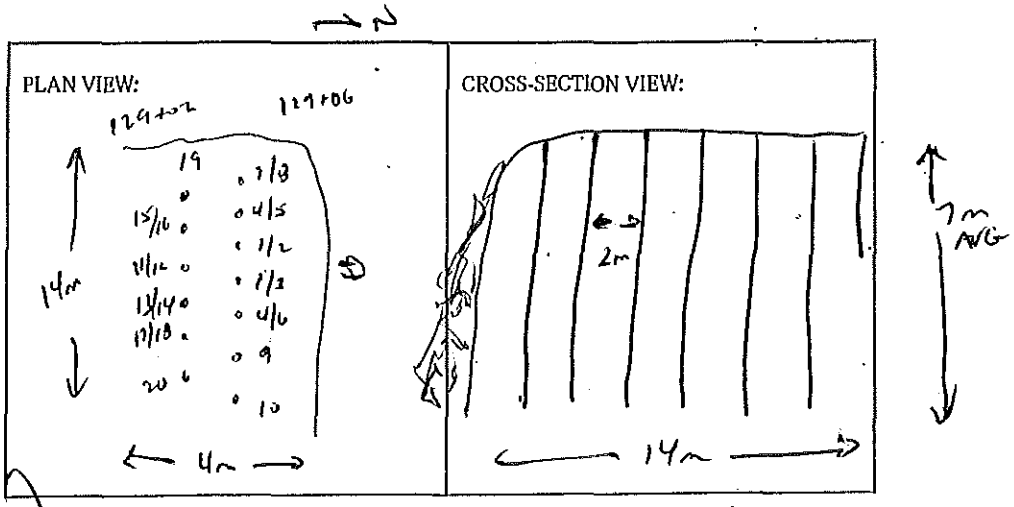
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 375 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 11:15am
BLAST # MW-0229

HIGHWAY# 97
BLAST LOCATION AT: 129+62 + 129+06 RS (60-50 bgmdc)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 4 B/L / 2 Bsfer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Blasters
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 4

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

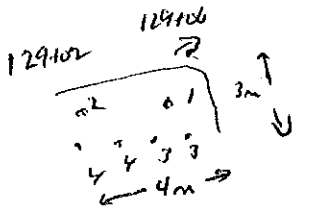
VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

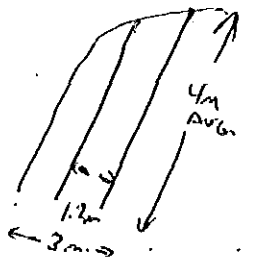
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct - Potrigger (< 0.04 ips)
@ 13117 Cliffstone Ct - 0.042 ips / 57Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B34B9

DATE PREPARED June 1/12
PROPOSED BLAST DATE June 7/12 11:15AM
BLAST # MW-0229

HIGHWAY# 97
BLAST LOCATION AT: STN 129+02 - 129+36 RS (TSUBGRADE)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY 31A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 4
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 4.2 (m)
PROPOSED TOTAL DEPTH 24 (m)
PROPOSED APPROX. NO. OF HOLES 4 B/L / 2 BUFFER
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE ~~ANFO~~ 2"x16" BLASTEX
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. NUMBER OF CARTRIDGES 15
APPROX. TOTAL WEIGHT 15 (kg)
PROPOSED NUMBER OF DELAYS 4
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 50 CAPS

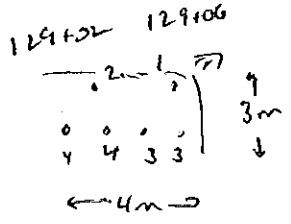
APPROX. VOLUME OF ROCK TO BE BLASTED 40 (m^3)

PROPOSED BLAST SKETCH:

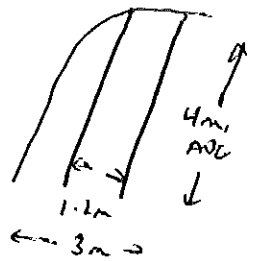
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 12:57pm
BLAST # MW-0230

HIGHWAY# 97
BLAST LOCATION AT: 128+98 - 129+02

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES all
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.8 (m)
TOTAL DEPTH 83 (m)

TOTAL NUMBER OF HOLES 11 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

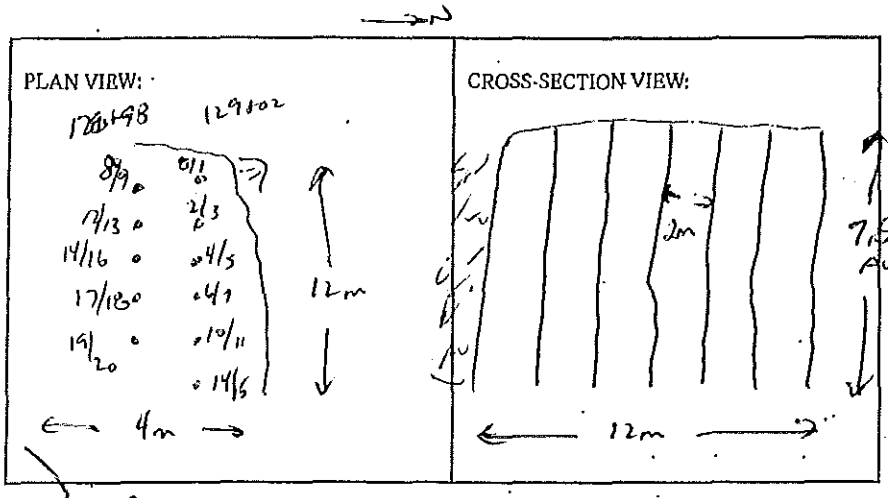
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.095 ips/39 Hz
" @ 13117 Cliffstone Crt - 0.11 ips/39 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 1/12
PROPOSED BLAST DATE June 1/12
BLAST # MW-0280

HIGHWAY # 97
BLAST LOCATION AT: STA 128+98 - 129+02

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.8 (m)
PROPOSED TOTAL DEPTH 83 (m)
PROPOSED APPROX. NO. OF HOLES 11 Pend
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 22
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 1.25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

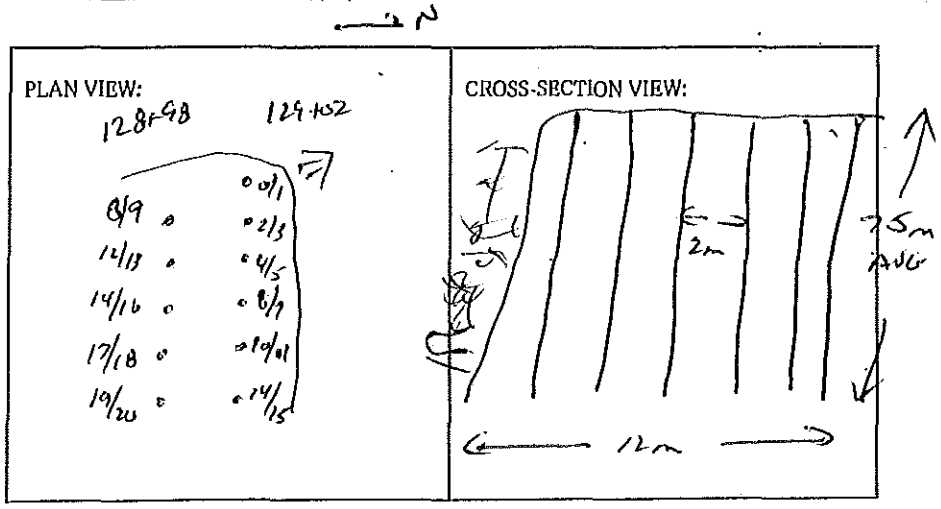
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE DB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834[illegible]

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 3:20 PM
BLAST # MW-0231

HIGHWAY# 97
BLAST LOCATION AT: STN 128+98 - 128+98

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 Pads
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

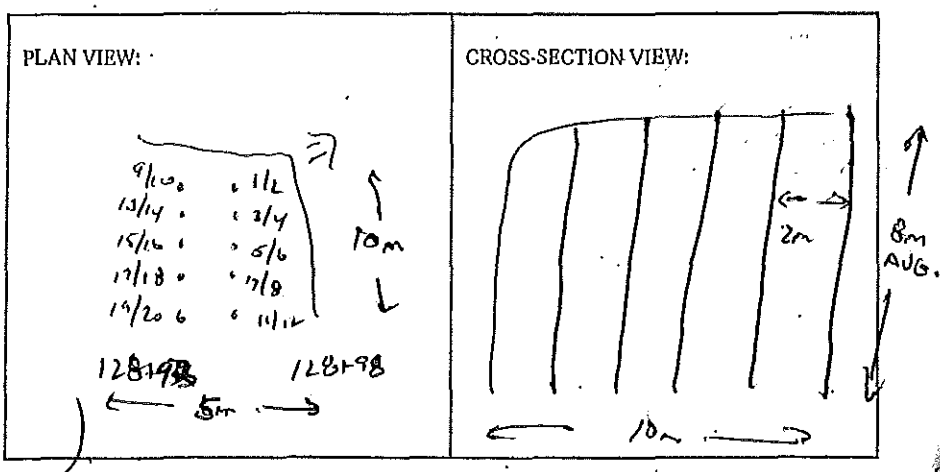
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE [illegible] CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting Inc

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Closest Crt - 0.14 ips / 34 Hz
" @ 13117 Closest Crt - 0.17 ips / 43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED June 1/12
PROPOSED BLAST DATE June 1/12
BLAST # MW-0231

HIGHWAY # 97
BLAST LOCATION AT: STA 128+93 - 128+98

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 8.3 (m)
PROPOSED TOTAL DEPTH 80 (m)

PROPOSED APPROX. NO. OF HOLES 10 Pairs.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

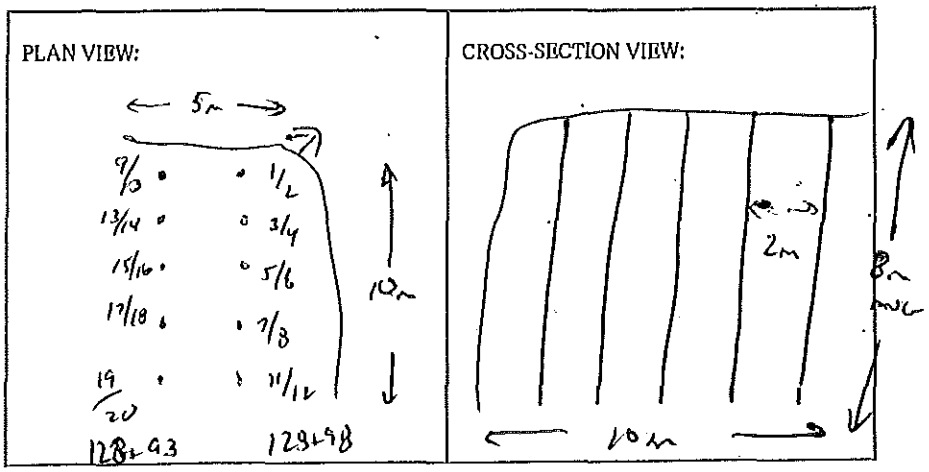
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE NB 330 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 4/12
ACTUAL BLAST DATE June 4/12 3:17 PM
BLAST # MW-0272

HIGHWAY# 97
BLAST LOCATION AT: 128+87 - 128+93

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: *

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N4
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 108 (m)

TOTAL NUMBER OF HOLES 12 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1/4 Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 210 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

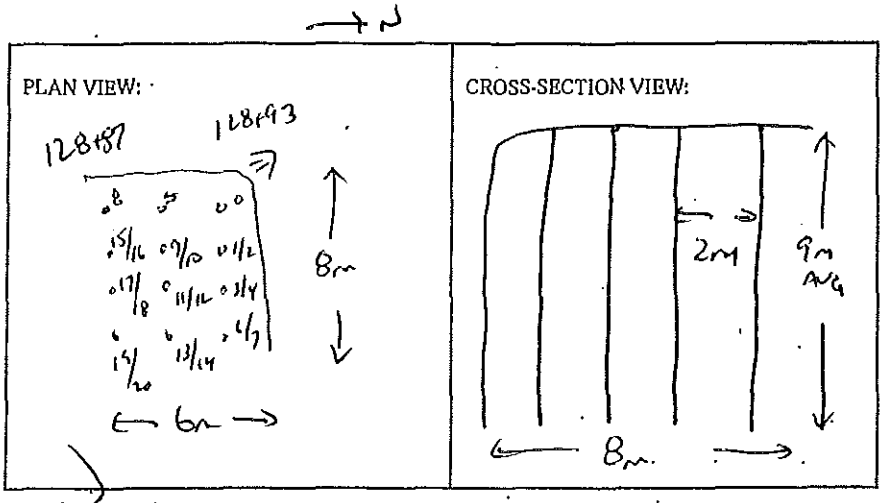
INITIATION DEVICE: (CIRCLE) E.D. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.22ips/32Hz
" @ 13117 Cliffstone Crt. 0.37ips/47Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834 89

DATE PREPARED June 4/12
PROPOSED BLAST DATE June 4/12
BLAST # MW-0232

HIGHWAY# 97
BLAST LOCATION AT: STA 128+87 – 128+93

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 9 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 10 (m)
PROPOSED TOTAL DEPTH 108 (m)

PROPOSED APPROX. NO. OF HOLES 12 Rnd
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 21
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

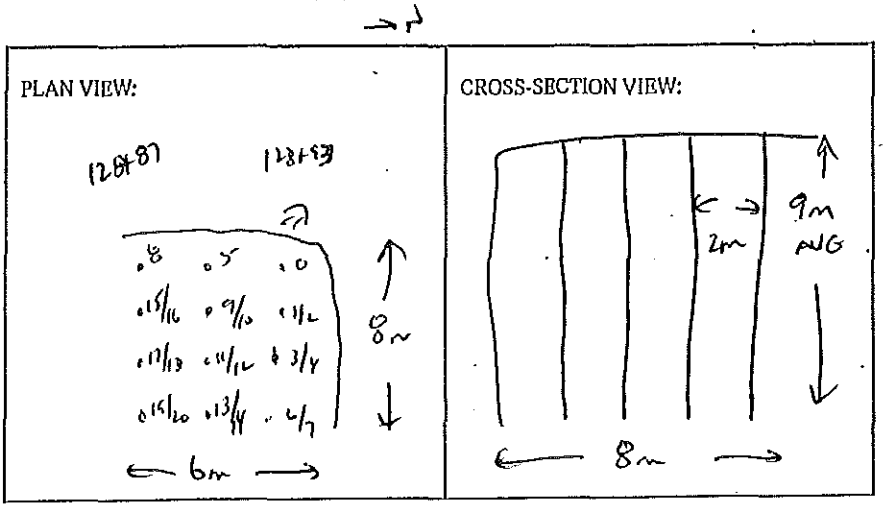
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 450 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 11:59
BLAST # MW-D233

HIGHWAY# 97
BLAST LOCATION AT: STN 128+81 - 128+87 Bench 2 alc

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 145 (m)

TOTAL NUMBER OF HOLES 23 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 115
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 145 (kg)
DELAY TYPE AND LENGTH 25 (ms)

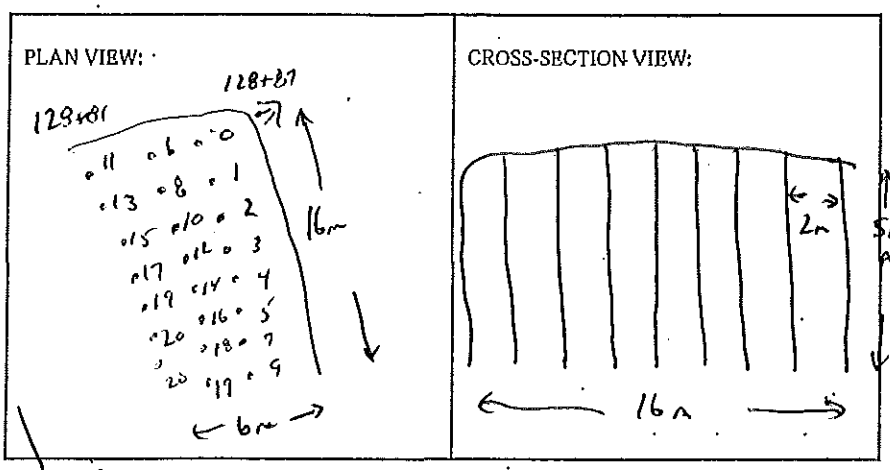
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HP3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 480 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crt. 0.14 ips/ 30Hz
@ 13117 cliffstone crt - 0.27 ips/ 5Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834 89

DATE PREPARED June 5/12
PROPOSED BLAST DATE June 5/12
BLAST # MLW-0233

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+81 - 128+87 Bench 2 c/c

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5.3 (m)
PROPOSED TOTAL DEPTH 11.5 (m)

PROPOSED APPROX. NO. OF HOLES 23 Rnd
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 115
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 145 (kg)
DELAY TYPE AND LENGTH 25 (ms)

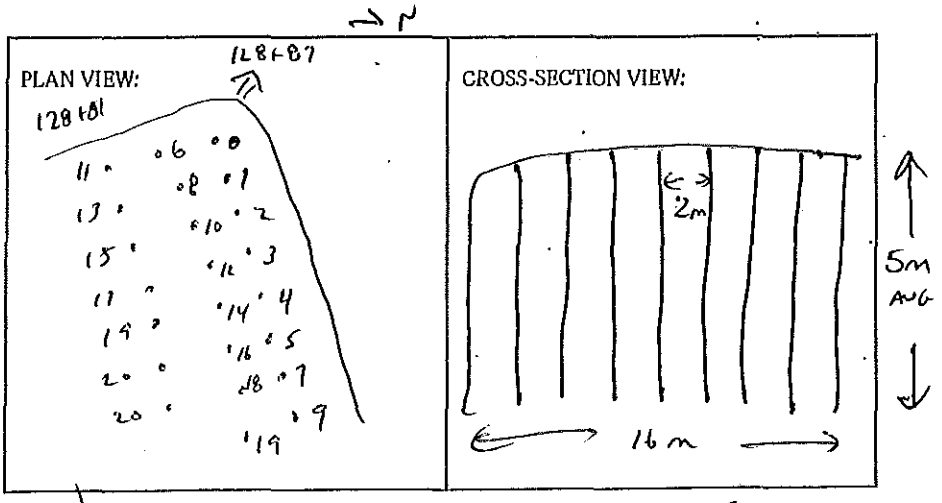
INITIATION DEVICE: (CIRCLE) EB CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 480 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 1:33 PM
BLAST # MW-0234

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128+64 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.8 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 10 Proo.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

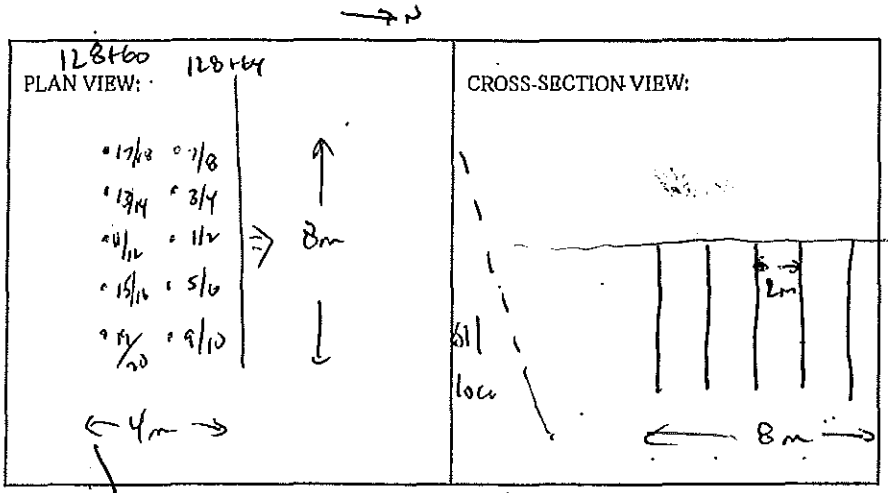
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1316' Cliffstone ext - 0.16 ips / 39 Hz
" @ 1817 Cliffstone ext - 0.23 ips / 5 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 5/12
PROPOSED BLAST DATE June 5/12
BLAST # MW-0274

HIGHWAY # 97
BLAST LOCATION AT: STN 128+60 - 128+64 (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.8 (m)
PROPOSED TOTAL DEPTH 55 (m)
PROPOSED APPROX. NO. OF HOLES 10 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

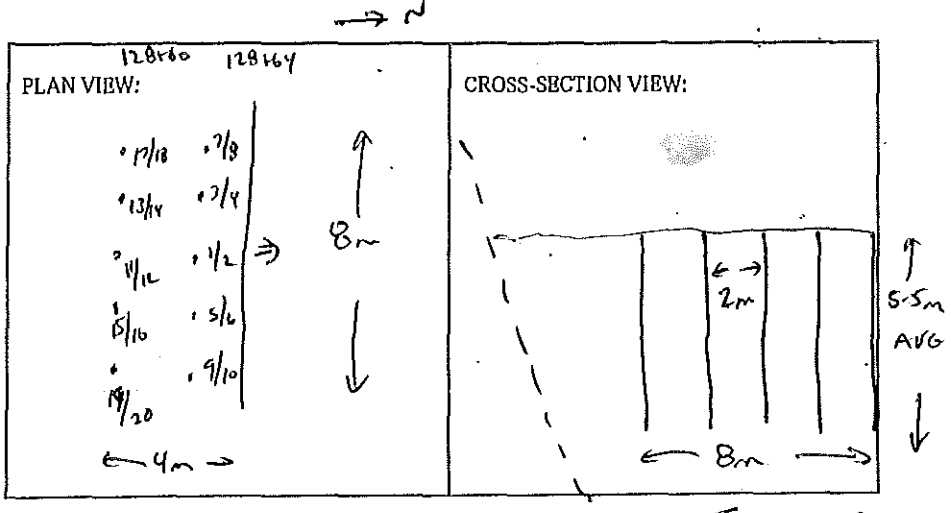
EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 20
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 160 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834(BC)

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 2:51PM
BLAST # NW-0235

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+57 - 128+62 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 BL
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.7 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 5 BL / 3 Buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2x16 Binex
TOTAL NUMBER OF CARTRIDGES
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

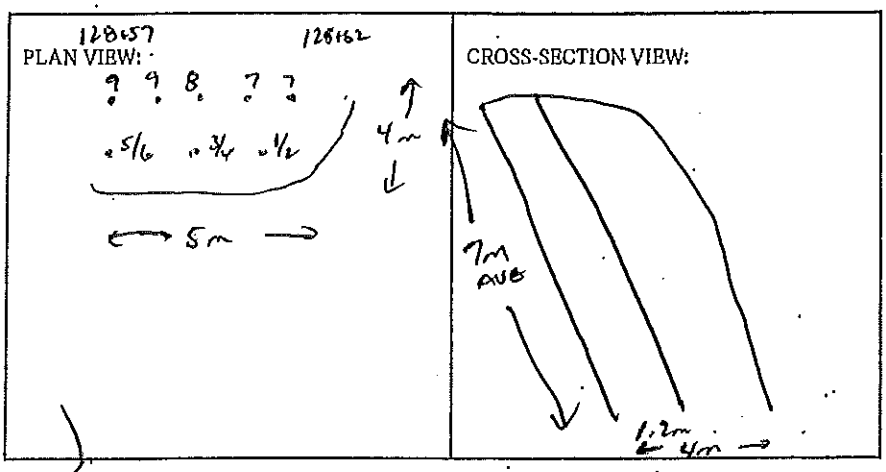
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 130 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt 0.085 ips/ 34Hz
@ 13117 Cliffstone Crt - 0.15 ips/ 57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5034089

DATE PREPARED June 5/12
PROPOSED BLAST DATE June 5/12
BLAST # MW-0235

HIGHWAY # 97
BLAST LOCATION AT: STN 128+57 - 128+62 LS (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE 68° (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 5
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.7 (m)
PROPOSED TOTAL DEPTH 56 (m)

PROPOSED APPROX. NO. OF HOLES 56/1/36 FAN
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + AMFO (2x16 Gravex)
APPROX. NUMBER OF CARTRIDGES _____
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

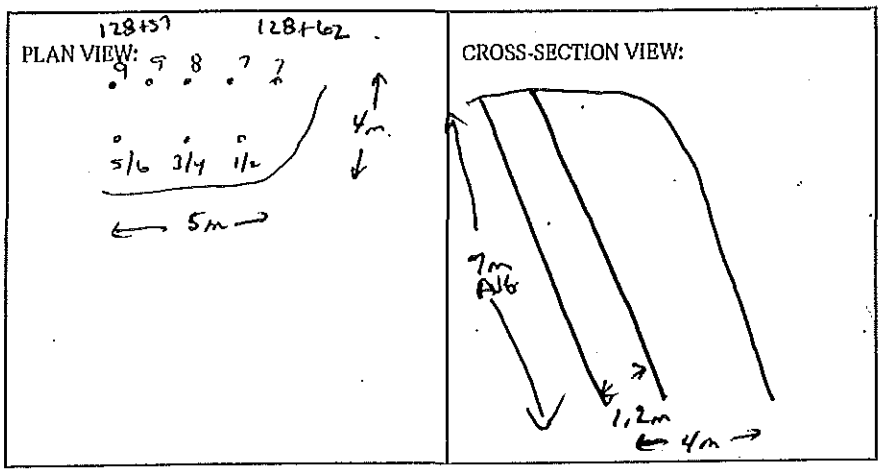
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 130 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 cliffstone cut.
" @ 13117 cliffstone cut -

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 11:22AM
BLAST # MW-0236

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+52 - 128+57 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 78 (m)

TOTAL NUMBER OF HOLES 13/200
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 83
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

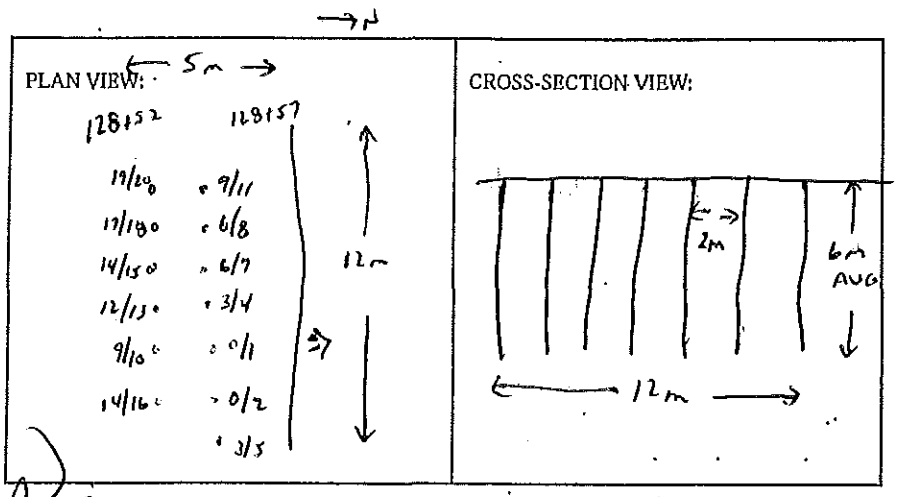
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone cnt - 0.201PS/39 Hz
" @ 13117 Cliffstone cnt - 0.32ips/34 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED June 6/12
PROPOSED BLAST DATE June 6/12
BLAST # MW-0236

HIGHWAY # 97
BLAST LOCATION AT: STN 128+52 - 128+57 Bench 2

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.5 (m)
PROPOSED TOTAL DEPTH 78 (m)

PROPOSED APPROX. NO. OF HOLES 13 Prop.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 13
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25' (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 caps

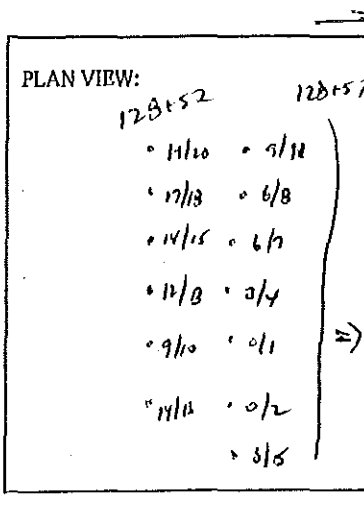
APPROX. VOLUME OF ROCK TO BE BLASTED 360 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTING CONSULTANT NAME Daryl Fleiber SIGNATURE _____ COMPANY Fleiber Rock. Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834187

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 12:44 PM
BLAST # MW-0237

HIGHWAY # 97
BLAST LOCATION AT: STN 128+52 - 128+57 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: *Blast matched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 4 BL / 2 Buffer / 1 Stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2"x16" Blastex
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

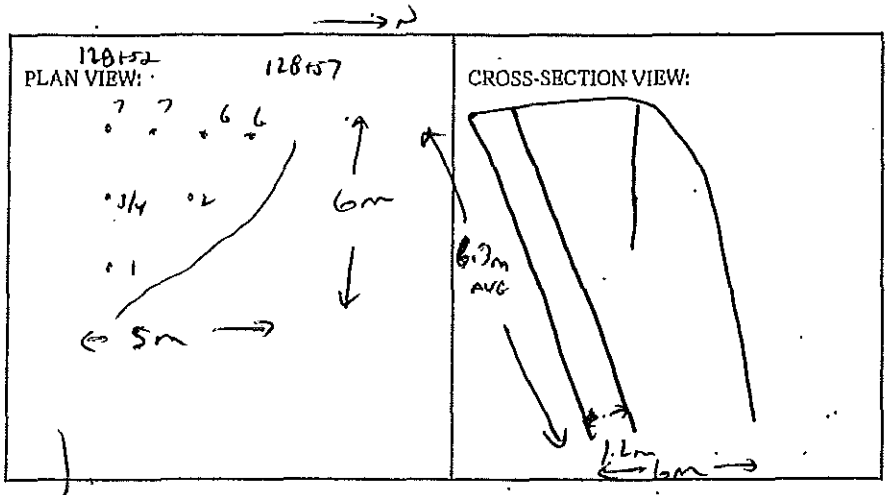
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cl; Ashtone Crk - 0.055 IPS / 47 Hz
@ 13117 Cliff stone Crk - 0.12 IPS / 47 Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 6/12
PROPOSED BLAST DATE June 6/12
BLAST # NWJ-0237

HIGHWAY # 97
BLAST LOCATION AT: STN 128+52 - 128+57 LS (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 4
PROPOSED AVG. DEPTH 6.3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.5 (m)
PROPOSED TOTAL DEPTH 40 (m)
PROPOSED APPROX. NO. OF HOLES 4 B/L / 2 Buffer / 1 Stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumalite + 2x16" Blasticy
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

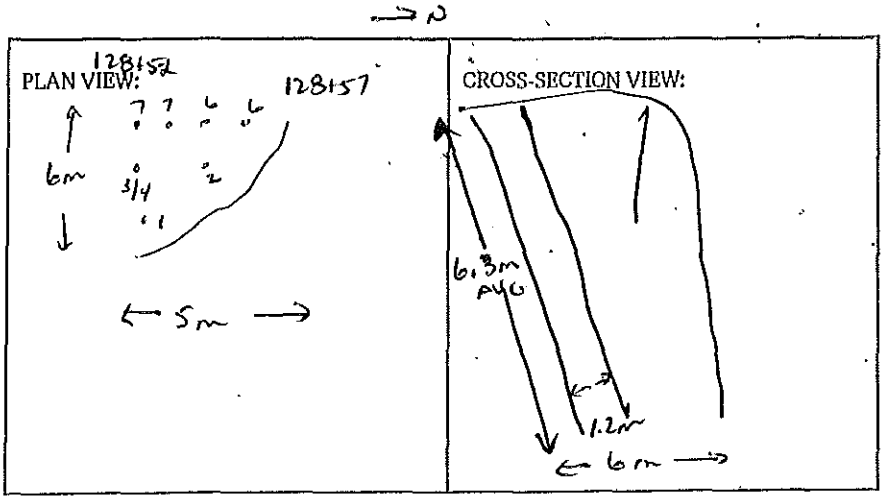
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE 1-B320 CAPACITY 100 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 180 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veerman
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 2:16PM
BLAST # MJ-0238

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+85 - 128+93 Top cut

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 24 P800
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

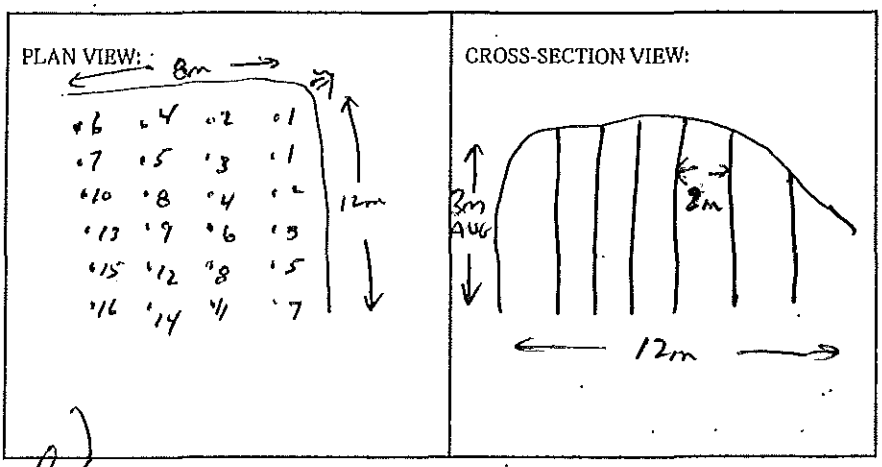
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 8 x CAPS

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veerman COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs @ 13167 Cliffstone entr - No telease (<0.04 ips)
" @ 13117 Cliffstone entr No telease (<0.04 ips)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED June 6/12
PROPOSED BLAST DATE June 6/12
BLAST # MW-0238

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+85 - 128+93 Top Cut

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 72 (m)

PROPOSED APPROX. NO. OF HOLES 24 Pcs
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN ~ (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

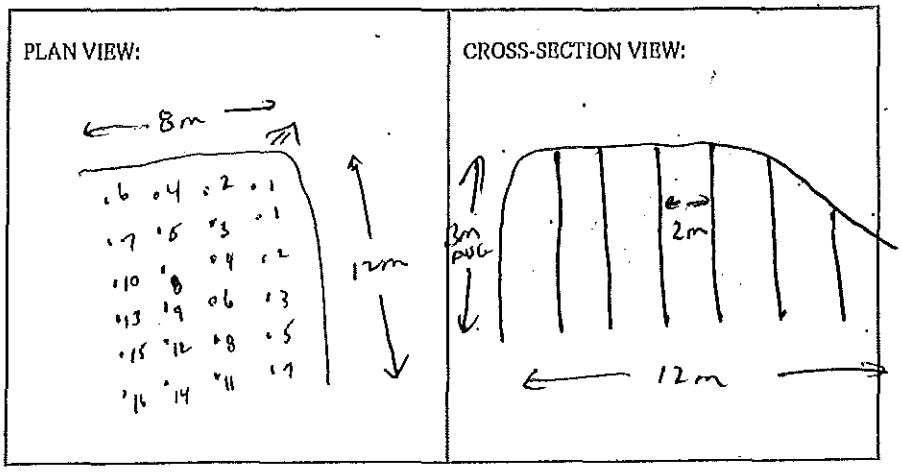
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 280 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieger SIGNATURE _____ COMPANY Fieger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Skeena Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 3:39 PM
BLAST # MW-0239

HIGHWAY# 97
BLAST LOCATION AT: SB 128+77 - 128+85 Top out

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alaskan Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.4 (m)
TOTAL DEPTH 57 (m)

TOTAL NUMBER OF HOLES 19 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 95
TOTAL NUMBER OF DELAYS 13

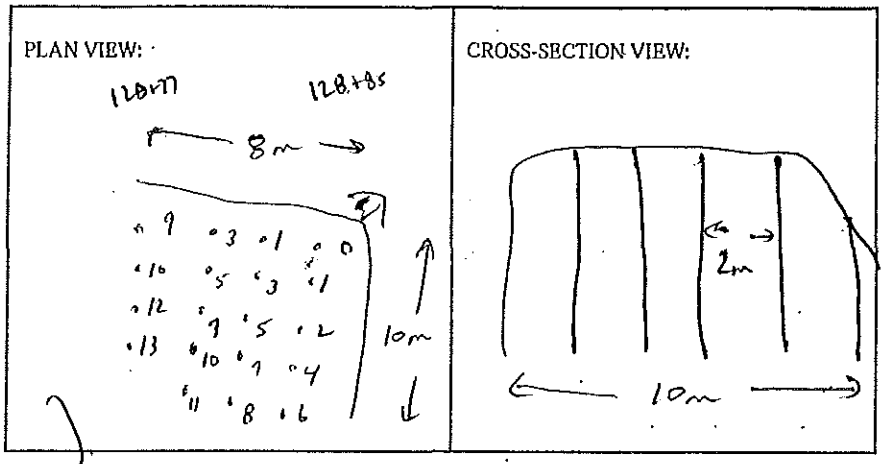
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 cap

VOLUME OF ROCK BLASTED 260 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY _____

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.040 ips / 47 Hz
@ 13117 Cliffstone Crt. 0.082 ips / 32 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME: Sierra Drilling & Blasting
BLASTER'S NAME: Wayne Verweg
BLASTER'S CERTIFICATE NUMBER: 5834 89

DATE PREPARED: June 6/12
PROPOSED BLAST DATE: June 6/12
BLAST #: MW-0239

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+77 - 128+85 TIP Co

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3.4 (m)
PROPOSED TOTAL DEPTH 57 (m)
PROPOSED APPROX. NO. OF HOLES 19 Perc.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 9.5
PROPOSED NUMBER OF DELAYS 13
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

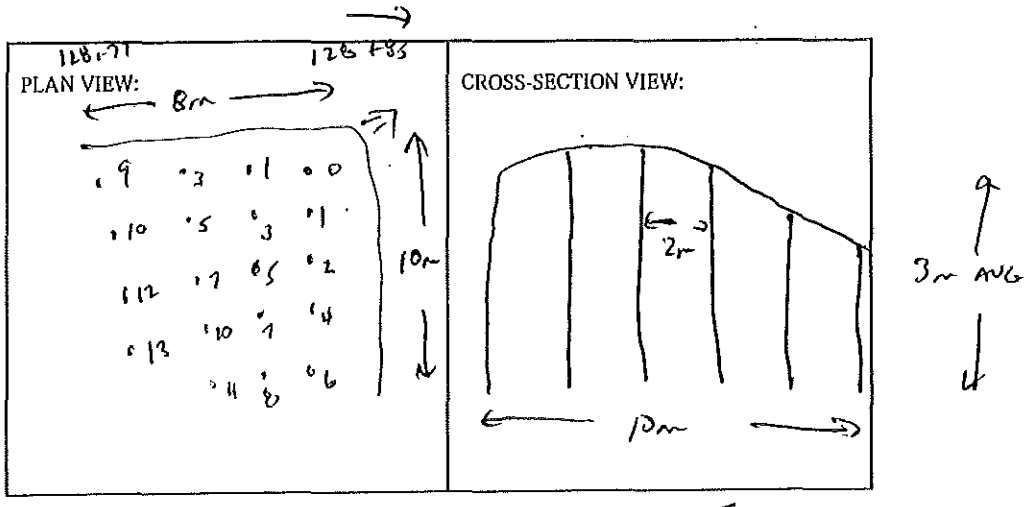
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 820 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 260 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME: Daniel Fieber SIGNATURE _____ COMPANY: Fieber Rock Eng.
BLASTER'S SIGNATURE: Wayne Verweg COMPANY: Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 12:23 PM
BLAST # MW-0240

HIGHWAY# 97
BLAST LOCATION AT: STN 128+67 – 128+77 C/L TP CUT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 71 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 70
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 460 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

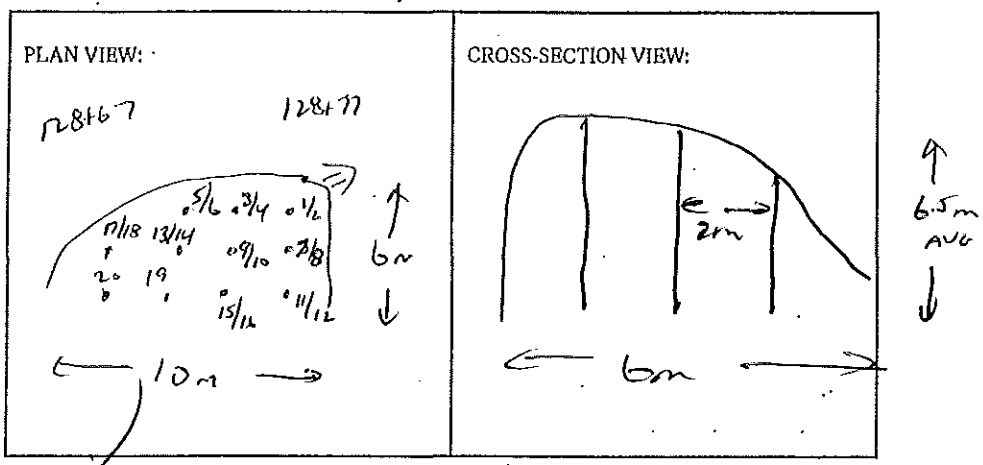
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE ~~FTS 320~~ CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 380 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone crt – 0.080 ips / 39 Hz
@ 13093 Cliffstone crt 0.14 ips / 34 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 7/12
PROPOSED BLAST DATE June 7/12 10:22 PM
BLAST # MW-0240

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+67 - 128+77 c/l (Top Cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY 5m (m) SLOPE ANGLE 90 (°) SLOPE LENGTH 5m (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 71 (m)

PROPOSED APPROX. NO. OF HOLES 11 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS-50 CAPACITY 50 caps

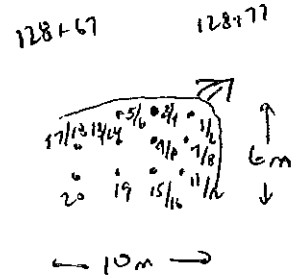
APPROX. VOLUME OF ROCK TO BE BLASTED 580 (m^3)

PROPOSED BLAST SKETCH:

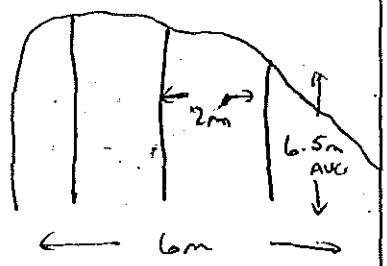
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darryl Fleiber SIGNATURE _____ COMPANY Fleiber Rock Eng.
BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/87

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12
BLAST # MW-0241

1:54 PM

HIGHWAY# 97
BLAST LOCATION AT: SBN 128+48 - 128+52 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alaskan Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 52 (m)

TOTAL NUMBER OF HOLES 8 Pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

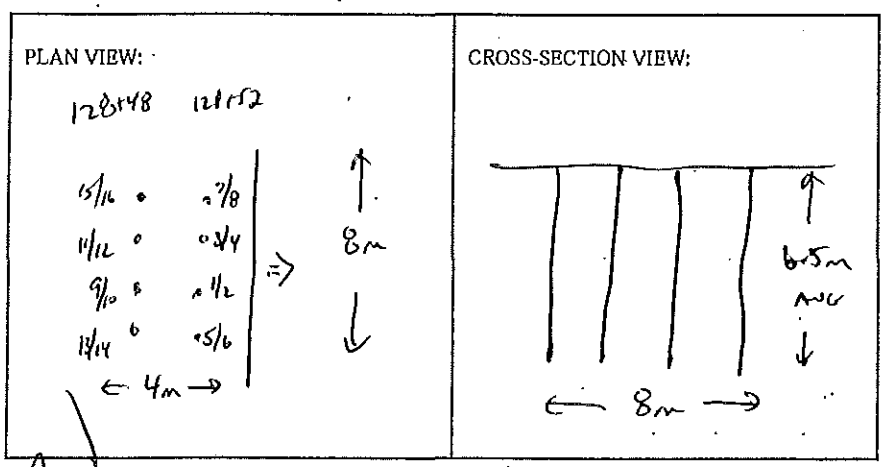
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.11 ips / 28 Hz
@ 13093 cliffstone crt - 0.33 ips / 27 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED June 7/12
PROPOSED BLAST DATE June 7/12
BLAST # MW-0241

HIGHWAY# 97
BLAST LOCATION AT: SB 128+48 - 128+52 Bench 2

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7 (m)
PROPOSED TOTAL DEPTH 52 (m)

PROPOSED APPROX. NO. OF HOLES 8 Pcod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Pumpmite & ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

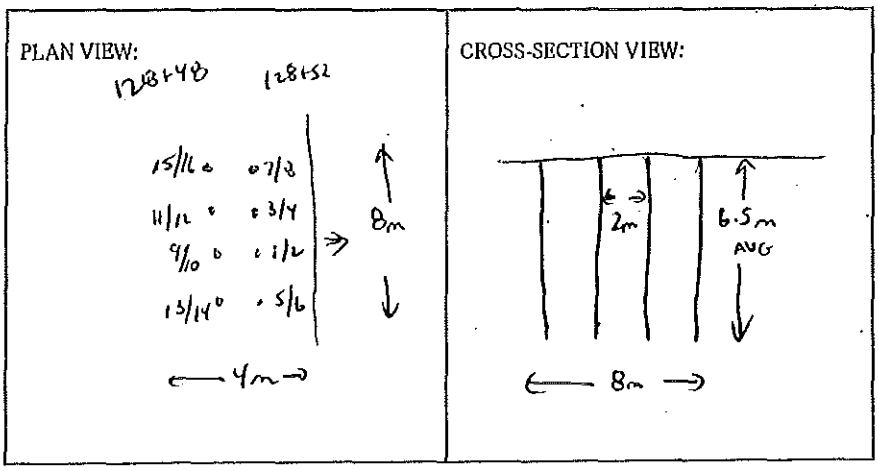
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-15 SSR CAPACITY 90 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleiger SIGNATURE _____ COMPANY Fleiger Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 2:59 PM
BLAST # MW-0242

HIGHWAY# 97
BLAST LOCATION AT: STN 128+48 - 128+52 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ok shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 3 BL / 2 Burden
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2x16 Blaster
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

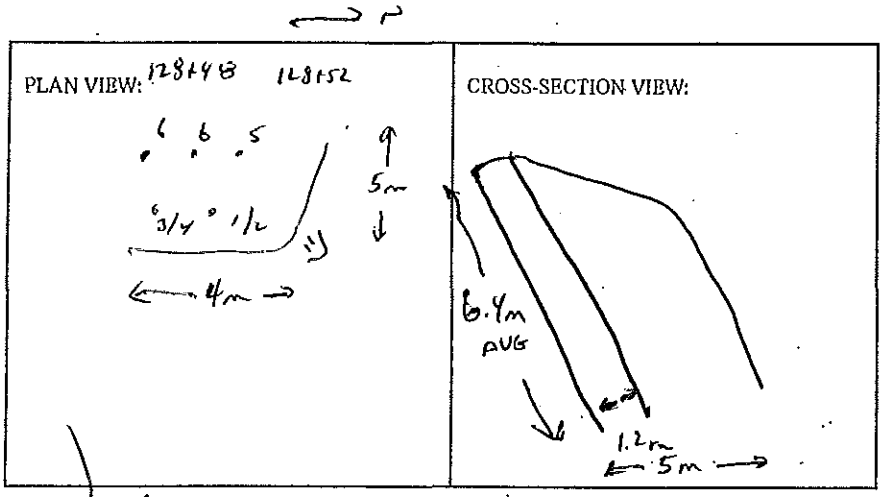
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.055 ips | 47 Hz
@ 13093 Cliffstone Crt. 0.241 ips | 34 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 7/12
PROPOSED BLAST DATE June 7/12
BLAST # MW-0242

HIGHWAY # 97
BLAST LOCATION AT: STA 128+48 - 128+52 LS (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 3
PROPOSED AVG. DEPTH 6.4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.6 (m)
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED APPROX. NO. OF HOLES 3 B/L / 2 Burden
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Nitro
2" x 16" Blasting

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. NUMBER OF CARTRIDGES _____
PROPOSED NUMBER OF DELAYS 6
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

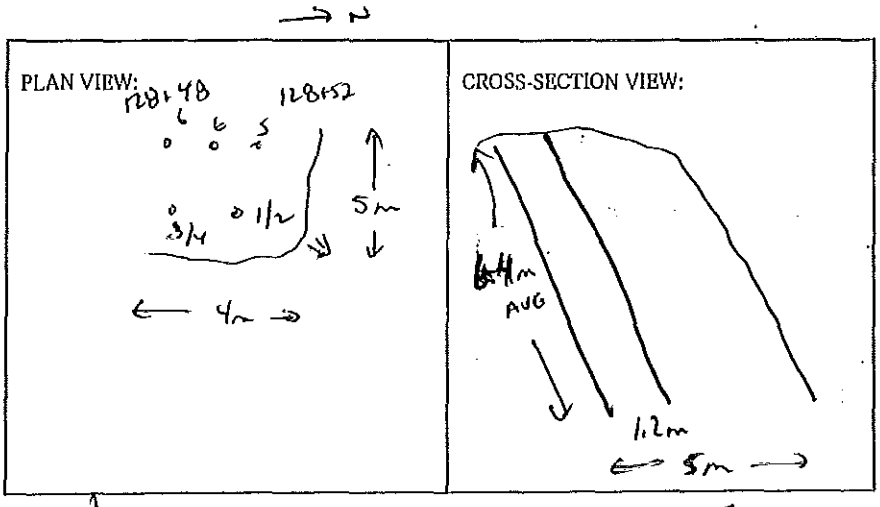
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 50 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME David Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B34189

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 4:04 PM
BLAST # MV-0243

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+85 c/l (High spot)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot marking

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.9 (m)
TOTAL DEPTH 39 (m)

TOTAL NUMBER OF HOLES 15 prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

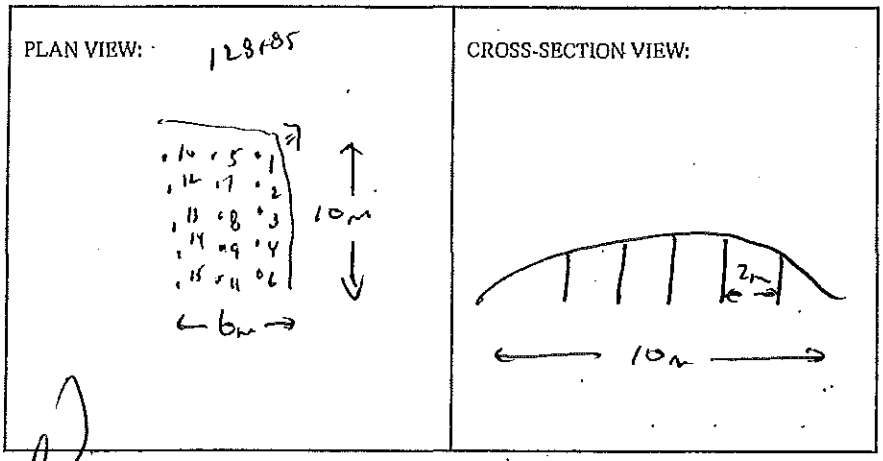
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED nil (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.050 in/s / 47 Hz
" @ 13039 Cliffstone Crt - 0.043 in/s / 26 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED June 7/12
PROPOSED BLAST DATE June 7/12
BLAST # MW-0243

HIGHWAY # 97
BLAST LOCATION AT: SHP 128+85 c/L High Spot

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.9 (m)
PROPOSED TOTAL DEPTH 39 (m)

PROPOSED APPROX. NO. OF HOLES 15 Pcs
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 7.5
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 5lb (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 60 caps

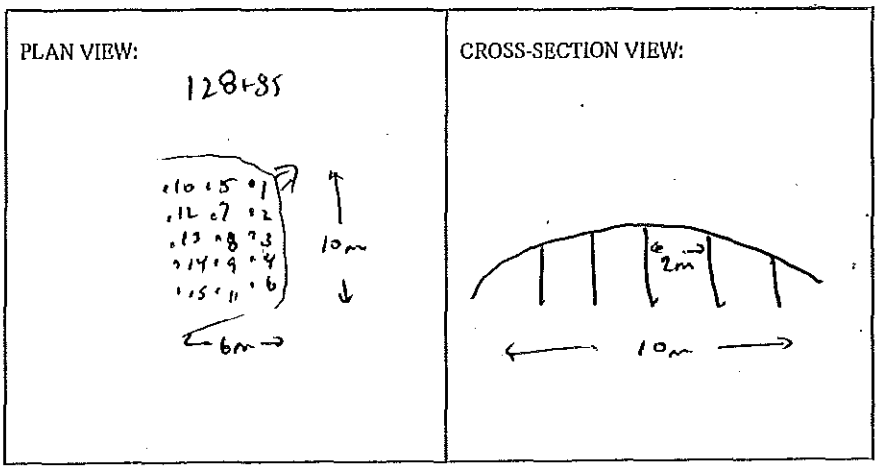
APPROX. VOLUME OF ROCK TO BE BLASTED Nil (m^3)

PROPOSED BLAST SKETCH:

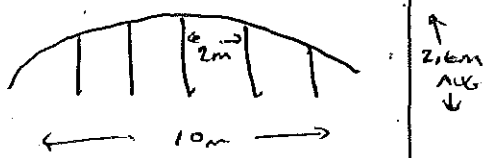
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daniel Fleiber SIGNATURE _____ COMPANY Fleiber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/87

DATE PREPARED June 8/12
ACTUAL BLAST DATE June 8/12 10:11 AM
BLAST # MWS-0244

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+355 (High Spot)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2½" Blastrex
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 9

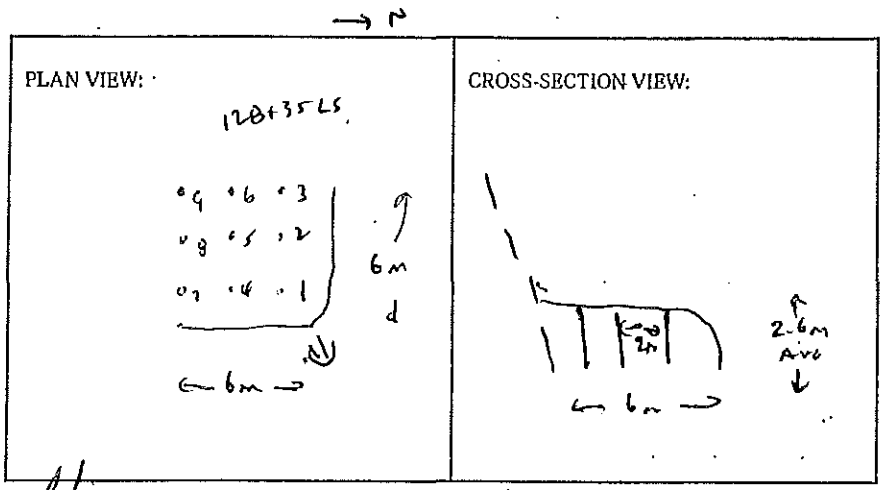
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - No Tribber (< 0.04 ips)
" @ 13117 Cliffstone Cut - 0.067 ips/57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED JUNE 8/12
PROPOSED BLAST DATE JUNE 8/12
BLAST # MW-0244

HIGHWAY # 97
BLAST LOCATION AT: STA 128+35 LS (HIGH SIDE)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.8 (m)
PROPOSED TOTAL DEPTH 23 (m)
PROPOSED APPROX. NO. OF HOLES 9 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS: 2x16" Blastex

EXPLOSIVE TYPE 1½" DYNAMITE + AMFO
APPROX. NUMBER OF CARTRIDGES 20
PROPOSED NUMBER OF DELAYS 9
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

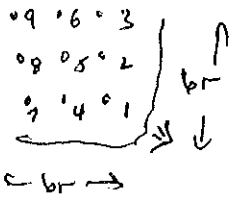
APPROX. VOLUME OF ROCK TO BE BLASTED Nil (m³)

PROPOSED BLAST SKETCH:

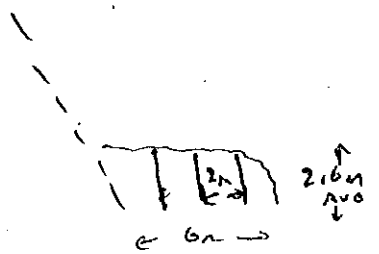
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: 128+35 LS



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling & BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834787

DATE PREPARED June 11/11
ACTUAL BLAST DATE June 11/11 11:42 AM
BLAST # MW - 0245

HIGHWAY # 97
BLAST LOCATION AT: STN 128+98 - 129+02 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Blast matted

HEIGHT ABOVE HWY 9/10 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 4.6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 4.8 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 5 B/L / 3 Buffer / 3 Stab / 51 Pro
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

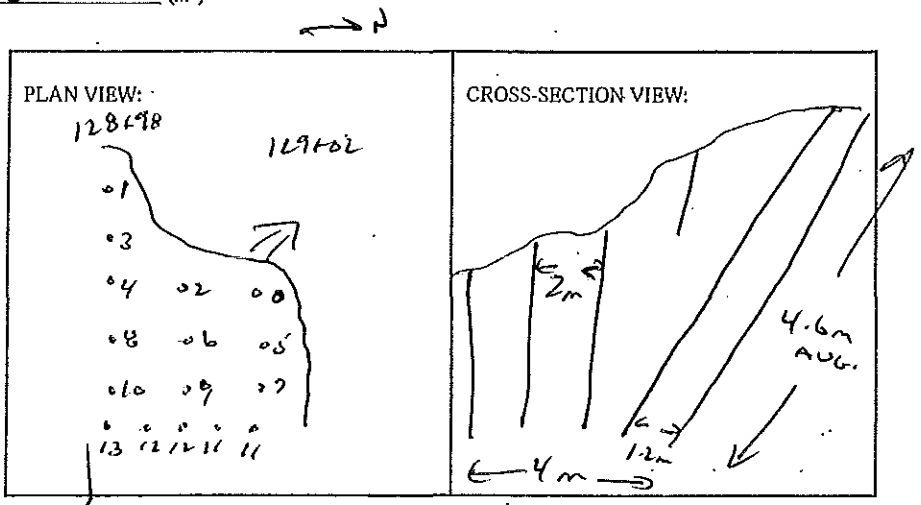
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.045 ips / 34 Hz
" @ 13117 Cliffstone Crt - 0.079 ips / 43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 11/12
PROPOSED BLAST DATE June 11/12
BLAST # MW-0245

HIGHWAY # 97
BLAST LOCATION AT: STN 128+98 - 129+02 RS (TO Subgrade

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 5
PROPOSED AVG. DEPTH 4.6 (m)
PROPOSED NO. OF ROWS 6
PROPOSED MAXIMUM DEPTH 4.8 (m)
PROPOSED TOTAL DEPTH 68 (m)

PROPOSED APPROX. NO. OF HOLES 50/L / 5 Buffer / 3 Stmo / 5 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½ DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

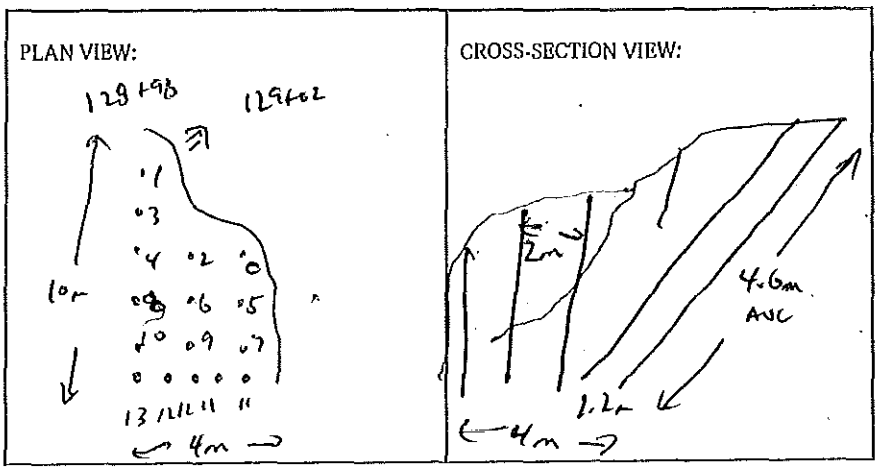
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-I 15 S20 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 180 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 11/12
ACTUAL BLAST DATE June 11/12 4:33 PM
BLAST # MW-0246 0246

HIGHWAY# 97
BLAST LOCATION AT: 128+90 - 128+98 RS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 92 (m)

TOTAL NUMBER OF HOLES 8 BL / 5 Buffer / 5 SMB / 1 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

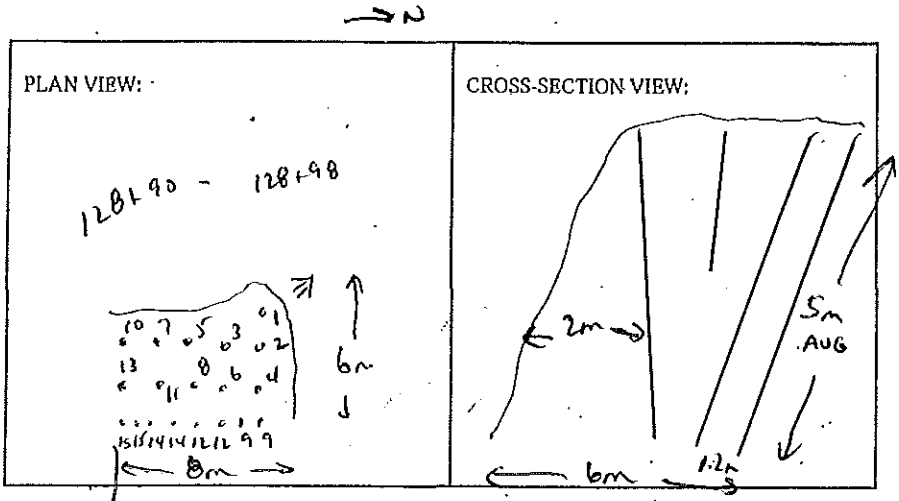
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.12 ips / 37 Hz
" @ 13117 Cliffstone Crt - 0.15 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 11/12
PROPOSED BLAST DATE June 11/12
BLAST # MW-0246

HIGHWAY# 97
BLAST LOCATION AT: SB 128+90 - 128+90 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 5.3 (m)
PROPOSED TOTAL DEPTH 92 (m)

PROPOSED APPROX. NO. OF HOLES 88/L / 5 BUFFER / 5 SMB / 1 PRIM
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 6
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

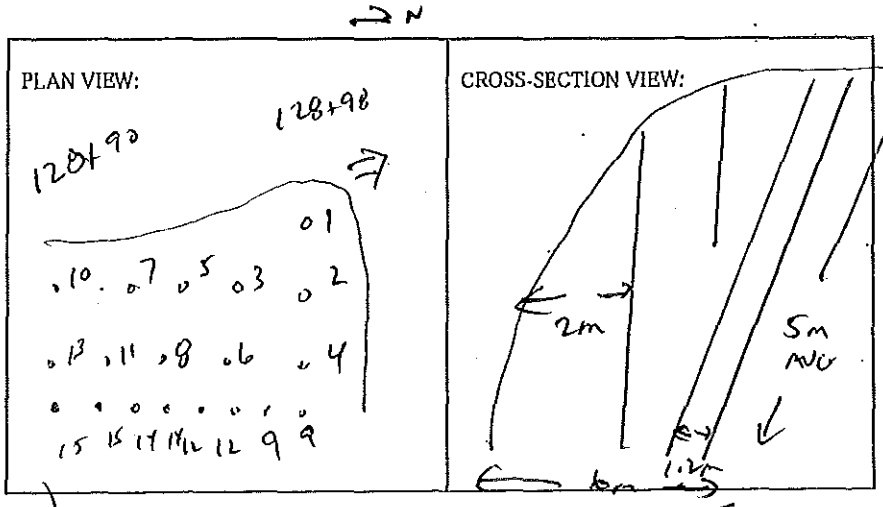
INITIATION DEVICE: (CIRCLE) EB CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 90 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daniel Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5931/87

DATE PREPARED June 12/12
ACTUAL BLAST DATE June 12/12 10:54 AM
BLAST # MW-0247

HIGHWAY# 97
BLAST LOCATION AT: STN 128154 - 128460 c/l (TOP CUT)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 115 (m)

TOTAL NUMBER OF HOLES 21 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 135 (kg)
DELAY TYPE AND LENGTH 25 (ms)

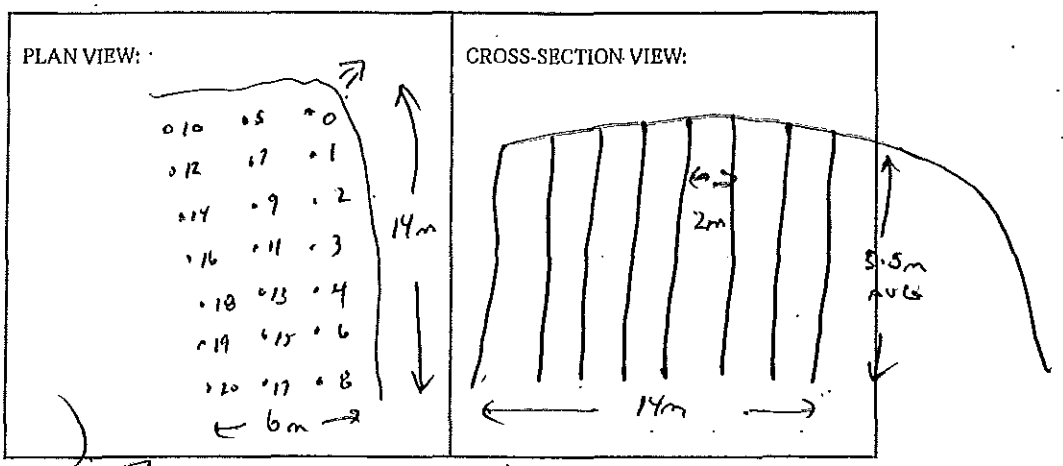
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 460 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.10 ips/ 39Hz
" @ 13097 Cliffstone Crt - 0.31 ips/ 5/Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED JUNE 12/12
PROPOSED BLAST DATE JUNE 12/12
BLAST # MW-0247

HIGHWAY # 97
BLAST LOCATION AT: STA 128+54 - 128+60 C/L (TOP BENCH)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 115 (m)

PROPOSED APPROX. NO. OF HOLES 21 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

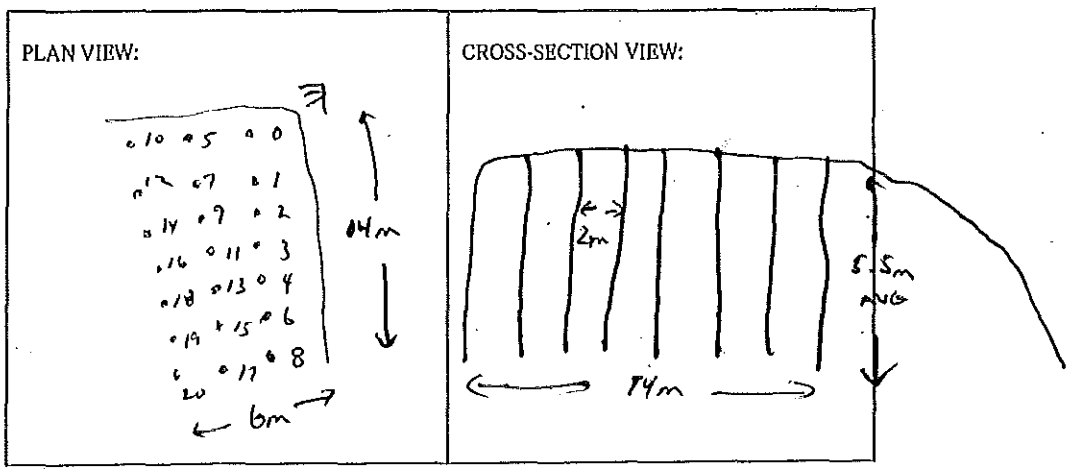
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-NB 3220 CAPACITY 50 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 460 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/87

DATE PREPARED June 12/12
ACTUAL BLAST DATE June 12/12 1:38 PM
BLAST # MW-0248

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+48 - 128+54 c/l (for cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot notified

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 126 (m)

TOTAL NUMBER OF HOLES 21 Plus
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

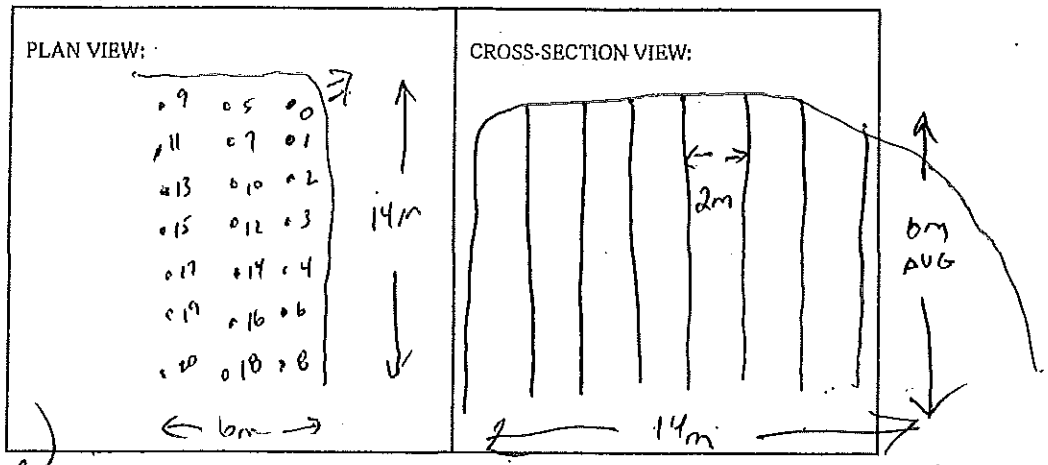
EXPLOSIVE SIZE 40 mm by 410 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.14 ips / 37 Hz
" @ 13093 Cliffstone Crt - 0.30 ips / 51 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 12/12
PROPOSED BLAST DATE June 12/12
BLAST # MW-0248

HIGHWAY # 97
BLAST LOCATION AT: STN 128+48 - 128+54 dt (TOP Cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.3 (m)
PROPOSED TOTAL DEPTH 126 (m)
PROPOSED APPROX. NO. OF HOLES 21 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

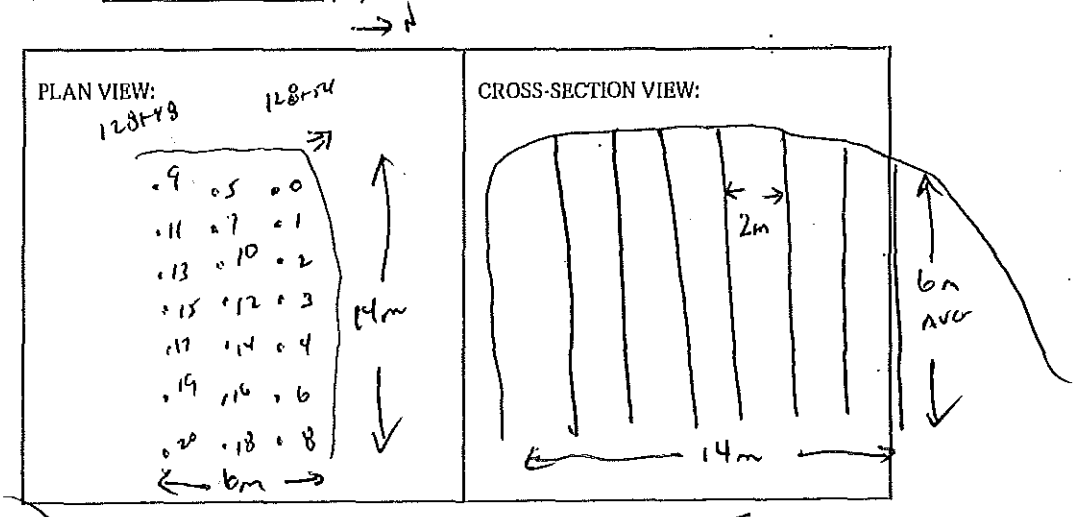
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1-15 SSO CAPACITY 90 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Crt -
" 13093 Cliffstone Crt.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21377-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 9:34AM
BLAST # MW-0251

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+49 - 128+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 16 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

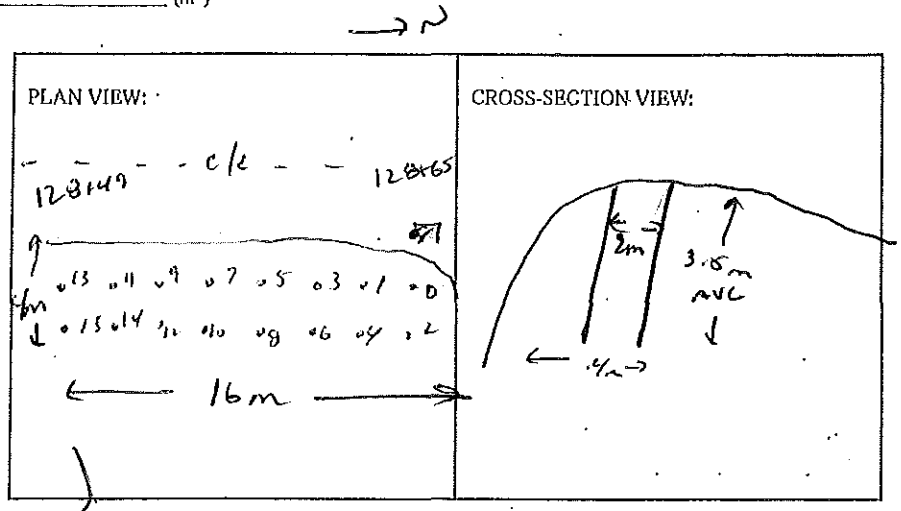
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 7.5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.37ips/39Hz
" @ 13167 Cliffstone Crt - 0.090ips/34Hz
" @ 13093 Cliffstone Crt - 0.19ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 14/12
PROPOSED BLAST DATE June 14/12
BLAST # MW-0251

HIGHWAY# 97
BLAST LOCATION AT: 128+49 - 128+65

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 4 (m)
PROPOSED TOTAL DEPTH 56 (m)
PROPOSED APPROX. NO. OF HOLES 16 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 16
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 60 CAPS

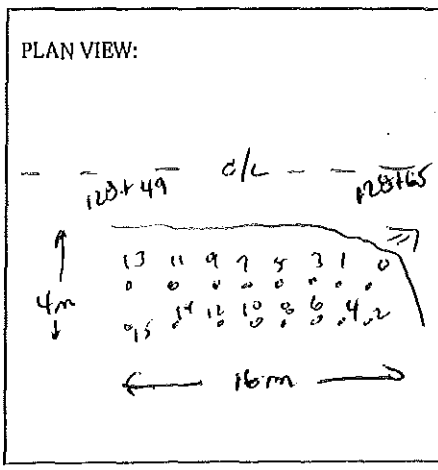
APPROX. VOLUME OF ROCK TO BE BLASTED 220 (m^3)

PROPOSED BLAST SKETCH:

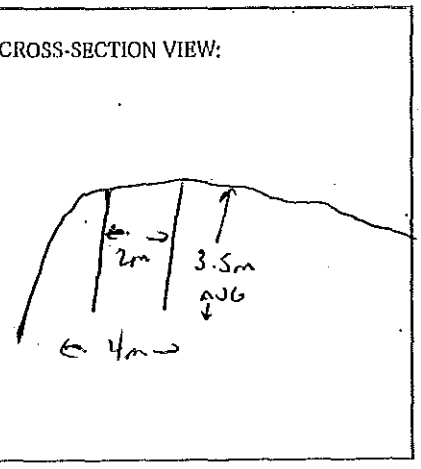
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21377-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 11:41 AM
BLAST # MW-0252

HIGHWAY# 97
BLAST LOCATION AT: STN 128+76 - 128+80 (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
no shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 11 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 105
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

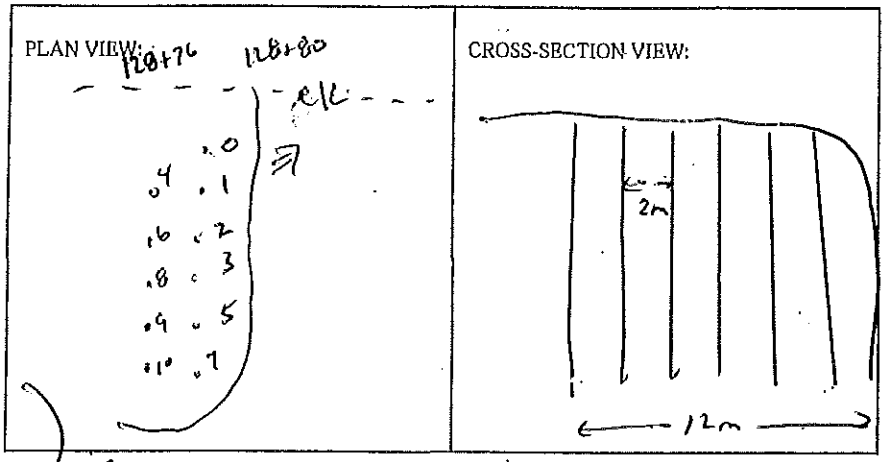
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.63 ips/34 Hz
" @ 13167 Cliffstone Crt - 0.18 ips/32 Hz
" @ 13093 Cliffstone Crt - 0.31 ips/34 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 14/12
PROPOSED BLAST DATE June 14/12
BLAST # MW-0252

HIGHWAY# 97
BLAST LOCATION AT: SD 128+76 - 128+80 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 56 (m)

PROPOSED APPROX. NO. OF HOLES 11 Proo.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 14" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 15.5
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

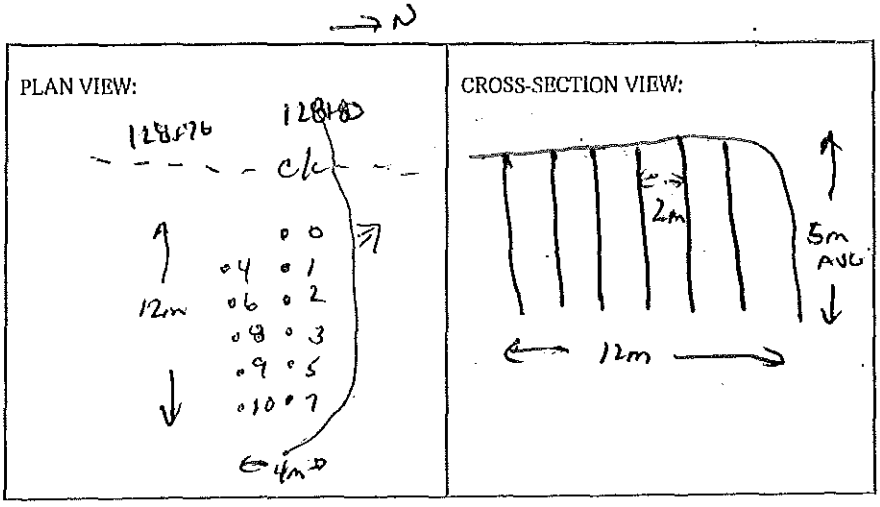
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 @ CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 240 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834897

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 2:58 PM
BLAST # MW-0263

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+70 - 129+76 c/l (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: de shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.8 (m)
TOTAL DEPTH 51 (m)

TOTAL NUMBER OF HOLES 17 /Row
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 85
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 35 (ms)

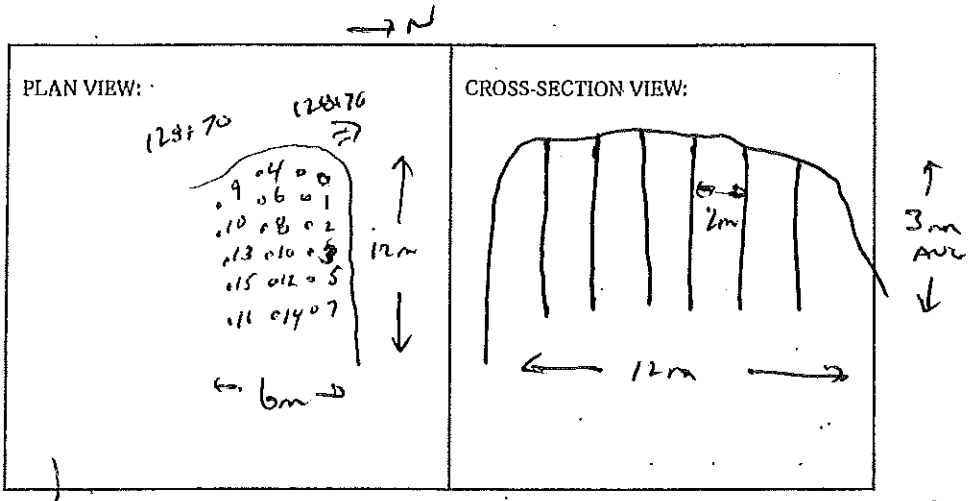
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.090 ips/34 Hz
" @ 13167 Cliffstone Crt - 0.045 ips/37 Hz
" @ 13093 Cliffstone Crt. 0.12 ips/57 Hz

PROPOSED BLAST DESIGN

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED June 14/12
PROPOSED BLAST DATE June 14/12
BLAST # MW-0253

HIGHWAY # 97
BLAST LOCATION AT: STN 128+70 - 128+76 c/L (Bench 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.8 (m)
PROPOSED TOTAL DEPTH 51 (m)

PROPOSED APPROX. NO. OF HOLES 17 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 8.5
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

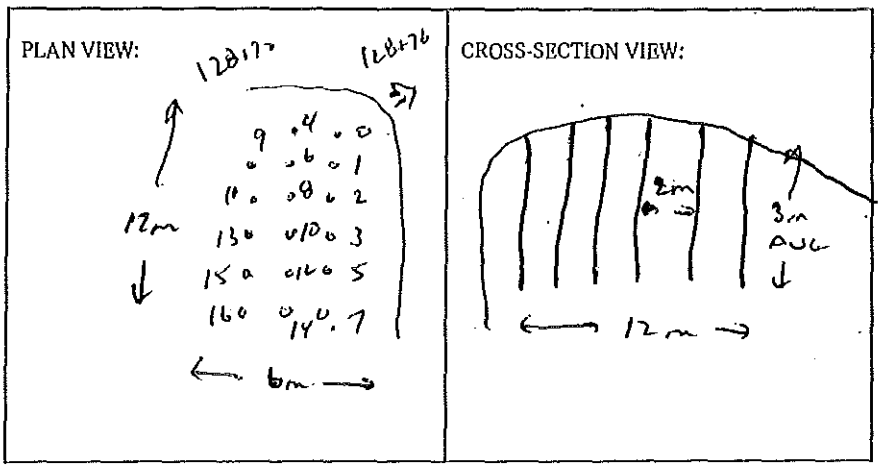
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HSX20 CAPACITY 90 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3487

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 4:06PM
BLAST # MW-0254

HIGHWAY# 97
BLAST LOCATION AT: STN 128+72 - 128+76 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
see shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 10 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

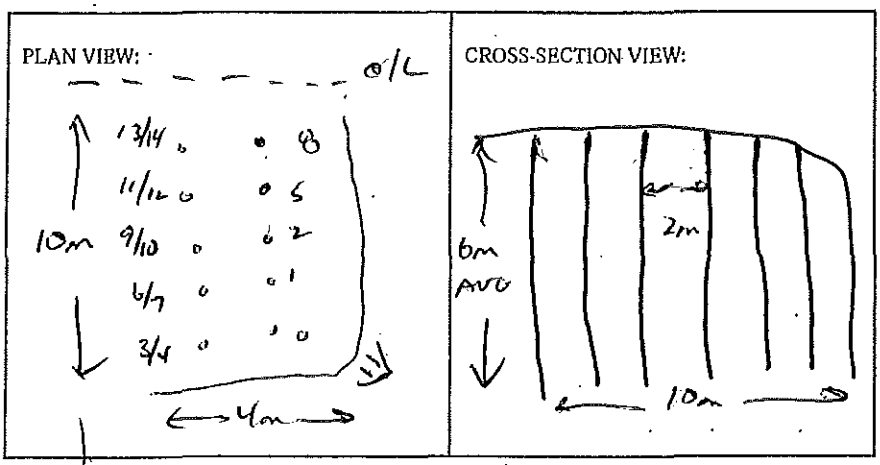
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HW320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.62 ips / 28 Hz
" @ 13167 Millstone Crt - 0.16 ips / 39 Hz
" @ 13093 Cliffstone Crt - 0.73 ips / 5 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 14/12
PROPOSED BLAST DATE June 14/12
BLAST # MW-0254

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+72 - 128+76 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.6 (m)
PROPOSED TOTAL DEPTH 60 (m)

PROPOSED APPROX. NO. OF HOLES 10 Rock
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 7.5
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

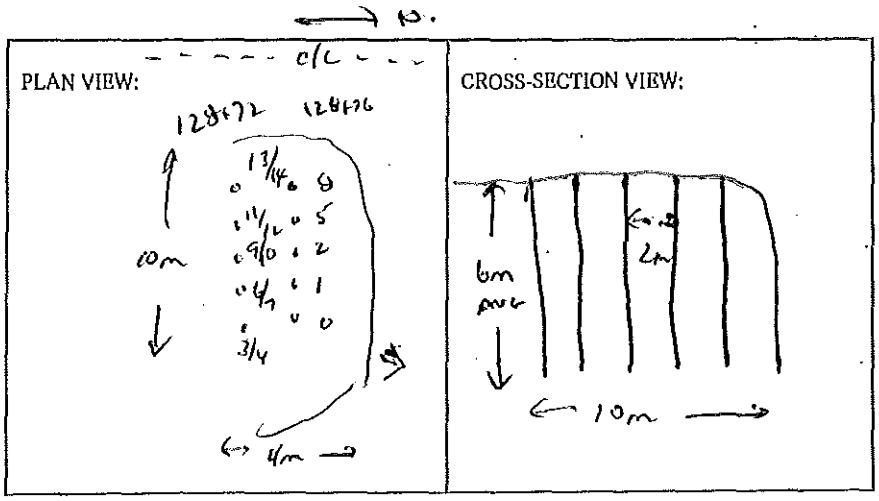
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 500 CAPACITY 100 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 240 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/87

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 10:00AM
BLAST # MW-0255

HIGHWAY# 97
BLAST LOCATION AT: SW 128+34 - 128+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES _____
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 95 (kg)
DELAY TYPE AND LENGTH 25 (ms)

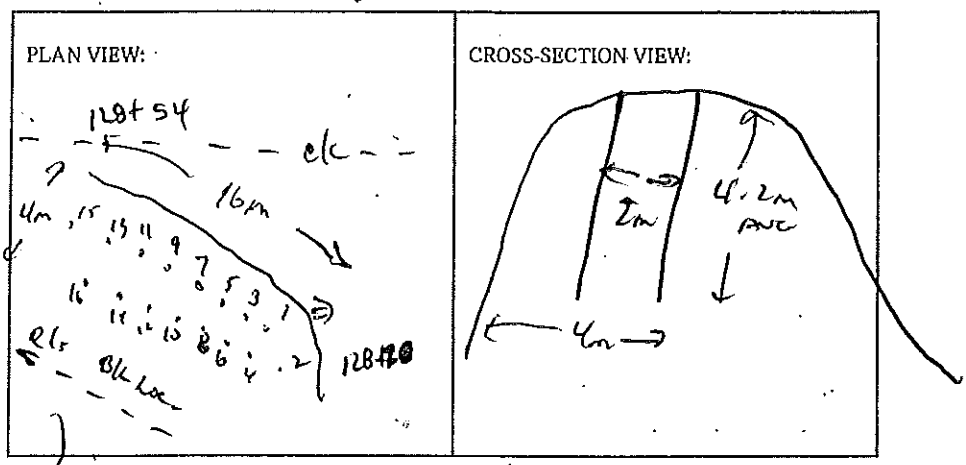
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.261PS / 34 Hz
" @ 13167 Cliffstone Crt – 0.060 IPS / 37 Hz
" @ 13093 Cliffstone Crt – 0.65 IPS / 5 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED June 15/12
PROPOSED BLAST DATE June 15/12
BLAST # MW-0255

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+54 - 128+70

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 4.2 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.6 (m)
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED APPROX. NO. OF HOLES 16 Pairs
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 3280 CAPACITY 80 caps

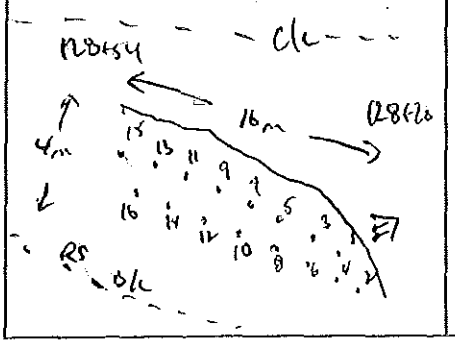
APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

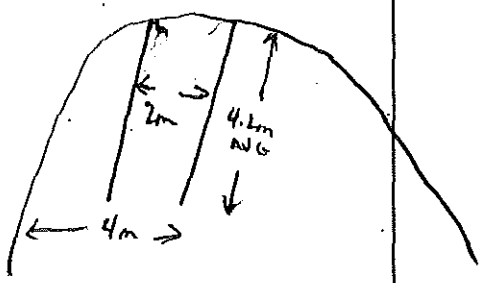
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5933(89)

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 11:44AM
BLAST # MW-0256

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+42 - 128+54

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 102 (m)

TOTAL NUMBER OF HOLES 17 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 85
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

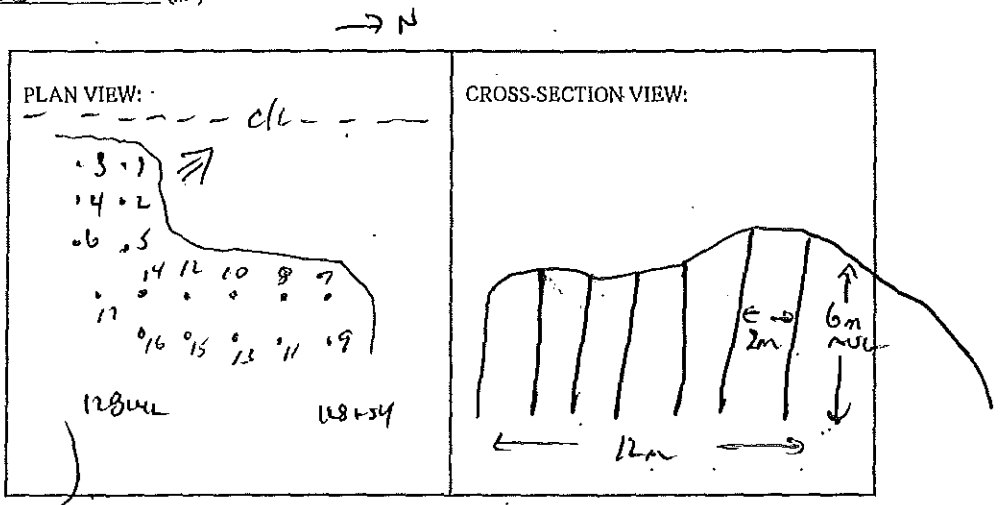
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 550 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13+50 Old Mission Rd — 0.30 in/s / 30 Hz
" @ 13167 Cliffstone Crt — 0.090 in/s / 43 Hz
" @ 13093 Cliffstone Crt. 0.29 in/s / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED June 15/12
PROPOSED BLAST DATE June 15/12
BLAST # MW-0256

HIGHWAY# 97
BLAST LOCATION AT: STA 128+42 - 128+54

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.6 (m)
PROPOSED TOTAL DEPTH 102 (m)
PROPOSED APPROX. NO. OF HOLES 17 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

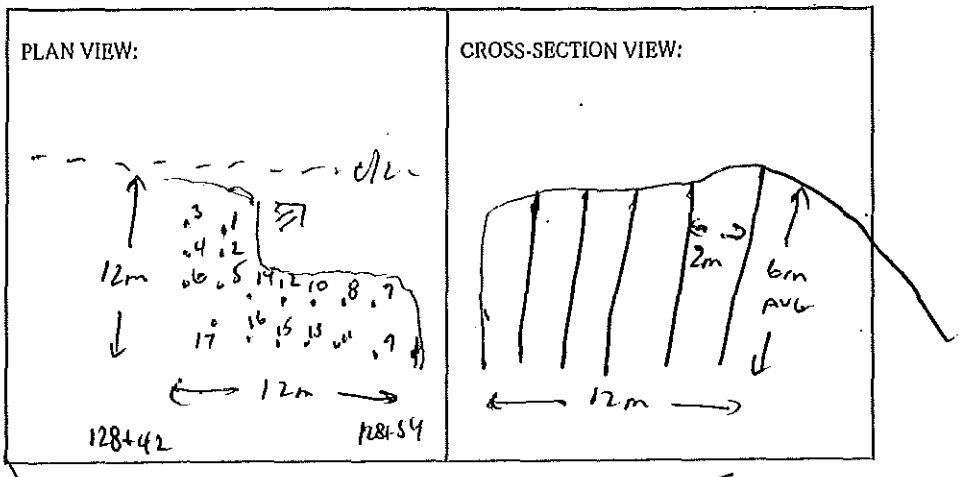
EXPLOSIVE TYPE 1½" Pyramite & ANFO
APPROX. NUMBER OF CARTRIDGES 85
PROPOSED NUMBER OF DELAYS 17
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-T B320 CAPACITY 150 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 550 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME DARYL FLEBER SIGNATURE _____ COMPANY FLEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 3:08 PM
BLAST # MW-0257

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+36 - 128+42 c/c

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4.8 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 20 Pass
HOLE DIAMETER 76 (mm)
HOLE SPACING _____ (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

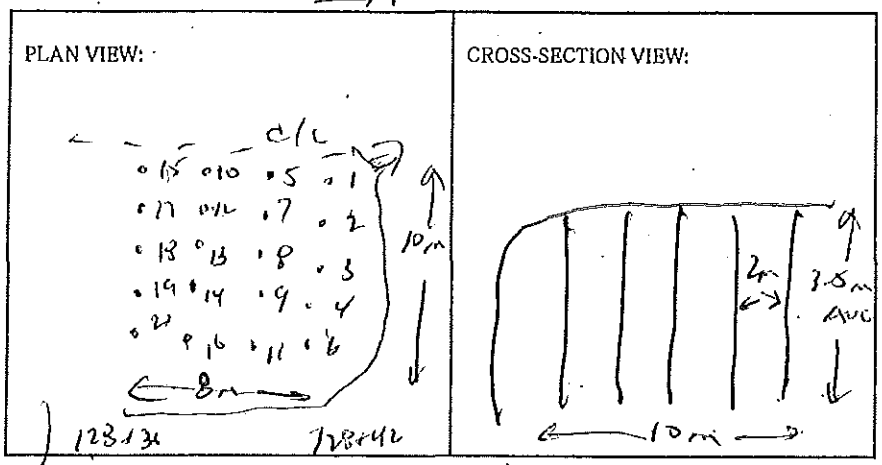
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.11 ips | 39Hz
" @ 13167 Cliffhanger - NO TRIGGER (< 0.04 ips)
" @ 13093 Cliffhanger 0.083 ips | 51Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED June 6/12
PROPOSED BLAST DATE June 15/12
BLAST # MW-0257

HIGHWAY # 97
BLAST LOCATION AT: SB 128+36 - 128+42 c/l

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Pil
PROPOSED AVG. DEPTH 3.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 4.5 (m)
PROPOSED TOTAL DEPTH 60 (m)
PROPOSED APPROX. NO. OF HOLES 20 Pad
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumalite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 20
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

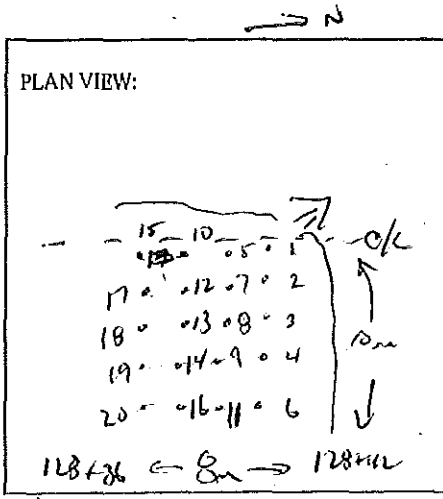
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 280 (m^3)

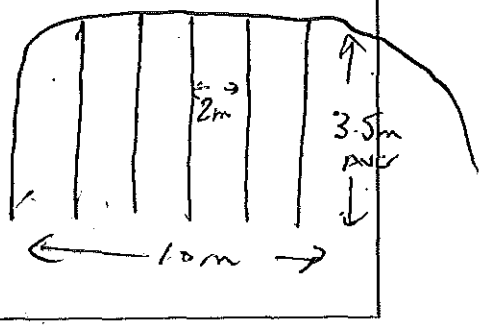
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darrel Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 19/12
ACTUAL BLAST DATE June 19/12 12:31 PM
BLAST # MW-0258

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+66 - 128+72 (TO submitted)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Sketched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 94 (m)

TOTAL NUMBER OF HOLES 16 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 21

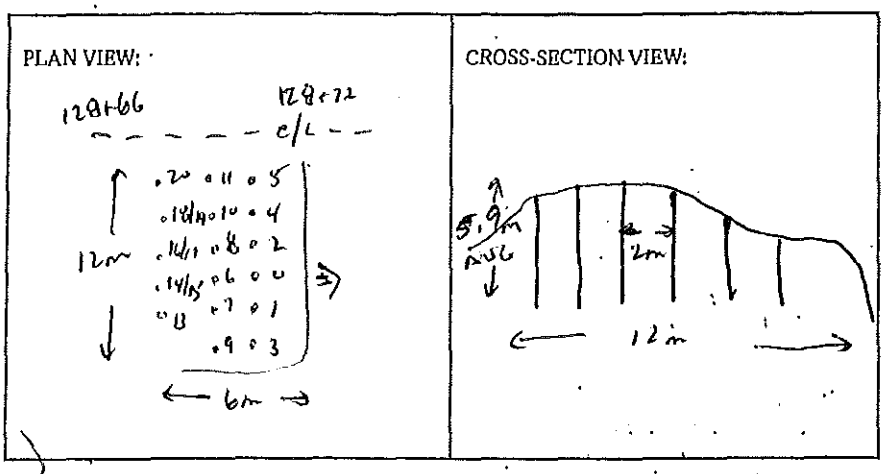
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 1.25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 385 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.49 ips/39Hz
" @ 13167 Cliffstone Crt - 0.09 ips/47Hz
" @ 13093 Cliffstone Crt - 0.36 ips/64Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED June 8/12
PROPOSED BLAST DATE June 9/12
BLAST # MW-025B

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+66 - 128+72 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.9 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.2 (m)
PROPOSED TOTAL DEPTH 94 (m)

PROPOSED APPROX. NO. OF HOLES 16 Pcod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 70
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

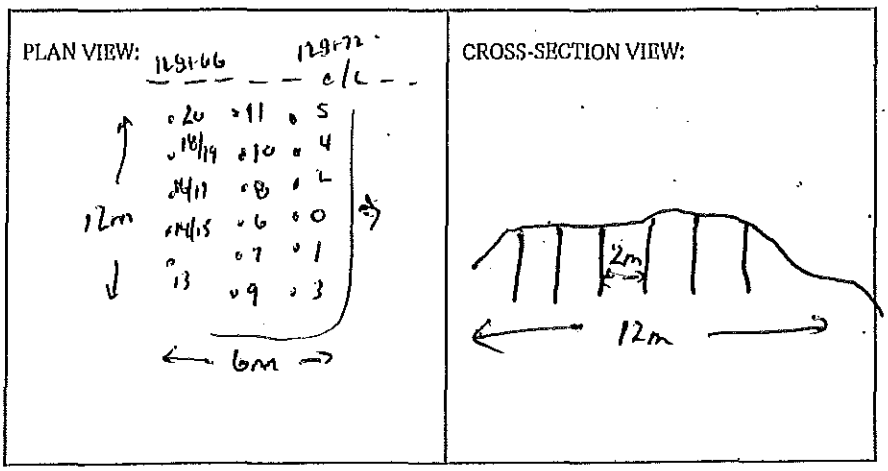
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 328 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 385 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834(8)

DATE PREPARED June 19/12
ACTUAL BLAST DATE June 19/12 2:14PM
BLAST # MW-0259

HIGHWAY # 97
BLAST LOCATION AT: 128+40 - 128+50 (TOP cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shotmatted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10 Pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

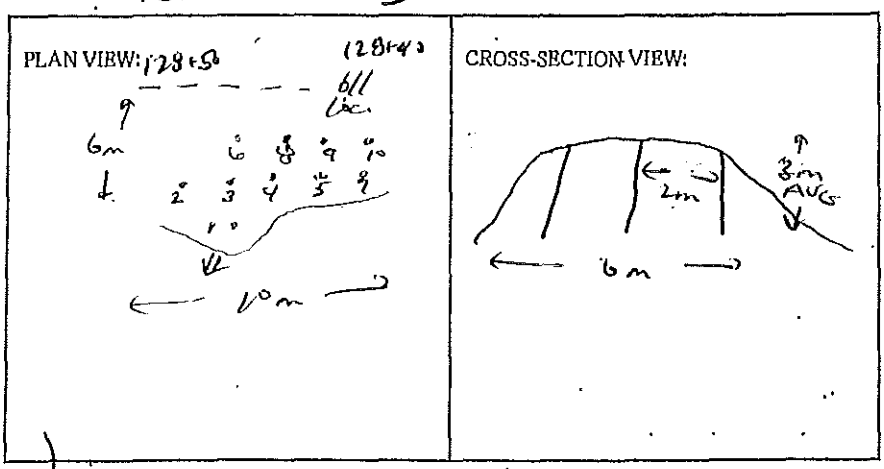
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE FFS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD MISSION RD 0.33 ips/ 39Hz.
@ 13167 Cliffside Ct. 0.065 ips/ 47Hz.
@ 13093 Cliffside Ct. 0.19 ips/ 57Hz.

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED June 19/12
PROPOSED BLAST DATE Jun 19/12
BLAST # MW-0259

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+40 - 128+50 (Top cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.2 (m)
PROPOSED TOTAL DEPTH 30 (m)
PROPOSED APPROX. NO. OF HOLES 10 Approx
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE M² Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 10
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

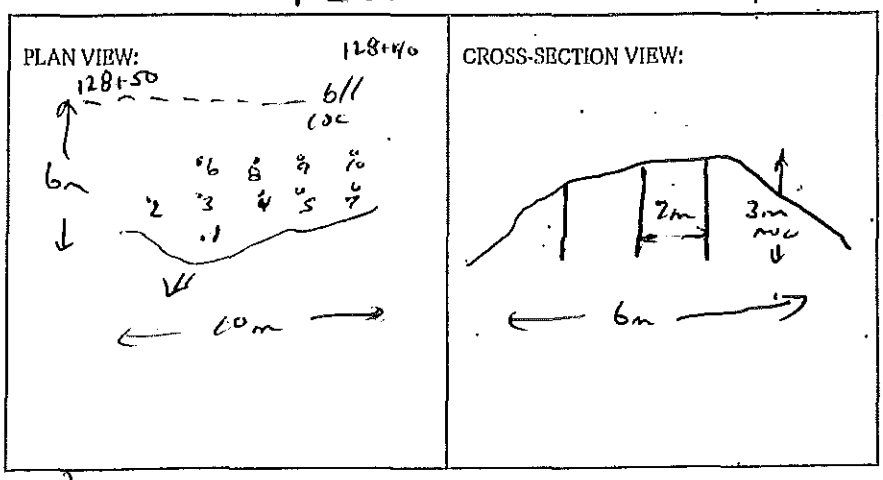
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-ITS 320 CAPACITY 90 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 9:18 AM
BLAST # MW-0260

HIGHWAY # 97
BLAST LOCATION AT: STN 128+66 - 128+72 (+ subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 Mod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

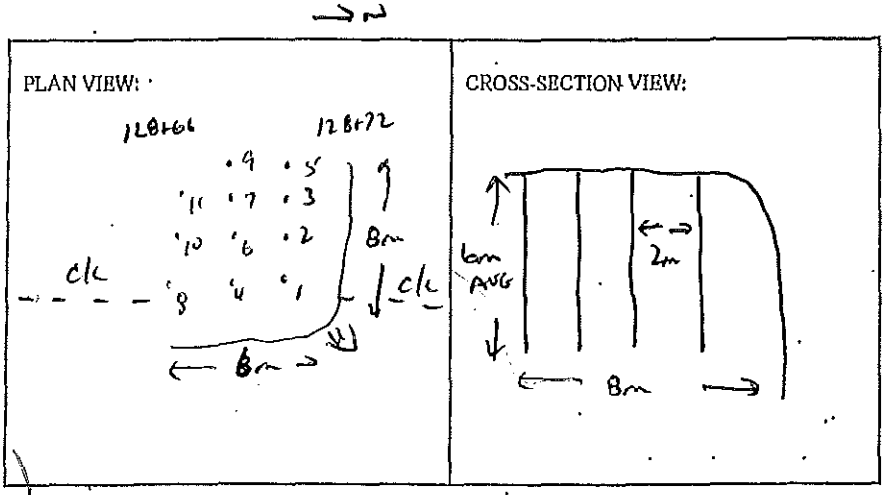
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 275 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old Mission Rd - 0.37 ips/32 Hz
" @ 13167 Cliffstone Crt - 0.12 ips/39 Hz
" @ 13093 Cliffstone Crt - 0.38 ips/43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5-83489

DATE PREPARED June 26/12
PROPOSED BLAST DATE June 28/12
BLAST # MW-0260

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+66 - 128+72 (to submitted)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.2 (m)
PROPOSED TOTAL DEPTH 66 (m)

PROPOSED APPROX. NO. OF HOLES 11 rep
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 55.5
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 76 (kg)
DELAY TYPE AND LENGTH 25 (ms)

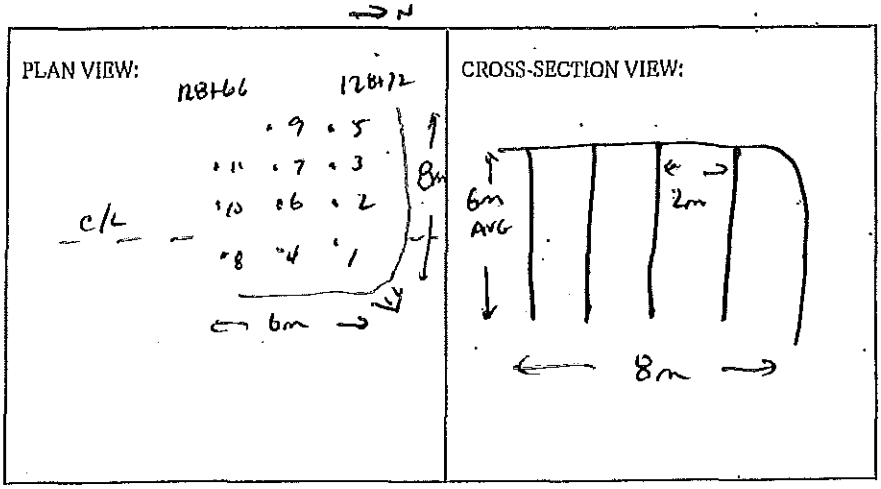
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 275 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834187

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 24/12 10:06am
BLAST # MW-026-1

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+50 - 128+58 (Top Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 4.5
TOTAL NUMBER OF DELAYS 9

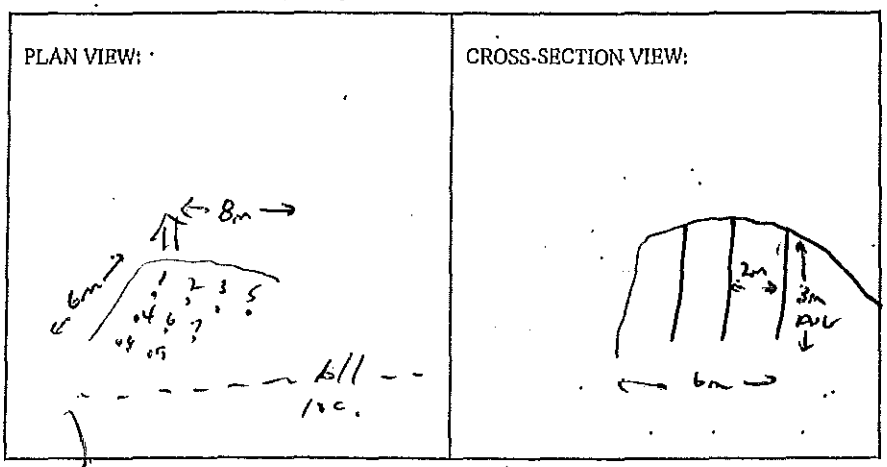
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 130 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.12 ips / 4Hz
" @ 13167 Cl: Hillstone Crt - No Trigger (<0.04 ips)
" @ 13093 Cl: Hillstone Crt - No Trigger (<0.04 ips)

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 20/12
PROPOSED BLAST DATE June 20/12
BLAST # MW-026

HIGHWAY # 97
BLAST LOCATION AT: SW 12B+50 - 123+58 (top cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.1 (m)
PROPOSED TOTAL DEPTH 27 (m)
PROPOSED APPROX. NO. OF HOLES 9 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 4.5
PROPOSED NUMBER OF DELAYS 9
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 330 CAPACITY 60 caps

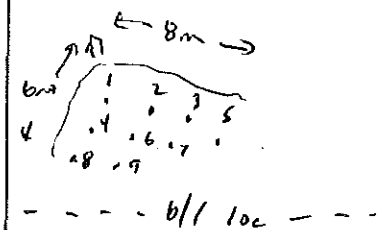
APPROX. VOLUME OF ROCK TO BE BLASTED 130 (m^3)

PROPOSED BLAST SKETCH:

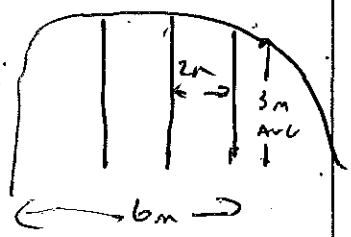
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Jun 20/12
ACTUAL BLAST DATE Jun 20/12 11:35AM
BLAST # MW-0262

HIGHWAY # 97
BLAST LOCATION AT: STN 128+58 - 128+72 (top cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 9 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 9

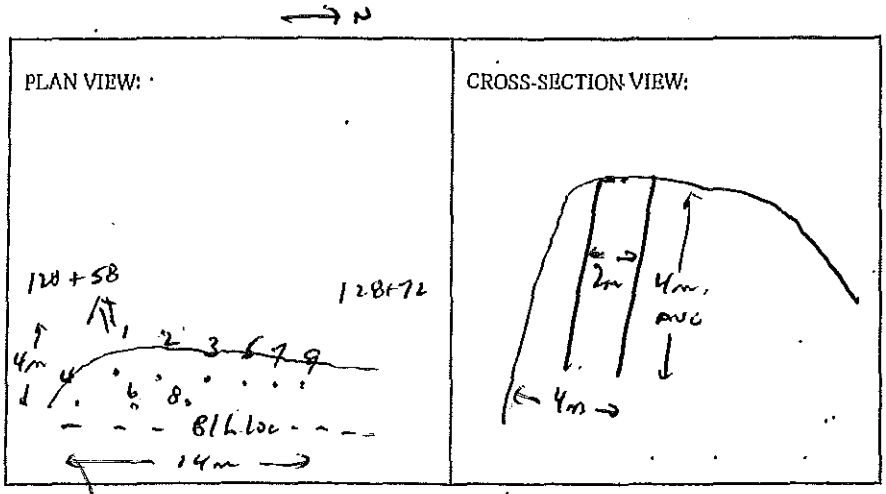
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13050 Old Mission Rd - 0.411 ips/32Hz
" @ 13167 Cliffstone Crt - 0.070 ips/37Hz
" @ 13093 Cliffstone Crt - 0.151 ips/87Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 20/12
PROPOSED BLAST DATE June 21/12
BLAST # MW-0262

HIGHWAY # 97
BLAST LOCATION AT: SW 128+58 - 128+72 (Top Cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5.5 (m)
PROPOSED TOTAL DEPTH 36 (m)
PROPOSED APPROX. NO. OF HOLES 9 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 4.5
PROPOSED NUMBER OF DELAYS 9
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 60 caps

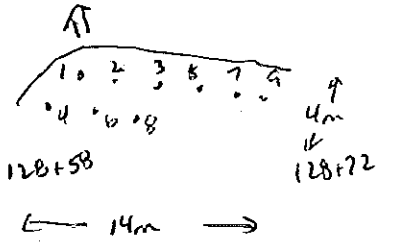
APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

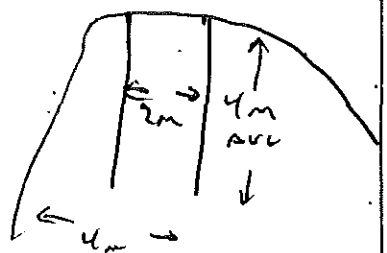
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834897

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 1:36PM
BLAST # MW-0263

HIGHWAY # 97
BLAST LOCATION AT: STN 128+71 - 128+78 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: de shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 B/L
AVERAGE DEPTH 4.8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 B/L / 4 Booster / 4 SMB / 4 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 Cart. Ex 16 Dynamite + 240gr det cord to 4' collar in B/L

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite +
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

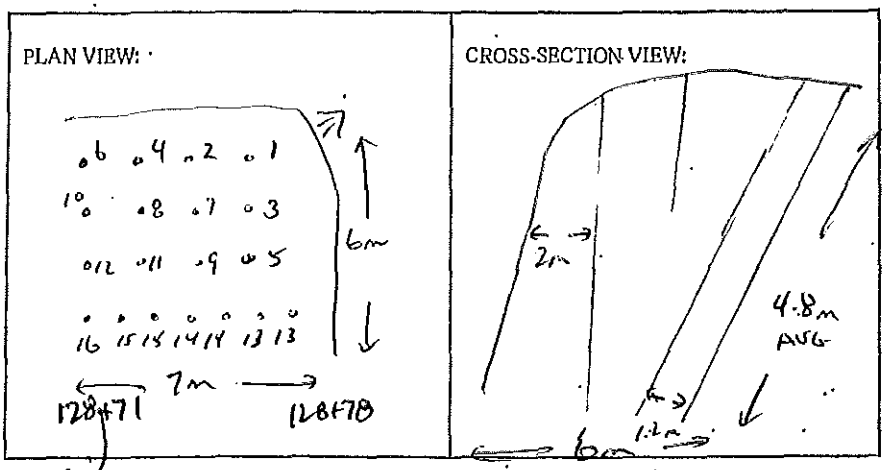
INITIATION DEVICE: (CIRCLE) E.B. CAP SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE MB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.40 ips / 28 Hz
@ 13167 Cliffstone Crt - 0.045 ips / 37 Hz
@ 13093 Cliffstone Crt - 0.13 ips / 87 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 20/12
PROPOSED BLAST DATE June 20/12
BLAST # MW-0263

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+71 - 128+78 RS (To Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 4.8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 80 (m)

PROPOSED APPROX. NO. OF HOLES 7 BL / 4 Buffer / 4 Stab / 4 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 6
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 406 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

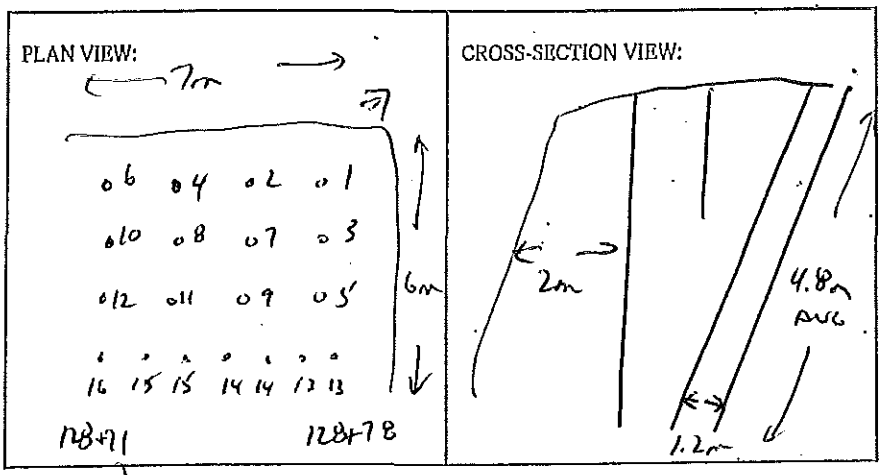
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleiber SIGNATURE _____ COMPANY Fleiber Rock. Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834(8?)

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 2:46PM
BLAST # MW-0264

HIGHWAY # 97
BLAST LOCATION AT: STN 128+68 - 128+71 RS (To submit)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 22 (m)

TOTAL NUMBER OF HOLES 4 B/L / 10 overall
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.7 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 3" Dynamite + 200gr detonator
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 3

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

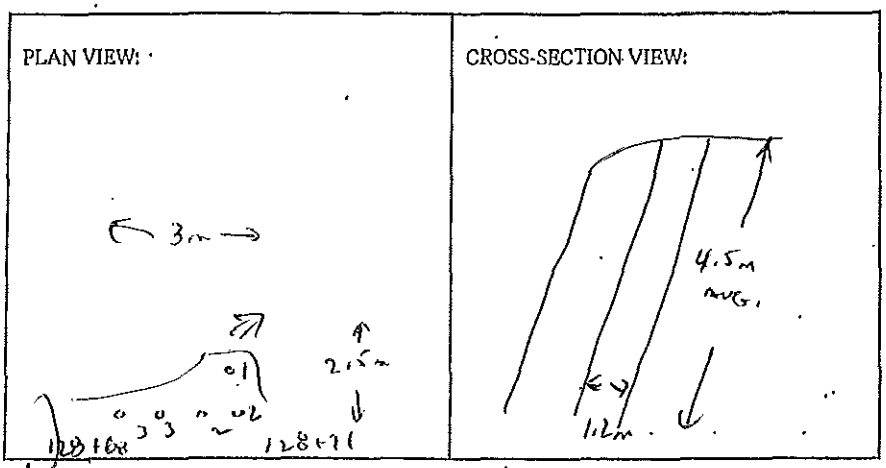
VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

2N

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.14 ips / 43Hz
" @ 13167 Cliffstone Crt - NO TRIGGER (<0.04 ips)
" @ 13093 Cliffstone Crt - 0.041 ips / 57Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED June 20/12
PROPOSED BLAST DATE June 26/12
BLAST # MW-0264

HIGHWAY # 97
BLAST LOCATION AT: STN 128+68 - 128+71 RS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 4
PROPOSED AVG. DEPTH 4.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 22 (m)

PROPOSED APPROX. NO. OF HOLES 4 B/L / 18 Offset
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.7 (m) BURDEN 1.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 200 gr detcord
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 3

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

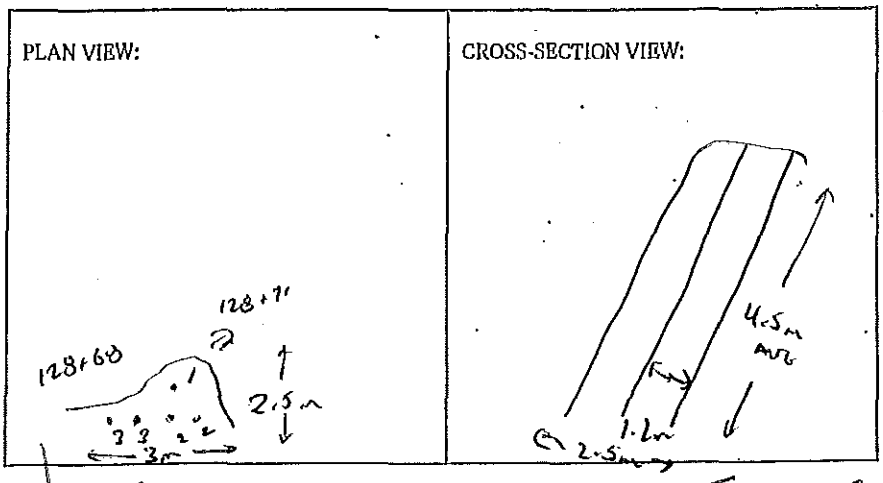
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB-320 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 50 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 1100 hrs
BLAST # MW-0265

HIGHWAY # 97
BLAST LOCATION AT: SW 128+70 - 128+80 C/L (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 19 (m)

TOTAL NUMBER OF HOLES 7 Plus
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 31.5
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

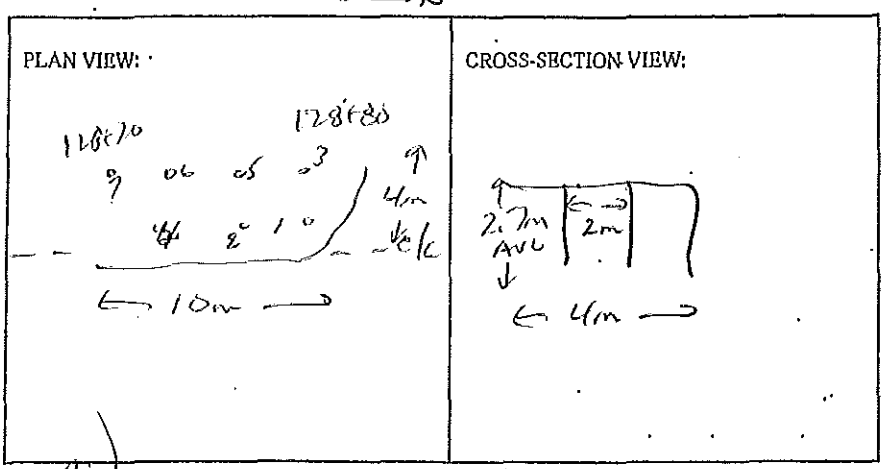
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD Mission Rd – 0.075 ips / 32 Hz
" @ 13167 Cliffstone Crt – NOT Recorded < 0.04 ips
" @ 13093 Cliffstone Crt – 0.091 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 21/12
PROPOSED BLAST DATE Jun 21/12
BLAST # MW-0265

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+70 - 128+80 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 19 (m)
PROPOSED APPROX. NO. OF HOLES 7 Pads
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 3.5
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

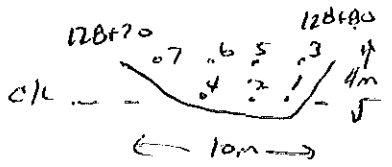
APPROX. VOLUME OF ROCK TO BE BLASTED 102 (m^3)

PROPOSED BLAST SKETCH:

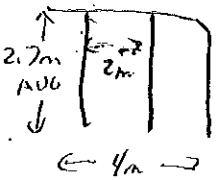
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834184

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 2:18 PM
BLAST # MW-0266.

HIGHWAY # 97
BLAST LOCATION AT: STA 128+60 - 128+66 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * not notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 86 (m)

TOTAL NUMBER OF HOLES 15 / Row.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 460 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

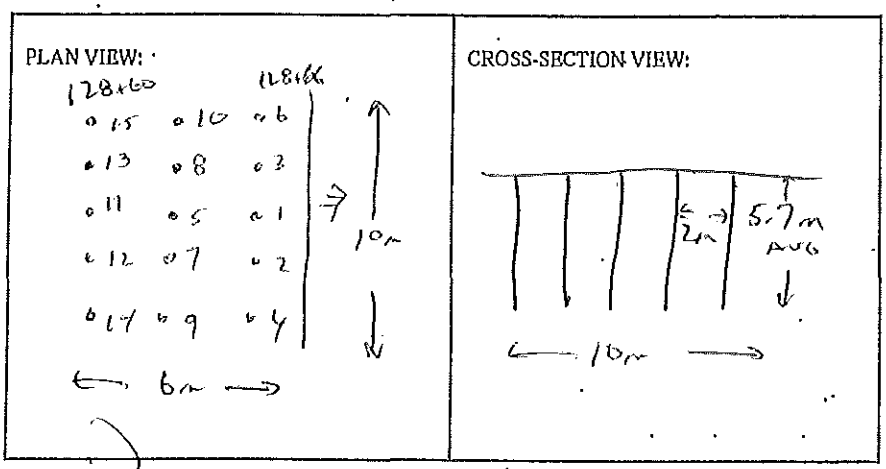
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~MS320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOGATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.39 ppv / 37Hz
" @ 13167 Cliffstone ct - 0.11 ips / 37Hz
" @ 13093 Cliffstone ct - 0.30 in/s 37Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweh
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED June 21/12
PROPOSED BLAST DATE Jun 21/12
BLAST # MW-0266

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+60 - 128+66 (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 86 (m)

PROPOSED APPROX. NO. OF HOLES 15 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumamite & ANFO
APPROX. NUMBER OF CARTRIDGES 75
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

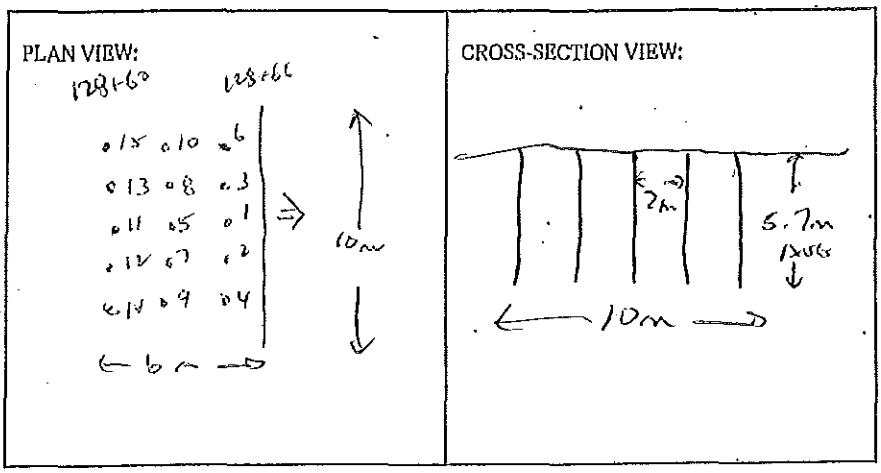
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 330 CAPACITY 90 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE COMPANY Fleiger Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweh COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 3:02pm
BLAST # MW-026

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+60 - 128+68 (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/c
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 10 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

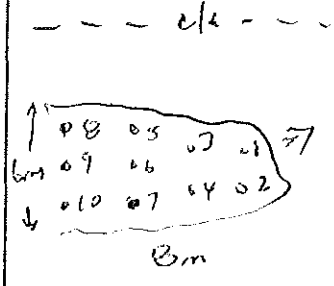
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m³)

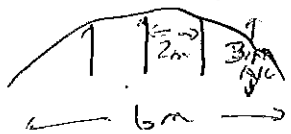
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.080 ips / 31/13
" @ 13167 Cliffstone ent - No trigger (<0.04 ips)
" @ 13093 Cliffstone ent - 0.044 ips / 37Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER SB34089

DATE PREPARED June 21/12
PROPOSED BLAST DATE June 21/12
BLAST # MW-0267

HIGHWAY # 97
BLAST LOCATION AT: STA 128+60 - 128+68 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 10/row
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

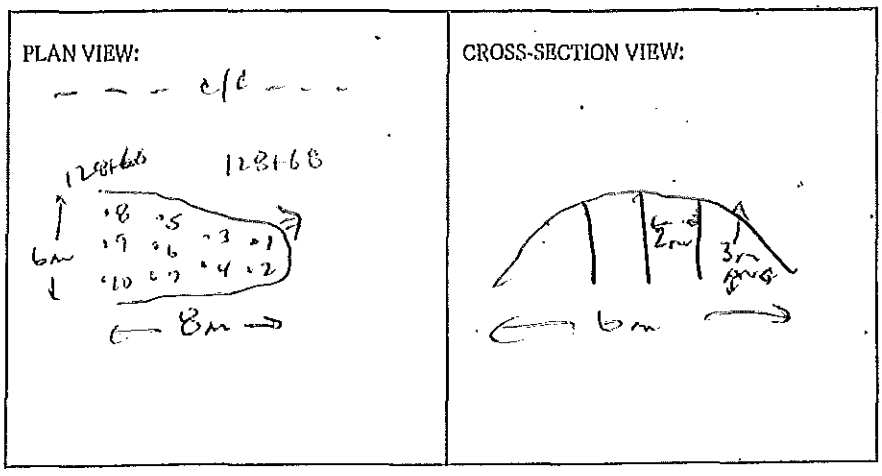
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

SECTION 204 ROCK CUTS

AS-BUILT Blast Record

~~PROPOSED BLAST DESIGN~~

File #:

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5934 09

DATE PREPARED June 22/12
PROPOSED BLAST DATE June 22/12 11:08 AM
BLAST # MW-0268

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+60 - 128+66 (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 63 (m)

PROPOSED APPROX. NO. OF HOLES 21 Resp
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 105
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH ~~25~~ (ms)

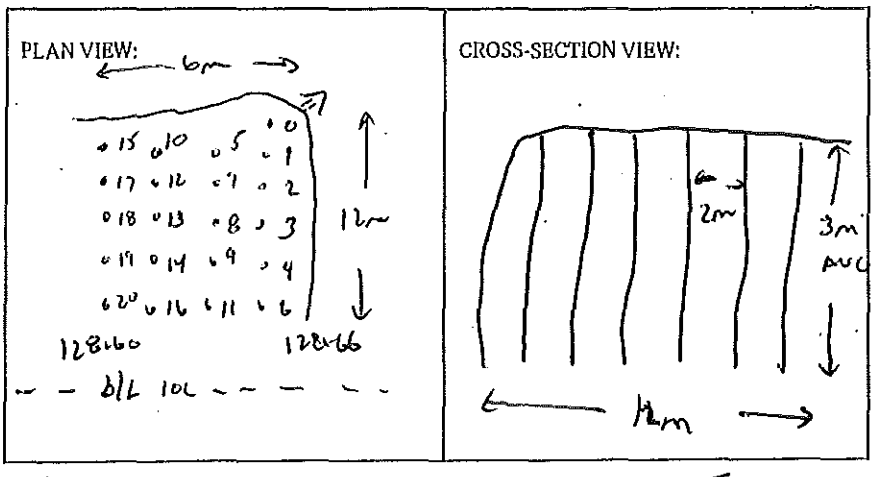
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HPS 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary) Seismograph @ 13050 OLO Mission Rd - 0.26 ips / 37 Hz
" @ 13167 Cliffstone Crt - 0.065 ips / 37 Hz
" @ 13093 Cliffstone Crt - 0.12 ips / 51 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verigin
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED June 22/12
PROPOSED BLAST DATE June 22/12
BLAST # MW-0268

HIGHWAY # 97
BLAST LOCATION AT: STN 1281+60 - 1281+66 (TO Subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 63 (m)
PROPOSED APPROX. NO. OF HOLES 21 P100
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE & ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

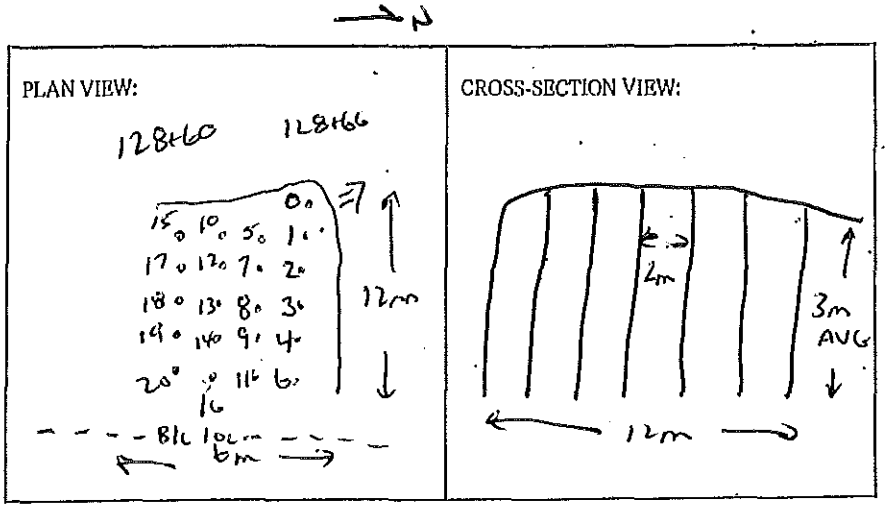
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 880 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m³)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verigin COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 22/12
ACTUAL BLAST DATE June 22/12 2:37 PM
BLAST # MW-0269

HIGHWAY # 97
BLAST LOCATION AT: STN 128+60 - 128+69 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

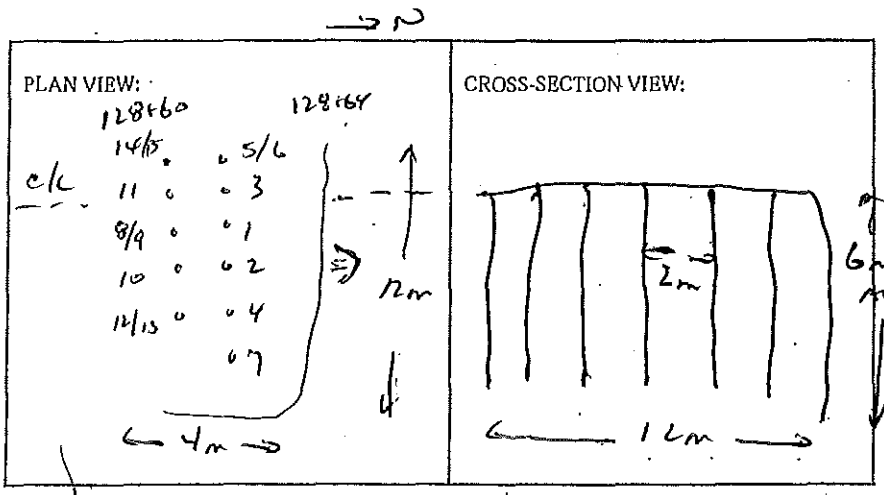
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.34 ips / 34 Hz
" @ 13167 Cliffstone crt – 0.10 ips / 30 Hz
" @ 13093 Cliffstone crt – 0.29 ips / 43 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED June 22/12
PROPOSED BLAST DATE June 22/12
BLAST # MU-0269

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+60 - 129+64 c/l (to submarelli)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.2 (m)
PROPOSED TOTAL DEPTH 16 (m)

PROPOSED APPROX. NO. OF HOLES 11 Pers
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pyramite + ANFO
APPROX. NUMBER OF CARTRIDGES 75
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

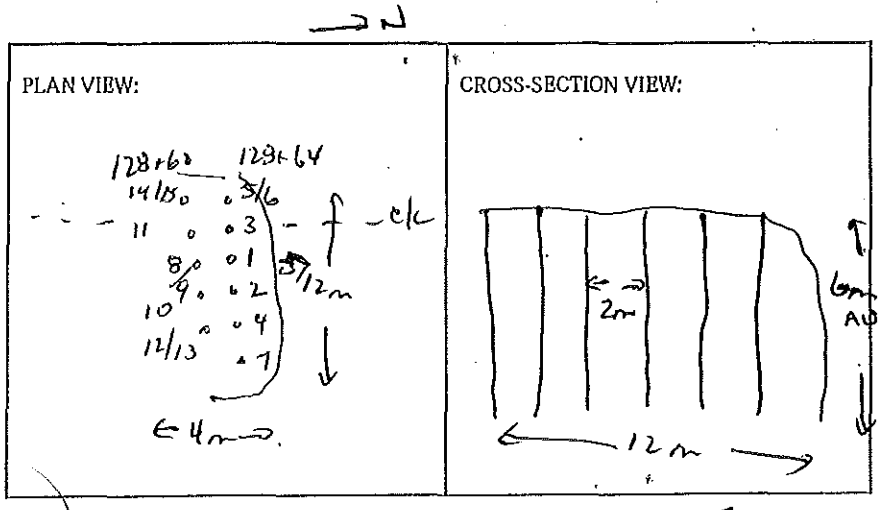
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 25/12
ACTUAL BLAST DATE June 25/12 12:08PM
BLAST # MW-027D

HIGHWAY# 97
BLAST LOCATION AT: STN 128+54 - 128+60 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.1 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 12 Pesd
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 450 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

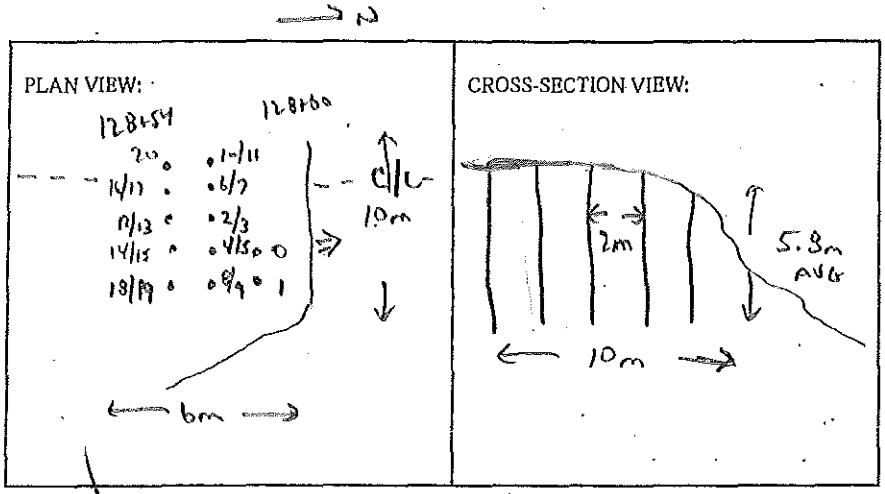
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.39 ips / 32 Hz
" @ 13167 Cliffstone Crt - 0.12 ips / 43 Hz
" @ 13093 Cliffstone Crt - 0.41 ips / 57 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 25/12
PROPOSED BLAST DATE June 25/12
BLAST # MW-0270

HIGHWAY # 97
BLAST LOCATION AT: SRW 128+54 - 128+60 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.1 (m)
PROPOSED TOTAL DEPTH 70 (m)
PROPOSED APPROX. NO. OF HOLES 12 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

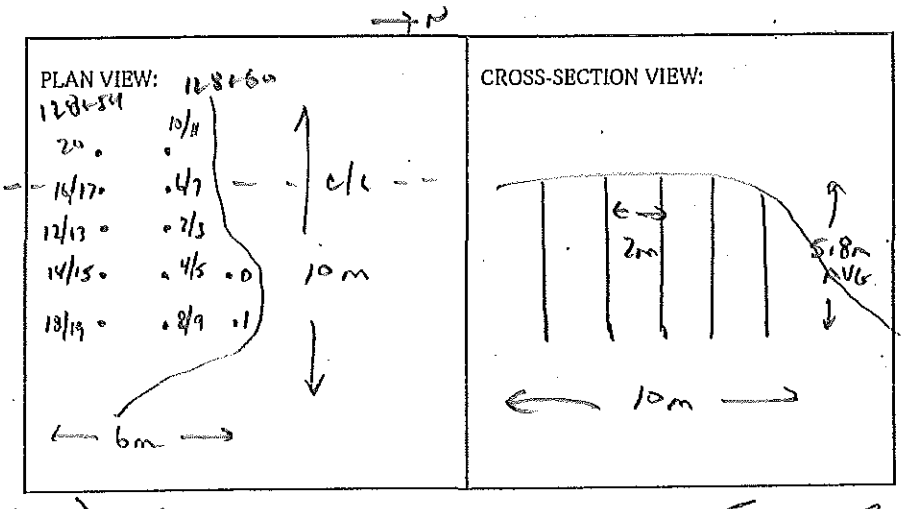
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB3380 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock. Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3487

DATE PREPARED June 25/12
ACTUAL BLAST DATE June 25/12 2:10 PM
BLAST # MW-0271

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+60 - 128+54 c/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot melted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/a
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 10 prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

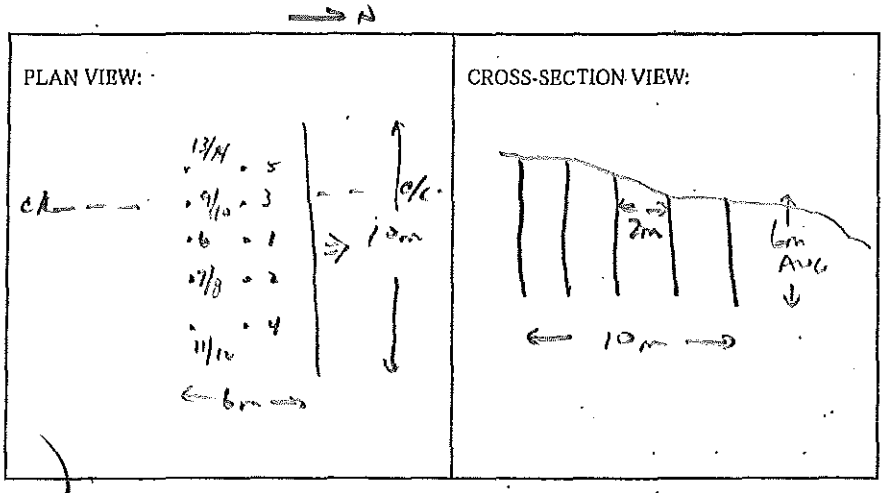
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13+50 old mission Rd - 0.45 ips / 30Hz
" @ 13+47 cliffstone crt - 0.101ps / 26Hz
" @ 13+93 cliffstone crt - 0.32 ips / 47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED June 25/12
PROPOSED BLAST DATE June 25/12
BLAST # MW-0171

HIGHWAY # 97
BLAST LOCATION AT: 128+50 - 128+54 c/l (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) SD (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6.2 (m)
PROPOSED TOTAL DEPTH 60 (m)

PROPOSED APPROX. NO. OF HOLES 10 Pods
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 3200 CAPACITY 80 caps

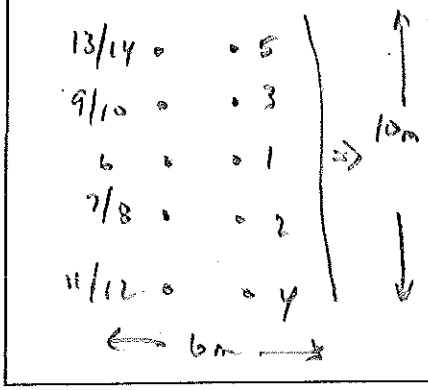
APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

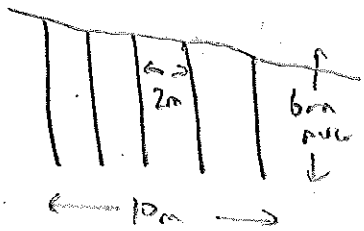
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5331489

DATE PREPARED June 26/12
ACTUAL BLAST DATE June 26/12 10:37 Am
BLAST # MW-0272

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+50 - 128+56 (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.7 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 15 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Hanger
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

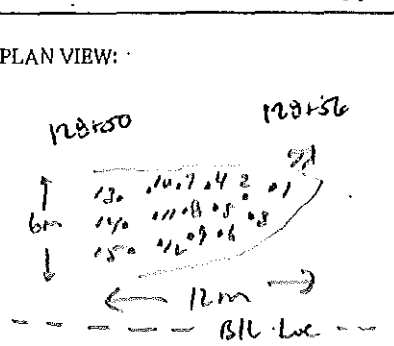
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m³)

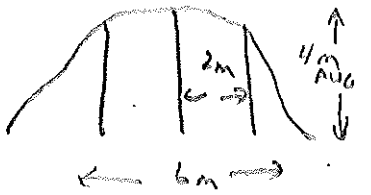
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old mission Rd - 0.231ps/ 37Hz
" @ 13167 cliffstone ct - 0.065 ips/ 39Hz
" @ 13093 cliffstone ct. 0.201ps/ 43Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED June 26/12
PROPOSED BLAST DATE June 26/12 10:27 AM
BLAST # MW-0272

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+50 - 128+56 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 4 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4.7 (m)
PROPOSED TOTAL DEPTH 60 (m)
PROPOSED APPROX. NO. OF HOLES 15 Per 0
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 7.5
PROPOSED NUMBER OF DELAYS 15
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

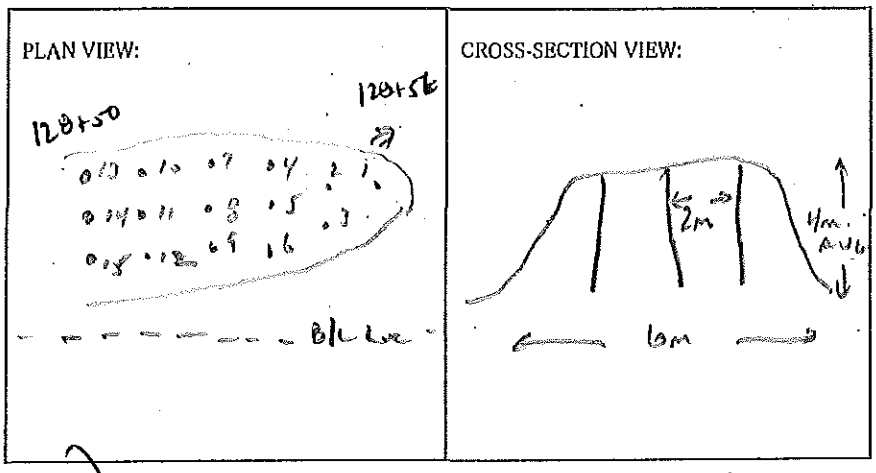
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 26/11
ACTUAL BLAST DATE June 26/11 11:21 AM
BLAST # MW-0273

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+44 - 128+50 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 2.9 (m)
TOTAL DEPTH 33 (m)

TOTAL NUMBER OF HOLES 13 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

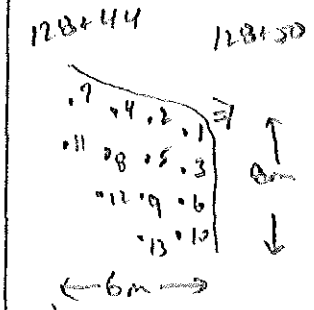
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 110 (m^3)

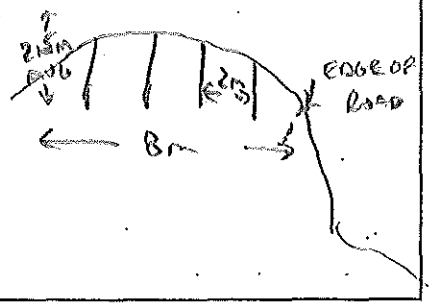
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.231 ips / 37Hz
" @ 13167 Cliffstone Crt - No Trigger (< 0.04 ips)
" @ 13093 Cliffstone Crt - 0.10 ips / 57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED June 26/12
PROPOSED BLAST DATE June 26/12
BLAST # MW-0273

HIGHWAY# 97
BLAST LOCATION AT: SB 12B+44 - 12B+50 (RS) (to 50 kg/mde)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 2.9 (m)
PROPOSED TOTAL DEPTH 33 (m)
PROPOSED APPROX. NO. OF HOLES 13 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 6.5
PROPOSED NUMBER OF DELAYS 13
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-I 5320 CAPACITY 120 caps

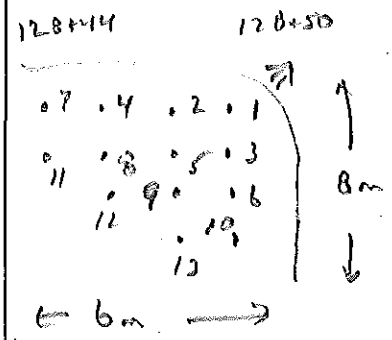
APPROX. VOLUME OF ROCK TO BE BLASTED 110 (m^3)

PROPOSED BLAST SKETCH:

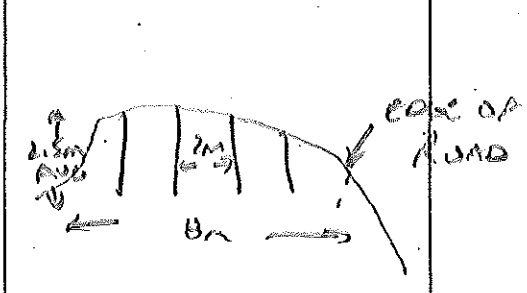
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 22/12
ACTUAL BLAST DATE June 22/12 12:44PM
BLAST # MW-0274

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+45 - 128+51 c/c (Top Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

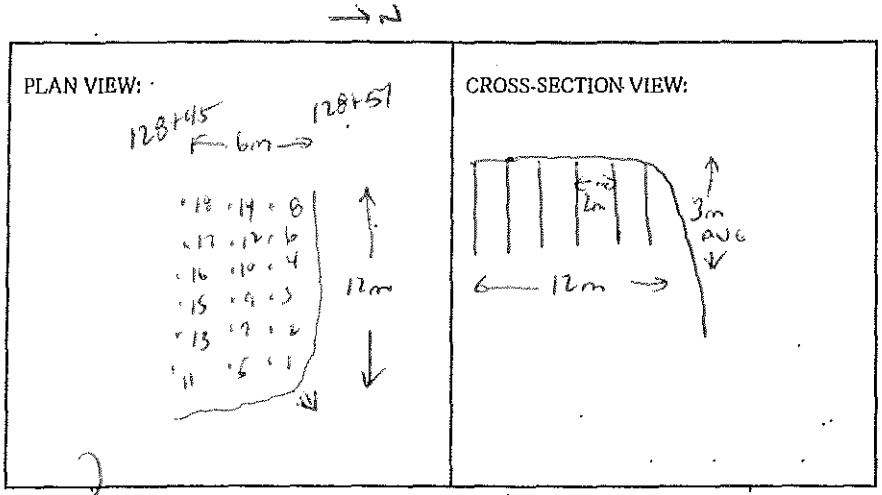
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.12 ips/47Hz
" @ 13167 Cliffstone Cut - No Trigger (<0.04 ips)
" @ 13093 Cliffstone Cut - 0.13 ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 27/12
PROPOSED BLAST DATE June 27/12
BLAST # MW-0274

HIGHWAY# 97
BLAST LOCATION AT: STN 128+45 - 128+51 c/l (TOP cut)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 54 (m)

PROPOSED APPROX. NO. OF HOLES 18 Proo.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

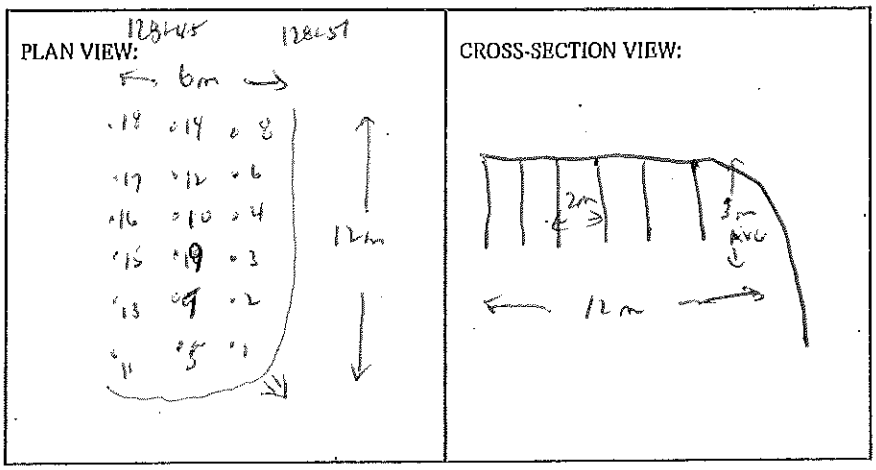
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HP5320 CAPACITY 90 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831487

DATE PREPARED June 27/12
ACTUAL BLAST DATE June 27/12 2:18PM
BLAST # MW-0275

HIGHWAY# 97
BLAST LOCATION AT: 128+30 - 128+45 c/L (TOP Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 12 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

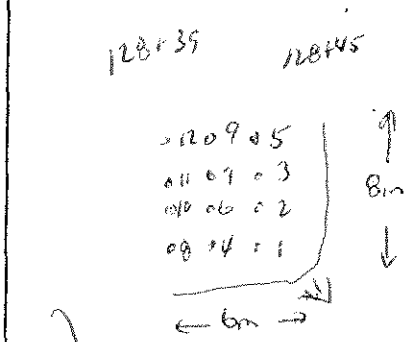
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~HB320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

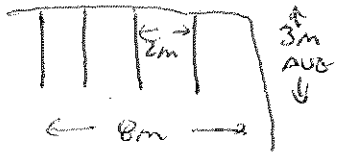
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.670 ips/39Hz
" @ 13167 Cliffstone Crt - no trigger (< 0.04 ips)
" @ 13093 Cliffstone Crt - 0.12 ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 27/12
PROPOSED BLAST DATE June 27/12
BLAST # MW-0275

HIGHWAY# 97
BLAST LOCATION AT: STN 128+39 - 128+45 c/L (roadway)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 36 (m)
PROPOSED APPROX. NO. OF HOLES 12 Pro
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 6
PROPOSED NUMBER OF DELAYS 12
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 338 CAPACITY 80 caps

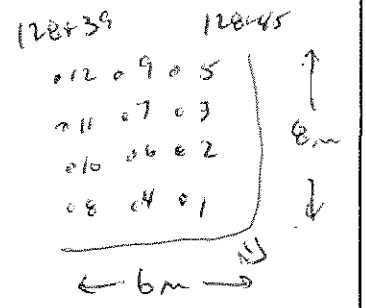
APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

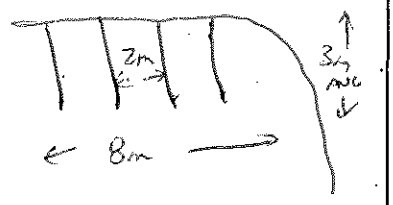
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 28/12
ACTUAL BLAST DATE June 28/12 11:58 AM
BLAST # MW-0376

HIGHWAY # 97
BLAST LOCATION AT: STN 128+94 - 129+80 LS (no subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 4 shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 7.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 5BL / 3 Buffer / 3SM8 / 6 Pad.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

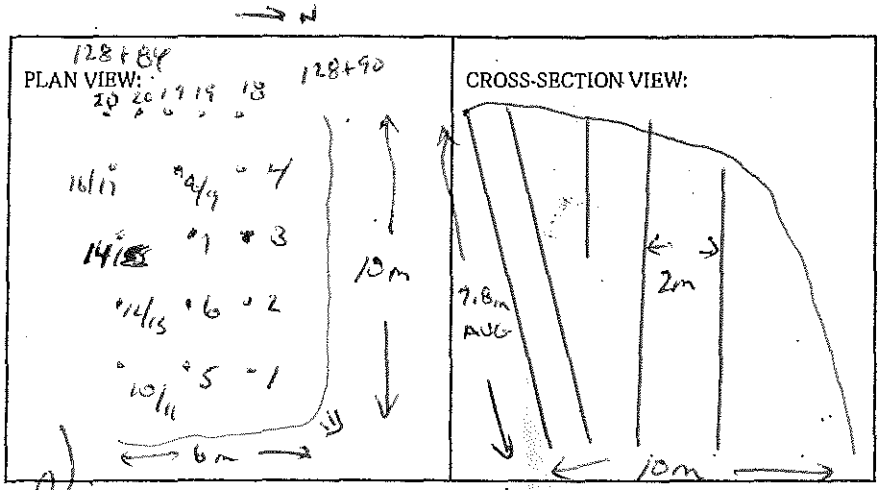
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13050 Old Mission Rd - 0.15 ips / 32Hz
Seismograph 13167 Cliffstone Ct - 0.085 ips / 32Hz
Seismograph 13093 Cliffstone Ct - 0.55 ips / 47Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934B9

DATE PREPARED June 28/12
PROPOSED BLAST DATE June 28/12
BLAST # MW-0226

HIGHWAY# 97
BLAST LOCATION AT: SW 128+84 - 128+80 US (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 5
PROPOSED AVG. DEPTH 7.8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 12 (m)

PROPOSED APPROX. NO. OF HOLES 5 BL / 3 Buffer / 3 Stag / 6 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

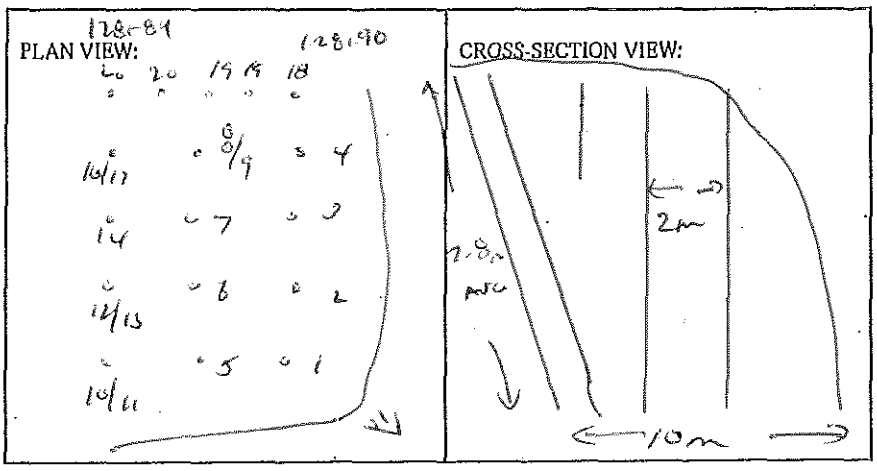
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 538 CAPACITY 150 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 450 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/87

DATE PREPARED Jul 9/12
ACTUAL BLAST DATE Jul 9/12 2:19 PM
BLAST # MW-0277

HIGHWAY# 97
BLAST LOCATION AT: 128+38 - 128+44 c/l to Buttress

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot metred

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 69 (m)

TOTAL NUMBER OF HOLES 21 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

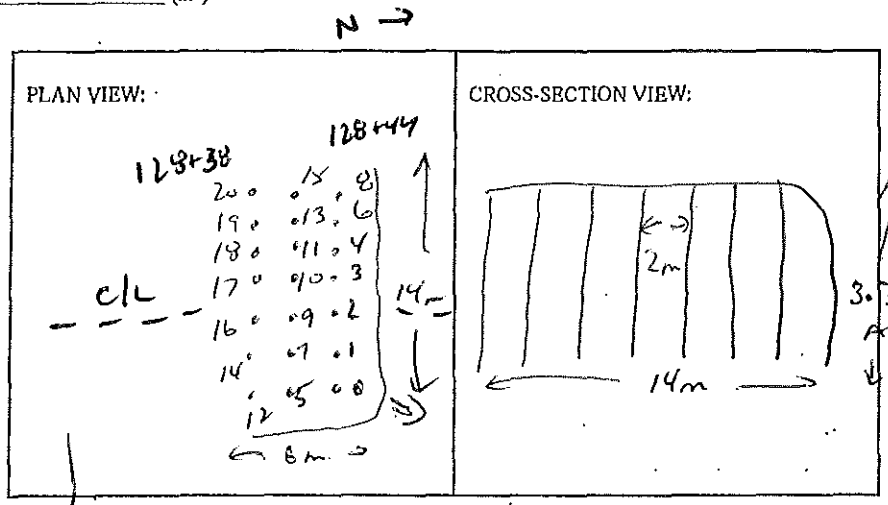
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 275 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.52 ips / 32Hz
" @ 13167 Clearstone Crt - 0.14 ips / 39Hz
" @ 13093 Clearstone Crt - 0.34 ips / 57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 9/12
PROPOSED BLAST DATE Jul 9/12
BLAST # MW-0277

HIGHWAY # 97
BLAST LOCATION AT: SW 128+38 - 128+44 c/l (TUS u bg mole)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3.3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 4.2 (m)
PROPOSED TOTAL DEPTH 69 (m)
PROPOSED APPROX. NO. OF HOLES 21 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

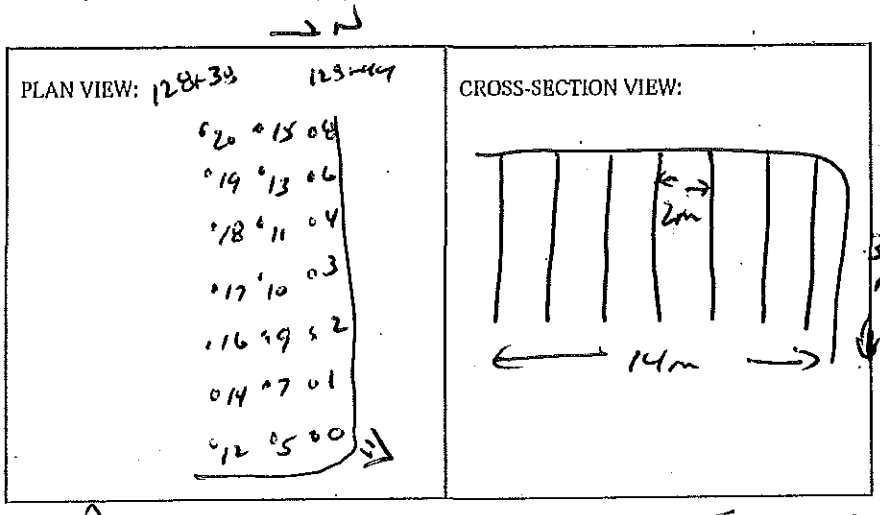
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 338 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 275 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5934789

DATE PREPARED Jul 9/12
ACTUAL BLAST DATE Jul 9/12 4:28 PM
BLAST # MW-0278

HIGHWAY# 97
BLAST LOCATION AT: STN 128+32 - 128-38 c/l (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 20 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

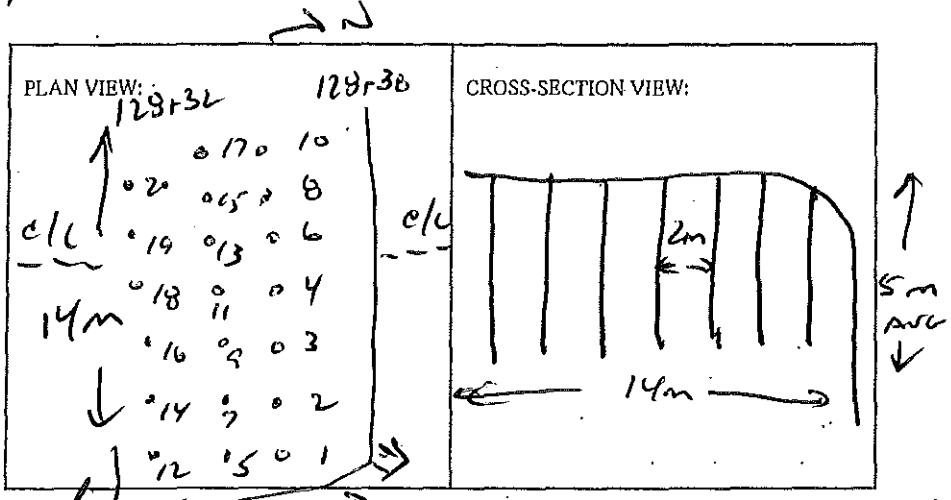
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HF3320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD Mission Rd - 0.35 ips/ 34Hz
" @ 13167 C/l Alstone Cnt - 0.12 ips/ 5Hz
" @ 13093 C/l Alstone Cnt - 0.21 ips/ 5Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 9/12
PROPOSED BLAST DATE Jul 9/12
BLAST # MW-0278

HIGHWAY# 97
BLAST LOCATION AT: SW 128+32 - 128+38 c/l (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5.6 (m)
PROPOSED TOTAL DEPTH 100 (m)

PROPOSED APPROX. NO. OF HOLES 20 Prop.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 20

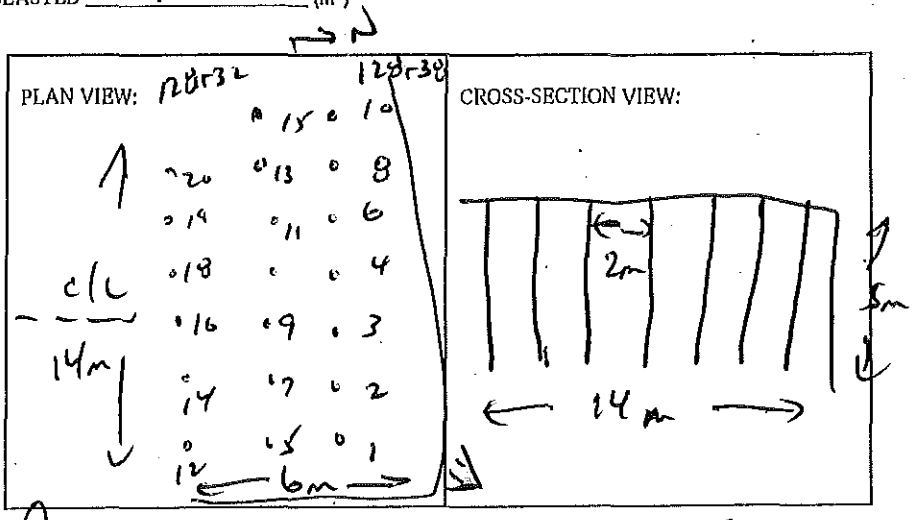
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB-SR0 CAPACITY 50 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED July/11
ACTUAL BLAST DATE July/11 10:18 AM
BLAST # MW-0279

HIGHWAY# 97
BLAST LOCATION AT: 127+85 - 128+08 c/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
all shot matted.

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) ~~BURDEN~~ 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

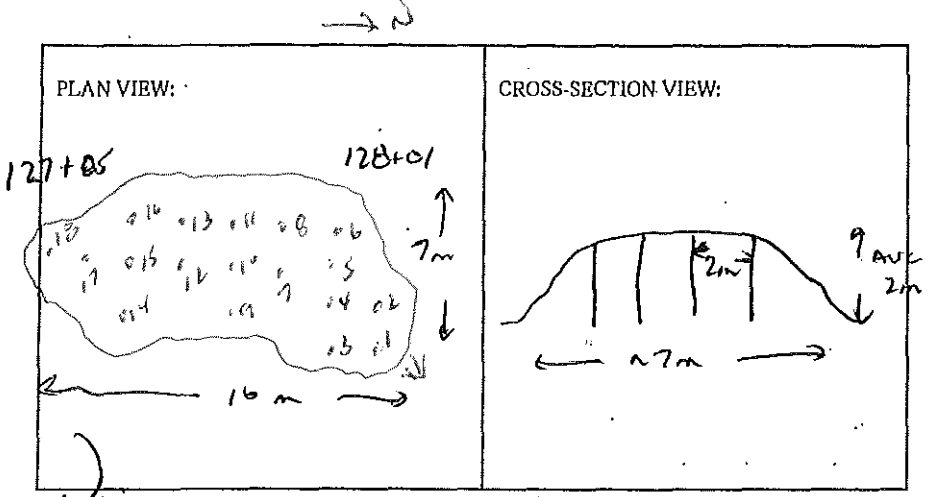
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs 13050 Old Mission Rd - 0.090 ips / 39 Hz
" @ 13167 C/L fillstone cut, No trigger (< 0.04 ips)
" @ 13093 C/L fillstone cut - 0.10 ips / 5 Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED July/12
PROPOSED BLAST DATE July/12
BLAST # MW-0279

HIGHWAY# 97
BLAST LOCATION AT: 127+85 - 128+01 c/L (TOSLA/Nicola)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 2 (m)
PROPOSED NO. OF ROWS 8
PROPOSED MAXIMUM DEPTH 2.0 (m)
PROPOSED TOTAL DEPTH 36 (m)
PROPOSED APPROX. NO. OF HOLES 18 prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 18
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

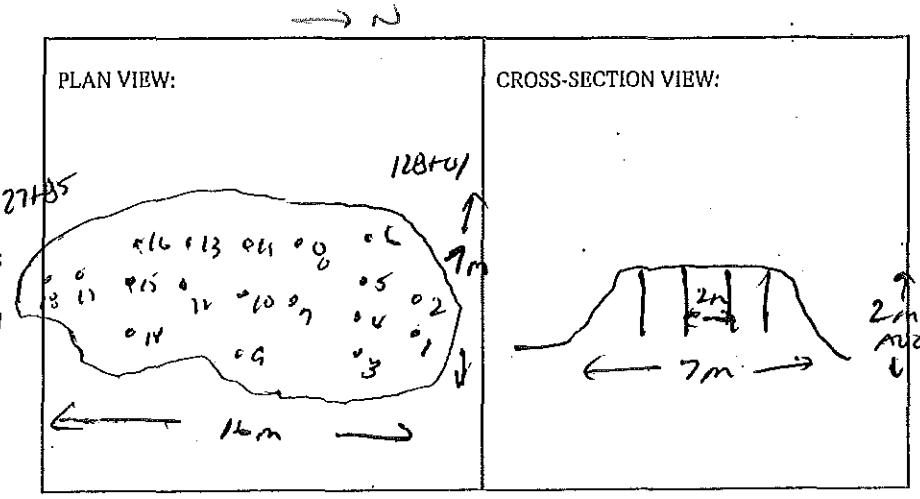
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE [illegible] CAPACITY 50 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darcy Fleber SIGNATURE COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3189

DATE PREPARED Jul 11/12
ACTUAL BLAST DATE Jul 11/12 11:53am
BLAST # MW-0280

HIGHWAY# 97
BLAST LOCATION AT: 128+29 - 128+35 (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 13 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 13

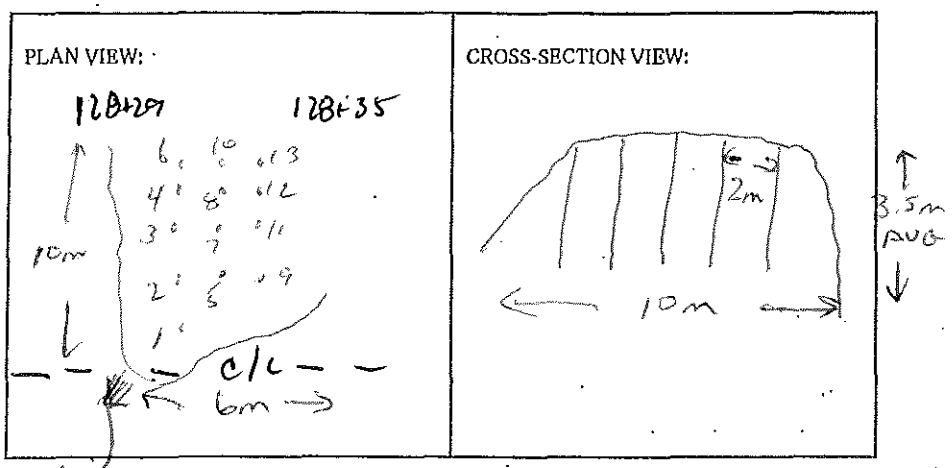
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH: 2N

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.131ips/47Hz
" @ 13167 Cliffstone Cut - 0.055ips/43Hz
" @ 13093 Cliffstone Cut - 0.241ips/57Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
DATE PREPARED July/12
BLASTER'S NAME Wayne Verweg
PROPOSED BLAST DATE July/12
BLASTER'S CERTIFICATE NUMBER SB34089
BLAST # MW-0280

HIGHWAY # 97
BLAST LOCATION AT: 128+29 - 128+35 (Borrow 2)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED APPROX. NO. OF HOLES 13 Prod.
PROPOSED AVG. DEPTH 3.5 (m)
HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 3
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 46 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. NUMBER OF CARTRIDGES 6.5
APPROX. TOTAL WEIGHT 25 (kg)
PROPOSED NUMBER OF DELAYS 13
DELAY TYPE AND LENGTH 25 (ms)

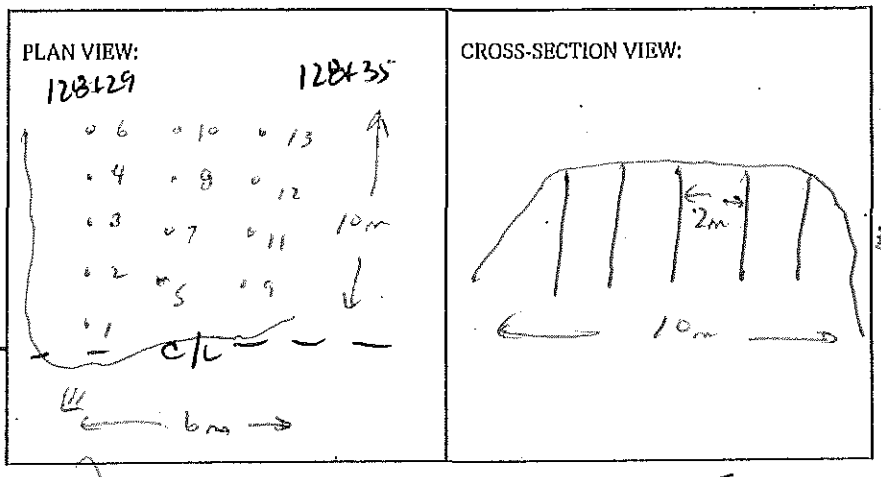
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834897

DATE PREPARED Jul 11/12
ACTUAL BLAST DATE Jul 11/12
BLAST # MW-0281

2:16 PM

HIGHWAY# 97
BLAST LOCATION AT: 128+29 - 128+35 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 96 (m)

TOTAL NUMBER OF HOLES 16 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 0
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

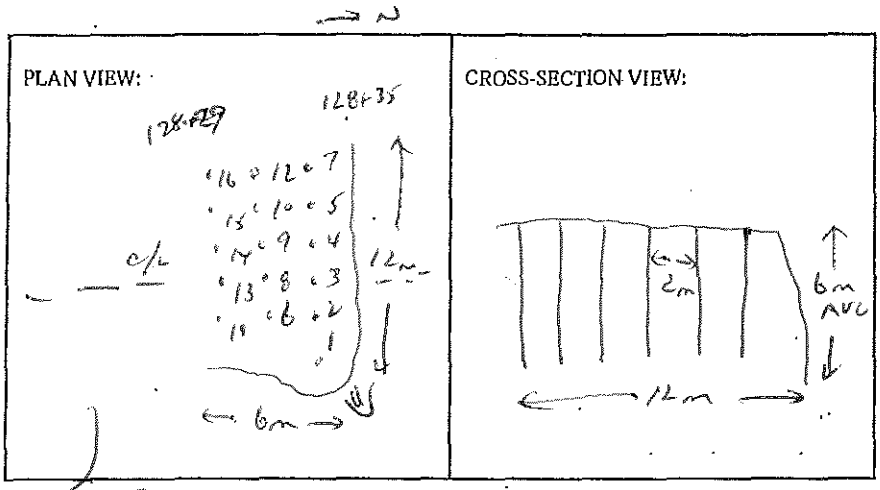
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old mission Rd - 0.30 ips / 32 Hz
" @ 13167 c/l Hoffstone Ent - 0.13 ips / 39 Hz
" @ 13093 c/l Hoffstone Ent - 0.38 ips / 51 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 553489

DATE PREPARED Jul 11/12
PROPOSED BLAST DATE Jul 11/12
BLAST # MW-0281

HIGHWAY # 97
BLAST LOCATION AT: 128+29 - 128+35 ch (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.3 (m)
PROPOSED TOTAL DEPTH 96 (m)

PROPOSED APPROX. NO. OF HOLES 16 Pr 00
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

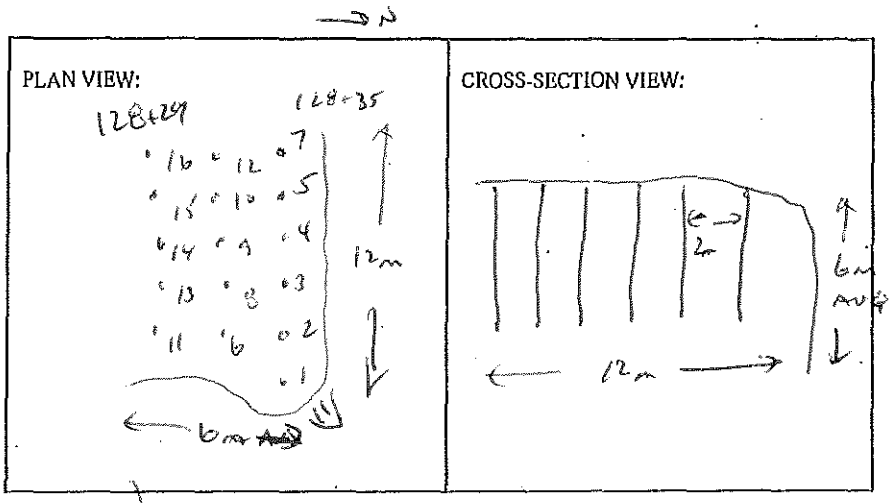
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5933480

DATE PREPARED Jul 12/12
ACTUAL BLAST DATE Jul 12/12 2:18PM
BLAST # MW-0282

HIGHWAY# 97
BLAST LOCATION AT: 128+65 - 128+71 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot metered

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 5x (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 11.2 (m)

TOTAL NUMBER OF HOLES 14/Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 105
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

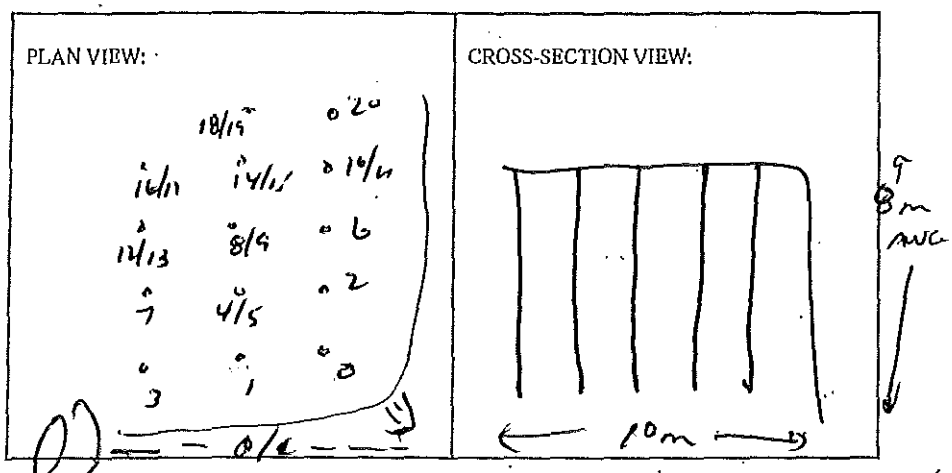
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.49 ips/37 Hz
" @ 13167 Cliffstone Crt - 0.19 ips/43 Hz
" @ 13093 Cliffstone Crt - 0.42 ips/64 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED Jul 12/12
PROPOSED BLAST DATE Jul 12/12
BLAST # MW-0282

HIGHWAY # 97
BLAST LOCATION AT: 128+65 - 128+71 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8.3 (m)
PROPOSED TOTAL DEPTH 112 (m)

PROPOSED APPROX. NO. OF HOLES 14 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10-5
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

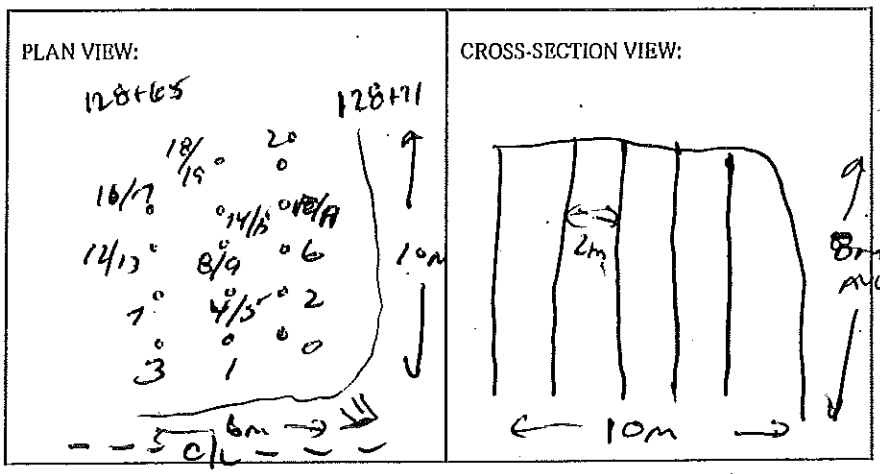
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSS 880 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.

BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 12/12
ACTUAL BLAST DATE Jul 12/12 4:00pm
BLAST # MW-0283

HIGHWAY# 97
BLAST LOCATION AT: 128+59 - 128+61 (Cross Log mark)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 8 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

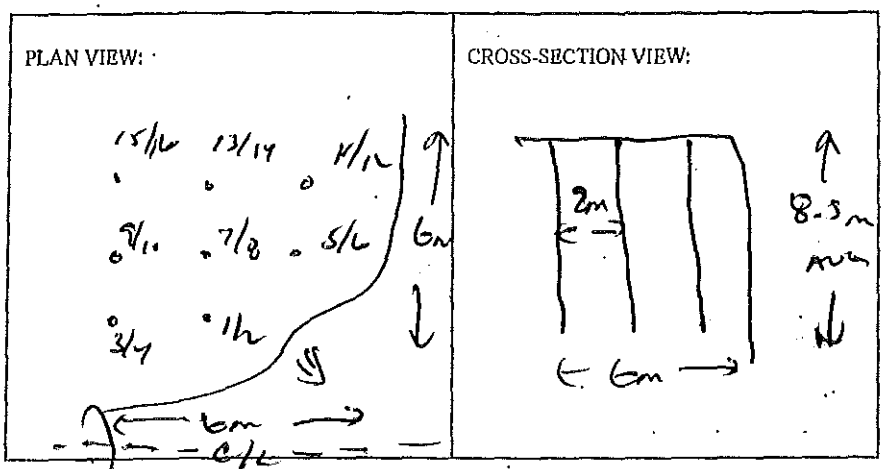
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HWS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.33 ips/32Hz
" @ 13167 C1: Fall out Cut - 0.12 ips/27Hz
" @ 13093 Cliffstone Cut - 0.46 ips/64Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED July 11/12
PROPOSED BLAST DATE July 12/12
BLAST # MW-0283

HIGHWAY# 97
BLAST LOCATION AT: 128+59 - 128+61 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 8.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 68 (m)

PROPOSED APPROX. NO. OF HOLES 8 Pads
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

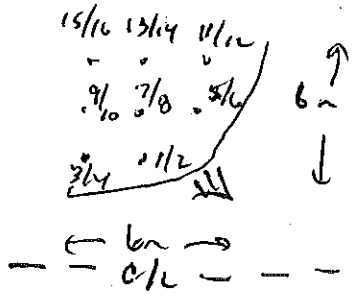
APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

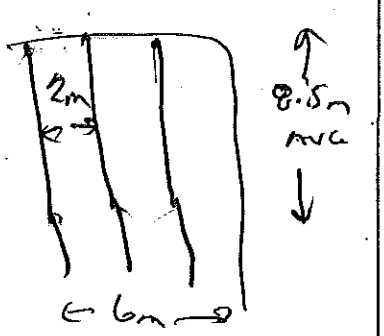
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED Jul 13/12
ACTUAL BLAST DATE Jul 13/12 12:35 PM
BLAST # MW-0284

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+64 - Stn 128+71 LS (105 subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 9 B/L / 4 Buffer / 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

1 each 2416 Dynamite + 200 gr. det cord to 4' collar in B/L holes.

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

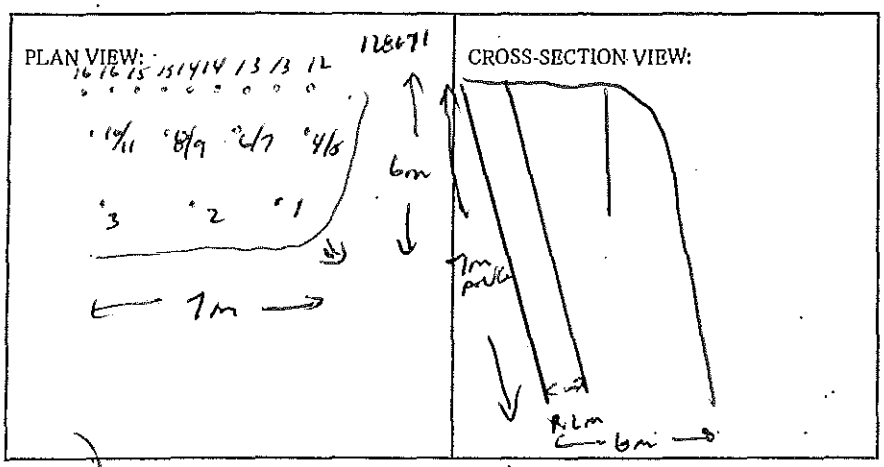
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.17 ips/ 39 Hz
" @ 13167 Cliffstone Crt - 0.090 ips/ 39 Hz
" @ 13093 Cliffstone Crt - 0.29 ips/ 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 13/12
PROPOSED BLAST DATE Jul 13/12
BLAST # MW-0284

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+64 - 128+71 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7.6 (m)
PROPOSED TOTAL DEPTH 100 (m)

PROPOSED APPROX. NO. OF HOLES 9 BL / 4 DS Rows / 3 STAB
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN ~ (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

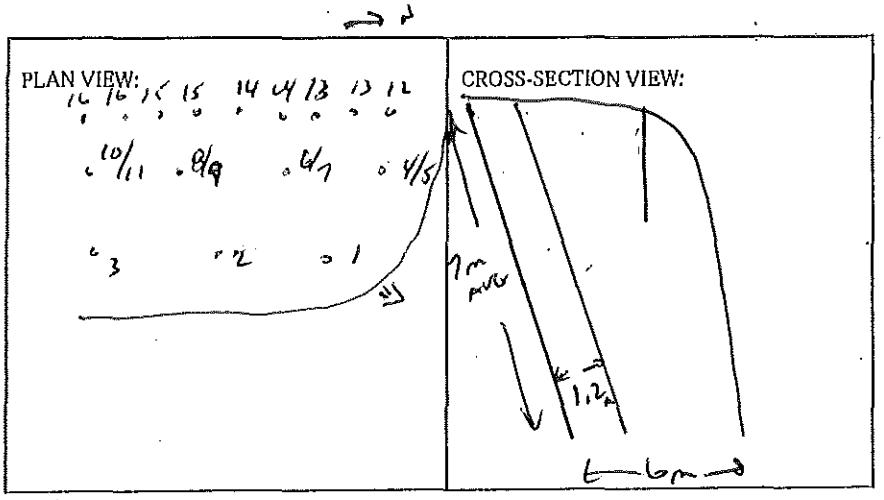
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 220 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darrel Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 16/12
ACTUAL BLAST DATE Jul 16/12 2:39 PM
BLAST # MW-0285

HIGHWAY# 97
BLAST LOCATION AT: TL 8+55 - 128+64 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
Not marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 60/L / 38 buffer / 5 stub / 4 relief
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 135 (kg)
DELAY TYPE AND LENGTH 25 (ms)

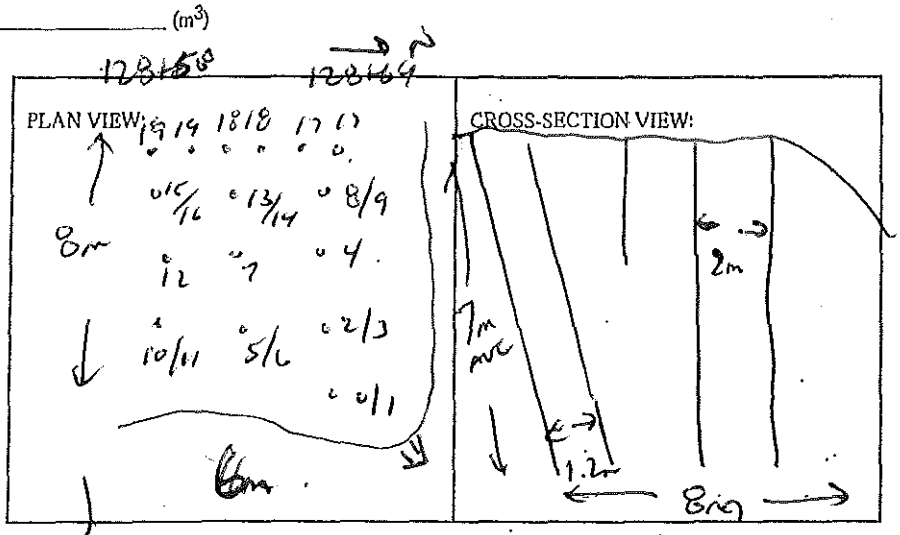
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 12650 Old Missionary Rd - 0.131 ips / 39 Hz
" @ 13167 Cliffstone Crt - 0.095 ips / 64 Hz
" @ 13093 Cliffstone Crt - 0.36 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 16/12
PROPOSED BLAST DATE Jul 16/12
BLAST # MW-0285

HIGHWAY# 97
BLAST LOCATION AT: STA 128+58 - 128+64 LS (Cut subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 100 (m)

PROPOSED APPROX. NO. OF HOLES 6B/6 / 3B after 3 sec / 4 rem
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 135 (kg)
DELAY TYPE AND LENGTH 25 (ms)

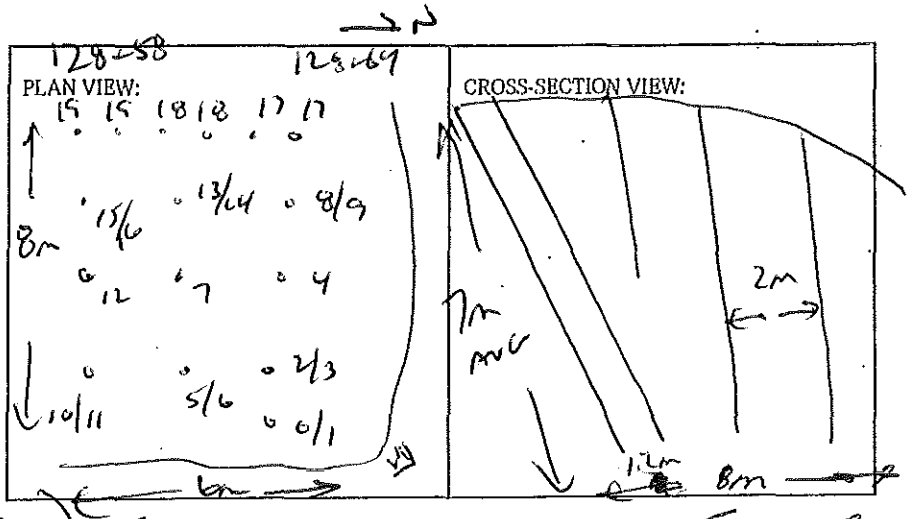
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 580 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED Jul 17/12
ACTUAL BLAST DATE Jul 17/12 11:15AM
BLAST # MW-0226

HIGHWAY# 97
BLAST LOCATION AT: STN 128+49 - 128+59 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.9 (m)
TOTAL DEPTH 98 (m)

TOTAL NUMBER OF HOLES 12 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 170 (kg)
DELAY TYPE AND LENGTH 25 (ms)

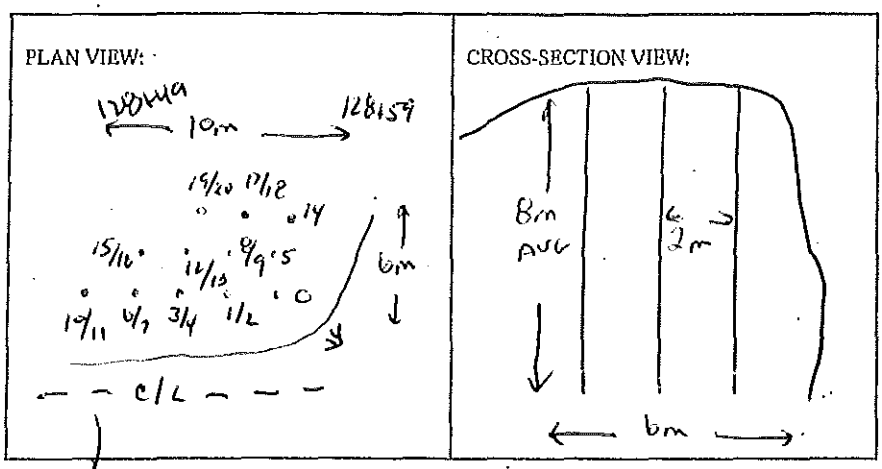
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 460 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD MISSION Rd - 0.37 ips/37½
" @ 13167 Cliffstone Crt - 0.100 ips/43½
" @ 13073 Cliffstone Crt - 0.68 ips/37½

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED Jul 17/12
PROPOSED BLAST DATE Jul 11/12
BLAST # MW-0296

HIGHWAY # 97
BLAST LOCATION AT: 128+49 - 128+59 (to submade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.9 (m)
PROPOSED TOTAL DEPTH 8 (m)

PROPOSED APPROX. NO. OF HOLES 12 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 11
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 170 (kg)
DELAY TYPE AND LENGTH 25 (ms)

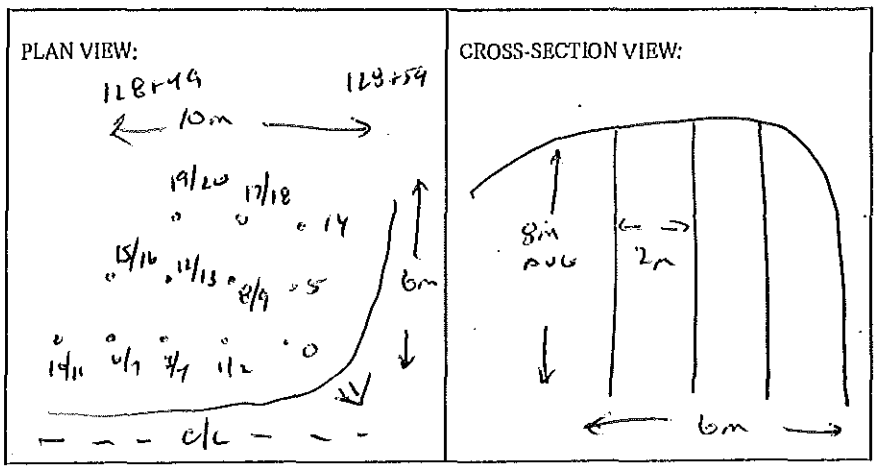
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 460 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5837487

DATE PREPARED Jul 18/12
ACTUAL BLAST DATE Jul 18/12
BLAST # MW-0287

9:58 AM

HIGHWAY # 97
BLAST LOCATION AT: STN 128+41 - 128+49 (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* Slot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Blasted Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 85 (m)

TOTAL NUMBER OF HOLES 10 Peoa
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

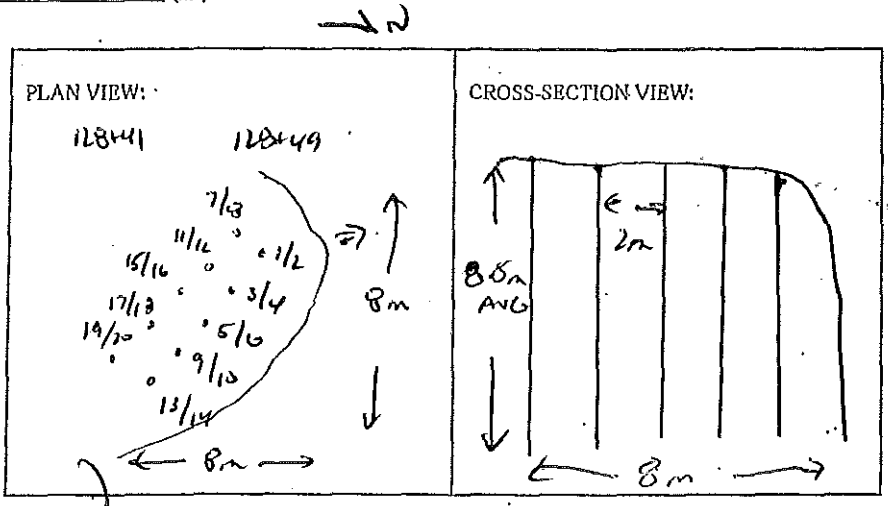
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLO mission Rd - 0.24 ips/ 37Hz
" @ 13167 Cliffstone crt - 0.090 ips/ 34Hz
" @ 13073 Cliffstone crt - 0.56 ips/ 47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 503409

DATE PREPARED Jul 18/12
PROPOSED BLAST DATE Jul 18/12
BLAST # MW-0287

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+41 - 128+49 (on subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 8.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 86 (m)

PROPOSED APPROX. NO. OF HOLES 10 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 20

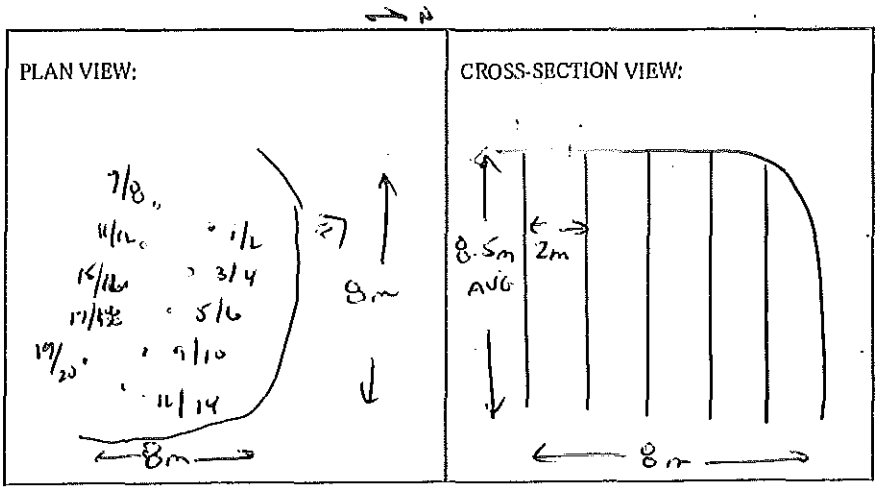
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleiger SIGNATURE _____ COMPANY Fleiger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3487

DATE PREPARED JUL 18/12
ACTUAL BLAST DATE JUL 18/12 12:19 PM
BLAST # MW-0288

HIGHWAY# 97
BLAST LOCATION AT: STN 128+53 - 128+58 LS (no subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY 5.0 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH 117 (m)

TOTAL NUMBER OF HOLES 7 BL / 2 Buffer / 2 Stmg / 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

- BL Holes loaded w/ 1 emer 2"x16" Dynamite + 200 grain det. cord w/ collar

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

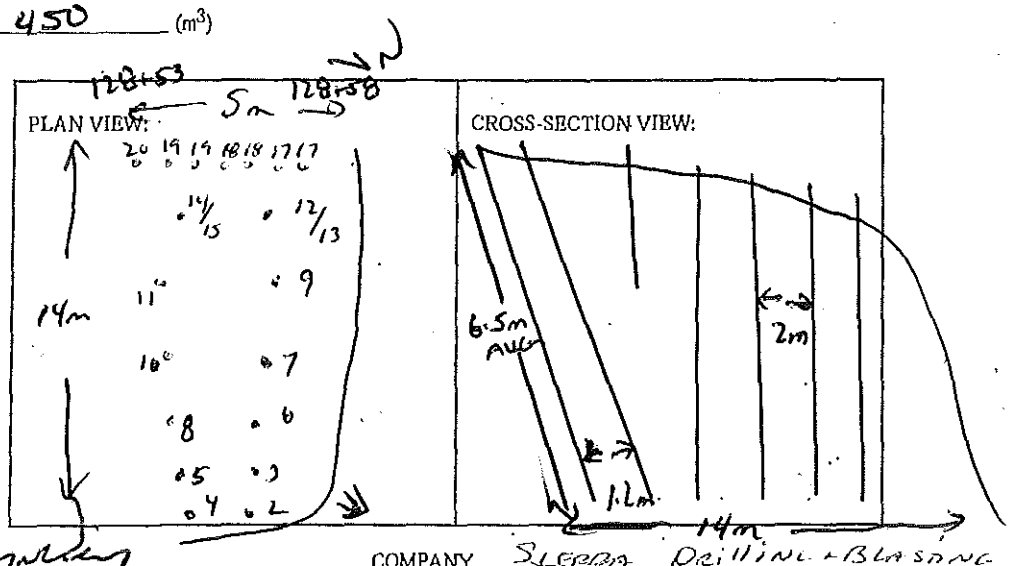
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.22 ips/57Hz
" @ 13167 Cliffstone Crt - 0.100 ips/39Hz
" @ 13073 Cliffstone Crt - 0.58 ips/47Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Jul 18/12
PROPOSED BLAST DATE Jul 18/12
BLAST # MW-0288

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+53 - 128+58 LS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 6.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.2 (m)
PROPOSED TOTAL DEPTH 117 (m)

PROPOSED APPROX. NO. OF HOLES 7 B/L / 2 Buffer / 2 Stmg / 8 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

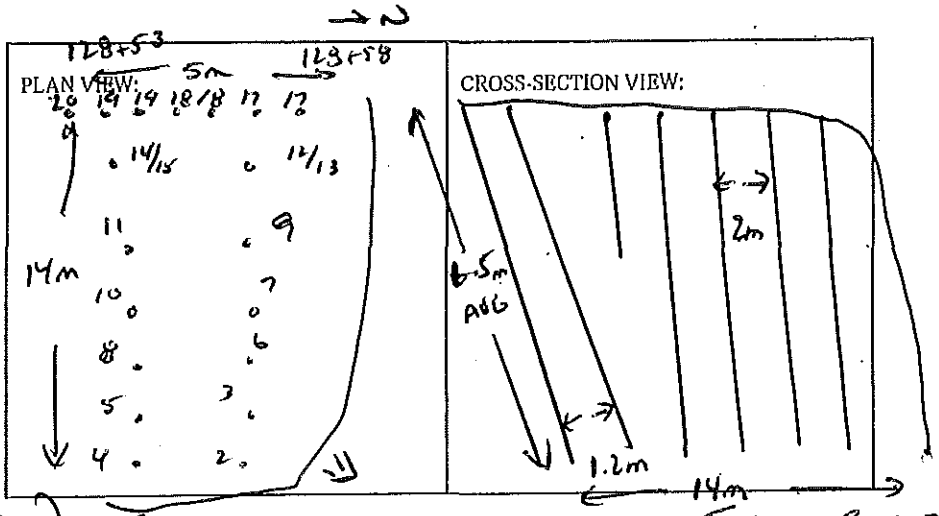
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-Hs 550 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 450 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daniel Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 19/12
ACTUAL BLAST DATE Jul 19/12 2:35PM
BLAST # MW-0289

HIGHWAY # 97
BLAST LOCATION AT: STA 128+44 - 128+53 (To Submit)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Banded Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 163 (m)

TOTAL NUMBER OF HOLES 9 B/L / 2 B.offset / 2 SMB / 6 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

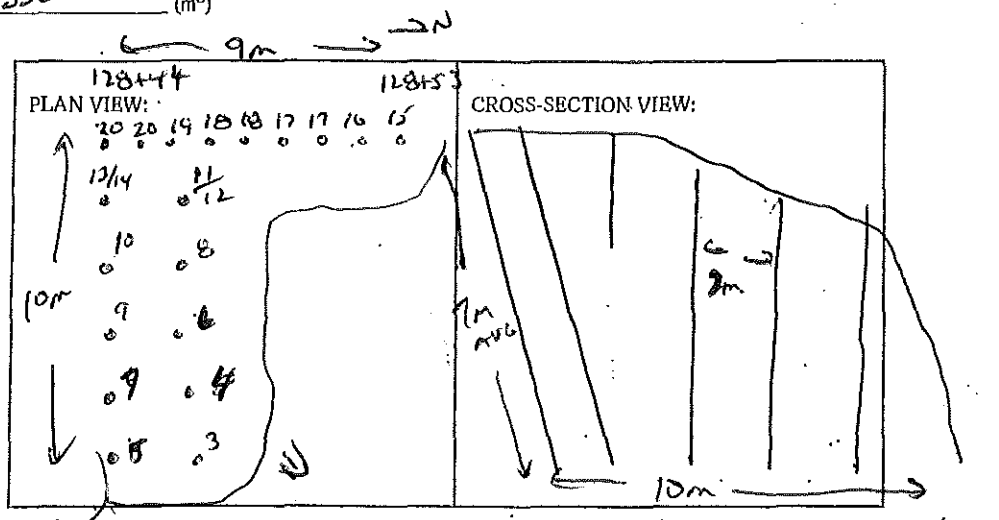
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HW3-20 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.16 ips / 34 Hz
" @ 13167 Cliffstone Crt 0.065 ips / 64 Hz
" @ 13073 Cliffstone Crt. 0.50 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED Jul 19/12
PROPOSED BLAST DATE Jul 19/12 2:35PM
BLAST # MW-0289

HIGHWAY # 97
BLAST LOCATION AT: SB 128+44 - 128+53.25 (TO Submit)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 7.6 (m)
PROPOSED TOTAL DEPTH 163 (m)

PROPOSED APPROX. NO. OF HOLES 9 BL / 2 Buffer / 2 Stab / 6 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 16
PROPOSED NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

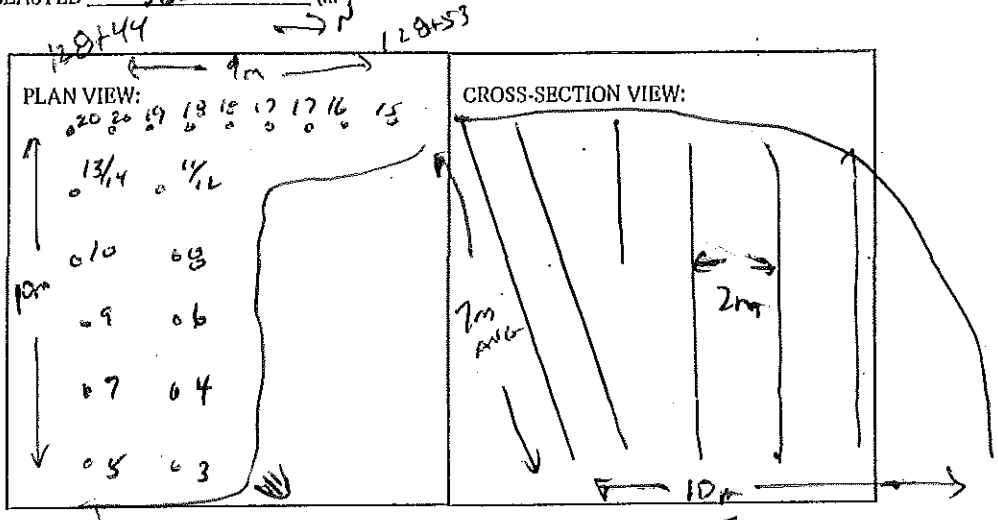
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-T-S 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5533489

DATE PREPARED Jul 20/12
ACTUAL BLAST DATE Jul 20/12 10:35AM
BLAST # MW-02913

HIGHWAY# 97
BLAST LOCATION AT: STN 128+24 - 128+32 e/c (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.4 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 14/Row.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 14

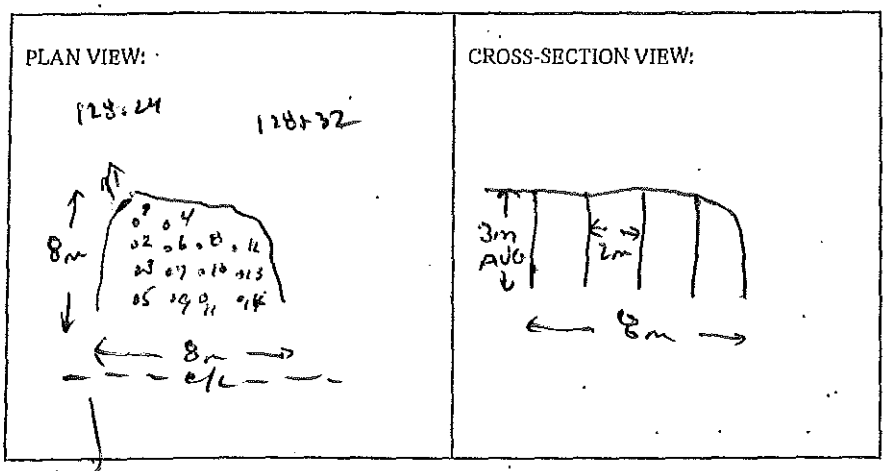
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old mission Rd - 0.12 ips/64 Hz
" @ 13167 Cliffstone ct - No Trigger (<0.04 ips)
" @ 13673 Cliffstone ct - 0.33 ips/ 51 Hz

PROPOSED BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JUL 20/12
PROPOSED BLAST DATE JUL 20/12 10:35AM
BLAST # MW-0290

HIGHWAY # 97
BLAST LOCATION AT: SPW 128+24 - SPW 128+82 clk (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 3.7 (m)
PROPOSED TOTAL DEPTH 42 (m)
PROPOSED APPROX. NO. OF HOLES 14 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 14
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

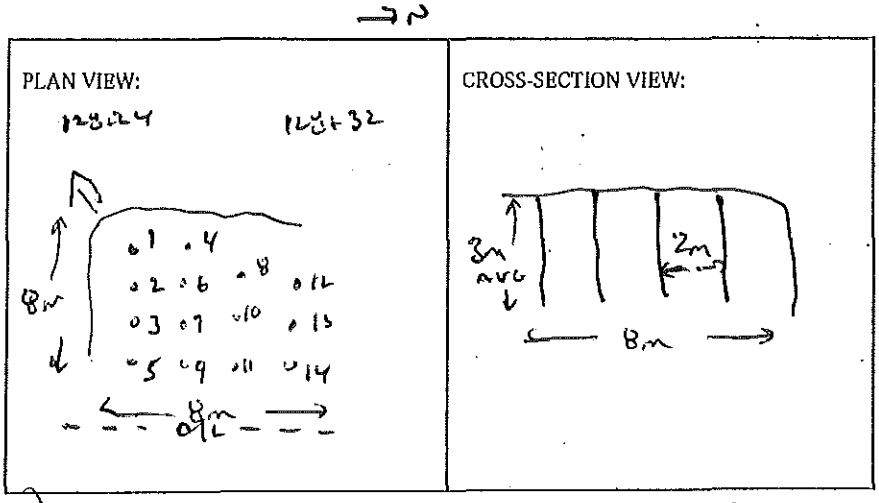
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP 3280 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 160 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME DARRYL FIEBER SIGNATURE COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE COMPANY SIERRA Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5837487

DATE PREPARED Jul 20/12
ACTUAL BLAST DATE Jul 20/12 12:01 PM
BLAST # MW-0298

HIGHWAY# 97
BLAST LOCATION AT: STA 128+23 - 128+35 (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 116 (m)

TOTAL NUMBER OF HOLES 21 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 105
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

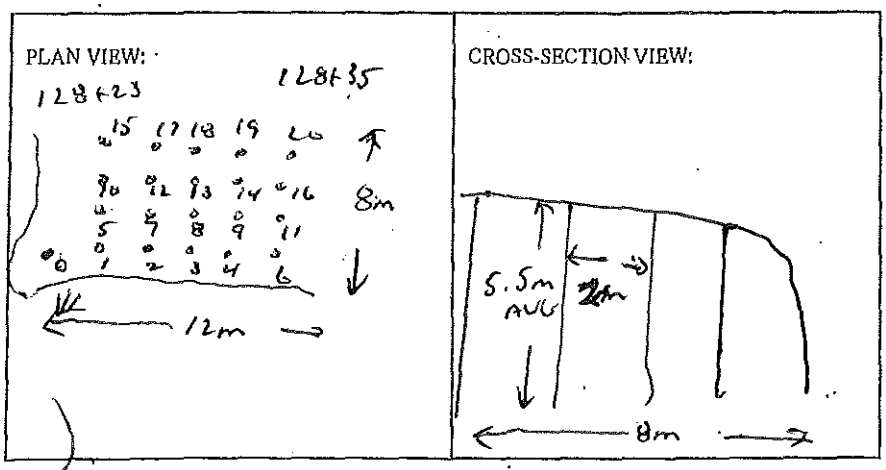
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 W/S Mission Rd - 0.23ips/ 32Hz
" @ 13167 Cliffstone Crt - 0.065ips/ 57Hz
" @ 13073 Cliffstone Crt - 0.49ips/ 43Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5834 89

DATE PREPARED Jul 26/12
PROPOSED BLAST DATE Jul 30/12
BLAST # MW-0298

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+23 - Stn 128+35 (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 116 (m)

PROPOSED APPROX. NO. OF HOLES 21 Prod.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 10.5
PROPOSED NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

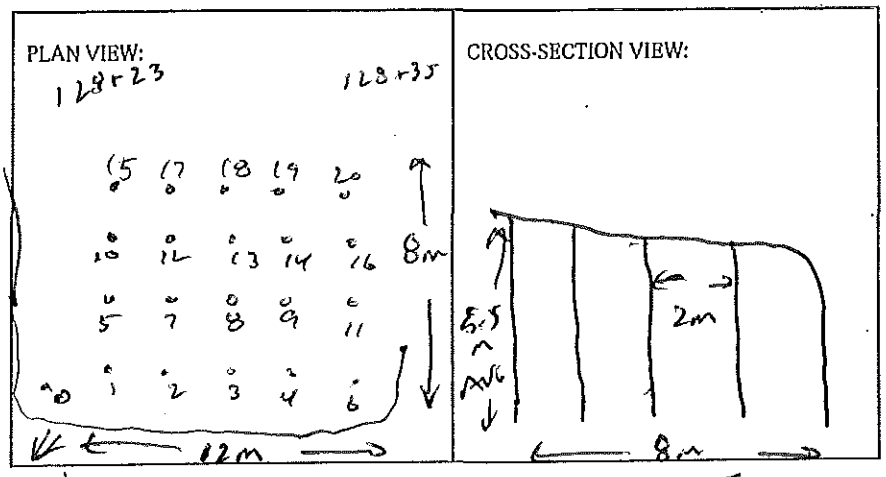
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 500 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darcy Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 20/12
ACTUAL BLAST DATE Jul 20/12 2:50PM
BLAST # MM-0292

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+39 - 128+45 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * cost matter

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 7 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 11

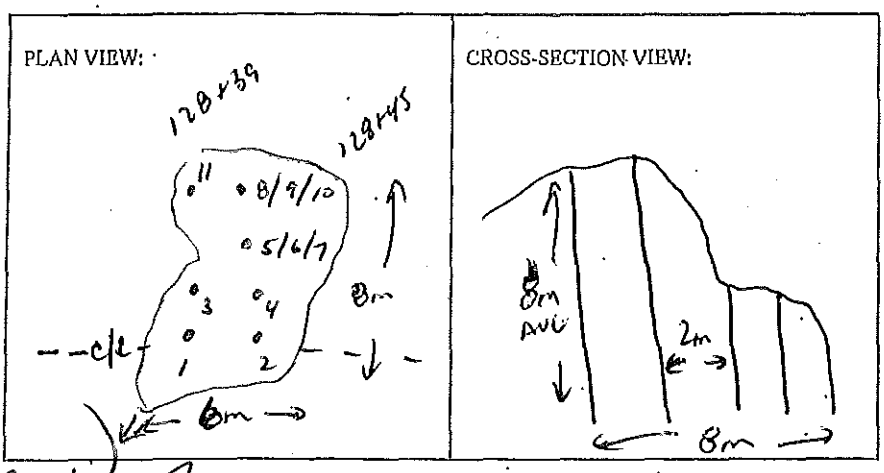
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HW 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.13 ips / 24 Hz
" @ 13167 Cliffstone Crt - 0.040 ips / 57 Hz
" @ 13073 Cliffstone Crt - 0.38 ips / 5 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3409

DATE PREPARED Jul 20/12
PROPOSED BLAST DATE Jul 20/12
BLAST # MW-0292

HIGHWAY# 97
BLAST LOCATION AT: STN 1284 39 - 1284 45 ch (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 9 (m)
PROPOSED TOTAL DEPTH 56 (m)

PROPOSED APPROX. NO. OF HOLES 7 PROD.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 45
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) EB CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

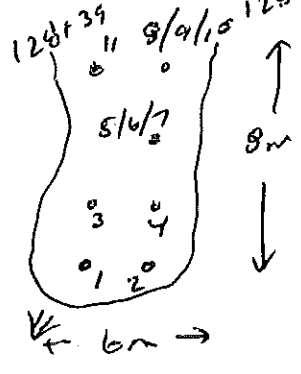
APPROX. VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

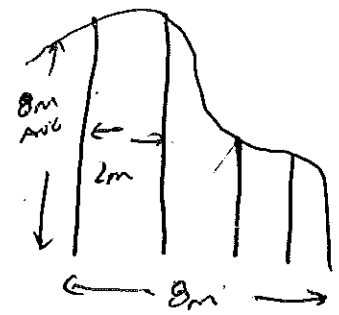
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FLEBER SIGNATURE _____ COMPANY FLEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831/89

DATE PREPARED Jul 24/12
ACTUAL BLAST DATE Jul 24/12 11:08am
BLAST # MM 0293

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+38 - 128+44 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 7m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH _____ (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 93 (m)

TOTAL NUMBER OF HOLES 78/L / 2 Buffer / 3 Stab / 3 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 Cart. 2x16" Dynamite + 200 g/m det cord to 4' collar in B/L holes

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

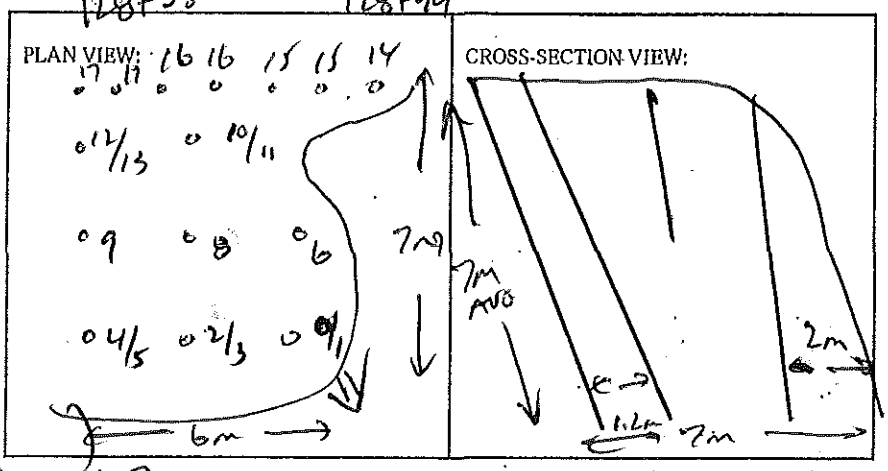
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~FTS 320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 275 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.151 ips/ 34 Hz
" @ 13167 Cliffstone Crt - 0.065 ips/ 73 Hz
" @ 13073 Cliffstone Crt - 0.50 ips/ 43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 24/12
PROPOSED BLAST DATE Jul 24/12
BLAST # MW-0293

HIGHWAY # 97
BLAST LOCATION AT: STN 128+38 - 128+44 LS (to Sooke)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7.5 (m)
PROPOSED TOTAL DEPTH 93 (m)

PROPOSED APPROX. NO. OF HOLES 7 BL / 2 DUFAX / 3 SMS / 3 PRIM.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) ~~BURDEN~~ 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumamite & ANFO
APPROX. NUMBER OF CARTRIDGES 14
PROPOSED NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

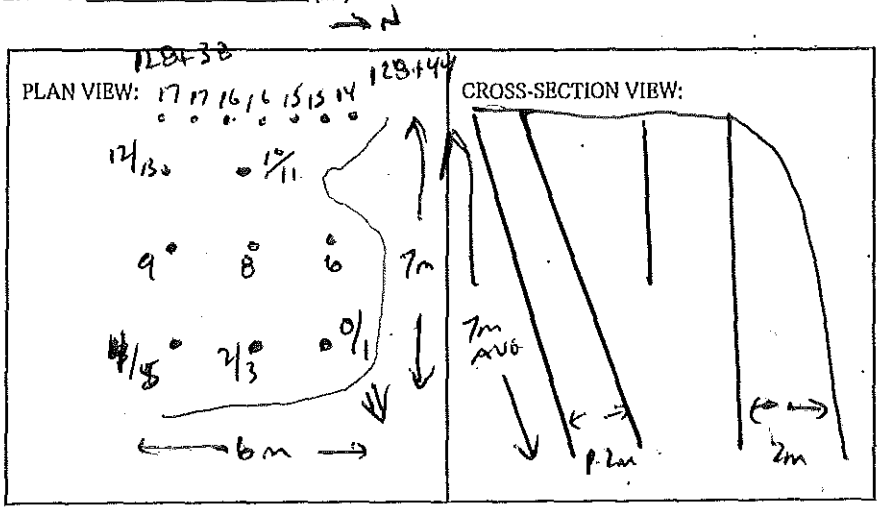
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-MS 320 CAPACITY 320 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 275 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darul Fleber SIGNATURE _____ COMPANY Fleber Rock. Eng.

BLASTER'S SIGNATURE Wayne V COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831189

DATE PREPARED Jul 24/12
ACTUAL BLAST DATE Jul 24/12 3:11 PM
BLAST # MW-0294

HIGHWAY# 97
BLAST LOCATION AT: STN 128+30 - 128+38 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9 B/L
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 126 (m)

TOTAL NUMBER OF HOLES 9B/L / 4Buffer) 3 stabs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

least 2x16 Dynamite + 200g. det cord to 4' collar in B/L holes

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

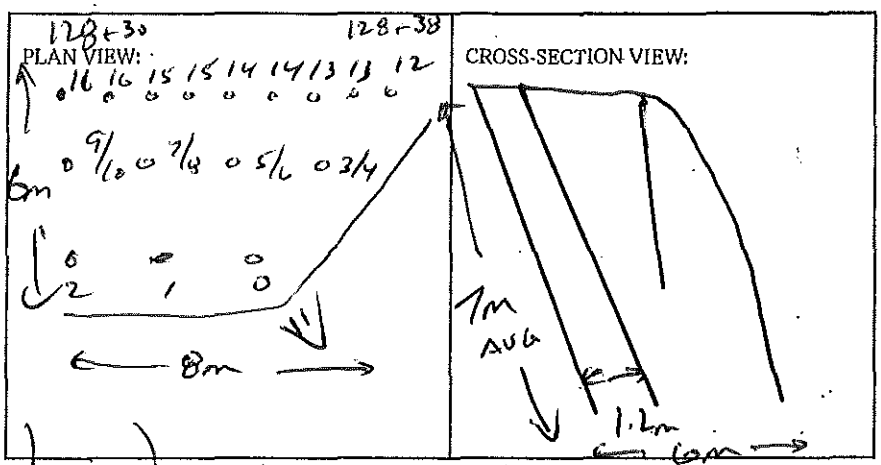
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) [redacted]

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.15 ips/39Hz
" @ 13167 Cliffstone Crt - 0.065 ips/85Hz
" @ 13073 Cliffstone Crt - 0.36 ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 24/12
PROPOSED BLAST DATE Jul 24/12
BLAST # MW-0294

HIGHWAY # 97
BLAST LOCATION AT: SB 128+30 - 128+38 LS (To subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 11A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 9
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 7.5 (m)
PROPOSED TOTAL DEPTH 126 (m)

PROPOSED APPROX. NO. OF HOLES 9B/L / 4 Buffer / 3 SMAB
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

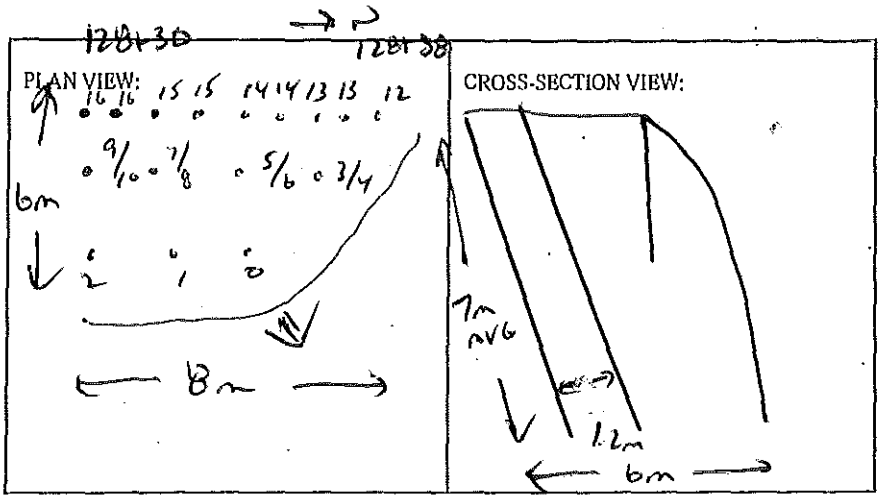
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-T-S 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED July 25/12
ACTUAL BLAST DATE July 25/12 10:30AM
BLAST # MW-0295

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+22 - 128+30 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 D/L/3 Buffer/3 smb
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE MV Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 13

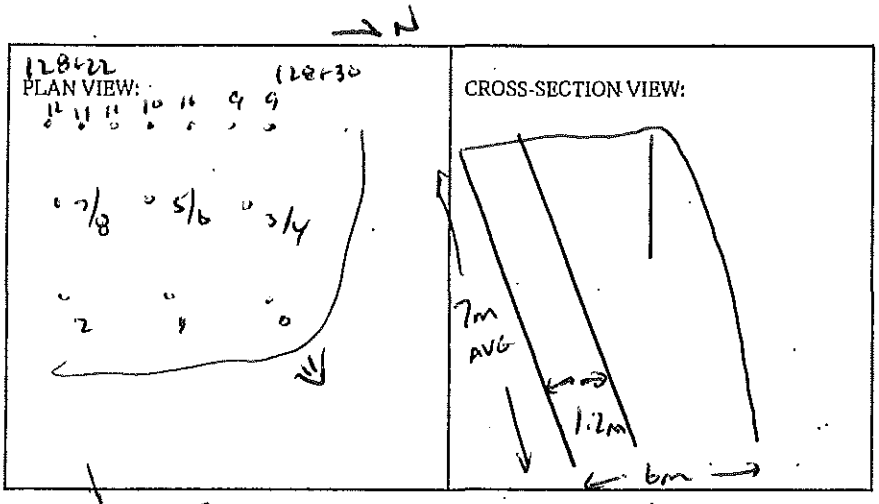
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 325 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD MISSION Rd - 0.14 ips / 39Hz
" @ 13167 Cliffstone Crt - 0.060 ips / 37Hz
" @ 15073 Cliffstone Crt. 0.51 ips / 47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 25/12
PROPOSED BLAST DATE Jul 25/12
BLAST # NW-0295

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+22 - 128+36 LS (no subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 7 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 7.5 (m)
PROPOSED TOTAL DEPTH 60 (m)

PROPOSED APPROX. NO. OF HOLES 7BL / 3Bffer / 3 stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Pumamite + ANFO
APPROX. NUMBER OF CARTRIDGES 12
PROPOSED NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

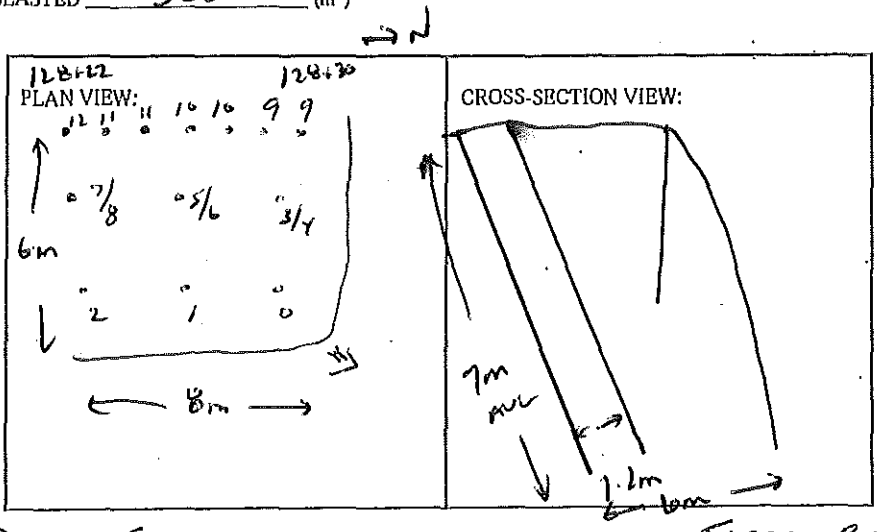
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 330 CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 325 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3189

DATE PREPARED Jul 25/12
ACTUAL BLAST DATE Jul 25/12 1:24 PM
BLAST # MW-0296

HIGHWAY# 97
BLAST LOCATION AT: STN 128+10 - 128+22 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 12 (m)
ROCK TYPE Alkaroo Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 17
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 142 (m)

TOTAL NUMBER OF HOLES 17 BH / 5 Buffer / 35 main
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 21

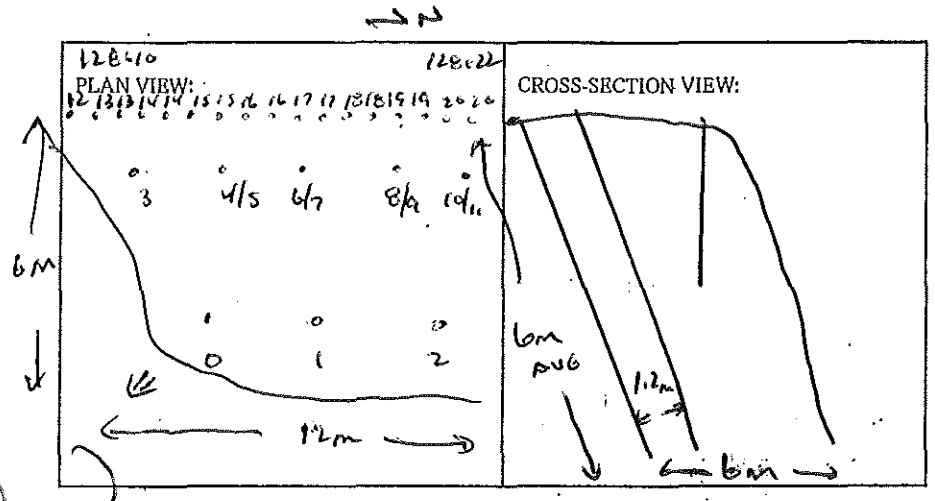
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) P.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD MISSION RD - 0.17 ips / 43 Hz
" @ 13167 Cliffstone ent - 0.055 ips / 28 Hz
" @ 13073 Cliffstone Crt - 0.31 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED Jul 25/12
PROPOSED BLAST DATE Jul 25/12
BLAST # MW-0296

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+10 - 128+22 LS (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 12 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 17
PROPOSED AVG. DEPTH 6 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 142 (m)

PROPOSED APPROX. NO. OF HOLES 17 B/L) 5 buffer / 3 stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 23
PROPOSED NUMBER OF DELAYS 21

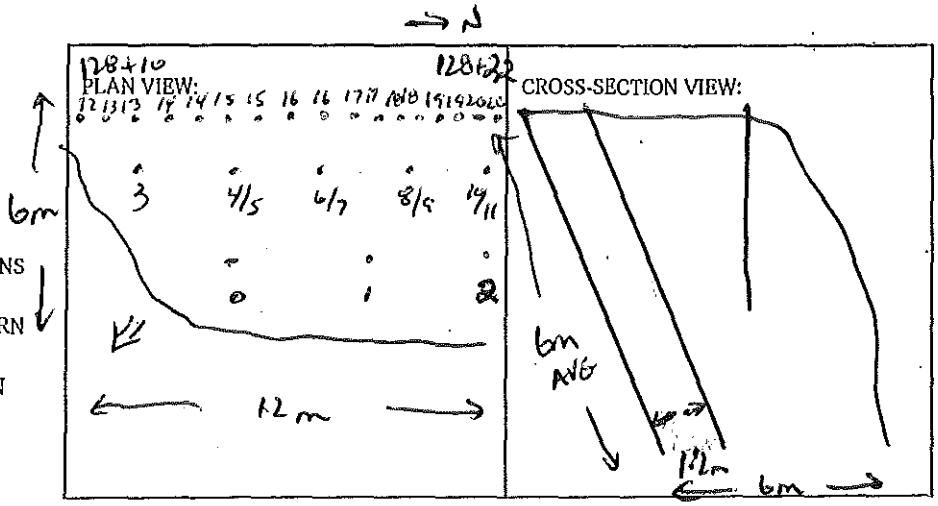
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 11-15-32@ CAPACITY 60 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 400 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Darryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831/87

DATE PREPARED JUL 26/12
ACTUAL BLAST DATE JUL 26/12 10:23 AM
BLAST # MW-0297

HIGHWAY# 97
BLAST LOCATION AT: STN 128+02 dL (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.4 (m)
TOTAL DEPTH 13 (m)

TOTAL NUMBER OF HOLES 6 Prod. + 2 C.S.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

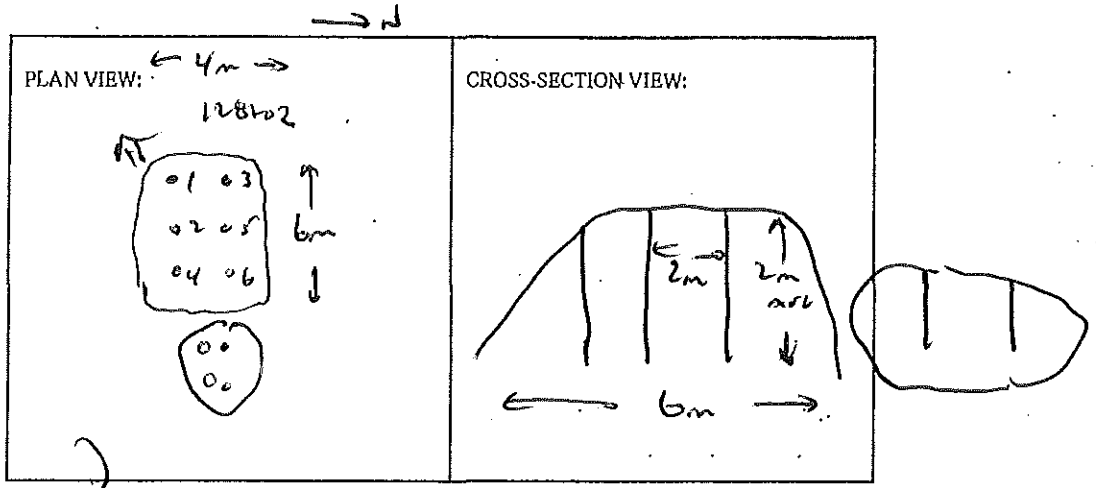
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HF 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 45 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.080 ips/57Hz
" @ 13167 cliffstone crt. No trigger (< 0.04 ips)
" @ 13073 Cliffstone crt - 0.064 ips/47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934489

DATE PREPARED Jul 26/12
PROPOSED BLAST DATE Jul 26/12
BLAST # MW-00297

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+02 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 2.9 (m)
PROPOSED TOTAL DEPTH 13 (m)
PROPOSED APPROX. NO. OF HOLES 6 Perm + 2 OS
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) ~~BURDEN~~ 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 3-5
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

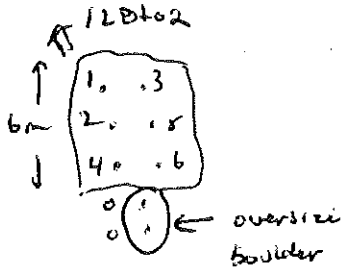
APPROX. VOLUME OF ROCK TO BE BLASTED 45 (m^3)

PROPOSED BLAST SKETCH:

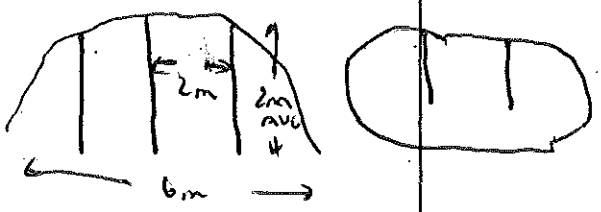
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: ← 4m →



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darul Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583/89

DATE PREPARED June 26/12
ACTUAL BLAST DATE June 26/12 10:58AM
BLAST # MW-029B

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+40 - 128+46 (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

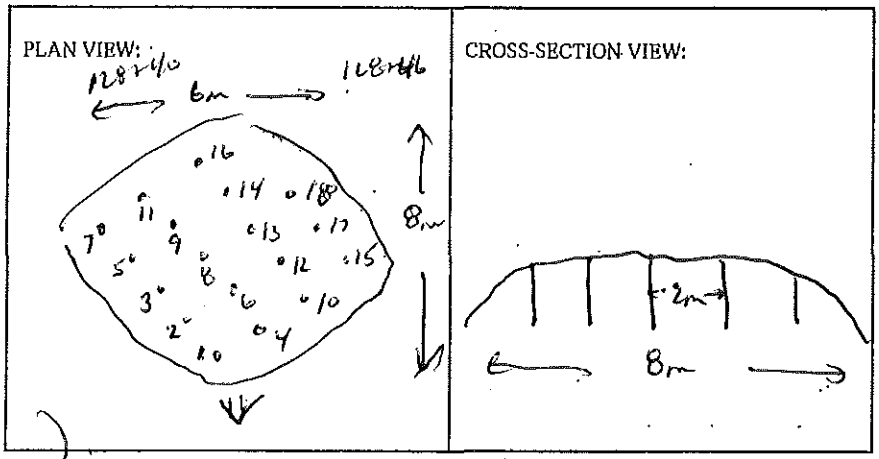
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH: 2 N

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.440 ips / 47Hz
" @ 13167 Cliffstone Crt - No Trigger (< 0.04 ips)
" @ 13073 Cliffstone Crt - 0.081 ips / 57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 26/12
PROPOSED BLAST DATE Jul 26/12
BLAST # MW-029B

HIGHWAY # 97
BLAST LOCATION AT: Stn 128+40 - 128+46 (Toe blast)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.2 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 2.6 (m)
PROPOSED TOTAL DEPTH 40 (m)
PROPOSED APPROX. NO. OF HOLES 18 Per 001
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Pumamite & ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 18
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

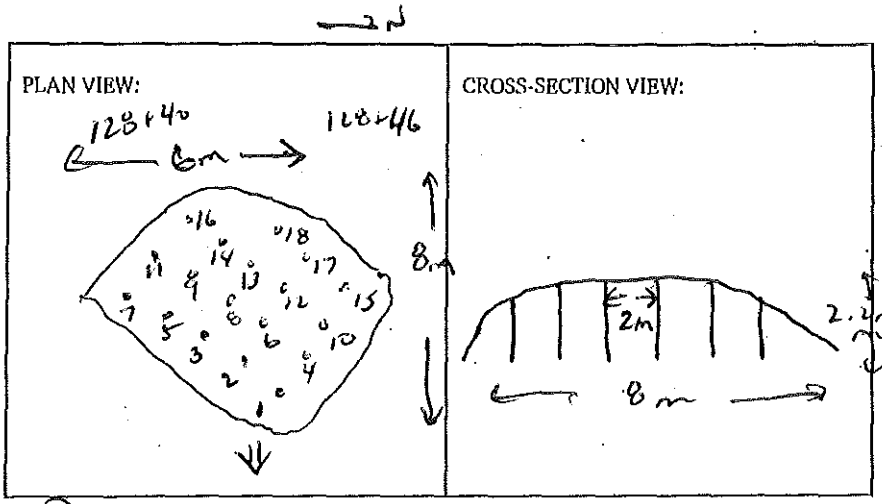
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-B 330 CAPACITY 180 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 60 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweij COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5831/89

DATE PREPARED AUG-2/12
ACTUAL BLAST DATE AUG-2/12 12:16 PM
BLAST # MW-0299

HIGHWAY# 97
BLAST LOCATION AT: STN 129+10 AND STN 128+20 (HIGH SIDE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS _____
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 13 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

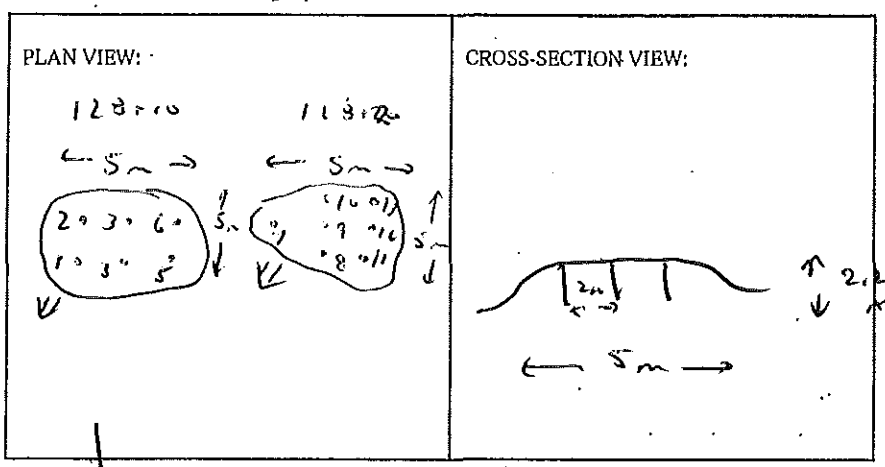
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 30 CAPS

VOLUME OF ROCK BLASTED NIL (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cl: Fastline Cat. 0.105 ips/37Hz
" @ 13050 Old Mission Rd. - 0.09 ips/47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED Aug 2/12
PROPOSED BLAST DATE Aug 2/12
BLAST # MW-0229

HIGHWAY# 97
BLAST LOCATION AT: STN 128+10 AND STN 128+20 (HIGH SPOTS)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 2.2 (m)
PROPOSED NO. OF ROWS _____
PROPOSED MAXIMUM DEPTH 2.8 (m)
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED APPROX. NO. OF HOLES 13 Prop.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 13
PROPOSED NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE I-I RS 220 CAPACITY 60 CAPS

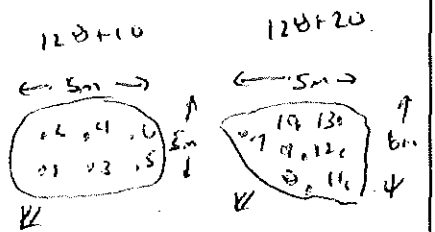
APPROX. VOLUME OF ROCK TO BE BLASTED NIL (m^3)

PROPOSED BLAST SKETCH:

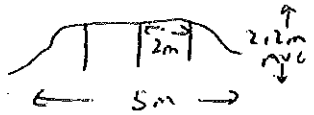
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darryl Fleger SIGNATURE _____ COMPANY Fleger Rock. Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED APR 12/12
ACTUAL BLAST DATE April/12 19:54hrs
BLAST # MW-0170

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 TO Subgrade

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 7.5 (m)

TOTAL NUMBER OF HOLES 7 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite Hand
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

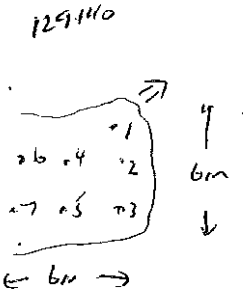
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 70 (m^3)

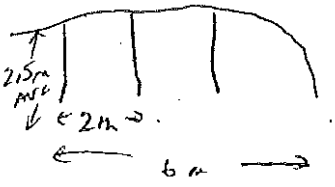
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstream - No reading <0.15 ips
" @ 13117 Cliffstream - 0.070 ips / 47 Hz

2.5' ANFO/Hole primed w/1 emtf 1"x8" Dynamite

10 sm

Date/Time Vert at 10:54:04 April 12, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

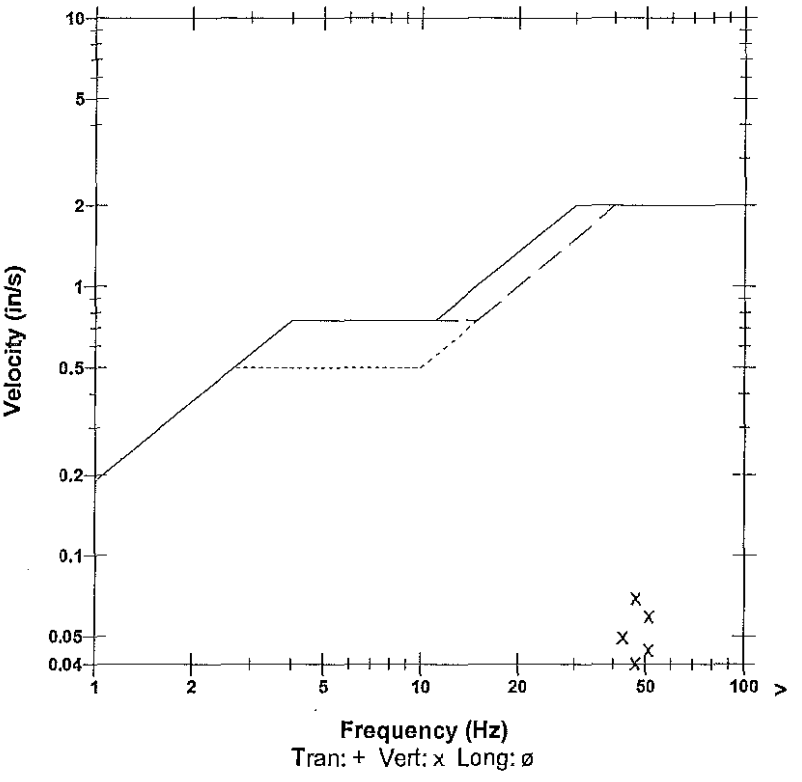
Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E8IU.A40

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

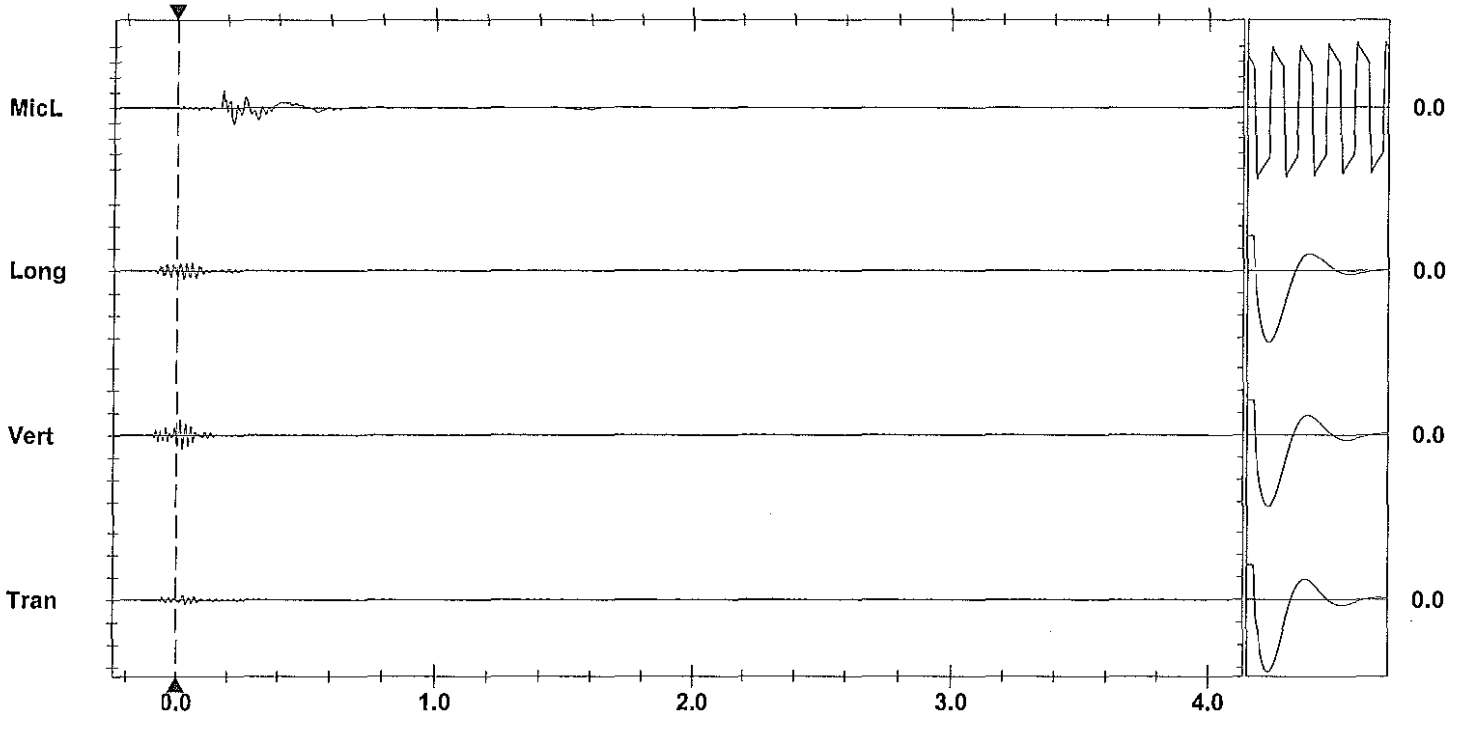
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00116 psi(L) at 0.181 sec
ZC Freq 22 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 593 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0700	0.0350	in/s
ZC Freq	43	47	39	Hz
Time (Rel. to Trig)	0.026	0.014	0.015	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00009	0.00022	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0768 in/s at 0.014 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vessey
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED Apr 12/12
ACTUAL BLAST DATE Apr 12/12 11:11am
BLAST # MW-0171

HIGHWAY# 97
BLAST LOCATION AT: STN 129+35 - 129+40 CS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.8 (m) BURDEN 1.8 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS220 CAPACITY 80 CAPS

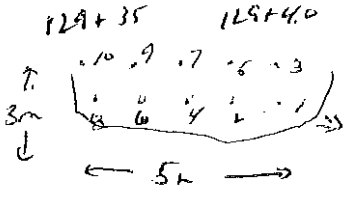
VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

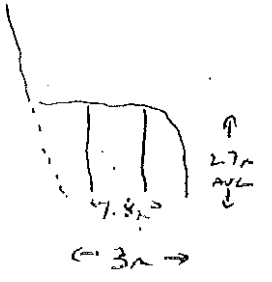
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vessey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Siesmograph @ 13167 c/: 1st face cut - No reading < 0.15 ips
@ 13117 c/: 1st face cut - 0.17 ips/ 57Hz

115' - 2' ANFO/hole primed w/ 1 each 1"x8" DYNAMITE

Instantel

Event Report

Date/Time Vert at 11:11:24 April 12, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

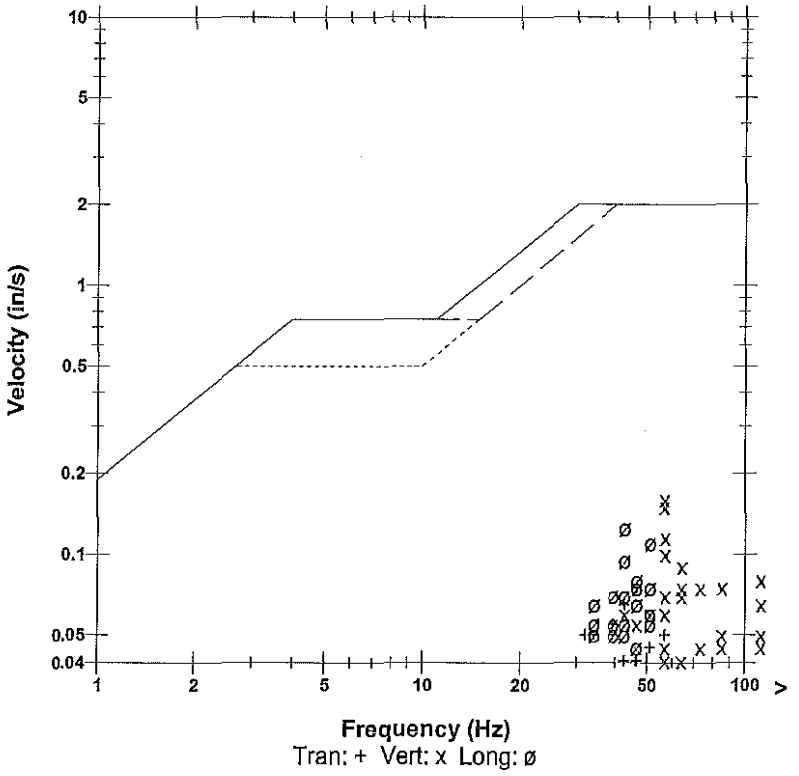
Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E8IV.300

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

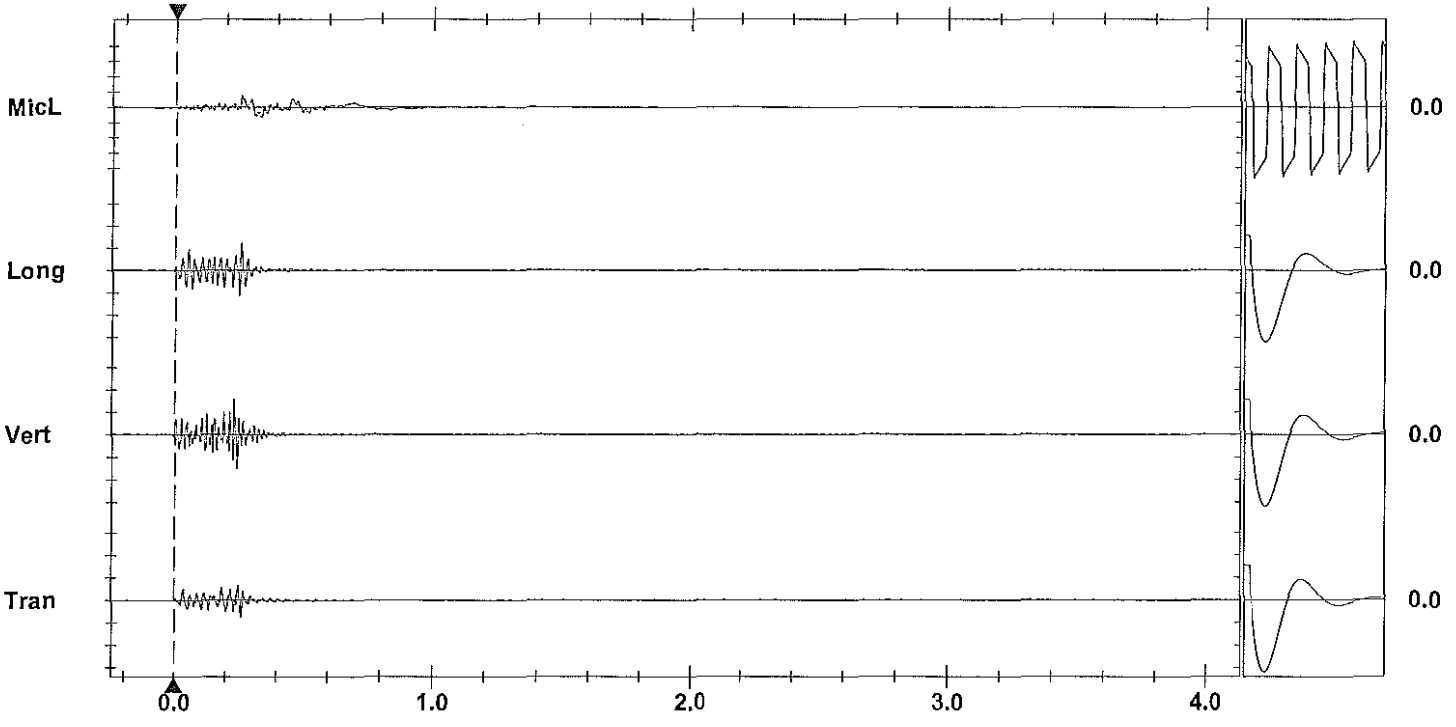
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00076 psi(L) at 0.260 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	0.0750	0.160	0.125	in/s
ZC Freq	47	57	43	Hz
Time (Rel. to Trig)	0.261	0.234	0.262	sec
Peak Acceleration	0.0795	0.225	0.0928	g
Peak Displacement	0.00025	0.00040	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.164 in/s at 0.234 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED Apr 12/12
ACTUAL BLAST DATE Apr 12/12 11:35 AM
BLAST # MUS-0122

HIGHWAY # 97
BLAST LOCATION AT: Stn 129+35 - 129+40 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: As shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.7 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Pownex 10E Hard
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

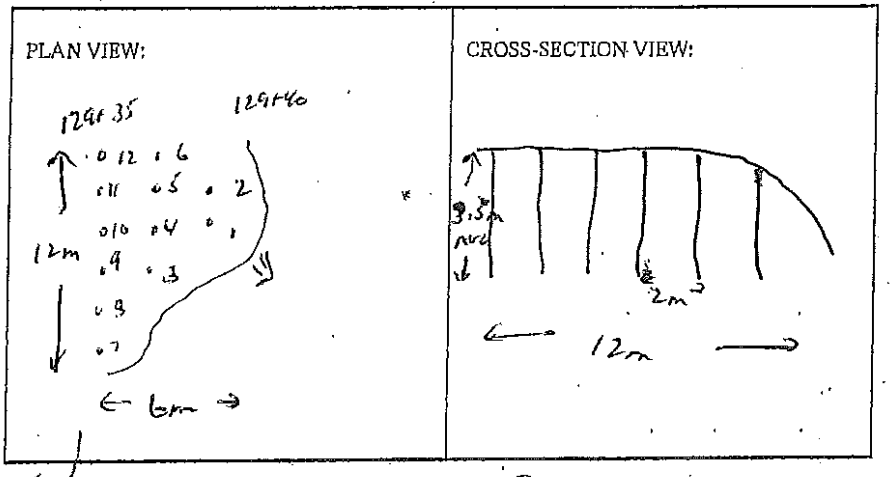
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD820 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 c/i Eastern Cut - No trigger < 0.15 ips
" @ 13117 c/i Eastern Cut - 0.100 ips / 39 Hz

R1 – 3' ANFO/Hole primed w/1 part 1"x8" Dynamite

Date/Time	Vert at 11:35:38 April 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8IW.7E0

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

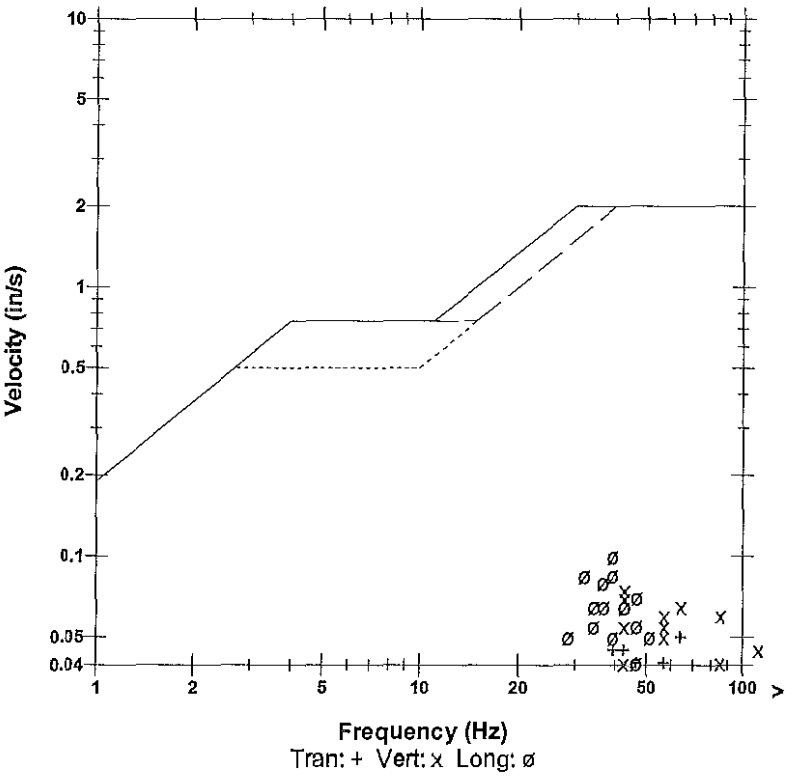
Extended Notes

Post Event Notes

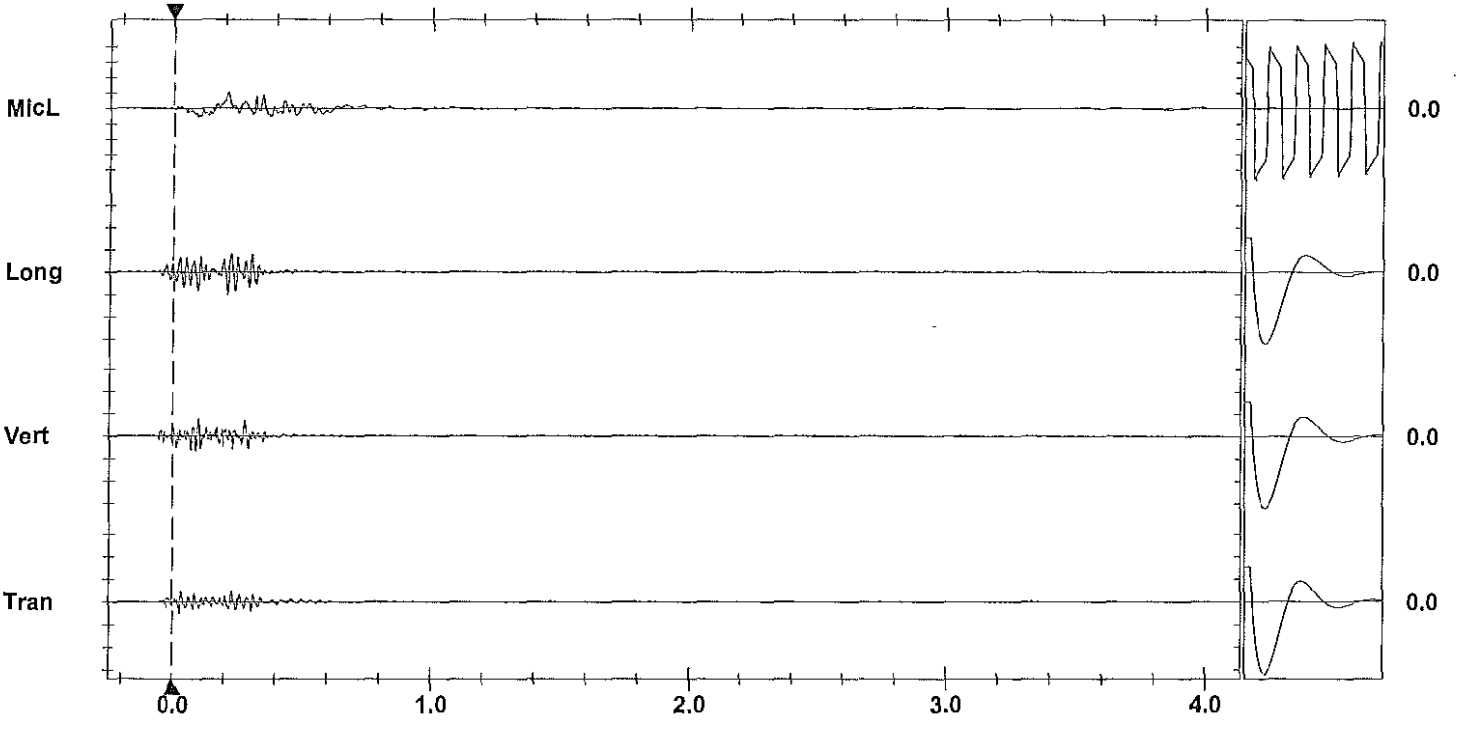
Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.209 sec
ZC Freq 7.4 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 601 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0750	0.1000	in/s
ZC Freq	64	43	39	Hz
Time (Rel. to Trig)	0.025	0.101	0.207	sec
Peak Acceleration	0.0530	0.0795	0.0663	g
Peak Displacement	0.00017	0.00026	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.103 in/s at 0.207 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Apr 12/11
ACTUAL BLAST DATE Apr 12/11 12:32 PM
BLAST # MW-0173

HIGHWAY# 97
BLAST LOCATION AT: STN 129+32 - 129+36 Lt (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not noted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5.8 (m)
TOTAL DEPTH 41 (m)

TOTAL NUMBER OF HOLES 36/11/26 Hor/ 10 Vert/ 2 Hor
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
2" Ammonite + 200 gram det cord in 6/11

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

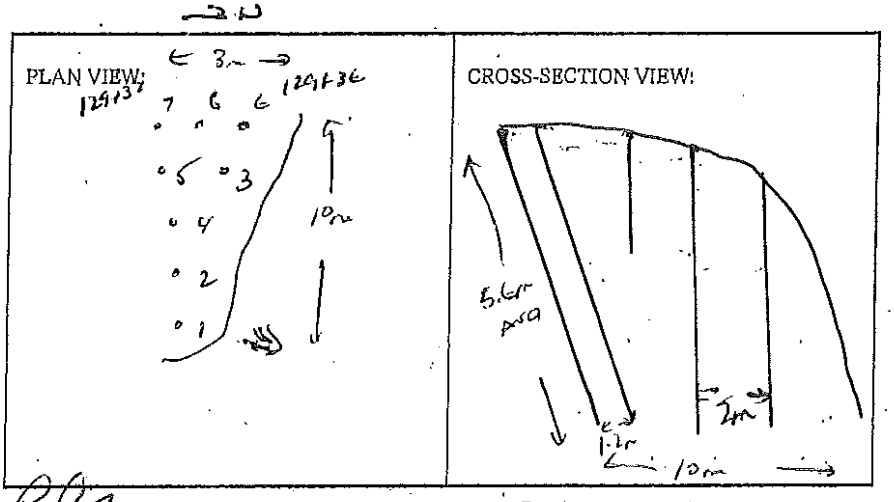
INITIATION DEVICE: (CIRCLE) P.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13/67 Cliffstone Crt. - No trigger < 0.15 ips
@ 13/17 Cliffstone Crt. - 0.22 ips / 73 Hz

Production Holes - 5'-6' ANFO/Hole

Stab Hole - 1.5' ANFO

Buffer Holes. 3-5 cart 2x16' Blastex

} All primed w/ 1 cart 1"x9" Dynamite

B/L Holes - 1 cart 2"x16" Dynamite + 200gr. det. cord to 4' collar.

Instantel

Event Report

Date/Time Vert at 12:32:26 April 12, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

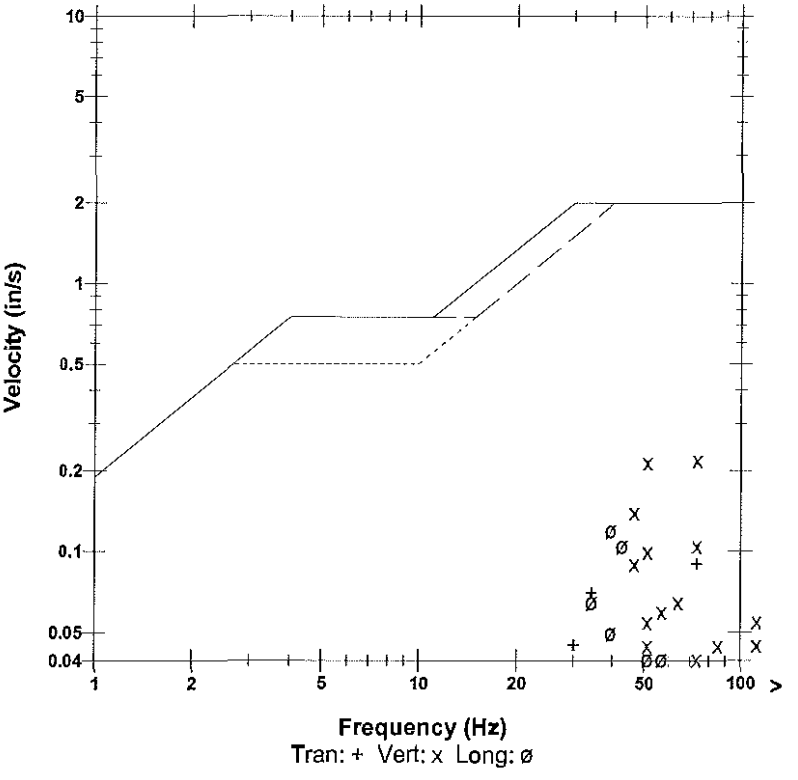
Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E8IY.U20

Notes
location:13117 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

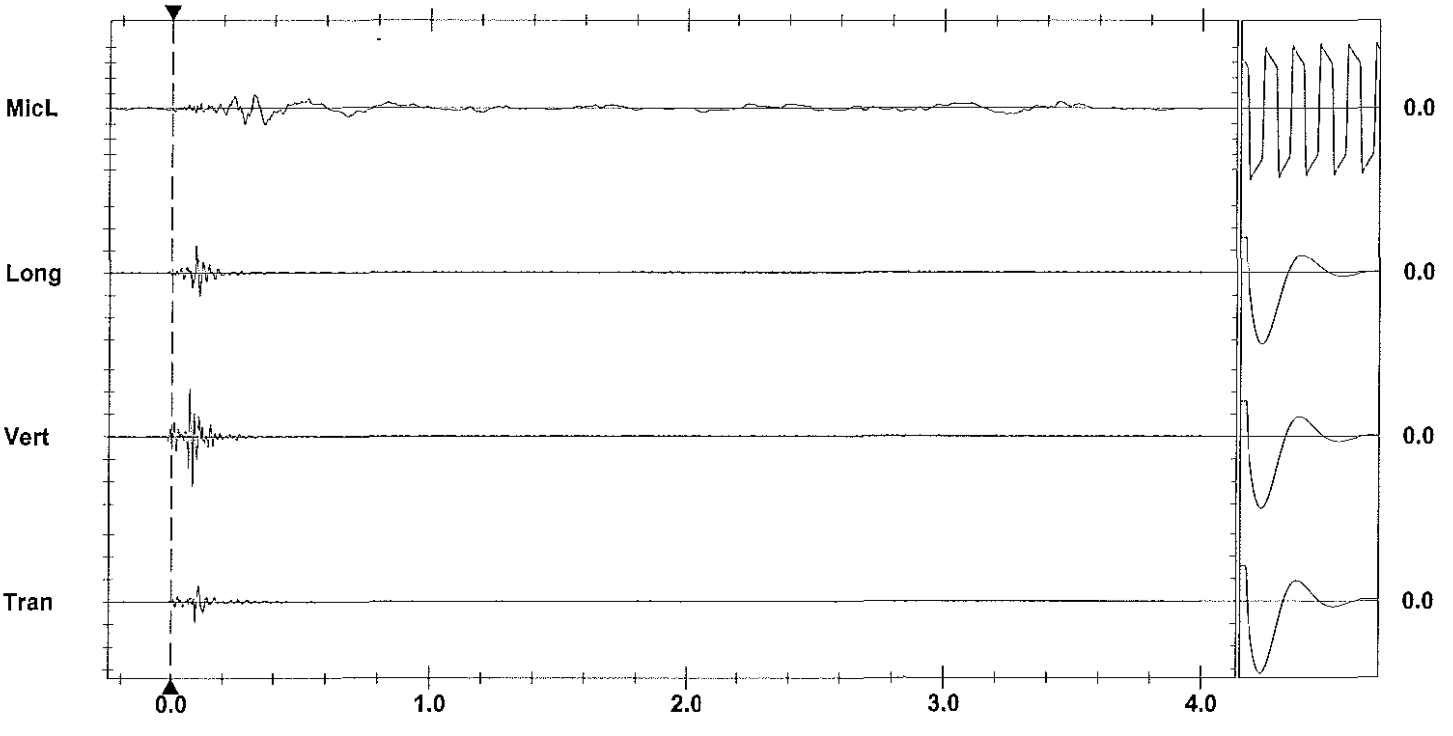
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.361 sec
ZC Freq 5.2 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 615 mv)

	Tran	Vert	Long	
PPV	0.0900	0.220	0.120	in/s
ZC Freq	73	73	39	Hz
Time (Rel. to Trig)	0.095	0.082	0.097	sec
Peak Acceleration	0.0795	0.278	0.0928	g
Peak Displacement	0.00032	0.00052	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.223 in/s at 0.082 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: April 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Apr 12/12
ACTUAL BLAST DATE Apr 11/12 1:41 PM
BLAST # MW-0194

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ALL
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.6 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 5 Proj
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HASZO CAPACITY 80 CAPS

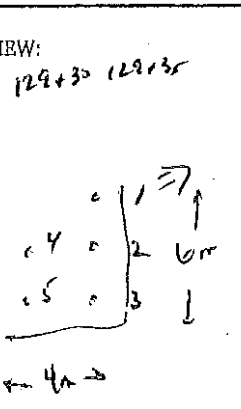
VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

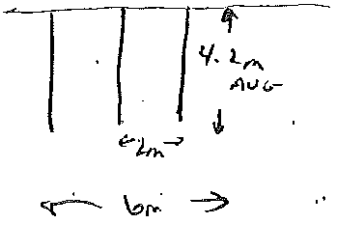
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Siesmograph @ 13167 Cliffstone ent - NO TRIG <0.15 ips
" @ 13117 Cliffstone ent - 0.14 ips / 51 Hz

3' - 4' ANFO / Hole Primed w/ 1 CART 1X8" DYNAMITE

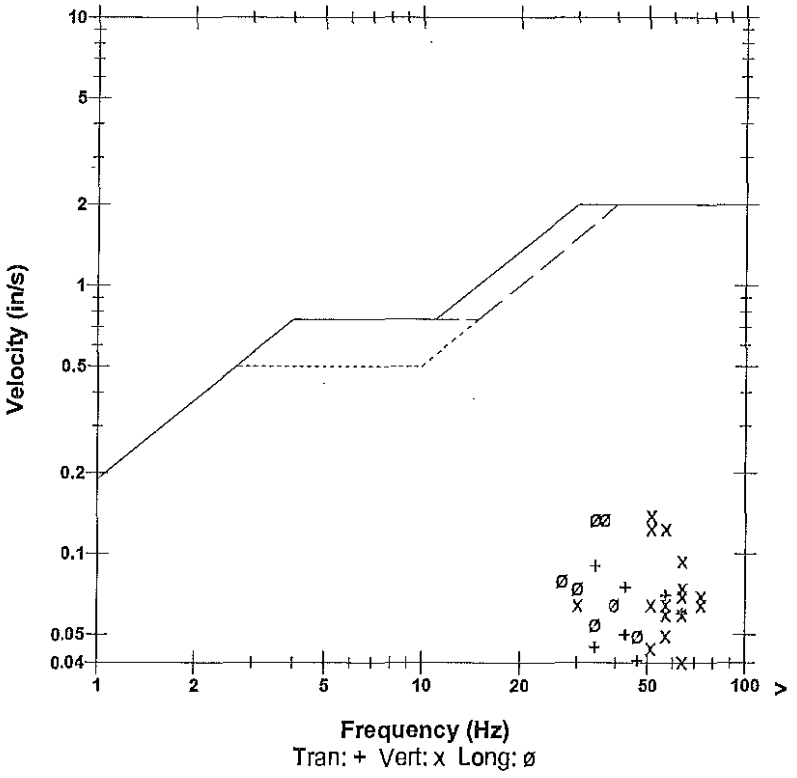
Date/Time	Vert at 13:41:52 April 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8J2.1S0

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

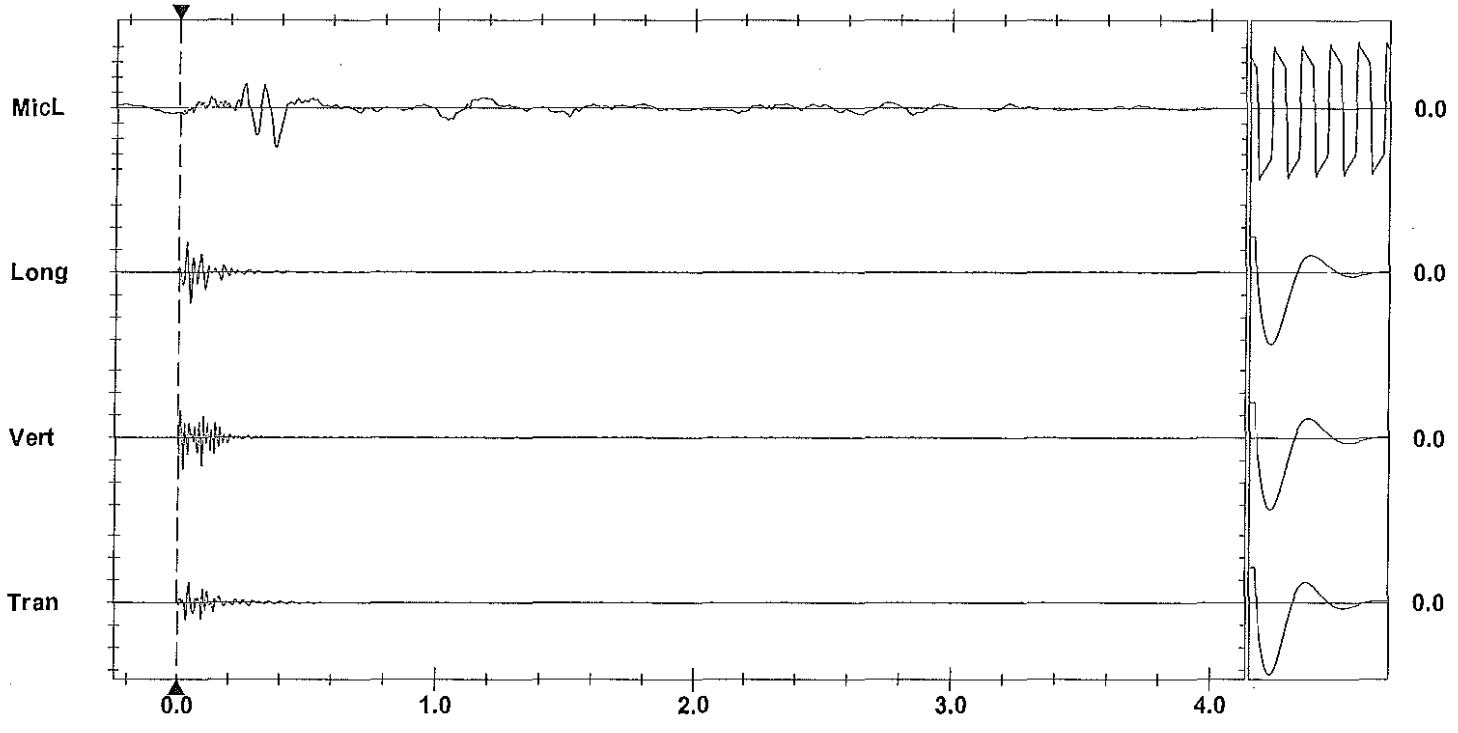
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00254 psi(L) at 0.376 sec
ZC Freq 8.3 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	0.0900	0.140	0.135	in/s
ZC Freq	34	51	34	Hz
Time (Rel. to Trig)	0.046	0.019	0.032	sec
Peak Acceleration	0.0663	0.133	0.0928	g
Peak Displacement	0.00037	0.00041	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.175 in/s at 0.046 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED April 14/11
ACTUAL BLAST DATE April 14/11
BLAST # MW-0175

2:46 PM

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+28 - 129+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* slot melted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Greenstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 31.5 (m)

TOTAL NUMBER OF HOLES 3 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Pwd
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 52 (kg)
DELAY TYPE AND LENGTH 25 (ms)

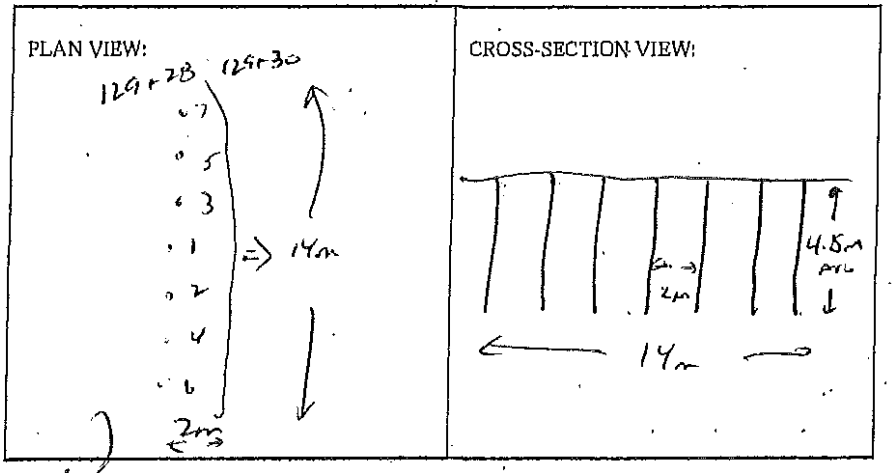
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. No trig < 0.15 ips
" @ 13187 Cliffstone Crt. 0.14 ips / 51 HZ

5'-6.5' ANFO/Hole Primed w/ 1 each 1" x 8" Dynamite

2"

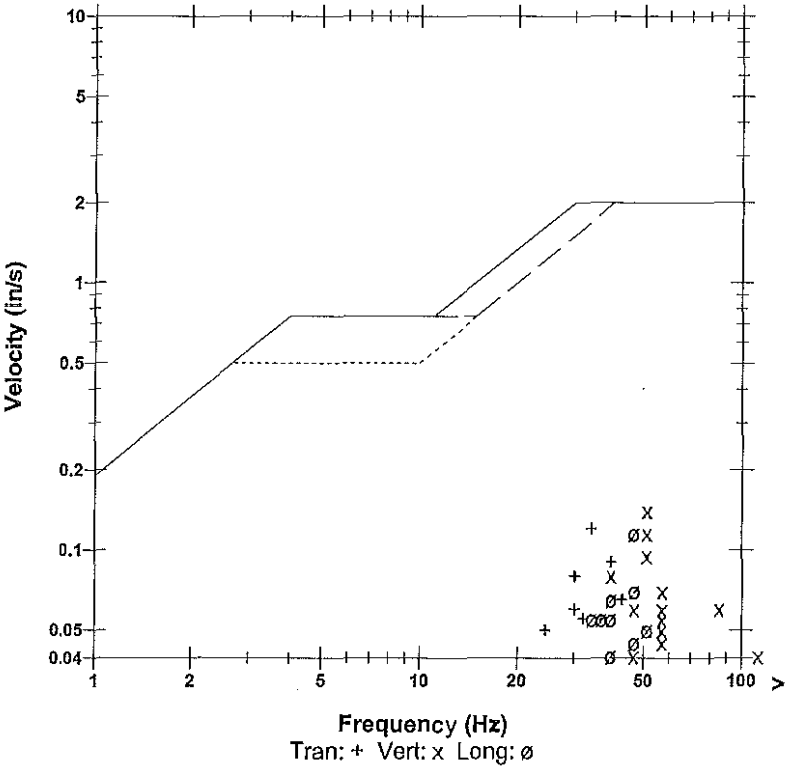
Date/Time	Vert at 14:46:06 April 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8J5.0U0

Notes
location:13117 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

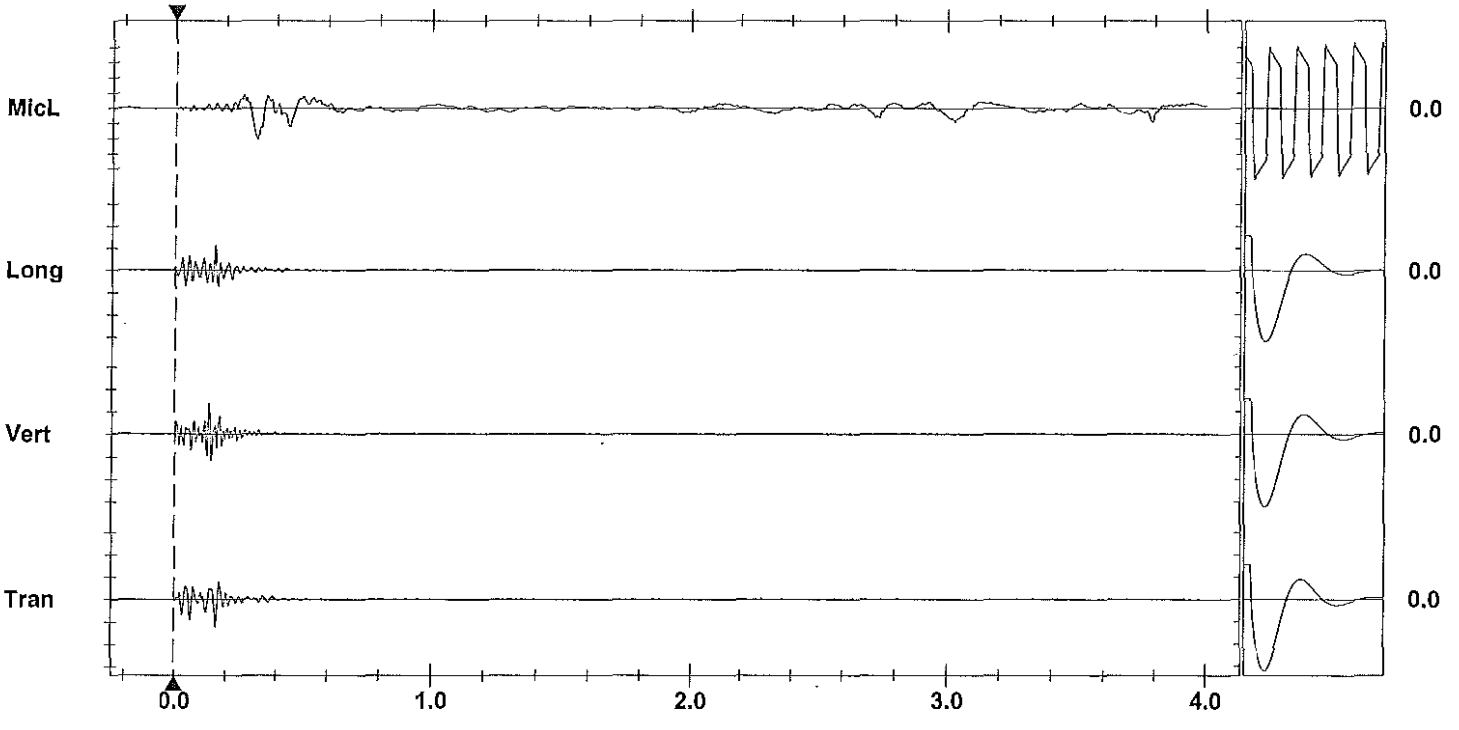
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00203 psi(L) at 0.322 sec
ZC Freq	9.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 620 mv)

	Tran	Vert	Long	
PPV	0.120	0.140	0.115	in/s
ZC Freq	34	51	47	Hz
Time (Rel. to Trig)	0.163	0.132	0.156	sec
Peak Acceleration	0.0795	0.159	0.0795	g
Peak Displacement	0.00052	0.00041	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.140 in/s at 0.132 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra D+B
BLASTER'S NAME W Hawley
BLASTER'S CERTIFICATE NUMBER 59348

DATE PREPARED APR 16/12
ACTUAL BLAST DATE APR 16/12 12:31 PM
BLAST # MW-0176

HIGHWAY# 97
BLAST LOCATION AT: STN 129+29 - 129+32 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 5.7 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5.9 (m)
TOTAL DEPTH 6.6 (m)

TOTAL NUMBER OF HOLES 56 / 36 Holes / 13 Holes / 2 Rows
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamex Canada
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

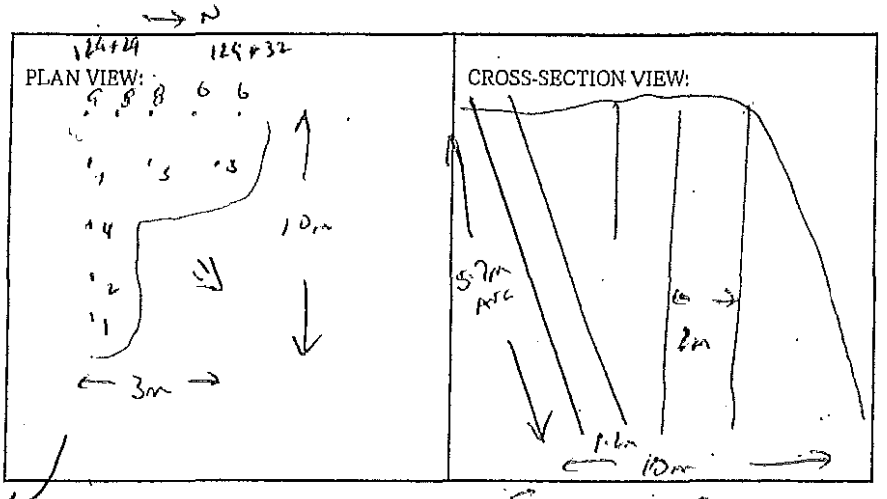
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 140 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE W Hawley COMPANY Sierra D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.081ips / 51Hz
@ 18119 Cliffstone Crt - 0.201ps / 64Hz

PRODUCTION HOLES - 5'-6' ANFO / HOLE

BUFFER HOLES - 4 - 5 CART 2"x16" BLASTEX / HOLE } Primed w/ 1 CART 1" x 8" DYNAMITE

STAB HOLE - 1.5' ANFO

B/L HOLES - TOE LOAD - 1 CART 2"x16" BLASTEX + 1 CART 1½" x16" DYNAMITE + 200gr det cord to 4' collar.

Instantel

Event Report

Date/Time	Tran at 12:31:29 April 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E8QD.GH0
Job Number:	1		

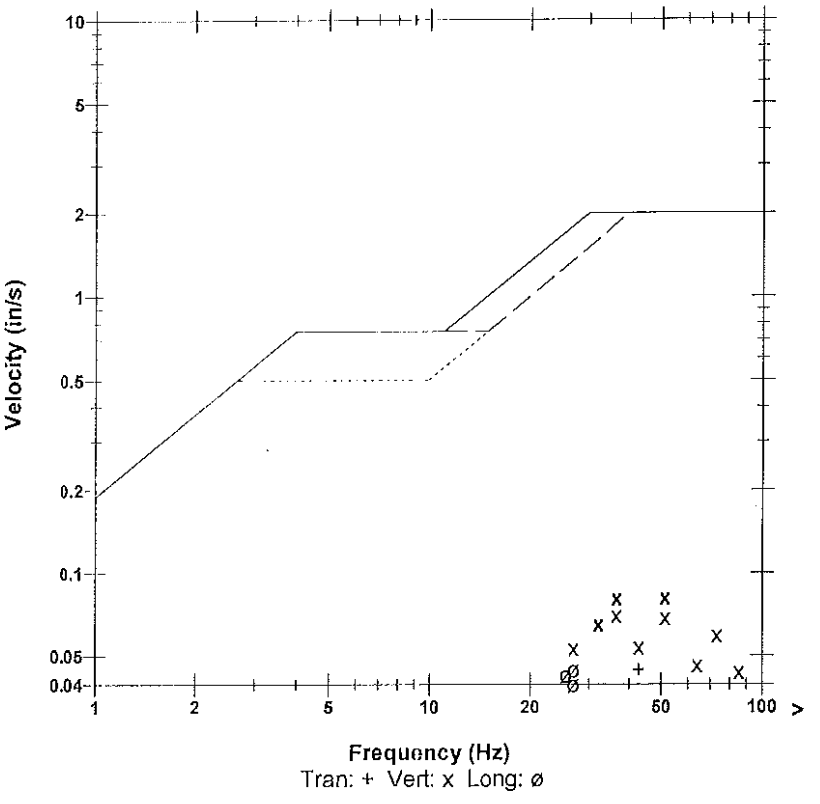
Notes
location:13167 Cliffstone Crt on rear patio slab

User Name:W Verwey
General:

Extended Notes

Post Event Notes

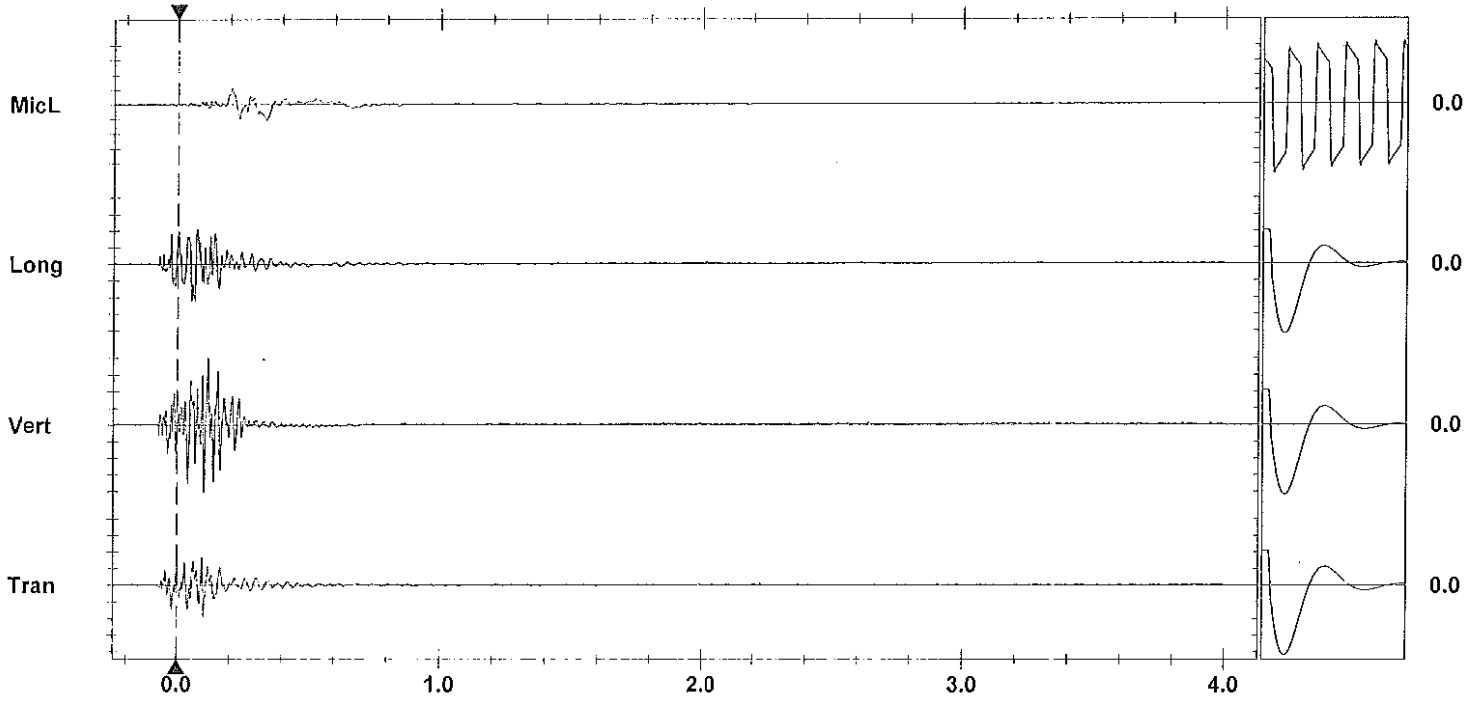
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00112 psi(L) at 0.205 sec			
ZC Freq	13 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 704 mv)			

	Tran	Vert	Long	
PPV	0.0444	0.0812	0.0444	in/s
ZC Freq	43	51	27	Hz
Time (Rel. to Trig)	0.001	0.103	0.054	sec
Peak Acceleration	0.0514	0.119	0.0679	g
Peak Displacement	0.00017	0.00031	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0893 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

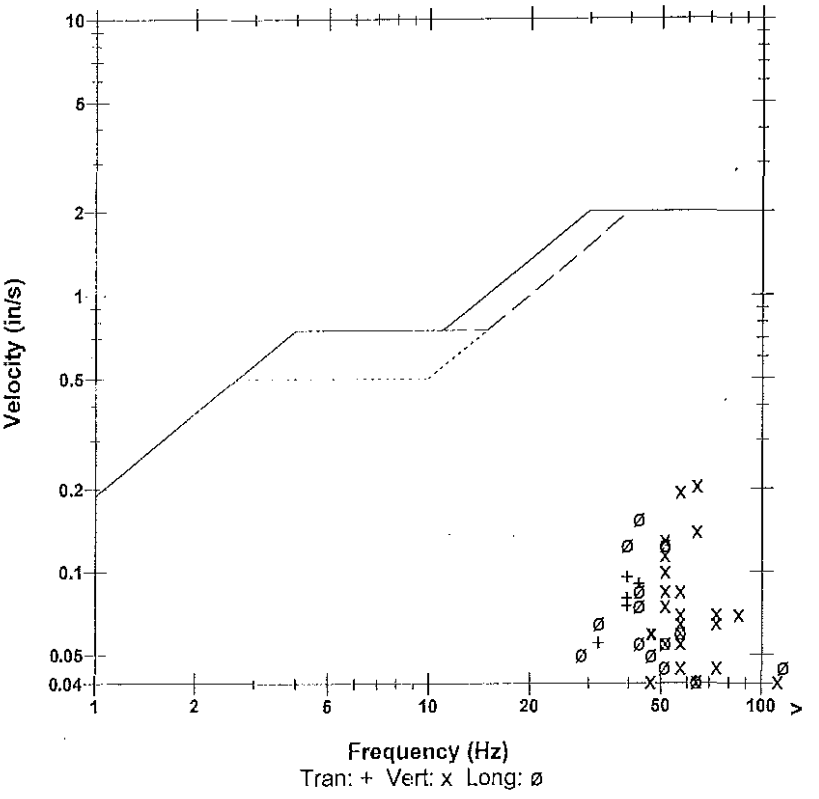
Date/Time	Vert at 12:31:25 April 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8QD.GD0

Notes
location:13117 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

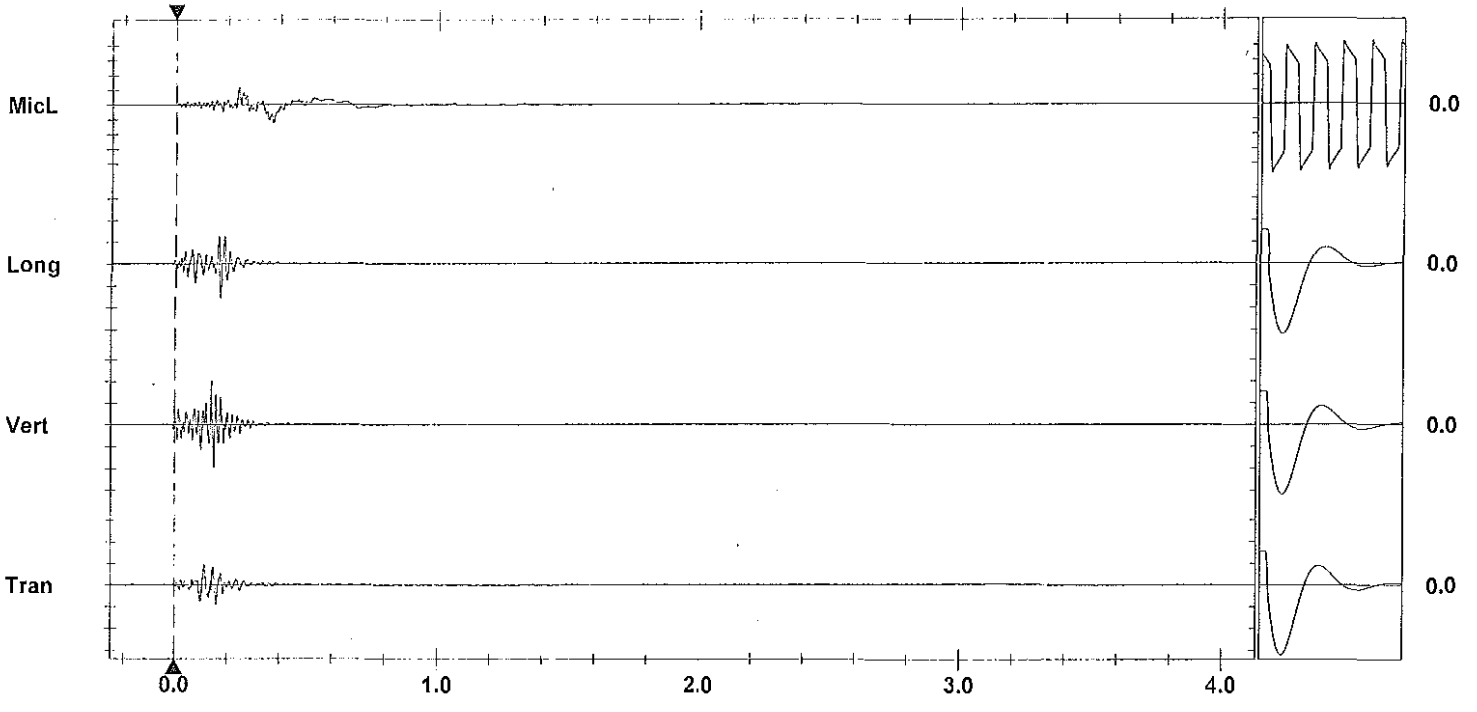
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.239 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 699 mv)

	Tran	Vert	Long	
PPV	0.0950	0.205	0.155	in/s
ZC Freq	39	64	43	Hz
Time (Rel. to Trig)	0.114	0.140	0.175	sec
Peak Acceleration	0.0663	0.225	0.133	g
Peak Displacement	0.00039	0.00047	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.4	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.209 in/s at 0.149 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED APR 17/12
ACTUAL BLAST DATE APR 17/12 1:29 PM
BLAST # MW-0177

HIGHWAY# 97
BLAST LOCATION AT: STN 129+24 - 129+28

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: we shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.7 (m)
TOTAL DEPTH 81 (m)

TOTAL NUMBER OF HOLES 13 Pairs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

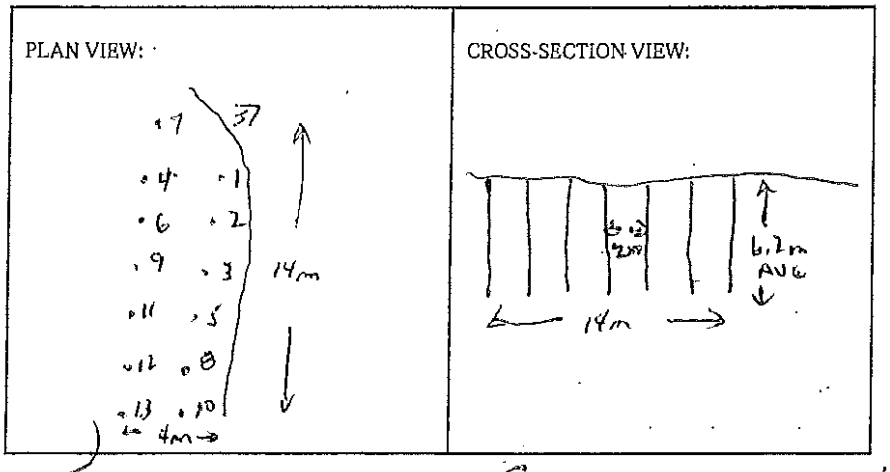
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.25 ips/39 Hz
@ 13117 Cliffstone Ct - 0.63 ips/5 Hz

10' - 14' ANFO/Hole Primed w/ 1 each 1½" dynamite

Instantel

Event Report

Date/Time	Vert at 13:30:02 April 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E8SA.U20
Job Number:	1		

Notes
location:13167 Cliffstone Crt on rear patio slab

User Name:W Verwey
General:

Extended Notes

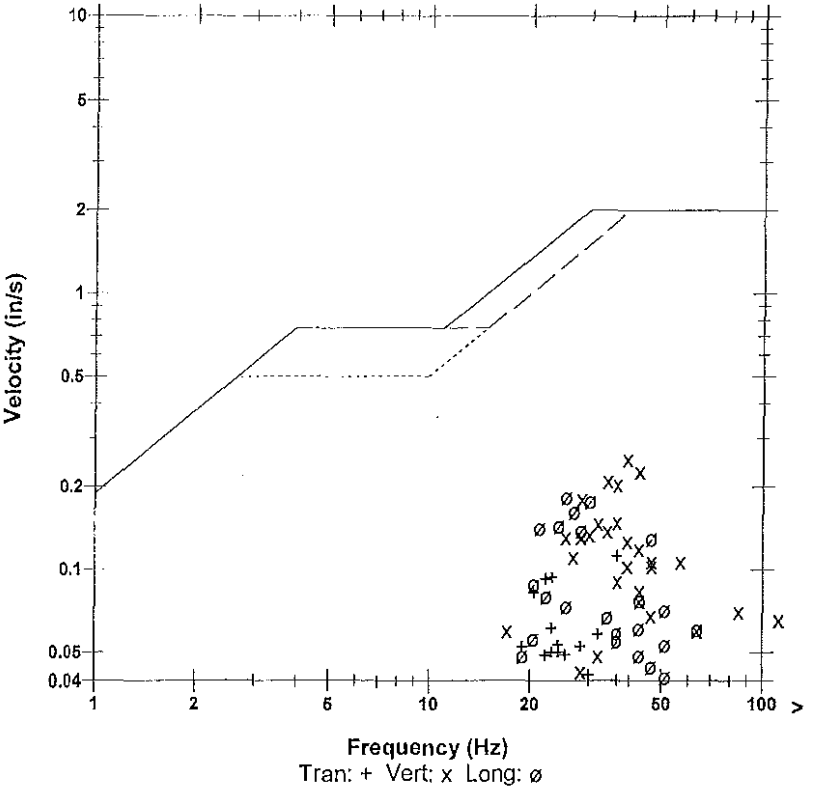
Post Event Notes

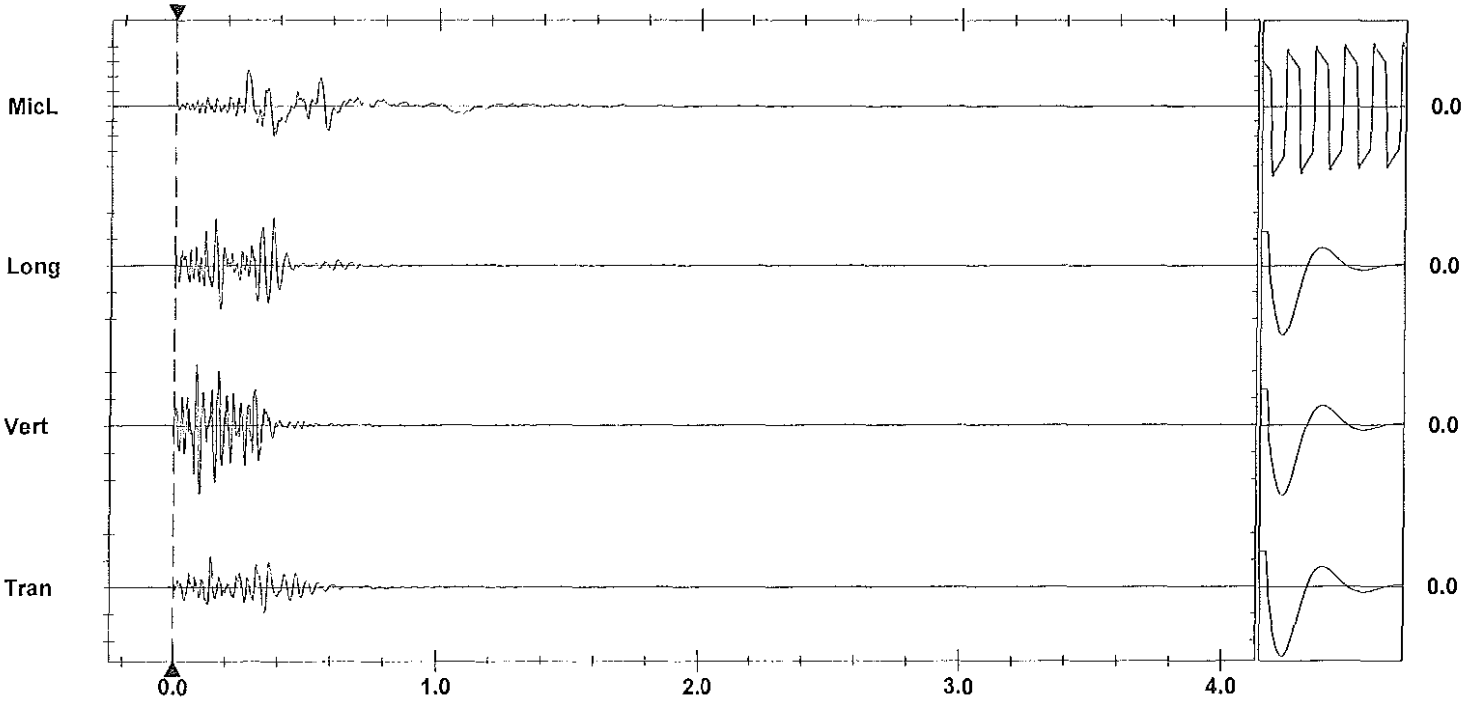
Microphone Linear Weighting
PSPL 0.00239 psi(L) at 0.277 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 550 mv)

	Tran	Vert	Long	
PPV	0.112	0.252	0.183	in/s
ZC Freq	37	39	26	Hz
Time (Rel. to Trig)	0.145	0.100	0.381	sec
Peak Acceleration	0.0779	0.287	0.103	g
Peak Displacement	0.00069	0.00104	0.00106	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.277 in/s at 0.157 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: April 21, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

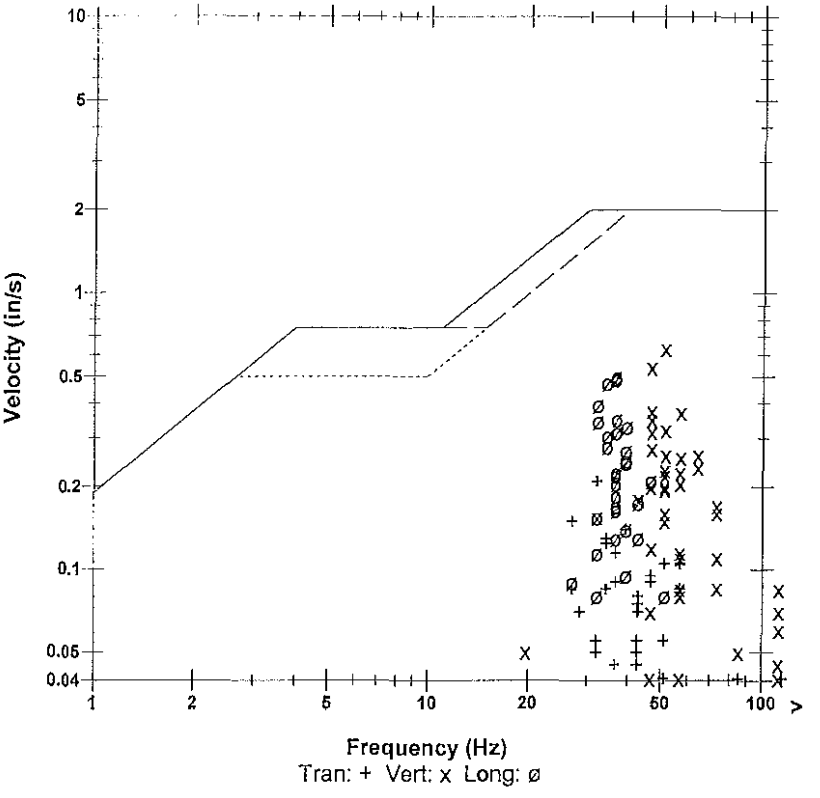
Date/Time	Vert at 13:29:57 April 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8SA.TX0

Notes
location:13117 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

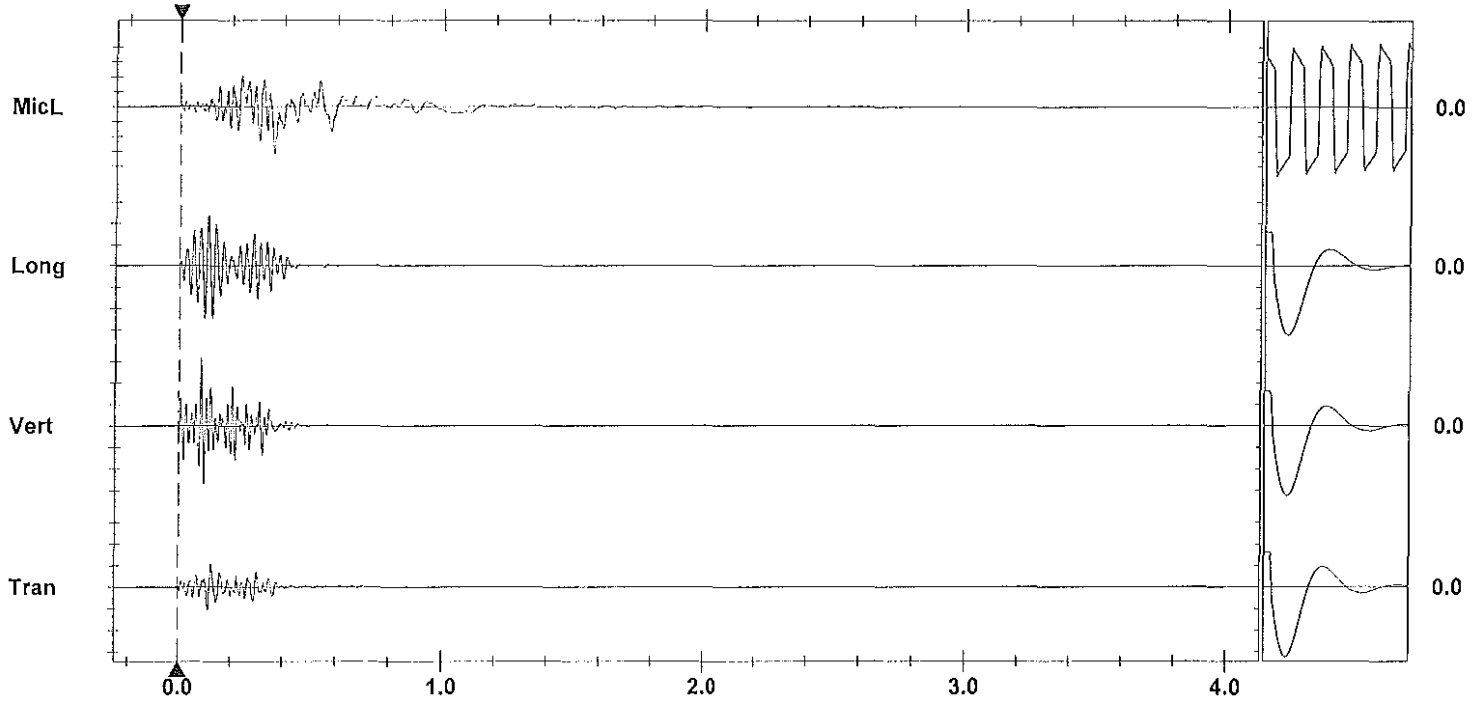
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00319 psi(L) at 0.362 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 592 mv)

	Tran	Vert	Long	
PPV	0.215	0.630	0.500	in/s
ZC Freq	37	51	37	Hz
Time (Rel. to Trig)	0.116	0.089	0.099	sec
Peak Acceleration	0.172	0.583	0.318	g
Peak Displacement	0.00097	0.00188	0.00217	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.738 in/s at 0.099 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: April 21, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 5834487

DATE PREPARED Apr 18/12
ACTUAL BLAST DATE Apr 18/12 2:37 PM
BLAST # MW-0177

HIGHWAY# 97
BLAST LOCATION AT: STN 129+20 - 129+24

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot melted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES No
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.8 (m)
TOTAL DEPTH 88 (m)

TOTAL NUMBER OF HOLES 14 Proposed
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite Famco
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 85 (ms)

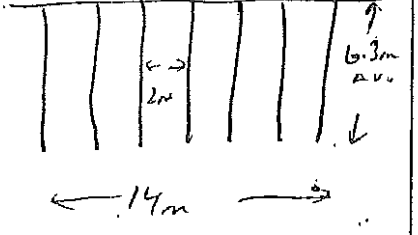
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE B320 CAPACITY 8 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:
12/13 = 1
9/16 = 1/2
14/17 = 3/15
15/17 = 6/8
16/16 = 1/1

CROSS-SECTION VIEW:


BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone Crt - 0.17 ips / 22 Hz
" 0.13117 Cliffstone Crt - 0.28 ips / 37 Hz

BOTTOM DECKS - 6'-9" AVG
TOP DECKS 4'-5" AVG } PAINTED W/ 1 COAT 1"x8" DYNAMINE

Instantel

Event Report

Date/Time	Long at 14:37:31 April 18, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E8U8.MJ0
Job Number:	1		

Notes
location:13167 Cliffstone Crt on rear patio slab

User Name:W Verwey
General:

Extended Notes

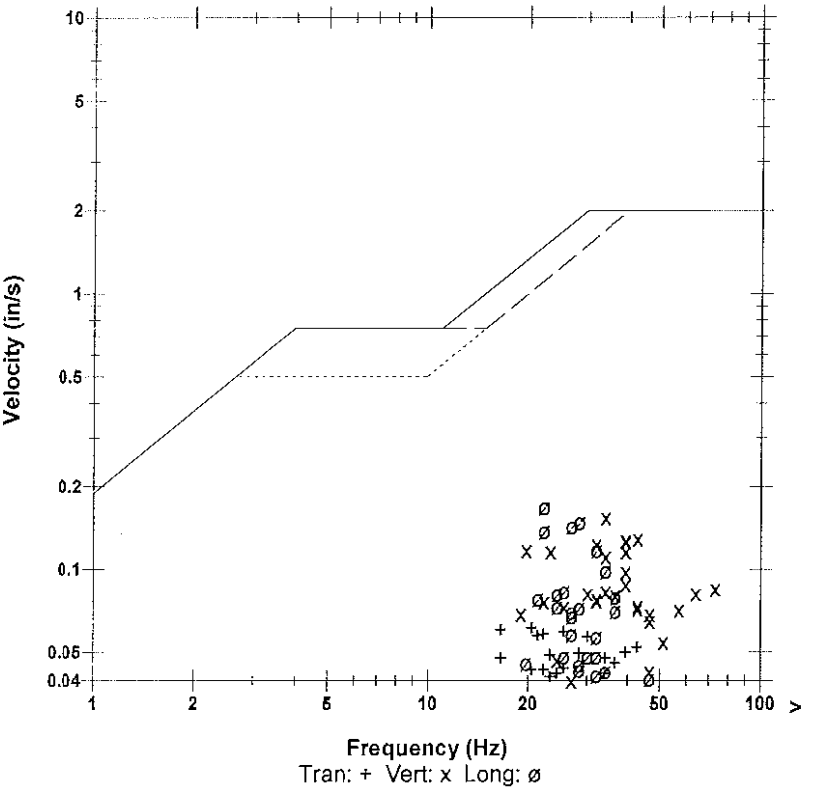
Post Event Notes

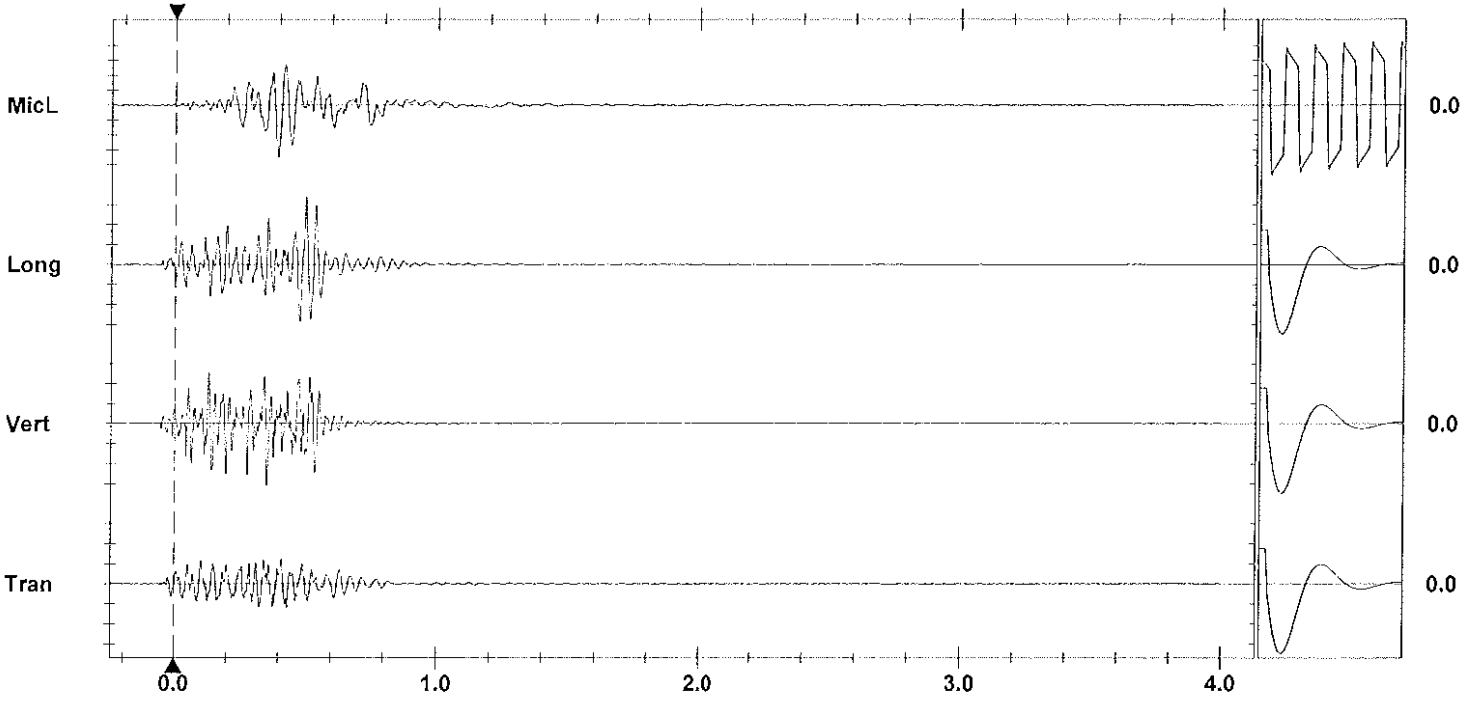
Microphone Linear Weighting
PSPL 0.00348 psi(L) at 0.395 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 589 mv)

	Tran	Vert	Long	
PPV	0.0612	0.154	0.168	in/s
ZC Freq	20	34	22	Hz
Time (Rel. to Trig)	0.413	0.354	0.502	sec
Peak Acceleration	0.0530	0.141	0.0862	g
Peak Displacement	0.00044	0.00073	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.191 in/s at 0.540 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: April 21, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

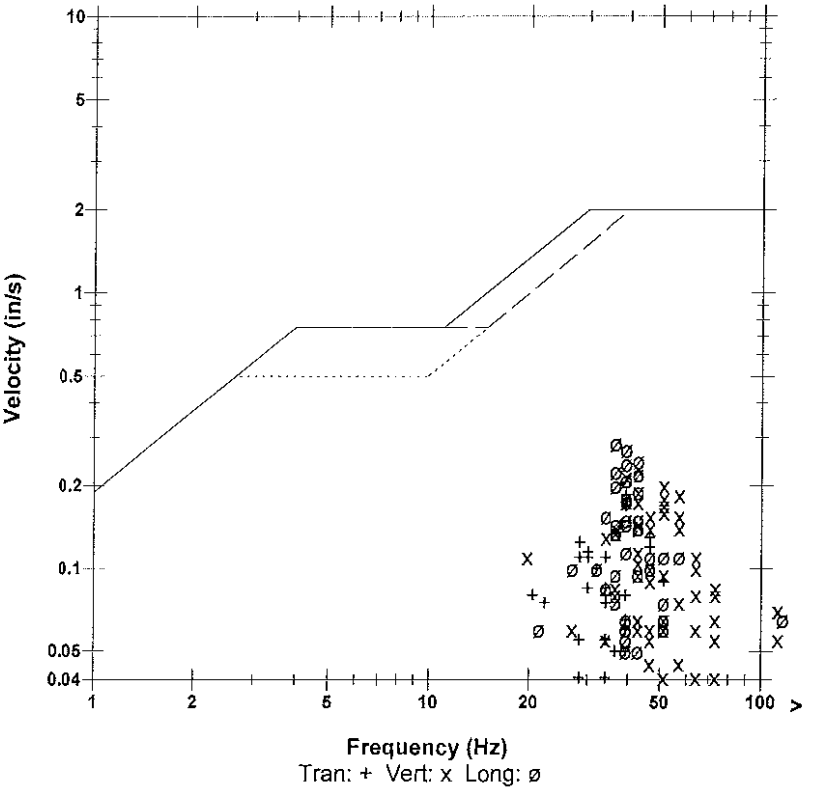
Date/Time	Vert at 14:37:26 April 18, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8U8.ME0

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

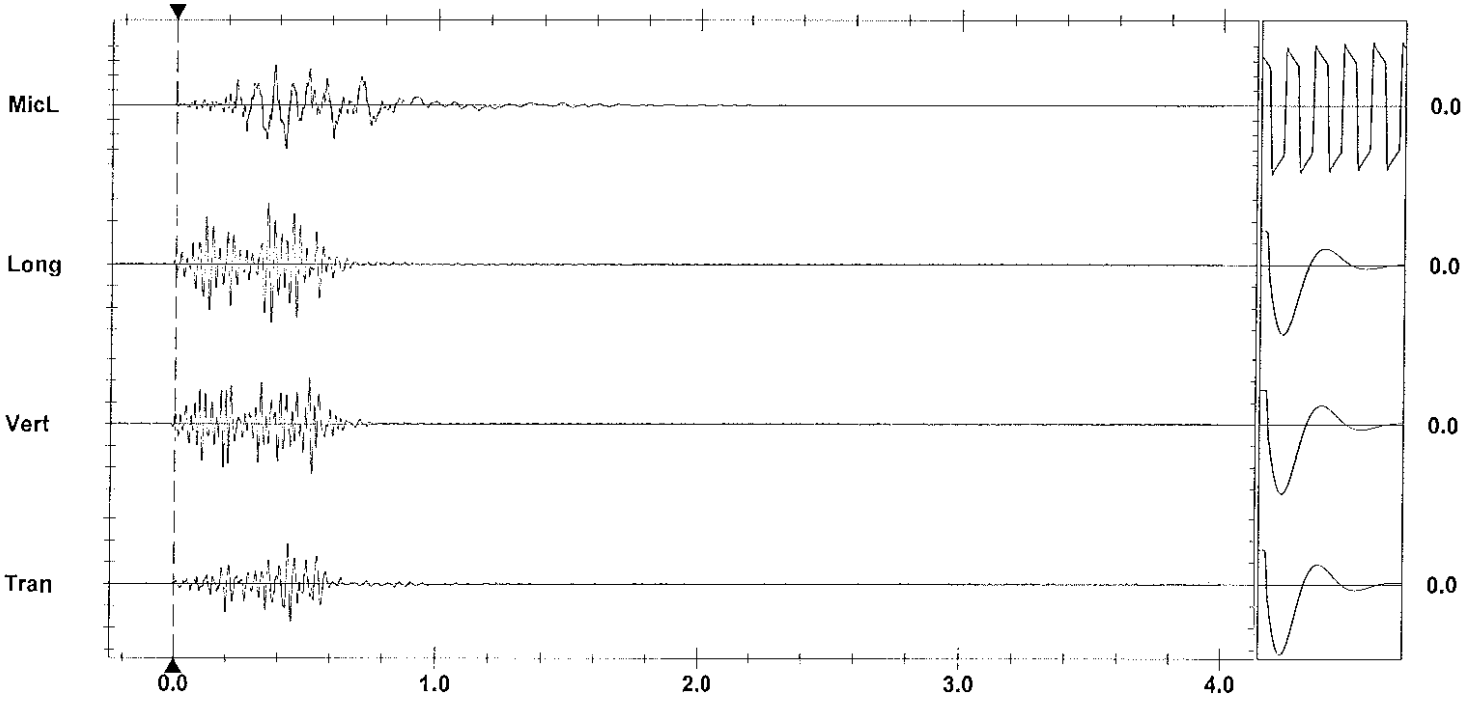
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00297 psi(L) at 0.422 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 601 mv)

	Tran	Vert	Long	
PPV	0.185	0.230	0.285	in/s
ZC Freq	39	43	37	Hz
Time (Rel. to Trig)	0.440	0.529	0.356	sec
Peak Acceleration	0.119	0.186	0.172	g
Peak Displacement	0.00069	0.00083	0.00126	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.304 in/s at 0.356 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Apr 19/12
ACTUAL BLAST DATE Apr 19/12 1:48 pm
BLAST # M20-0178

HIGHWAY# 97
BLAST LOCATION AT: Stn 129+24 - 129+29 CS (to Substandard)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
No shot matrial

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 69 (m)

TOTAL NUMBER OF HOLES 7611/46 after
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

2" Dynamite @ 200gr det. cord in 6/11 holes

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2" x 12" Boosters
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

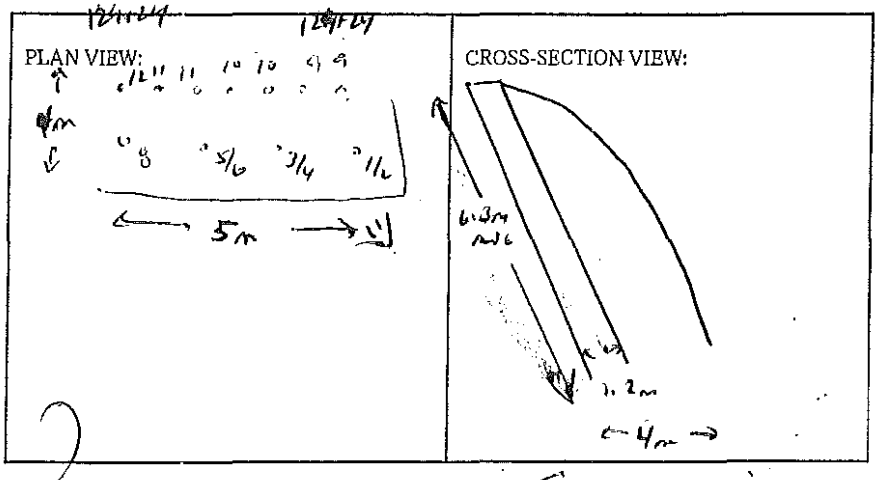
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~HB 320~~ CAPACITY 80 caps

VOLUME OF ROCK BLASTED 110 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.091 ips/ 43Hz
@ 13117 Cliffstone Cut - 0.13 ips/ 51Hz

BUFFER Holes - Bottom Decks - 3-5 cart 2"x16" Blastex } Primed w/ 0.5 cart 2"x16" Dynamite
- Top Decks 1-2 cart 2"x16" Blastex

B/L Holes - 1 cart 2"x16" Dynamite + 200 gr det cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 13:49:01 April 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E8W1.1P0
Job Number:	1		

Notes
location:13167 Cliffstone Crt on rear patio slab

User Name:W Verwey
General:

Extended Notes

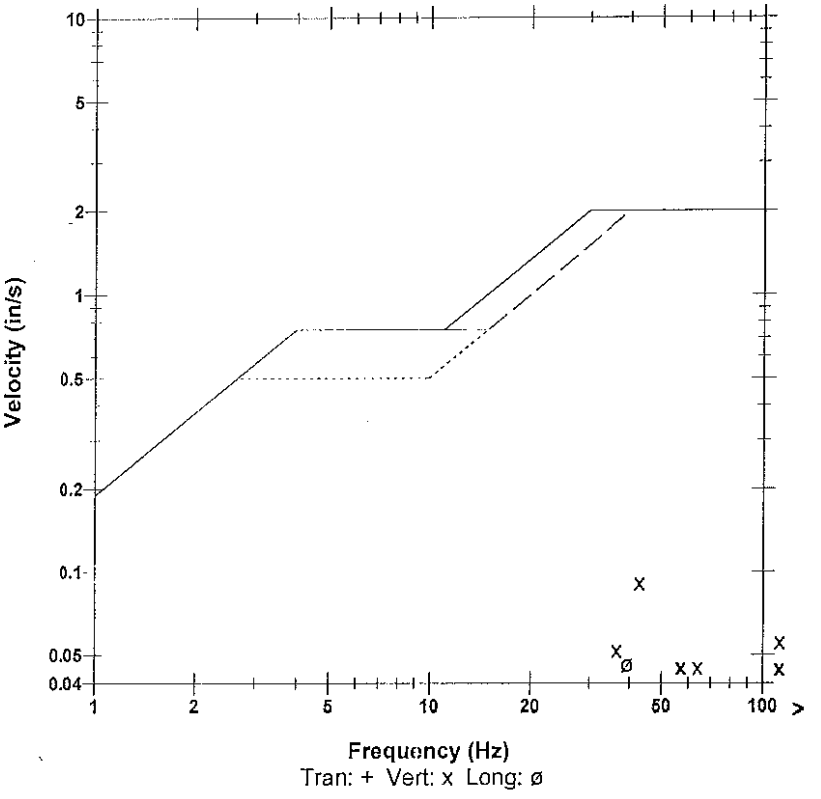
Post Event Notes

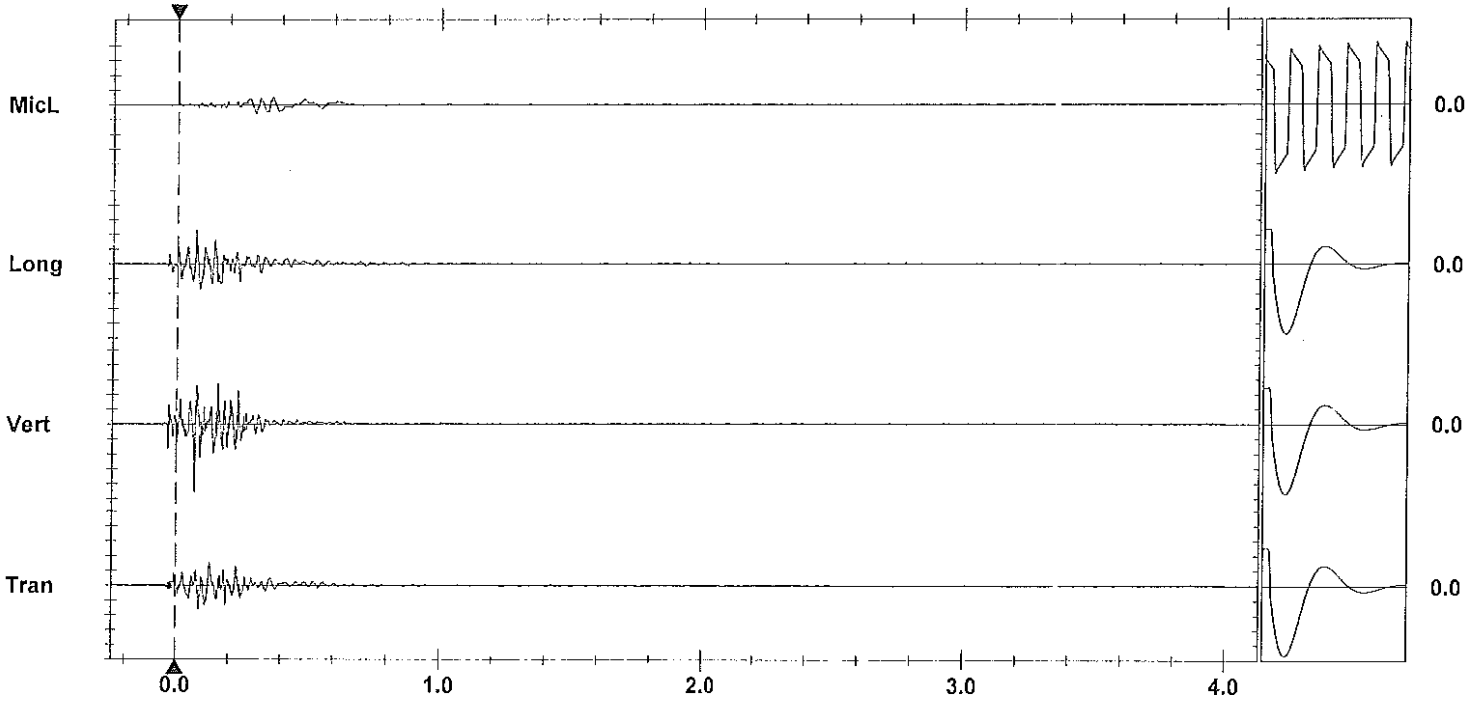
Microphone Linear Weighting
PSPL 0.00058 psi(L) at 0.296 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 614 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0912	0.0462	in/s
ZC Freq	39	43	39	Hz
Time (Rel. to Trig)	0.089	0.070	0.073	sec
Peak Acceleration	0.0414	0.157	0.0315	g
Peak Displacement	0.00015	0.00020	0.00022	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.0933 in/s at 0.070 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:48:54 April 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8W1.1I0

Notes
location:13117 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

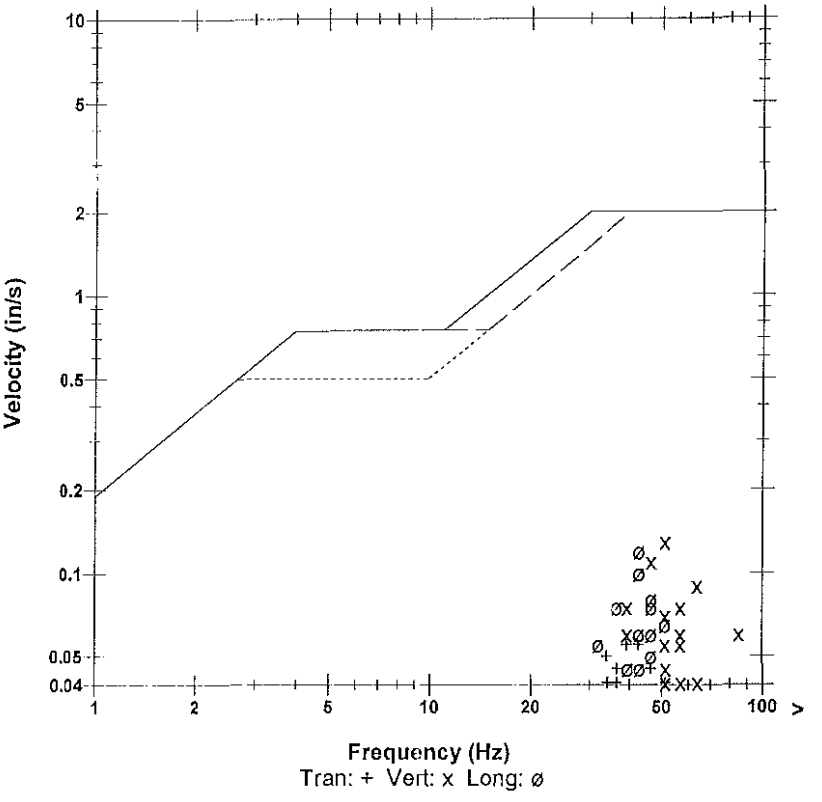
Extended Notes

Post Event Notes

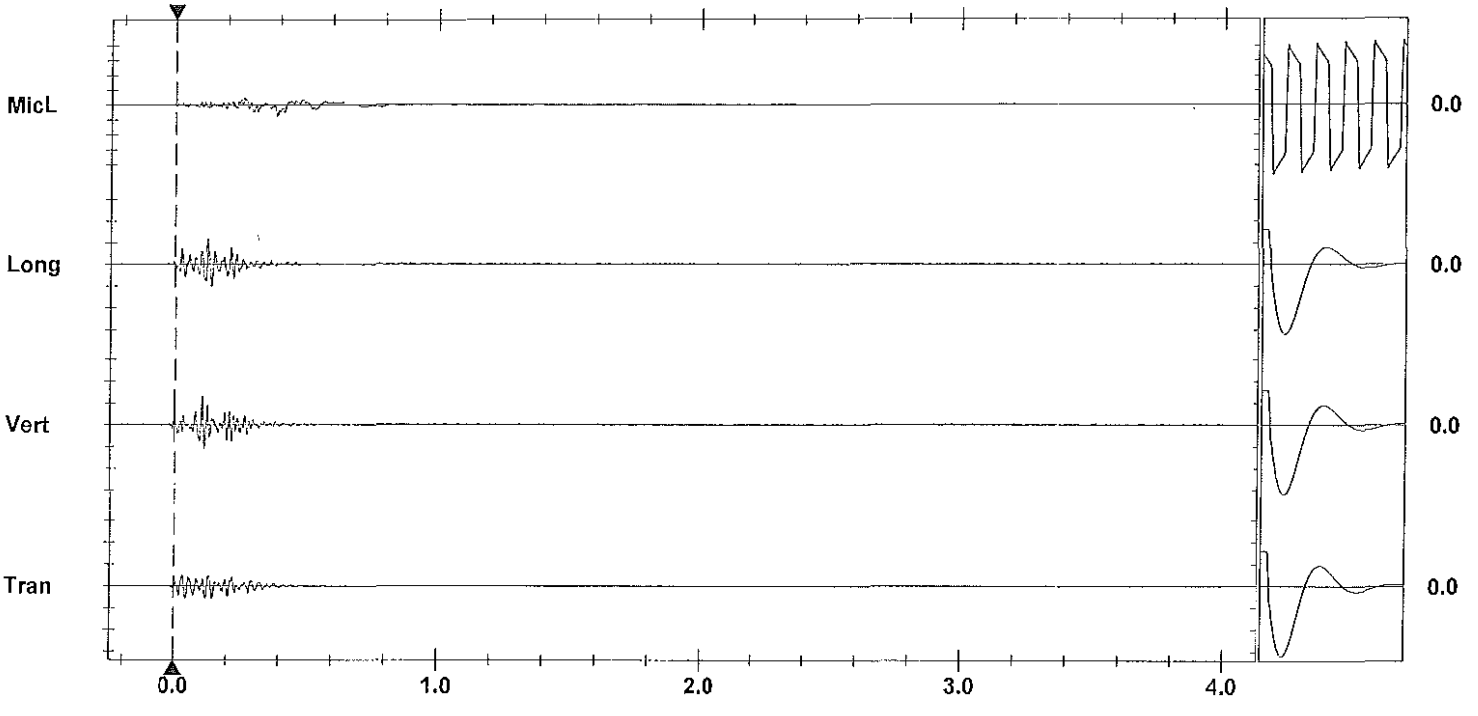
Microphone Linear Weighting
PSPL 0.00073 psi(L) at 0.387 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 637 mv)

	Tran	Vert	Long	
PPV	0.0550	0.130	0.120	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.046	0.104	0.125	sec
Peak Acceleration	0.0530	0.119	0.0928	g
Peak Displacement	0.00023	0.00038	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.155 in/s at 0.125 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sloan Drilling + Blasting
BLASTER'S NAME Wayne Jeremy
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED APR 20/12
ACTUAL BLAST DATE APR 20/12 1:26PM
BLAST # MU-0179

HIGHWAY# 97
BLAST LOCATION AT: STN 129+16-129+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 5x (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 108 feet (m)

TOTAL NUMBER OF HOLES 14 prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2x (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 28
TOTAL NUMBER OF DELAYS 24

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

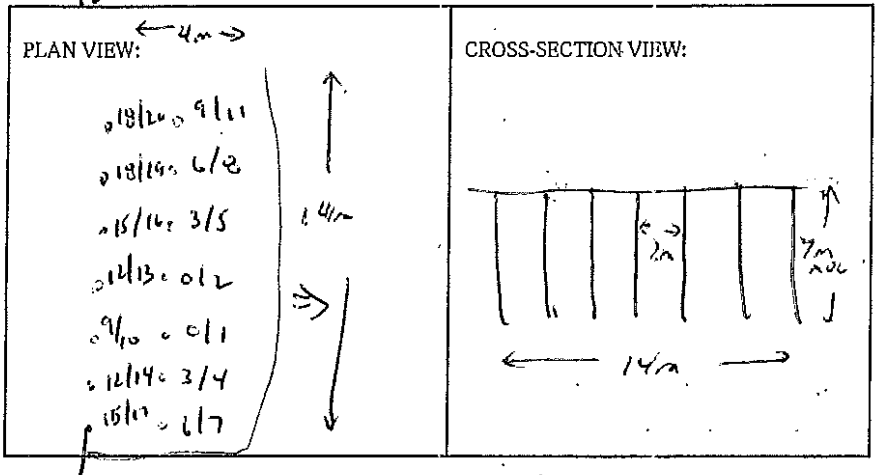
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB30 CAPACITY 30 caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Jeremy COMPANY Sloan Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.20 ips/ 64 Hz
" @ 13117 cliffstone crt - 0.37 ips/ 51 Hz

Bottom Decks - 5'-6' ANFO
Top Decks - 3'-5' ANFO
} Primed w/ 1 emat 1"x 9" Dynamite

Instantel

Event Report

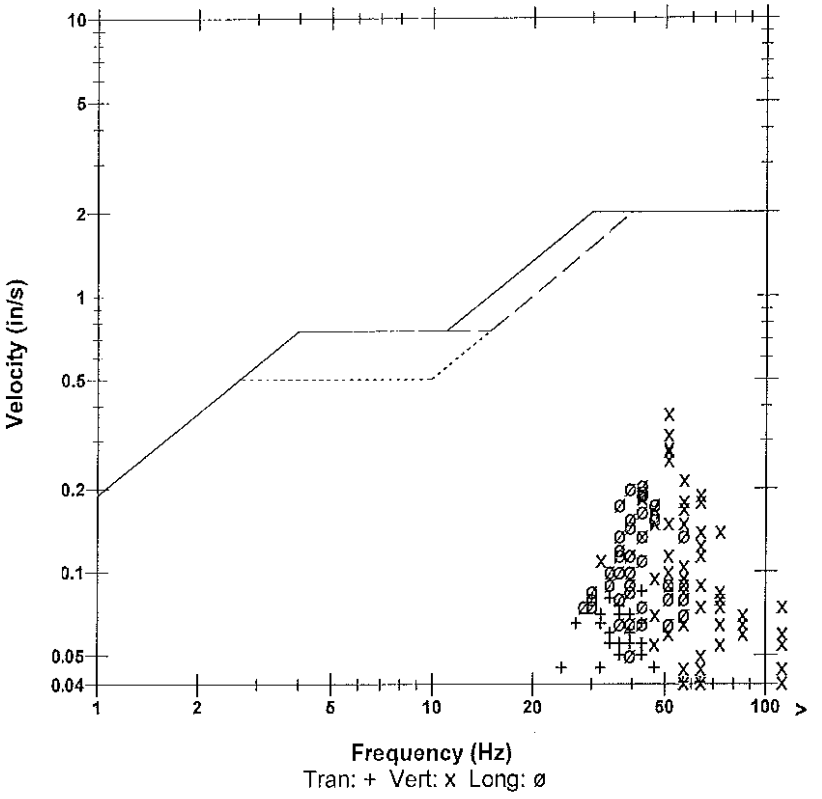
Date/Time	Vert at 13:26:36 April 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E8XU.OC0

Notes
location:13117 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

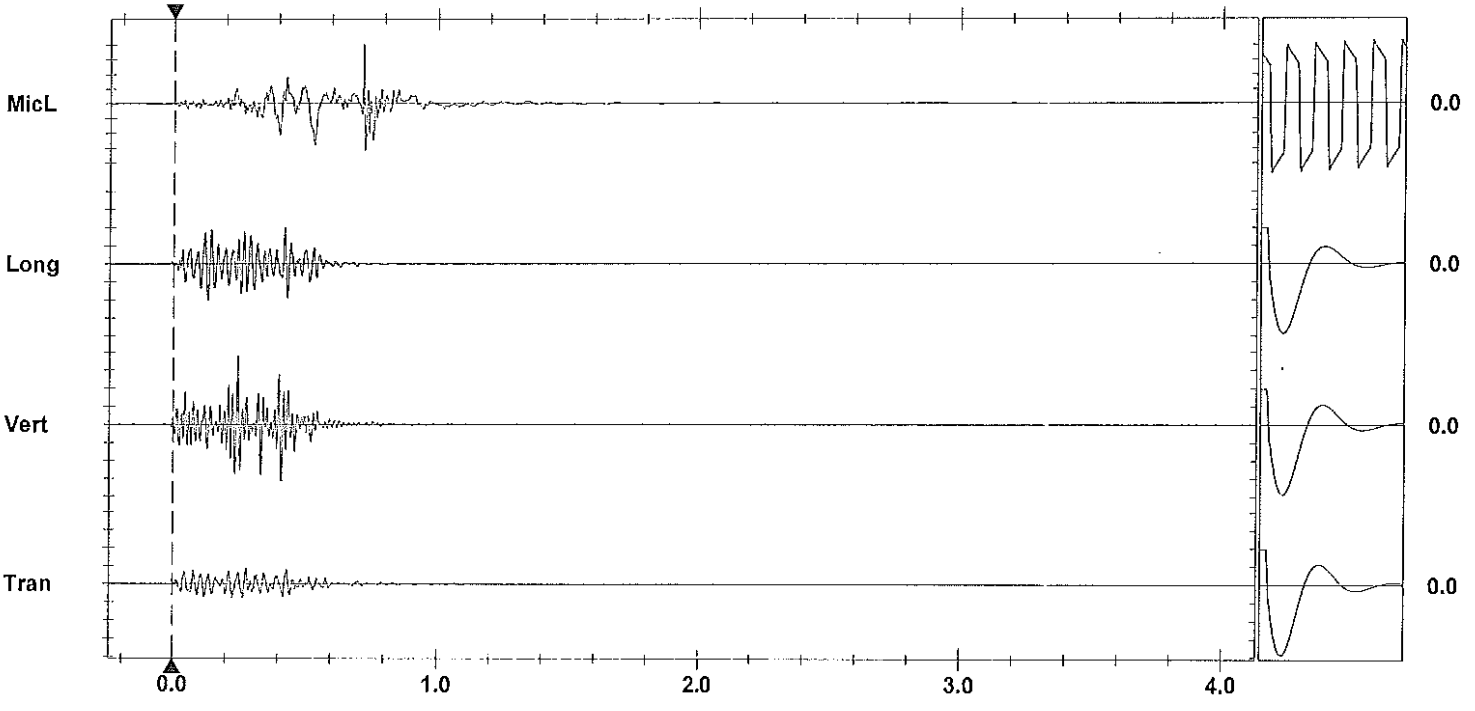
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00406 psi(L) at 0.719 sec
ZC Freq	85 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 607 mv)

	Tran	Vert	Long	
PPV	0.0850	0.375	0.205	in/s
ZC Freq	43	51	43	Hz
Time (Rel. to Trig)	0.282	0.248	0.425	sec
Peak Acceleration	0.0663	0.305	0.146	g
Peak Displacement	0.00037	0.00111	0.00081	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.402 in/s at 0.248 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 13:26:43 April 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E8XU.OJ0
Job Number:	1		

Notes
location:13167 Cliffstone Crt on rear patio slab

User Name:W Verwey
General:

Extended Notes

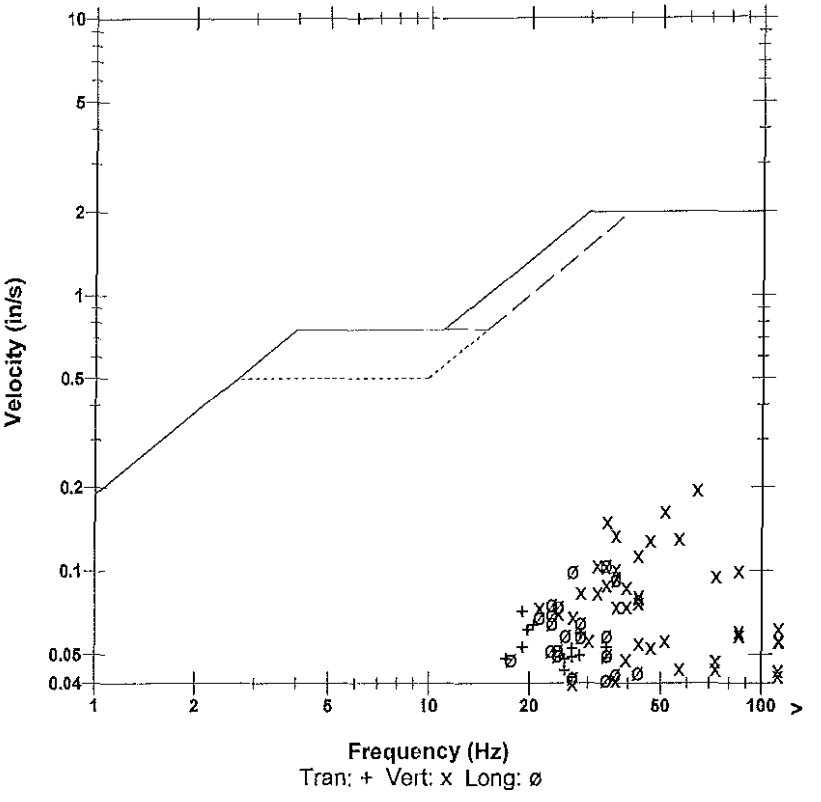
Post Event Notes

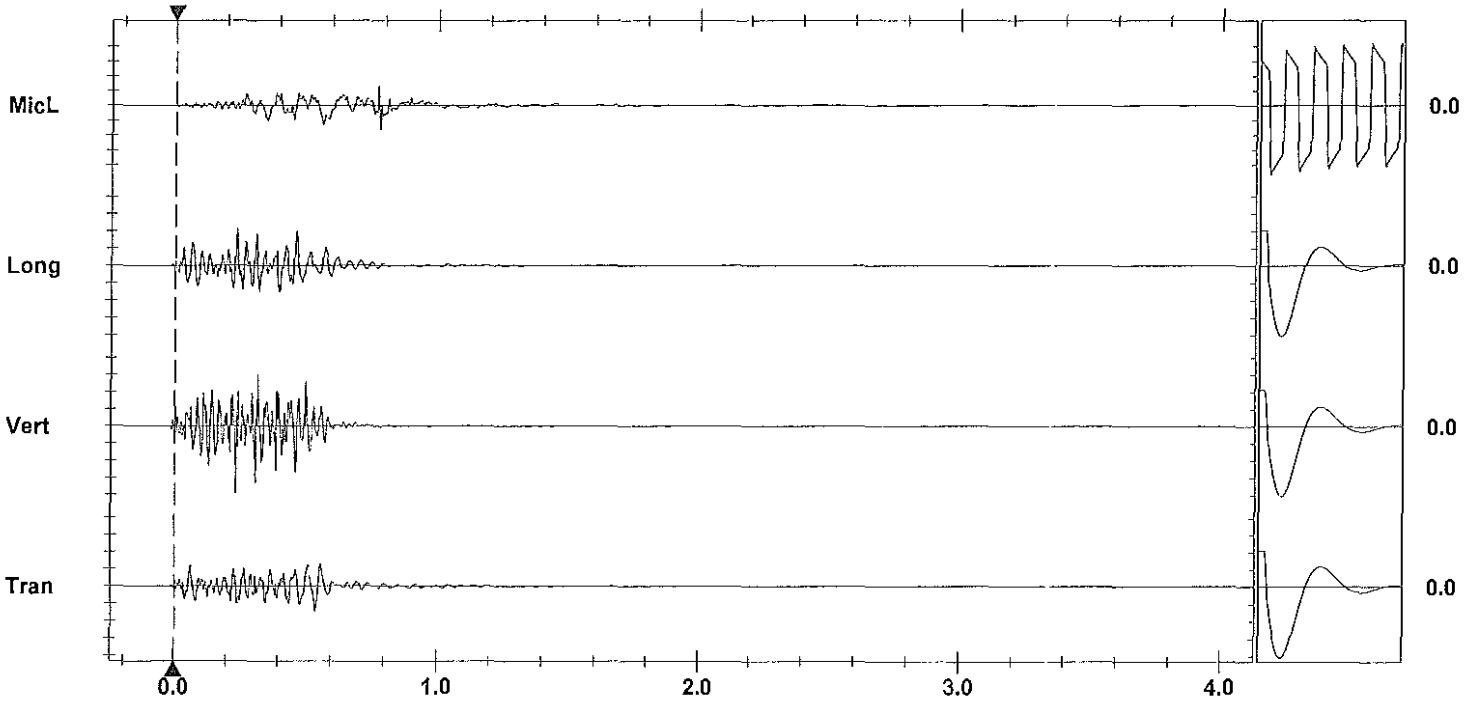
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.777 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 499 mv)

	Tran	Vert	Long	
PPV	0.0712	0.196	0.105	in/s
ZC Freq	19	64	34	Hz
Time (Rel. to Trig)	0.540	0.235	0.237	sec
Peak Acceleration	0.0829	0.234	0.0580	g
Peak Displacement	0.00046	0.00054	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.7	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.216 in/s at 0.235 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 6B3489

DATE PREPARED Apr 23/12
ACTUAL BLAST DATE Apr 23/12 2:00 PM
BLAST # MW-0180

HIGHWAY# 97
BLAST LOCATION AT: STN 129+12 - 129+16

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 91 [illegible] (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS [illegible] 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 180 (kg)
DELAY TYPE AND LENGTH 25 (ms)

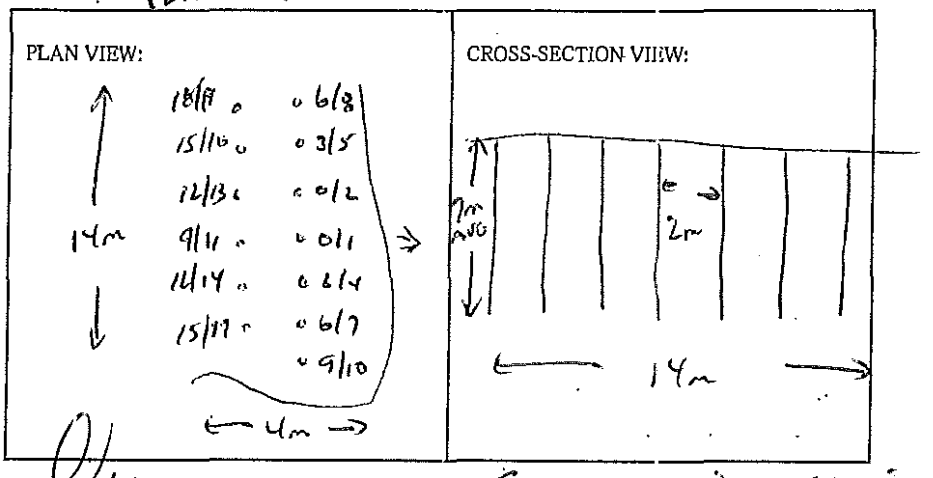
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crk. 0.18 ips / 47 Hz
@ 13117 cliffstone crk. 0.44 ips / 64 Hz

Bottom Decks - 6'-7' ANFO
Top Decks - 5'-6' ANFO
} Primed w/ 1 each 1½" dynamite

Instantel

Event Report

Date/Time	Vert at 14:00:04 April 23, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E93G.840

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

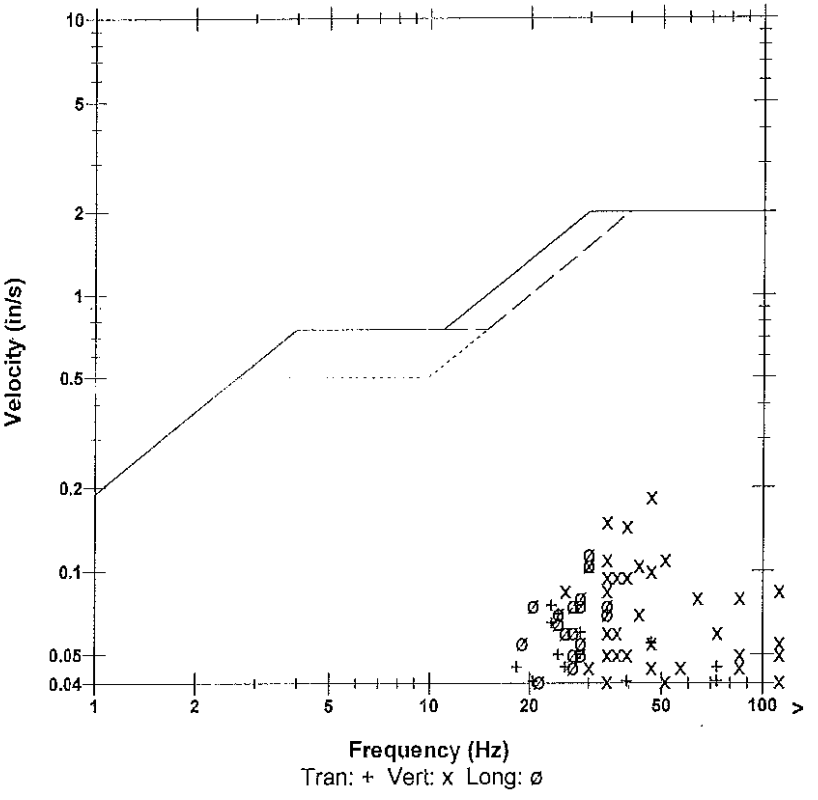
Extended Notes

Post Event Notes

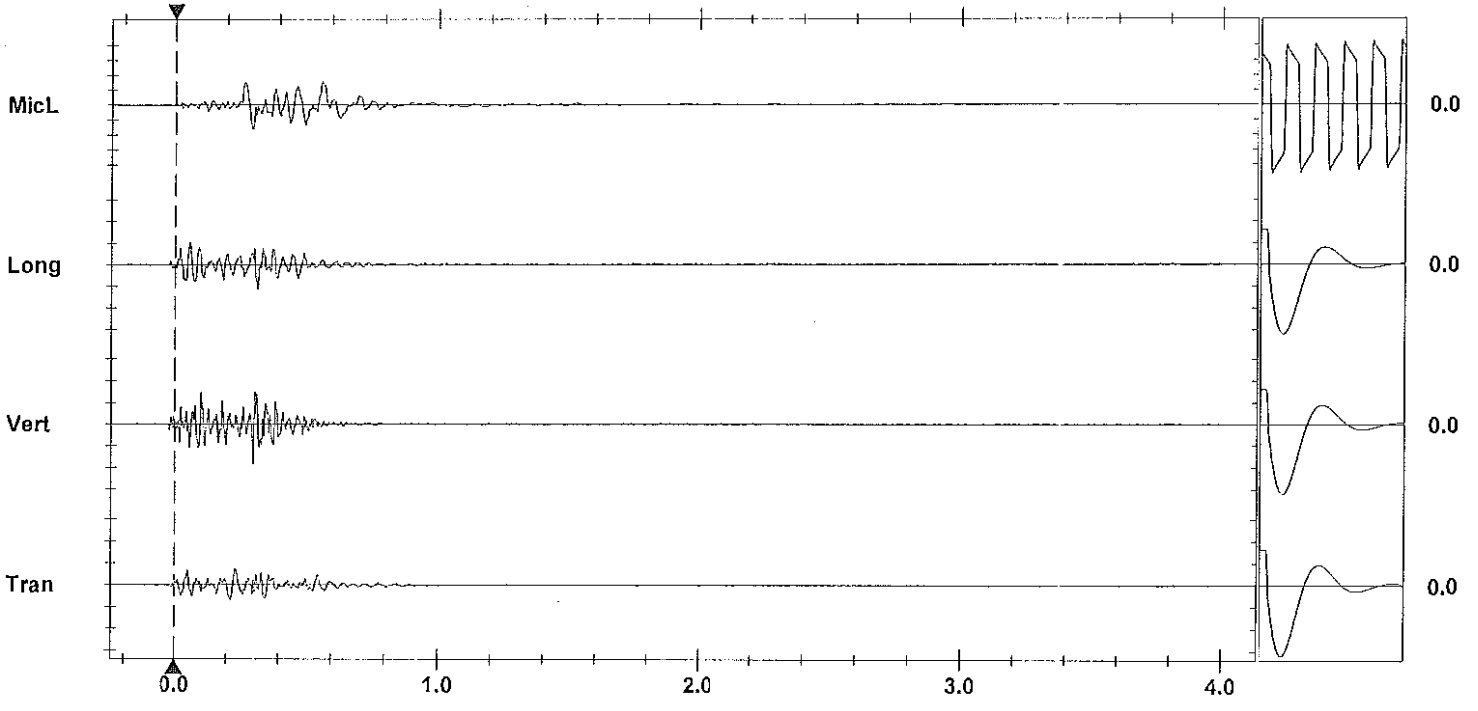
Microphone Linear Weighting
PSPL 0.00167 psi(L) at 0.562 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 495 mv)

	Tran	Vert	Long	
PPV	0.0750	0.185	0.115	in/s
ZC Freq	23	47	30	Hz
Time (Rel. to Trig)	0.234	0.304	0.318	sec
Peak Acceleration	0.0663	0.225	0.106	g
Peak Displacement	0.00049	0.00069	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.4	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.193 in/s at 0.304 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:00:15 April 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E93G.8F0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

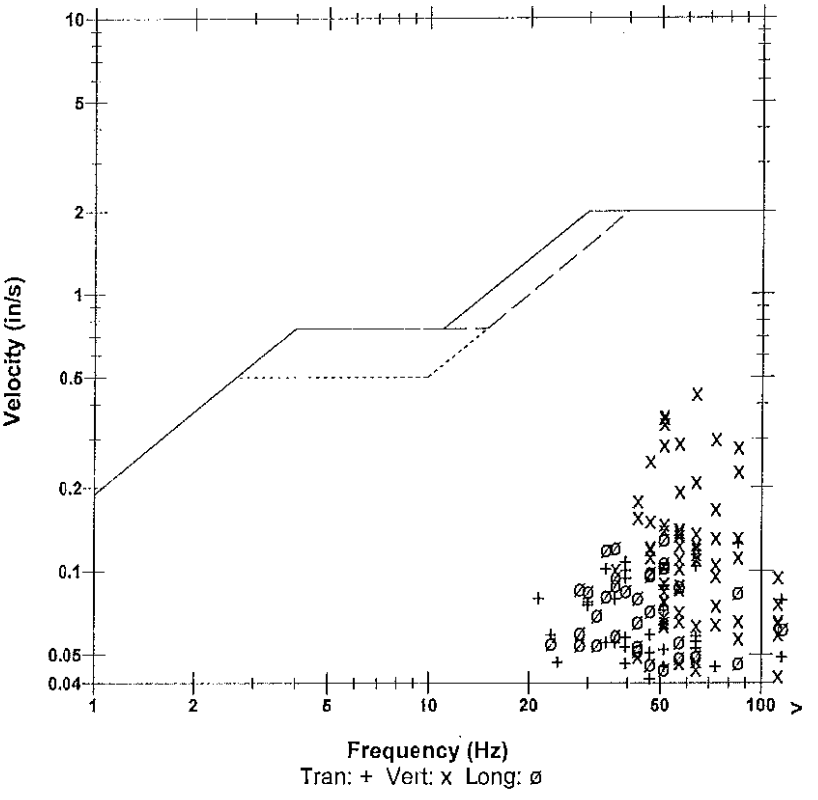
Post Event Notes

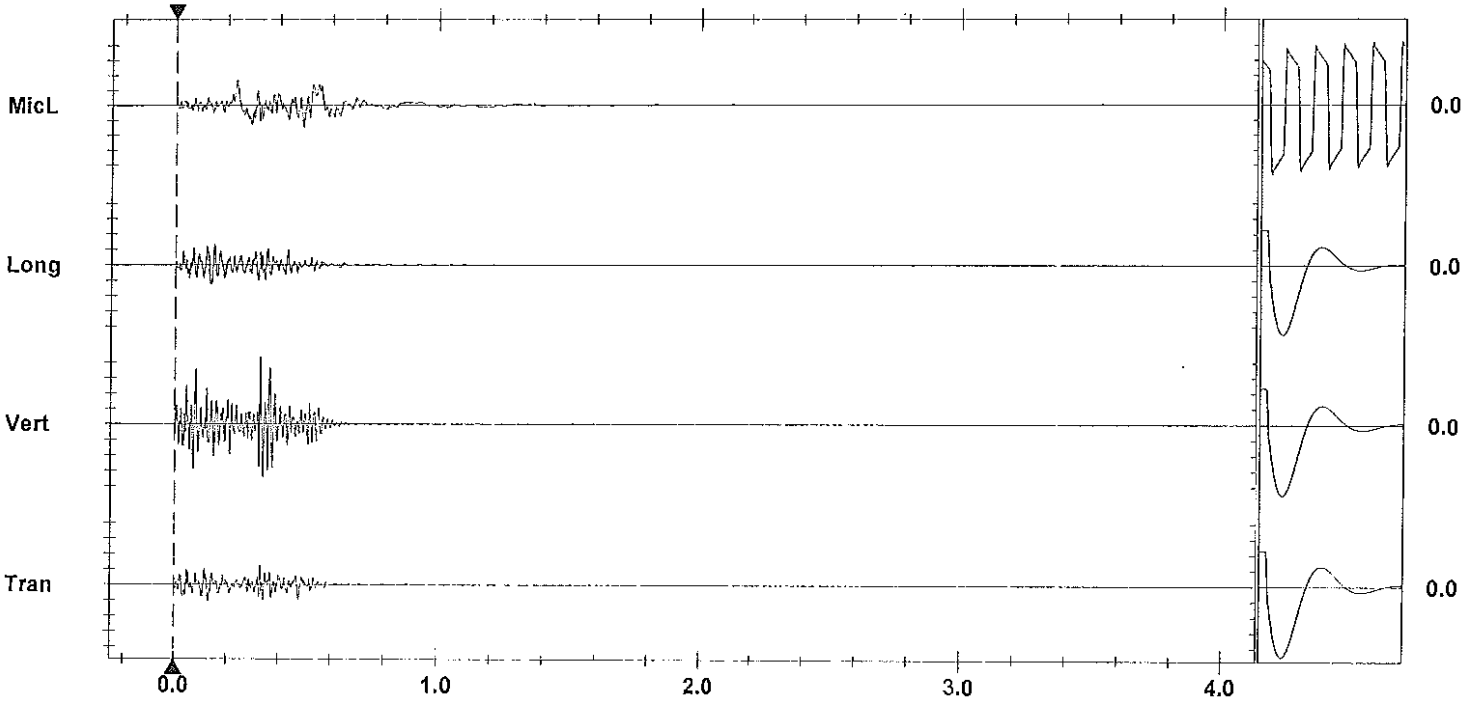
Microphone Linear Weighting
PSPL 0.00167 psi(L) at 0.231 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 568 mv)

	Tran	Vert	Long	
PPV	0.126	0.436	0.130	in/s
ZC Freq	85	64	51	Hz
Time (Rel. to Trig)	0.333	0.330	0.149	sec
Peak Acceleration	0.189	0.539	0.128	g
Peak Displacement	0.00044	0.00116	0.00061	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.436 in/s at 0.330 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED Apr 24/12
ACTUAL BLAST DATE Apr 24/12 10:58 AM
BLAST # MW-0191

HIGHWAY# 97
BLAST LOCATION AT: 129+12 – 129+17 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
+ shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 76/11 / 3 buffer / 3 stab.
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

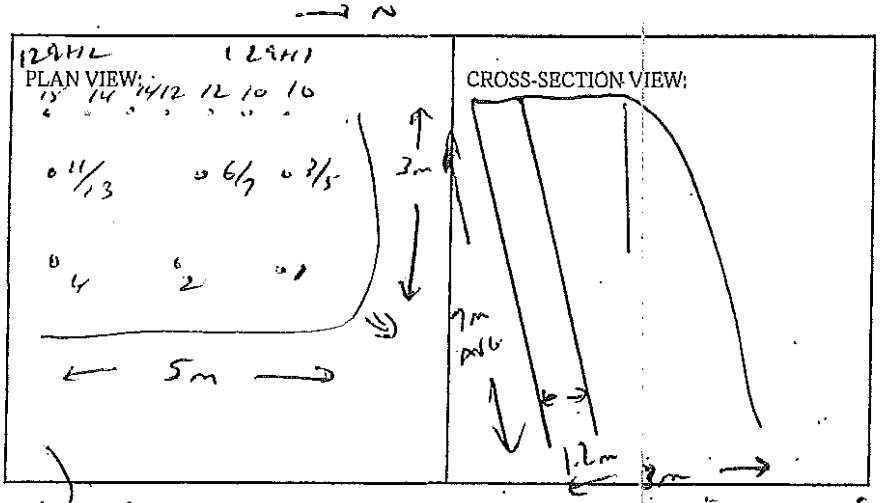
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE Hasco CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut – 0.1065 ips) 34 Hz
" @ 13117 Cliffstone Cut – 0.14 ips) 5 Hz

STAB HOLES - 1.5' - 2' APART/HOLE

BUFFER HOLES - BOTTOM DECKS - 4-5 CART 2"x16" BLASTEX
- TOP DECKS - 3-4 CART 2"x16" BLASTEX

& ALL PRIMED W/ 1 CART 1"x8" DYNAMITE

B/K HOLES - 1 CART 2"x16" DYNAMITE + 200 gr. det. cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 10:58:44 April 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E952.HW0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

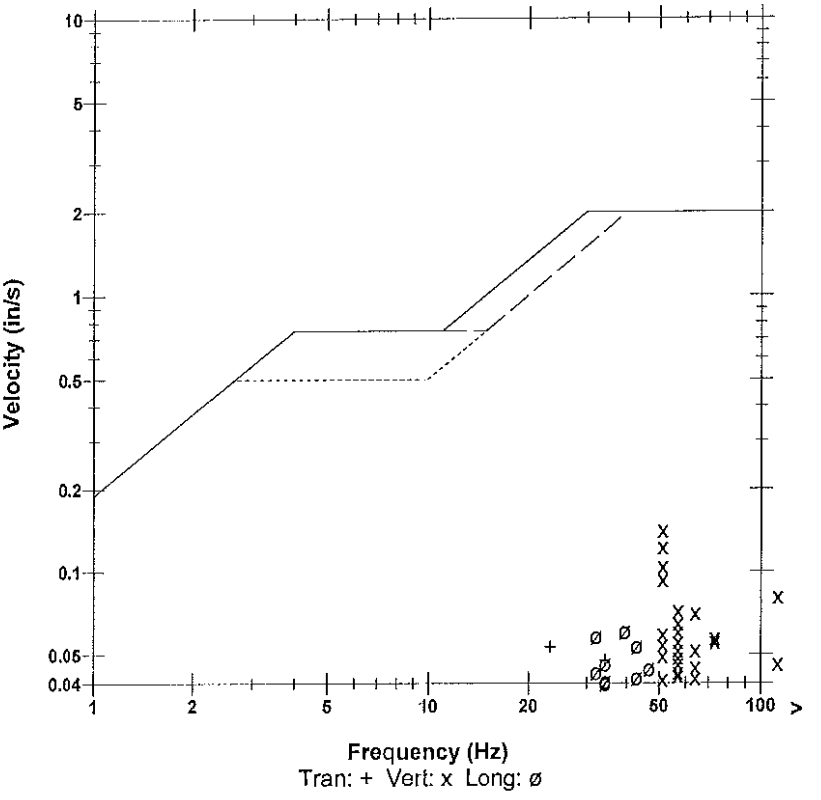
Post Event Notes

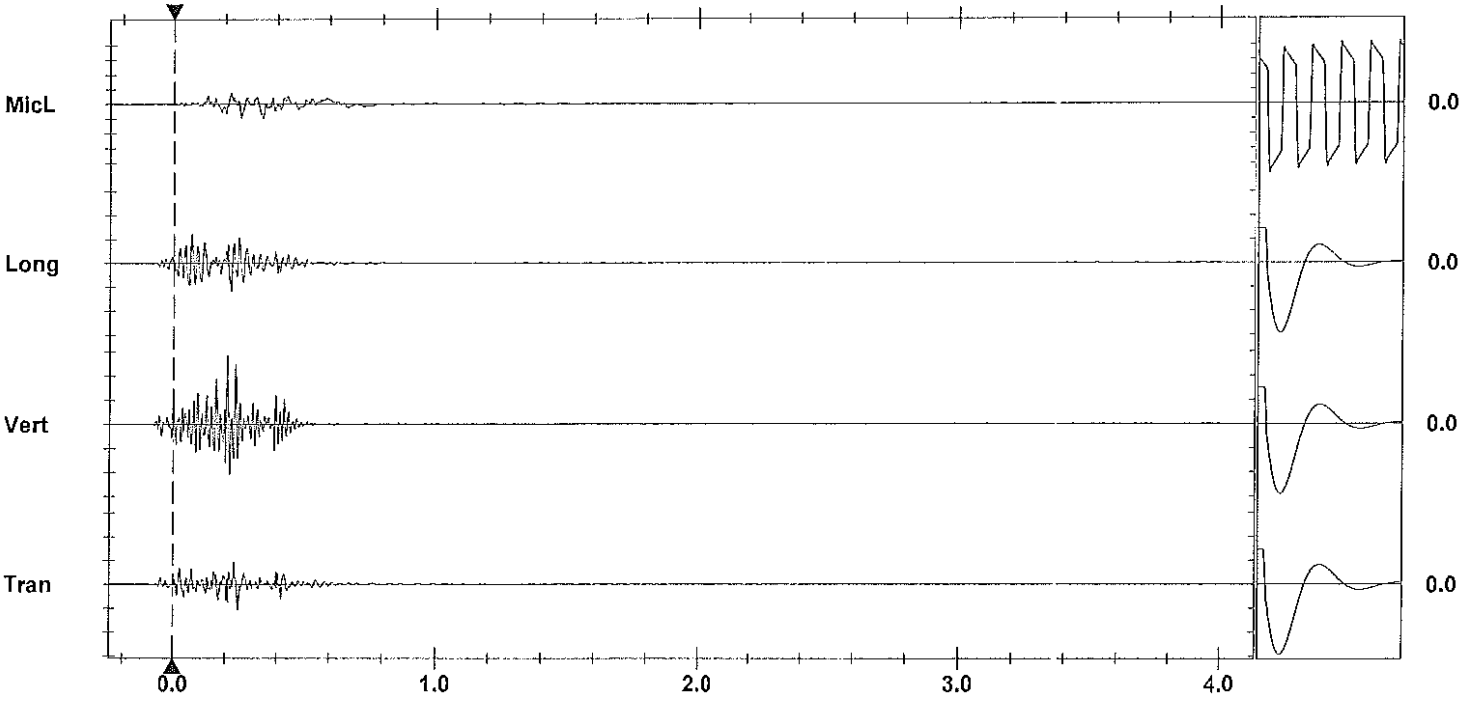
Microphone Linear Weighting
PSPL 0.00094 psi(L) at 0.259 sec
ZC Freq 27 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 573 mv)

	Tran	Vert	Long	
PPV	0.0531	0.141	0.0606	in/s
ZC Freq	23	51	39	Hz
Time (Rel. to Trig)	0.253	0.208	0.070	sec
Peak Acceleration	0.0713	0.141	0.0729	g
Peak Displacement	0.00023	0.00039	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.142 in/s at 0.208 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 10:58:33 April 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E952.HL0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

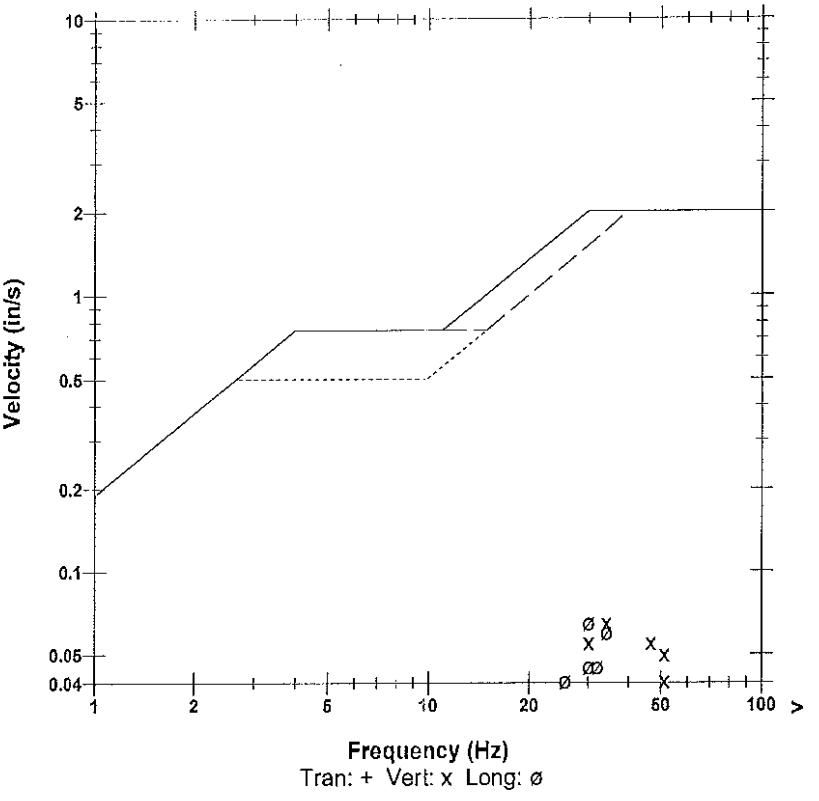
Extended Notes

Post Event Notes

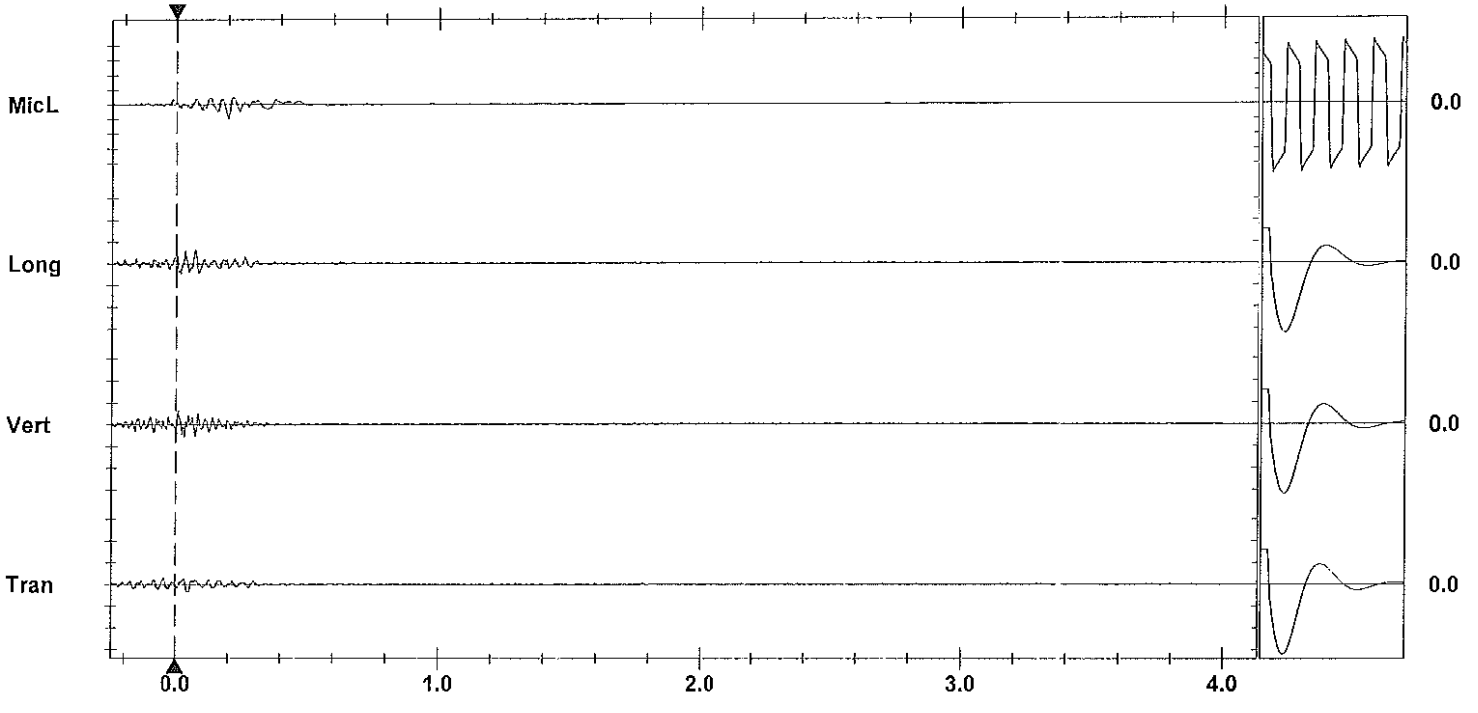
Microphone Linear Weighting
PSPL 0.00098 psi(L) at 0.197 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 568 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0650	0.0650	in/s
ZC Freq	27	34	30	Hz
Time (Rel. to Trig)	0.047	0.009	0.073	sec
Peak Acceleration	0.0398	0.0795	0.0530	g
Peak Displacement	0.00024	0.00026	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0838 in/s at 0.075 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 582709

DATE PREPARED APR 24/12
ACTUAL BLAST DATE APR 24/12 1:50PM
BLAST # MW2-0102

HIGHWAY# 97
BLAST LOCATION AT: 129+09 - 129+12 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 36/1/2 buffer/2 stab/10 proud
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMEL 60 + ANFO
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

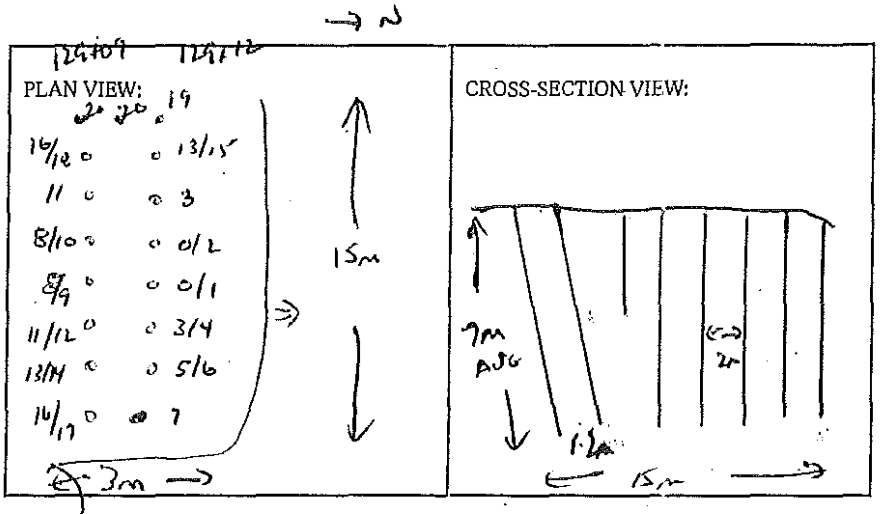
INITIATION DEVICE: (CIRCLE) ~~DET. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 850 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

seismograph @ 13167 cliffstone cut - 0.16 ips/87Hz
" @ 13117 cliffstone cut - 0.38 ips/57Hz

PRODUCTION Holes - BOTTOM DECKS - 5'-6' ANFO
- TOP DECKS - 3'-4' ANFO

STAB Holes - 1.5'-2' ANFO/Hole

BUFFER Holes - BOTTOM DECKS - 4-5 each 2"x16" BLASTEX
- TOP DECKS - 2-4 each 2"x16" BLASTEX

All Primed w/ 1 each 1"x8" DYNAMITE

B/L Holes - 1 each 2"x16" DYNAMITE + 200 gr. det. cord to 4' collar.

Instantel

Event Report

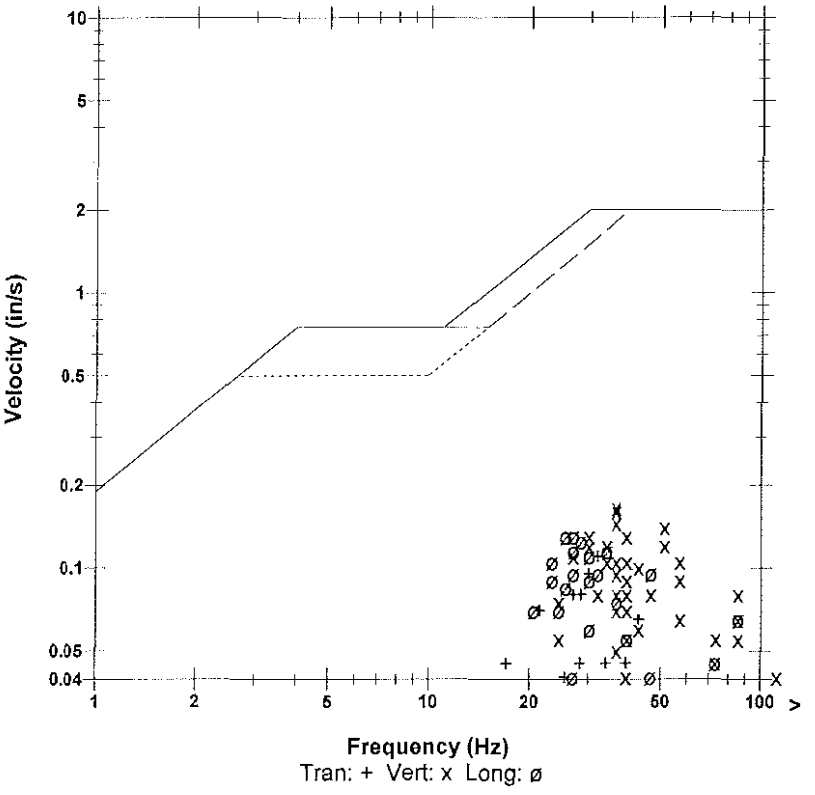
Date/Time	Vert at 13:50:38 April 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E95A.GE0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

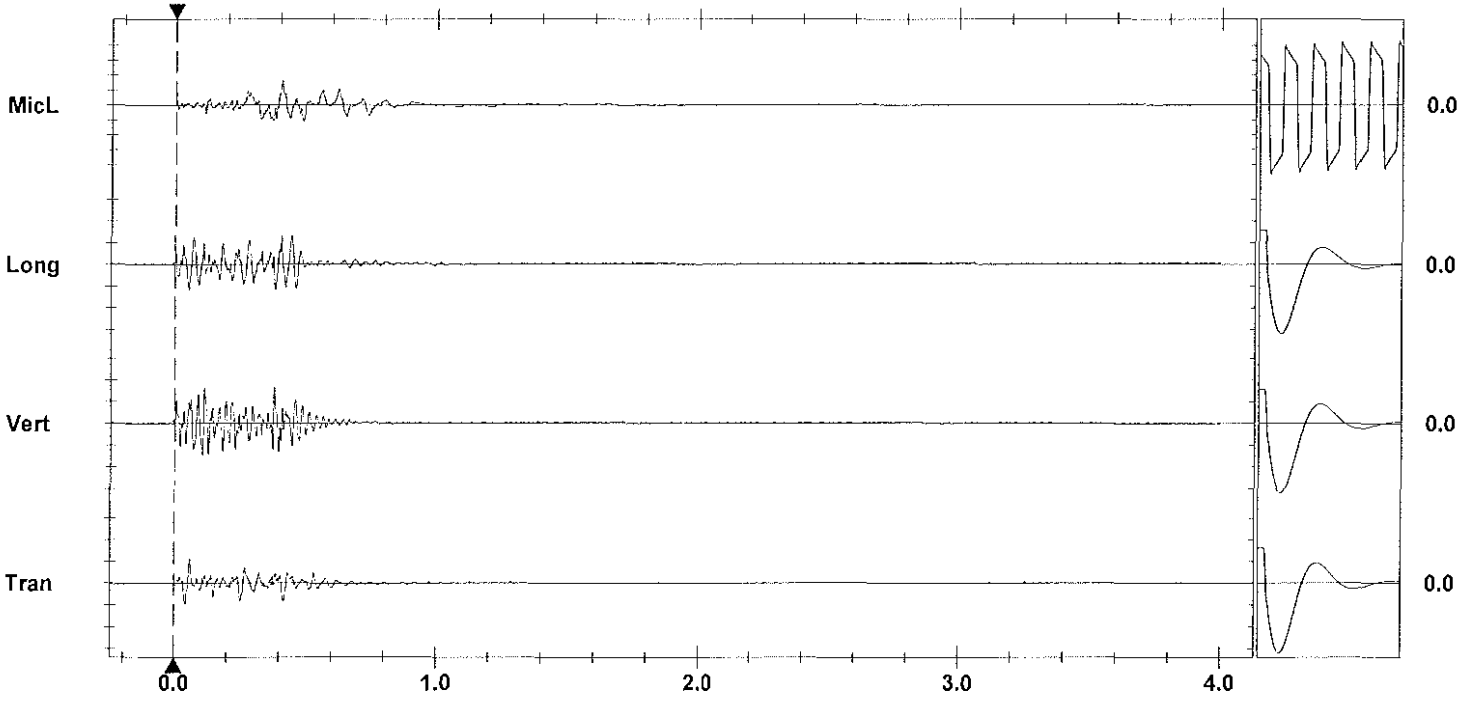
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.405 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.110	0.165	0.130	in/s
ZC Freq	32	37	27	Hz
Time (Rel. to Trig)	0.062	0.381	0.408	sec
Peak Acceleration	0.0663	0.199	0.106	g
Peak Displacement	0.00050	0.00068	0.00077	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.184 in/s at 0.382 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: April 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 13:50:49 April 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E95A.GP0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

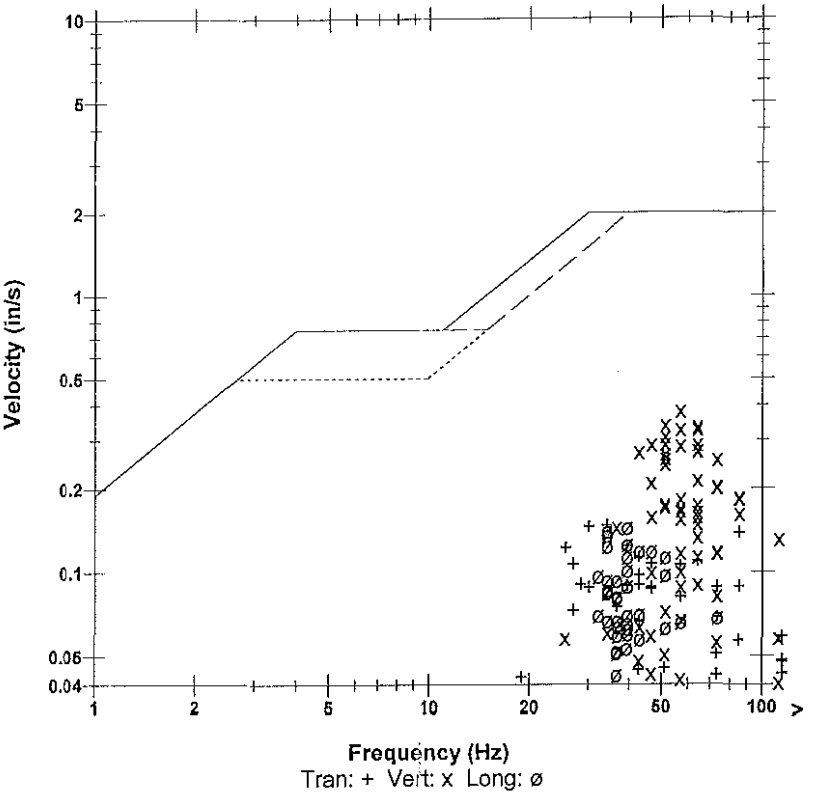
Post Event Notes

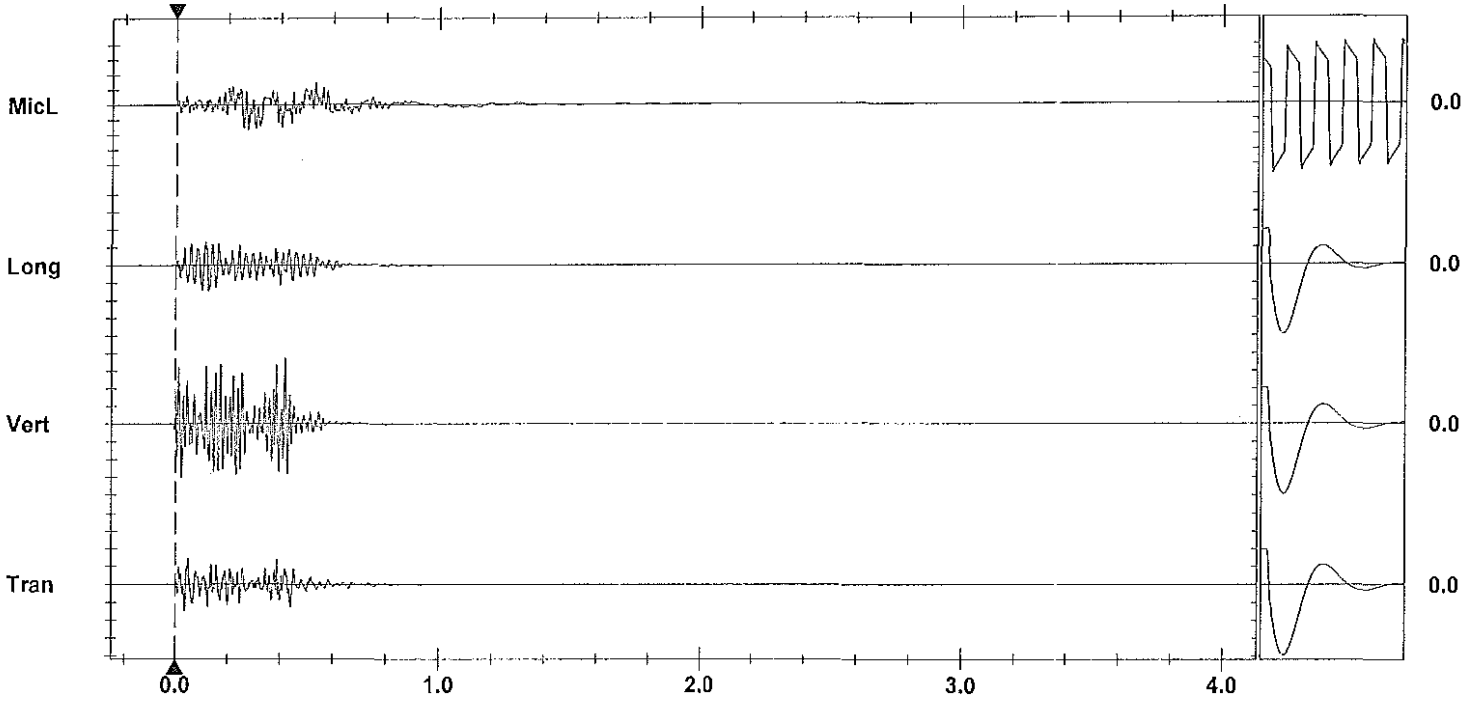
Microphone Linear Weighting
PSPL 0.00167 psi(L) at 0.274 sec
ZC Freq 24 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	0.147	0.381	0.144	in/s
ZC Freq	34	57	39	Hz
Time (Rel. to Trig)	0.050	0.420	0.127	sec
Peak Acceleration	0.229	0.360	0.192	g
Peak Displacement	0.00063	0.00108	0.00063	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.390 in/s at 0.420 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834897

DATE PREPARED Apr 25/12
ACTUAL BLAST DATE Apr 25/12 11:39 am
BLAST # MW-0182

HIGHWAY# 97
BLAST LOCATION AT: STN 129+08 - 129+12

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: + shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered conglom
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.4 (m)
TOTAL DEPTH 87.5 (m)

TOTAL NUMBER OF HOLES 12 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Blaster
TOTAL NUMBER OF CARTRIDGES 90
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

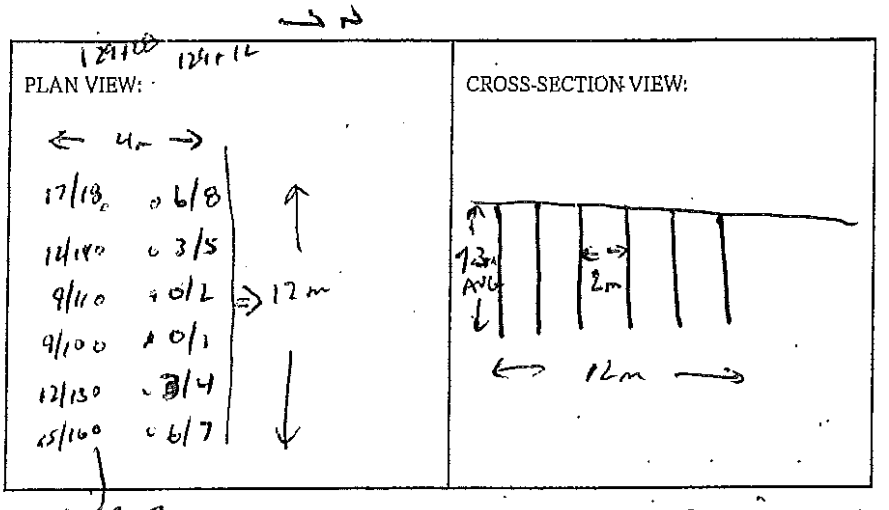
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 330 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Chipstone Crk. 0.14 ips / 27 Hz
" @ 13117 Chipstone Crk - 0.28 ips / 57 Hz

ALL holes Very Wet

Bottom Deck - max 6 cartridges 2x16 Blastex

Top Deck - max 3 cartridges 2x16 Blastex

5'-7' stemming Deck Between Explosive Decks

Bore Decks Primed w/ 1x8 Unimax.

Instantel

Event Report

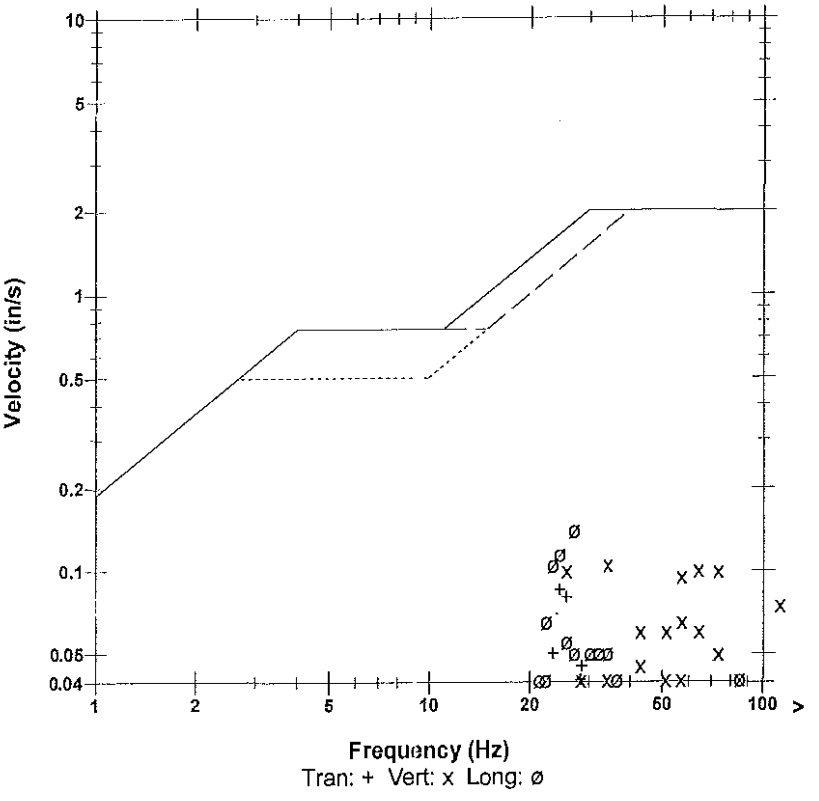
Date/Time	Vert at 11:39:48 April 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E96Z.2C0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

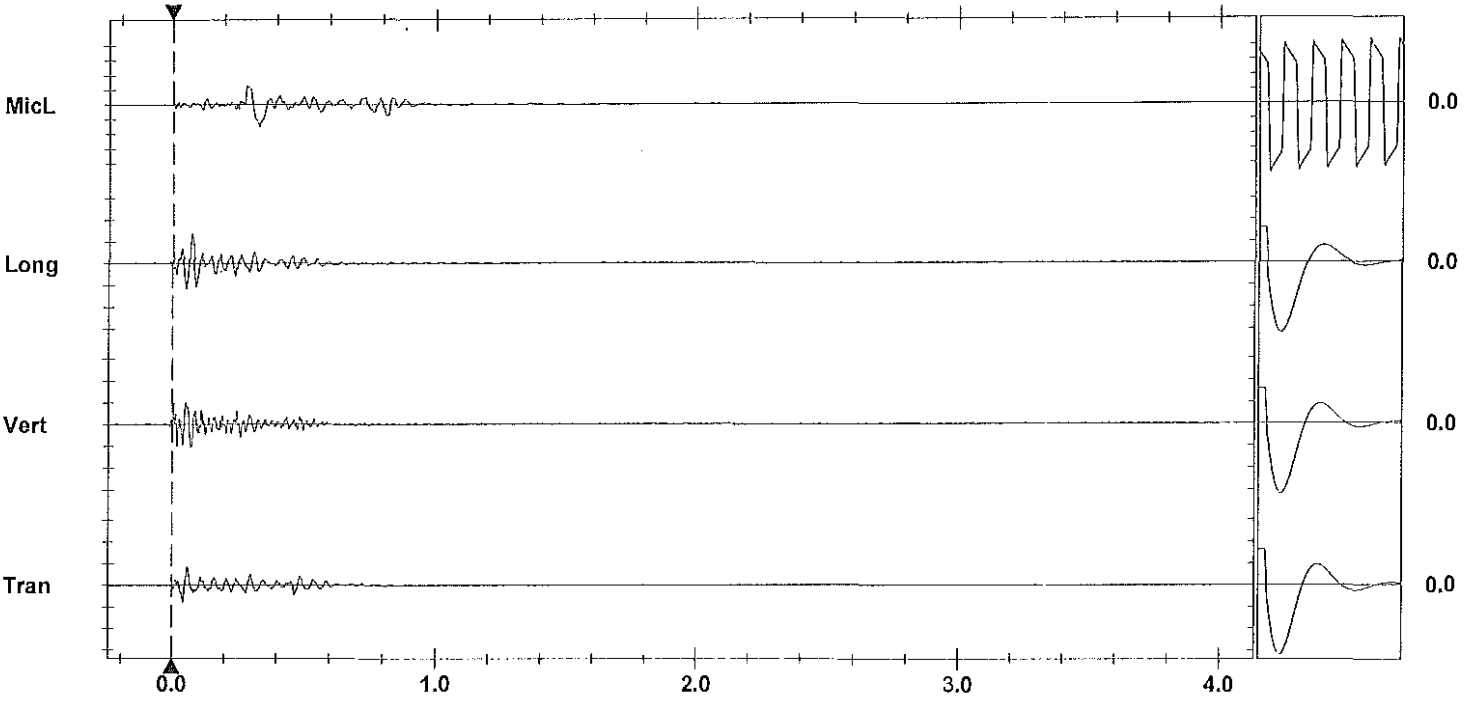
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.330 sec
ZC Freq 9.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	0.0850	0.105	0.140	in/s
ZC Freq	24	34	27	Hz
Time (Rel. to Trig)	0.061	0.073	0.074	sec
Peak Acceleration	0.0398	0.133	0.0928	g
Peak Displacement	0.00049	0.00068	0.00084	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.175 in/s at 0.074 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:40:00 April 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E96Z.2O0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

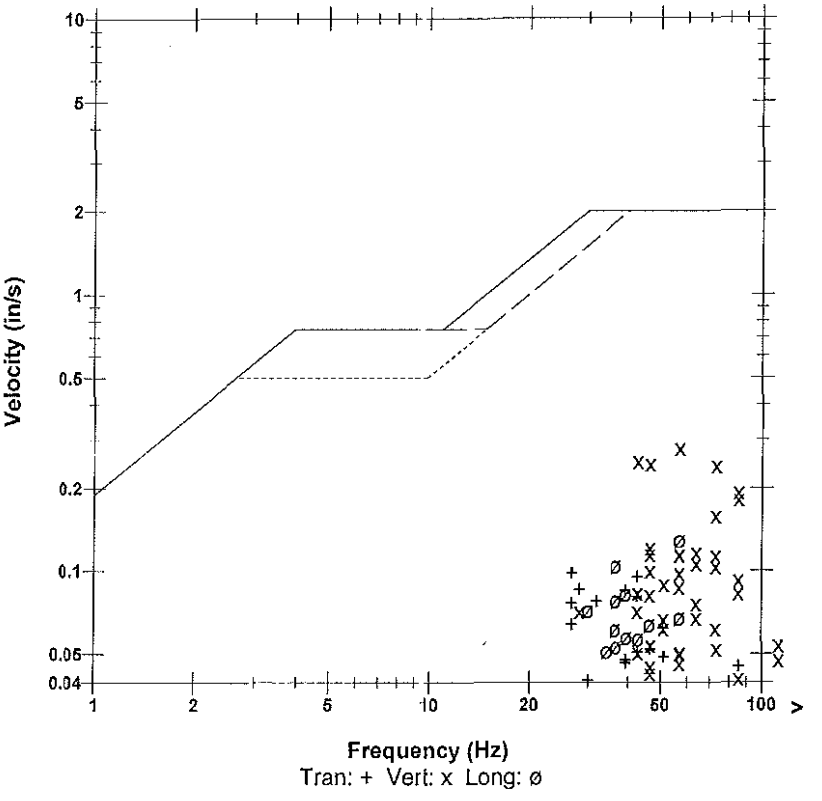
Post Event Notes

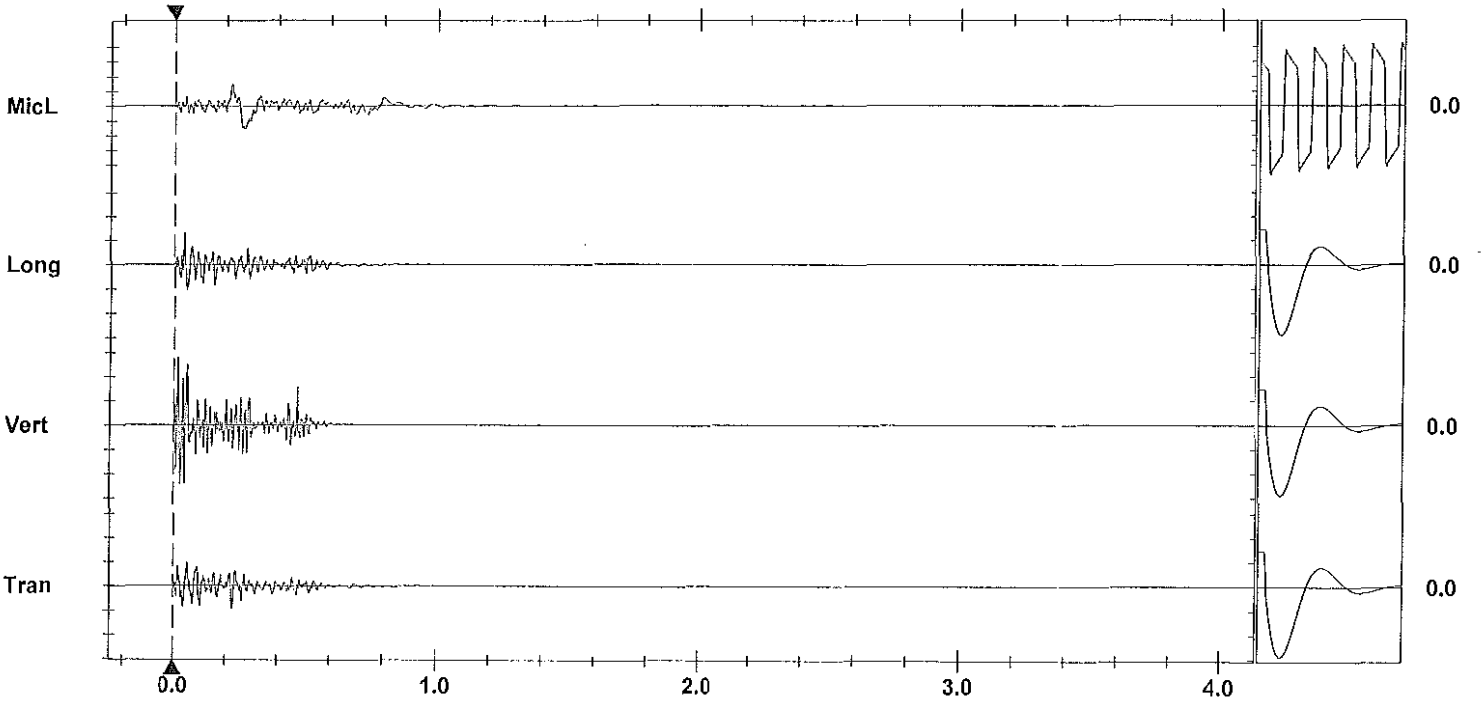
Microphone Linear Weighting
PSPL 0.00156 psi(L) at 0.268 sec
ZC Freq 7.9 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 591 mv)

	Tran	Vert	Long	
PPV	0.0981	0.279	0.129	in/s
ZC Freq	27	57	57	Hz
Time (Rel. to Trig)	0.054	0.016	0.039	sec
Peak Acceleration	0.108	0.317	0.129	g
Peak Displacement	0.00042	0.00090	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.2	7.5	7.6	Hz
Overswing Ratio	3.7	3.6	3.9	

Peak Vector Sum 0.282 in/s at 0.016 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Visenberg
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Apr 25/12
ACTUAL BLAST DATE Apr 25/12 1:14 PM
BLAST # MW-0183

HIGHWAY# 97
BLAST LOCATION AT: STN 129+68 - 129+72 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 56/1 / 300 After / 2 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 emer 2x16 Dynamite + 200gr. det cord in 61 holes

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite * 2x16" Blasdex
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 510 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

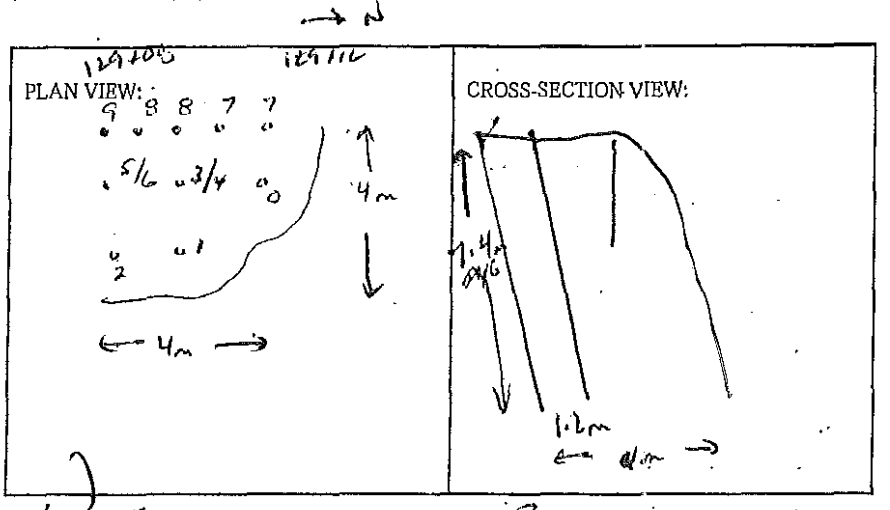
INITIATION DEVICE: (CIRCLE) RB. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 115 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffside cut - 0.065 ips / 57 Hz
" @ 13117 cliffside cut - 0.15 ips / 47 Hz

Buffer holes - wet

Bottom Rock - 3-5 cartridges 2x16 Blastex

Top Rock - 1-2 cartridges 2x16 Blastex

Boot Rock Primed w/ 1x8 Unimax

Smash holes - 1-2 each 2x16 Blastex

B/I holes - 1 each 2x16 Unimax + 200 gr. det cord to 4' collar.

Instantel

Event Report

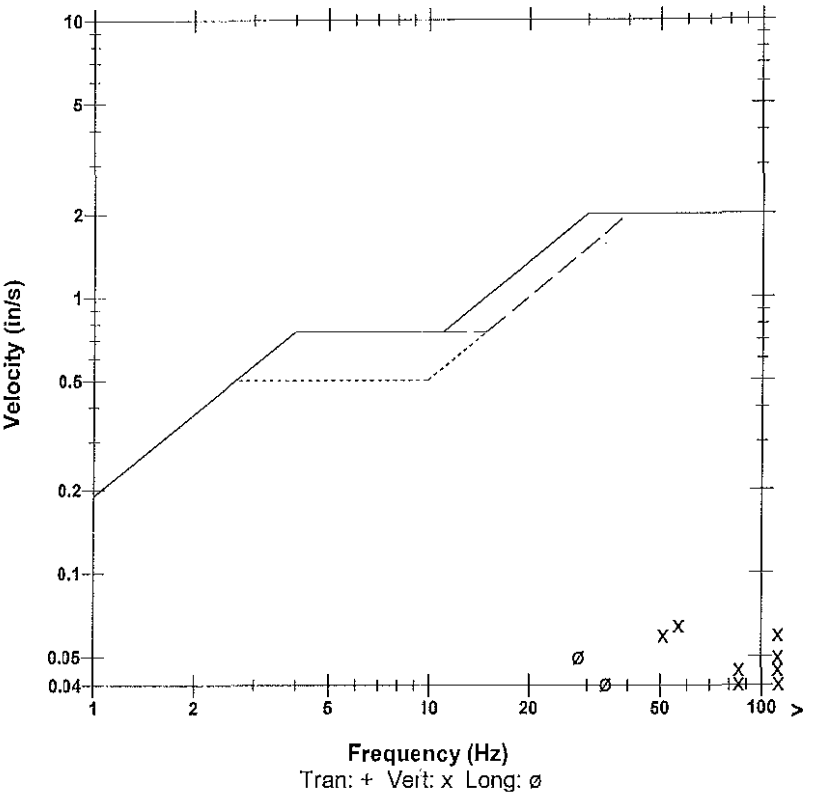
Date/Time	Vert at 13:14:32 April 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E973.G80

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

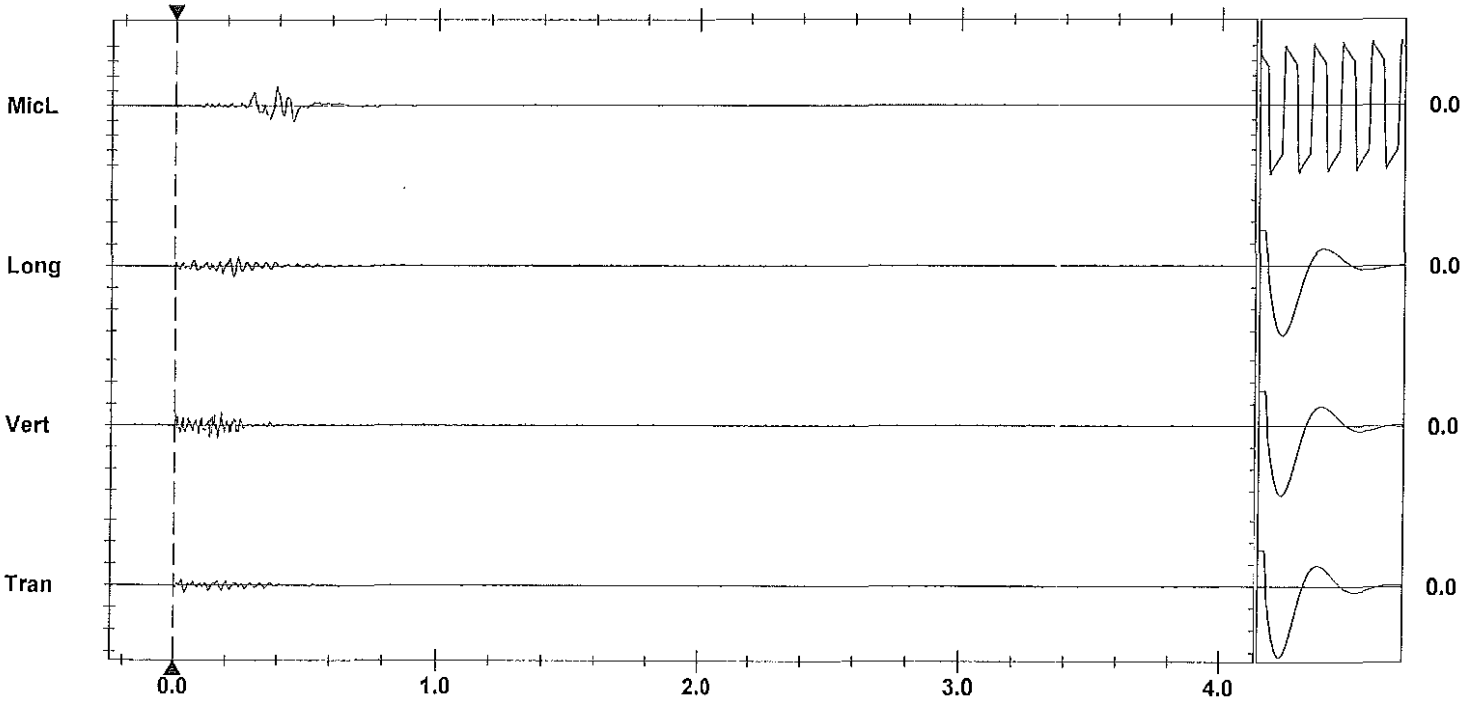
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.391 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 544 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0650	0.0500	in/s
ZC Freq	32	57	28	Hz
Time (Rel. to Trig)	0.041	0.180	0.225	sec
Peak Acceleration	0.0265	0.106	0.0398	g
Peak Displacement	0.00017	0.00017	0.00028	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0723 in/s at 0.180 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger =

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Instantel

Event Report

Date/Time	Vert at 13:14:44 April 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E973.GK0
Job Number:	1		

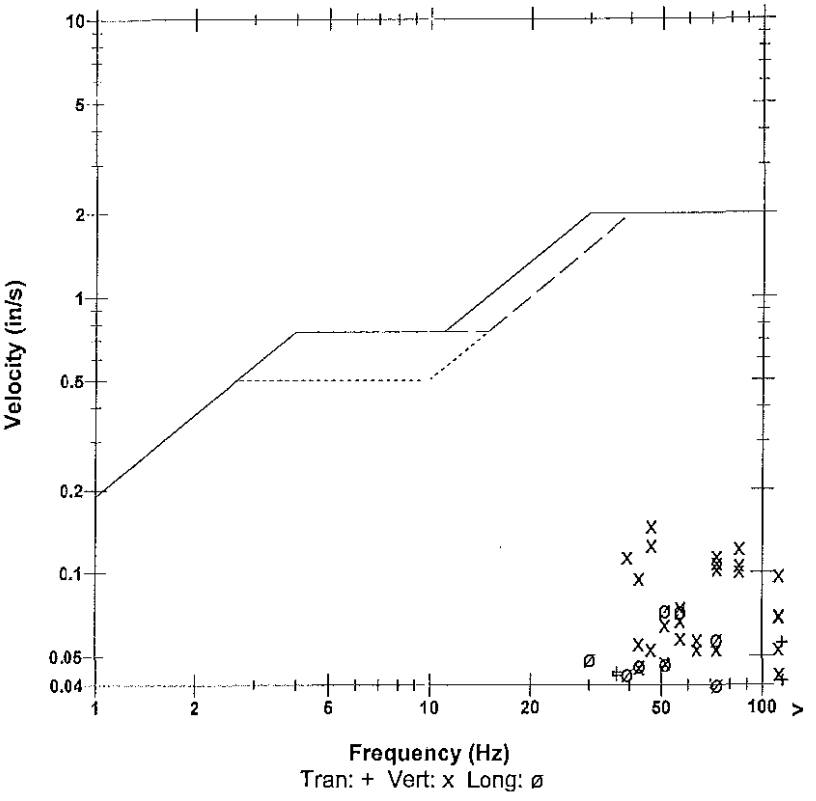
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

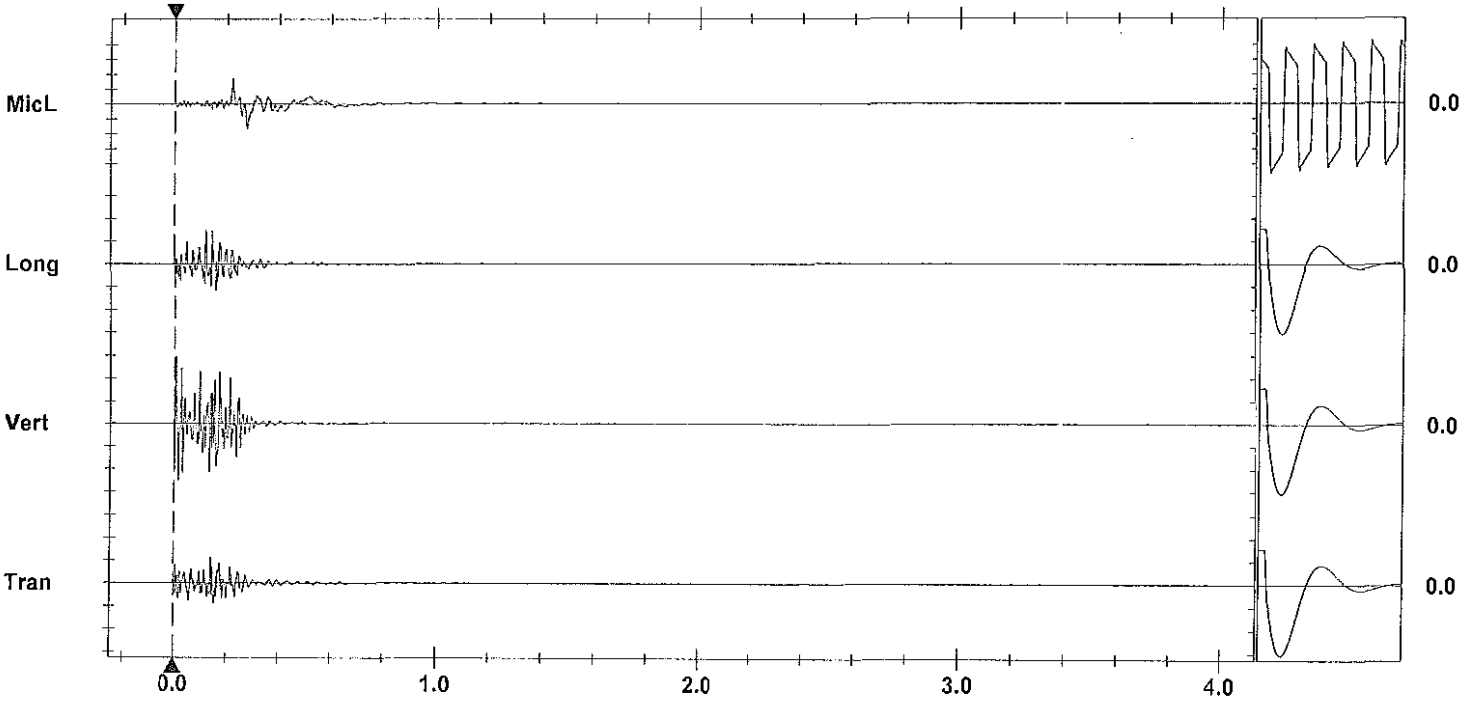
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.221 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.0556	0.148	0.0731	in/s
ZC Freq	>100	47	51	Hz
Time (Rel. to Trig)	0.144	0.007	0.146	sec
Peak Acceleration	0.0829	0.210	0.106	g
Peak Displacement	0.00017	0.00036	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.150 in/s at 0.007 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B24189

DATE PREPARED Apr 26/12
ACTUAL BLAST DATE Apr 26/12 11:18 PM
BLAST # MW-0184

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+04 - 129+08

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slight matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.4 (m)
TOTAL DEPTH 79 (m)

TOTAL NUMBER OF HOLES 11 Prod.
HOLE DIAMETER 7 1/2 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 2x16" Blasdex
TOTAL NUMBER OF CARTRIDGES 70
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

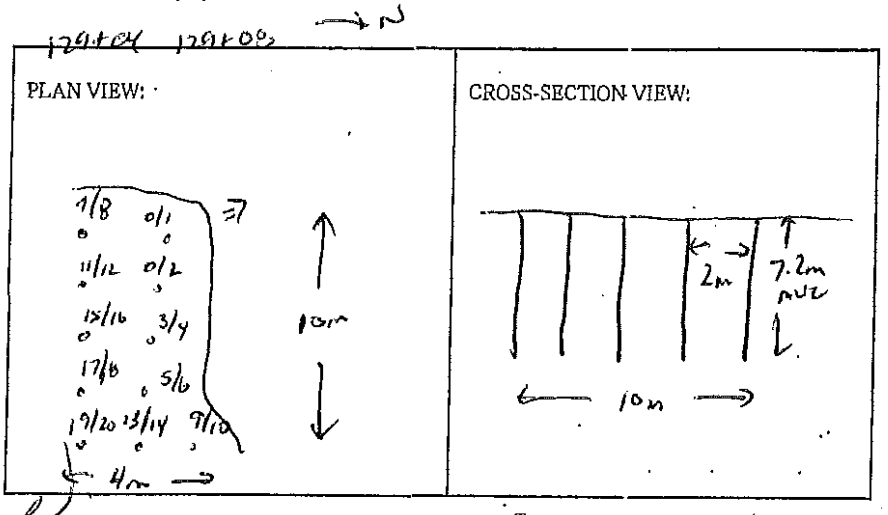
INITIATION DEVICE: (CIRCLE) P.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone crt. 0.16 ips/ 28 Hz
" @ 13117 Cliffstone crt. 0.34 ips/ 43 Hz

Bottom Decks Primed w/ 1 Coat 1x6 Universal

+ 3-5 Coat. 2x16 Blastex

Top Decks Primed w/ 1 Coat 1x8 Universal

+ 1-2 Coat 2x16 Blastex

All Holes Nail*

Instantel

Event Report

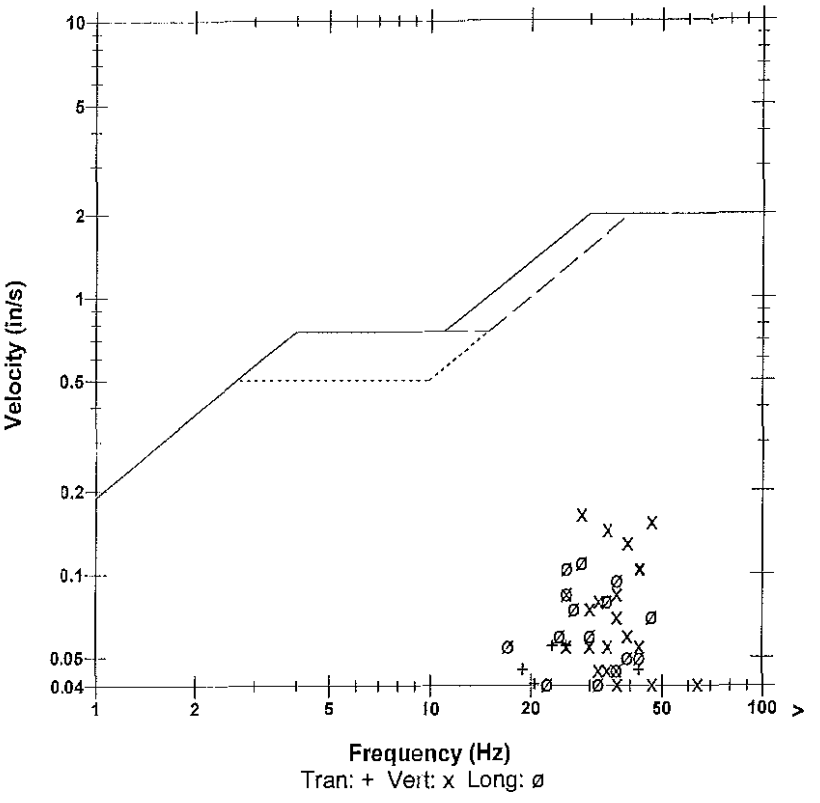
Date/Time	Vert at 11:18:08 April 26, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E98S.Q80

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

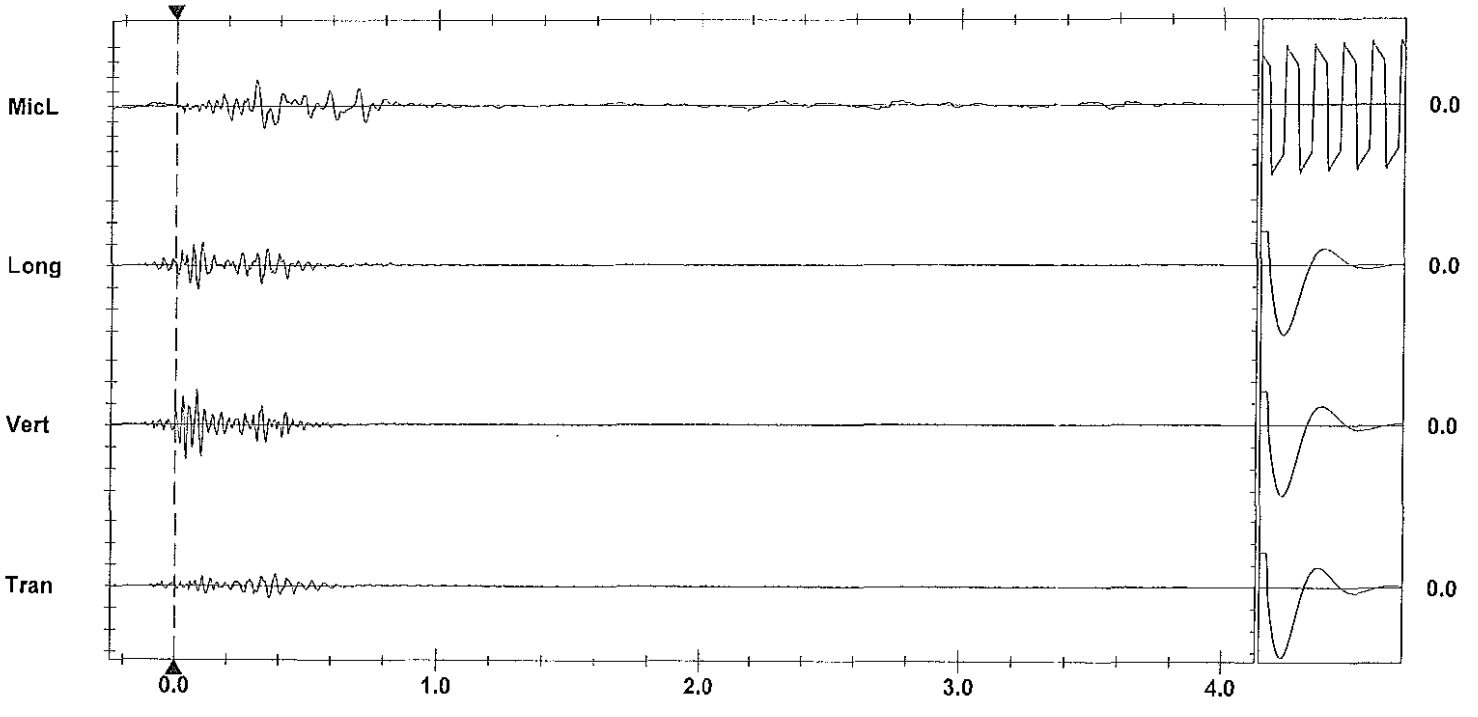
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.309 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 668 mv)

	Tran	Vert	Long	
PPV	0.0550	0.165	0.110	in/s
ZC Freq	26	28	28	Hz
Time (Rel. to Trig)	0.362	0.084	0.084	sec
Peak Acceleration	0.0265	0.133	0.0530	g
Peak Displacement	0.00036	0.00073	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.4	7.1	Hz
Overswing Ratio	3.5	3.7	4.4	

Peak Vector Sum 0.199 in/s at 0.084 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:18:21 April 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E98S.QL0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

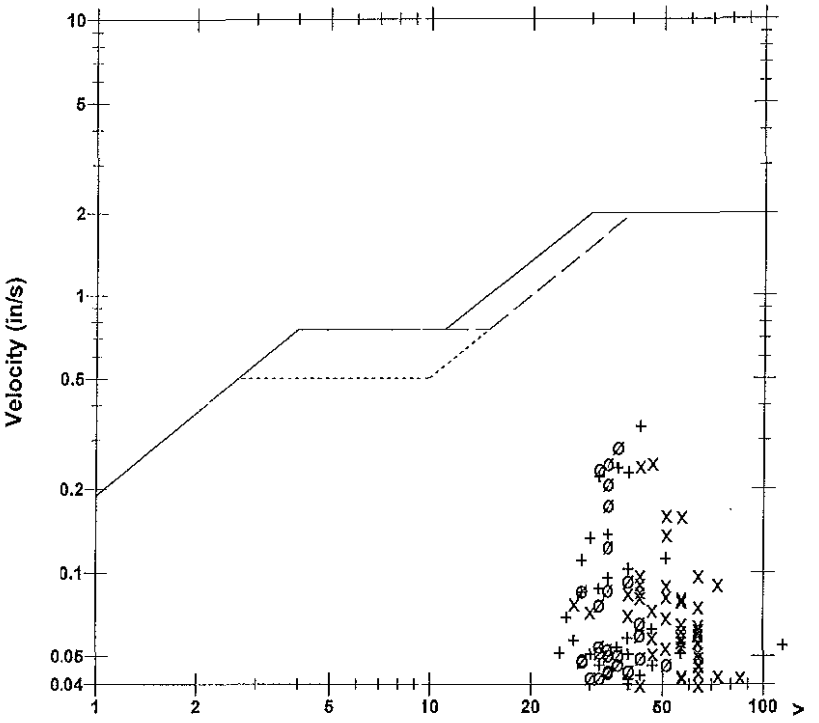
Post Event Notes

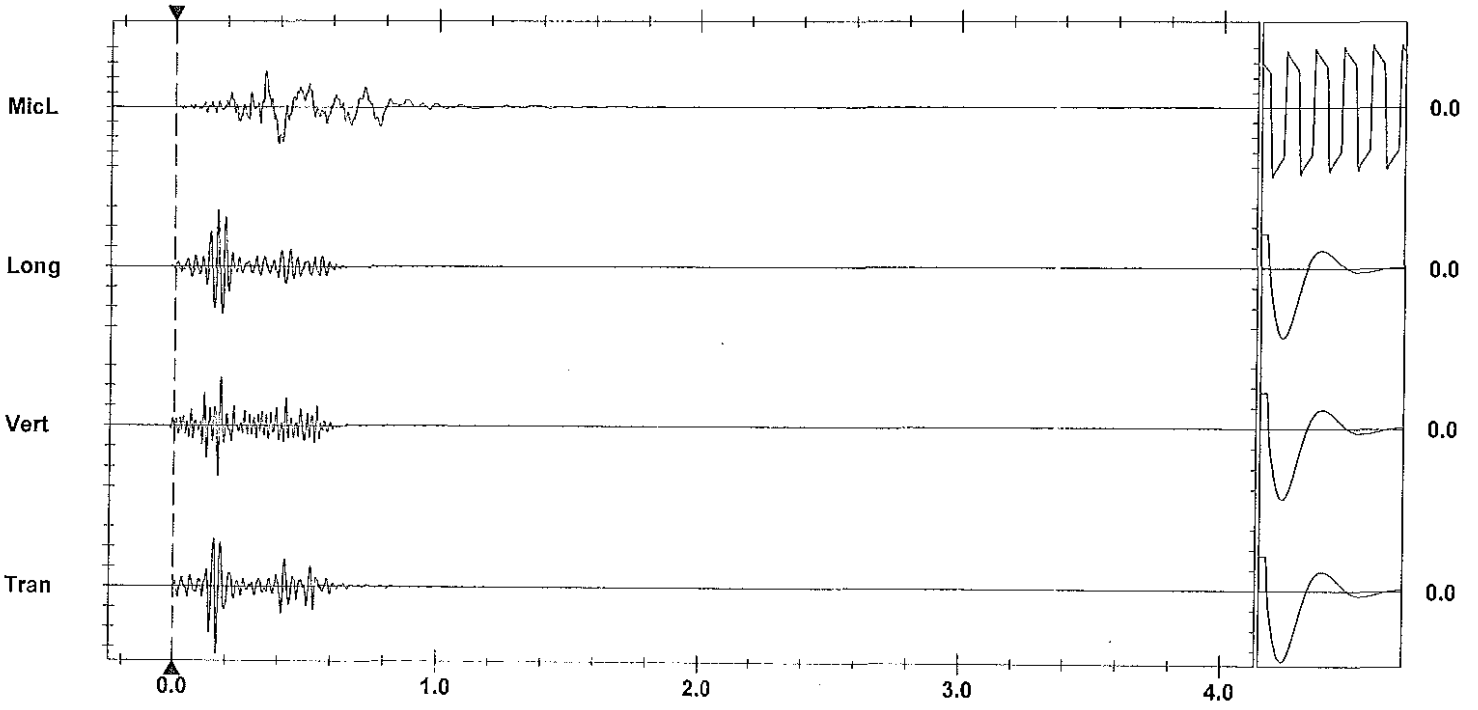
Microphone Linear Weighting
PSPL 0.00247 psi(L) at 0.394 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 632 mv)

	Tran	Vert	Long	
PPV	0.336	0.249	0.283	in/s
ZC Freq	43	47	37	Hz
Time (Rel. to Trig)	0.166	0.168	0.165	sec
Peak Acceleration	0.230	0.217	0.171	g
Peak Displacement	0.00122	0.00084	0.00124	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.484 in/s at 0.166 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Apr 27/12
ACTUAL BLAST DATE Apr 27/12 11:56am
BLAST # MW-0185

HIGHWAY# 97
BLAST LOCATION AT: 129+04 - 129+08 LS (no subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 46 11/36 toe/12 stab/9 B200
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 1x16" Blastex
TOTAL NUMBER OF CARTRIDGES ~~80~~
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT ~~80~~ (kg)
DELAY TYPE AND LENGTH 25 (ms)

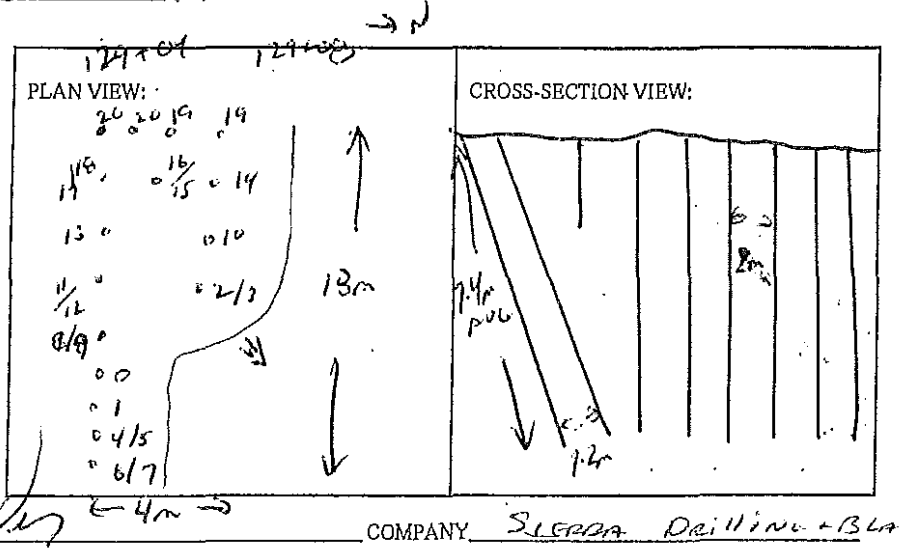
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. No Trigger (< 0.04 ips)
" @ 13117 Cliffstone Crt. 0.36 ips/47 Hz

Pinned w/ 1 LVL6 UNIMAX — Bottom Deck — 3-5 Cantilevers 2x16 @ 12" o.c.

Pinned w/ 1 1x8 UNIMAX — Top Deck — 1-3 Cantilevers 2x16 @ 12" o.c.

— B/1 — 1 row 2x16 Unimax + 2x8 rafter cont to 4' collar

Instantel

Event Report

Date/Time	Vert at 11:56:12 April 27, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9AP.5O0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

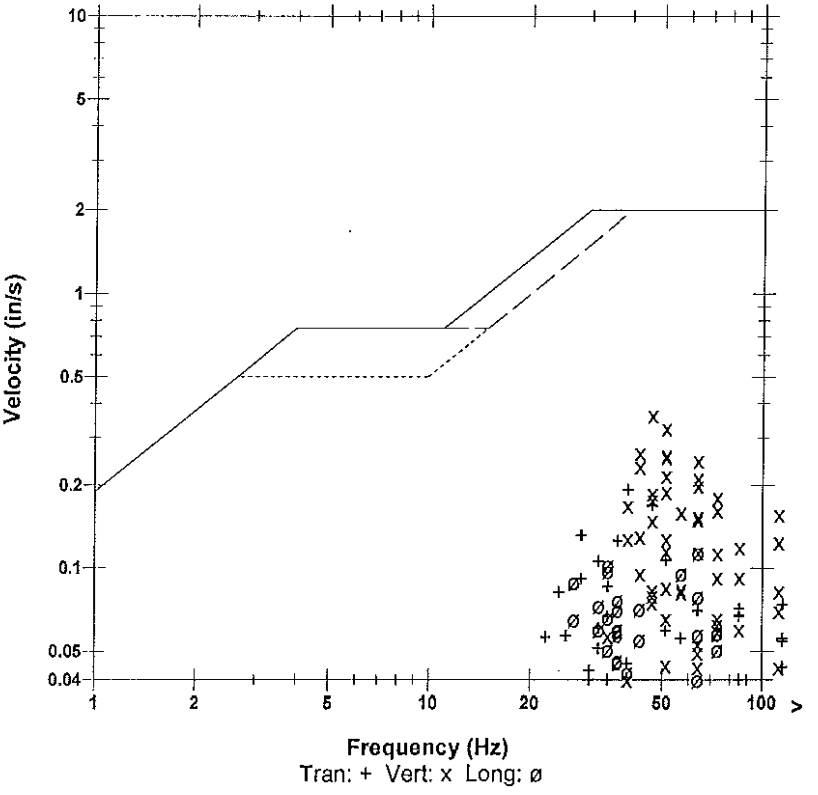
Post Event Notes

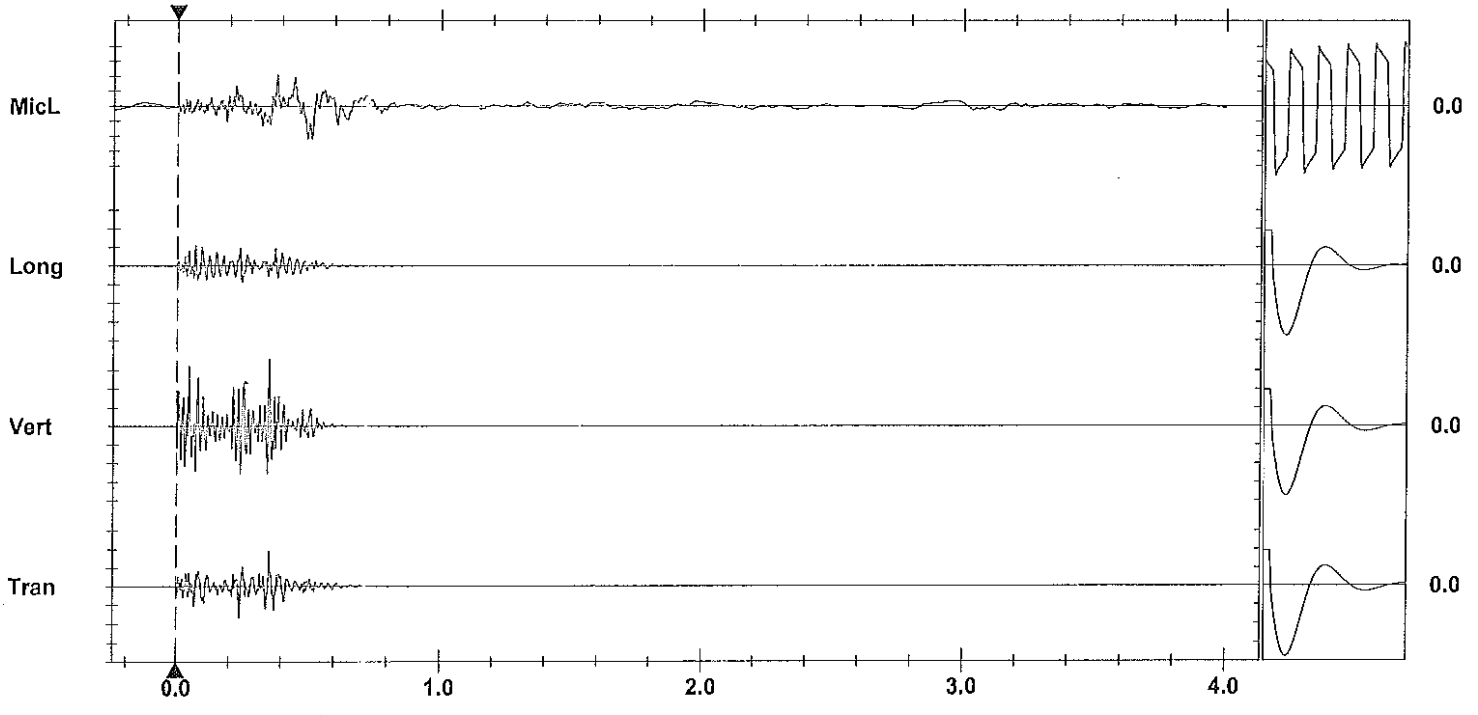
Microphone Linear Weighting
PSPL 0.00221 psi(L) at 0.494 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.192	0.362	0.114	in/s
ZC Freq	39	47	64	Hz
Time (Rel. to Trig)	0.357	0.354	0.070	sec
Peak Acceleration	0.171	0.373	0.109	g
Peak Displacement	0.00060	0.00101	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.374 in/s at 0.354 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: April 29, 2012 (V 8.01 - 8.01)

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 1/12
ACTUAL BLAST DATE May 1/12 11:02AM
BLAST # MJ-0186

HIGHWAY# 97
BLAST LOCATION AT: STA 129+03 - 129+04 LS (to extend)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: + Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS: # 200 spin det cord in bll to 4' collar.

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.4 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 6bll / 35 offer / 2 stab / 4 Proo
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 28
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

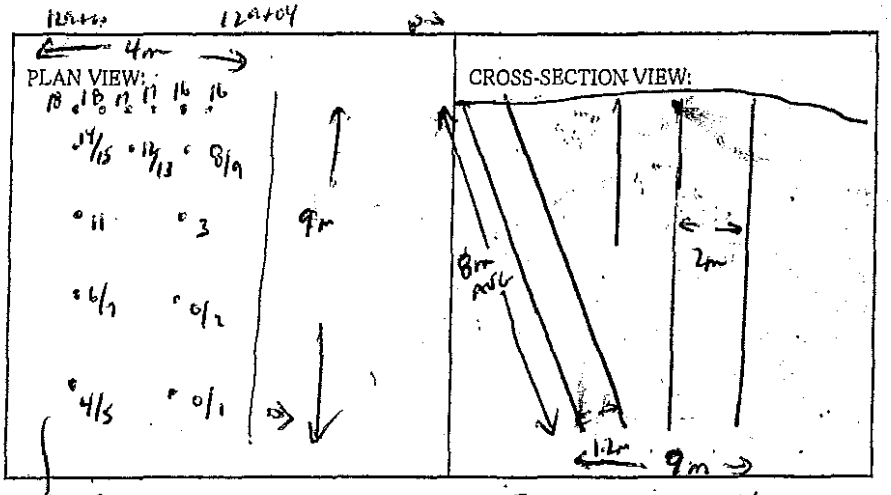
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 275 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

seismograph @ 13167 cliffstone cut - 0.12 ips/ 34 Hz
" @ 13117 cliffstone cut - 0.24 ips/ 47 Hz

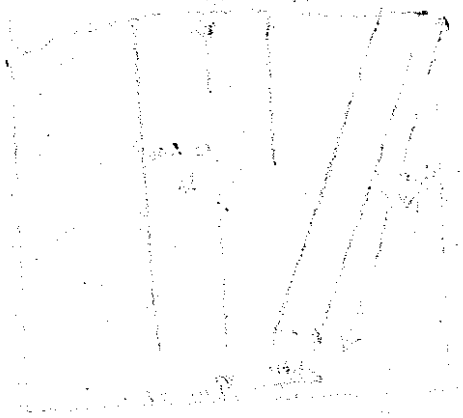
PROD — Bottom Rock - 5'-8' ANFO + 2"x16" Dynamite Primer

— Top Rock - 1'-4' ANFO - 1"x8" Dynamite Primer

Bill 2 cartridges 2"x16" Dynamite + 2oz ANFO down to 4' below

Buffer — Bottom Rock - 3-4 cartridges 1"x16" Blasted + 2"x16" Dynamite Primer

— Top Rock - 1-2 cartridges 2"x16" Blasted + 1"x8" Dynamite Primer



Instantel

Event Report

Date/Time	Vert at 11:02:17 May 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9I1.BT0
Job Number:	1		

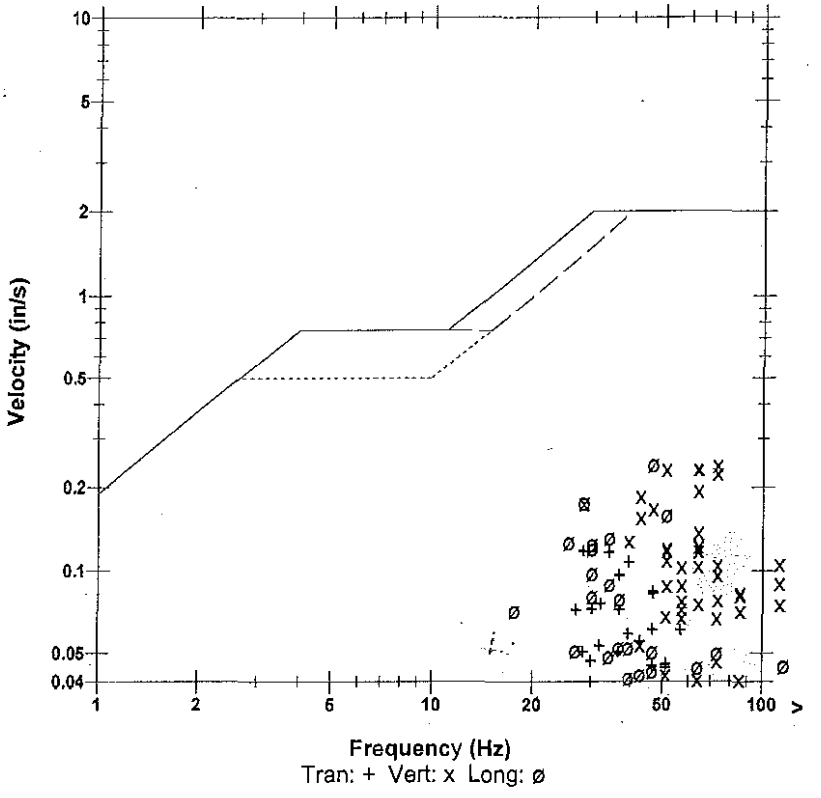
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

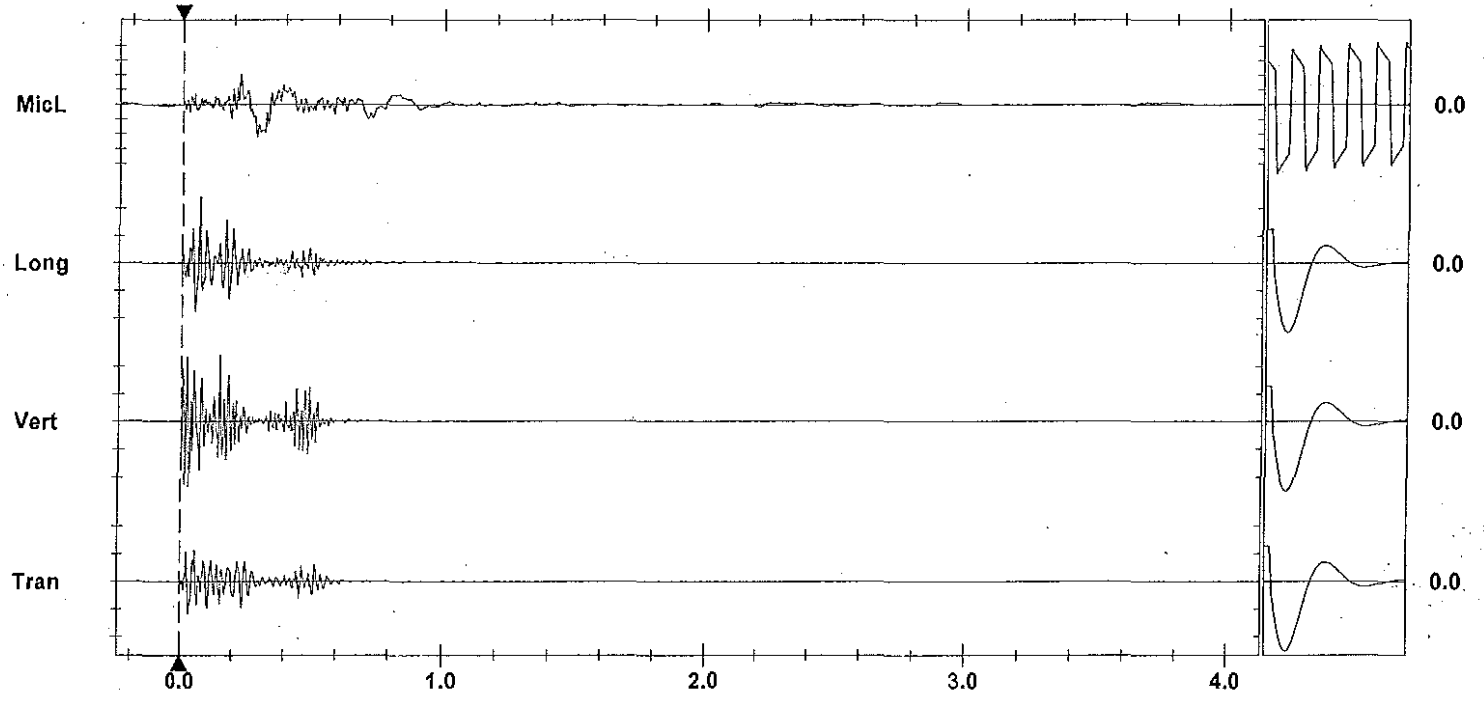
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00221 psi(L) at 0.287 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 629 mv)

	Tran	Vert	Long	
PPV	0.118	0.239	0.241	in/s
ZC Freq	28	73	47	Hz
Time (Rel. to Trig)	0.035	0.151	0.070	sec
Peak Acceleration	0.113	0.297	0.177	g
Peak Displacement	0.00052	0.00066	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.295 in/s at 0.070 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: May 8, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

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Event Report

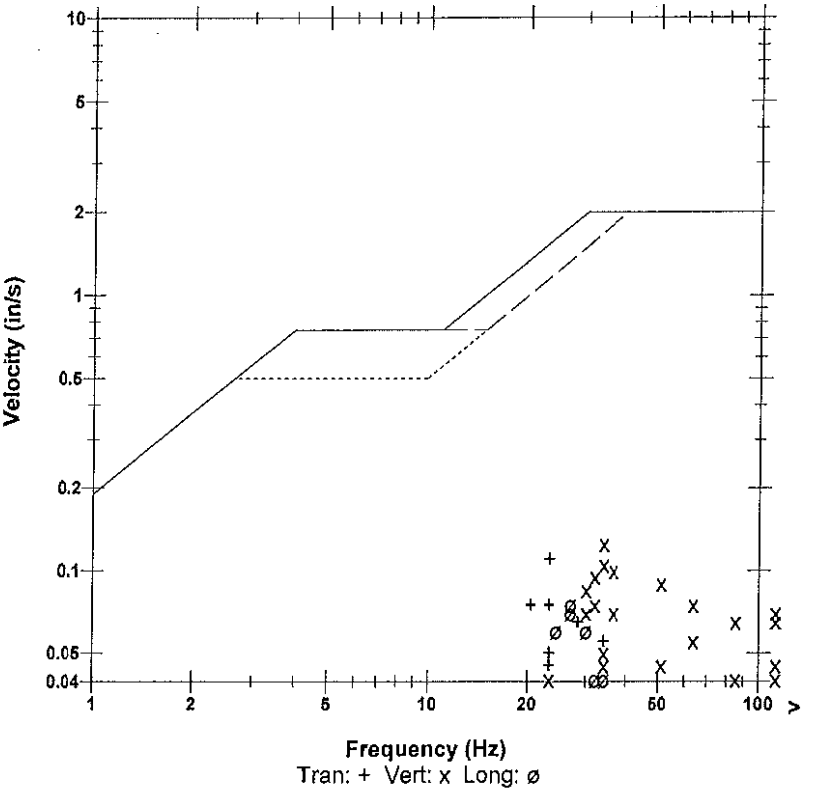
Date/Time	Vert at 11:01:58 May 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9I1.BA0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

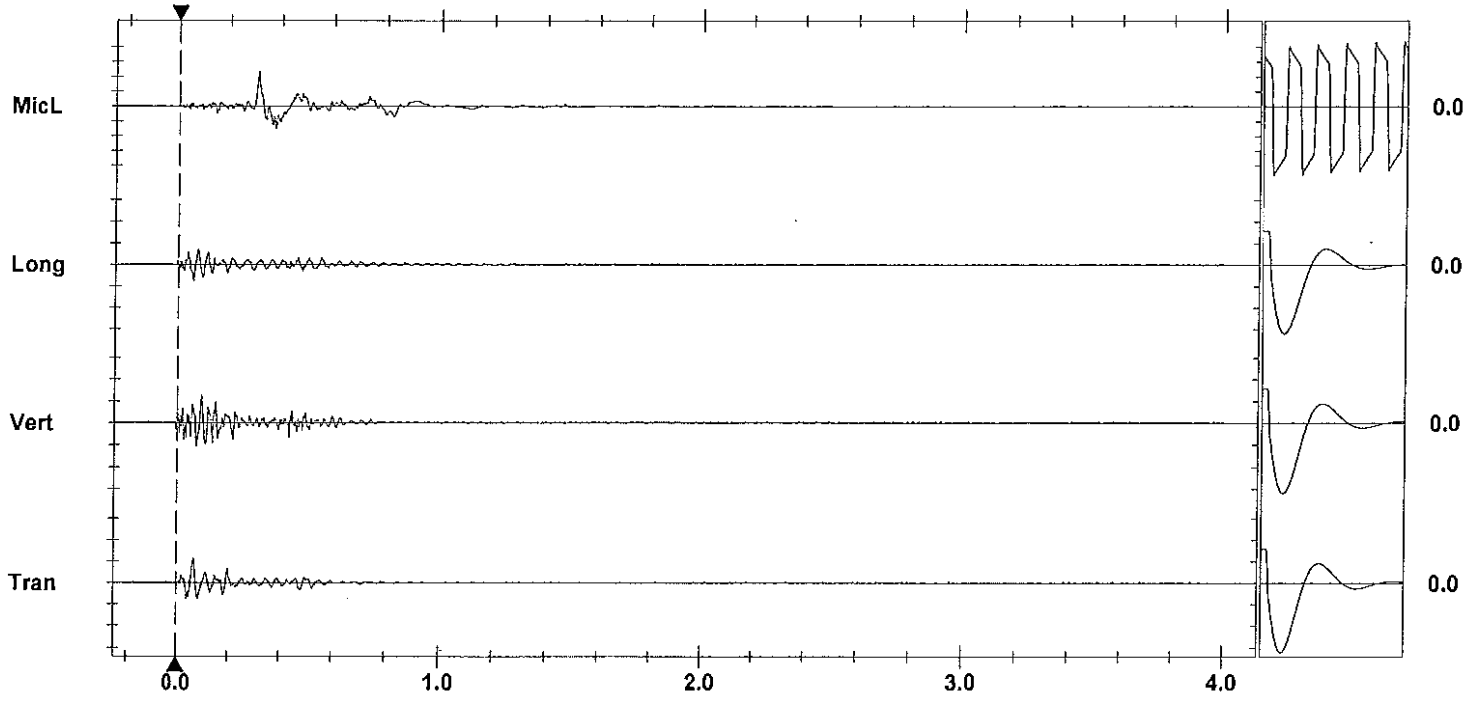
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00232 psi(L) at 0.310 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.110	0.125	0.0750	in/s
ZC Freq	23	34	27	Hz
Time (Rel. to Trig)	0.069	0.096	0.061	sec
Peak Acceleration	0.0663	0.119	0.0530	g
Peak Displacement	0.00068	0.00054	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.139 in/s at 0.097 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: May 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 1/12
ACTUAL BLAST DATE May 1/12 2:55 PM
BLAST # MW-0187

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+06

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9.1 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 10 Proad
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 113 (kg)
DELAY TYPE AND LENGTH 25 (ms)

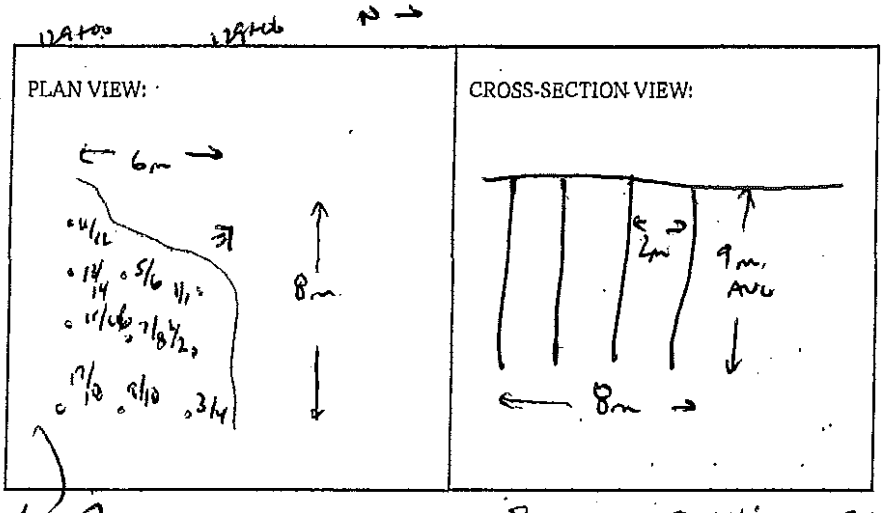
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 425 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1316? Cliffstone Creek - 0.18 ips/37 Hz
" @ 1311? Cliffstone Creek - 0.39 ips/5 Hz

Holes Dry

Bottom Deck 6'-8' ANFO 1¼" Dynamite Primer

Top Deck 2-4' ANFO 1¼" Dynamite Primer

Instantel

Event Report

Date/Time	Vert at 14:55:23 May 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9IC.4B0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

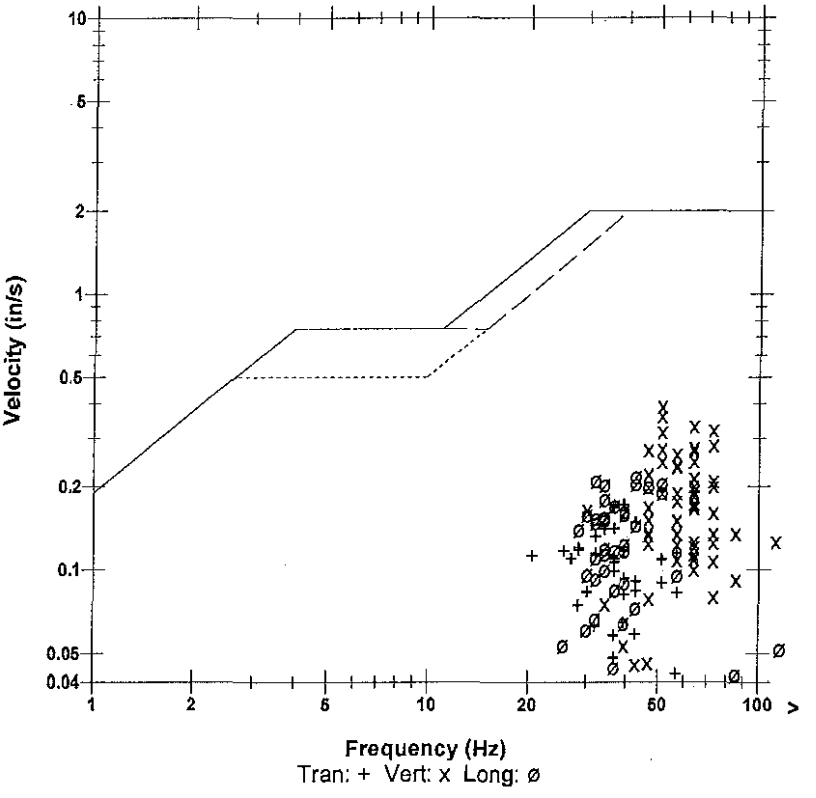
Post Event Notes

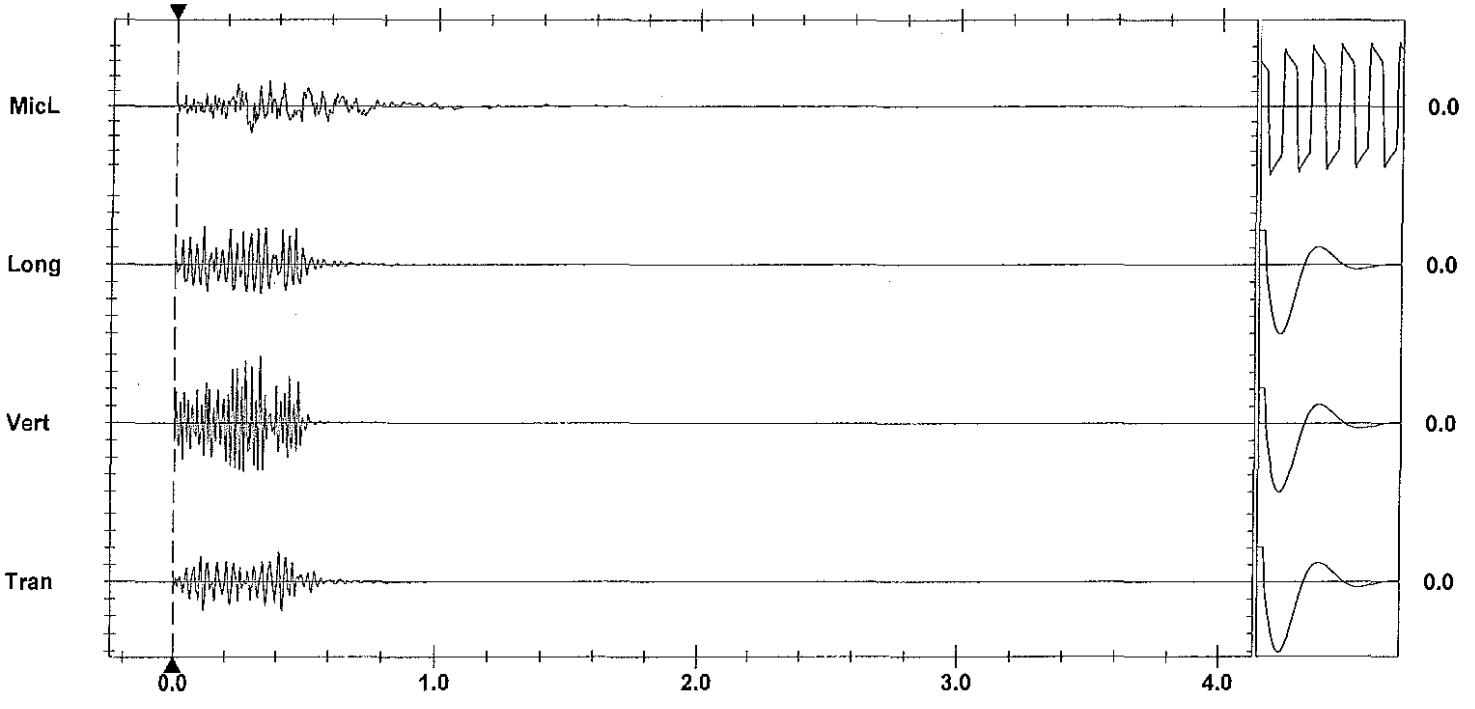
Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.290 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.172	0.392	0.218	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.411	0.335	0.115	sec
Peak Acceleration	0.169	0.368	0.159	g
Peak Displacement	0.00075	0.00121	0.00097	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.428 in/s at 0.335 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Event Report

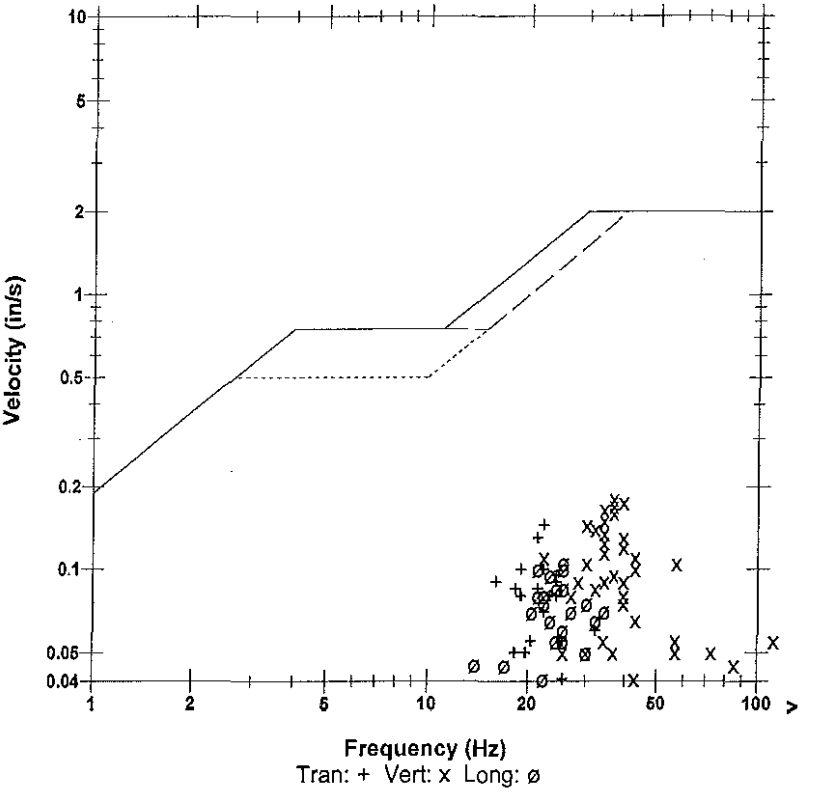
Date/Time	Vert at 14:55:05 May 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9IC.3T0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

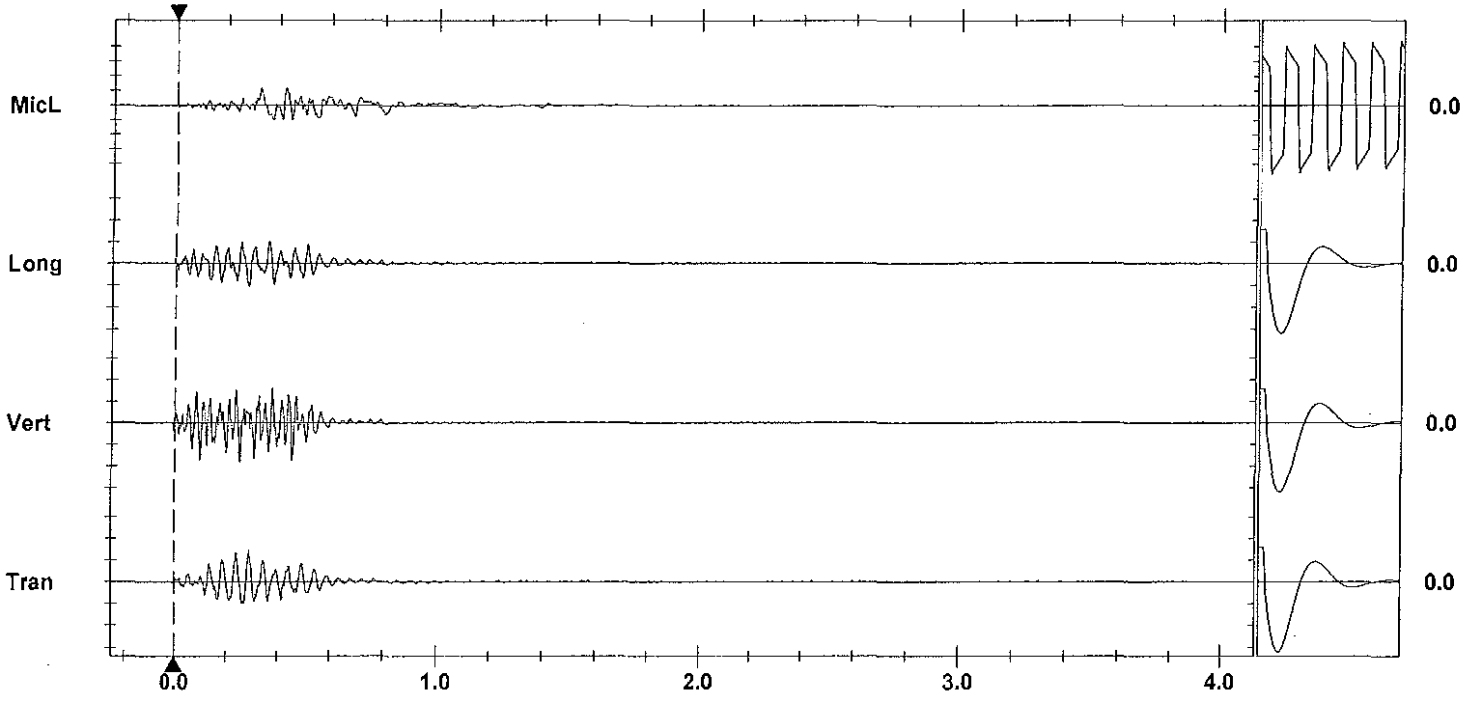
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.324 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	0.145	0.180	0.105	in/s
ZC Freq	22	37	26	Hz
Time (Rel. to Trig)	0.293	0.252	0.286	sec
Peak Acceleration	0.0663	0.146	0.0663	g
Peak Displacement	0.00094	0.00073	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.198 in/s at 0.253 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: May 8, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

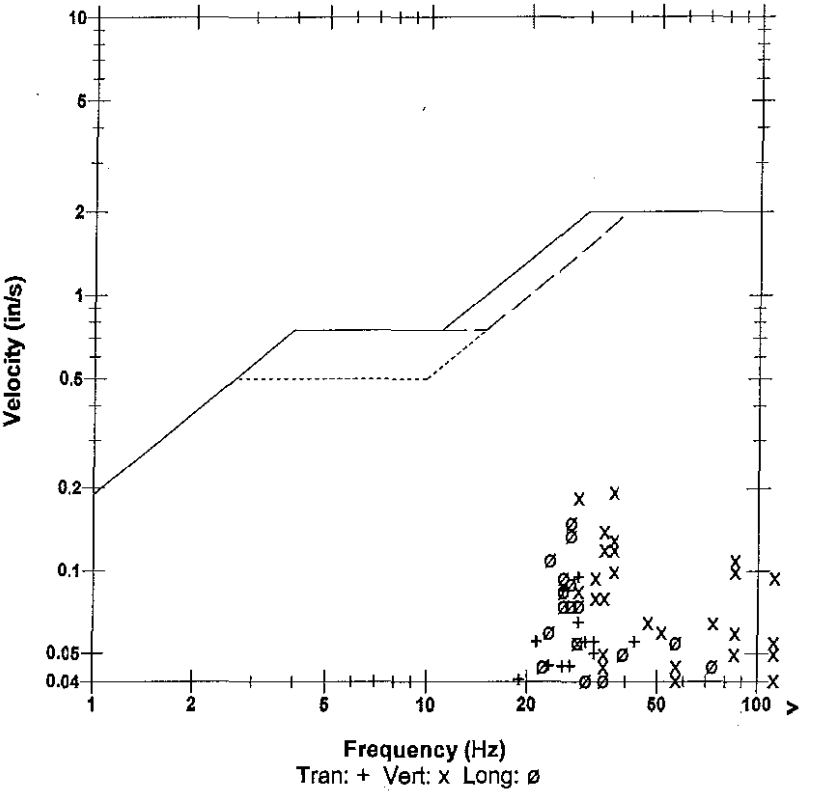
Date/Time	Vert at 12:35:28 May 2, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9K0.B40

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

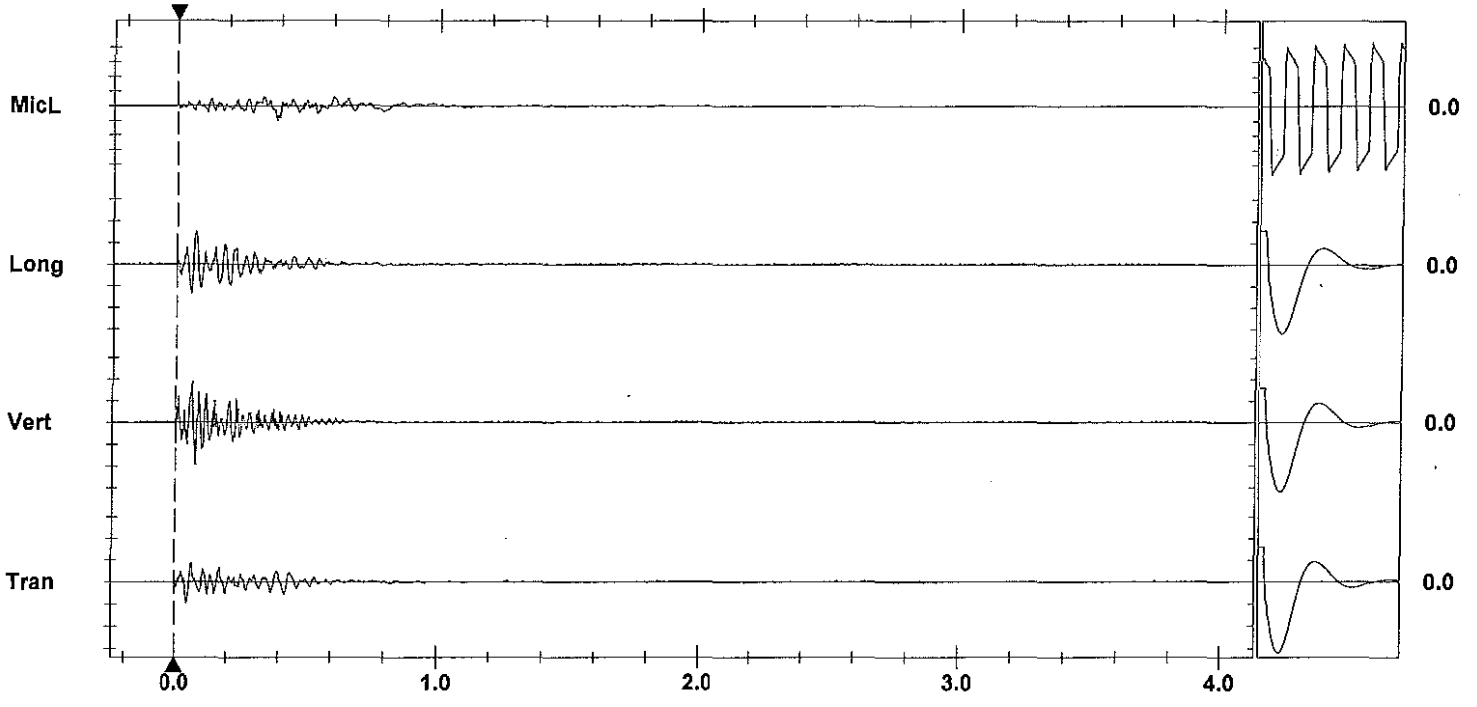
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.384 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.0950	0.195	0.150	in/s
ZC Freq	28	37	27	Hz
Time (Rel. to Trig)	0.048	0.080	0.076	sec
Peak Acceleration	0.0530	0.172	0.0928	g
Peak Displacement	0.00052	0.00094	0.00099	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.234 in/s at 0.080 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: August 13, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:35:48 May 2, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9K0.BO0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

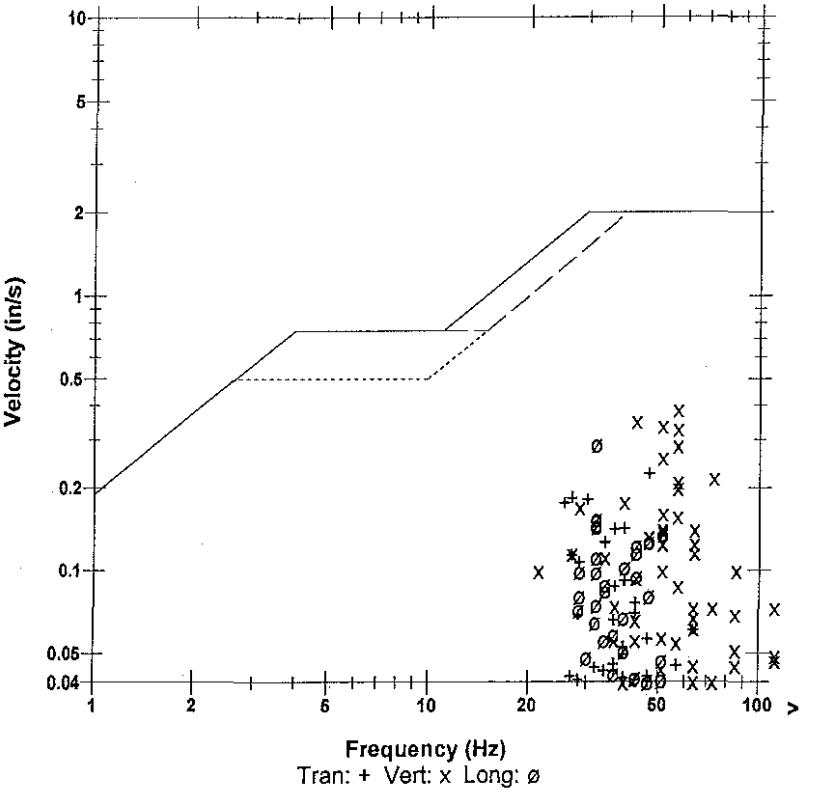
Post Event Notes

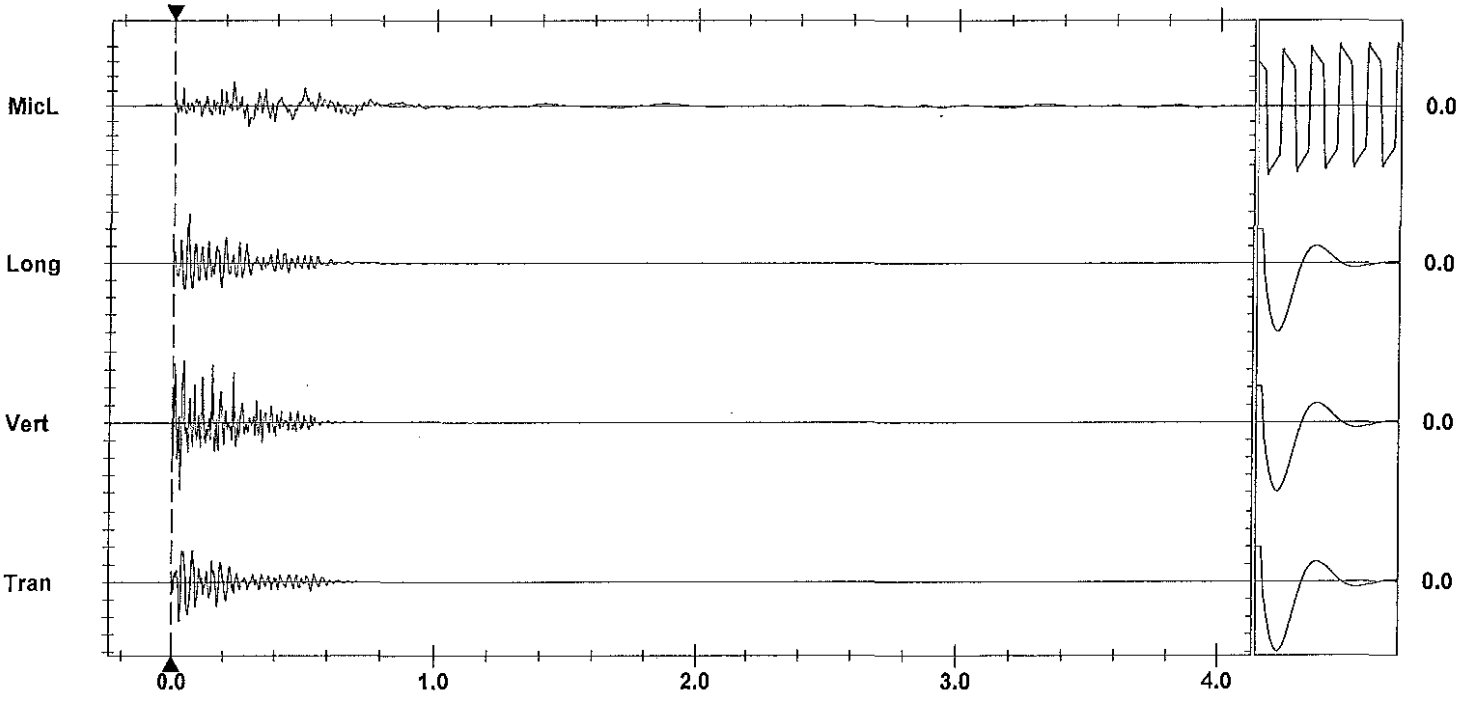
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.230 sec
ZC Freq 34 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.224	0.384	0.287	in/s
ZC Freq	47	57	32	Hz
Time (Rel. to Trig)	0.030	0.031	0.060	sec
Peak Acceleration	0.204	0.358	0.123	g
Peak Displacement	0.00118	0.00135	0.00122	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.463 in/s at 0.031 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: May 8, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 2/12
ACTUAL BLAST DATE May 2/12 12:35 PM
BLAST # MW-0188

HIGHWAY# 97
BLAST LOCATION AT: STN 128+96 - 129+00 LS (70 sq hg mode)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 4-shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.7 (m)
TOTAL DEPTH 130 (m)

TOTAL NUMBER OF HOLES 56/1 / 36 AHA / 2 sh 6/7 Pod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2 Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 32
TOTAL NUMBER OF DELAYS 20

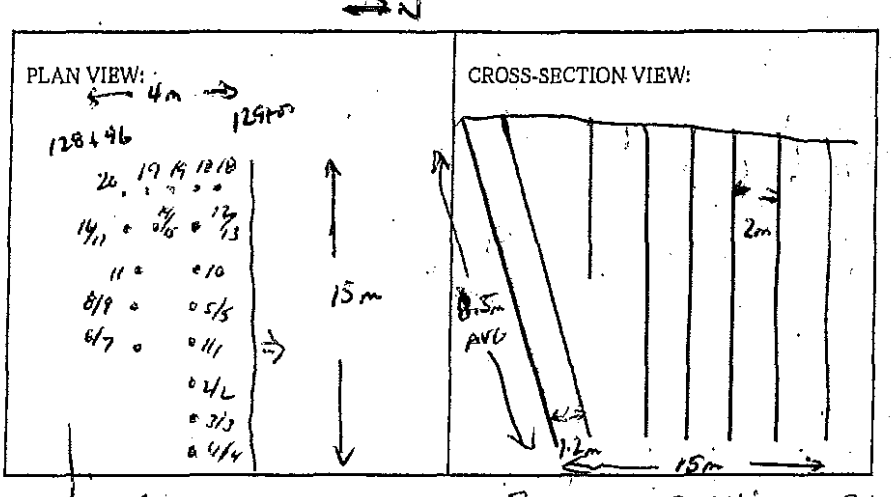
EXPLOSIVE SIZE 50 mm by 410 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 2.5 (ms)

INITIATION DEVICE: (CIRCLE) ~~E.E. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 480 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.19 ips / 37 Hz
" @ 13117 cliffstone crt - 0.38 ips / 57 Hz

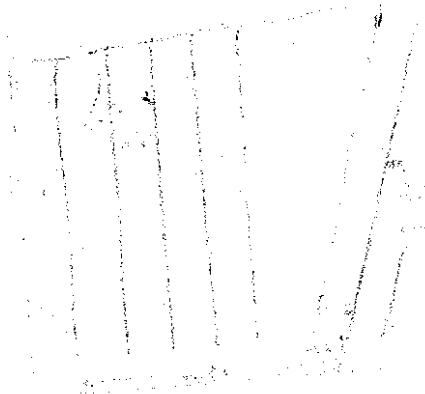
Pecos - Bottom Deck 5'-6' Apart + 2"x16" Dynamite Primer

Top Deck 1'-3' Apart . 1"x8" Dynamite Primers

Buffer holes - Bottom Deck 5 connections 2"x16" Blasting + 2x16 Dynamite Primer

- Top Deck 1-2 connections 2"x16" Blasting + 1"x8" Dynamite Primer

6/1 - 2 each 2x16 Dynamite + 200 grain cord to 4' collar.



AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 3/12
ACTUAL BLAST DATE May 3/12 11:24AM
BLAST # MW-0189

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+80 - 128+95 c/l (2nd bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
No shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 92 (m)

TOTAL NUMBER OF HOLES 20 Perp
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

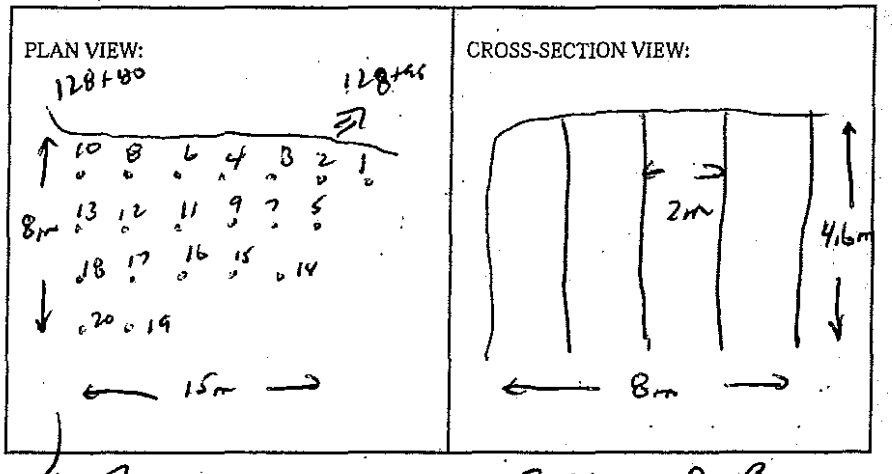
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



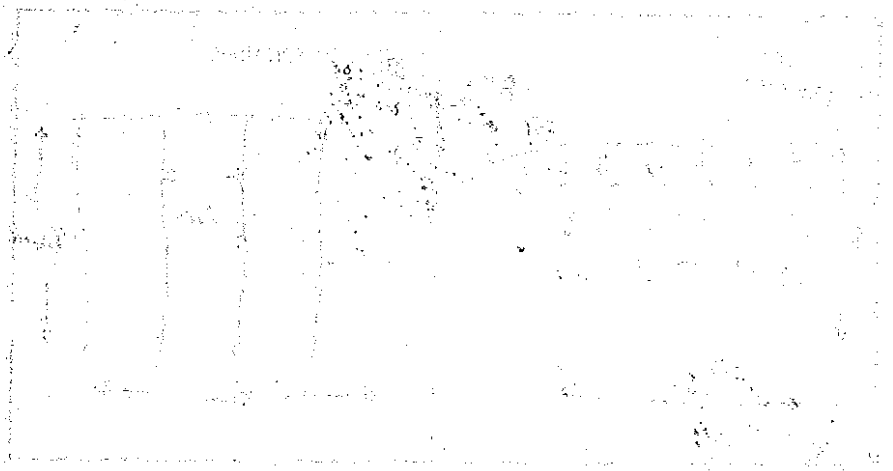
BLASTER'S SIGNATURE _____ COMPANY Sierra D & B.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct — 0.11 ips/37Hz
" @ 13117 Cliffstone Ct - 0.17 ips/32Hz

5'-6' ANGLE/HOLDOUT CAULK 1"x8" PAINTED PRIMED



Instantel

Event Report

Date/Time	Vert at 11:24:12 May 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9LR.OC0
Job Number:	1		

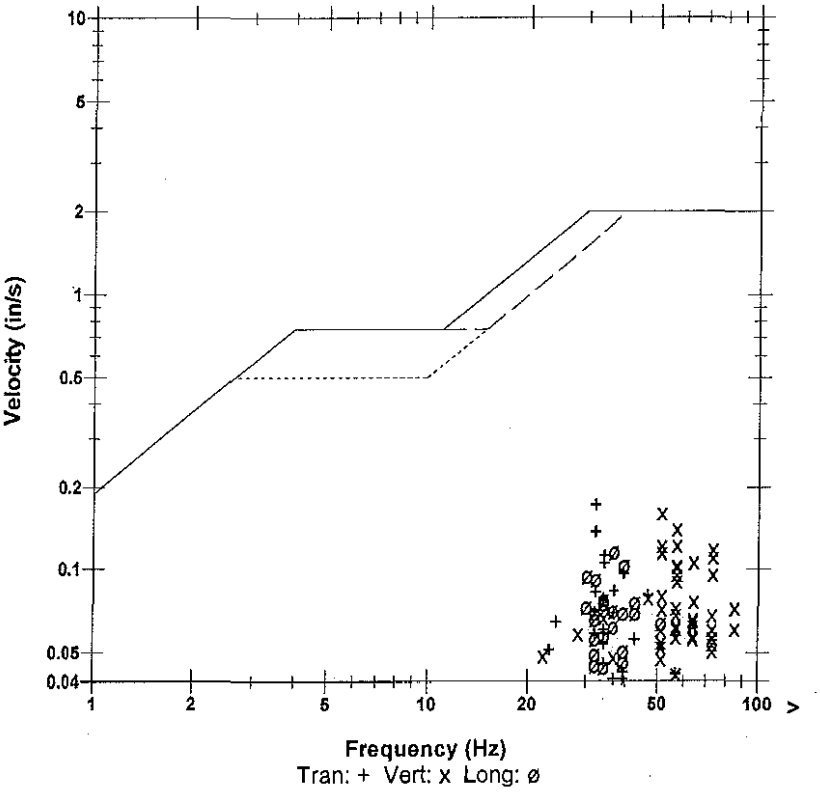
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

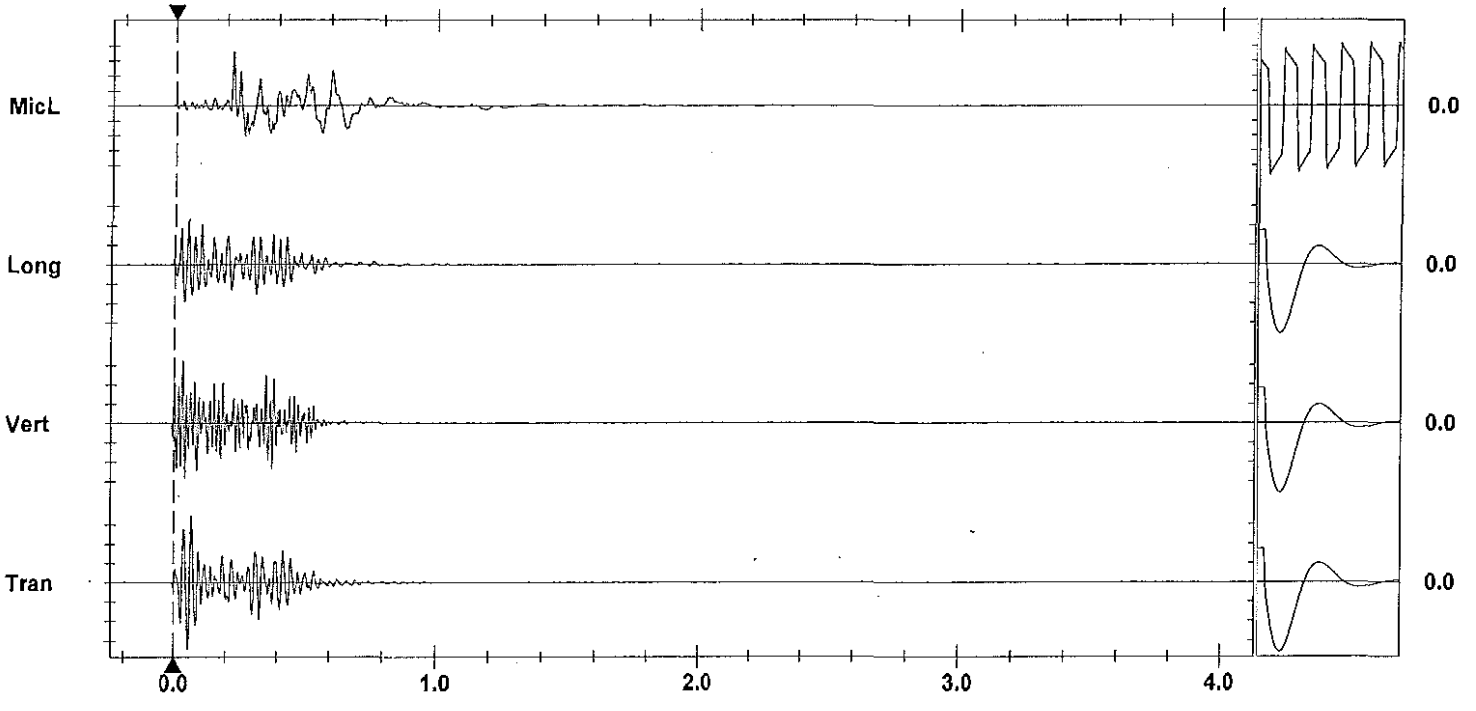
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00363 psi(L) at 0.222 sec
ZC Freq	30 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 679 mv)

	Tran	Vert	Long	
PPV	0.172	0.161	0.116	in/s
ZC Freq	32	51	37	Hz
Time (Rel. to Trig)	0.058	0.034	0.056	sec
Peak Acceleration	0.103	0.149	0.0646	g
Peak Displacement	0.00082	0.00046	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.210 in/s at 0.057 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: May 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

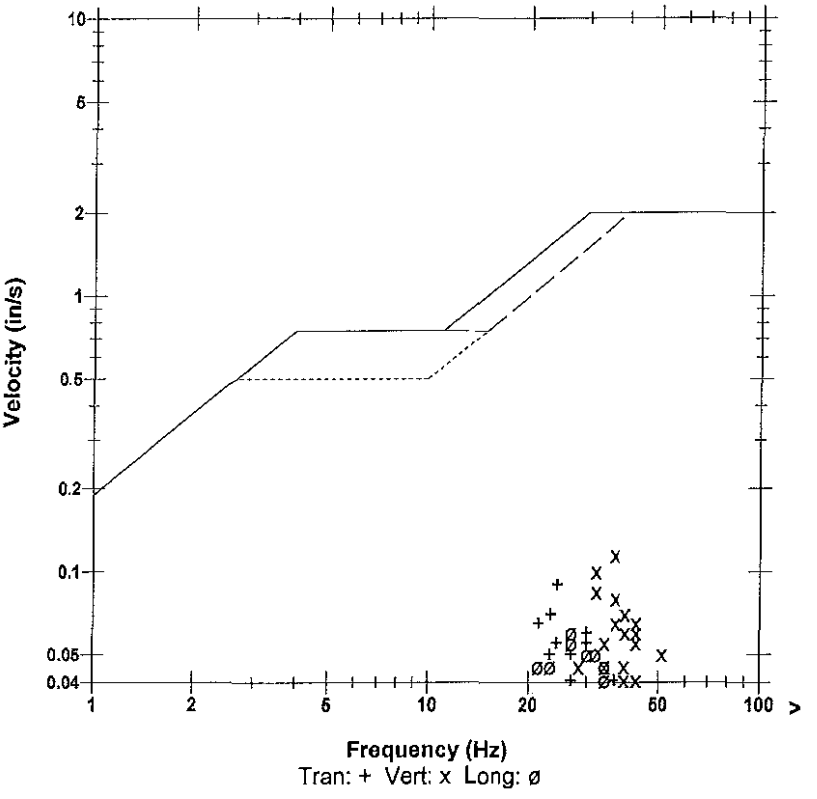
Date/Time	Vert at 11:23:52 May 3, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9LR.NS0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

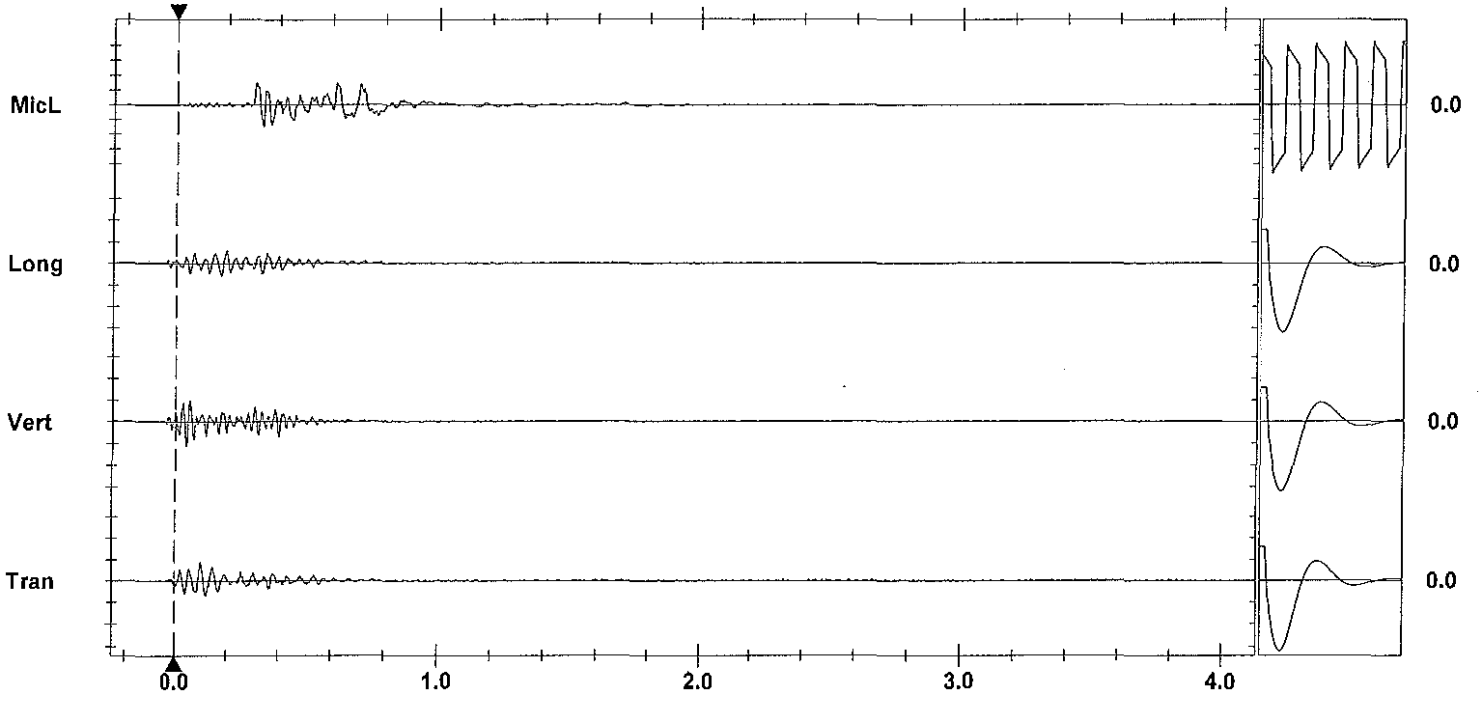
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00149 psi(L) at 0.308 sec			
ZC Freq	18 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 641 mv)			

	Tran	Vert	Long	
PPV	0.0900	0.115	0.0600	in/s
ZC Freq	24	37	27	Hz
Time (Rel. to Trig)	0.104	0.043	0.195	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00052	0.00050	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.127 in/s at 0.043 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: May 8, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-00001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAY 3/12
ACTUAL BLAST DATE MAY 3/12 2:30PM
BLAST # MW-0190

HIGHWAY# 97
BLAST LOCATION AT: SBN 129+40 - 129+55

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
@ shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE altered cgranite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 2.9 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 21 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamine Hanfo
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 21

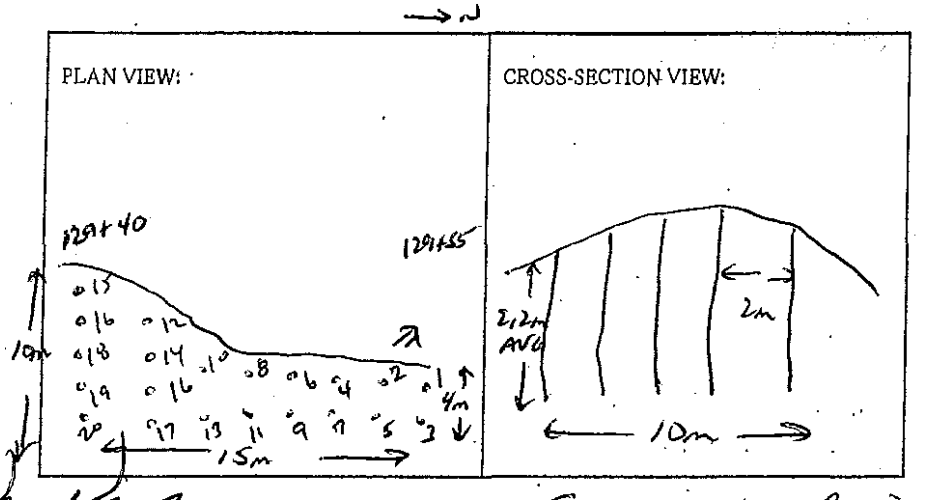
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HA 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct. 0.085 ips/ 43Hz
" @ 13117 Cliffstone Ct. 0.088 ips/ 47Hz

2' ANFO /Hole + 1 CAST 1X8 DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 14:30:22 May 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9M0.AM0
Job Number:	1		

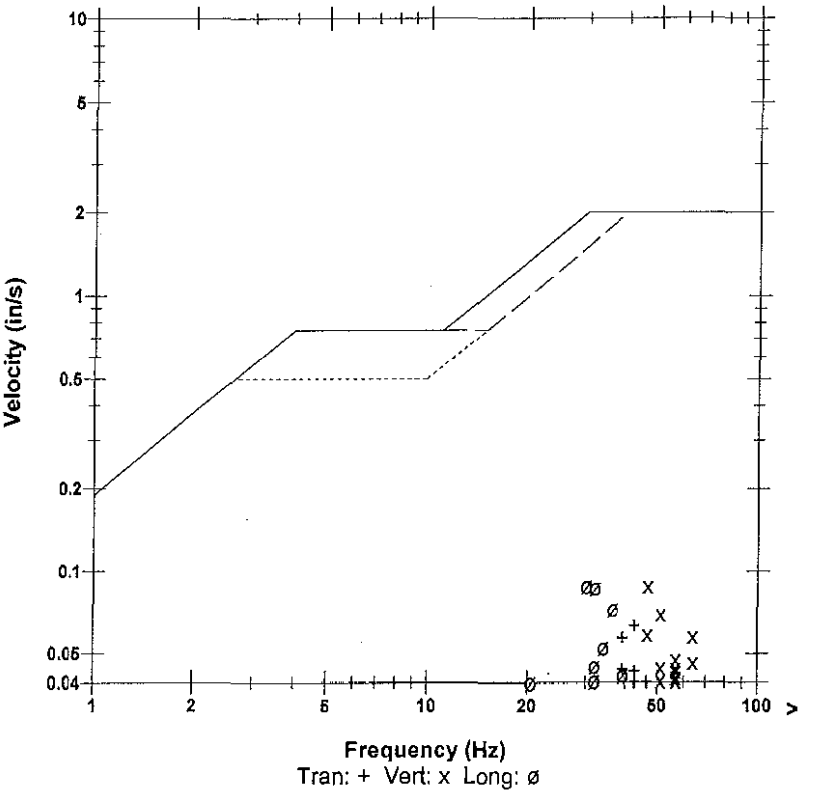
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

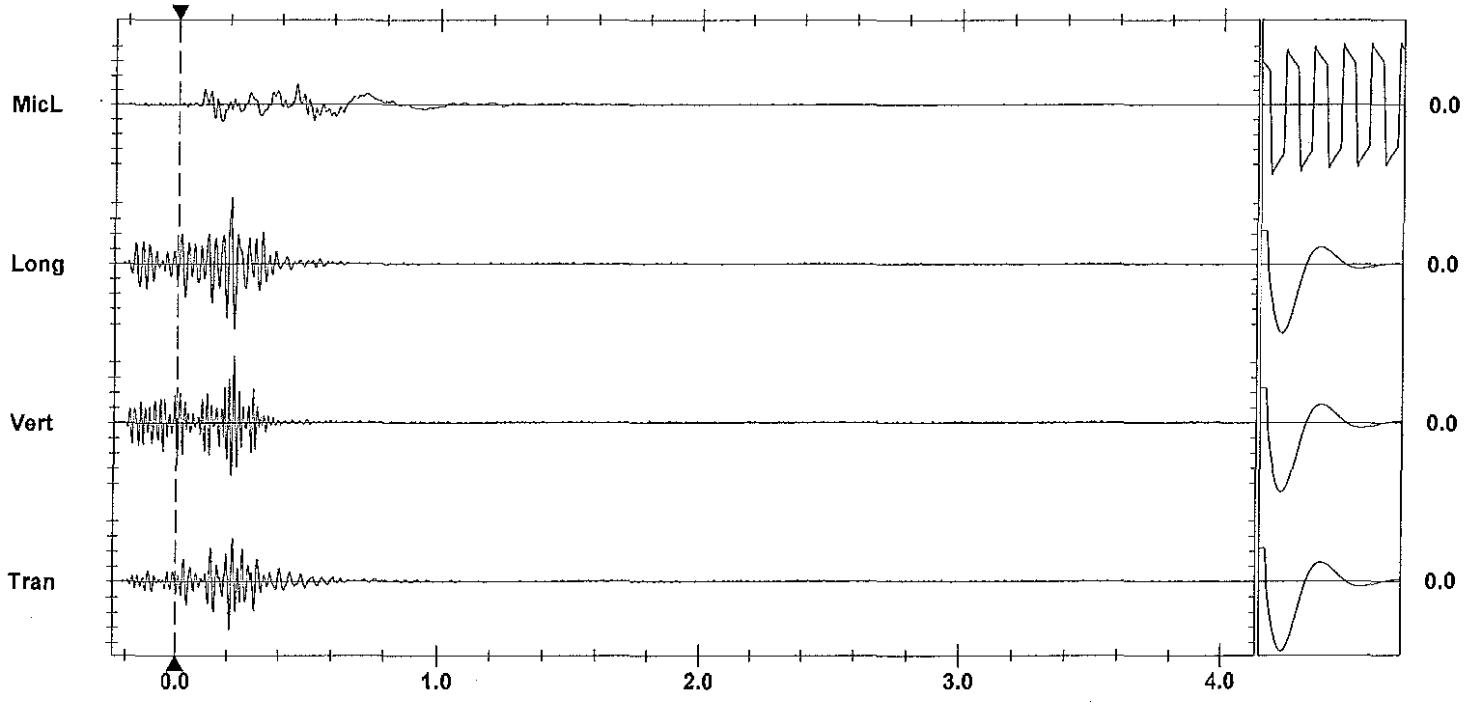
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00141 psi(L) at 0.456 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 644 mv)

	Tran	Vert	Long	
PPV	0.0631	0.0881	0.0881	in/s
ZC Freq	43	47	30	Hz
Time (Rel. to Trig)	0.209	0.220	0.206	sec
Peak Acceleration	0.0414	0.0829	0.0530	g
Peak Displacement	0.00022	0.00028	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.134 in/s at 0.221 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: May 6, 2040 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time Vert at 14:30:01 May 3, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E9M0.A10

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

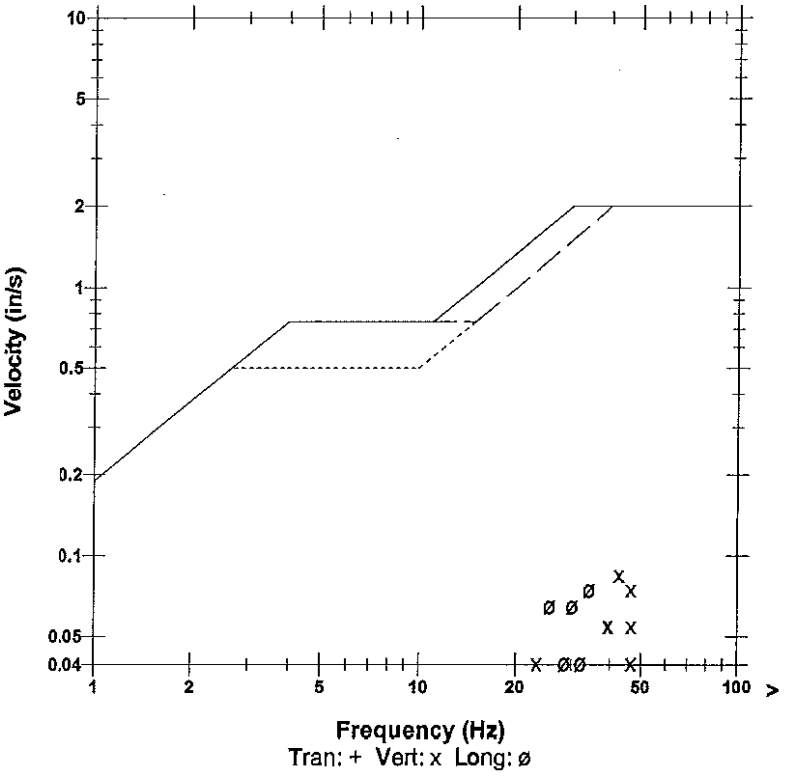
Extended Notes

Post Event Notes

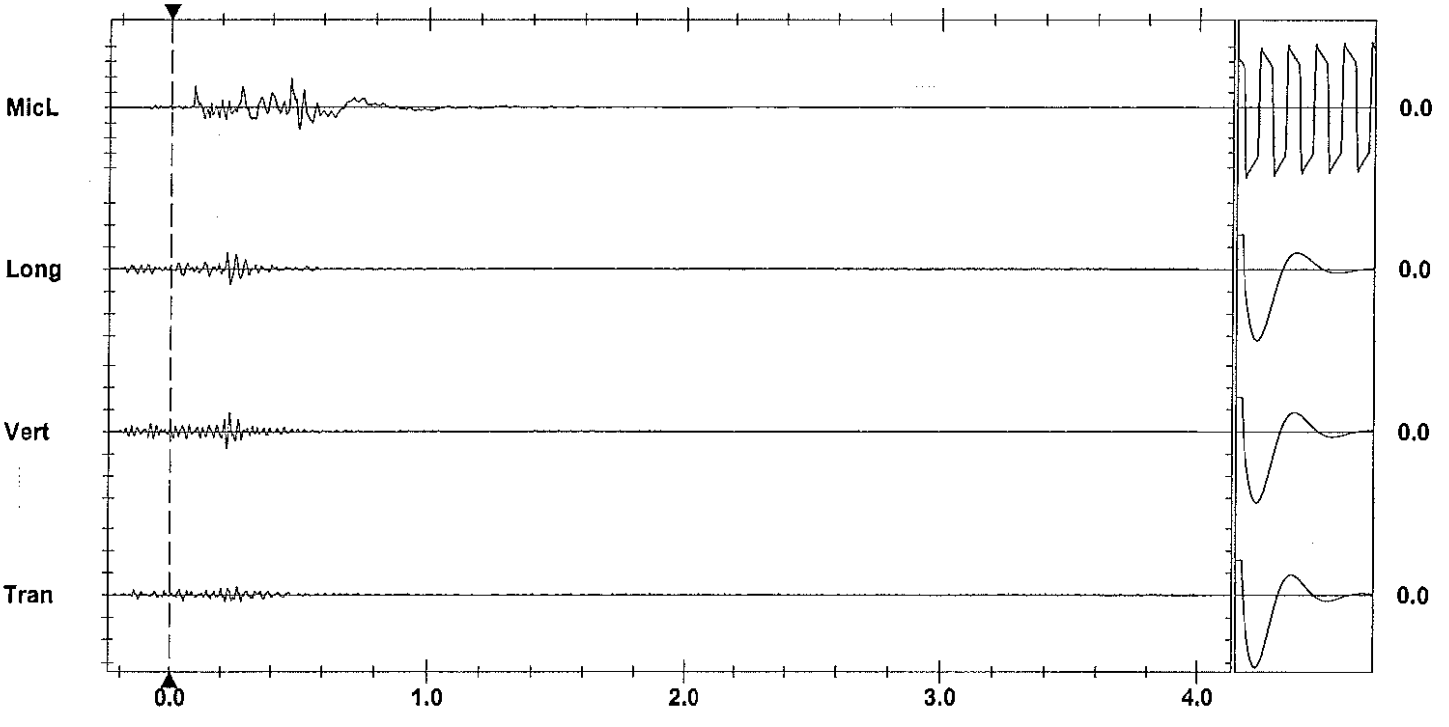
Microphone Linear Weighting
PSPL 0.00189 psi(L) at 0.472 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 660 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0850	0.0750	in/s
ZC Freq	30	43	34	Hz
Time (Rel. to Trig)	0.267	0.234	0.223	sec
Peak Acceleration	0.0265	0.0663	0.0530	g
Peak Displacement	0.00016	0.00031	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.109 in/s at 0.234 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — ◀

Printed: April 21, 2013 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting Ltd
BLASTER'S NAME Wayne Vickers
BLASTER'S CERTIFICATE NUMBER 5834889

DATE PREPARED May 4/12
ACTUAL BLAST DATE May 4/12 10:06am
BLAST # MW-0191

HIGHWAY# 97
BLAST LOCATION AT: Stn 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE diorite granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5th
AVERAGE DEPTH 2.7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Hand
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

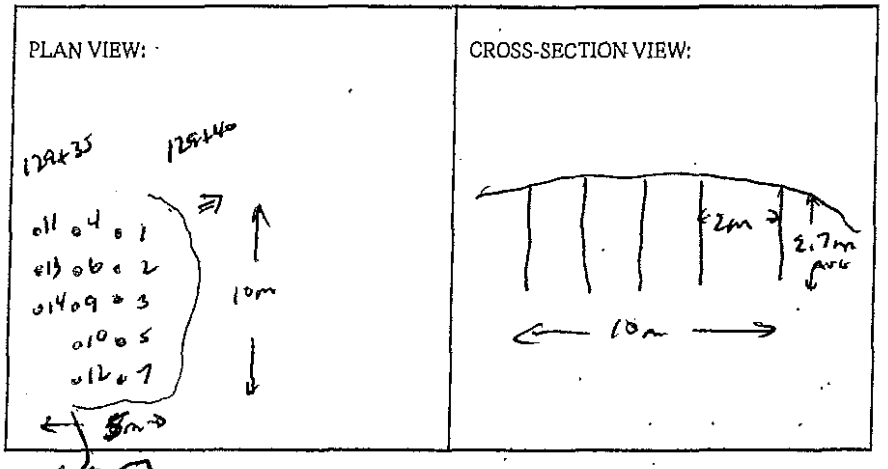
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE _____ CAPACITY _____

VOLUME OF ROCK BLASTED 220 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vickers COMPANY _____

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt. 0.065 ips/43Hz
@ 13117 cliffstone crt - 0.097 ips/32Hz

3'-4' ANCHOR HOLE ± 0.5 CMPT 1½"x16" Primer

Instantel®

Event Report

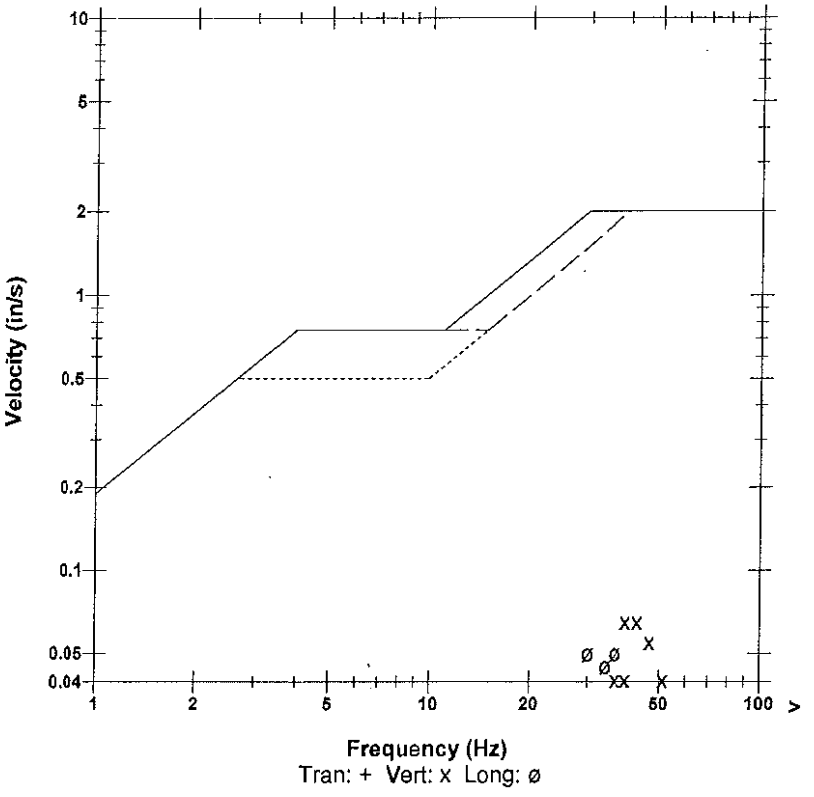
Date/Time	Vert at 10:06:33 May 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9NI.QX0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

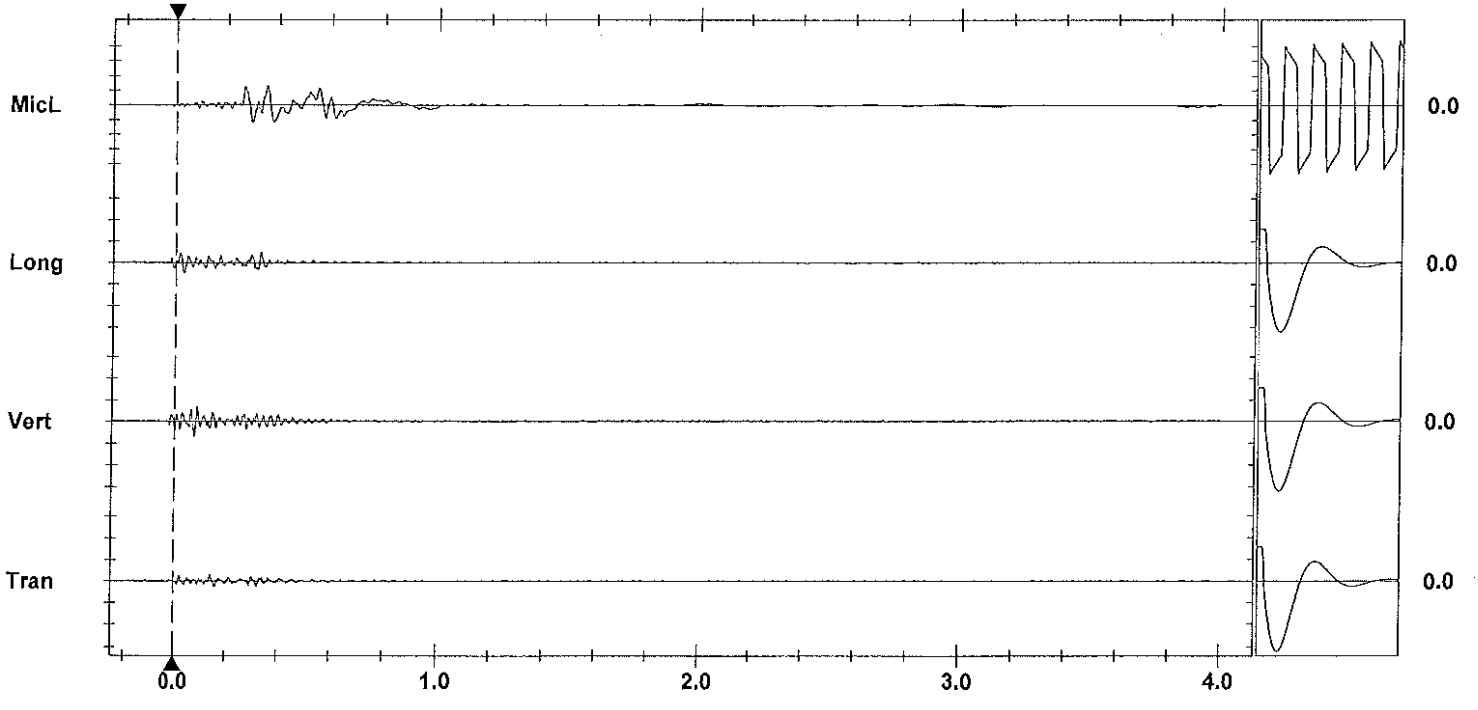
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.353 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0650	0.0500	in/s
ZC Freq	47	43	30	Hz
Time (Rel. to Trig)	0.146	0.078	0.031	sec
Peak Acceleration	0.0265	0.0530	0.0398	g
Peak Displacement	0.00010	0.00026	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0698 in/s at 0.079 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 10:06:54 May 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9NI.RI0
Job Number:	1		

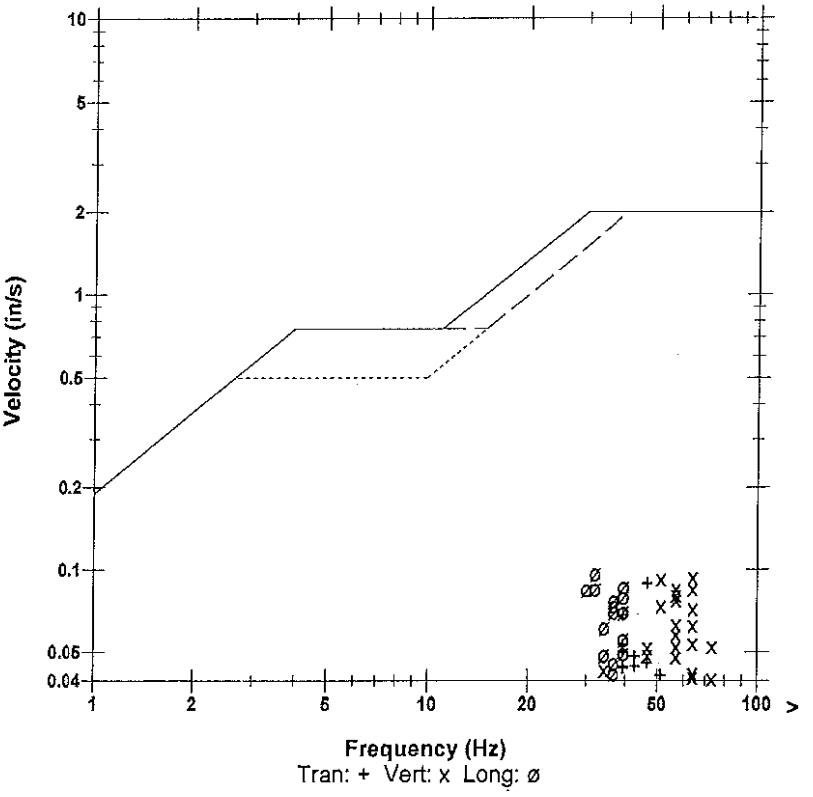
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

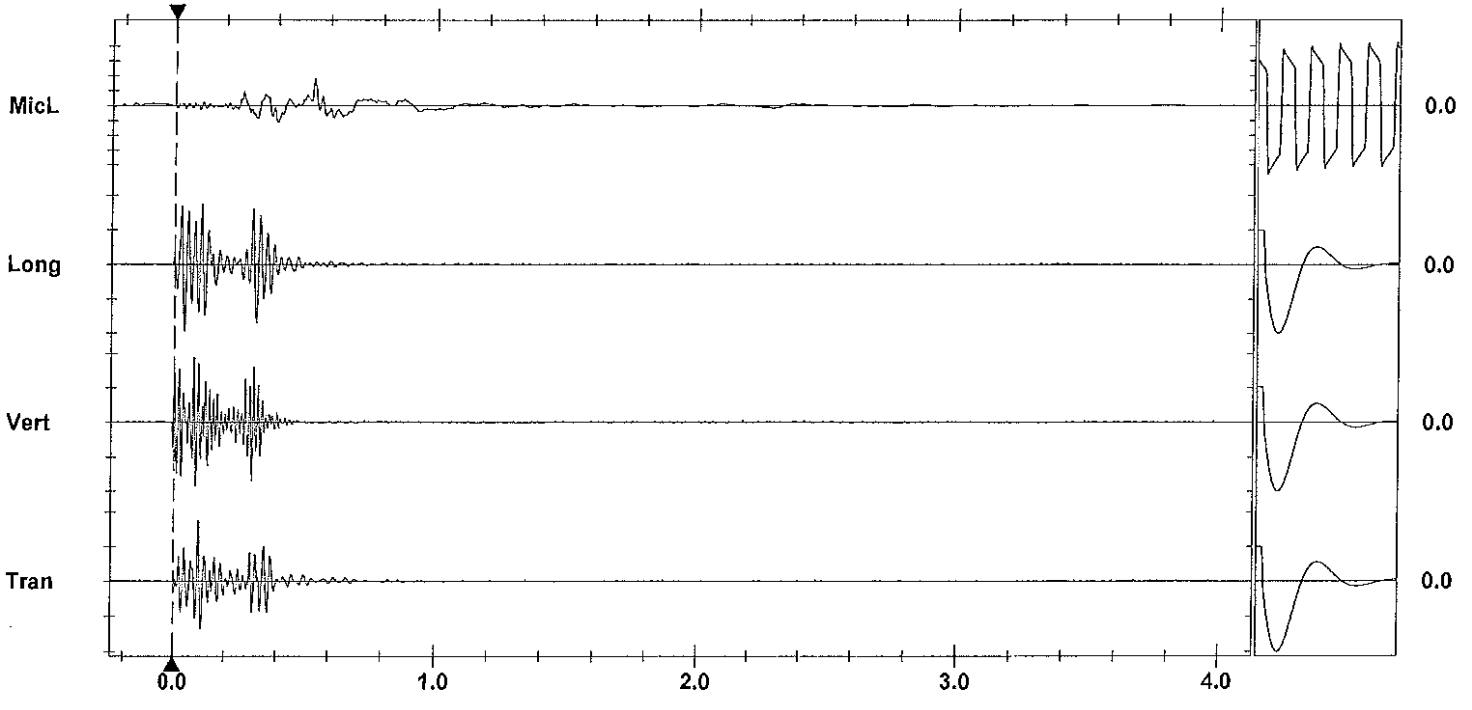
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.540 sec
ZC Freq	7.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 589 mv)

	Tran	Vert	Long	
PPV	0.0887	0.0937	0.0969	in/s
ZC Freq	47	64	32	Hz
Time (Rel. to Trig)	0.101	0.080	0.040	sec
Peak Acceleration	0.0646	0.106	0.0613	g
Peak Displacement	0.00029	0.00027	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.125 in/s at 0.099 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Skeena Drilling + Blasting
BLASTER'S NAME Wayne Jensen
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 4/12
ACTUAL BLAST DATE May 4/12 11:11 AM
BLAST # MW-0192

HIGHWAY# 97
BLAST LOCATION AT: SW 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot mutted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9 PRODUCTION
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE 60% EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 9 TOTAL WEIGHT 40 (kg)
TOTAL NUMBER OF DELAYS 9 DELAY TYPE AND LENGTH 25 (ms)

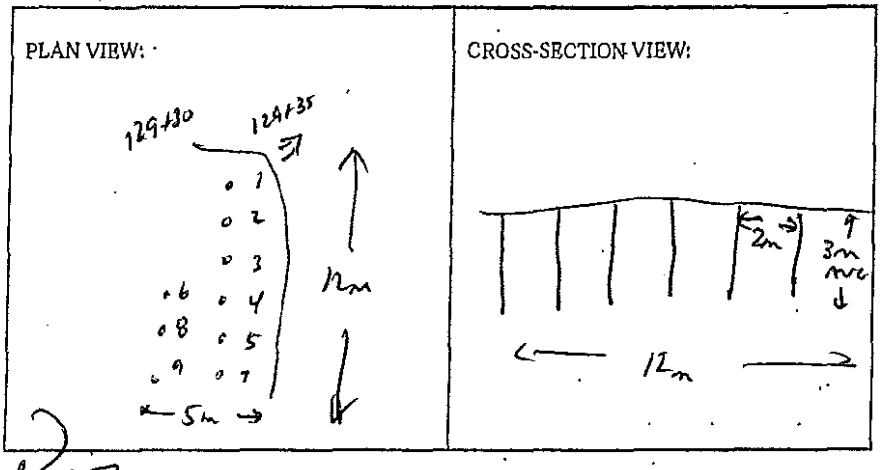
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD 320 CAPACITY 800

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Jensen COMPANY _____

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.060 ips/39Hz
@ 13117 Cliffstone Cut - 0.11 ips/5Hz

3'-4' ANFO / hole + 0.5 cast 1½x16" Dynamite Primer

Instantel

Event Report

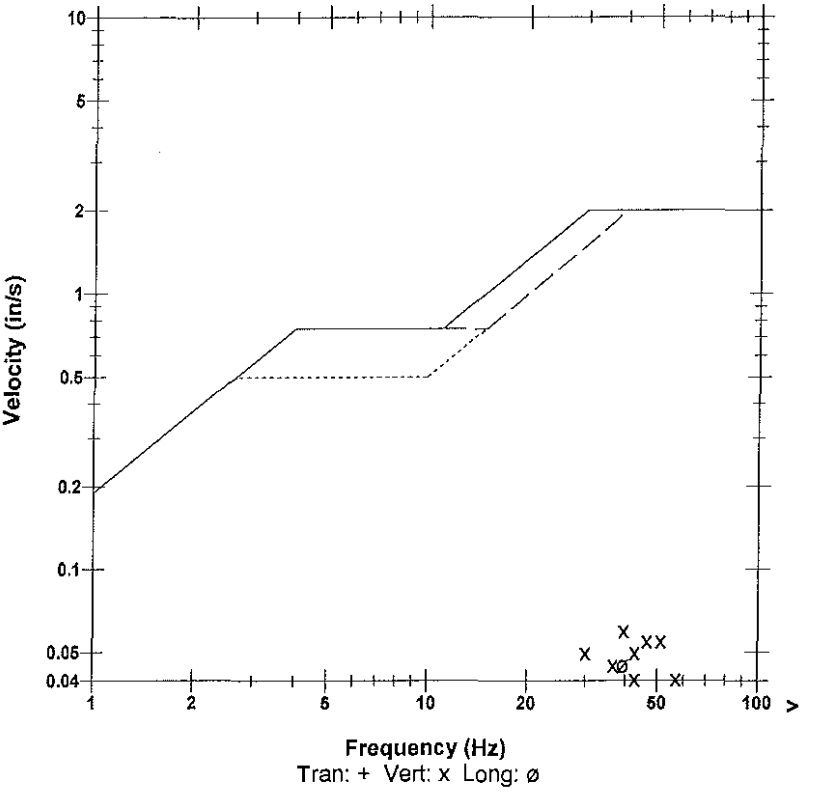
Date/Time	Vert at 11:11:56 May 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9NL.RW0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

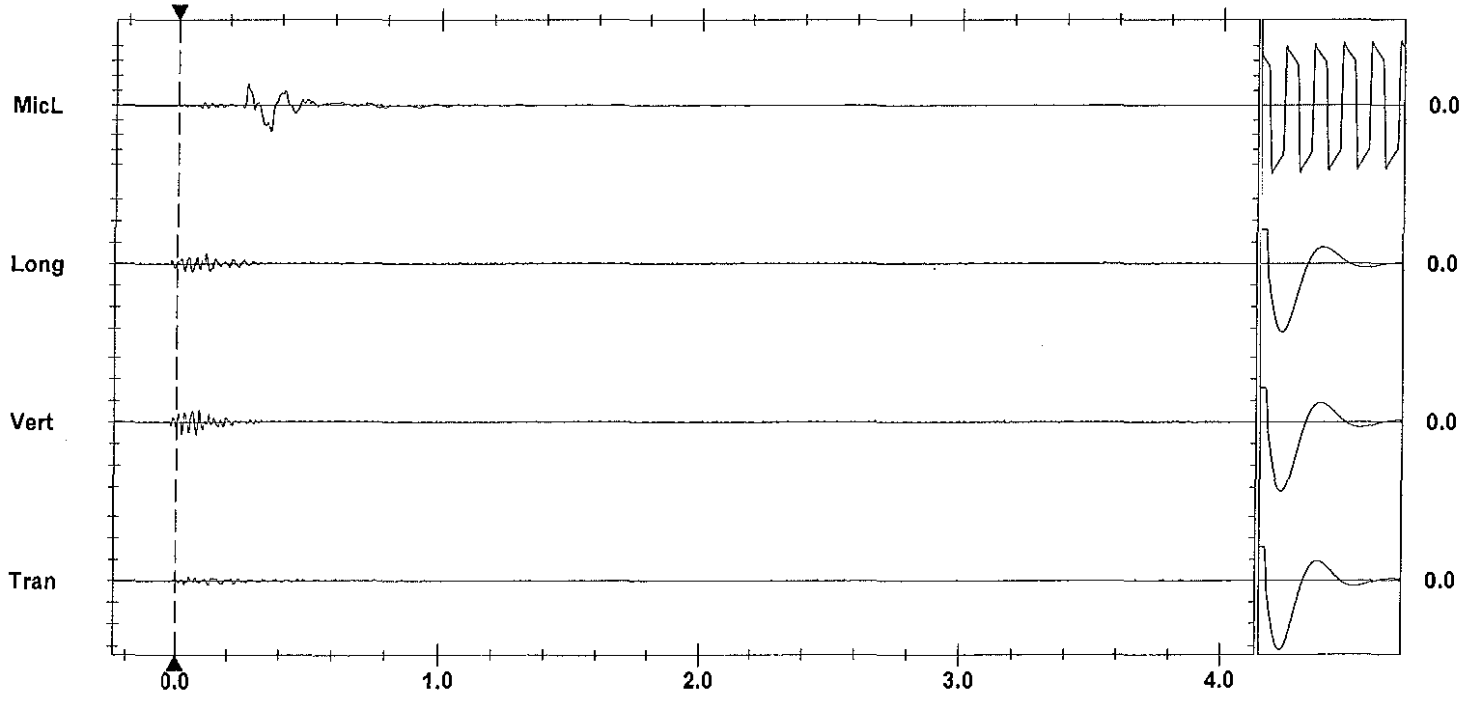
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.358 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0600	0.0450	in/s
ZC Freq	57	39	39	Hz
Time (Rel. to Trig)	0.053	0.077	0.114	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00008	0.00028	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0650 in/s at 0.077 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: May 8, 2012 IV 8.01 - 8.011 Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:12:17 May 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9NL.SH0
Job Number:	1		

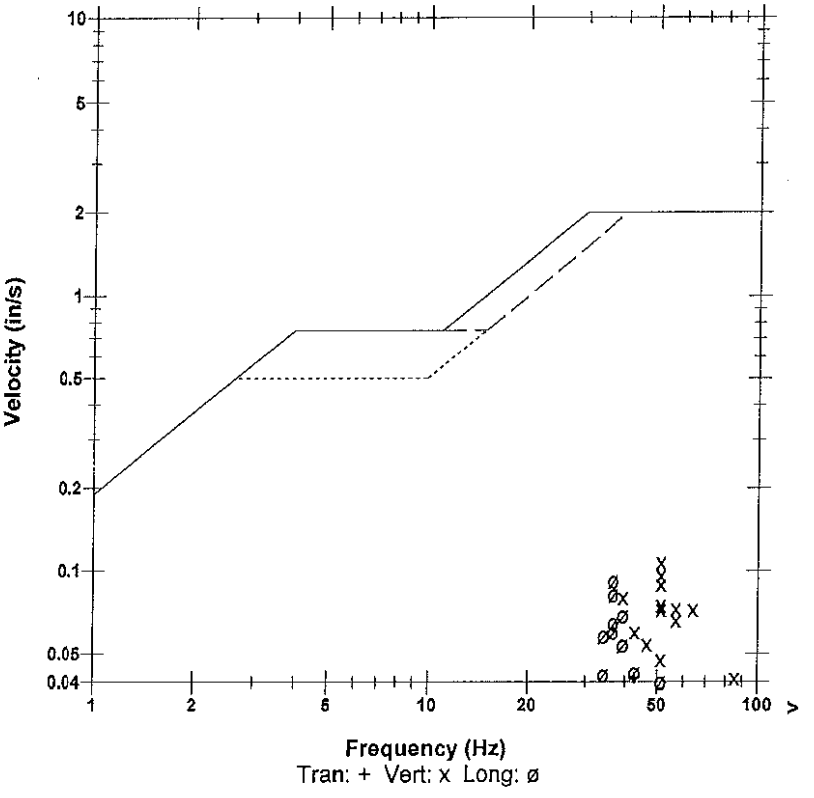
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

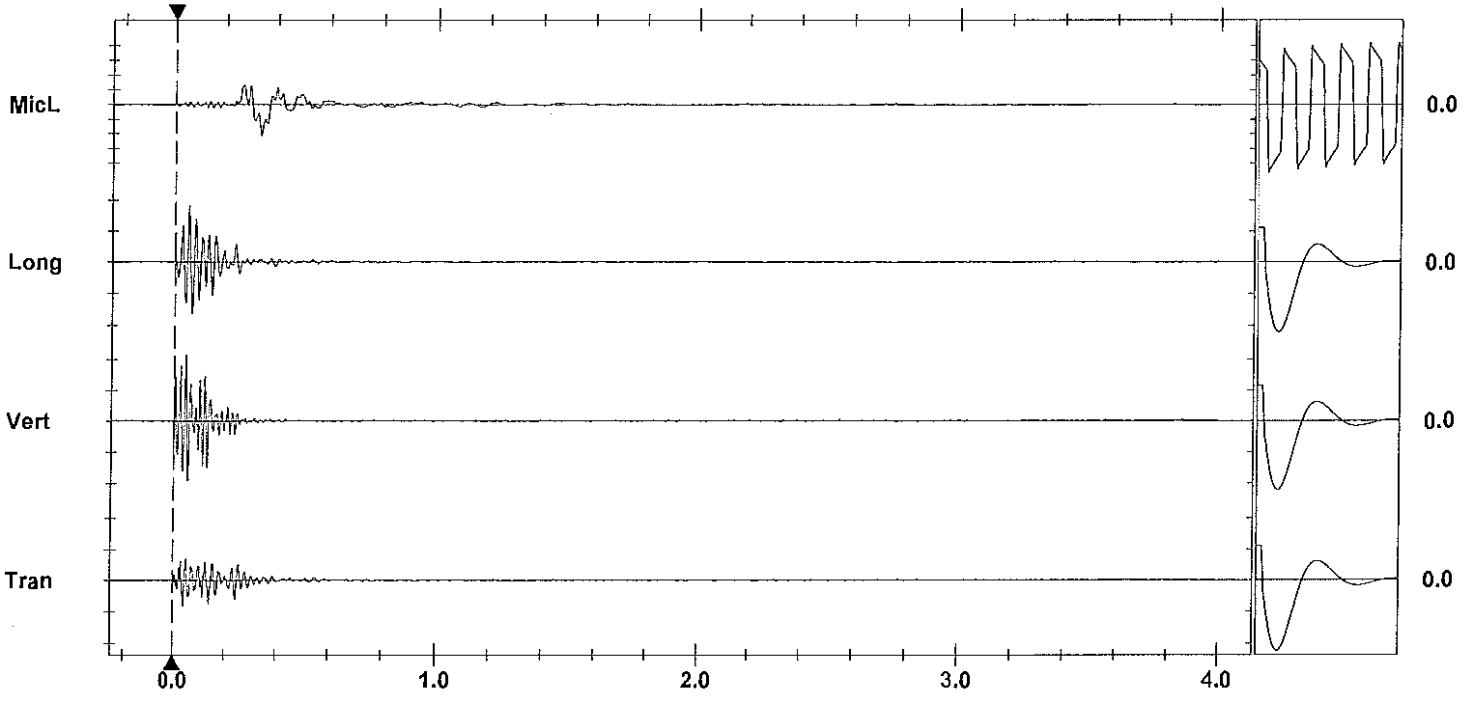
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00214 psi(L) at 0.335 sec
ZC Freq	7.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.0406	0.107	0.0919	in/s
ZC Freq	43	51	37	Hz
Time (Rel. to Trig)	0.042	0.047	0.056	sec
Peak Acceleration	0.0381	0.103	0.0563	g
Peak Displacement	0.00015	0.00032	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.134 in/s at 0.056 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: May 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Usenuk
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 4/12
ACTUAL BLAST DATE May 4/12 2:55 PM
BLAST # MW-0193

HIGHWAY# 97
BLAST LOCATION AT: SMP 129+25 - 129+30 dlL

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 9 Pedo
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

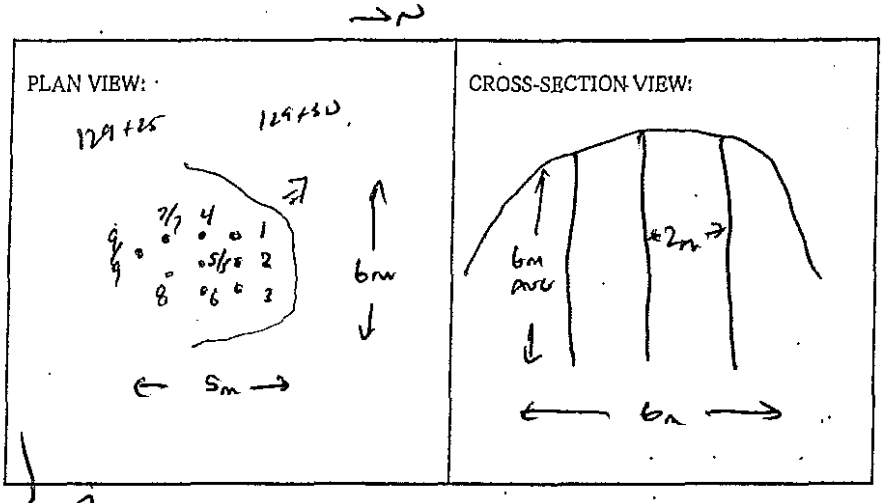
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HA320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Usenuk COMPANY _____

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph # 13167 Cliffstone Crt. 0.085 ips/64Hz
& # 13117 Cliffstone Crt. 0.211 ips/64Hz

BOTTOM DECKS - 4'-5' ANFO
TOP DECKS - 2'-3' ANFO
} Primed w/0.5 CAST 1½" x 16" DYNAMITE

Instantel

Event Report

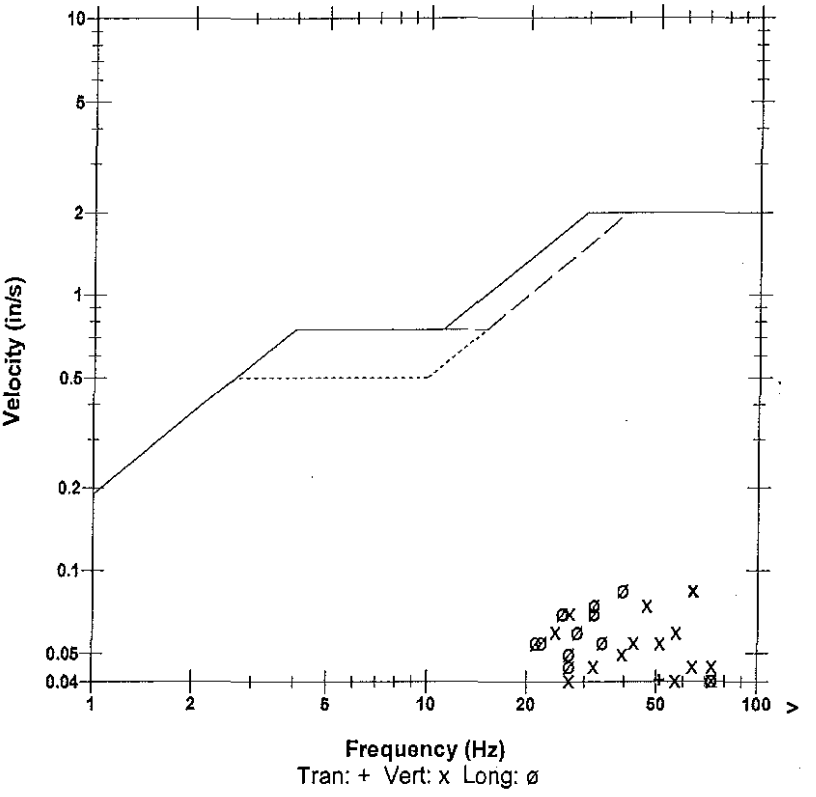
Date/Time	Long at 14:55:33 May 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9NW.4L0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

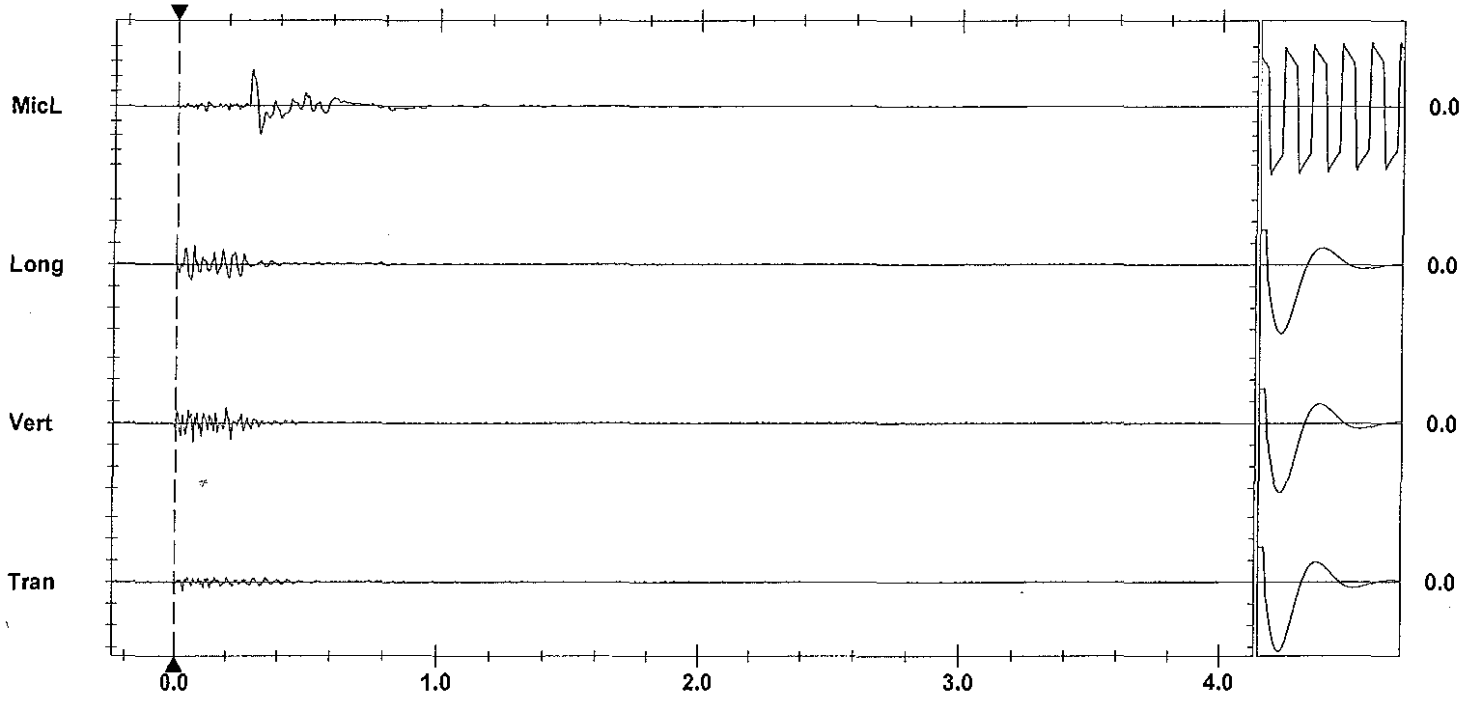
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00239 psi(L) at 0.293 sec			
ZC Freq	16 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 623 mv)			

	Tran	Vert	Long	
PPV	0.0400	0.0850	0.0850	in/s
ZC Freq	51	64	39	Hz
Time (Rel. to Trig)	0.032	0.069	0.071	sec
Peak Acceleration	0.0265	0.0795	0.0530	g
Peak Displacement	0.00011	0.00036	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.6	4.2	

Peak Vector Sum 0.110 in/s at 0.070 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:55:54 May 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9NW.560
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

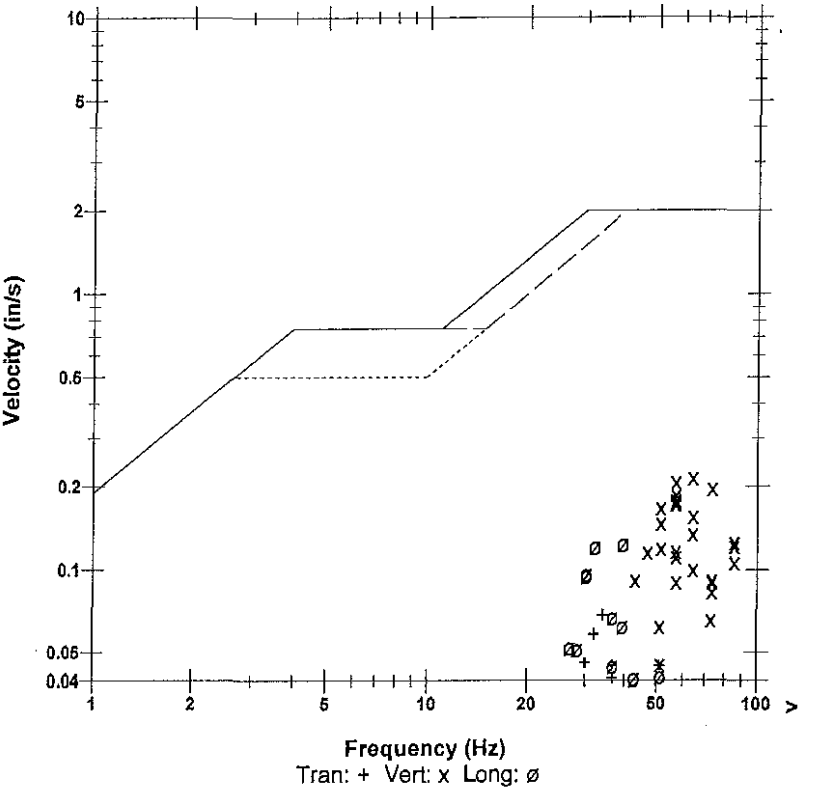
Post Event Notes

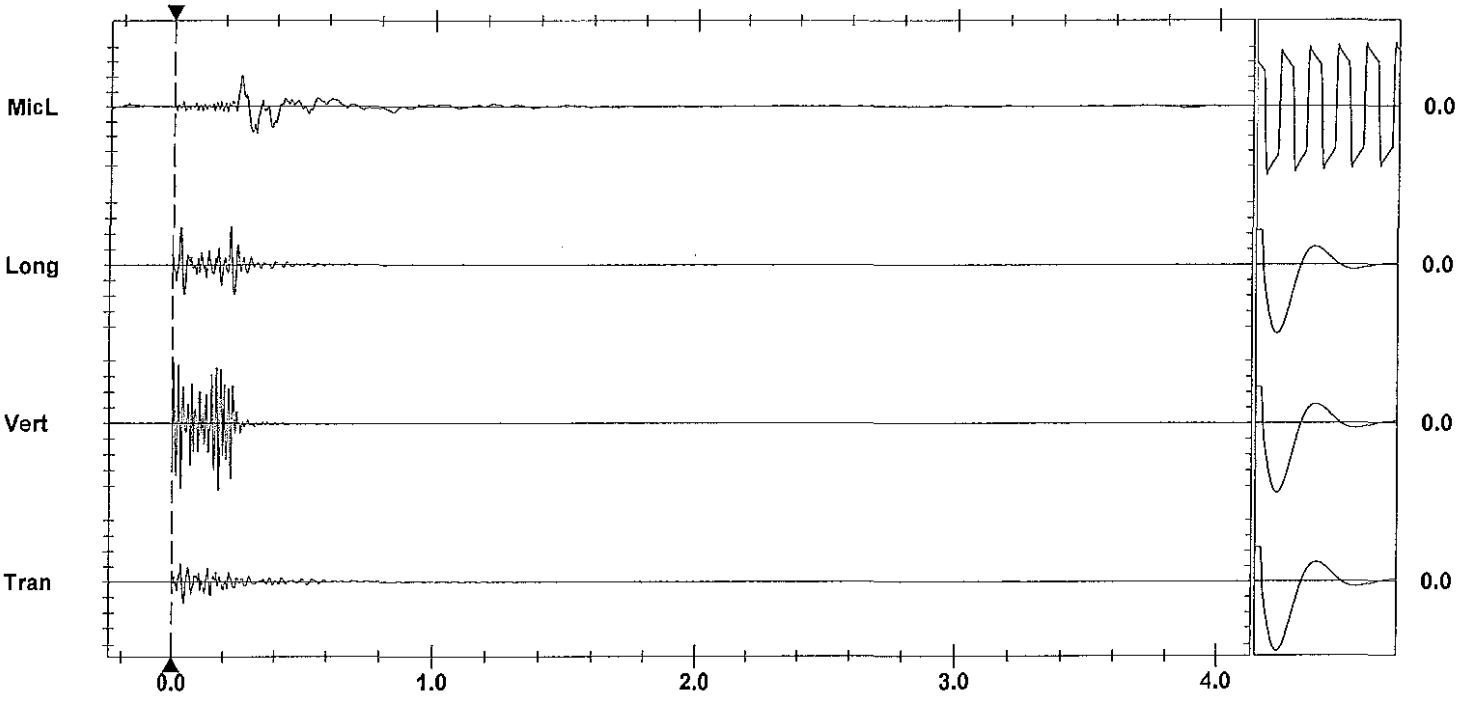
Microphone Linear Weighting
PSPL 0.00210 psi(L) at 0.262 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 622 mv)

	Tran	Vert	Long	
PPV	0.0681	0.214	0.123	in/s
ZC Freq	34	64	39	Hz
Time (Rel. to Trig)	0.047	0.181	0.227	sec
Peak Acceleration	0.0514	0.217	0.0762	g
Peak Displacement	0.00031	0.00056	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.244 in/s at 0.033 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Sensorcheck

Printed: May 6, 2012 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 9/12
ACTUAL BLAST DATE May 8/12 1:16 PM
BLAST # MW-01-91

HIGHWAY# 97
BLAST LOCATION AT: STN 129+34 – 129+40 (th subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
the shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 121 (m)

TOTAL NUMBER OF HOLES 22 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

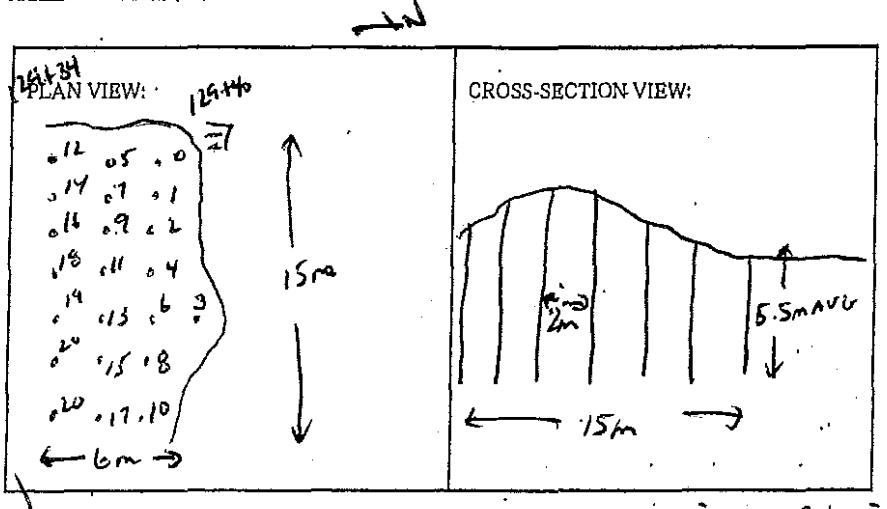
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting LTD

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Siesmograph @ 13167 cliffstone crt - 0.13 ips/43Hz
+ @ 13117 cliffstone crt - 0.22 ips/57Hz

22 POOR. HOLES 10' - 20' Deep.

4' - 10' ANFO PER HOLES

MAX 2 holes per Delay → #20 - 2 HOLES 12' Deep 4' ANFO/H

Instantel

Event Report

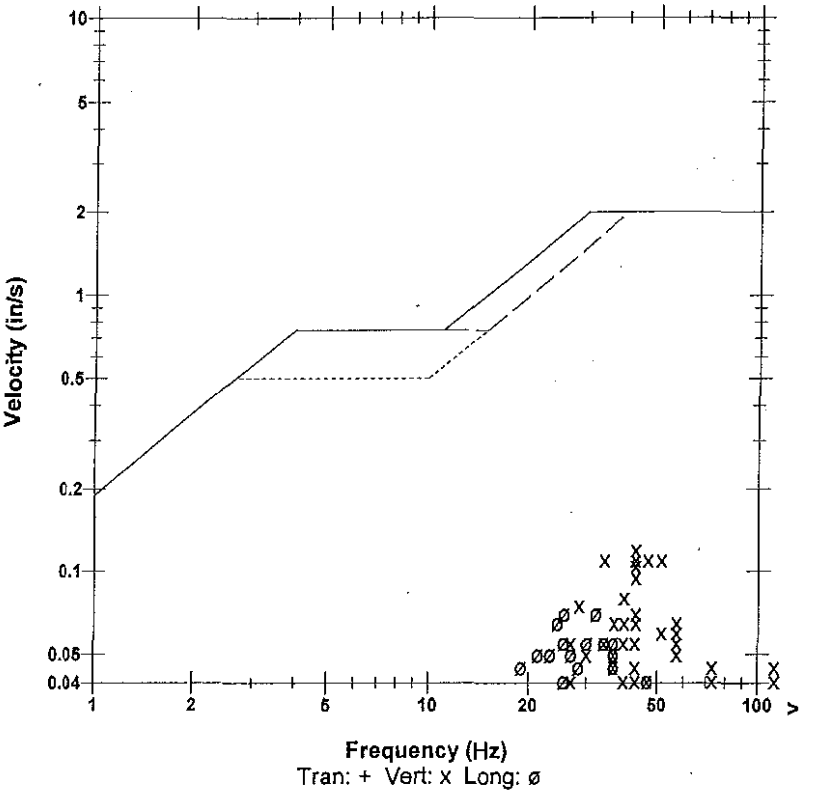
Date/Time	Vert at 13:16:11 May 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9V6.6Z0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

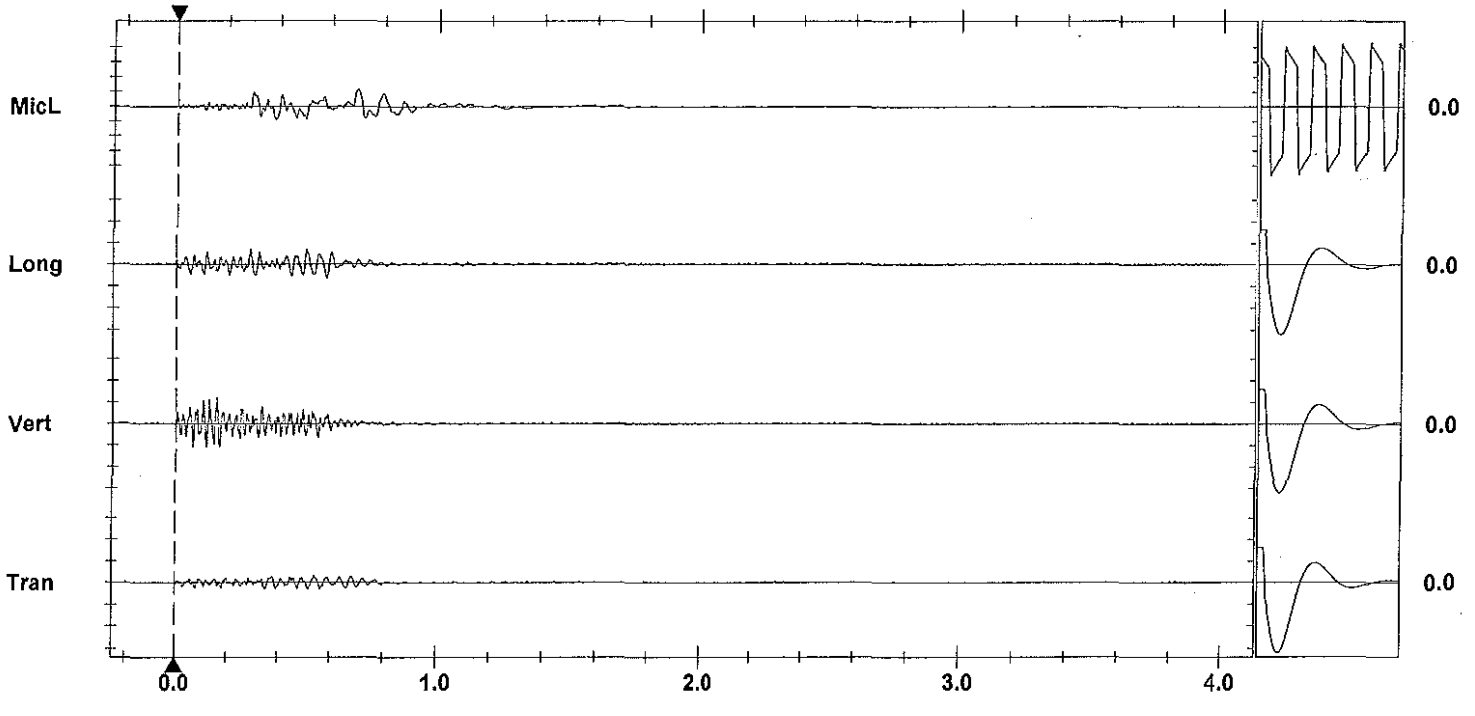
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.694 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 561 mv)

	Tran	Vert	Long	
PPV	0.0300	0.120	0.0700	in/s
ZC Freq	30	43	32	Hz
Time (Rel. to Trig)	0.354	0.161	0.289	sec
Peak Acceleration	0.0265	0.119	0.0530	g
Peak Displacement	0.00021	0.00042	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.123 in/s at 0.120 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger =

Printed: May 20, 2012 (V 8.01 - 8.01)

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Instantel

Event Report

Date/Time	Vert at 13:16:11 May 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9V6.6Z0
Job Number:	1		

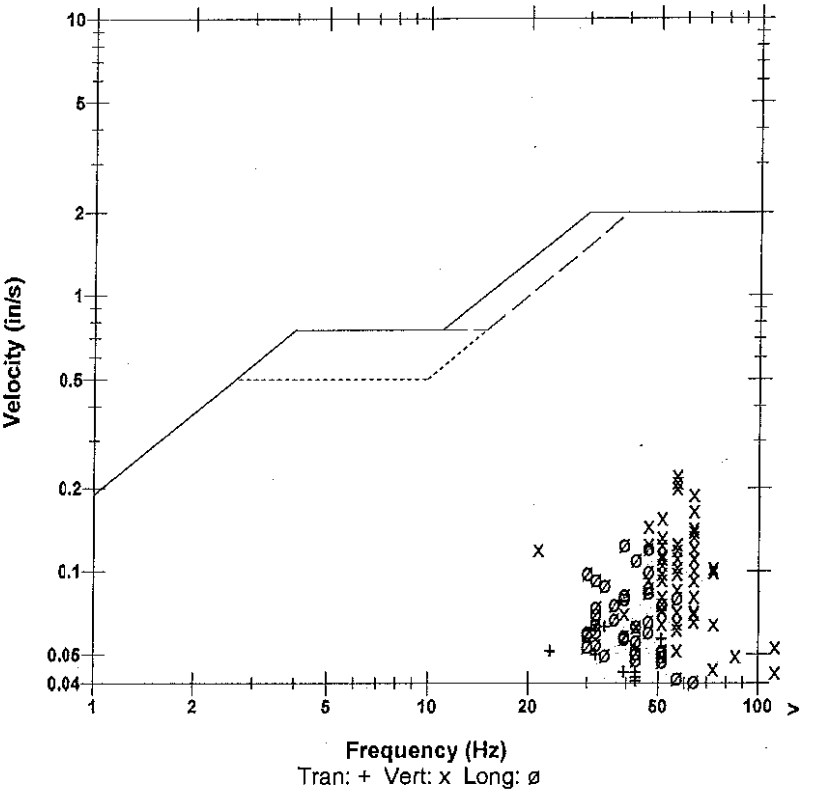
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

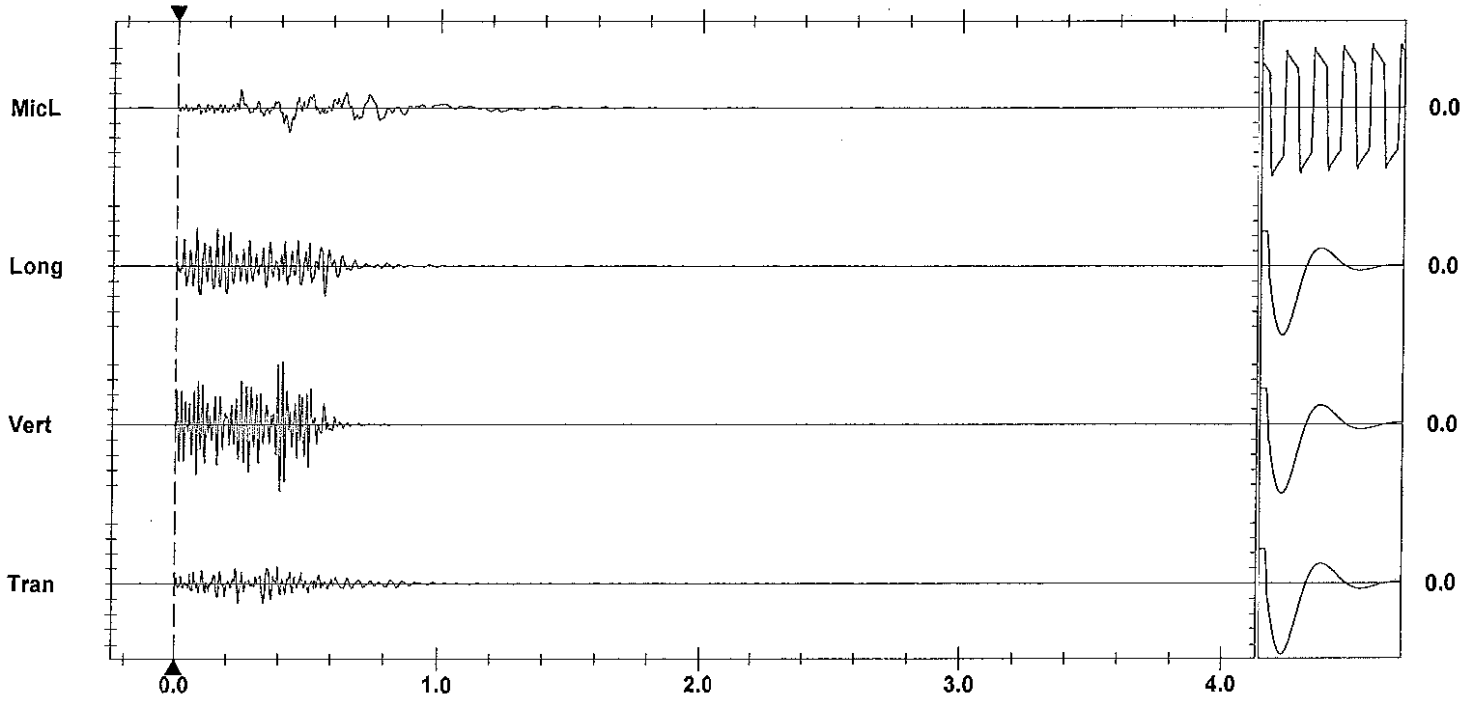
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.432 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.0637	0.222	0.125	in/s
ZC Freq	32	57	39	Hz
Time (Rel. to Trig)	0.344	0.404	0.080	sec
Peak Acceleration	0.0530	0.212	0.0911	g
Peak Displacement	0.00031	0.00063	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.226 in/s at 0.404 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: May 13, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 502489

DATE PREPARED May 9/12
ACTUAL BLAST DATE May 9/12 12:10PM
BLAST # MW-0192

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 - 129+34

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 11 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

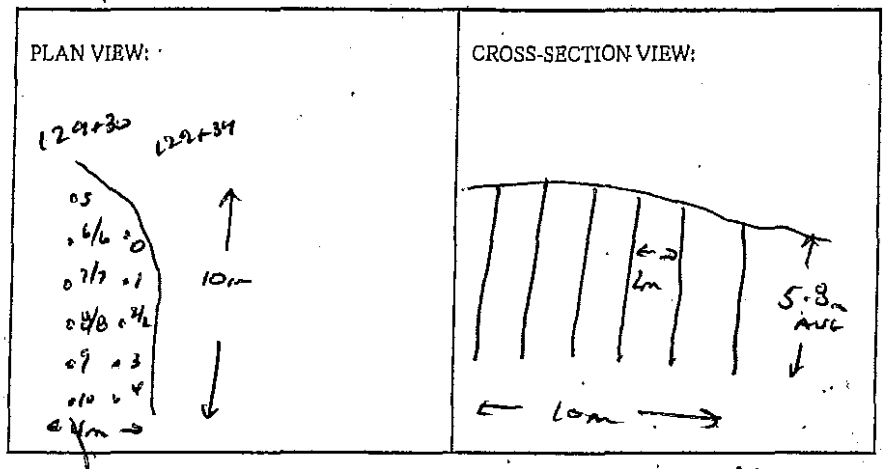
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.16 ips/ 37Hz
" @ 13117 Cliffstone Ct - 0.26 ips/ 57Hz

BOTTOM DECKS - 4'-5' ANFO
TOP DECKS - 3'-4' ANFO
} Primed w/ 1 each 1"x8" DYNAMITE

Instantel

Event Report

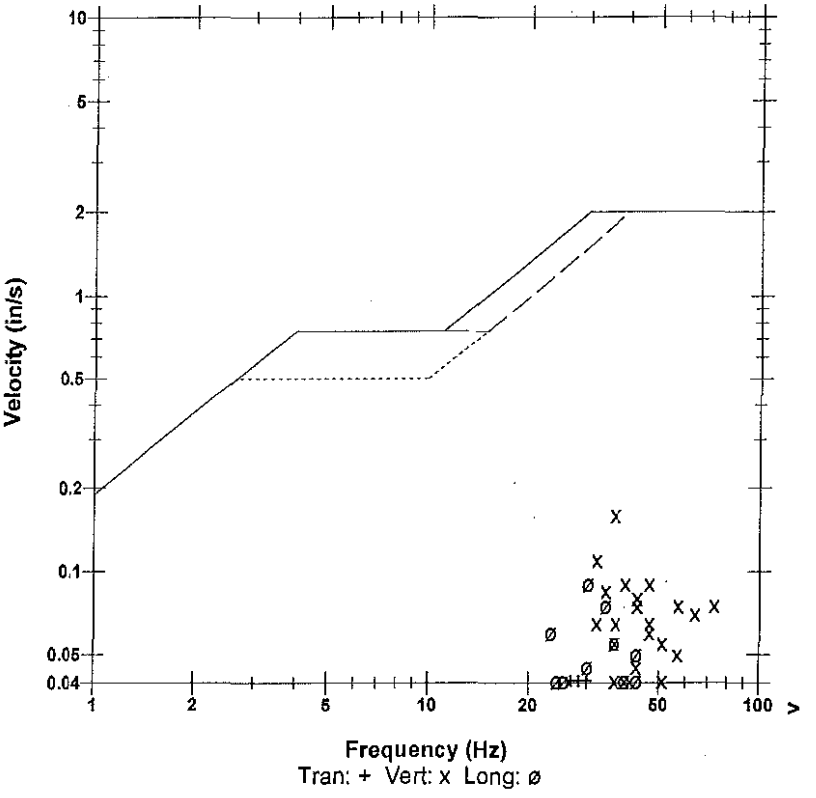
Date/Time	Vert at 12:10:49 May 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9WX.U10

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

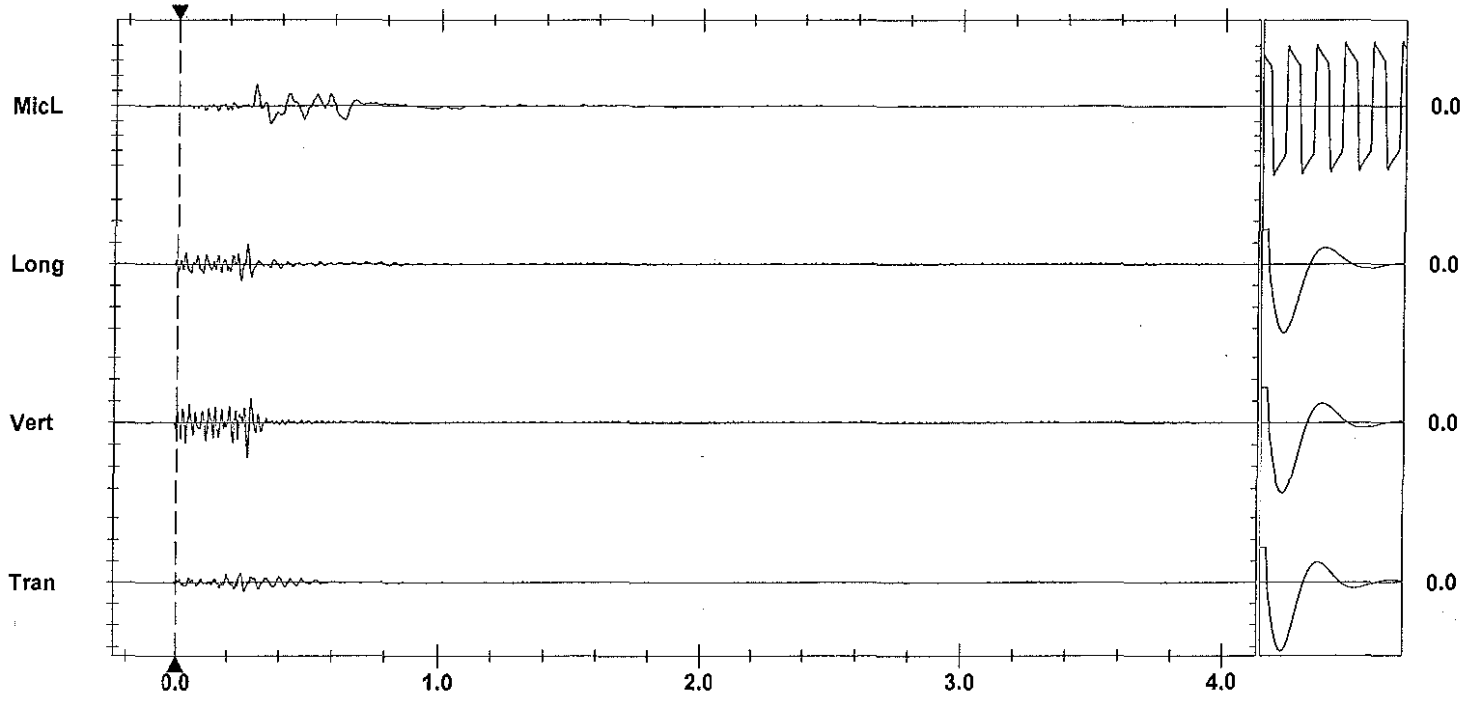
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00141 psi(L) at 0.302 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 598 mv)

	Tran	Vert	Long	
PPV	0.0400	0.160	0.0900	in/s
ZC Freq	30	37	30	Hz
Time (Rel. to Trig)	0.199	0.276	0.275	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00025	0.00064	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	8.1	7.5	7.1	Hz
Overswing Ratio	3.4	3.7	4.3	

Peak Vector Sum 0.182 in/s at 0.276 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: May 20, 2013 04:8:01 -8:04)
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Instantel

Event Report

Date/Time	Vert at 12:10:50 May 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9WX.U20
Job Number:	1		

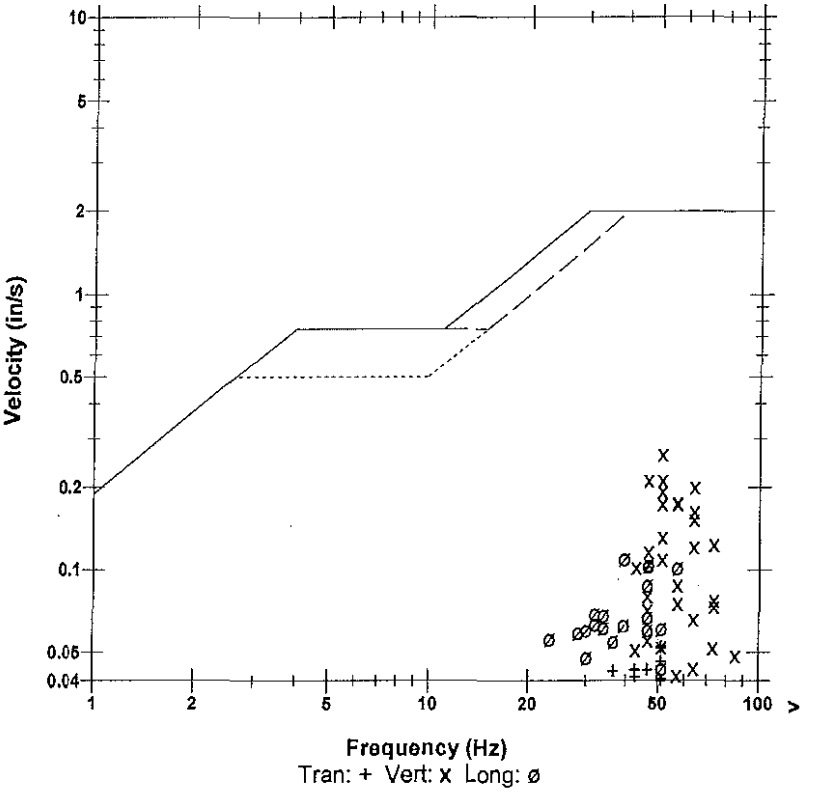
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
Generel:

Extended Notes

Post Event Notes

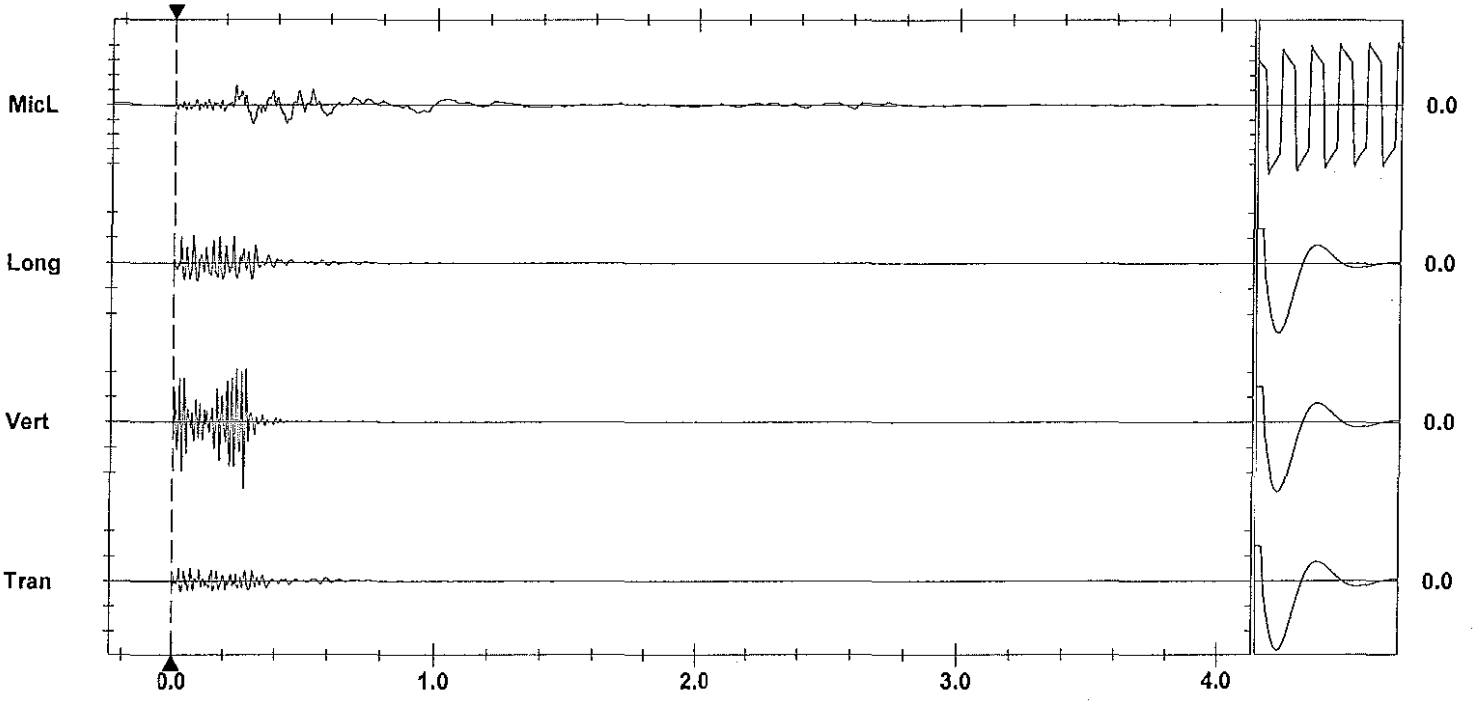
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.237 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 627 mv)

	Tran	Vert	Long	
PPV	0.0525	0.264	0.110	in/s
ZC Freq	51	51	39	Hz
Time (Rel. to Trig)	0.076	0.276	0.079	sec
Peak Acceleration	0.0613	0.232	0.0895	g
Peak Displacement	0.00020	0.00080	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.267 in/s at 0.276 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED May 9/12
ACTUAL BLAST DATE May 9/12
BLAST # MW-0193 2:21 PM

HIGHWAY # 97
BLAST LOCATION AT: SBD 129+30 - 129+34

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot notified

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 72m (m)

TOTAL NUMBER OF HOLES 12 Proj
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

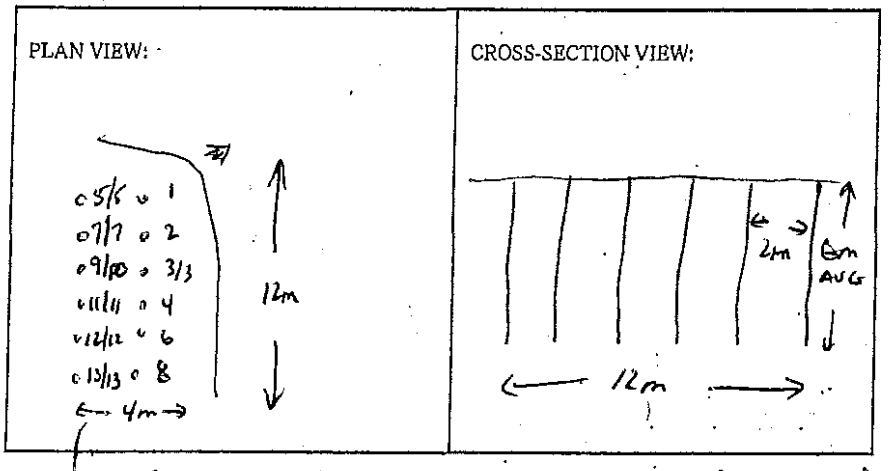
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 cliffstone cut - 0.12 ips / 5Hz
" @ 13117 cliffstone cut - 0.31 ips / 5Hz

Bottom Decks - 4'-5' ANFO
Top Decks - 3'-4' ANFO
} Primed w/1 each 1"x8" Dynamite

Instantel

Event Report

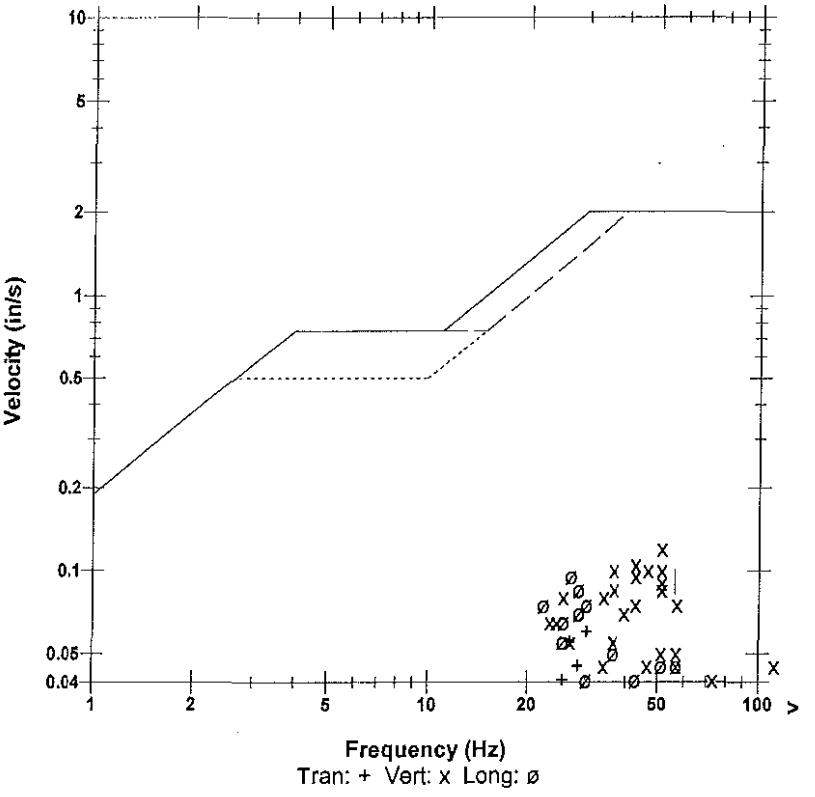
Date/Time	Vert at 14:21:03 May 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9X3.V30

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

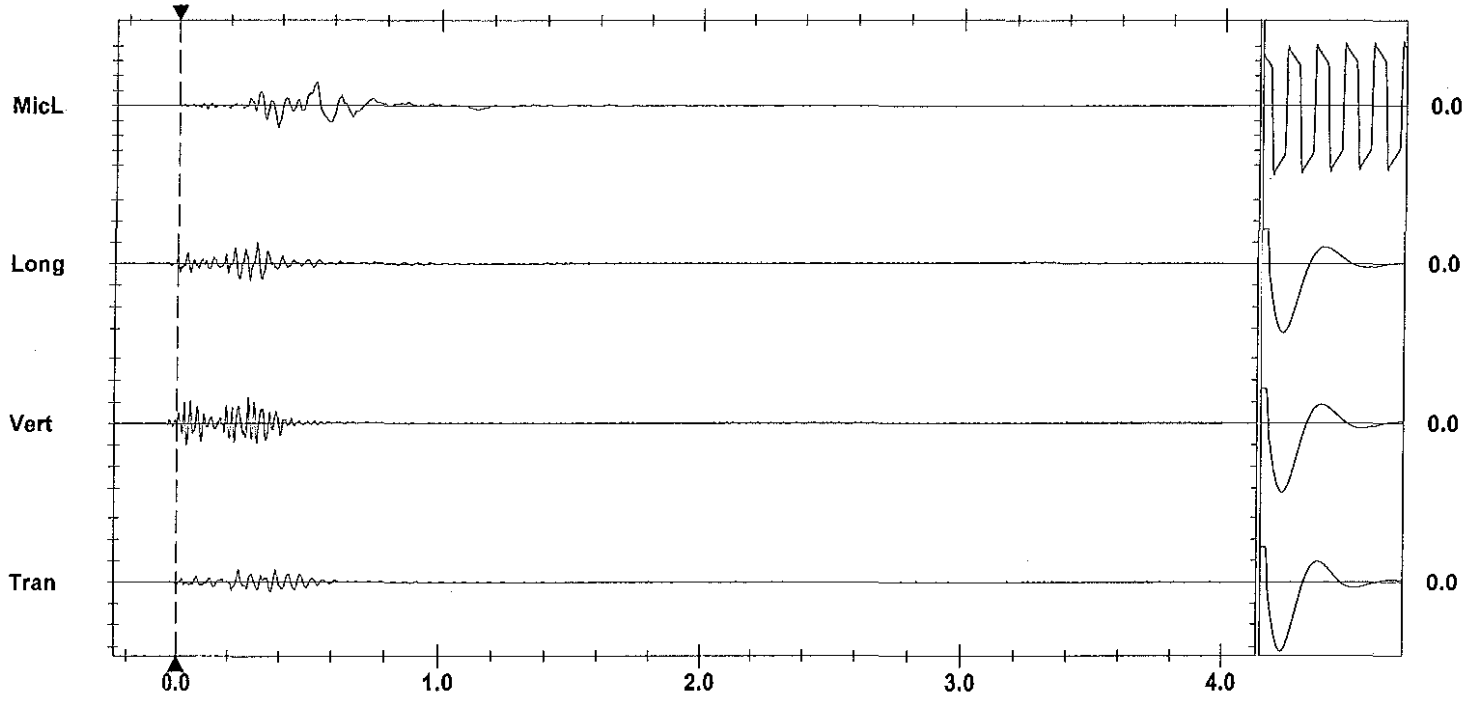
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00156 psi(L) at 0.528 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 573 mv)

	Tran	Vert	Long	
PPV	0.0600	0.120	0.0950	in/s
ZC Freq	30	51	27	Hz
Time (Rel. to Trig)	0.244	0.279	0.310	sec
Peak Acceleration	0.0265	0.106	0.0530	g
Peak Displacement	0.00031	0.00050	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.4	3.7	4.2	

Peak Vector Sum 0.136 in/s at 0.280 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 14:21:04 May 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9X3.V40
Job Number:	1		

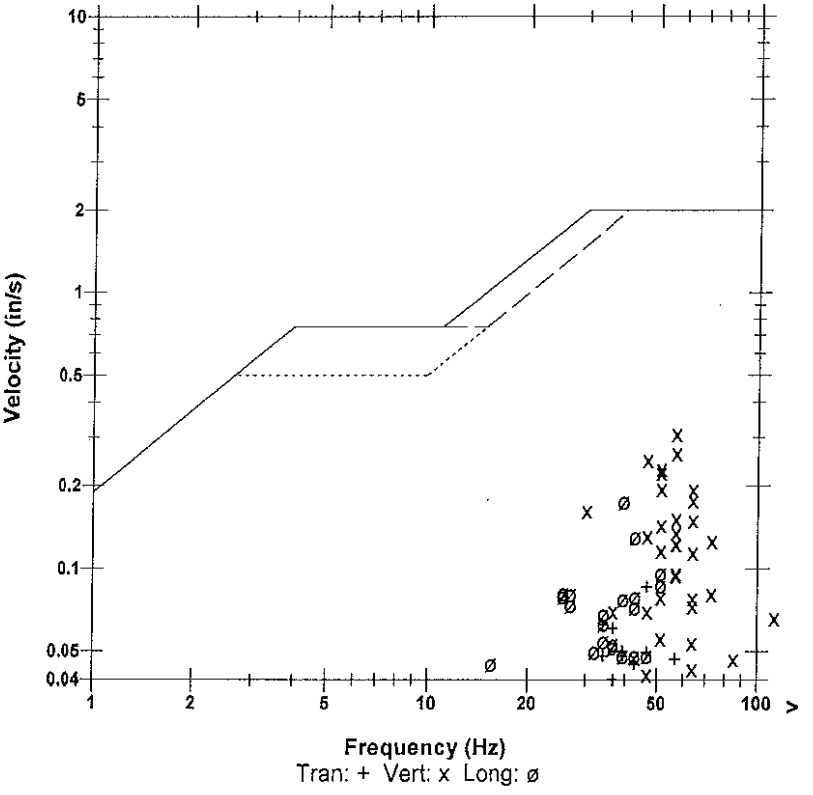
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

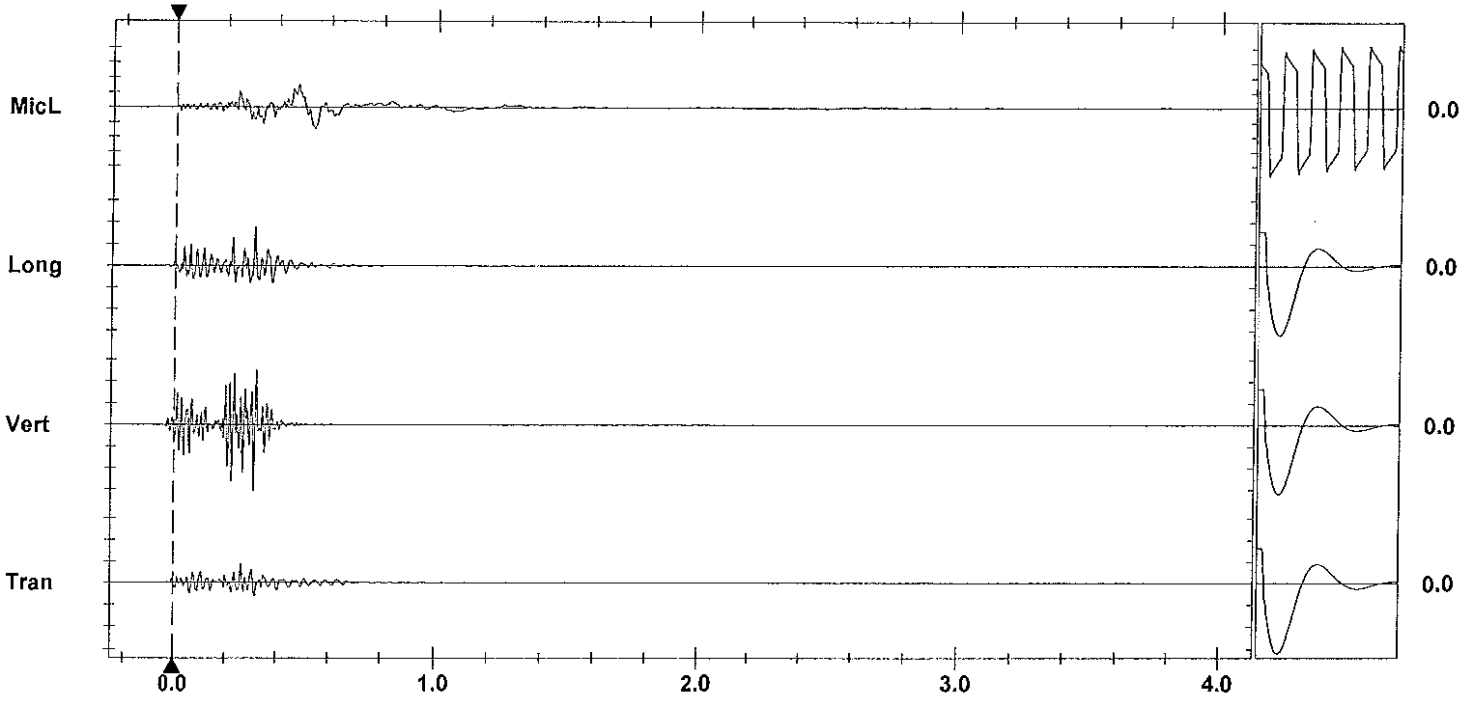
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00152 psi(L) at 0.474 sec
ZC Freq	6.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 605 mv)

	Tran	Vert	Long	
PPV	0.0856	0.309	0.175	in/s
ZC Freq	47	57	39	Hz
Time (Rel. to Trig)	0.265	0.312	0.311	sec
Peak Acceleration	0.0646	0.257	0.108	g
Peak Displacement	0.00029	0.00086	0.00062	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.352 in/s at 0.312 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 10/12
ACTUAL BLAST DATE May 10/12 12:00PM
BLAST # MW-0194

HIGHWAY# 97
BLAST LOCATION AT: 129+065 - 129+140

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.4 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 10 Ahead
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

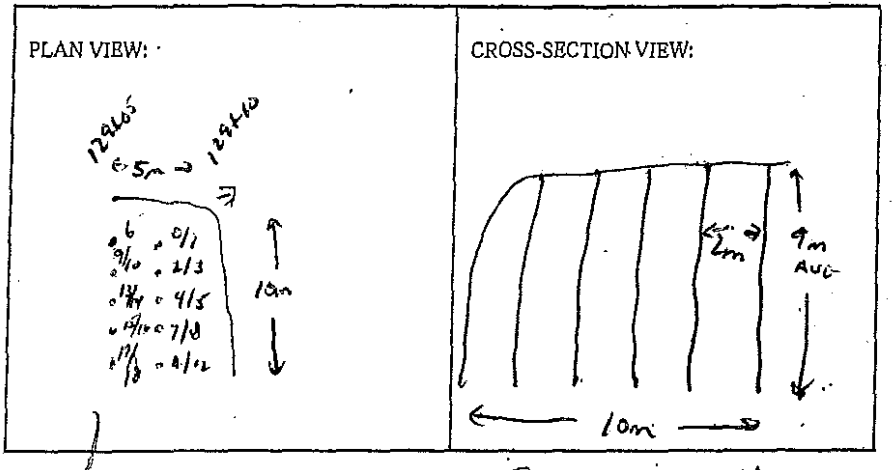
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.13 ips / 39 Hz
Seismograph @ 13117 Cliffstone Crt - 0.26 ips / 57 Hz

10 Perm Holes

- Bottom Deck 6-10' ANFO
- Top Deck 2'-4' ANFO
- Both Decks Primed w/ 1 x 8 Dynamite = 1 Shot.

Instantel®

Event Report

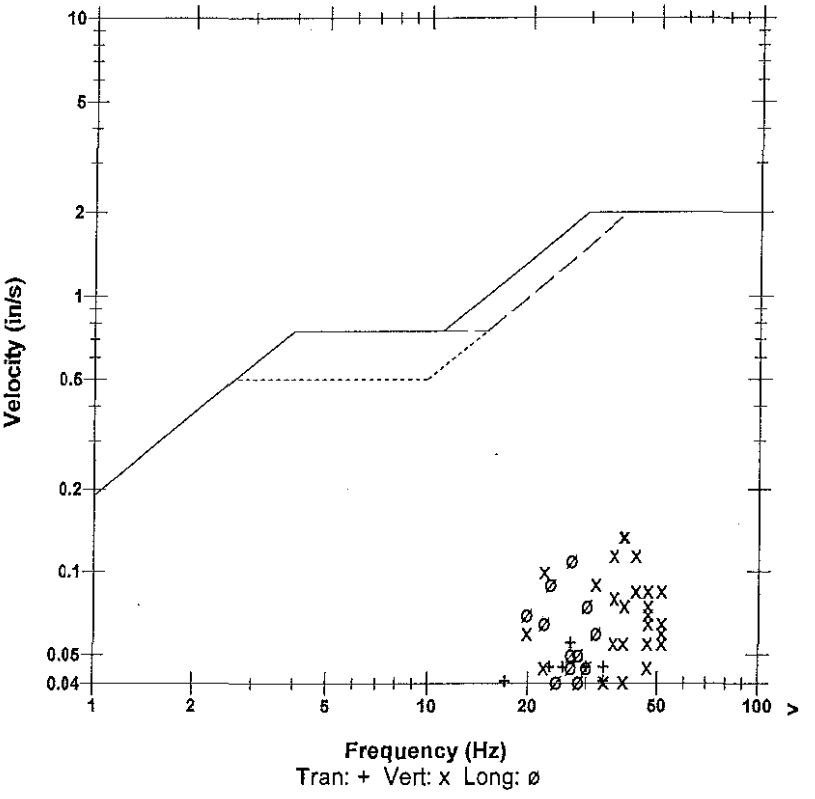
Date/Time	Vert at 12:00:04 May 10, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E9YS.040

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

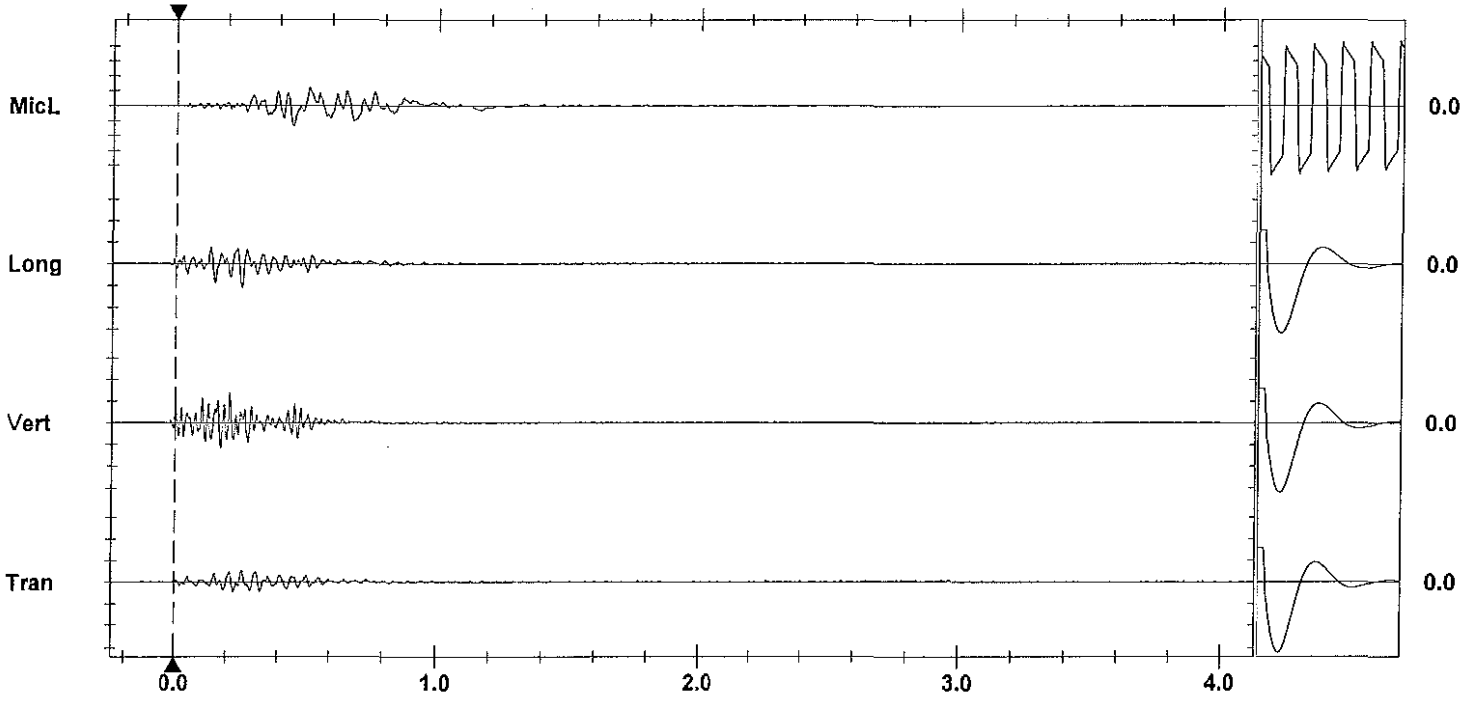
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.449 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 595 mv)

	Tran	Vert	Long	
PPV	0.0550	0.135	0.110	in/s
ZC Freq	27	39	27	Hz
Time (Rel. to Trig)	0.265	0.213	0.260	sec
Peak Acceleration	0.0265	0.0928	0.0530	g
Peak Displacement	0.00035	0.00062	0.00067	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.3	

Peak Vector Sum 0.154 in/s at 0.214 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Event Report

Date/Time	Vert at 12:00:06 May 10, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E9YS.060
Job Number:	1		

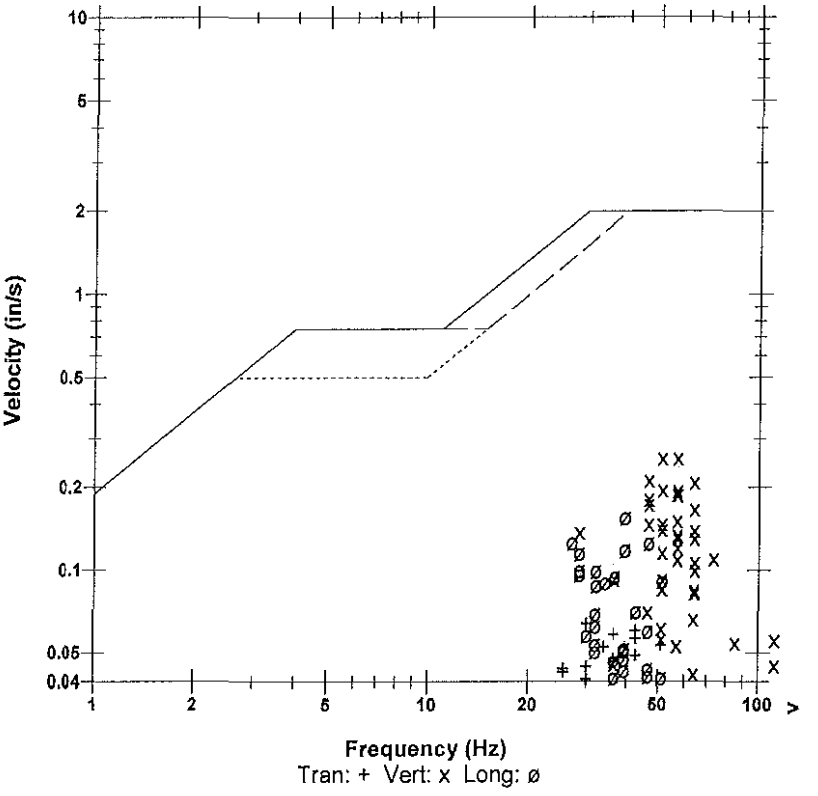
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

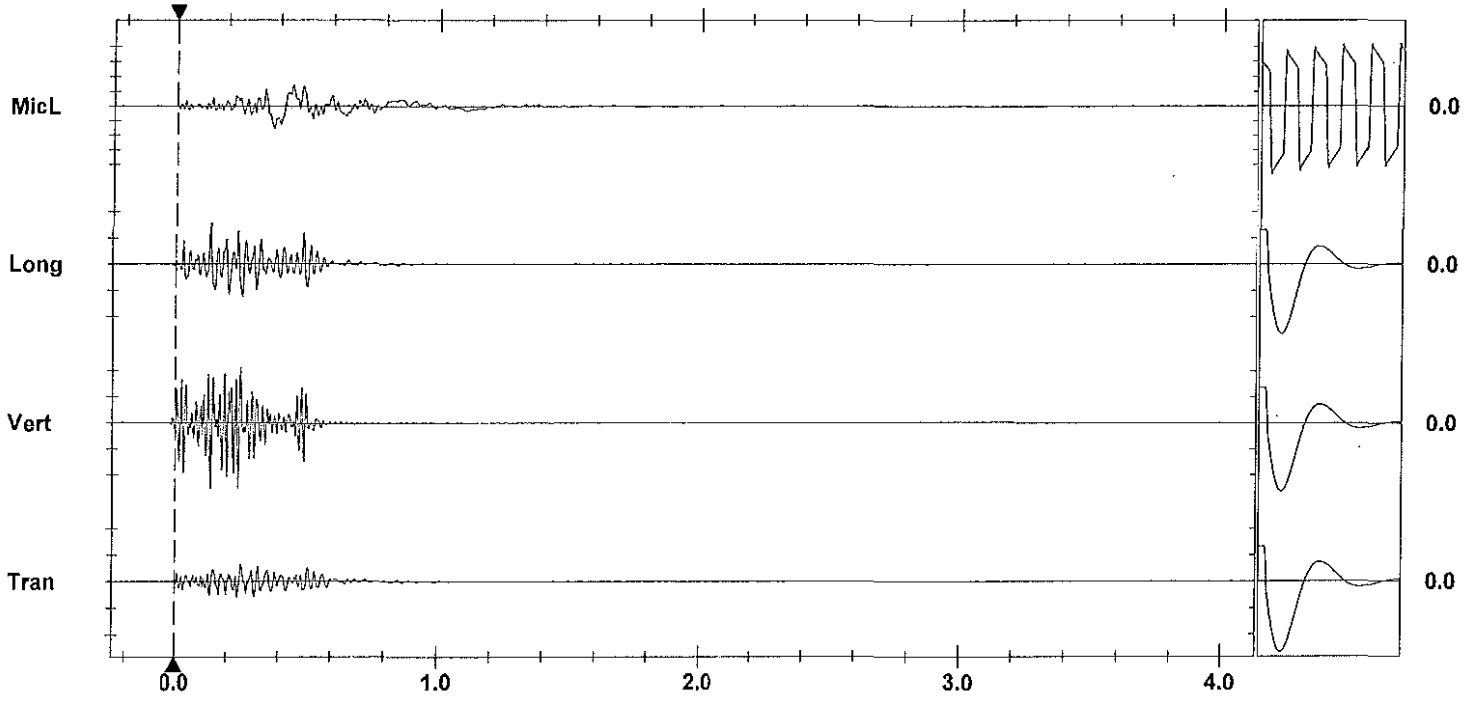
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00152 psi(L) at 0.374 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 620 mv)

	Tran	Vert	Long	
PPV	0.0637	0.256	0.156	in/s
ZC Freq	30	57	39	Hz
Time (Rel. to Trig)	0.259	0.140	0.138	sec
Peak Acceleration	0.0514	0.232	0.0994	g
Peak Displacement	0.00031	0.00075	0.00076	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.289 in/s at 0.139 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 11/12
ACTUAL BLAST DATE MAY 11/12 11:27 AM
BLAST # MUD-0195

HIGHWAY# 97
BLAST LOCATION AT: S→N 129+00-129+05 C/L

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shut matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 9.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.7 (m)
TOTAL DEPTH 92 (m)

TOTAL NUMBER OF HOLES 10/Row
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

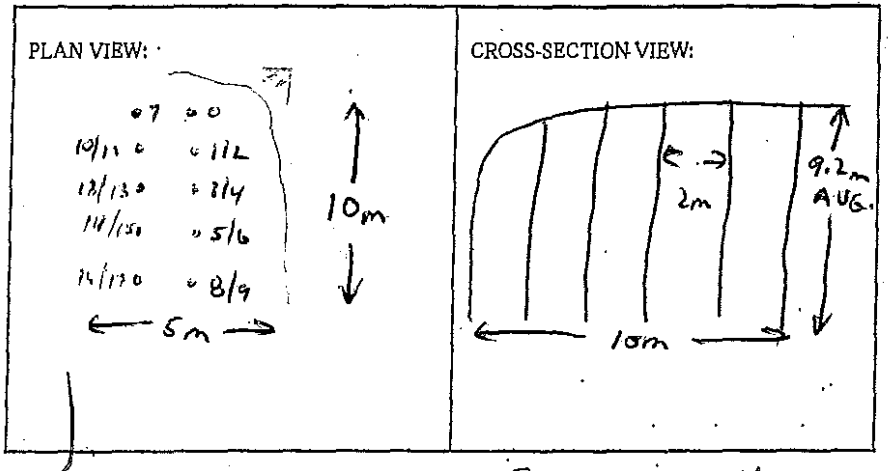
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 190 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.14 ips/39 Hz
" @ 13117 Cliffstone Crt - 0.32 ips/57 Hz

10 Perm. Holes

8 x 2 Decks/Hole ← Top Deck - 1'-5' ANFO
← Bottom Deck - 8'-10' ANFO

2 x Bottom Deck only - 10' ANFO

All Decks Primed w/ 1 Cart. 1"x8" Dynamite

Instantel®

Event Report

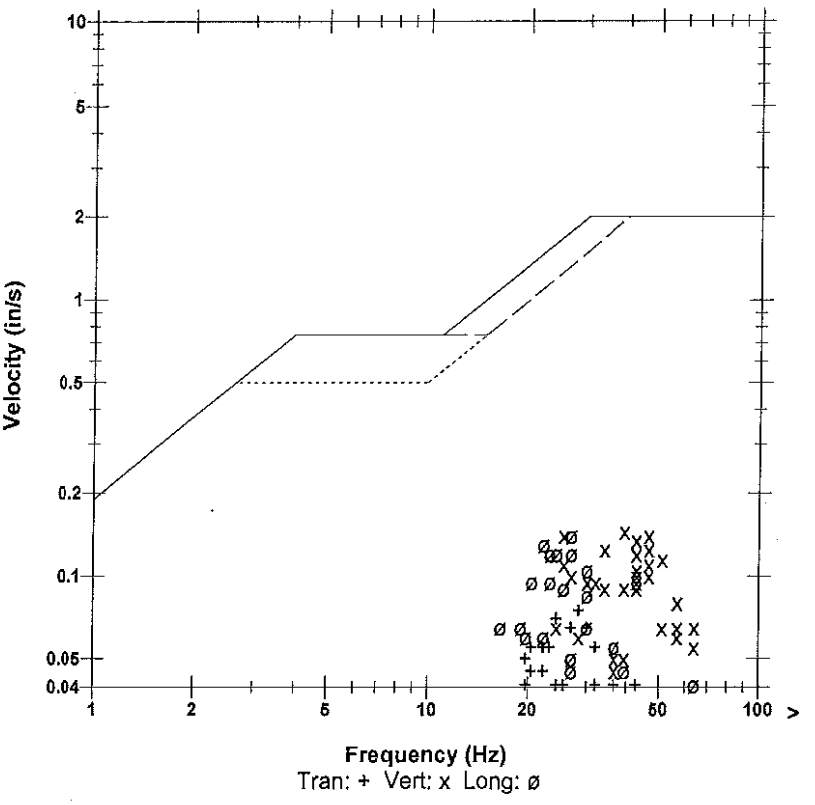
Date/Time	Vert at 11:27:44 May 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	5.9 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA0L.680

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

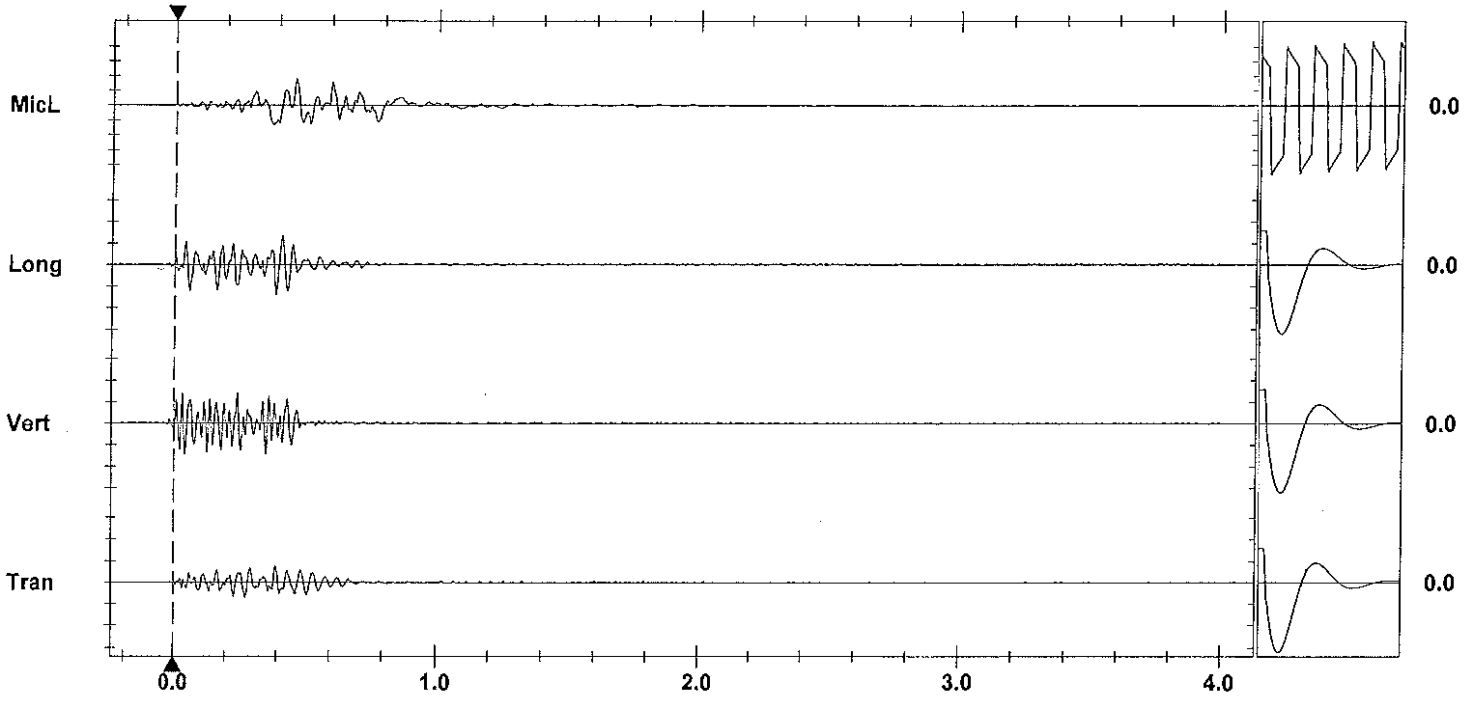
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.462 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 575 mv)

	Tran	Vert	Long	
PPV	0.0750	0.145	0.140	in/s
ZC Freq	28	39	27	Hz
Time (Rel. to Trig)	0.395	0.044	0.393	sec
Peak Acceleration	0.0398	0.119	0.0795	g
Peak Displacement	0.00044	0.00078	0.00089	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.179 in/s at 0.044 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 11:27:47 May 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA0L.6B0
Job Number:	1		

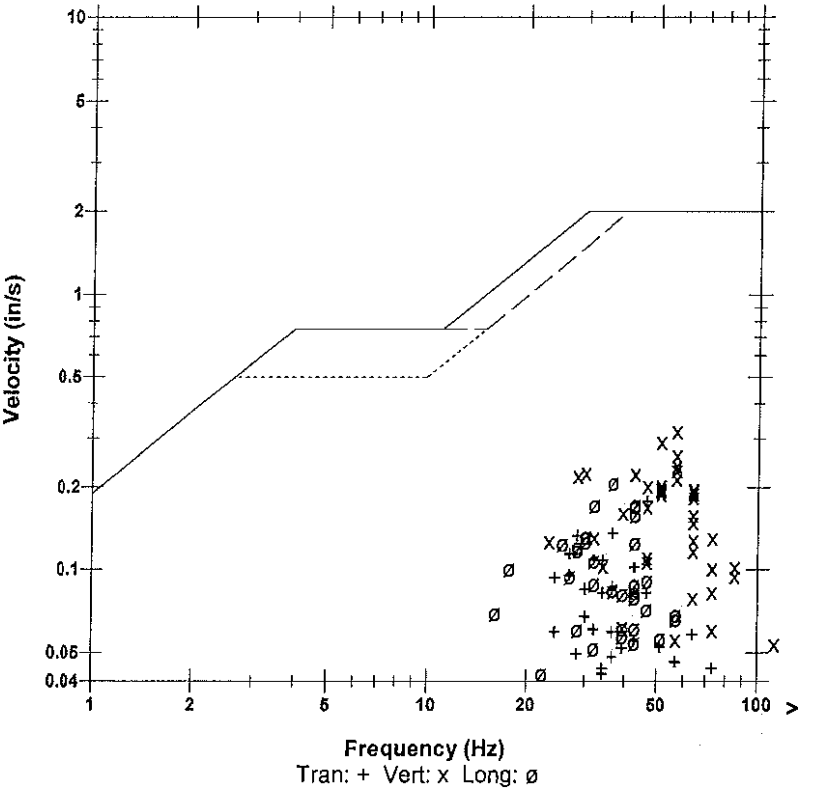
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

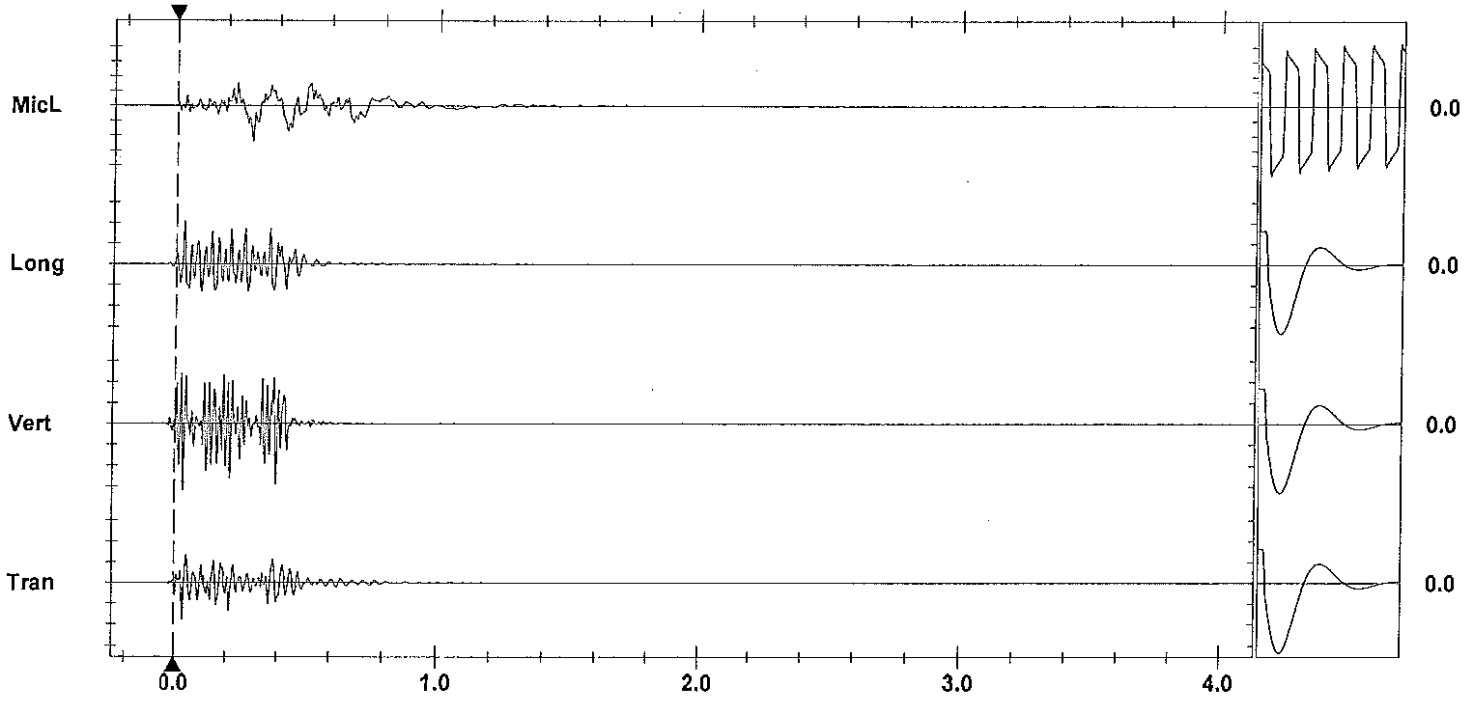


Tran: + Vert: x Long: ø

Microphone	Linear Weighting			
PSPL	0.00243 psi(L) at 0.295 sec			
ZC Freq	7.9 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 602 mv)			

	Tran	Vert	Long	
PPV	0.178	0.319	0.208	in/s
ZC Freq	47	57	37	Hz
Time (Rel. to Trig)	0.034	0.034	0.032	sec
Peak Acceleration	0.162	0.315	0.152	g
Peak Displacement	0.00070	0.00094	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.411 in/s at 0.034 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 14/12
ACTUAL BLAST DATE MAY 14/12 12:05 PM
BLAST # MW-0196

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+45 - 129+00 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shotmelted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 10 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10.5 (m)
TOTAL DEPTH 110 (m)

TOTAL NUMBER OF HOLES 11 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

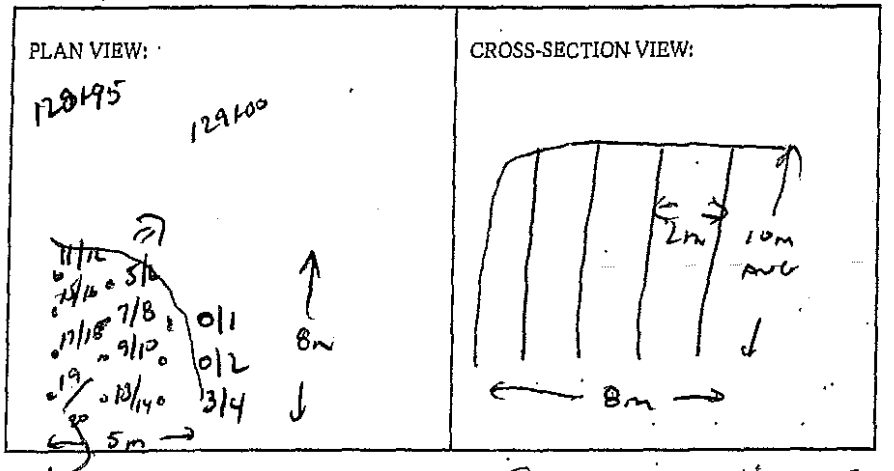
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HIS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crt - 0.29 ips 37Hz
@ 13117 cliffstone crt - 0.32 ips/51Hz

BOTTOM DECK – 8' – 11' AMSL

TOP DECKS – 4' – 6' AMSL

2 ± TOP DECKS OF REMOLD 2' AMSL EACH ±

ALL PRIMED W/ 1 CAN 1X8 DYNAMITE

Instantel®

Event Report

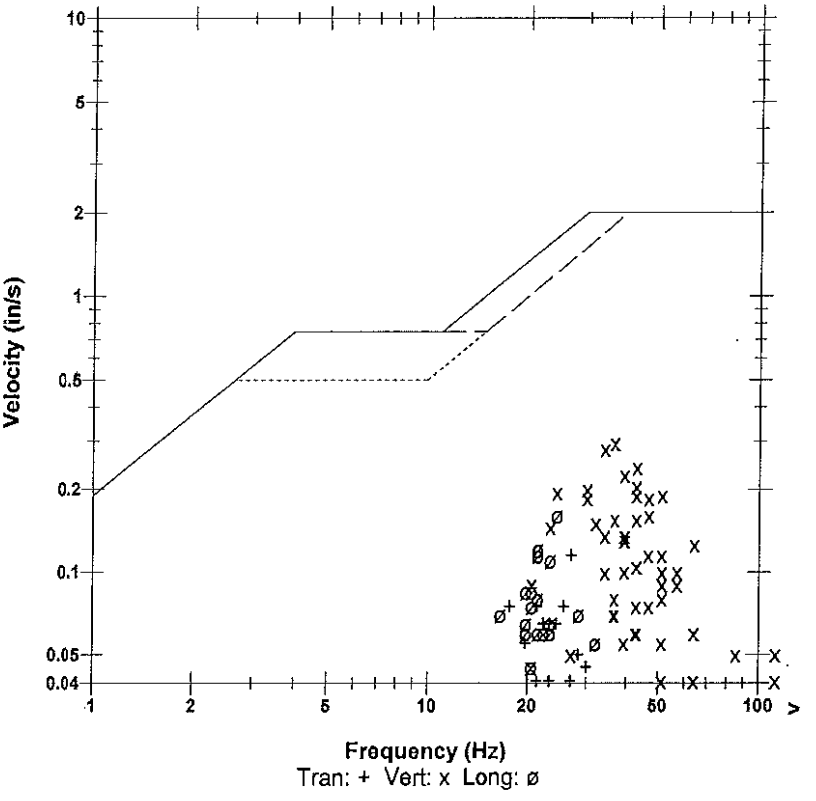
Date/Time	Vert at 12:05:05 May 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA66.WH0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

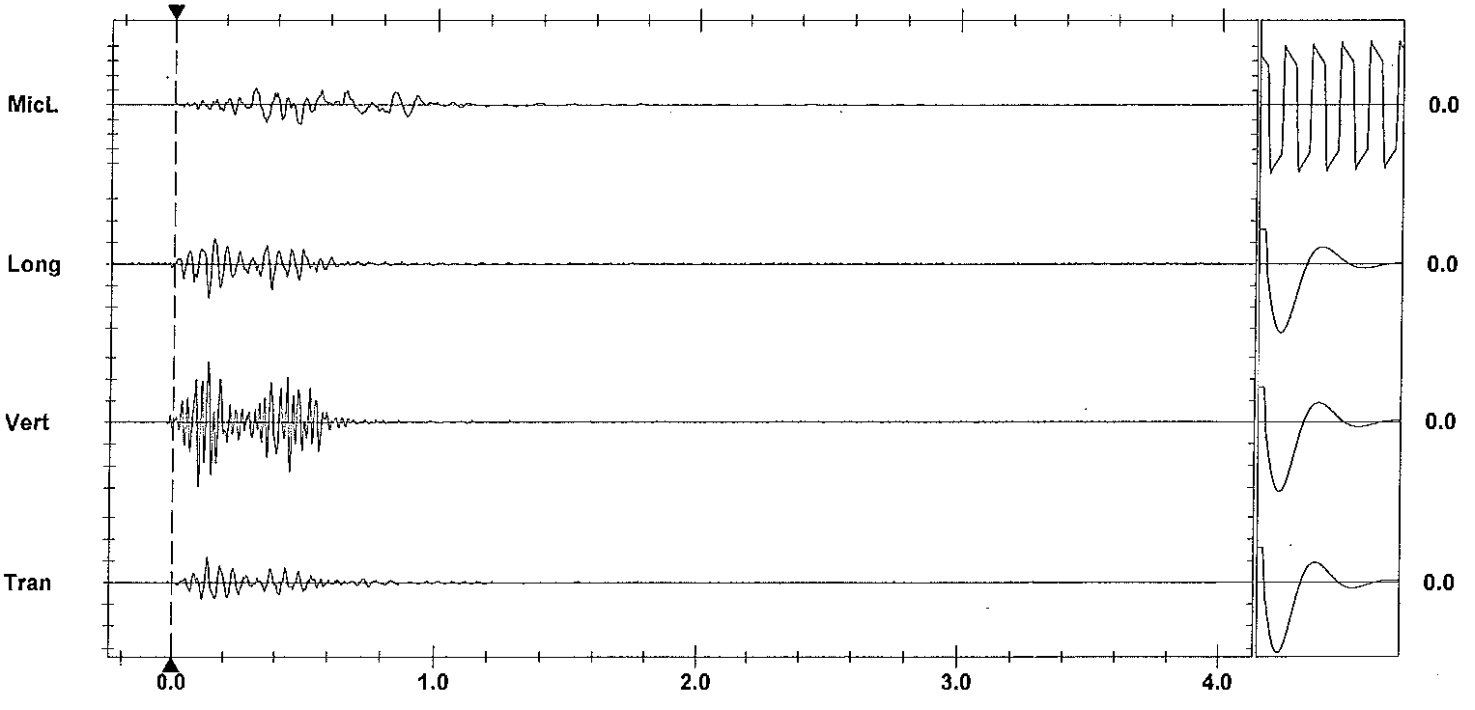
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.484 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 512 mv)

	Tran	Vert	Long	
PPV	0.115	0.295	0.160	in/s
ZC Freq	27	37	24	Hz
Time (Rel. to Trig)	0.140	0.102	0.135	sec
Peak Acceleration	0.0530	0.199	0.0663	g
Peak Displacement	0.00068	0.00136	0.00098	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.329 in/s at 0.138 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 12:05:11 May 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA66.WN0
Job Number:	1		

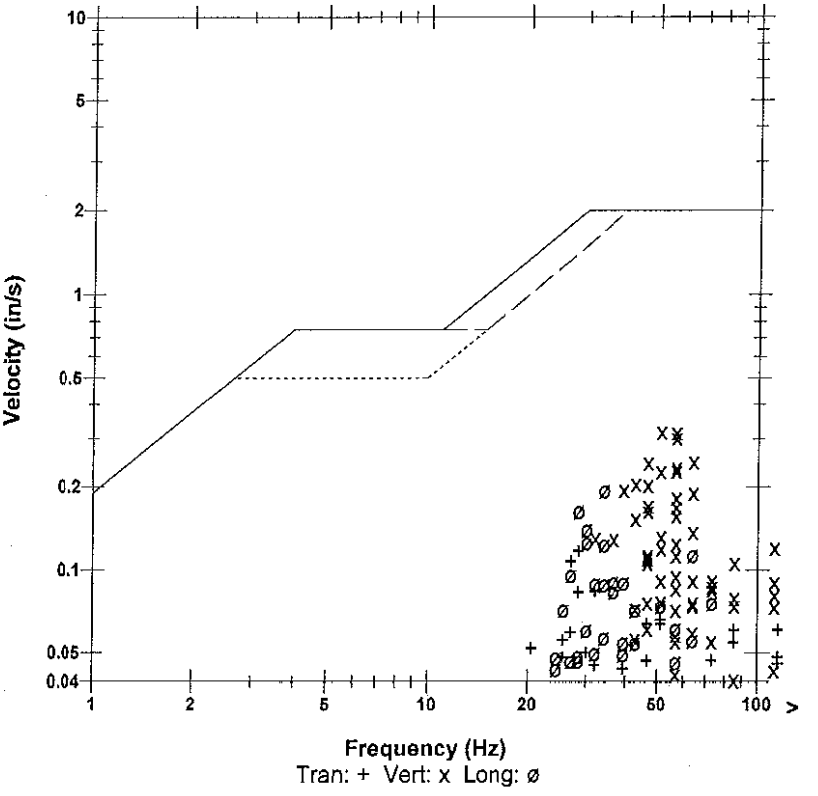
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

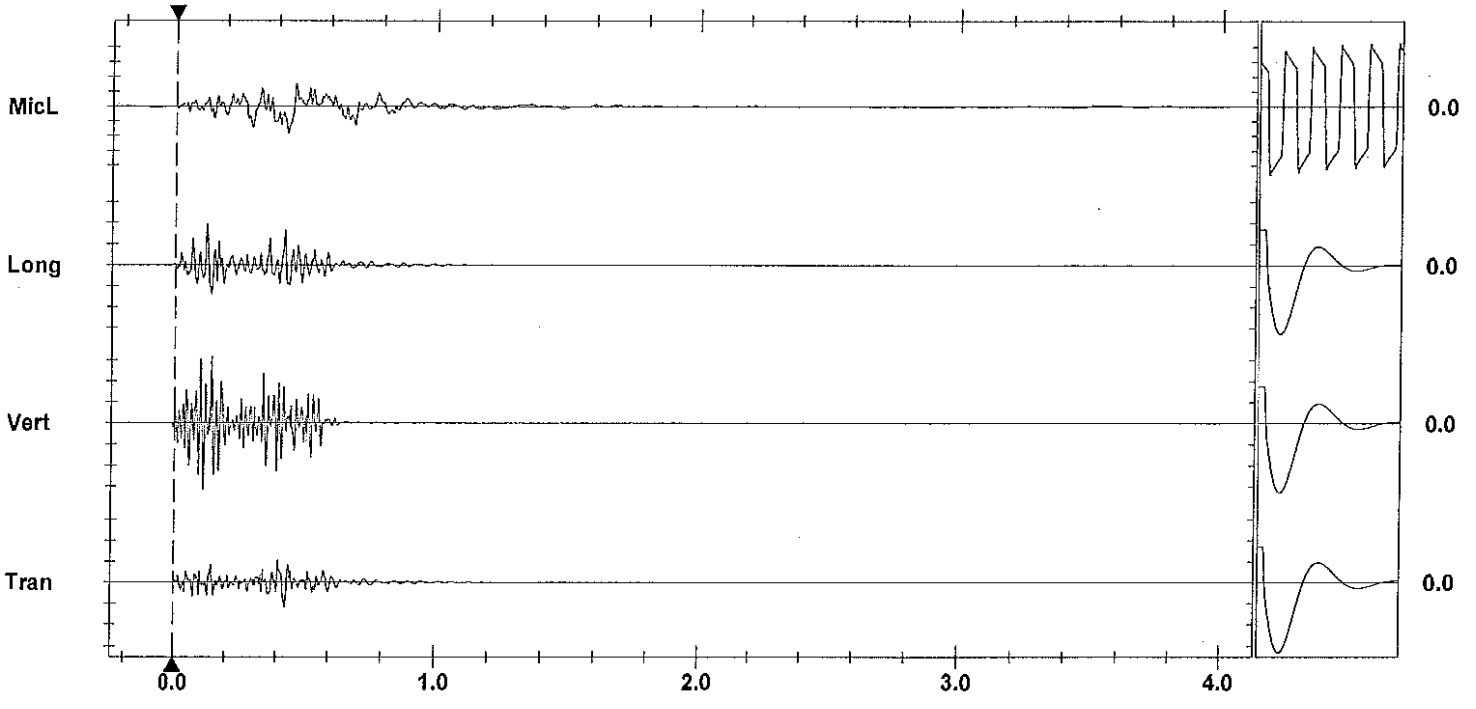
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.436 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 531 mv)

	Tran	Vert	Long	
PPV	0.117	0.319	0.194	in/s
ZC Freq	28	51	34	Hz
Time (Rel. to Trig)	0.434	0.115	0.126	sec
Peak Acceleration	0.109	0.336	0.116	g
Peak Displacement	0.00065	0.00103	0.00079	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.346 in/s at 0.146 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 15/11
ACTUAL BLAST DATE May 15/11 11:12AM
BLAST # MW-0197

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+90 - 128+95 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 10.6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 11.2 (m)
TOTAL DEPTH 116 (m)

TOTAL NUMBER OF HOLES 11 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 (ms)

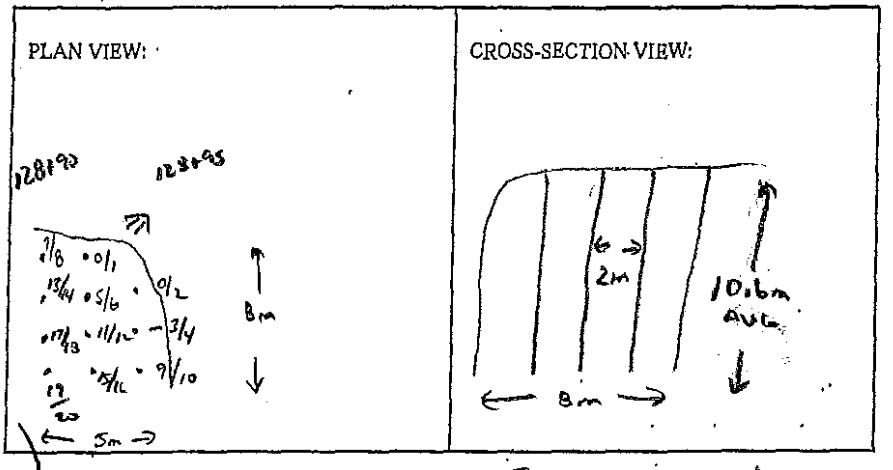
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 425 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ext - 0.26 ppl/32Hz
" @ 13177 cliffstone ext - 0.401 ppl/57Hz

BOTTOM DECK - 10'-13' AMFO

TOP DECK - 3-8' AMFO

BOTH DECKS PRIMED W/ 1 CHEAP IVH DYNAMITE

* TOP DECKS ON PERIOD 'D' WERE 2' AMFO EACH *

Instantel

Event Report

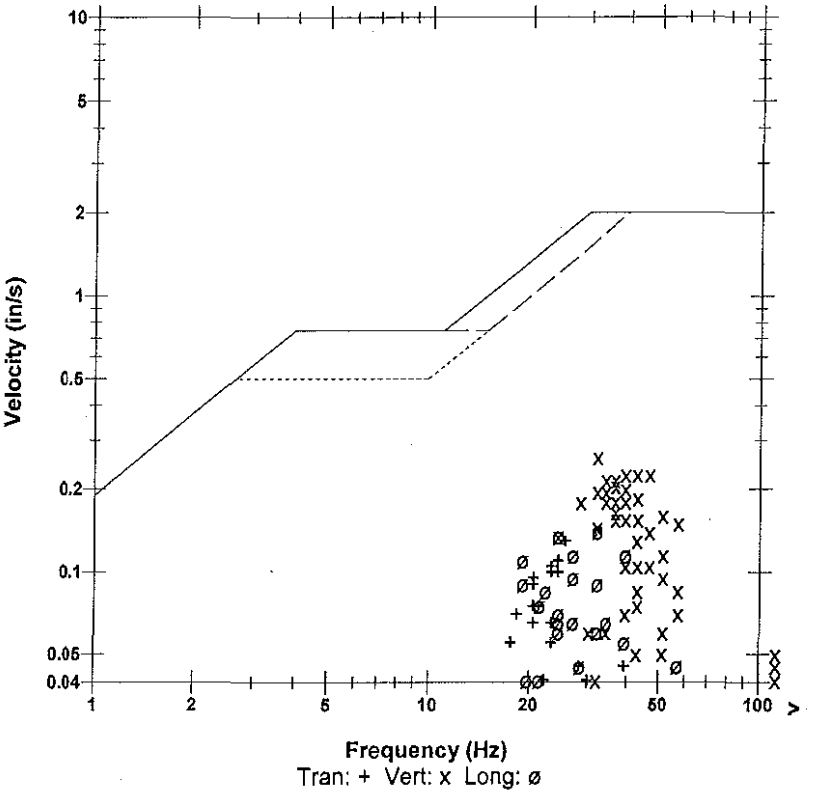
Date/Time	Vert at 11:12:17 May 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA7Z.4H0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

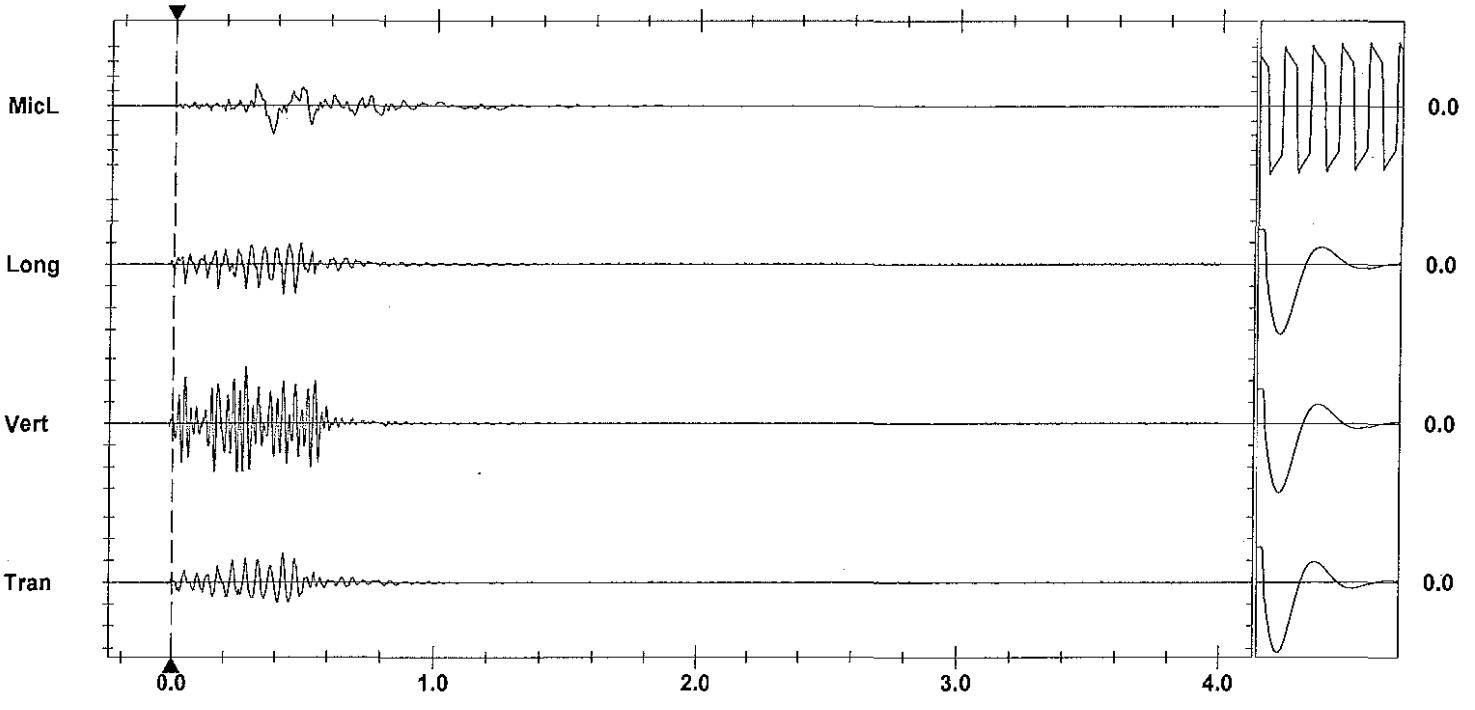
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.379 sec
ZC Freq	7.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.130	0.260	0.140	in/s
ZC Freq	26	32	32	Hz
Time (Rel. to Trig)	0.430	0.284	0.426	sec
Peak Acceleration	0.0530	0.199	0.0795	g
Peak Displacement	0.00077	0.00131	0.00078	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.287 in/s at 0.284 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:12:24 May 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA7Z.4O0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

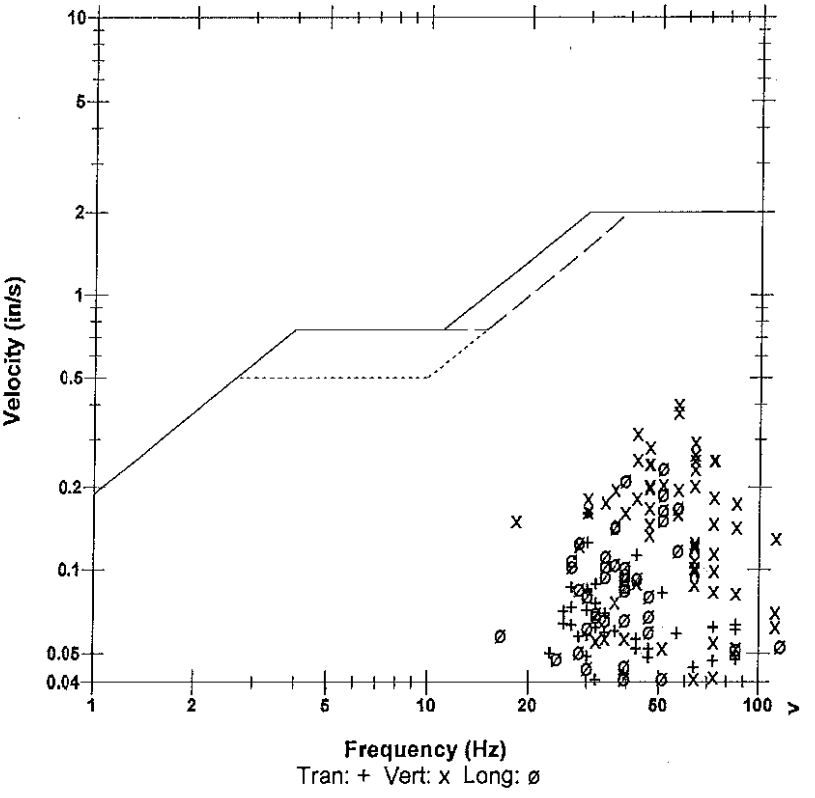
Post Event Notes

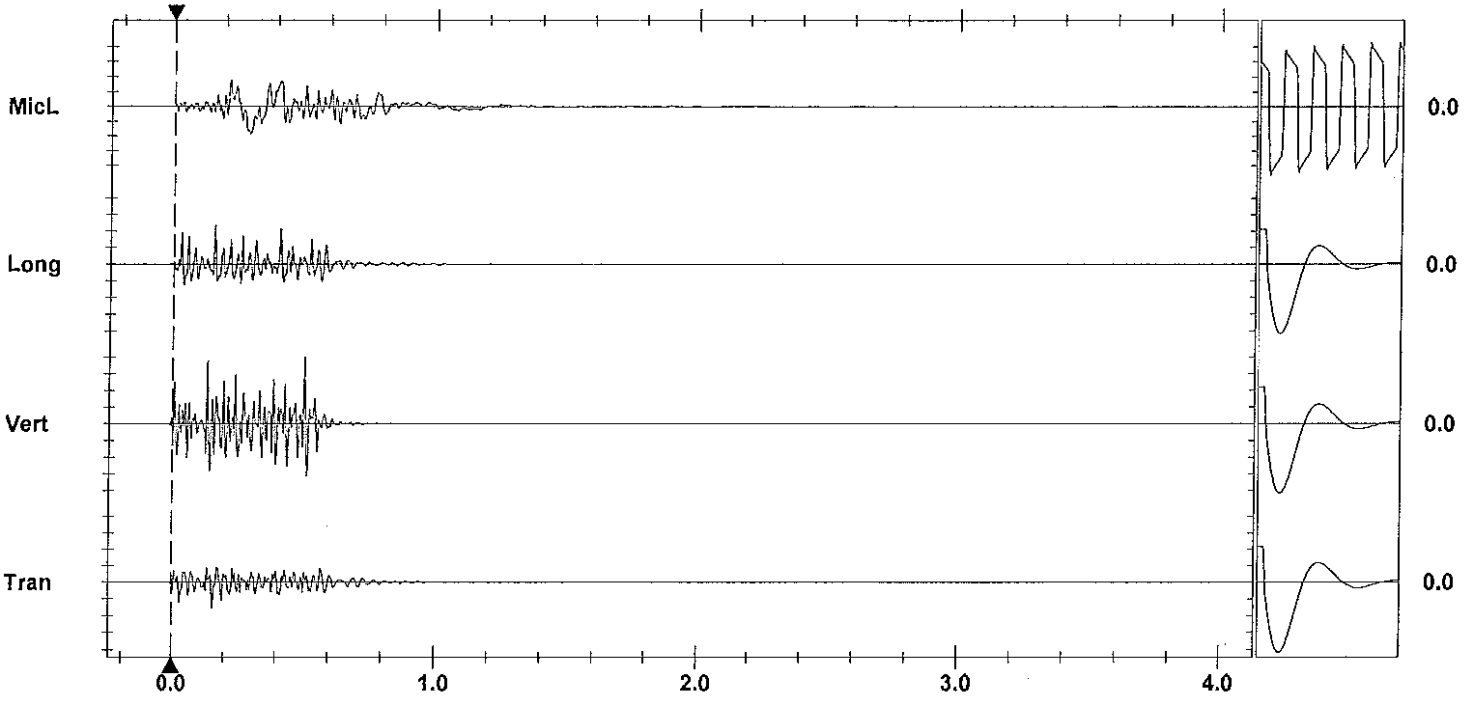
Microphone Linear Weighting
PSPL 0.00189 psi(L) at 0.291 sec
ZC Freq 7.2 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 508 mv)

	Tran	Vert	Long	
PPV	0.161	0.402	0.236	in/s
ZC Freq	30	57	51	Hz
Time (Rel. to Trig)	0.160	0.509	0.160	sec
Peak Acceleration	0.103	0.336	0.182	g
Peak Displacement	0.00055	0.00115	0.00072	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.403 in/s at 0.509 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: May 20, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 15/12
ACTUAL BLAST DATE May 15/12 2:12 PM
BLAST # MW-0198

HIGHWAY# 97
BLAST LOCATION AT: 128+90 - 128+95

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 35 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 94 (m)

TOTAL NUMBER OF HOLES 10 Per o.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 240 mm
TOTAL WEIGHT 180 (kg)
DELAY TYPE AND LENGTH 25 (ms)

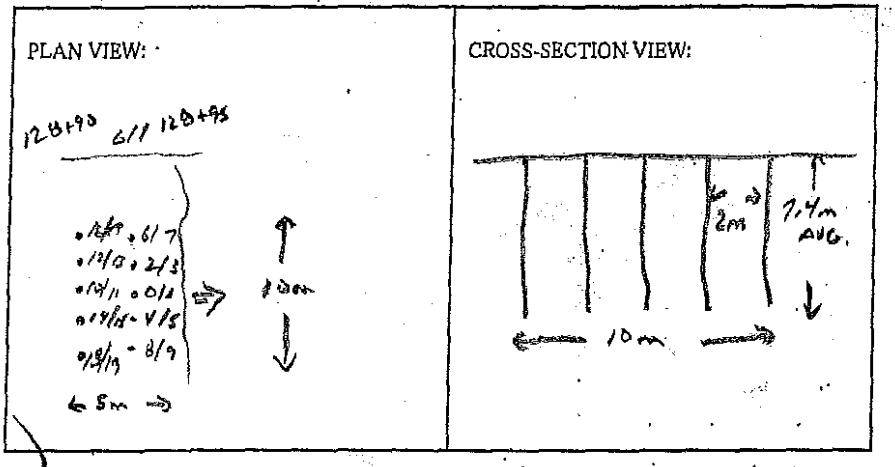
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13/67 Cliffstone Cut - 0.19 ips / 34 Hz
@ 13/11 Cliffstone Cut - 0.67 ips / 73 Hz

BOTTOM DECK - 8'-11' ANFO

TOP DECKS - 4'-7' ANFO

BOTH DECKS PRIMED WITH 1 CART 1KB DYNAMITE

Instantel

Event Report

Date/Time	Vert at 14:18:33 May 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA87.QX0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

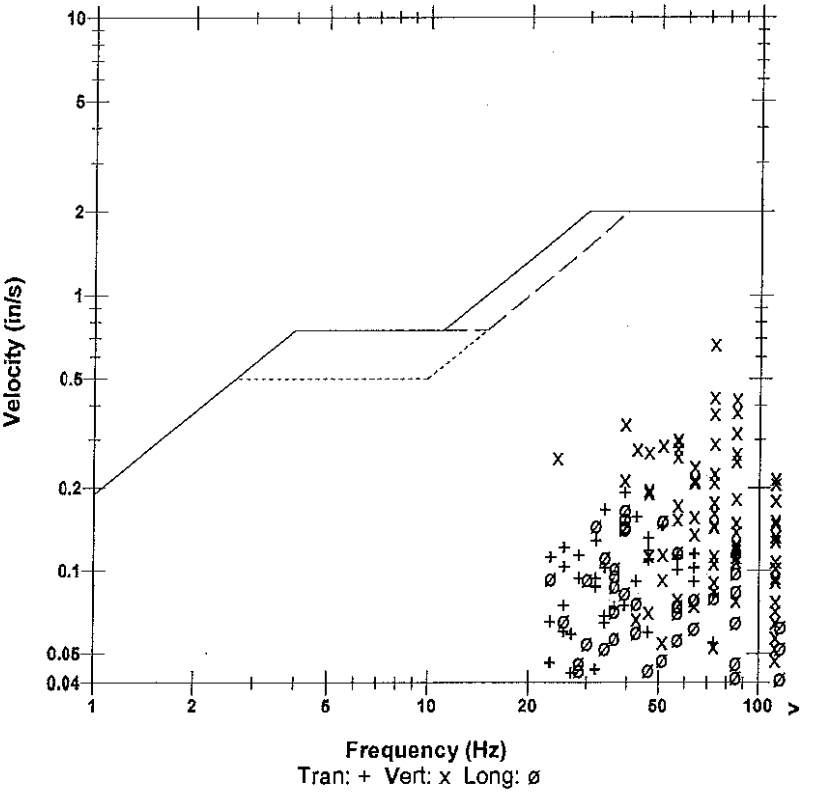
Post Event Notes

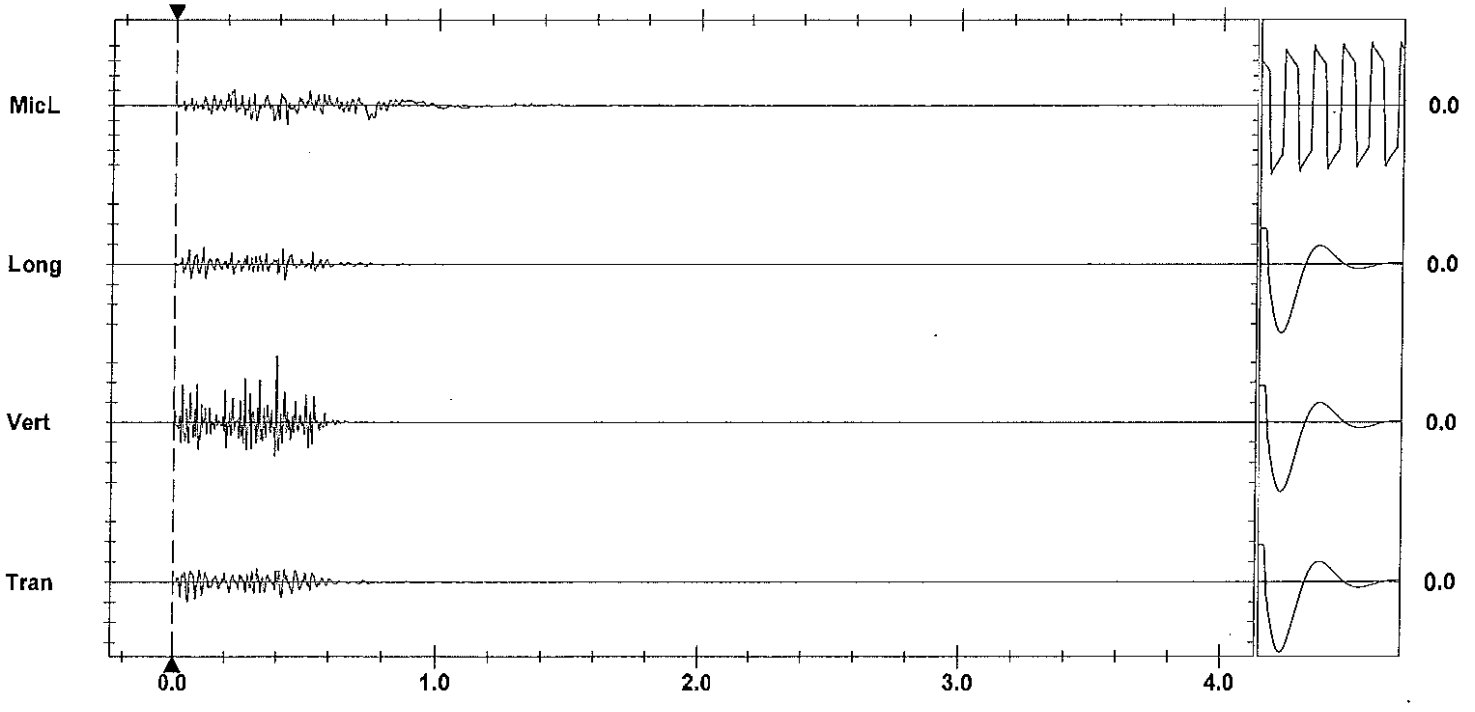
Microphone Linear Weighting
PSPL 0.00127 psi(L) at 0.429 sec
ZC Freq 51 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 498 mv)

	Tran	Vert	Long	
PPV	0.192	0.669	0.166	in/s
ZC Freq	39	73	39	Hz
Time (Rel. to Trig)	0.059	0.397	0.110	sec
Peak Acceleration	0.159	0.708	0.166	g
Peak Displacement	0.00077	0.00124	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.677 in/s at 0.397 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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Instantel

Event Report

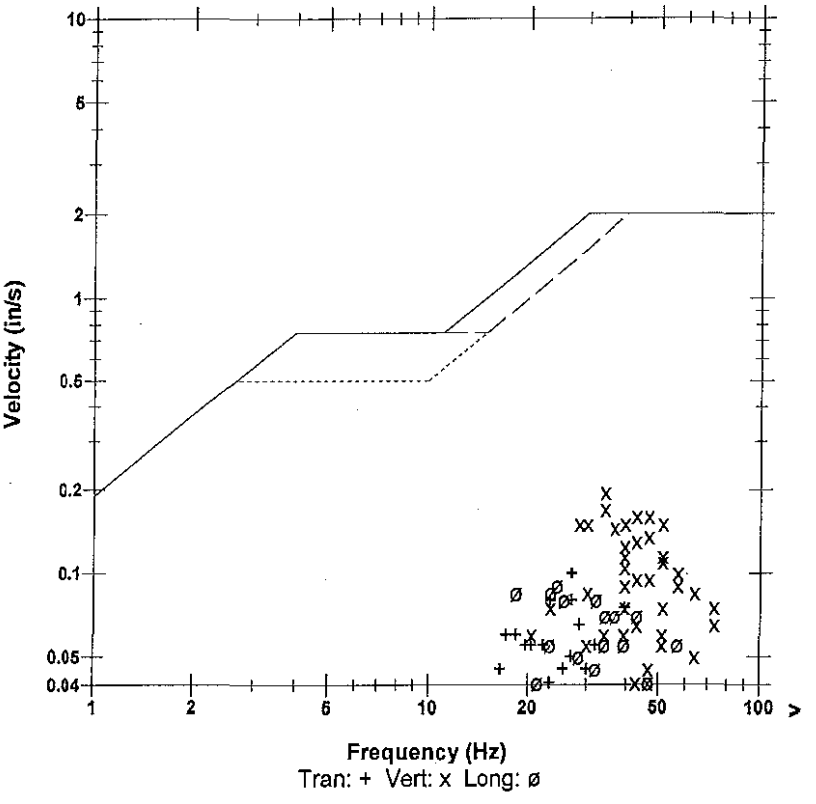
Date/Time	Vert at 14:18:26 May 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA87.QQ0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

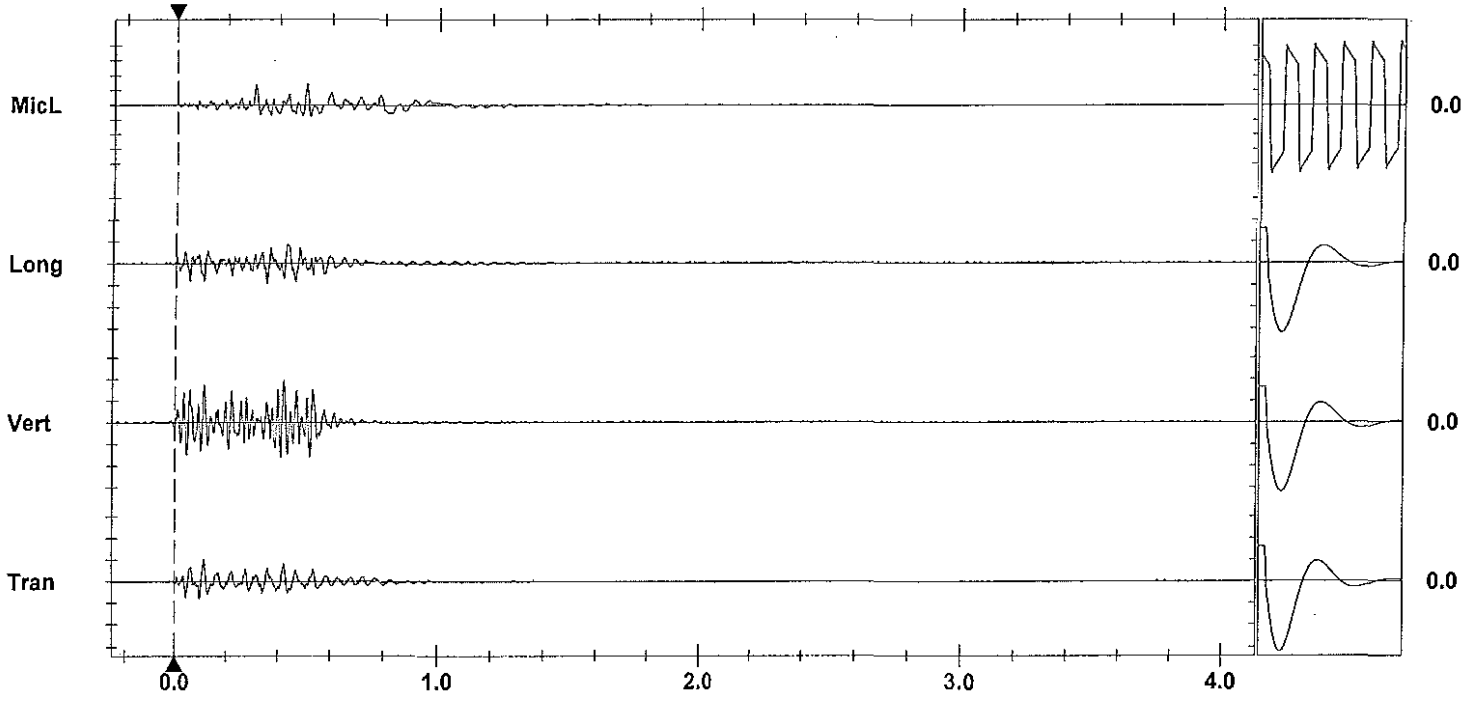
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00141 psi(L) at 0.503 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 495 mv)

	Tran	Vert	Long	
PPV	0.1000	0.195	0.0900	in/s
ZC Freq	27	34	24	Hz
Time (Rel. to Trig)	0.117	0.424	0.355	sec
Peak Acceleration	0.0530	0.133	0.0663	g
Peak Displacement	0.00054	0.00089	0.00064	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.213 in/s at 0.424 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sansorcheck

Printed: May 20, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 16/12
ACTUAL BLAST DATE May 16/12 10:55 AM
BLAST # MW-0199

HIGHWAY# 97
BLAST LOCATION AT: SW 128+90 - 128+95 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 20 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 3 Buffer 1551
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 6/1 holes - 1-2 cart 2x16 Dynamite + 200g det. cord to 4' collar

EXPLOSIVE TYPE 1A DYNAMITE + 2x16 Blast Ex EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 9
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

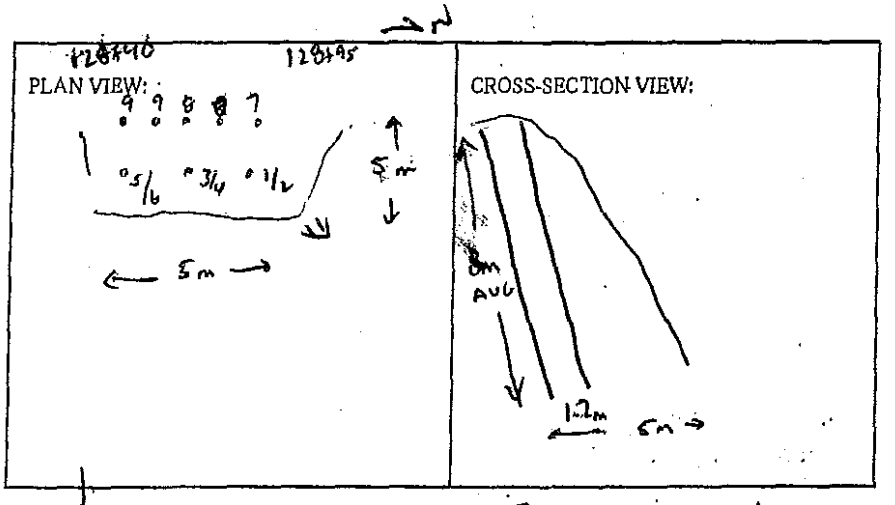
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt. 0.075 ips/34 Hz
" @ 13117 cliffstone crt - 0.23 ips/57 Hz

BORDER HOLES - BOTTOM DECK - 3-4 CART 2"x16" BLASTEX

- TOP DECK - 2-3 CART 2"x16" BLASTEX

Primed w/ 0.5 CART 2"x16" DYNAMITE

B/L HOLES - 1 CART 2"x16" DYNAMITE
+ 200 grain det. cord to 4' collar

Instantel

Event Report

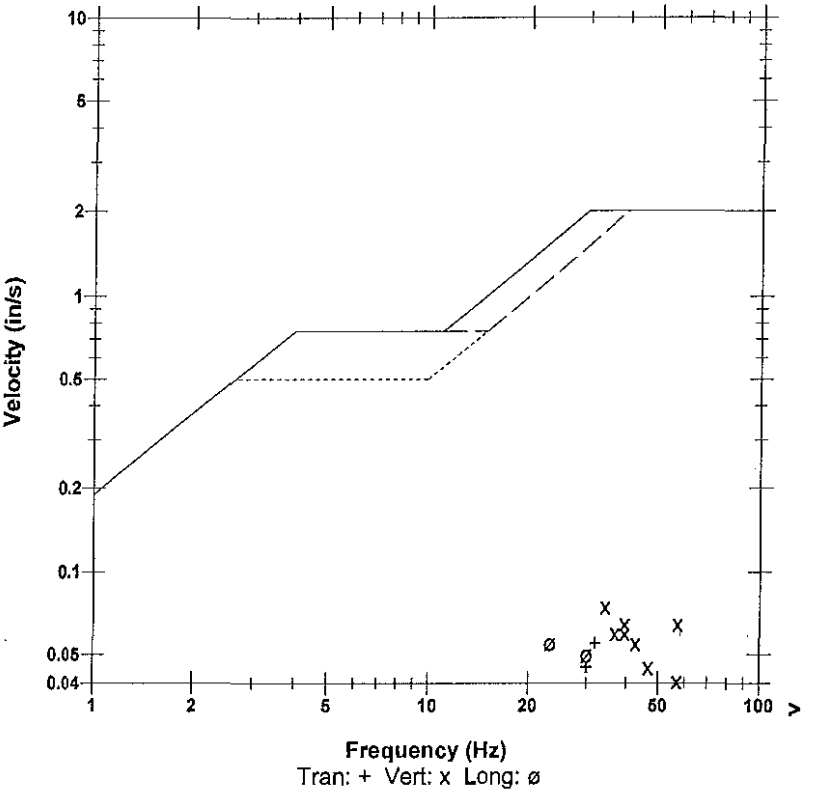
Date/Time	Vert at 10:55:51 May 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA9T.130

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

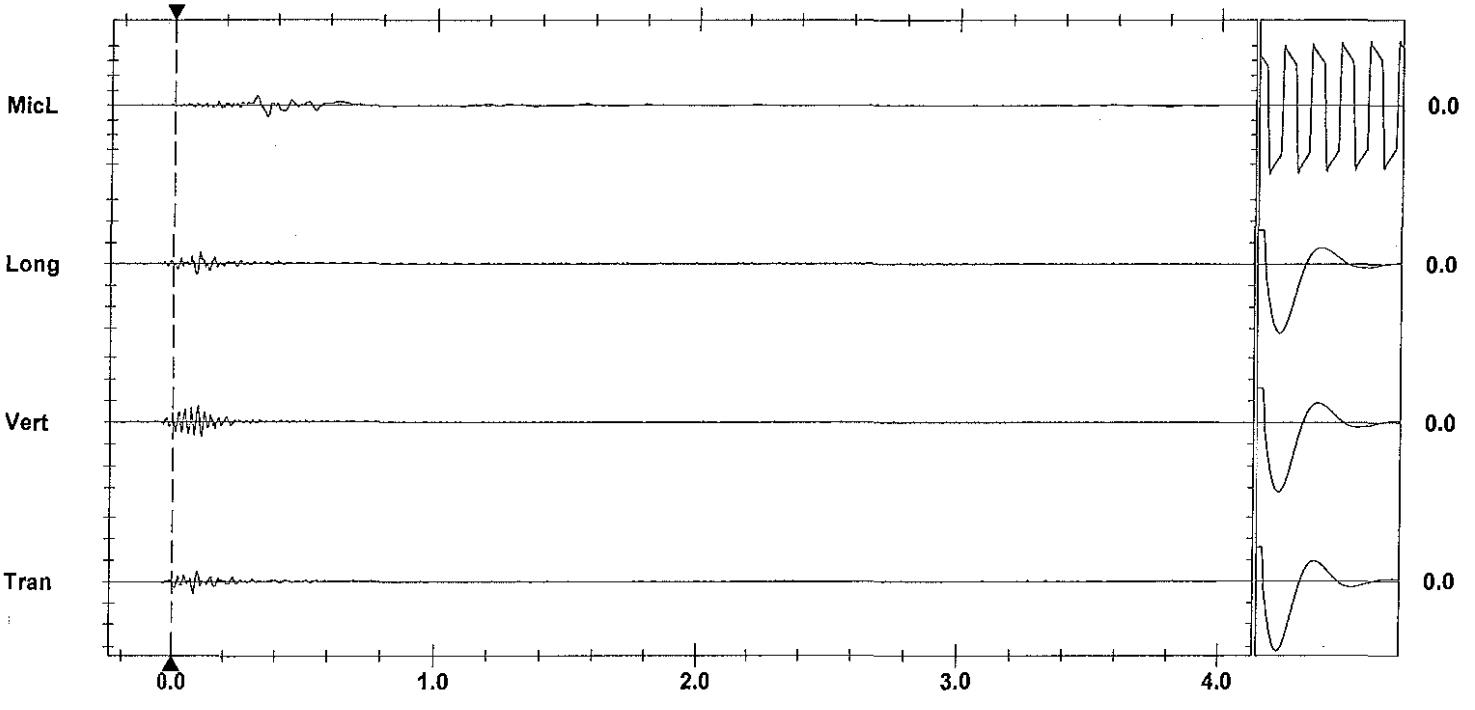
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00076 psi(L) at 0.358 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0750	0.0550	in/s
ZC Freq	32	34	23	Hz
Time (Rel. to Trig)	0.084	0.101	0.106	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00024	0.00033	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.0875 in/s at 0.101 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

Date/Time	Vert at 10:55:59 May 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA9T.1B0
Job Number:	1		

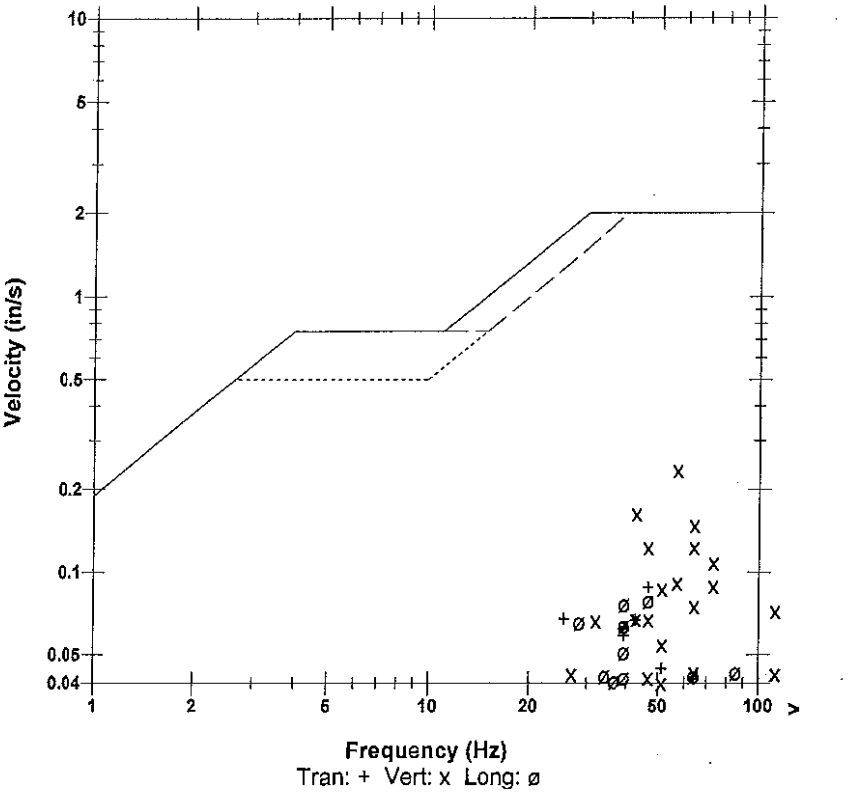
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

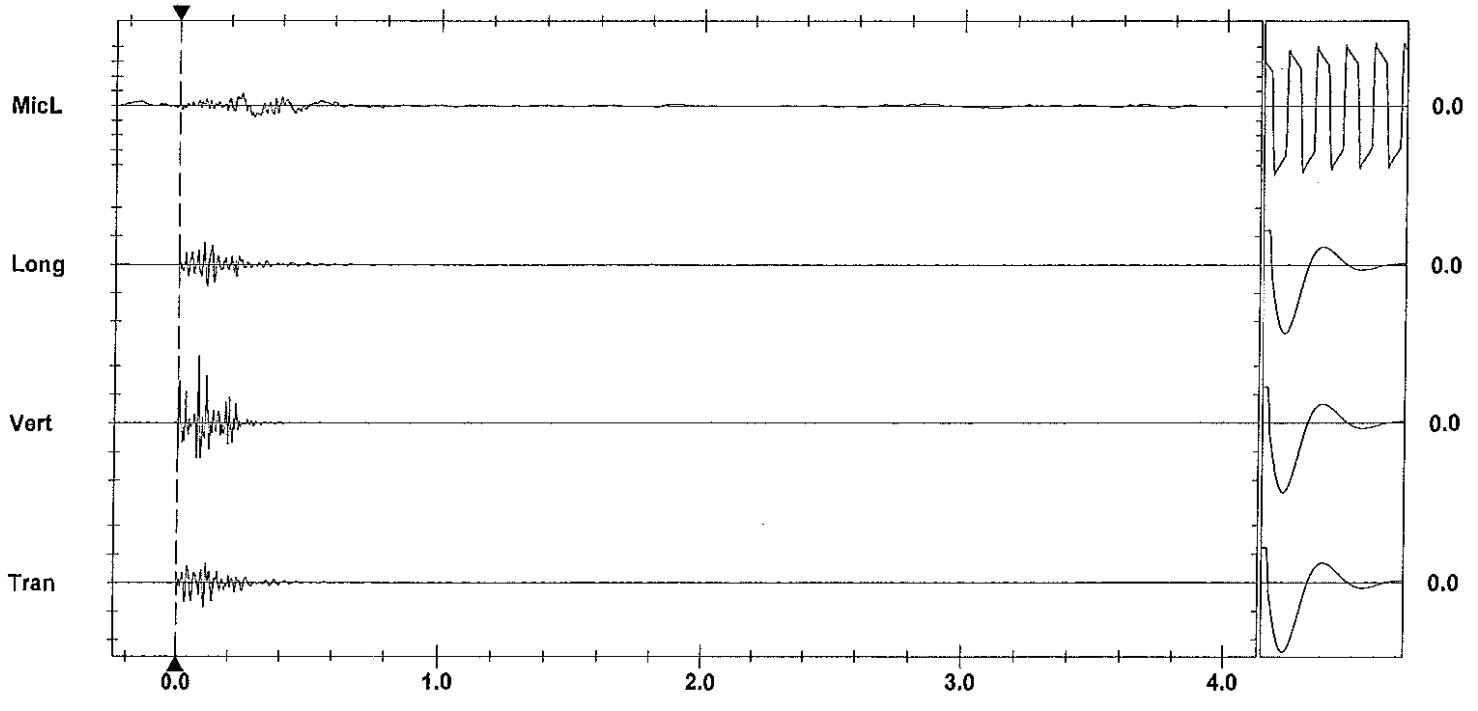
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00083 psi(L) at 0.243 sec			
ZC Freq	13 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 548 mv)			

	Tran	Vert	Long	
PPV	0.0881	0.235	0.0787	in/s
ZC Freq	47	57	47	Hz
Time (Rel. to Trig)	0.106	0.082	0.101	sec
Peak Acceleration	0.0729	0.219	0.0862	g
Peak Displacement	0.00028	0.00054	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.237 in/s at 0.082 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 16/12
ACTUAL BLAST DATE May 15/12 12:55 PM
BLAST # MW-0200

HIGHWAY# 97
BLAST LOCATION AT: 128+86 - 128+90 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot metted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 11 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 11.3 (m)
TOTAL DEPTH 88 (m)

TOTAL NUMBER OF HOLES 8 Proo
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

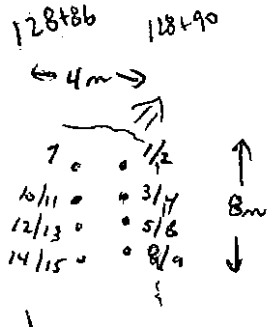
VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH: N

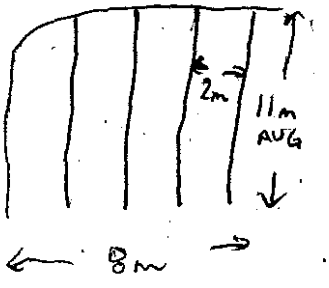
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



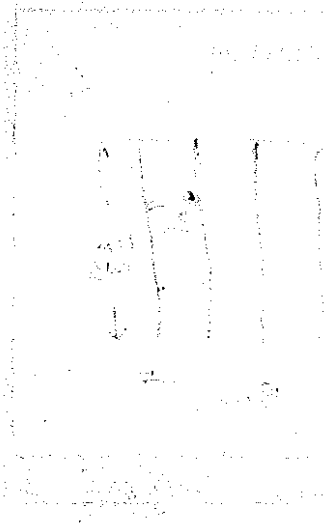
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.21 ips/37 Hz
@ 13117 Cliffstone Crt - 0.41 ips/57 Hz

BOTTOM DECKS - 9'-10' ANFO
TOP DECKS - 7'-9' ANFO
} Primed w/ 1 CART 1X8" DYNAMITE



Instantel

Event Report

Date/Time	Vert at 12:55:57 May 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EA9Y.L90
Job Number:	1		

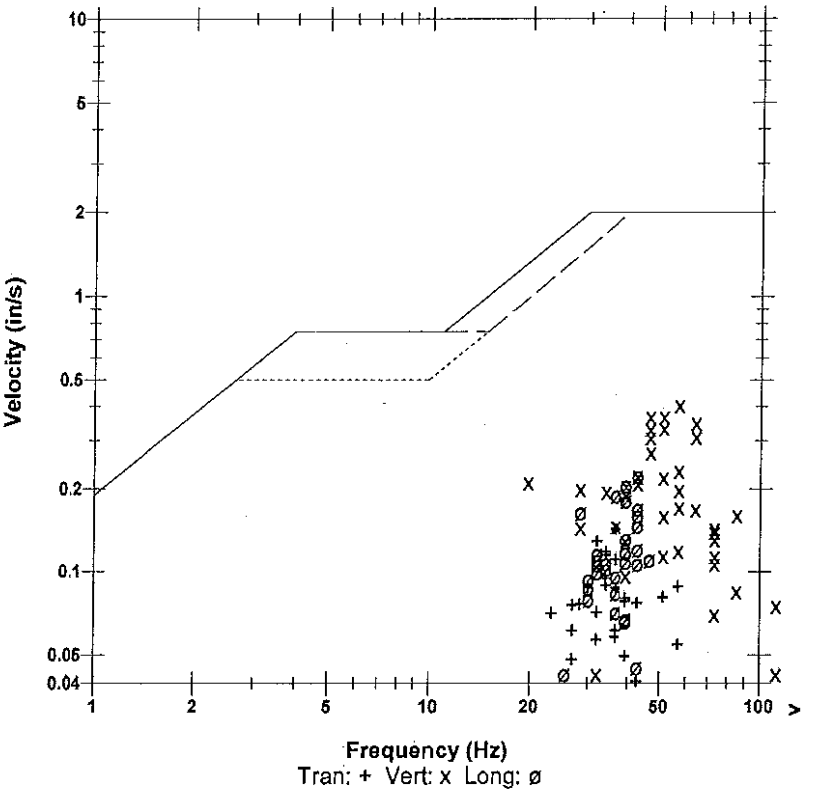
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

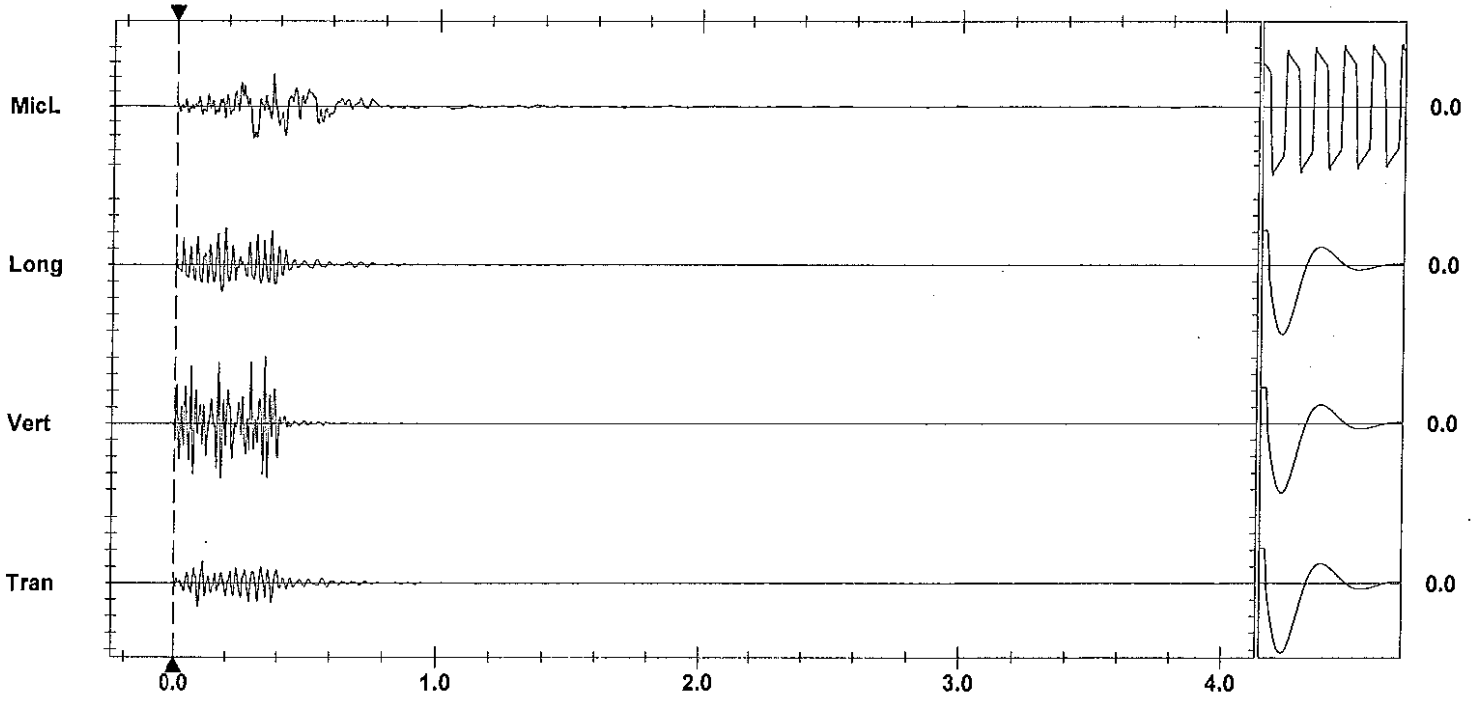
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00221 psi(L) at 0.297 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 559 mv)

	Tran	Vert	Long	
PPV	0.143	0.406	0.224	in/s
ZC Freq	37	57	43	Hz
Time (Rel. to Trig)	0.094	0.350	0.192	sec
Peak Acceleration	0.106	0.462	0.159	g
Peak Displacement	0.00060	0.00110	0.00097	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.406 in/s at 0.350 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

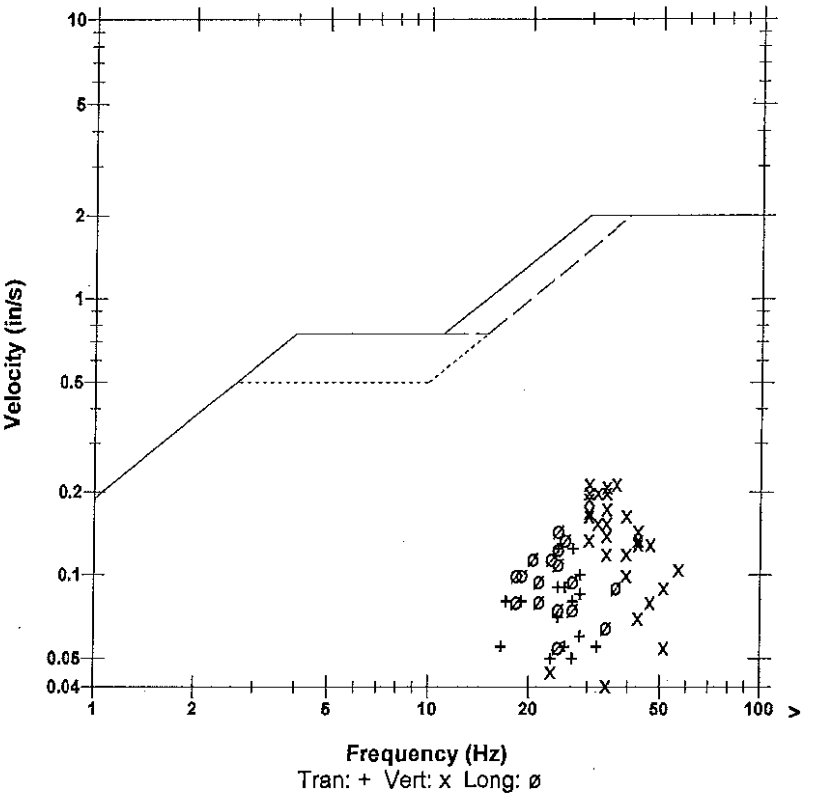
Date/Time	Vert at 12:55:50 May 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EA9Y.L20

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

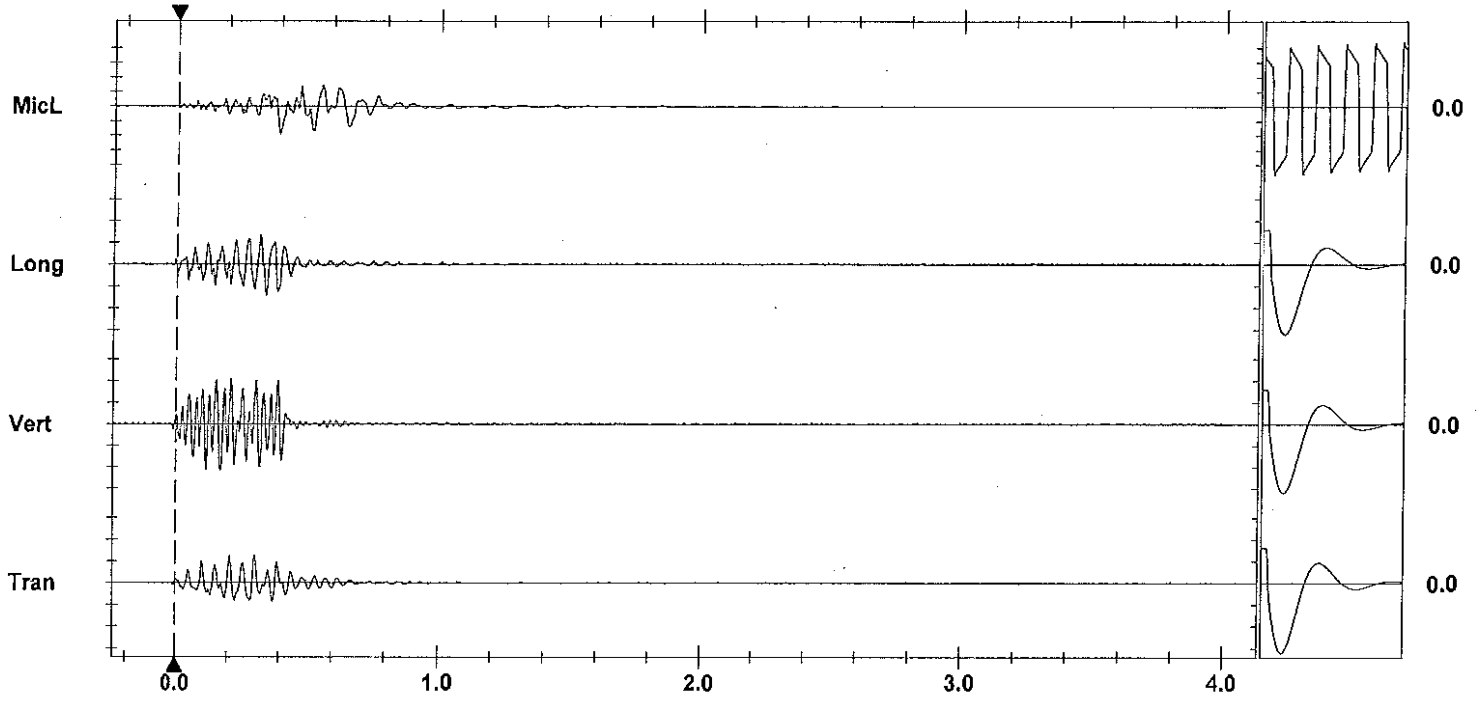
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.392 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.125	0.215	0.145	in/s
ZC Freq	24	37	24	Hz
Time (Rel. to Trig)	0.212	0.120	0.346	sec
Peak Acceleration	0.0530	0.146	0.0795	g
Peak Displacement	0.00076	0.00121	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.247 in/s at 0.212 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: May 20, 2012 (V 8.04 - 8.04) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 11:53AM
BLAST # MW-0201

HIGHWAY# 97
BLAST LOCATION AT: 128+82 - 128+86

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Stat matters

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

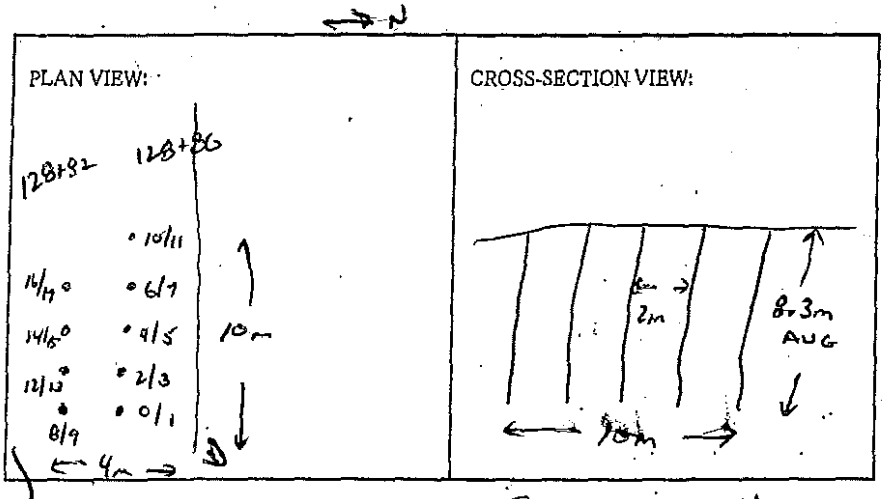
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.22 ips / 32 nL
@ 18117 Cliffstone Crt - 0.48 ips / 57 nL

BOTTOM DECKS - 6'-7' AMPS

TOP DECKS - 5'-6' AMPS

BOTH DECKS PRIMED W/ IKB DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:53:16 May 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAKZ.OS0
Job Number:	1		

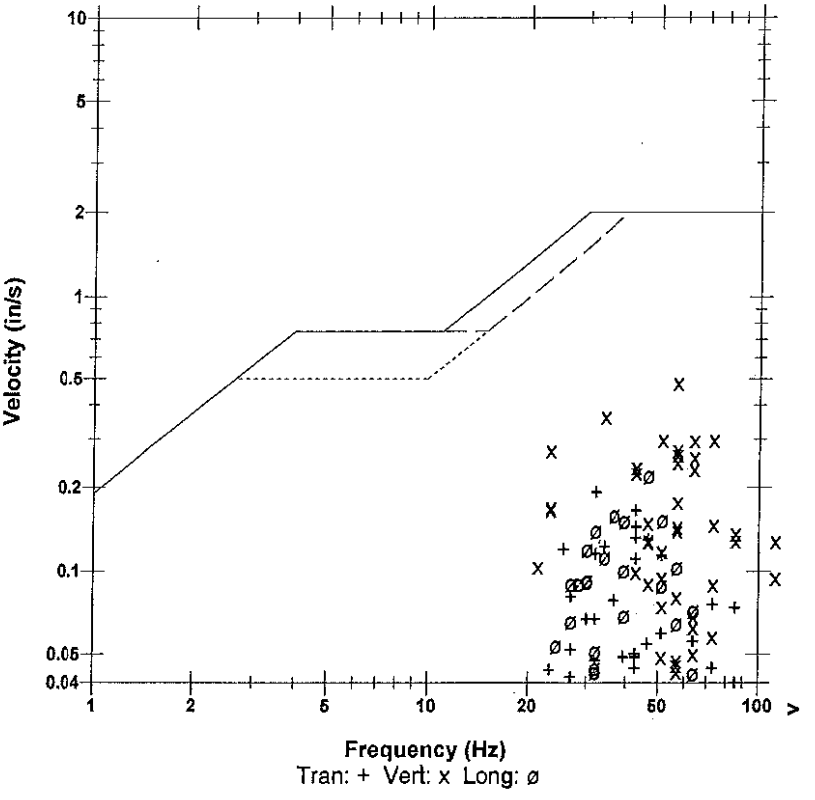
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

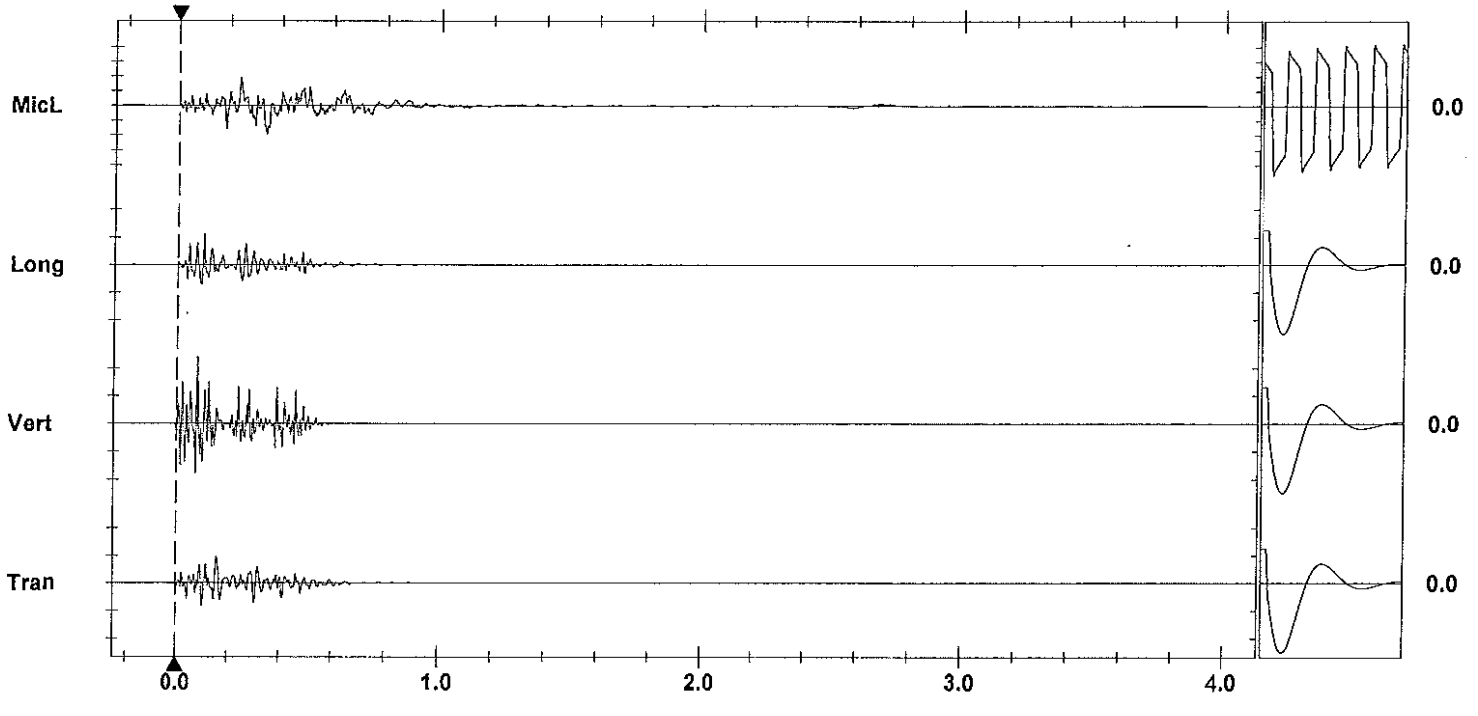
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.239 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 591 mv)

	Tran	Vert	Long	
PPV	0.192	0.484	0.221	in/s
ZC Freq	32	57	47	Hz
Time (Rel. to Trig)	0.162	0.082	0.104	sec
Peak Acceleration	0.177	0.514	0.181	g
Peak Displacement	0.00096	0.00153	0.00075	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.485 in/s at 0.082 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:53:02 May 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAKZ.OE0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

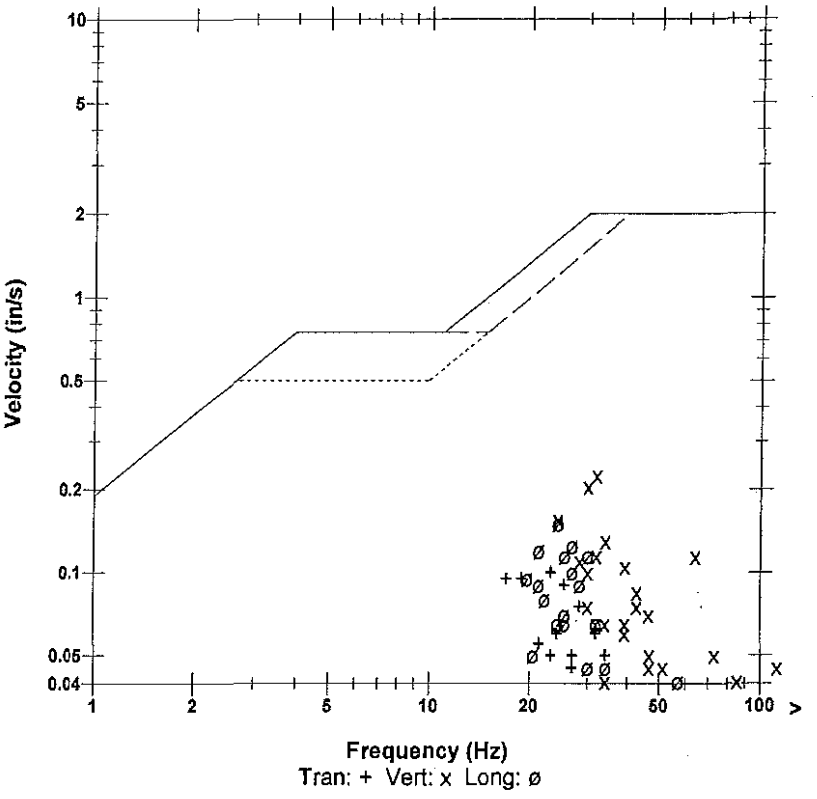
Post Event Notes

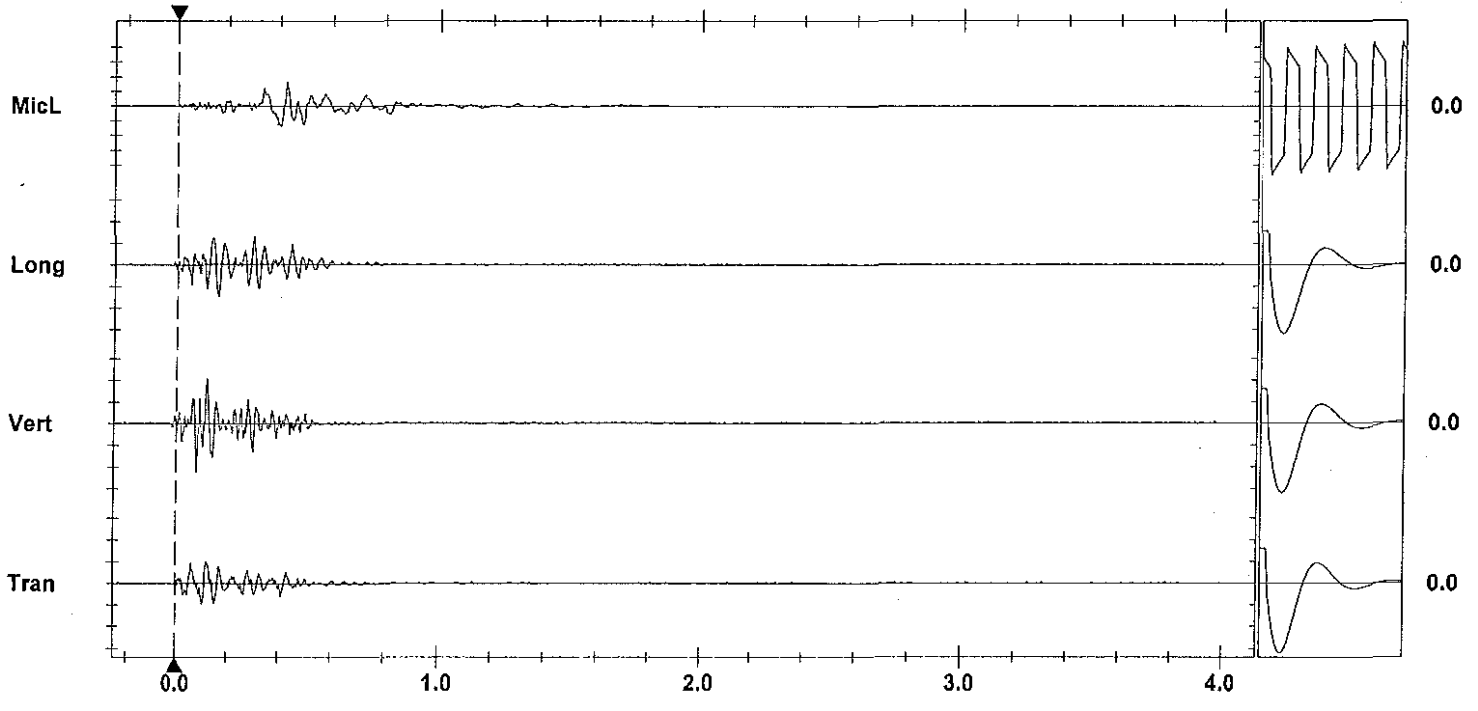
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.424 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 576 mv)

	Tran	Vert	Long	
PPV	0.1000	0.225	0.150	in/s
ZC Freq	23	32	24	Hz
Time (Rel. to Trig)	0.124	0.082	0.161	sec
Peak Acceleration	0.0663	0.133	0.0795	g
Peak Displacement	0.00075	0.00105	0.00100	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.233 in/s at 0.122 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: May 27, 2012 0(8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 1:01 PM
BLAST # MW-0202

HIGHWAY# 97
BLAST LOCATION AT: STN 128+86 - 128+90 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 60 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.9 (m)
TOTAL DEPTH 63 (m)

TOTAL NUMBER OF HOLES 36/1 / 2 buffer / 2 shock / 2 relief
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

2x16" Dynamite + 200gr det cord to 4' collar in 6//
2x16" Boosted in Buffer holes

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 80
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

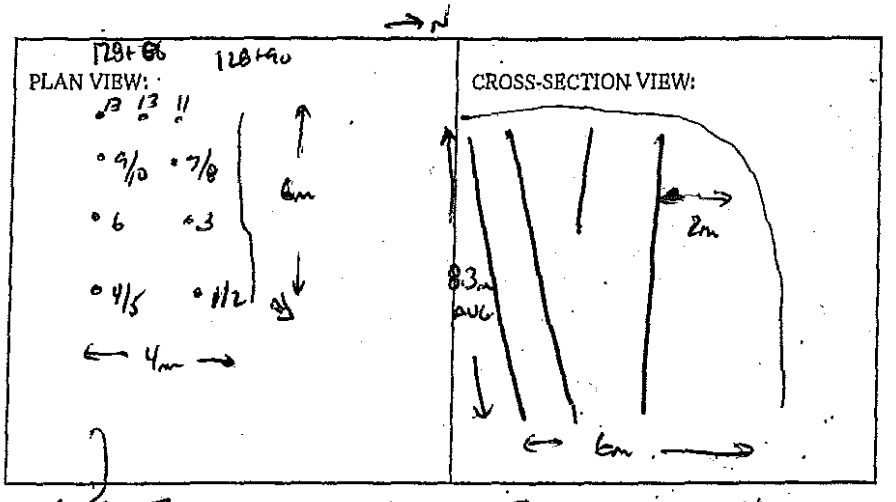
INITIATION DEVICE: (CIRCLE) P.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HHS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstar Crt. 0.12 ips / 24 Hz
@ 13117 Cliffstar Crt. 0.43 ips / 51 Hz

PROD - BOTTOM DECKS 6' AVG

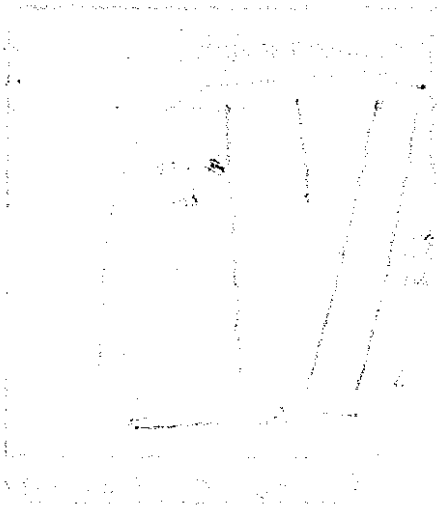
TOP DECKS 5'-6' AVG

BUFFER HOLES - BOTTOM DECKS - 6 CAPS 2x16 BLASTOX

TOP DECKS - 3-4 CAPS 2x16 BLASTOX

SHOCK HOLES - 1'-2' AVG PRIMED W/1 CAP 1x8 DYNO

D/L HOLES - 1 CAP 2x16 DYNAMITE + 200 GRAM CHARGE TO 4' BELOW.



Instantel

Event Report

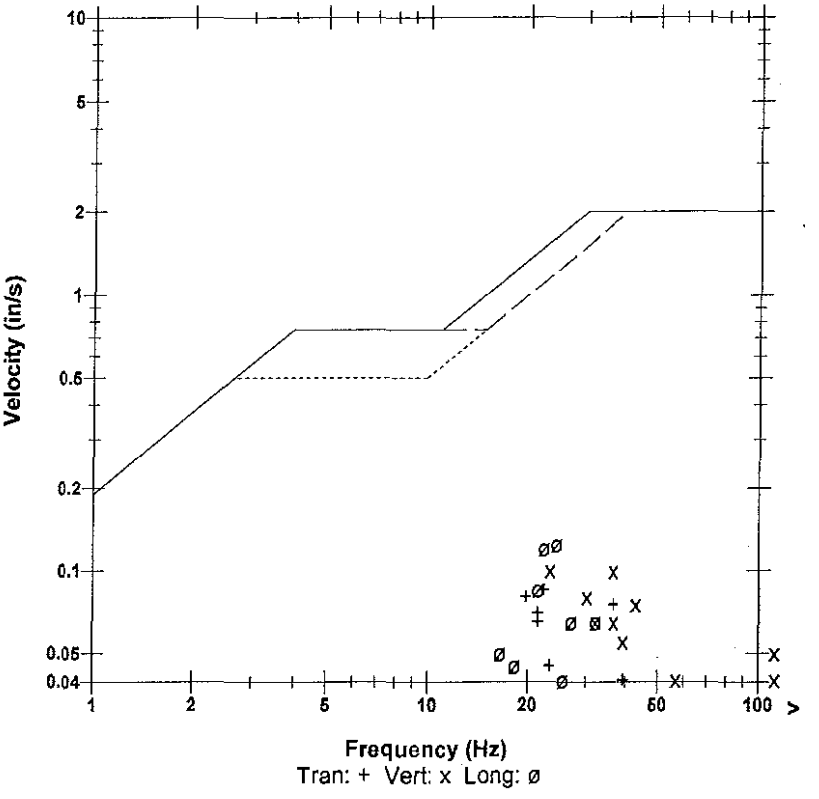
Date/Time	Vert at 13:01:26 May 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	5.9 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAL2.UE0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

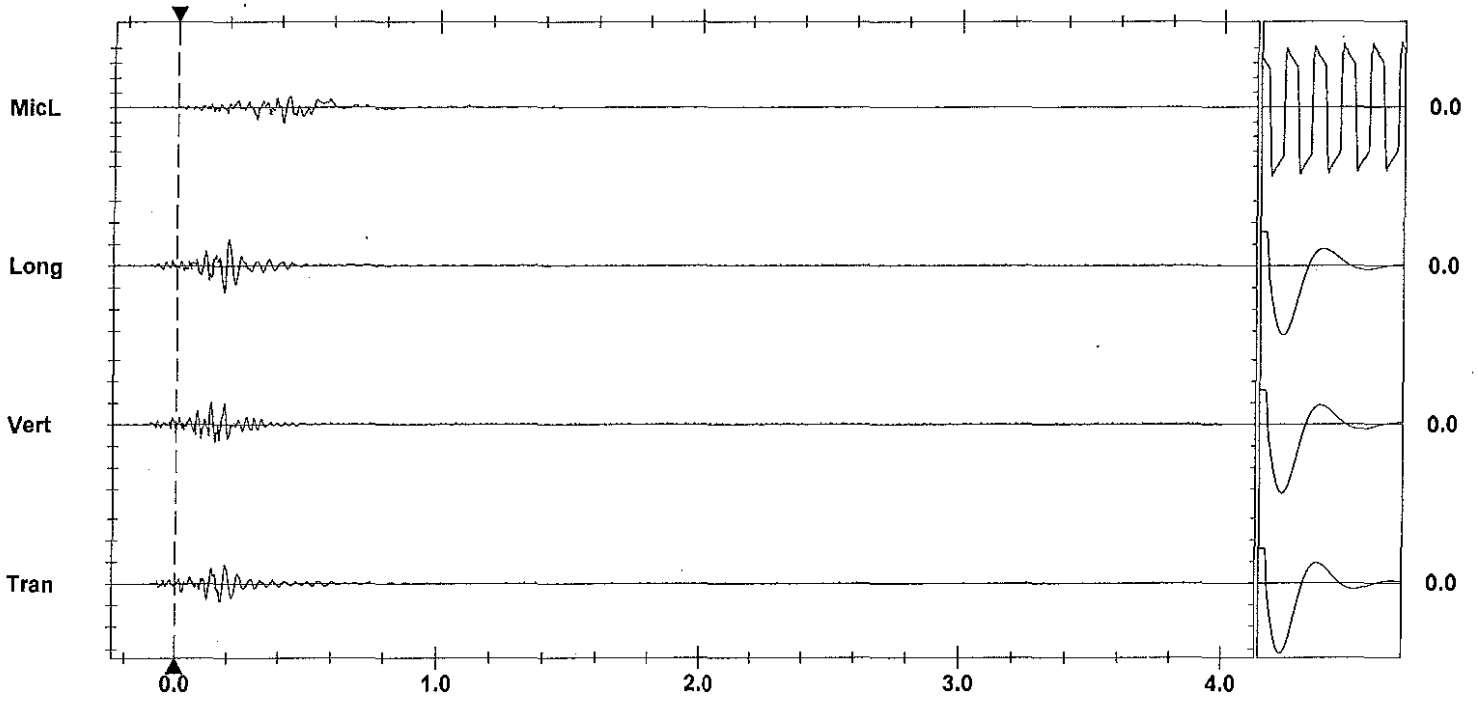
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00105 psi(L) at 0.408 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 553 mv)

	Tran	Vert	Long	
PPV	0.0850	0.1000	0.125	in/s
ZC Freq	22	37	24	Hz
Time (Rel. to Trig)	0.193	0.139	0.185	sec
Peak Acceleration	0.0530	0.119	0.0530	g
Peak Displacement	0.00059	0.00059	0.00087	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.147 in/s at 0.200 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 13:01:39 May 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAL2.UR0
Job Number:	1		

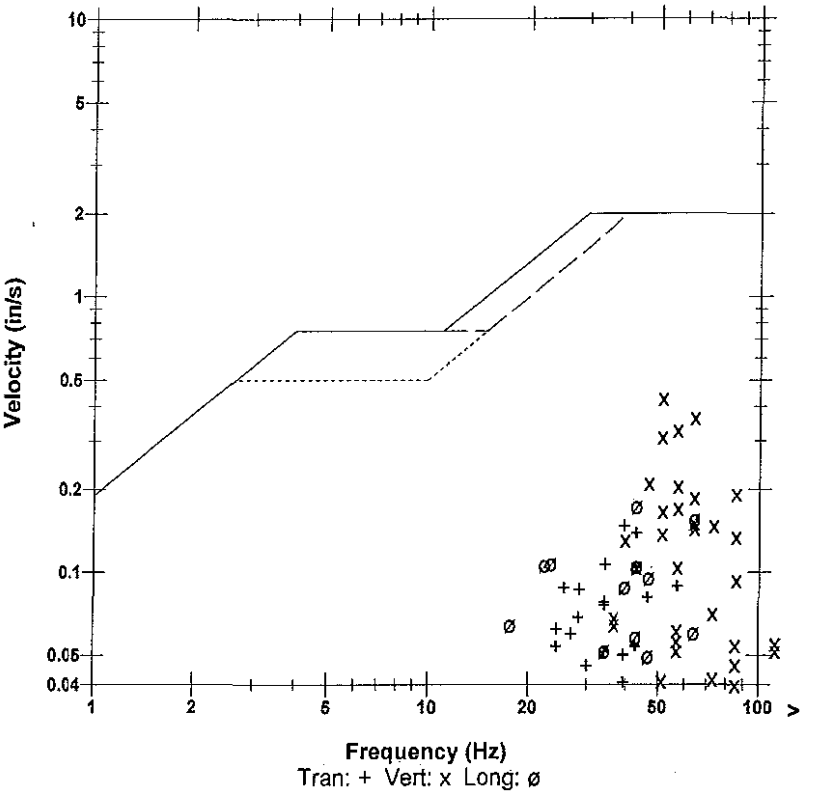
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

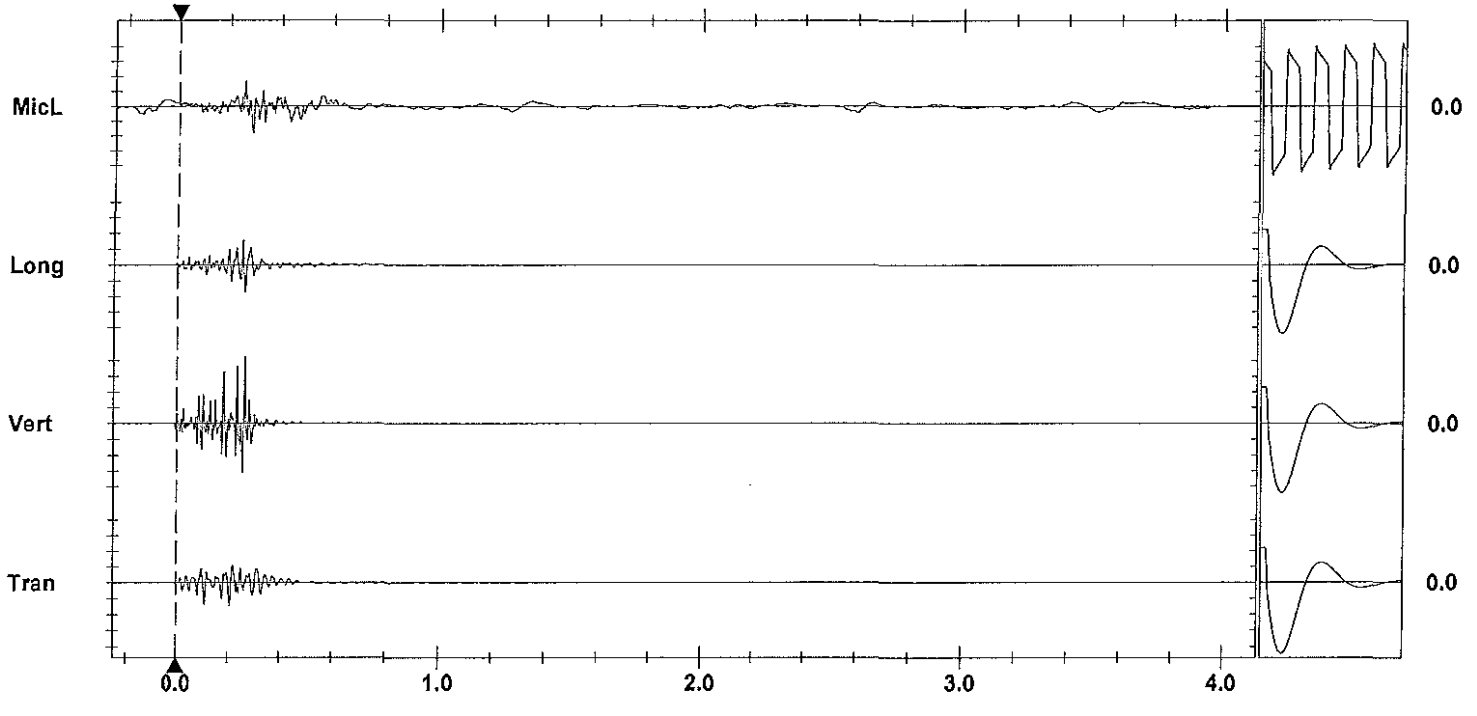
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.288 sec
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 612 mv)

	Tran	Vert	Long	
PPV	0.147	0.427	0.174	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.210	0.266	0.266	sec
Peak Acceleration	0.108	0.428	0.147	g
Peak Displacement	0.00057	0.00112	0.00067	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.462 in/s at 0.266 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 21/12 2:16PM
BLAST # MW-0203

HIGHWAY # 97
BLAST LOCATION AT: 128+74 - 128+80 Blast to Level Bench.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2m (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 25 (m)
TOTAL DEPTH 22 (m)

TOTAL NUMBER OF HOLES 10 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

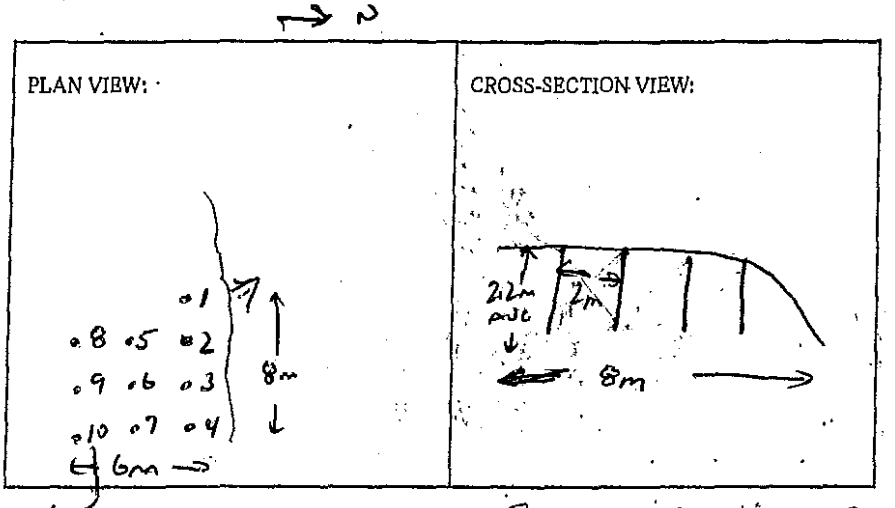
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~MS320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Crt - no trigger (< 0.04 ips)
@ 13117 Cliffstone Crt - 0.087 ppv / 57 Hz

APUL Holes 1'-2' AMSD

Primed w/ 1 part IVB DWN.

Instantel

Event Report

Date/Time	Vert at 14:16:49 May 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAL6.C10
Job Number:	1		

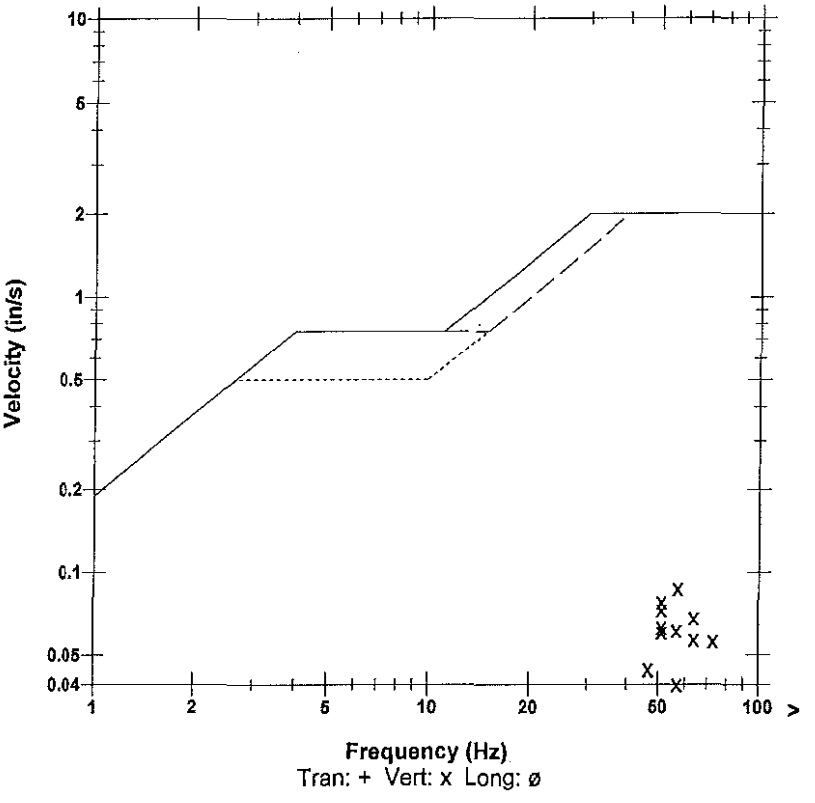
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

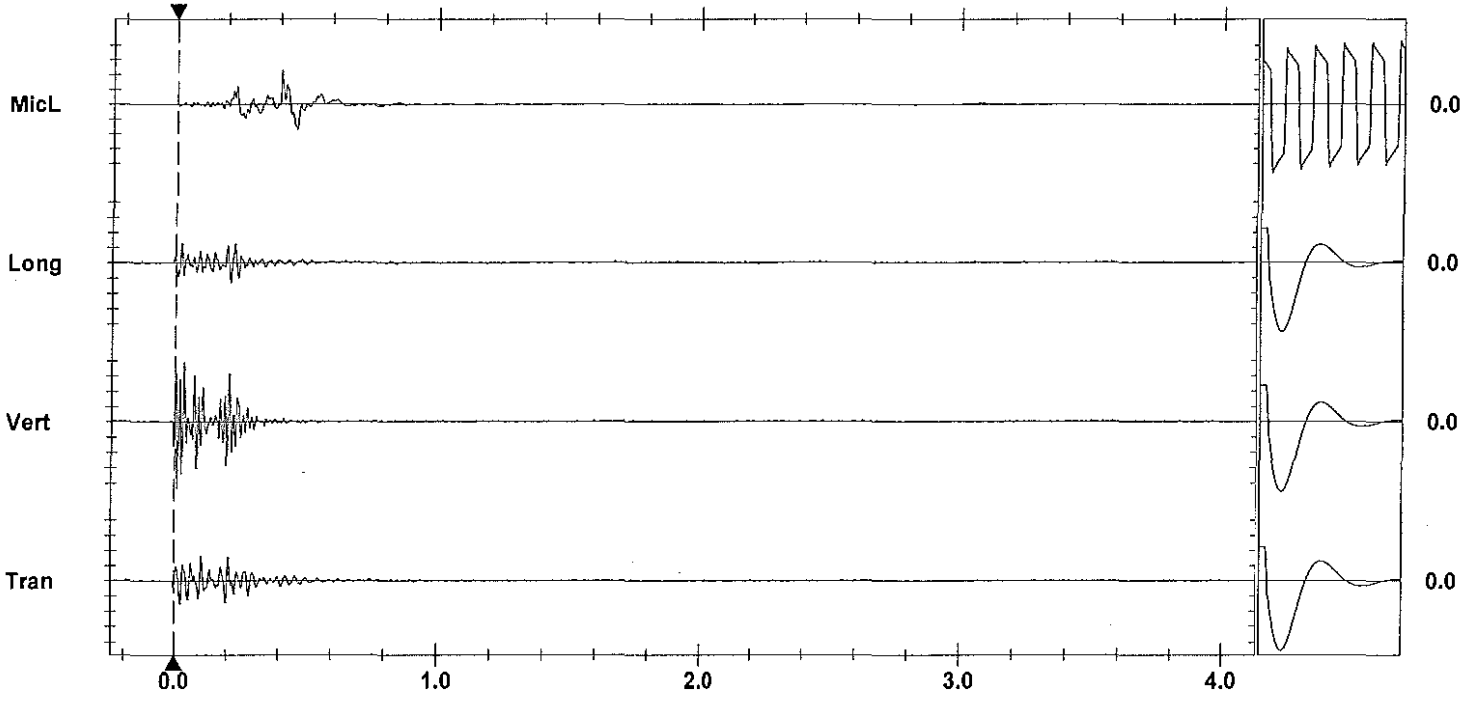
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00232 psi(L) at 0.403 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 587 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0875	0.0262	in/s
ZC Freq	43	57	37	Hz
Time (Rel. to Trig)	0.107	0.012	0.212	sec
Peak Acceleration	0.0249	0.0795	0.0215	g
Peak Displacement	0.00013	0.00023	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0897 in/s at 0.012 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 22/12
ACTUAL BLAST DATE May 22/12 3:19 PM
BLAST # NW-024

HIGHWAY# 97
BLAST LOCATION AT: 128+70 - 128+74 Blast To Level Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: de shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 41 (m)

TOTAL NUMBER OF HOLES 17 Rock
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

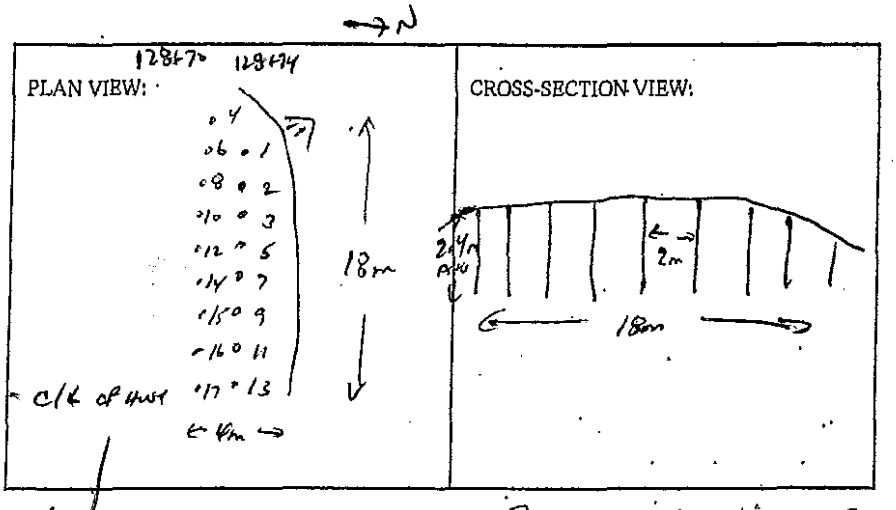
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

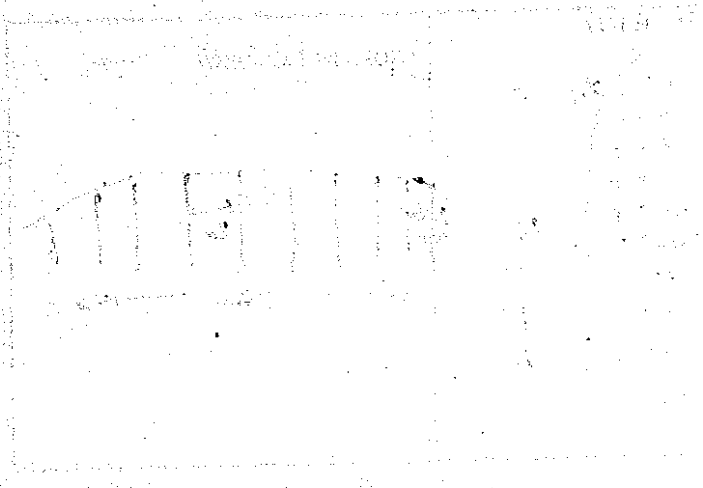
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - No Trigger (< 0.04 ips)
@ 13117 Cliffstone Crt - 0.079 ips / 57 Hz

ALL Holes 1'-2' AMSD

primed w/ 1x8 DYN.



Instantel

Event Report

Date/Time	Vert at 15:19:18 May 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAL9.860
Job Number:	1		

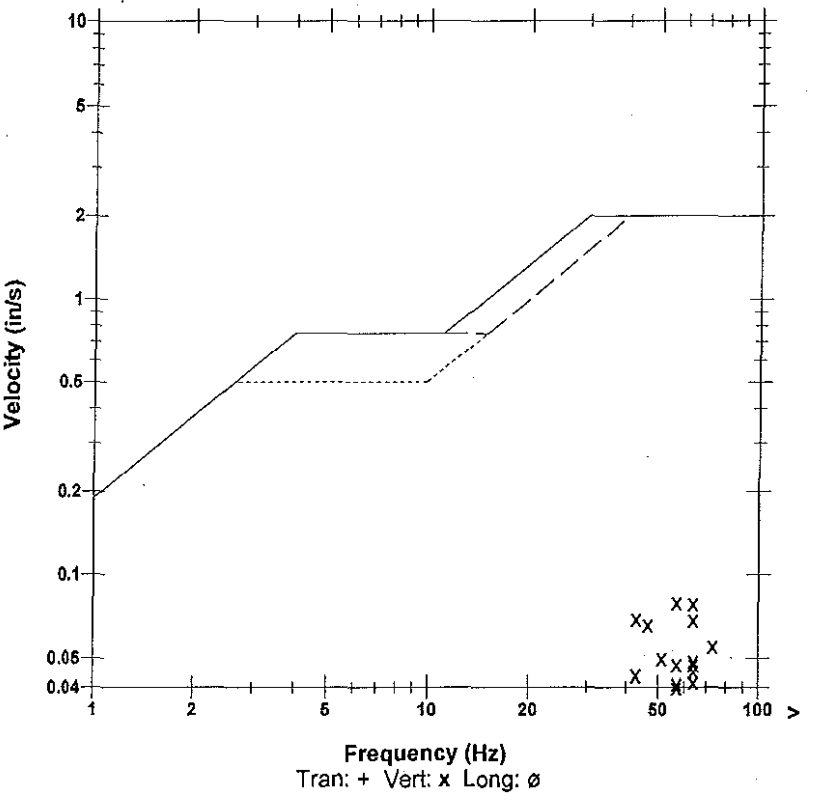
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

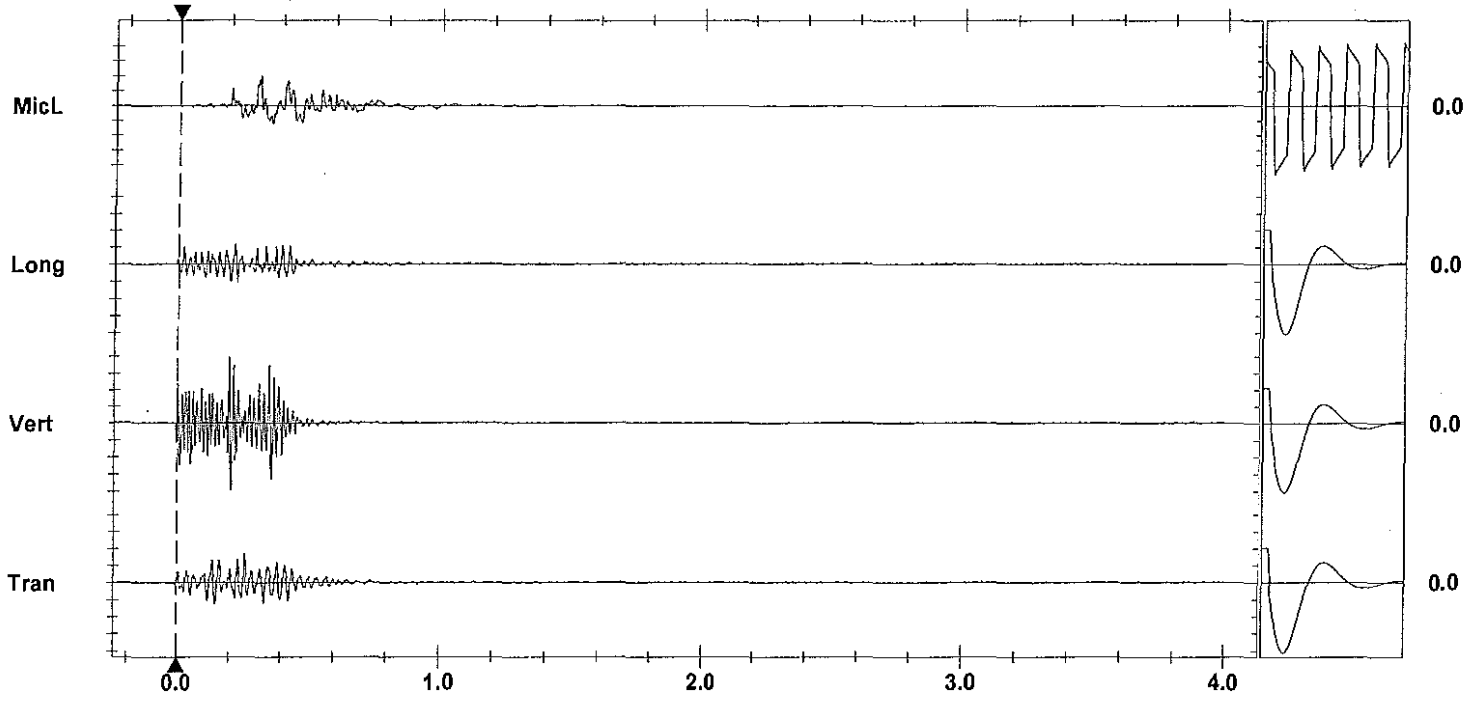
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00199 psi(L) at 0.311 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 592 mv)

	Tran	Vert	Long	
PPV	0.0337	0.0794	0.0231	in/s
ZC Freq	43	57	34	Hz
Time (Rel. to Trig)	0.263	0.209	0.220	sec
Peak Acceleration	0.0232	0.0729	0.0232	g
Peak Displacement	0.00012	0.00023	0.00009	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0814 in/s at 0.200 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 23/12
ACTUAL BLAST DATE May 23/12 10:09 AM
BLAST # MW-0205

HIGHWAY # 97
BLAST LOCATION AT: 128+66 to #28+70 (Blast to Lower Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slot raised

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 12 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

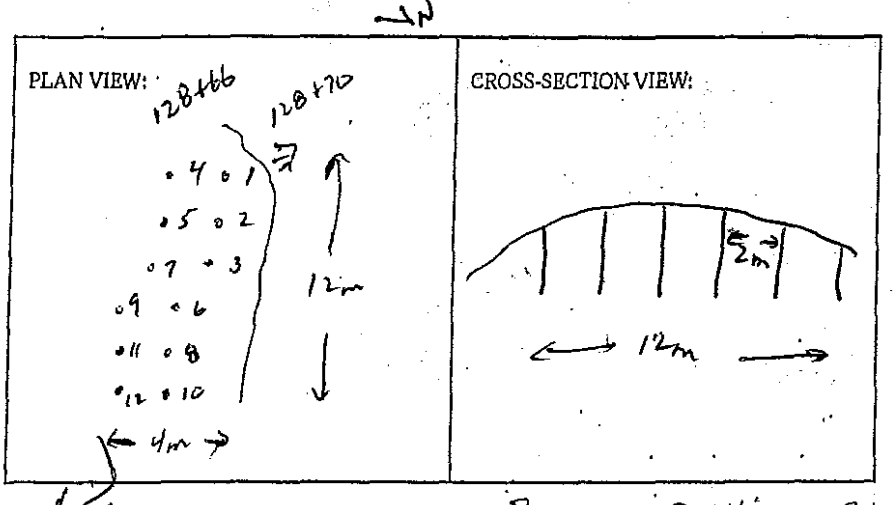
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13/67 Cliffstone Cut - 0.055 ips / 39Hz
@ 13/17 Cliffstone Cut - 0.070 ips / 43Hz

PRODUCTION HOLES - 1.5-2' ANFO - PRIMED W/ 1 CARTEX 8 DYNAMITE

Instantel

Event Report

Date/Time Vert at 10:08:54 May 23, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866EAMP.IU0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

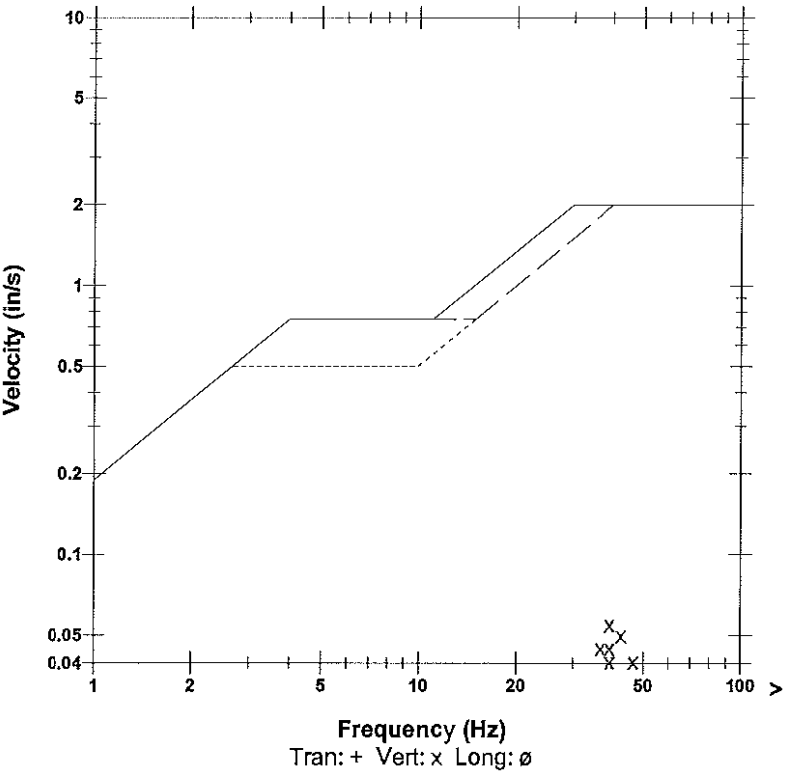
Extended Notes

Post Event Notes

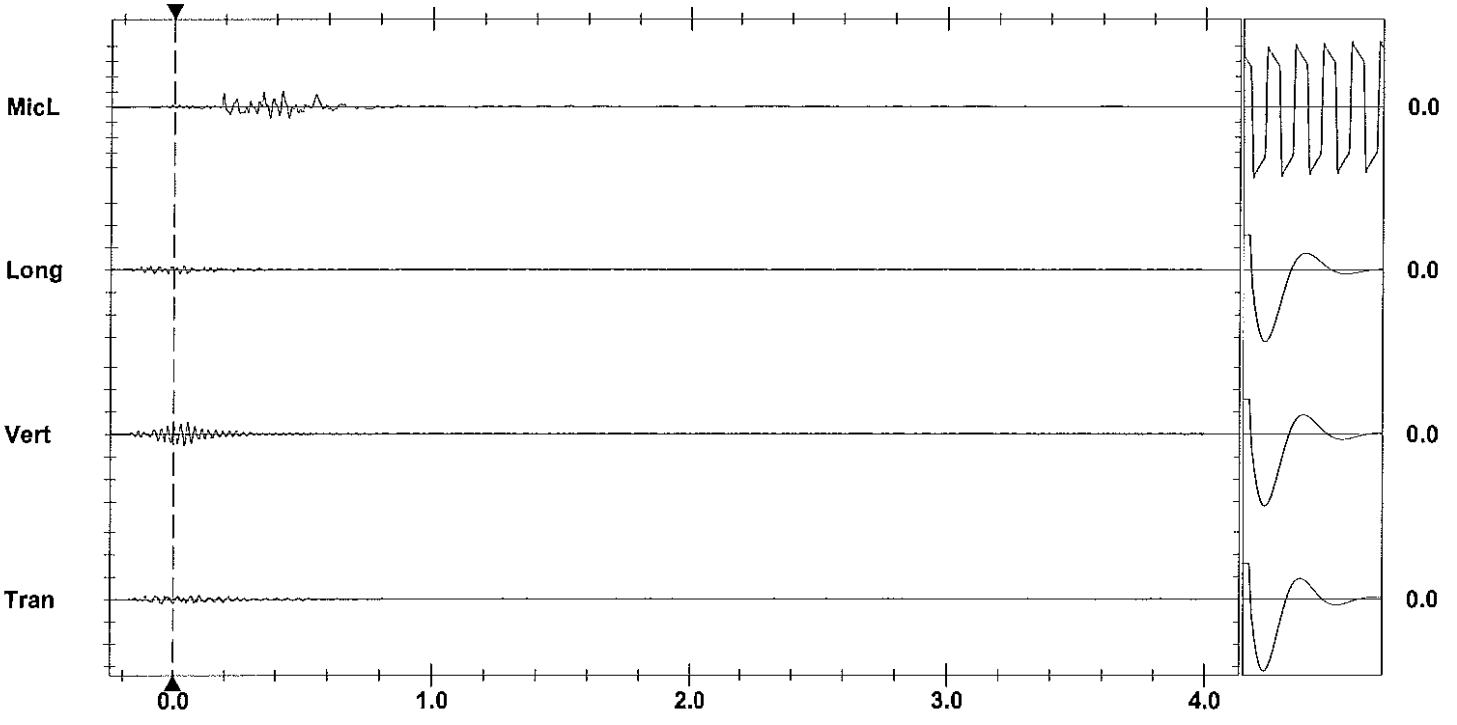
Microphone Linear Weighting
PSPL 0.00102 psi(L) at 0.422 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 607 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0550	0.0200	in/s
ZC Freq	39	39	43	Hz
Time (Rel. to Trig)	-0.045	0.058	0.040	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00010	0.00022	0.00007	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0559 in/s at 0.058 sec



Time Scale:0.20 sec/div **Amplitude Scale**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: November 12, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 10:09:08 May 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAMP.J80
Job Number:	1		

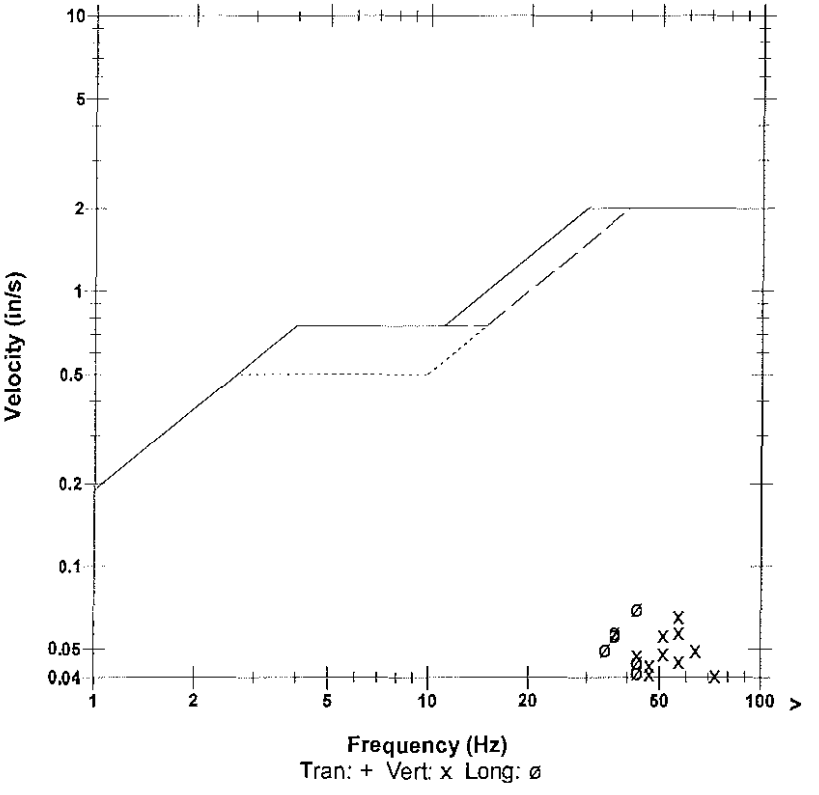
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

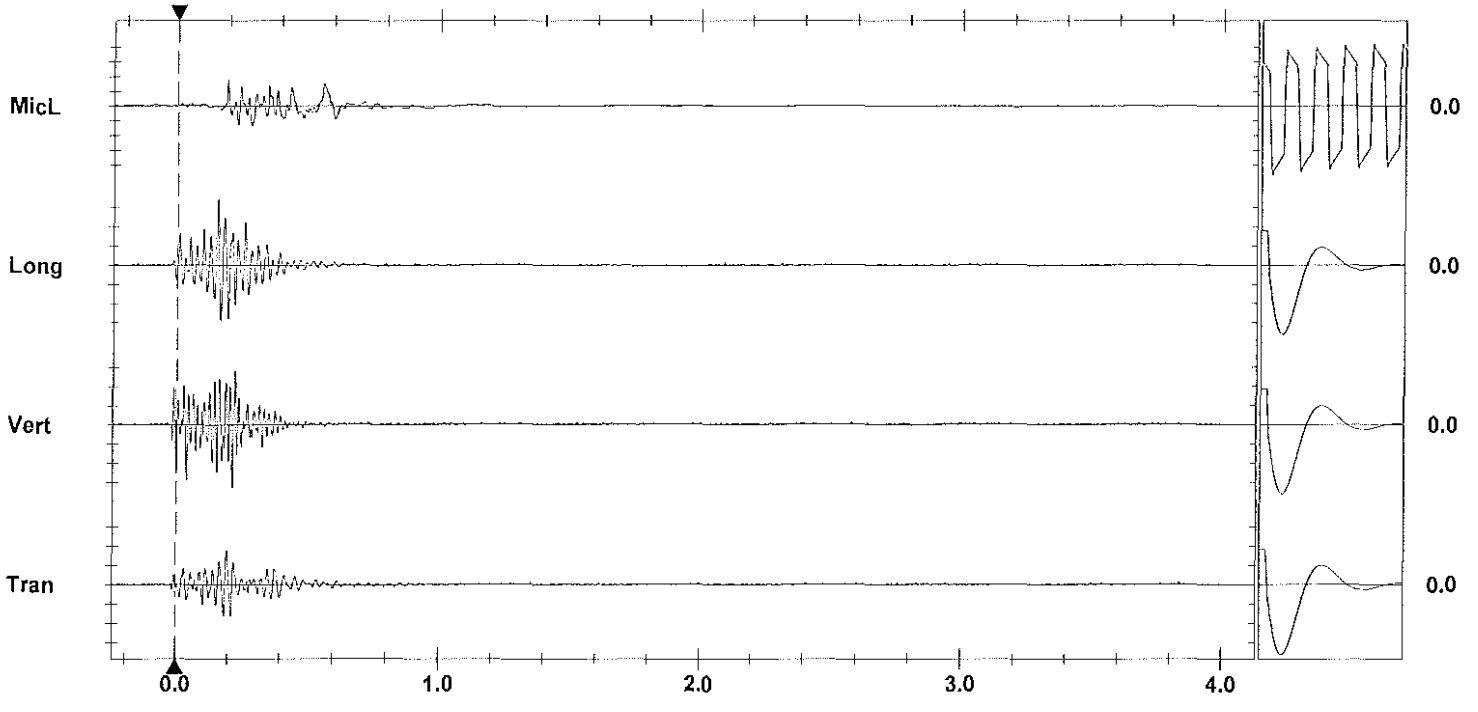
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.193 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 572 mv)

	Tran	Vert	Long	
PPV	0.0356	0.0656	0.0700	in/s
ZC Freq	37	57	43	Hz
Time (Rel. to Trig)	0.198	0.217	0.155	sec
Peak Acceleration	0.0298	0.0746	0.0447	g
Peak Displacement	0.00016	0.00018	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.0848 in/s at 0.156 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED MAY 23/12
ACTUAL BLAST DATE MAY 23/12 11:18 AM
BLAST # MW-0260

HIGHWAY# 97
BLAST LOCATION AT: 128+60 - 128+66 (Blast to Level Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 16 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

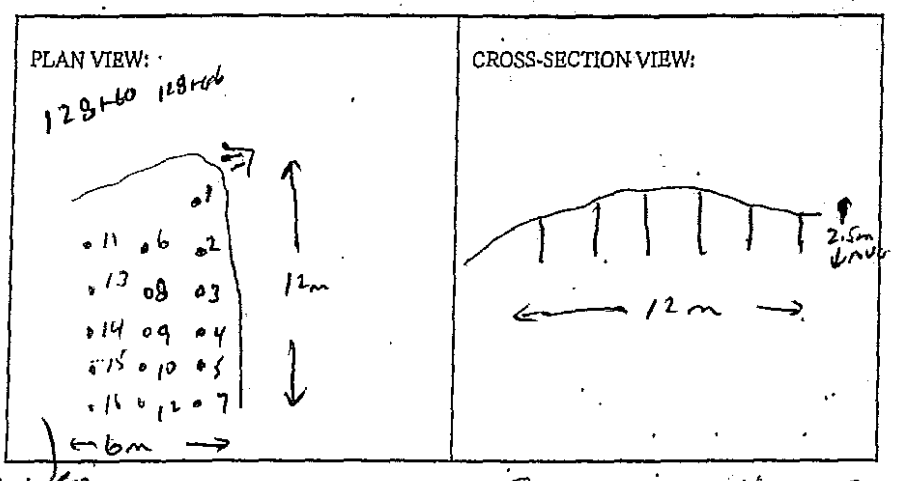
INITIATION DEVICE: (CIRCLE) ~~EB CAPS~~ SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



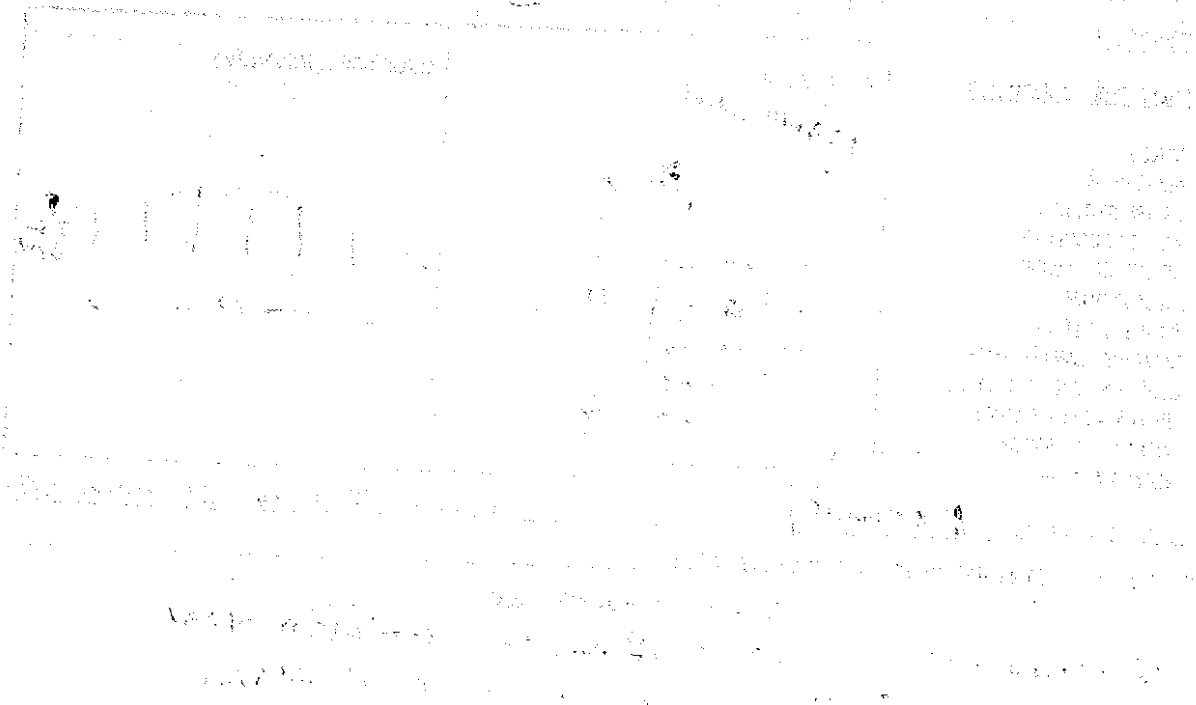
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct - NOTRIG (< 0.04 ips)
" @ 13117 Cliffstone Ct - 0.066 ips / 57 Hz

PRODUCTION HOLES - 1.5'-2' ANFO - PRIMED W/ 1 each 1X8 DYNAMITE



Instantel

Event Report

Date/Time	Vert at 11:18:25 May 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAMS.QP0
Job Number:	1		

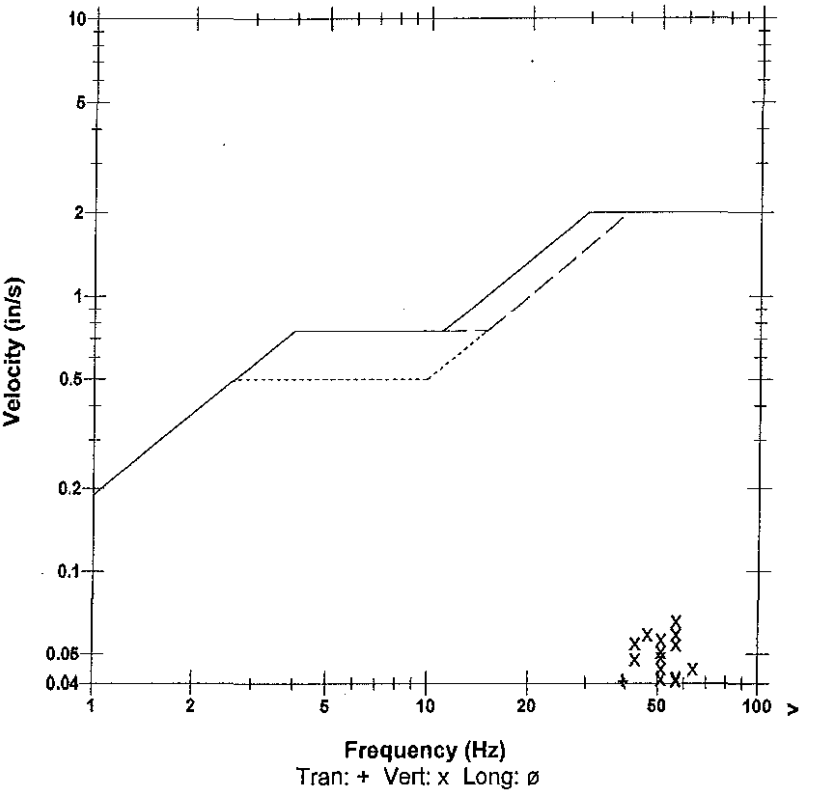
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

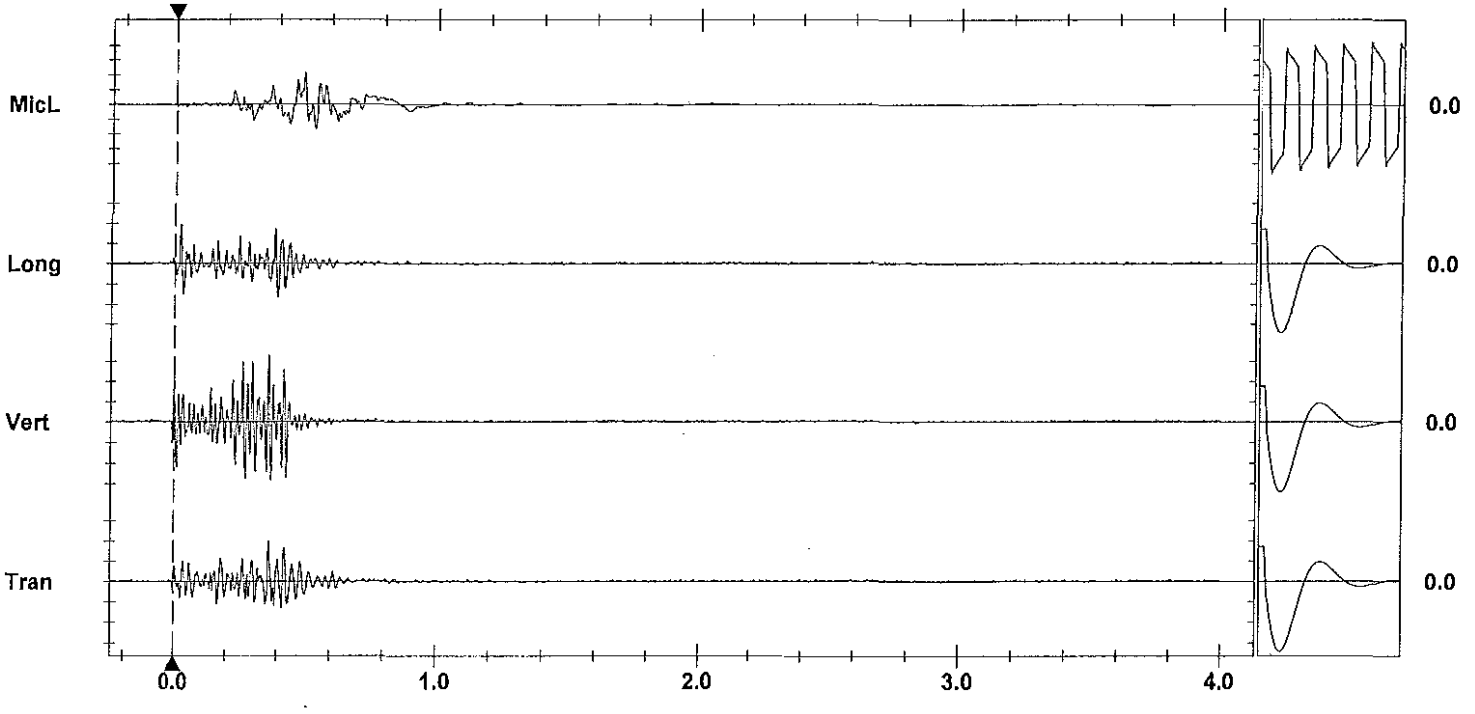
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00214 psi(L) at 0.493 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 621 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0662	0.0381	in/s
ZC Freq	39	57	43	Hz
Time (Rel. to Trig)	0.371	0.367	0.022	sec
Peak Acceleration	0.0381	0.0630	0.0298	g
Peak Displacement	0.00014	0.00020	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.0719 in/s at 0.368 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 23/12
ACTUAL BLAST DATE MAY 23/12 2:17 PM
BLAST # MW-0207

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128-66 (Blast to Lower Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Augen Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 20 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

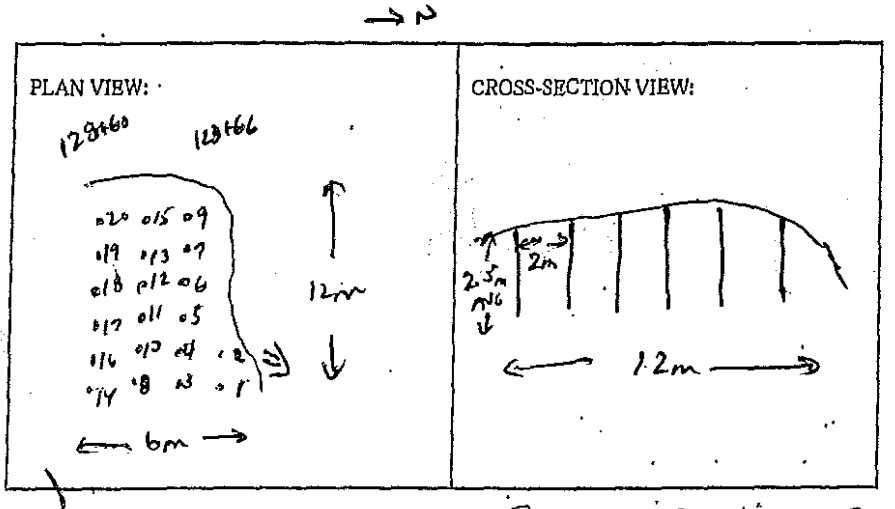
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



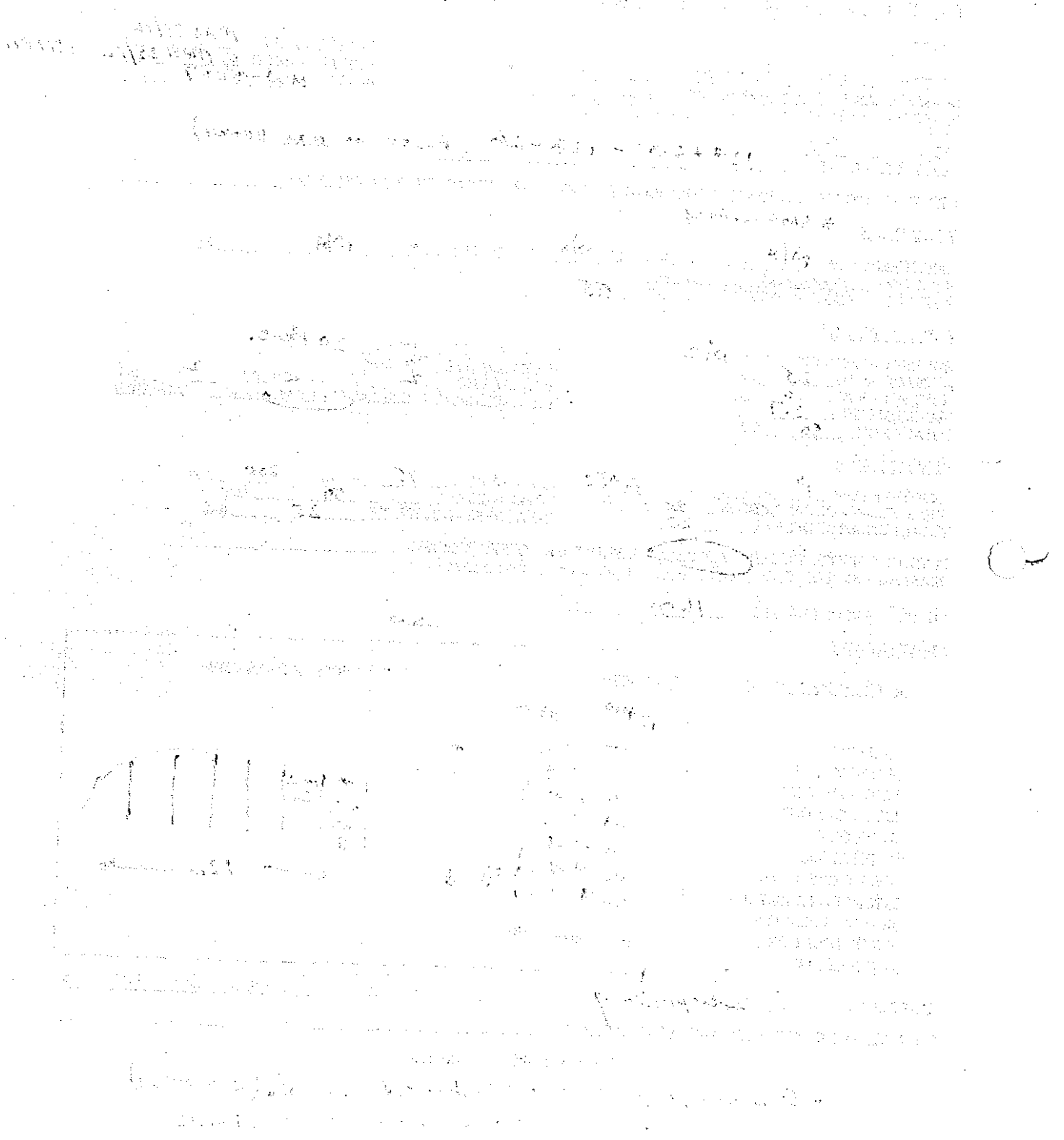
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

- Seismograph @ 13167 Cl: Fastrac ext - No trig (< 0.04 ips)
- @ 13117 Cl: Fastrac ext - 0.05 ips / 5 / 112

PRODUCTION HOLES - 15' - 2' ANFO + PRIMER / CAST LEAD DYNAMITE



Instantel

Event Report

Date/Time	Vert at 14:17:30 May 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAN1.160
Job Number:	1		

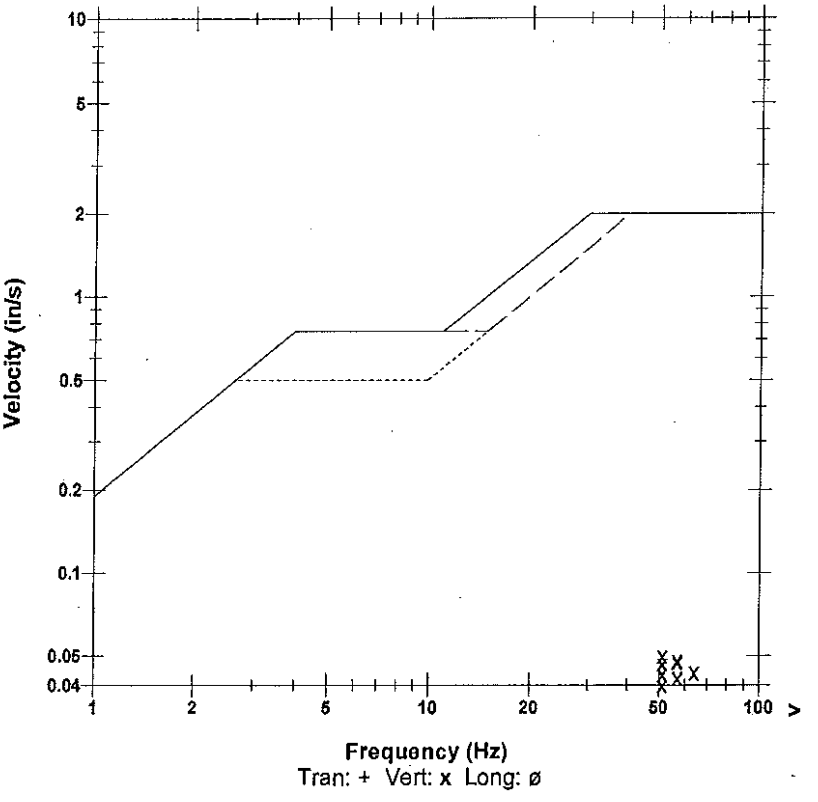
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

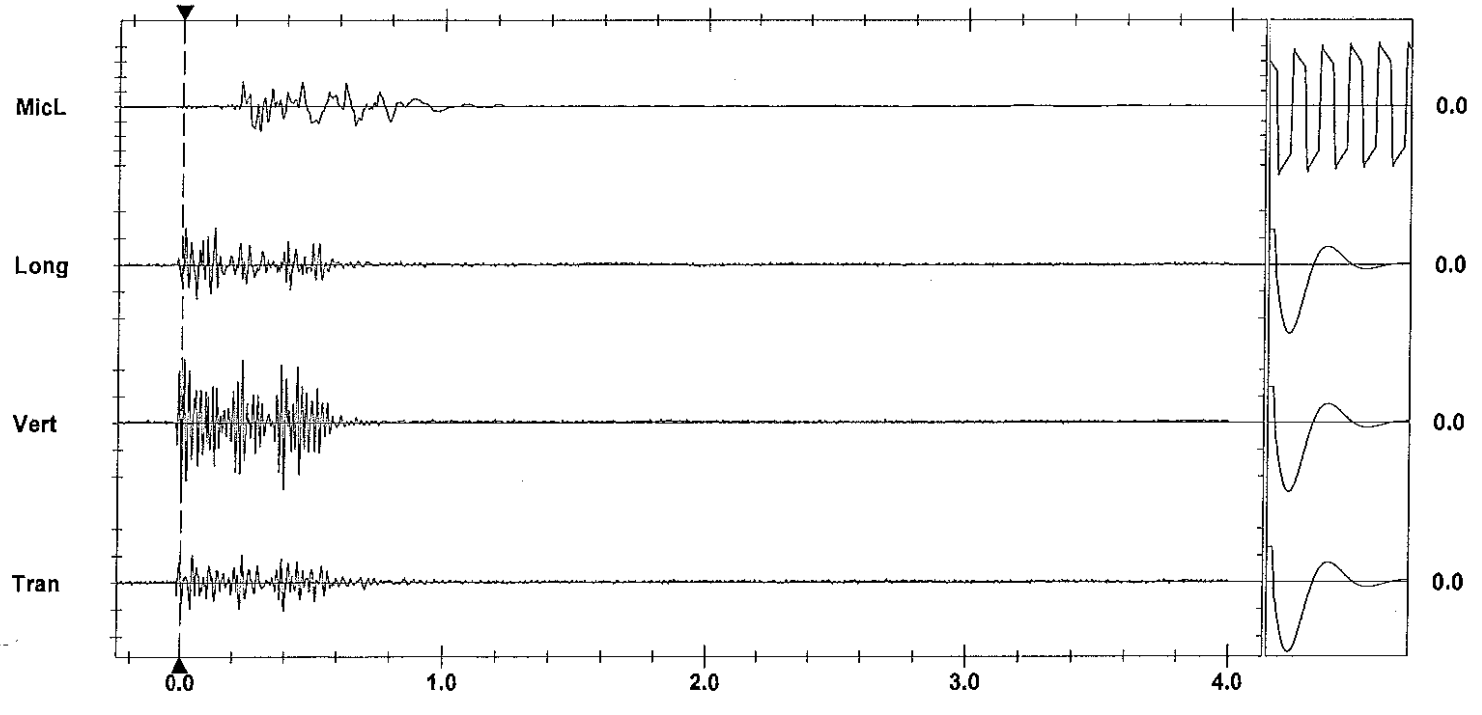
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.229 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 615 mv)

	Tran	Vert	Long	
PPV	0.0212	0.0500	0.0275	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.398	0.395	0.014	sec
Peak Acceleration	0.0232	0.0481	0.0199	g
Peak Displacement	0.00008	0.00015	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.0511 in/s at 0.395 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 24/12
ACTUAL BLAST DATE May 24/12 12:09 PM
BLAST # MW-0208

HIGHWAY# 97
BLAST LOCATION AT: 128+54 - 128+60 (Blast to Lever Boards)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY NA (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 43 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

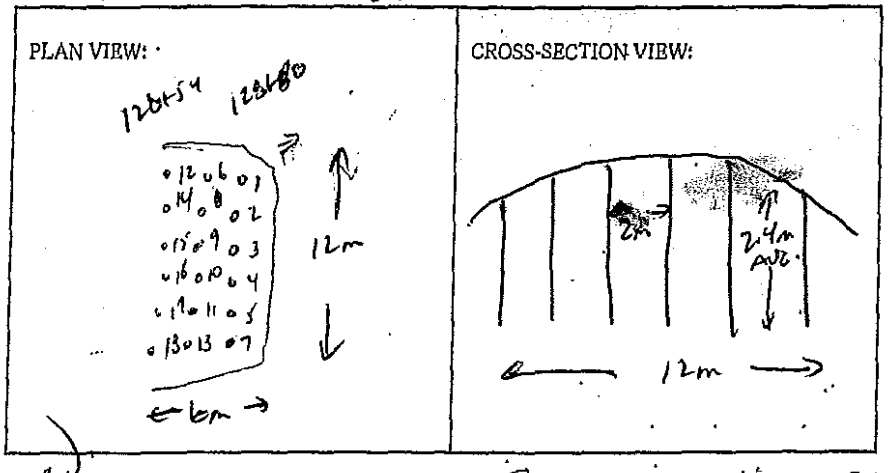
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH: SN

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13165 Cliffstone Crt. No Trigger (< 0.04 ips)
" @ 13117 Cliffstone Crt. 0.056 ips / 57.172

PRODUCTION HOLES – 1'–1.5' ANFO + 1x8 DYNAMITE B. PRIMER

Instantel

Event Report

Date/Time	Vert at 12:08:05 May 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAOP.PH0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

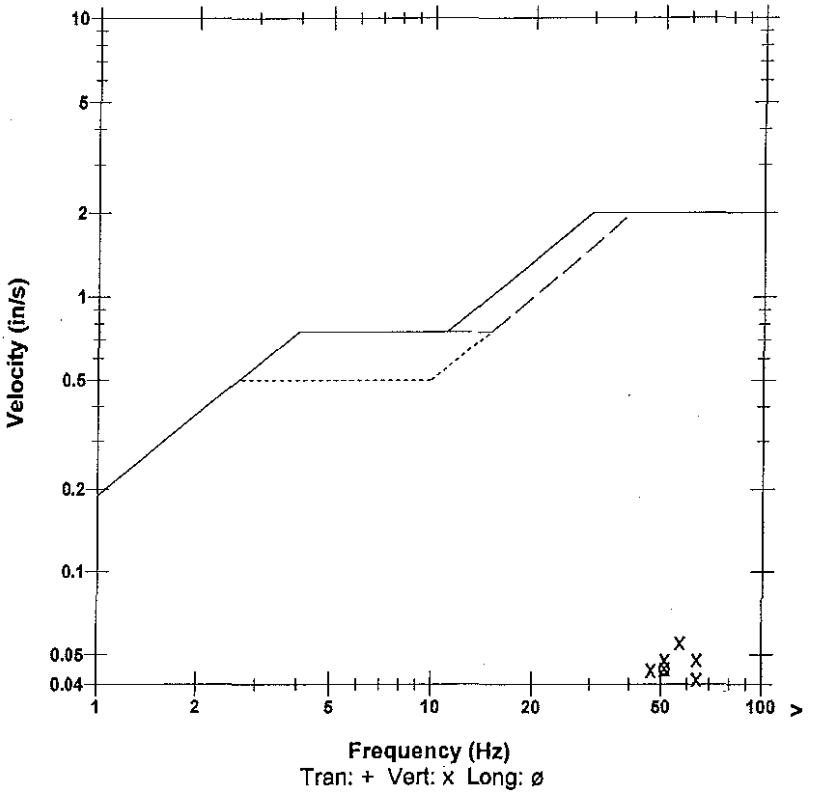
Post Event Notes

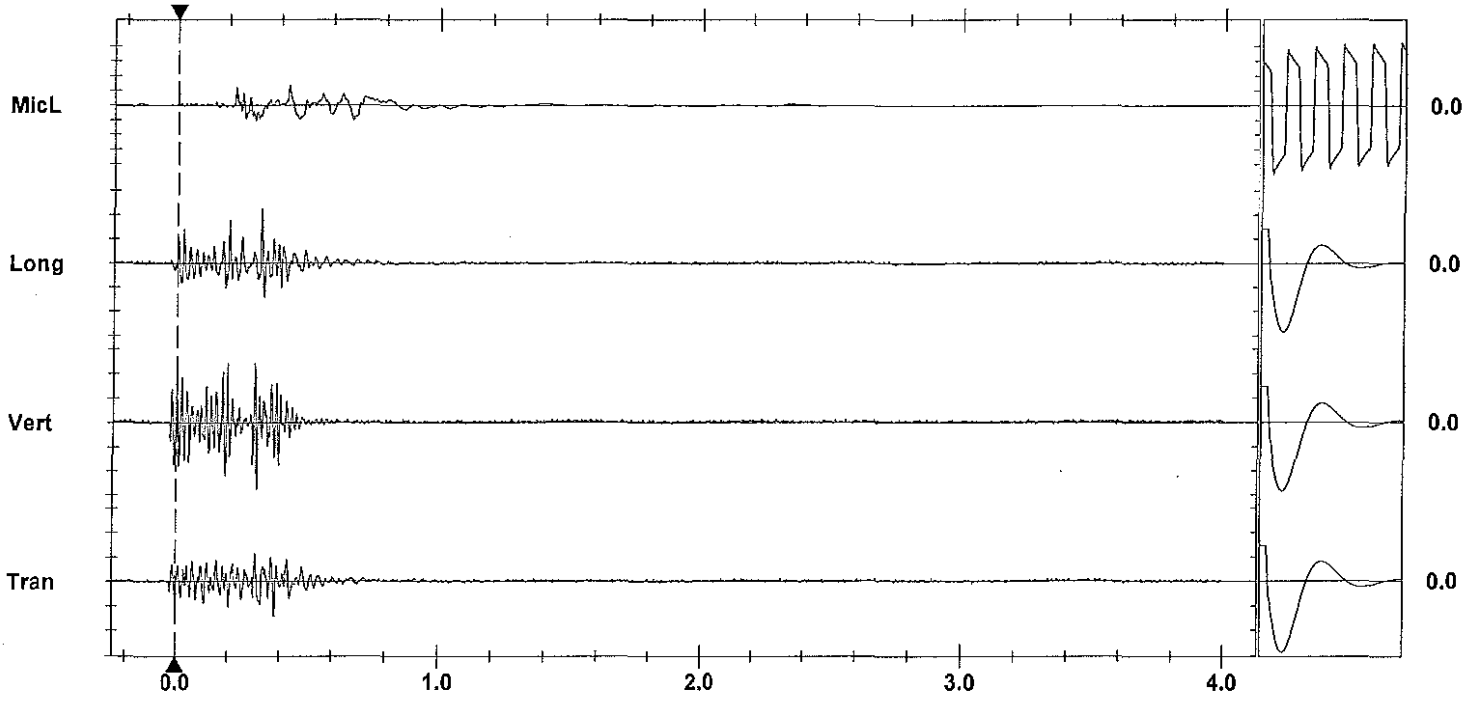
Microphone Linear Weighting
PSPL 0.00134 psi(L) et 0.429 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 581 mv)

	Tran	Vert	Long	
PPV	0.0287	0.0556	0.0450	in/s
ZC Freq	51	57	51	Hz
Time (Rel. to Trig)	0.383	0.315	0.327	sec
Peak Acceleration	0.0215	0.0597	0.0348	g
Peak Displacement	0.00012	0.00015	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0563 in/s at 0.315 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 24/11
ACTUAL BLAST DATE May 24/11 2:29 PM
BLAST # MW-0209

HIGHWAY# 97
BLAST LOCATION AT: 128+38 - 128+42

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shotmatted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.8 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9 Proo
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 4 kg (kg)
DELAY TYPE AND LENGTH (ms)

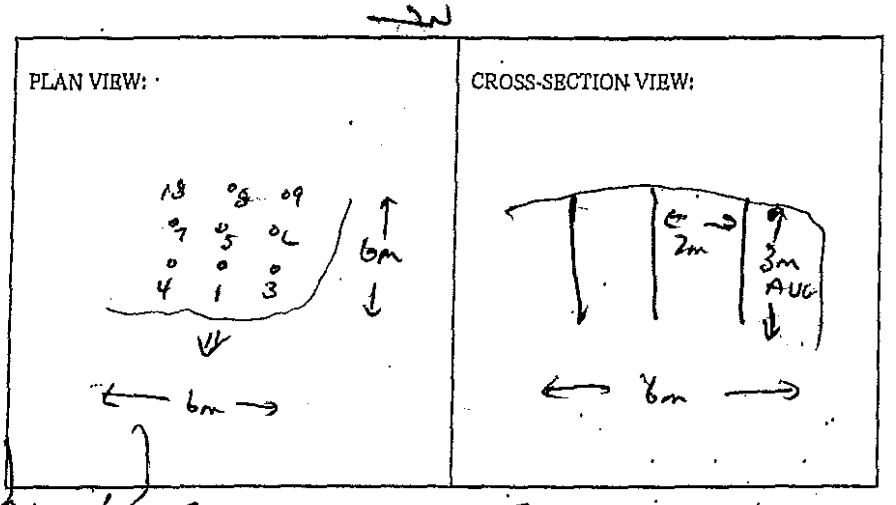
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone cut - 0.070 ips / 28 Hz
@ 13117 Cliffstone cut - 0.18 ips / 57 Hz

Production Holes - 4'-6' ANFO + 1 lb Dyn-Primer

Instantel®

Event Report

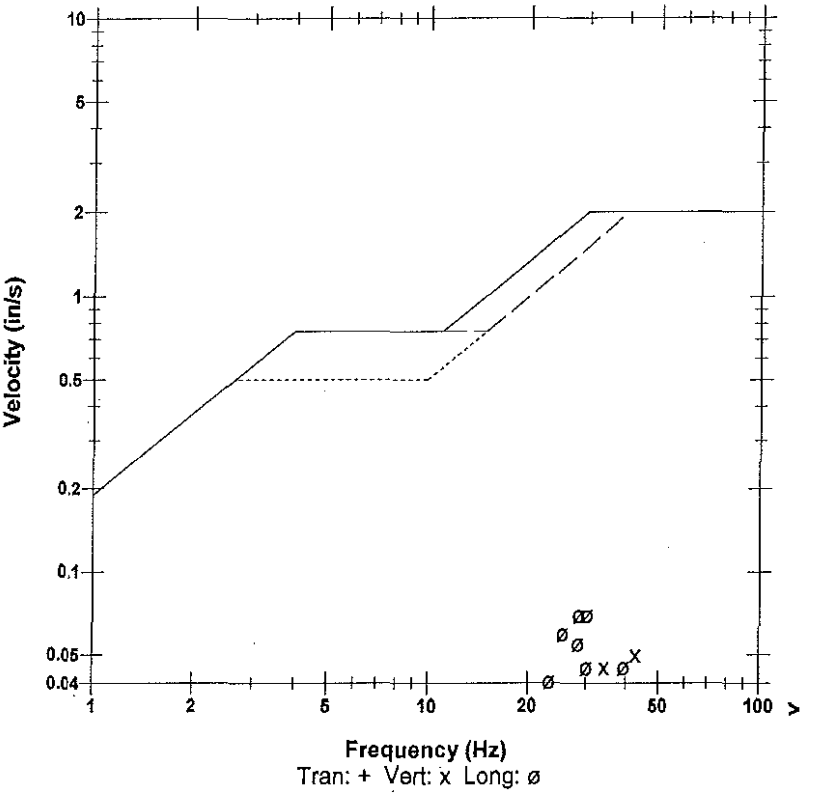
Date/Time	Vert at 14:29:12 May 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAOW.8O0

Notes
location:13167 Cliffstone Crt on
rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

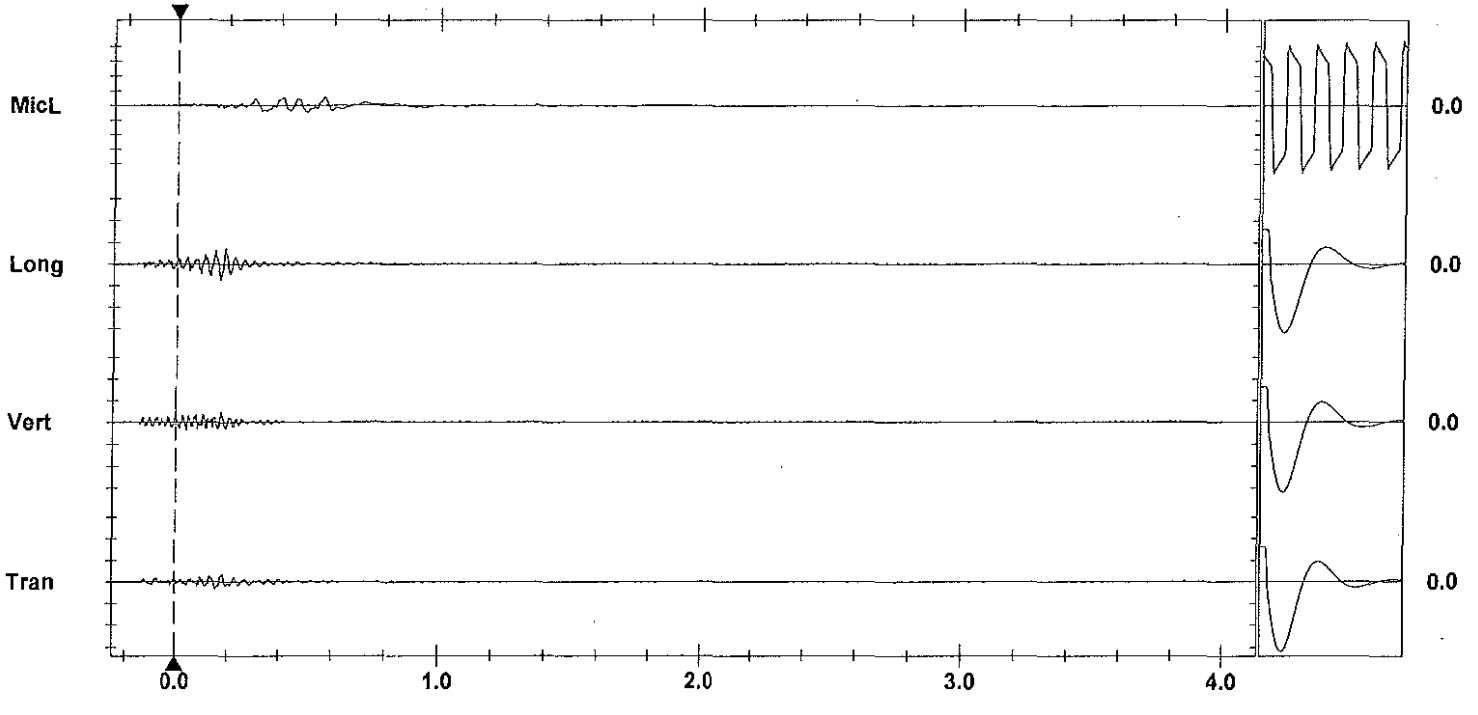
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00058 psi(L) at 0.564 sec			
ZC Freq	14 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 542 mv)			

	Tran	Vert	Long	
PPV	0.0350	0.0500	0.0700	in/s
ZC Freq	24	43	28	Hz
Time (Rel. to Trig)	0.159	0.001	0.170	sec
Peak Acceleration	0.0398	0.0663	0.0530	g
Peak Displacement	0.00023	0.00019	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0787 in/s at 0.188 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 14:29:27 May 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAOW.930
Job Number:	1		

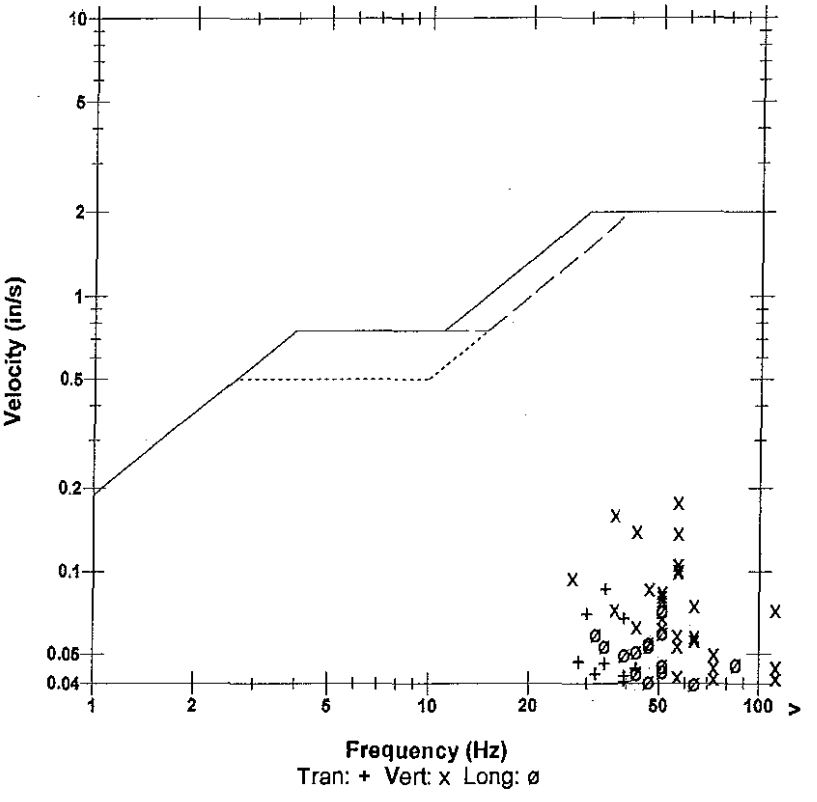
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

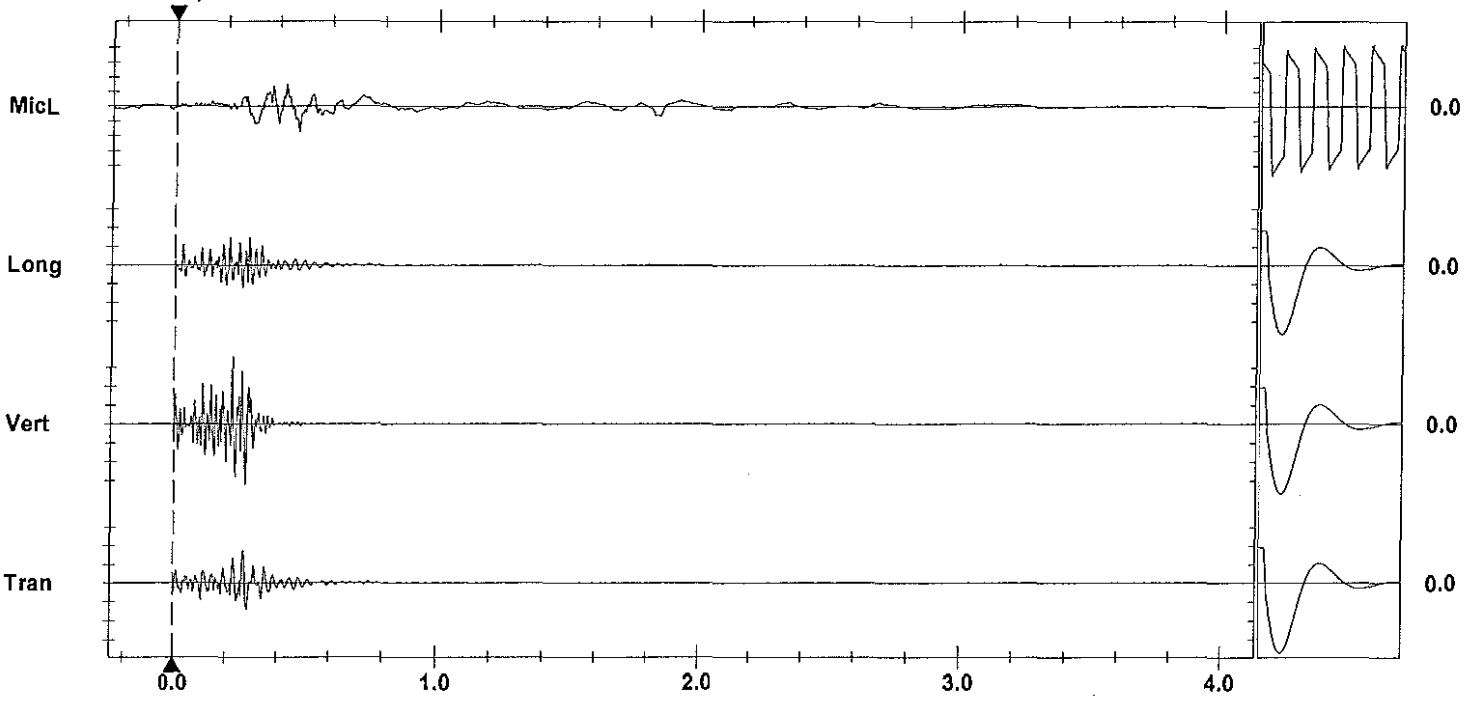
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00174 psi(L) at 0.474 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 595 mv)

	Tran	Vert	Long	
PPV	0.0862	0.178	0.0725	in/s
ZC Freq	34	57	51	Hz
Time (Rel. to Trig)	0.272	0.226	0.213	sec
Peak Acceleration	0.0696	0.164	0.0696	g
Peak Displacement	0.00040	0.00062	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.182 in/s at 0.226 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED May 25/12
ACTUAL BLAST DATE May 25/12 10:09 AM
BLAST # MW - 020

HIGHWAY # 97
BLAST LOCATION AT: 128+30 - 128+36

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot notified.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 6 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

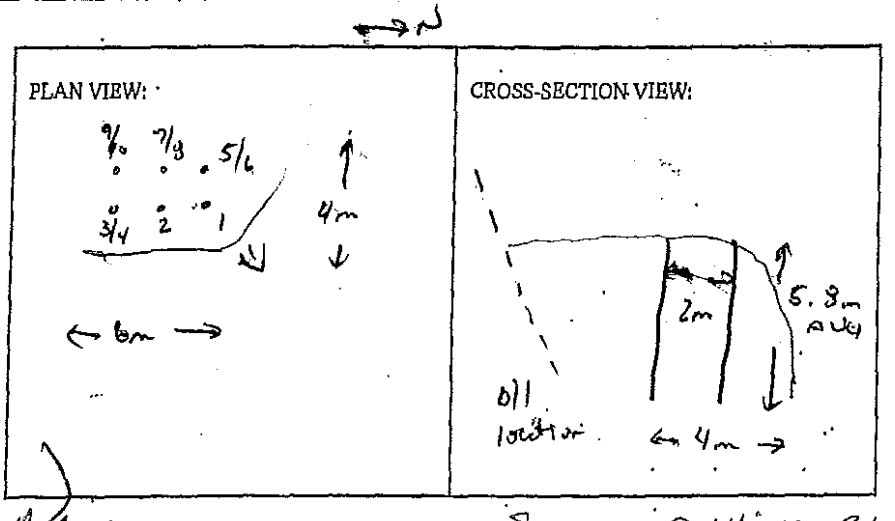
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 125 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone ent. 0.61 ips / 5 Hz
" @ 13117 Cliffstone ent. 0.21 ips / 34 Hz

Production Holes - Bottom Deck 4'-6' ANFO
- Top Deck 2'-4' ANFO

All primed w/ 1 each 1½ Dynamite

Instantel

Event Report

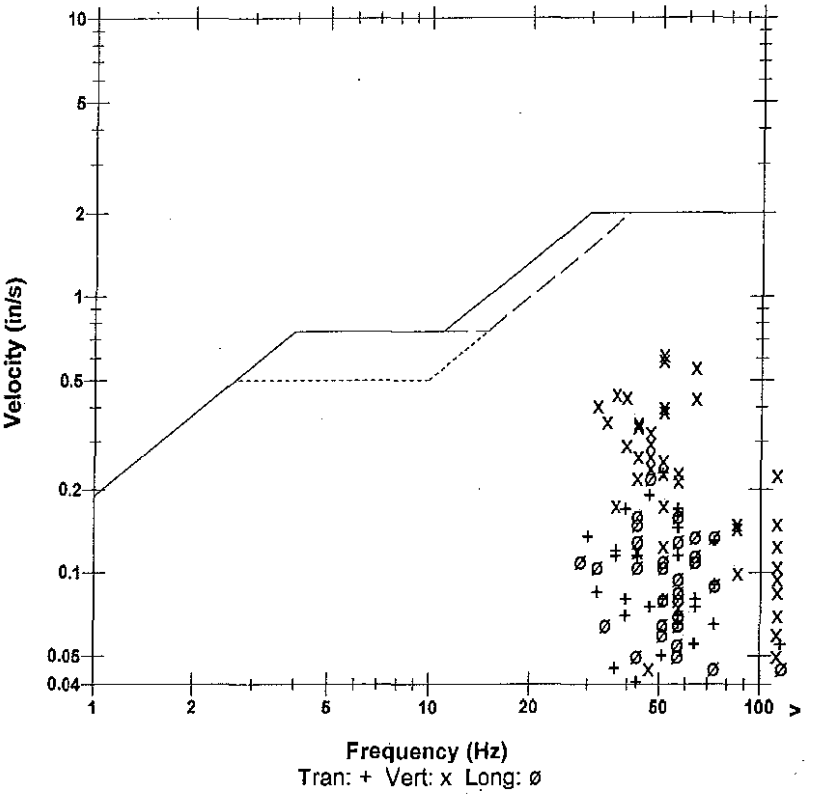
Date/Time	Vert at 10:09:22 May 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0900 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAQE.VM0

Notes
location:13073 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

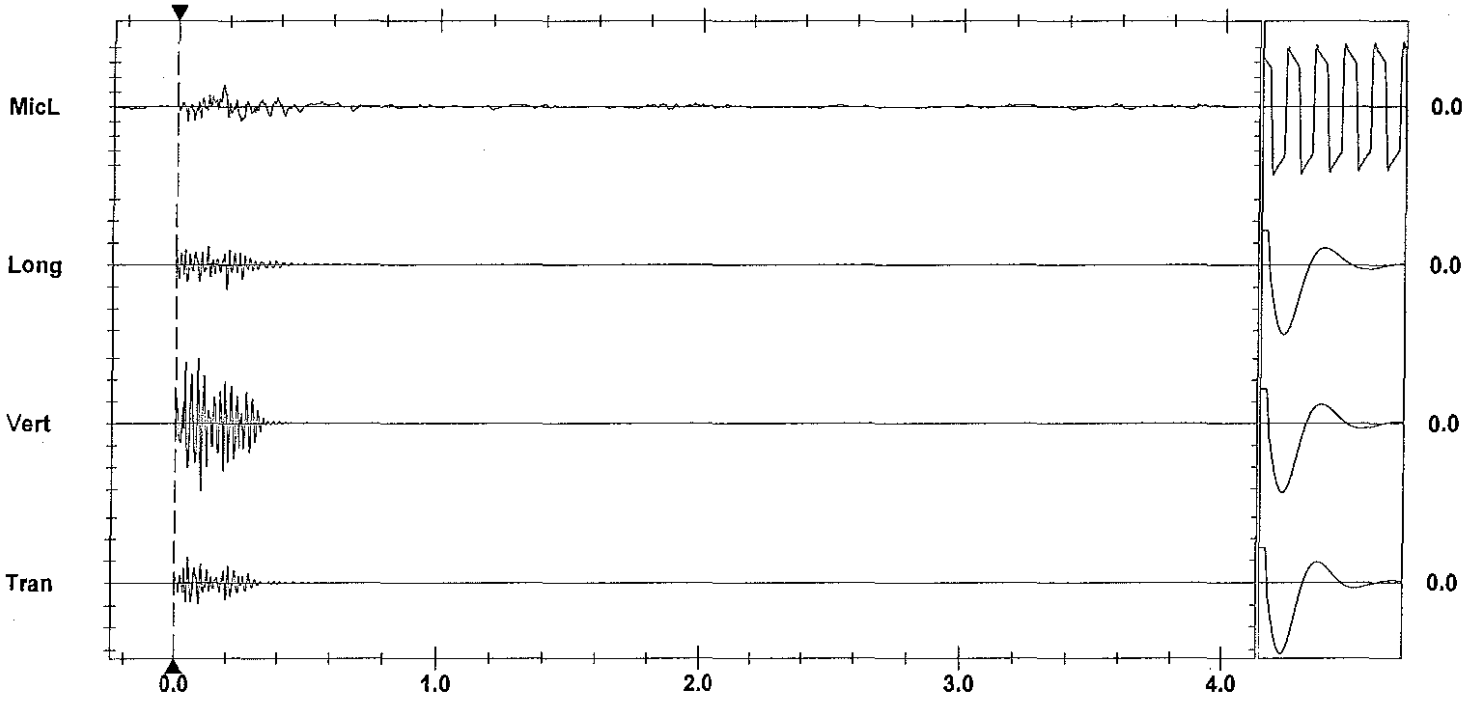
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00149 psi(L) at 0.180 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 545 mv)

	Tran	Vert	Long	
PPV	0.230	0.615	0.220	in/s
ZC Freq	51	51	47	Hz
Time (Rel. to Trig)	0.055	0.101	0.196	sec
Peak Acceleration	0.186	0.583	0.172	g
Peak Displacement	0.00069	0.00195	0.00071	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.623 in/s at 0.101 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 10:09:39 May 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAQE.W30
Job Number:	1		

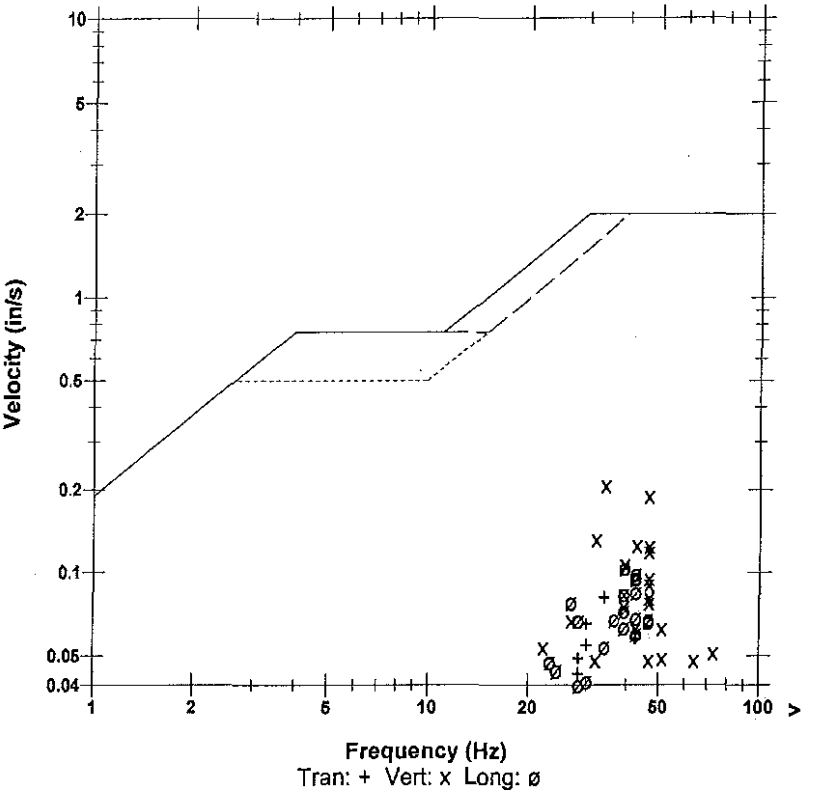
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

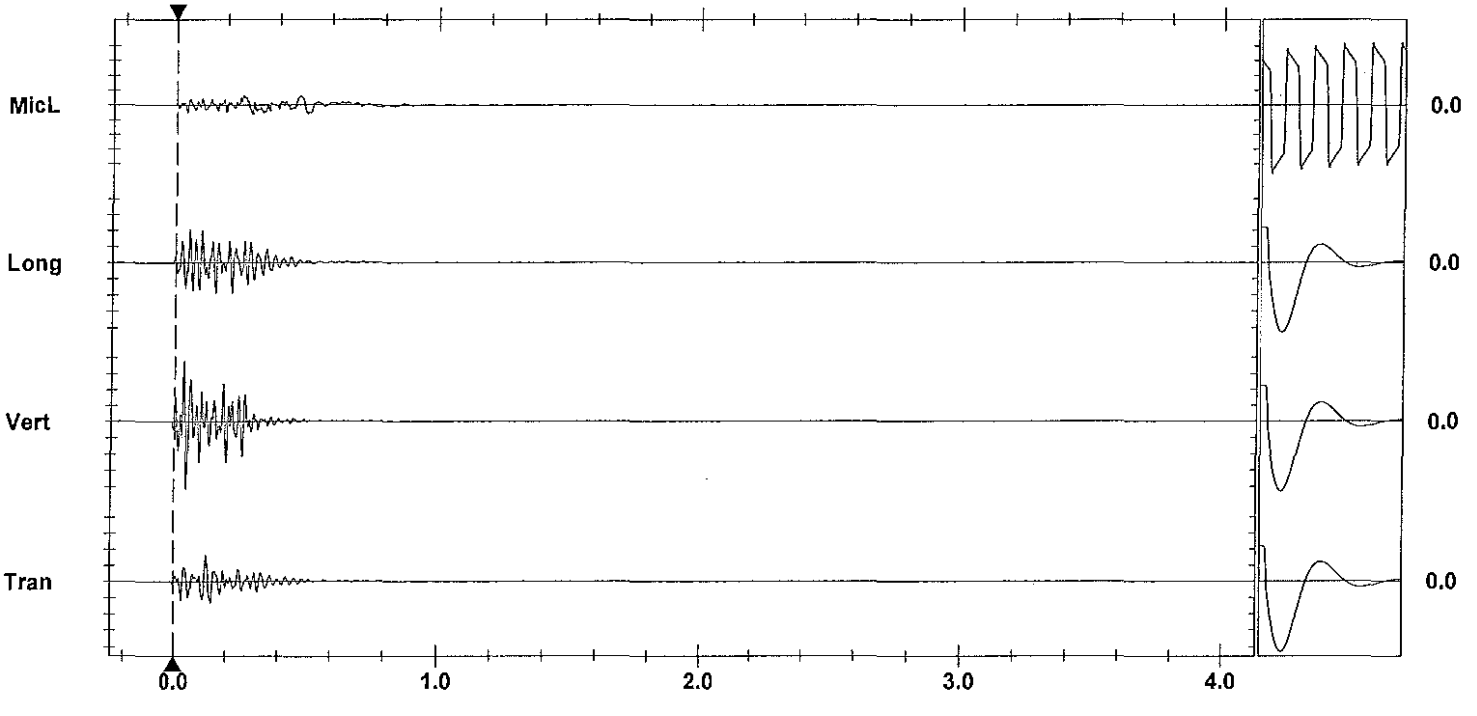
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00069 psi(L) at 0.259 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 546 mv)

	Tran	Vert	Long	
PPV	0.0806	0.207	0.104	in/s
ZC Freq	34	34	39	Hz
Time (Rel. to Trig)	0.129	0.048	0.056	sec
Peak Acceleration	0.0464	0.136	0.0812	g
Peak Displacement	0.00038	0.00090	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.211 in/s at 0.048 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 25/12
ACTUAL BLAST DATE May 25/12 12:46 PM
BLAST # MW-0211

HIGHWAY# 97
BLAST LOCATION AT: STN 128+80 - 128+86

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * slot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 12 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

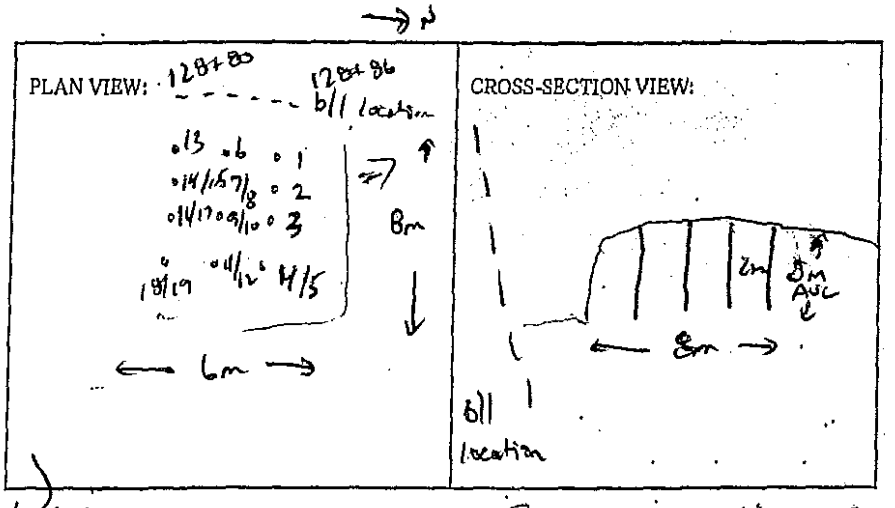
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE ~~HB320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13187 Cliffstone Ct 0.22 ips / 30 Hz
@ 13167 Cliffstone Ct 0.090 ips / 23 Hz

Prod Holes - Bottom Rock - 4' - 6' and

Top Rock - 1' - 3' and

Primed w/ 1x8 Dynamite

Instantel®

Event Report

Date/Time	Vert at 12:46:05 May 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAQM.4T0
Job Number:	1		

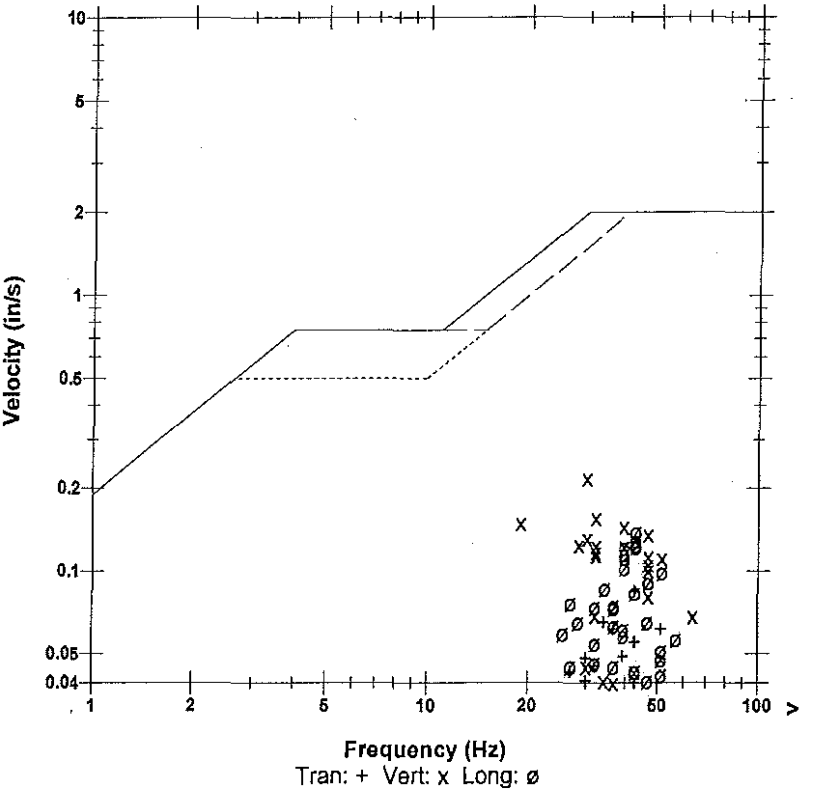
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

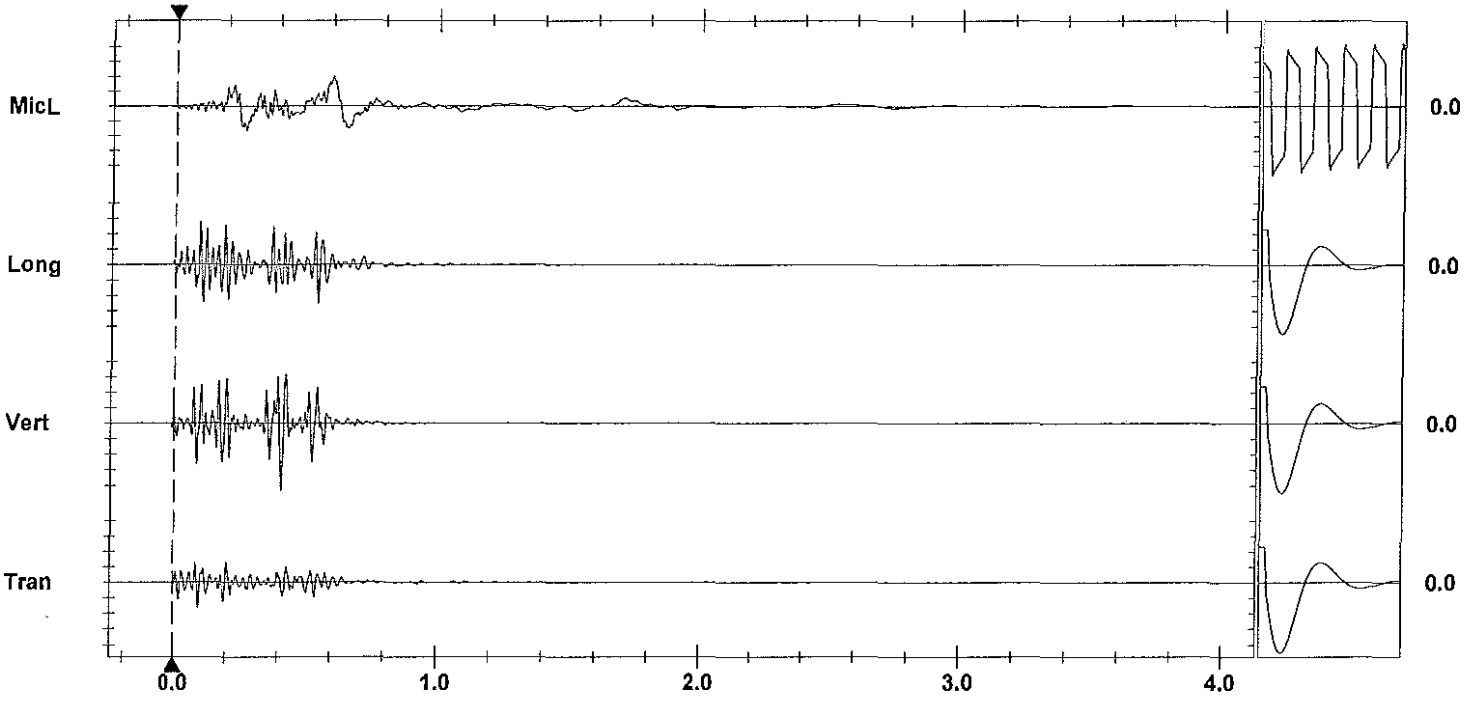
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00196 psi(L) at 0.601 sec
ZC Freq	4.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 590 mv)

	Tran	Vert	Long	
PPV	0.0837	0.217	0.139	in/s
ZC Freq	43	30	43	Hz
Time (Rel. to Trig)	0.099	0.413	0.099	sec
Peak Acceleration	0.0514	0.144	0.0928	g
Peak Displacement	0.00029	0.00109	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.227 in/s at 0.413 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: May 27, 2012 0(8:04 - 8:24) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

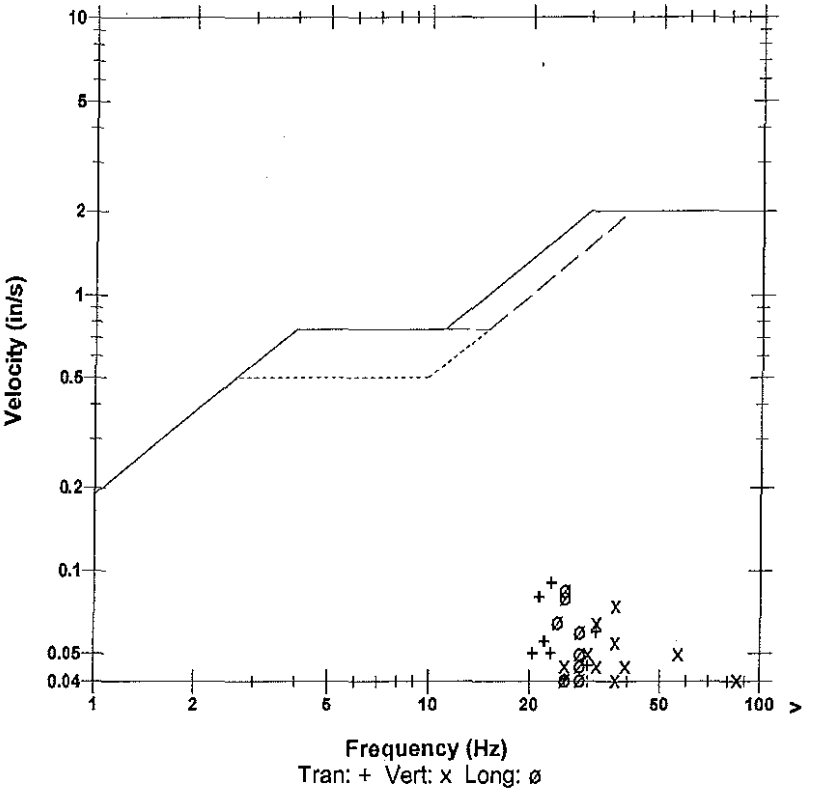
Date/Time	Tran at 12:45:49 May 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0900 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAQM.4D0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

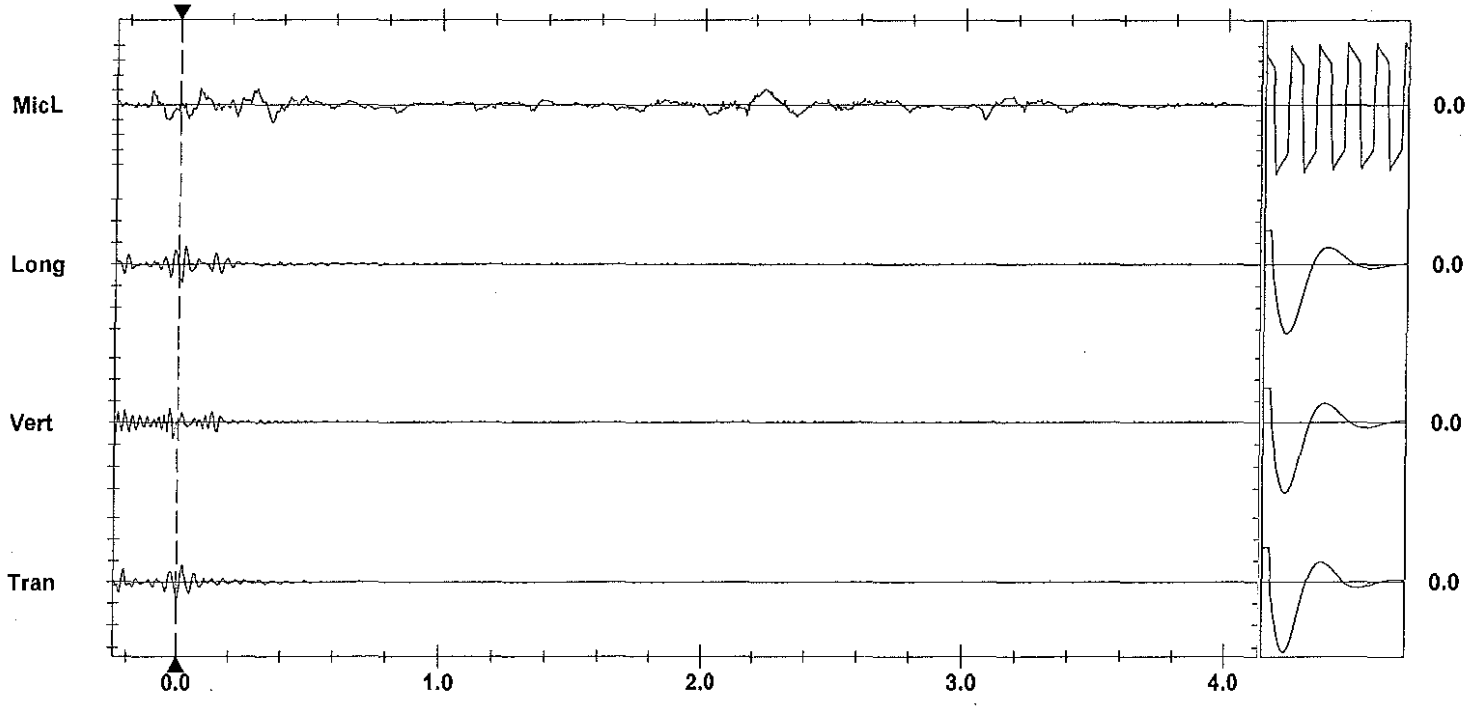
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.358 sec
ZC Freq	6.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0900	0.0750	0.0850	in/s
ZC Freq	23	37	26	Hz
Time (Rel. to Trig)	0.000	-0.020	0.010	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00057	0.00033	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.103 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Printed: May 27, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 28/12
ACTUAL BLAST DATE May 28/12 1:04PM
BLAST # MW-0212

HIGHWAY# 97
BLAST LOCATION AT: 128+76 - 128+80 2nd Bench

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot material

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.13 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 8 Perp / 2 Stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

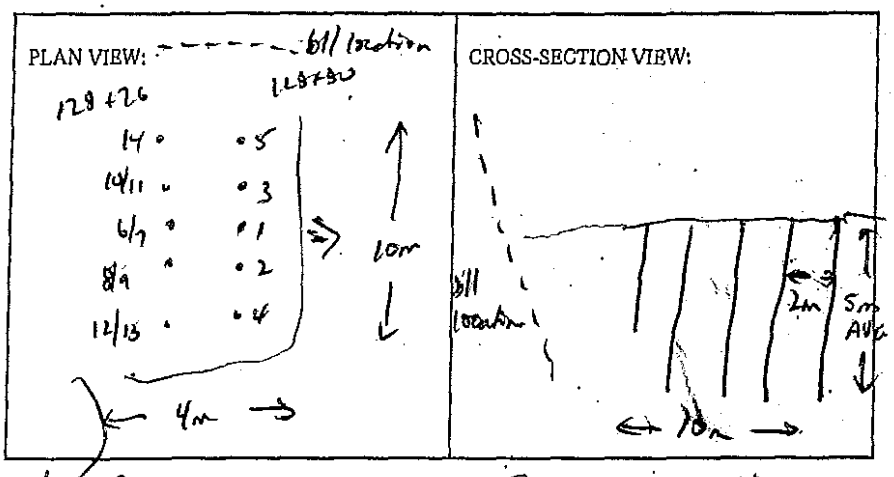
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE [signature] COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct - Noterober (< 0.09 ips)
@ 13117 Cliffstone Ct - 0.18 ips / 57 Hz

PROD HOLES - BOTTOM DECK 5'-6' ANFO

- TOP DECK 1'-2' ANFO

STEM HOLES - 1'-1.5' ANFO

ALL PRIMED W/ 1 CAST 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 13:04:12 May 28, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAW6.Z00
Job Number:	1		

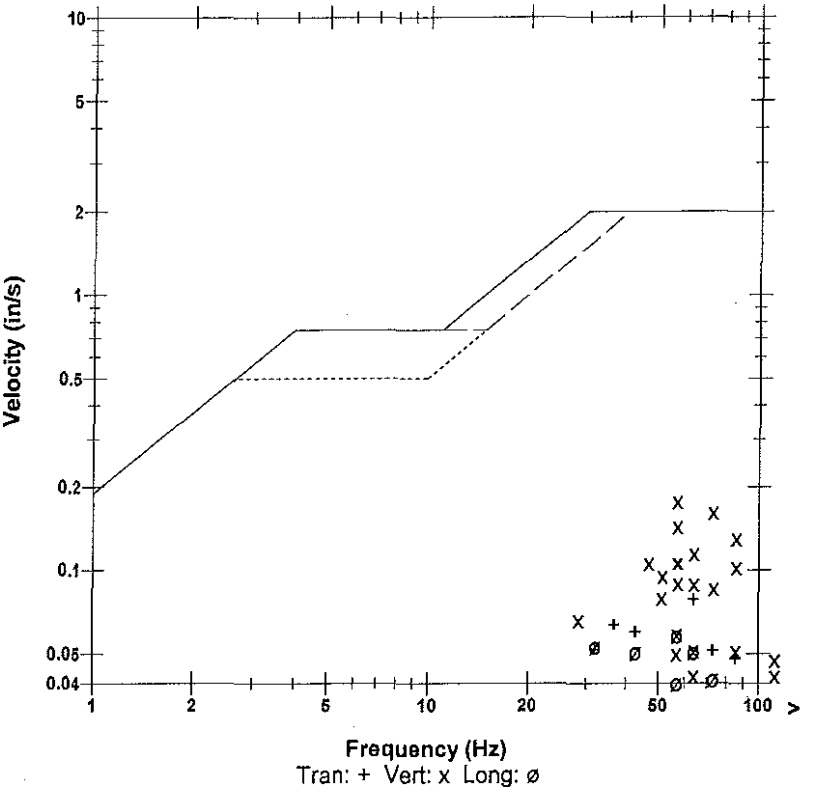
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

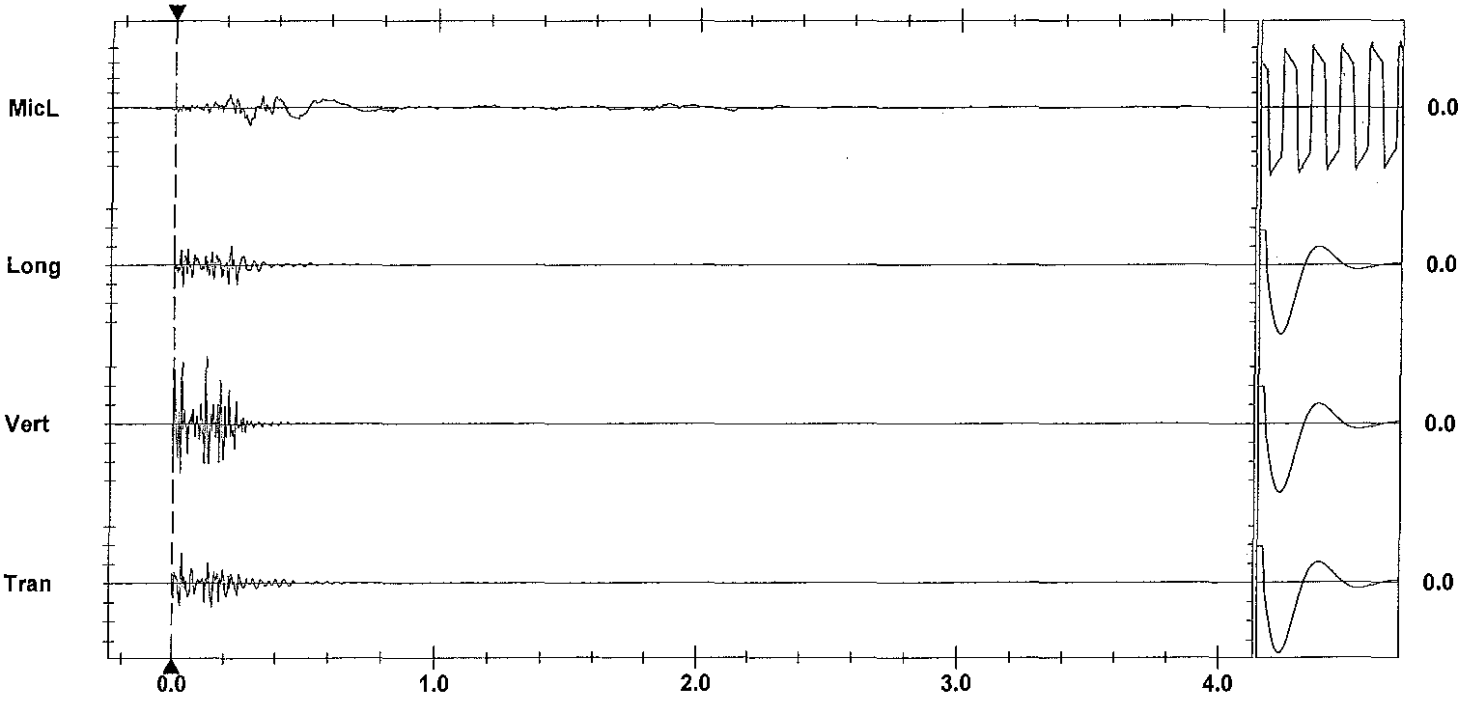
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0781	0.177	0.0581	in/s
ZC Freq	64	57	57	Hz
Time (Rel. to Trig)	0.038	0.129	0.033	sec
Peak Acceleration	0.0779	0.172	0.0630	g
Peak Displacement	0.00026	0.00042	0.00019	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Microphone Linear Weighting
PSPL 0.00120 psi(L) at 0.290 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 534 mv)

Peak Vector Sum 0.179 in/s at 0.129 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 2347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 553489

DATE PREPARED May 28/12
ACTUAL BLAST DATE May 28/12 11:58am
BLAST # MJ-0213

HIGHWAY# 97
BLAST LOCATION AT: 128+76 – 128+90 LS Bore #2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
dp slot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 58 (m)

TOTAL NUMBER OF HOLES 6 bll / 5 bottom
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 2" Dynamite + 250 gr det cord to 4' collar in bll

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Blasters
TOTAL NUMBER OF CARTRIDGES 34
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 406 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

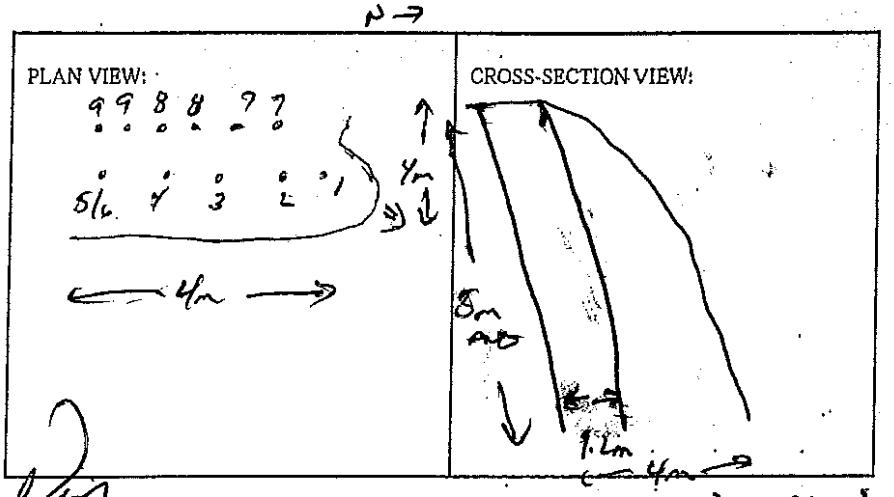
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

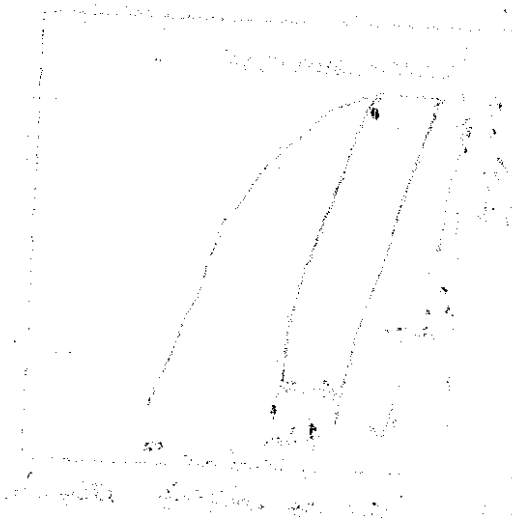
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Clifftop Ct 0.11 ips / 34 Hz
& @ 13117 Clifftop Ct. 0.25 ips / 5 Hz

Buffer Holes (2"x16" Blastex) – 4-5 Cartridges in Bottom
– 1 Decked Hole 1400 1 Cart in Top Deck

B/L Holes – 1 Cart 2x16 UNIMAX + 400gm det cord to 4' Collar



Instantel

Event Report

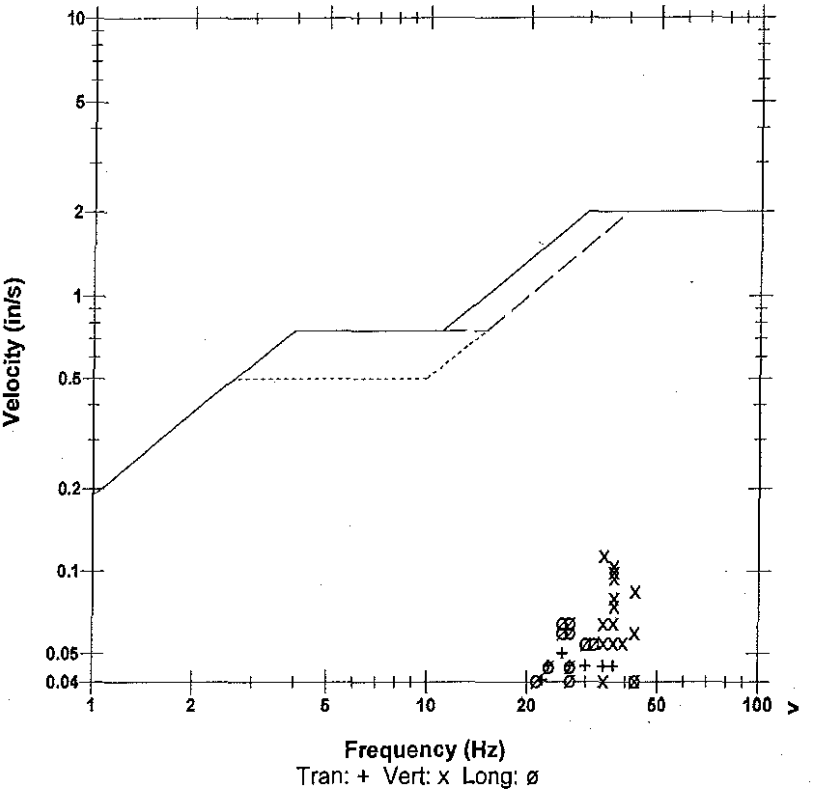
Date/Time	Vert at 11:56:10 May 28, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0900 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAW3.TM0

Notes
location:13167 Cliffstone Crt on rear patio slab
User Name:Wayne V
General:

Extended Notes

Post Event Notes

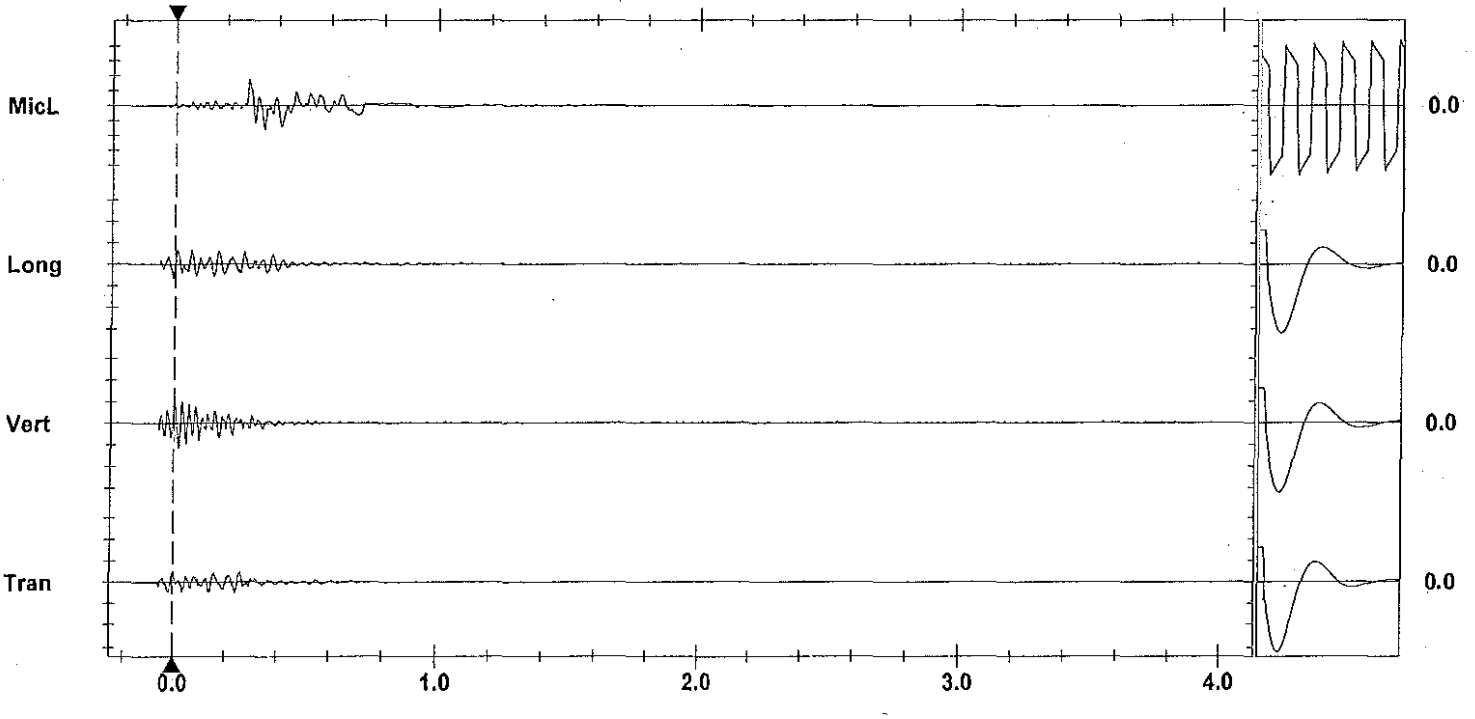
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.287 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 499 mv)

	Tran	Vert	Long	
PPV	0.0500	0.115	0.0650	in/s
ZC Freq	26	34	26	Hz
Time (Rel. to Trig)	0.242	0.017	-0.008	sec
Peak Acceleration	0.0398	0.0795	0.0398	g
Peak Displacement	0.00028	0.00050	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.118 in/s at 0.017 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——·——◀

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:56:29 May 28, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAW3.U50
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

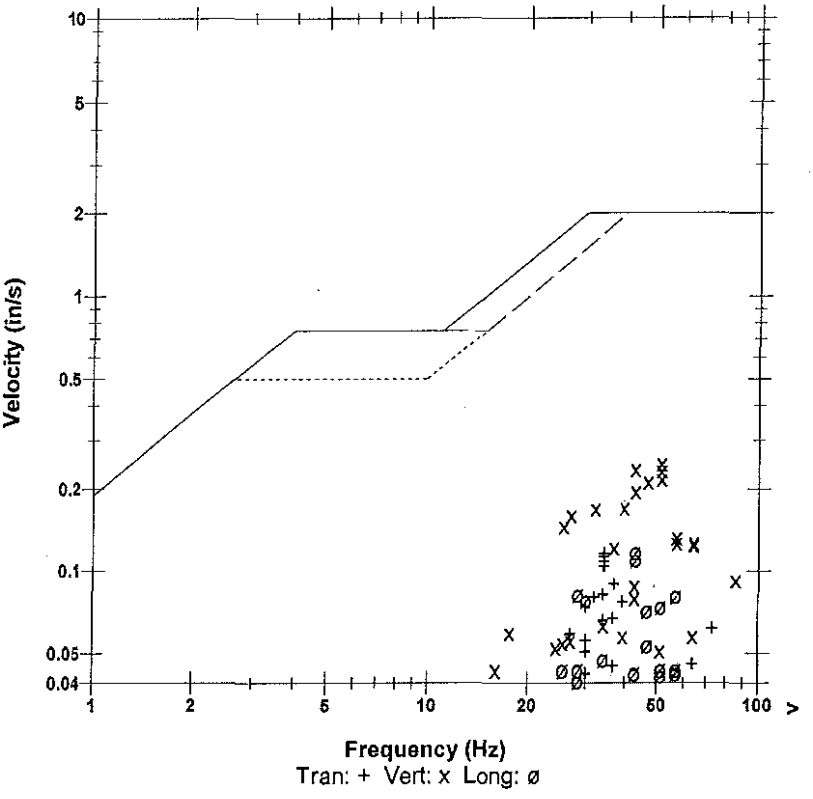
Post Event Notes

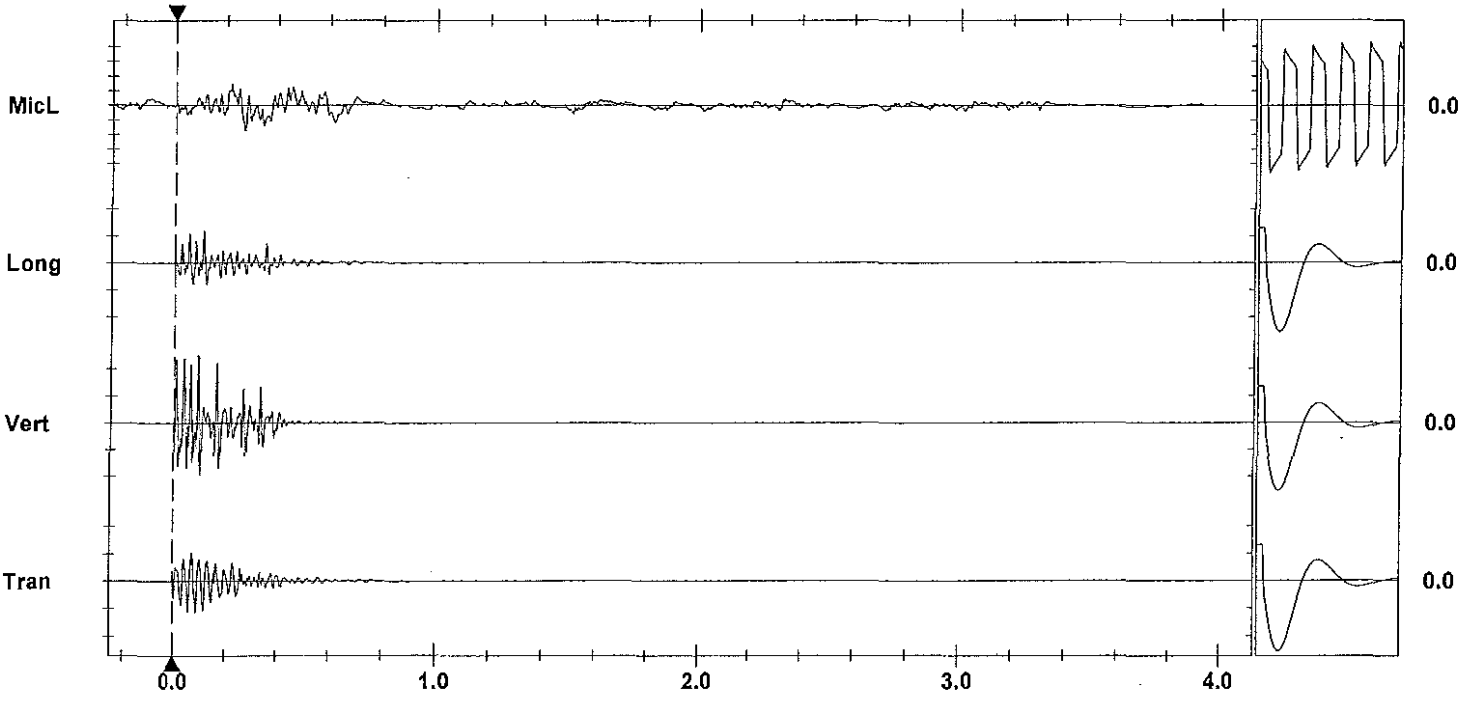
Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.268 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.116	0.247	0.117	in/s
ZC Freq	34	51	43	Hz
Time (Rel. to Trig)	0.091	0.095	0.115	sec
Peak Acceleration	0.0878	0.174	0.0812	g
Peak Displacement	0.00049	0.00084	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.258 in/s at 0.095 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489
DATE PREPARED May 29/12
ACTUAL BLAST DATE May 28/12 10:05 AM
BLAST # MoT-0214

HIGHWAY# 97
BLAST LOCATION AT: 128+70 - 128+76 Bench 3

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: 4 shot matted

HEIGHT ABOVE HWY 8m (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 59 (m)
TOTAL NUMBER OF HOLES 12 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

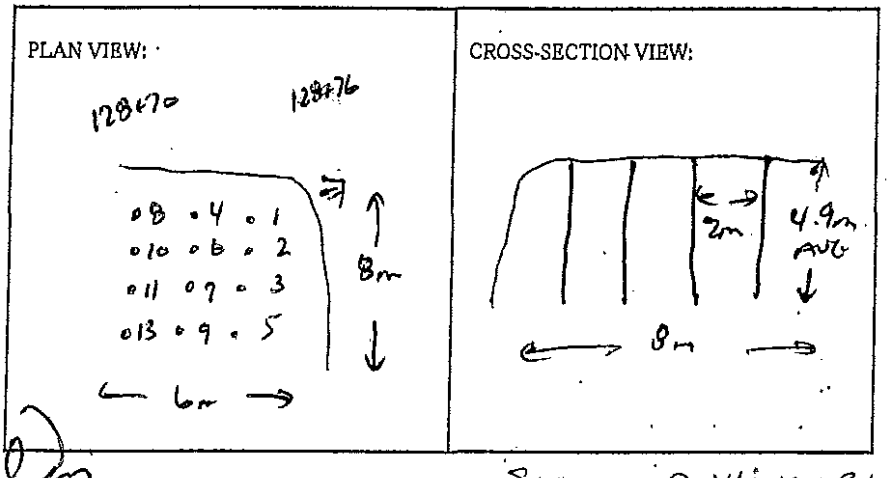
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 225 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

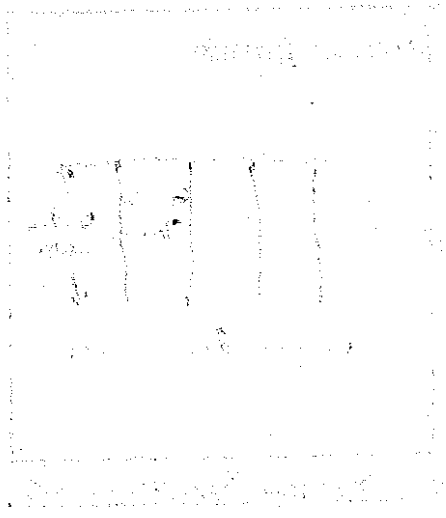


BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Ent. - NO Reading - Seismograph Turned off.
" @ 13117 Cliffstone Ent - 0.181 ips / 57Hz

PROD CASES - 5'-7' ANFO PRIMED W/ CAST NOB BOOSTER/TB



Instantel

Event Report

Date/Time	Vert at 10:05:55 May 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAXT.DV0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

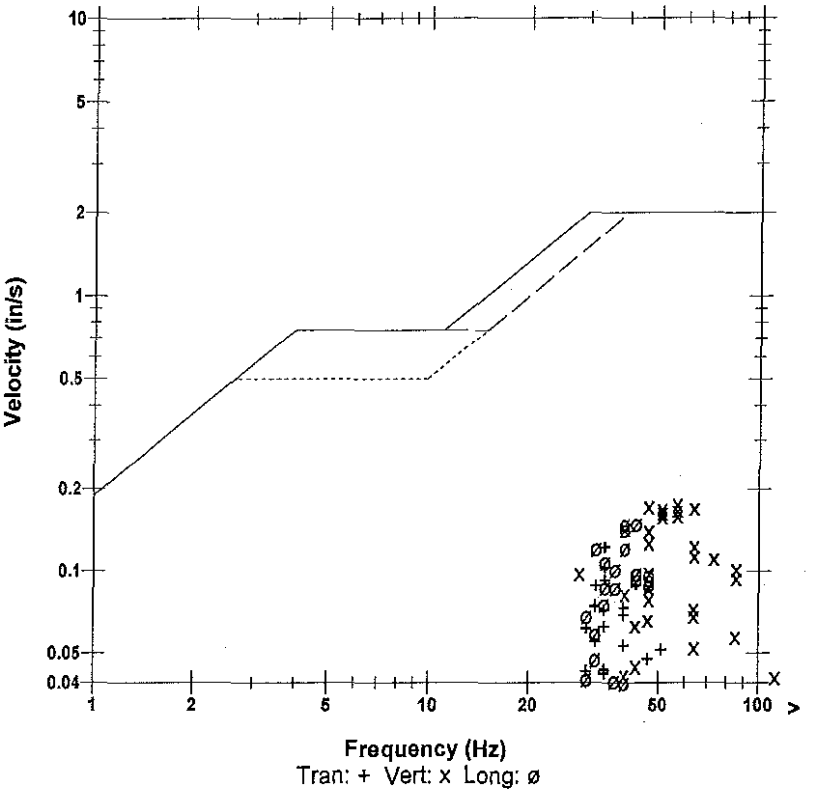
Post Event Notes

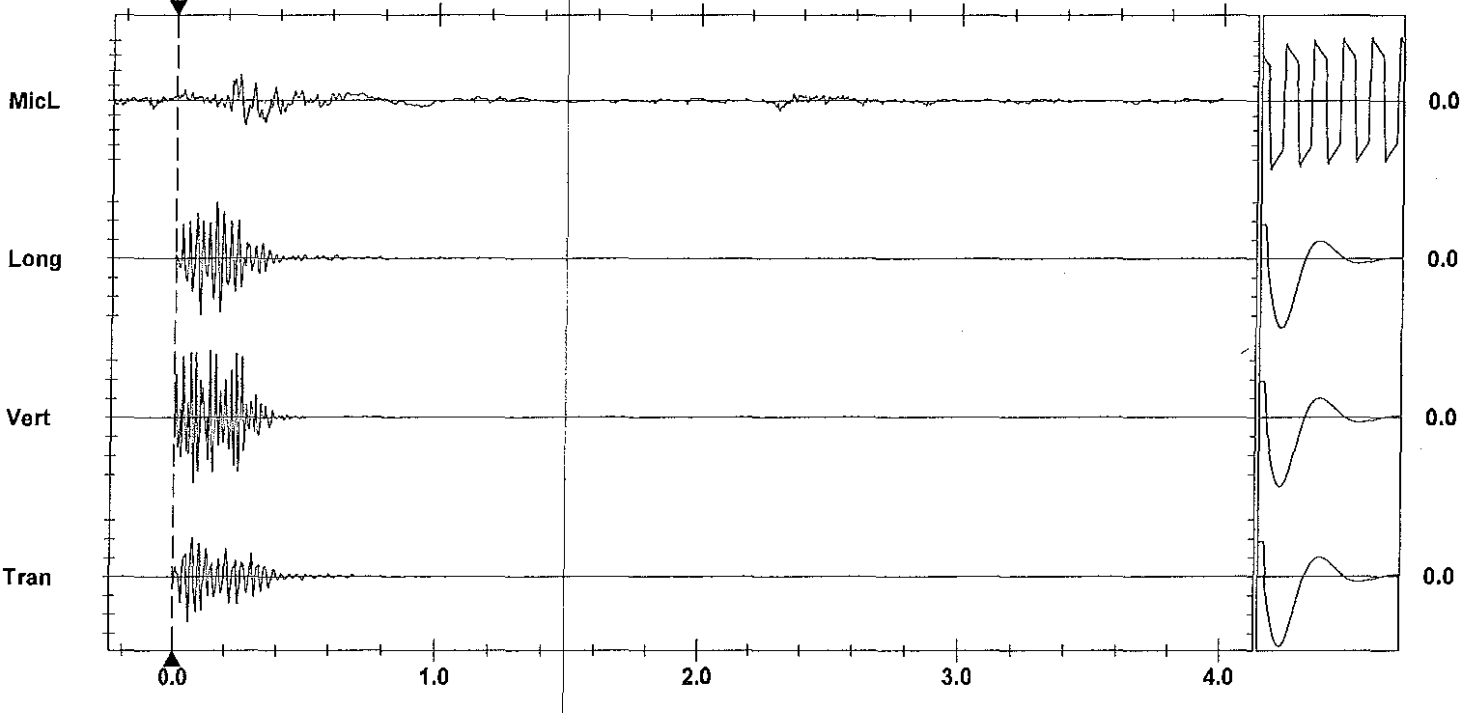
Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.250 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 552 mv)

	Tran	Vert	Long	
PPV	0.121	0.176	0.149	in/s
ZC Freq	34	57	43	Hz
Time (Rel. to Trig)	0.062	0.141	0.096	sec
Peak Acceleration	0.0911	0.209	0.124	g
Peak Displacement	0.00051	0.00056	0.00059	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.226 in/s at 0.163 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED May 29/12
ACTUAL BLAST DATE May 29/12 12:05 PM
BLAST # MAW-0215

HIGHWAY# 97
BLAST LOCATION AT: SBD 128+70 - 128+76 LS B GALLERY 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 93 (m)

TOTAL NUMBER OF HOLES 5 PRod / 3 STAB / 3 BUFFER / 6 B/L
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS: 2"x16" Blasticon in Buffer Holes / 2"x16" Dynamite + 200 gr. det cord to 4' collar in B/L

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

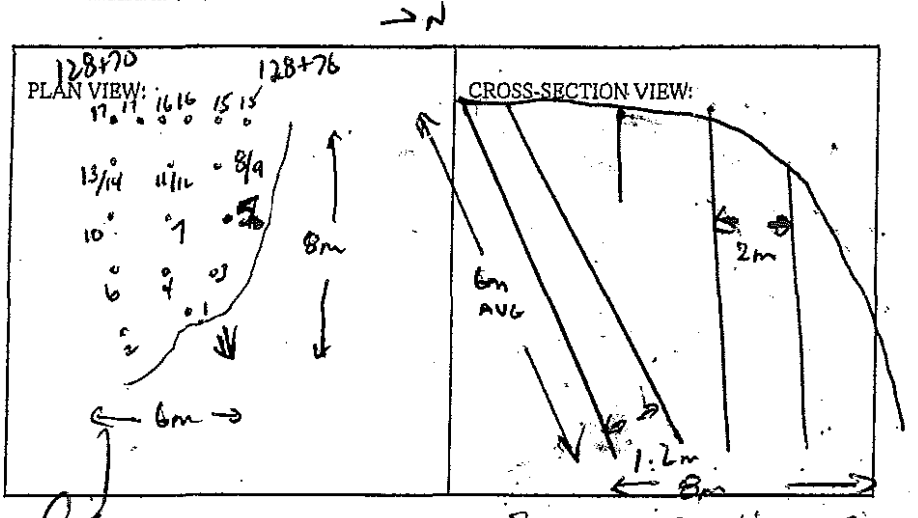
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - No Reading - Seismograph turned off.
" @ 13117 Cliffstone Crt - 0.44 ips / 37 Hz

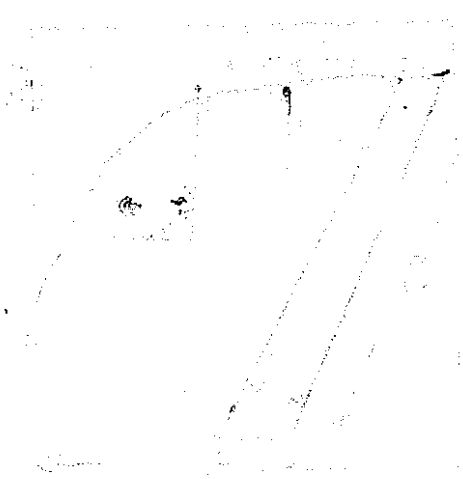
PROD HOLES - 6'-7' APART + 1X8 DYNAMITE PRIMER

STAB HOLES 1'-1½' APART + 1X8 DYNAMITE PRIMER

BUFFER HOLES - BOTTOM DECK 4-6 STICKS 2X16 BLASTEX

1X8 DYNAMITE PRIMERS - TOP DECK 2-3 STICKS 2X16 BLASTEX

B/L HOLES - TOE LOAD 1 CART 2X16 UNIMAX + 200 gr det. cord to 4' collar



Instantel®

Event Report

Date/Time	Vert at 12:55:01 May 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAY1.7P0
Job Number:	1		

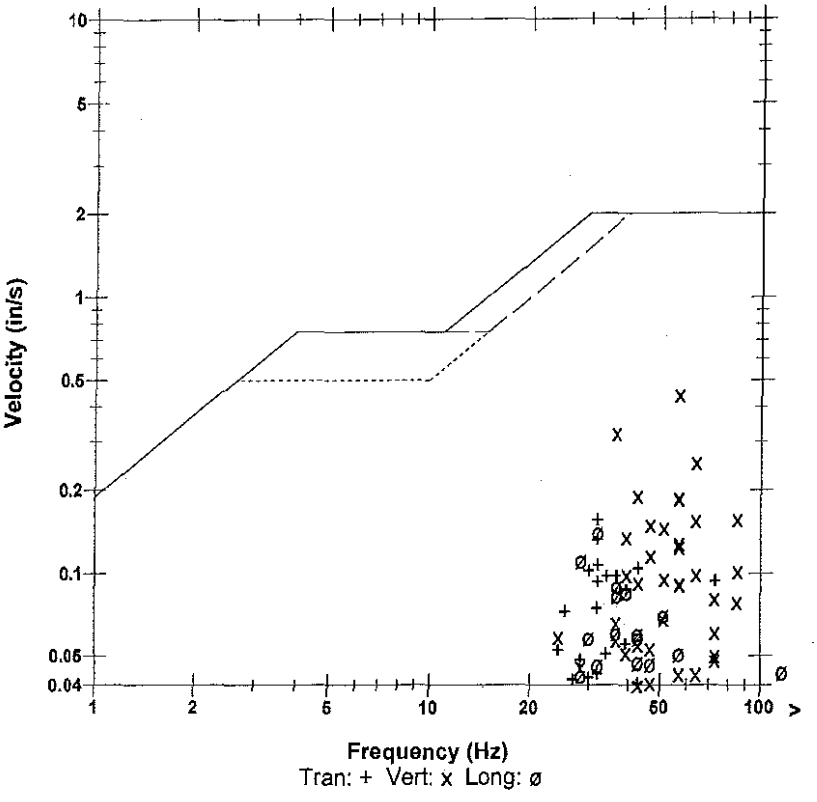
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

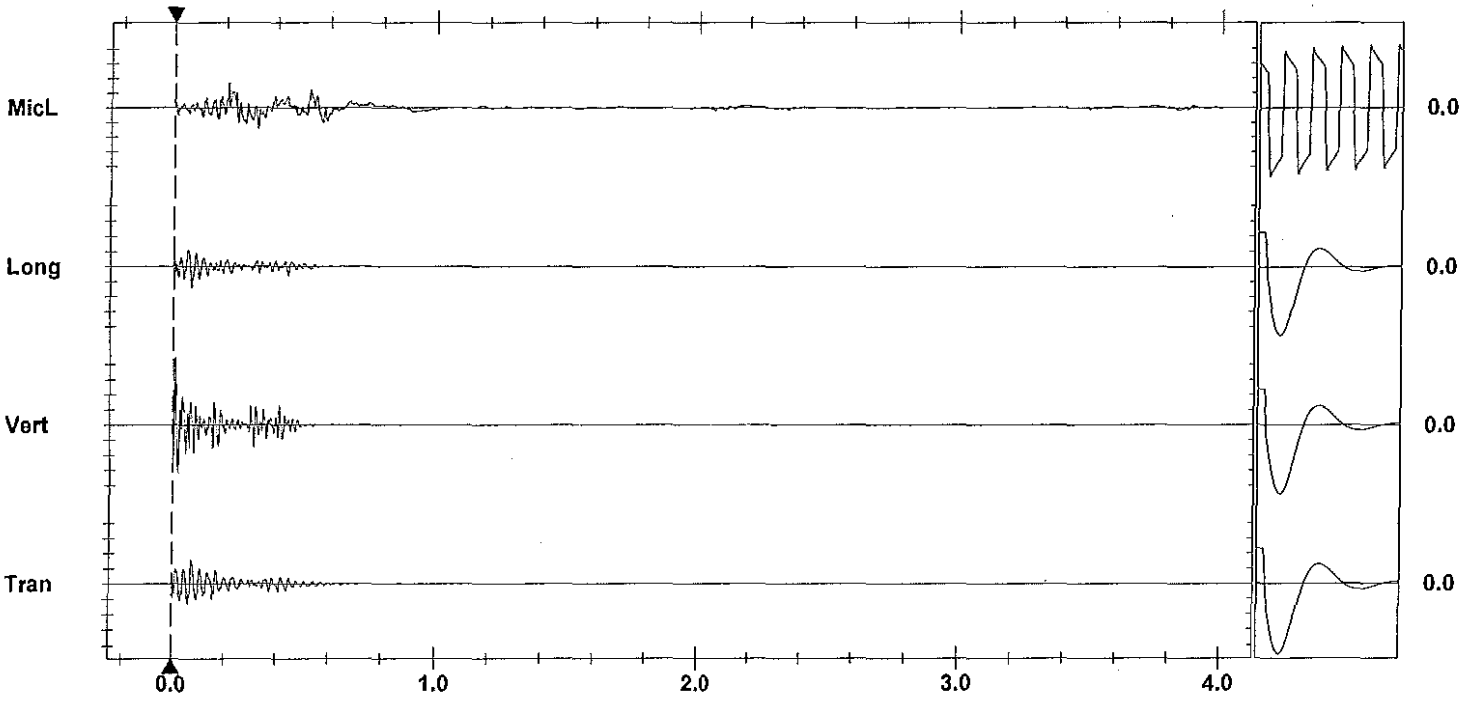
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.206 sec
ZC Freq	39 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.156	0.441	0.140	in/s
ZC Freq	32	57	32	Hz
Time (Rel. to Trig)	0.077	0.009	0.070	sec
Peak Acceleration	0.134	0.471	0.101	g
Peak Displacement	0.00077	0.00123	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.443 in/s at 0.009 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 29/12
ACTUAL BLAST DATE MAY 29/12 3:39 PM
BLAST # MW-0026

HIGHWAY# 97
BLAST LOCATION AT: STN 128+64 - 128+70 c/l Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALASKO GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.4 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 12 Pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

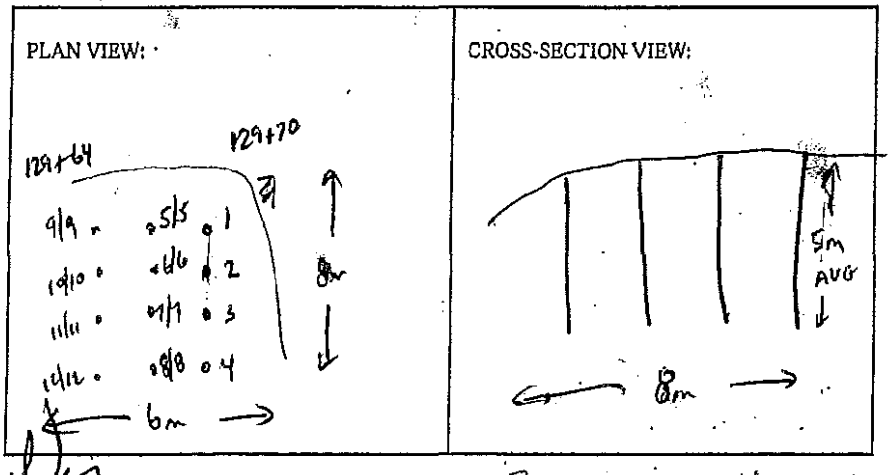
INITIATION DEVICE: (CIRCLE) E-B CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crk. NO READING - SEISMOGRAPH TURNED OFF
@ 13+17 Cliffstone Crk. 0.34 ips/64 Hz

Production Holes - Bottom Deck 5'-6' ANFO

— Top Deck 1'-2' ANFO

Primed w/ 1 each 1x8 Dynamite / Deck.

Instantel

Event Report

Date/Time	Vert at 15:39:08 May 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAY8.T80
Job Number:	1		

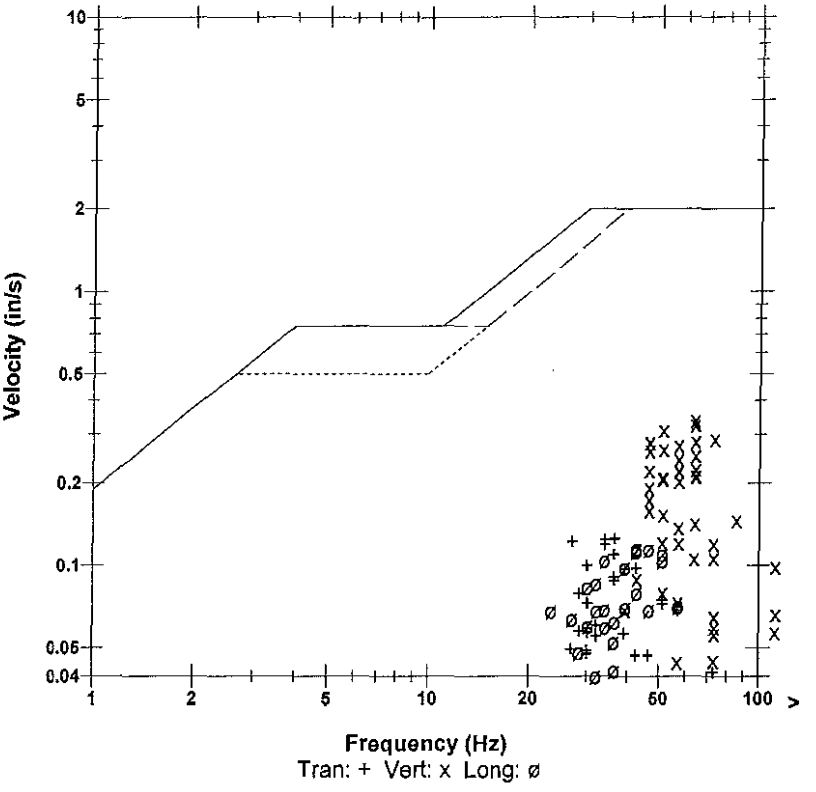
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

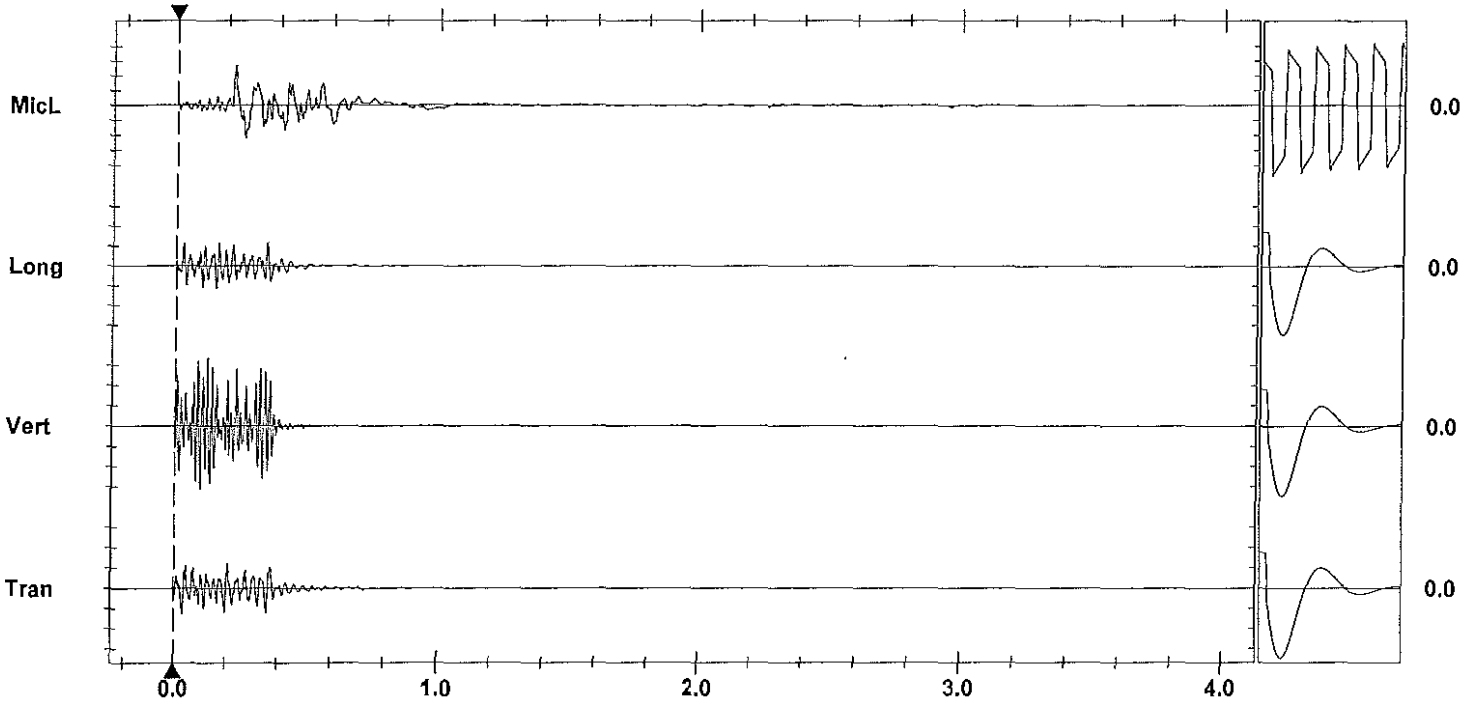
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00268 psi(L) at 0.223 sec			
ZC Freq	19 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 582 mv)			

	Tran	Vert	Long	
PPV	0.125	0.337	0.116	in/s
ZC Freq	37	64	43	Hz
Time (Rel. to Trig)	0.358	0.124	0.354	sec
Peak Acceleration	0.109	0.356	0.104	g
Peak Displacement	0.00056	0.00095	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.343 in/s at 0.124 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 10:52 am
BLAST # MW-0217

HIGHWAY# 97
BLAST LOCATION AT: Sta 127 + 85 (High spot in SG)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY 10m (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5ea
AVERAGE DEPTH 1.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.8 (m)
TOTAL DEPTH 14.4 (m)

TOTAL NUMBER OF HOLES 8 proj
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 4 (8x.5)
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY: 80 Caps

VOLUME OF ROCK BLASTED 2 (m^3)

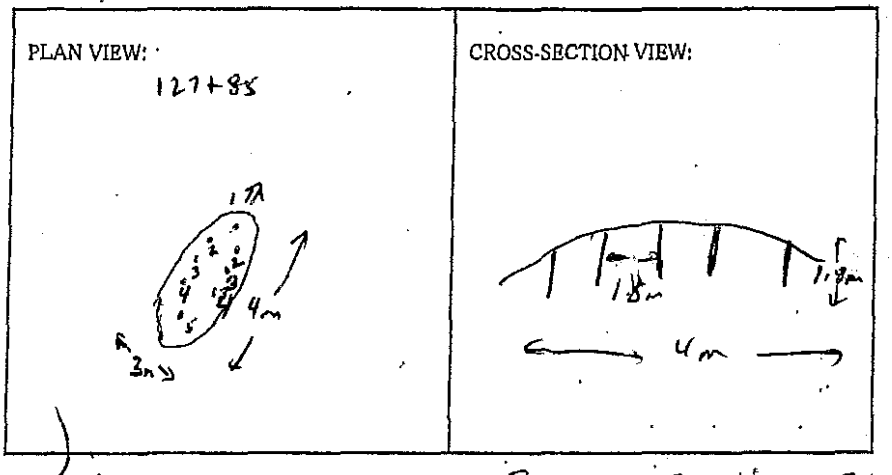
BLAST SKETCH:

→ N

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

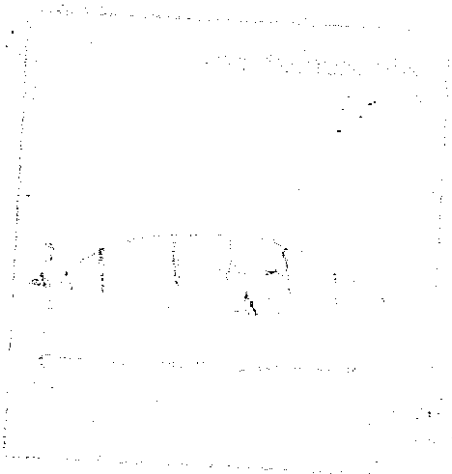
(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt. - 0.100 ips / 51 Hz
@ 13117 Cliffstone Crt - No trig (< 0.04 ips)

* Seismograph at 13073 was located approx mid-way to structure from blast area. - Landscapers working @ 13073 w/ Bobcat & Loader
Page 787
TRA-2013-00119

about 80m SE of structure

6' Holes – 1'-1.5' ANFO + 0.5 CART 1½ LBS DYNAMITE PRIMER



Instantel

Event Report

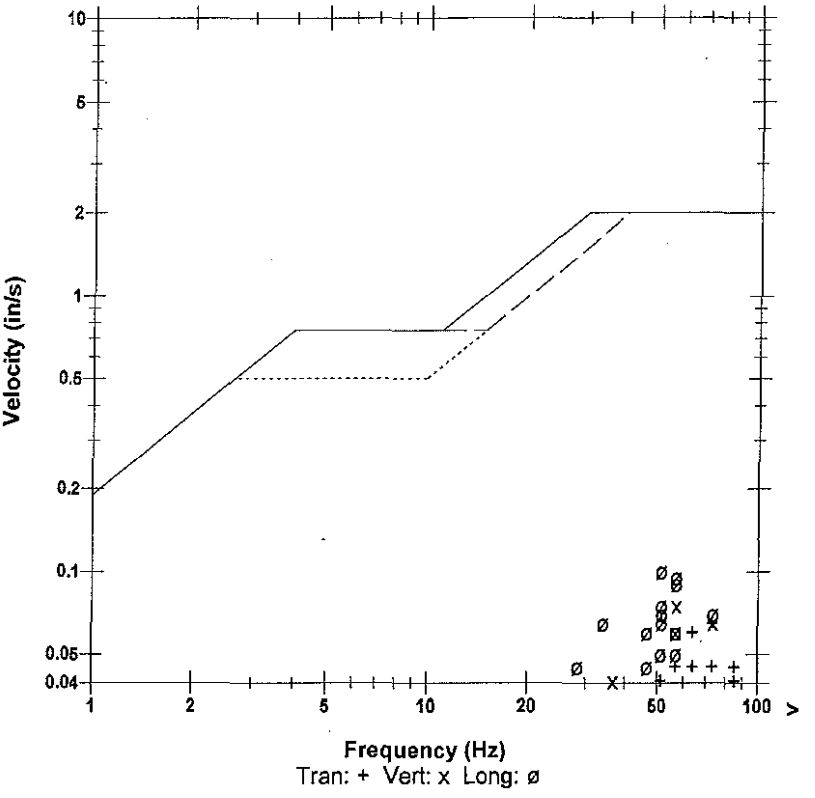
Date/Time	Vert at 10:52:38 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAZQ.7Q0

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

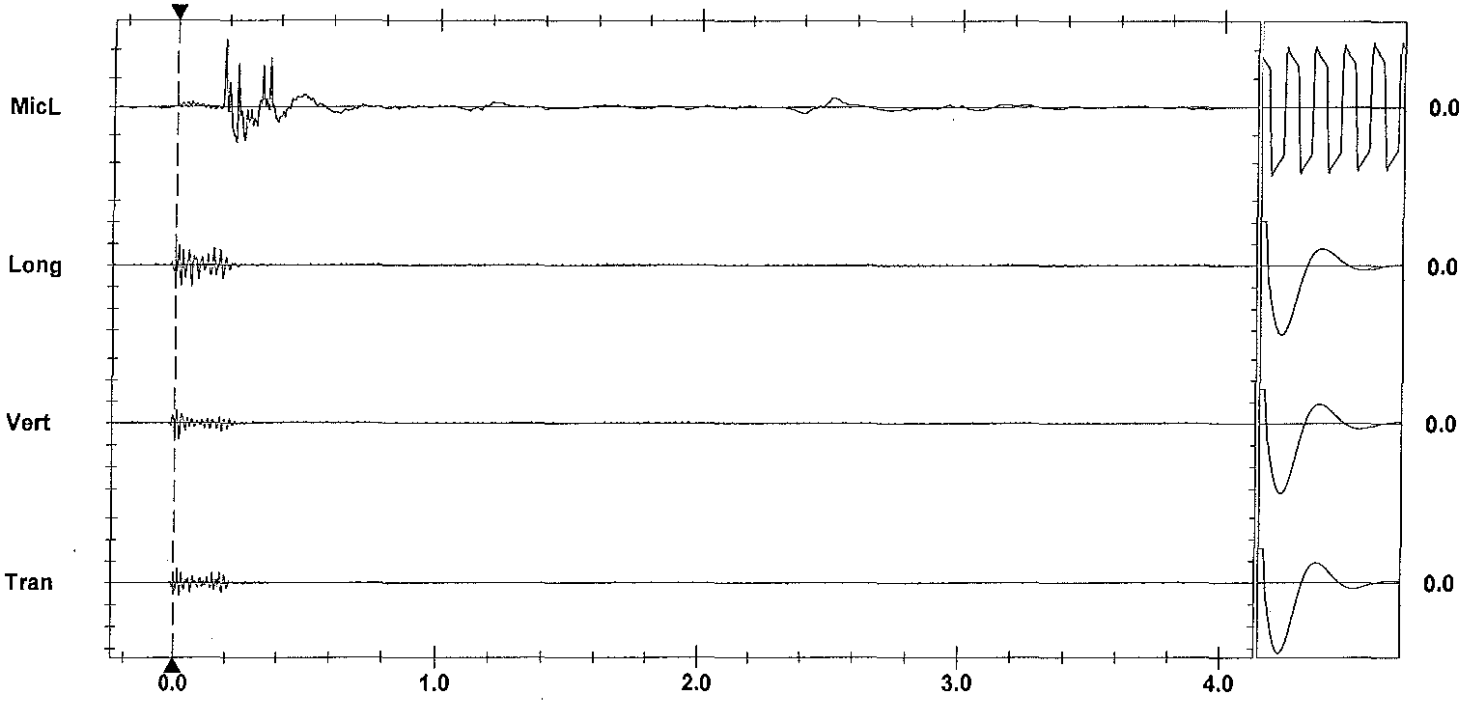
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00475 psi(L) at 0.187 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 580 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0750	0.1000	in/s
ZC Freq	73	57	51	Hz
Time (Rel. to Trig)	0.016	0.018	0.063	sec
Peak Acceleration	0.0663	0.0795	0.0928	g
Peak Displacement	0.00015	0.00021	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.3	Hz
Overswing Ratio	3.6	3.6	4.1	

Peak Vector Sum 0.112 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 11:08AM
BLAST # MW-0218

HIGHWAY# 97
BLAST LOCATION AT: STN 127+95 - 128+05 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Argillaceous Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 4.5 (9 x 0.5)
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 0.03 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

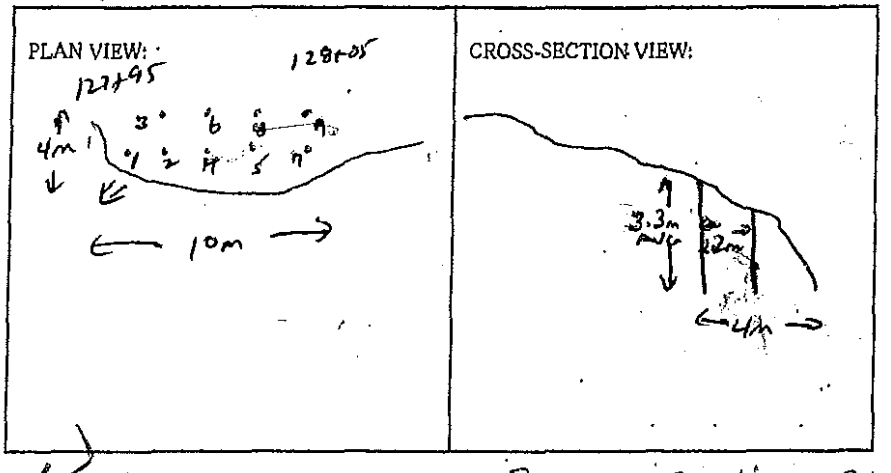
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HIS 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.94 ips/64Hz *
" @ 13117 Cliffstone Crt - 0.12 ips/47Hz

* Seismograph @ 13073 located as per previous shot*

1.5' - 2.5' ANFO/HOLE + 0.5 emul 1½" x 16" DYNAMITE PRIMER

Instantel®

Event Report

Date/Time	Vert at 11:08:51 May 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAZQ.YR0
Job Number:	1		

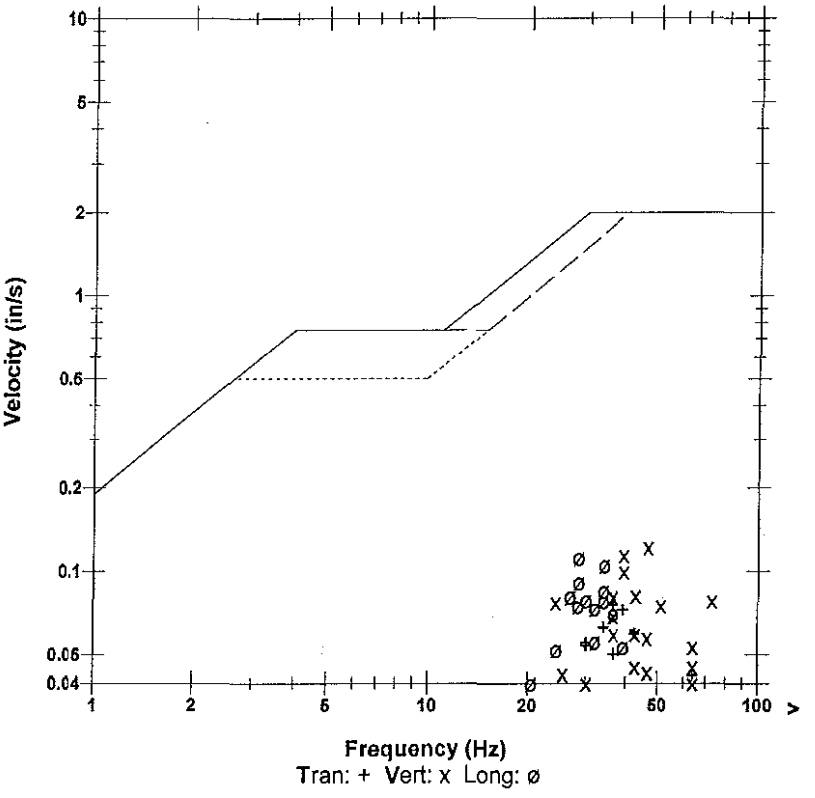
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

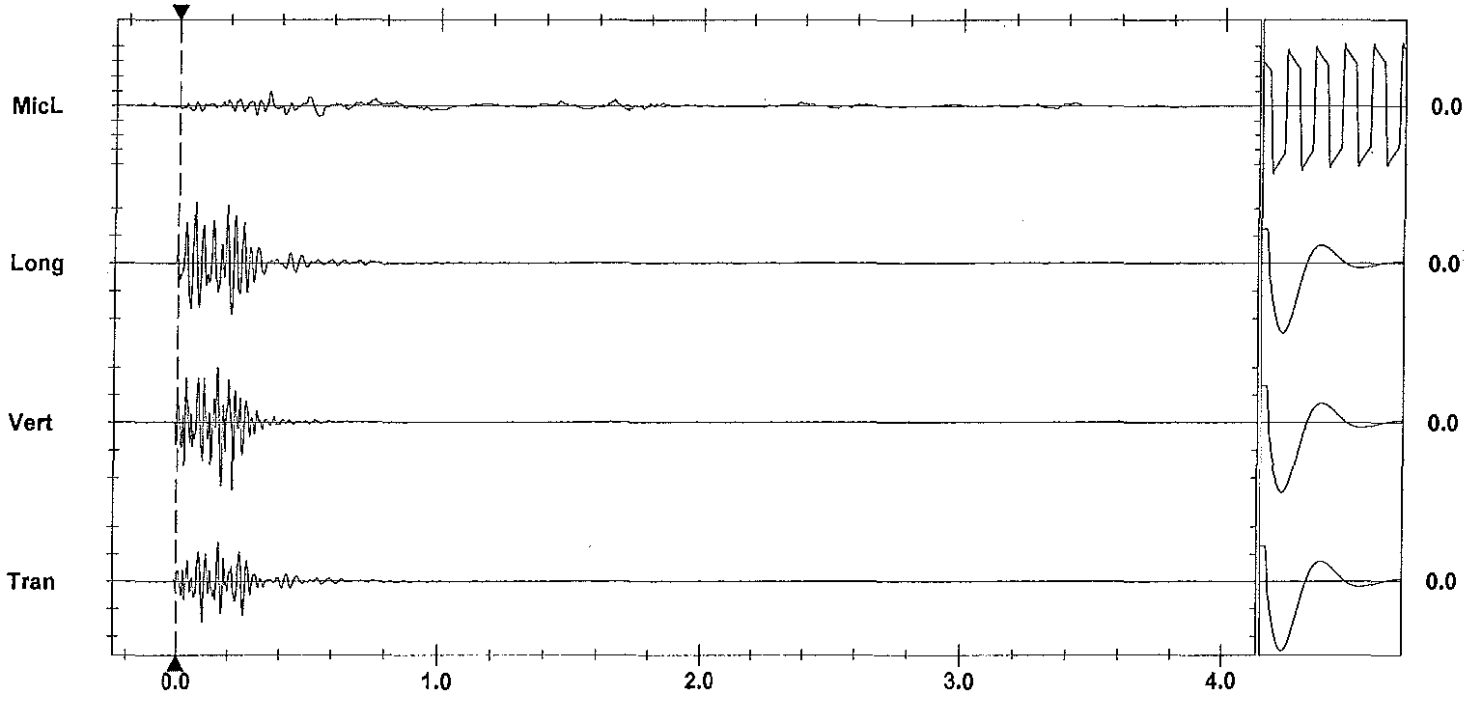
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.352 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 608 mv)

	Tran	Vert	Long	
PPV	0.0756	0.122	0.112	in/s
ZC Freq	37	47	28	Hz
Time (Rel. to Trig)	0.104	0.218	0.067	sec
Peak Acceleration	0.0530	0.103	0.0630	g
Peak Displacement	0.00029	0.00046	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.126 in/s at 0.219 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

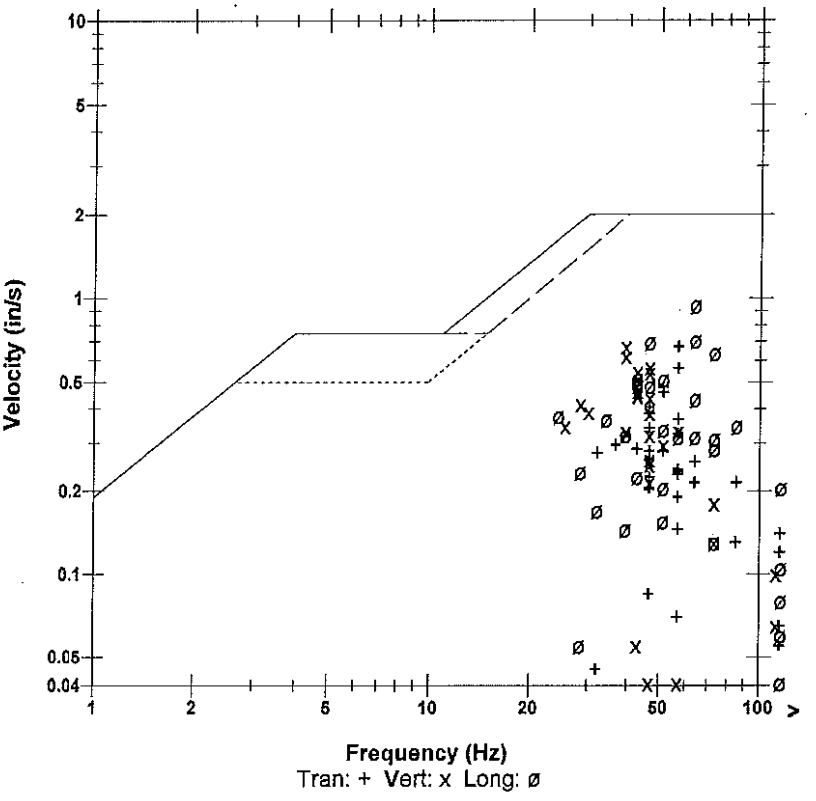
Date/Time	Vert at 11:08:29 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAZQ.Y50

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

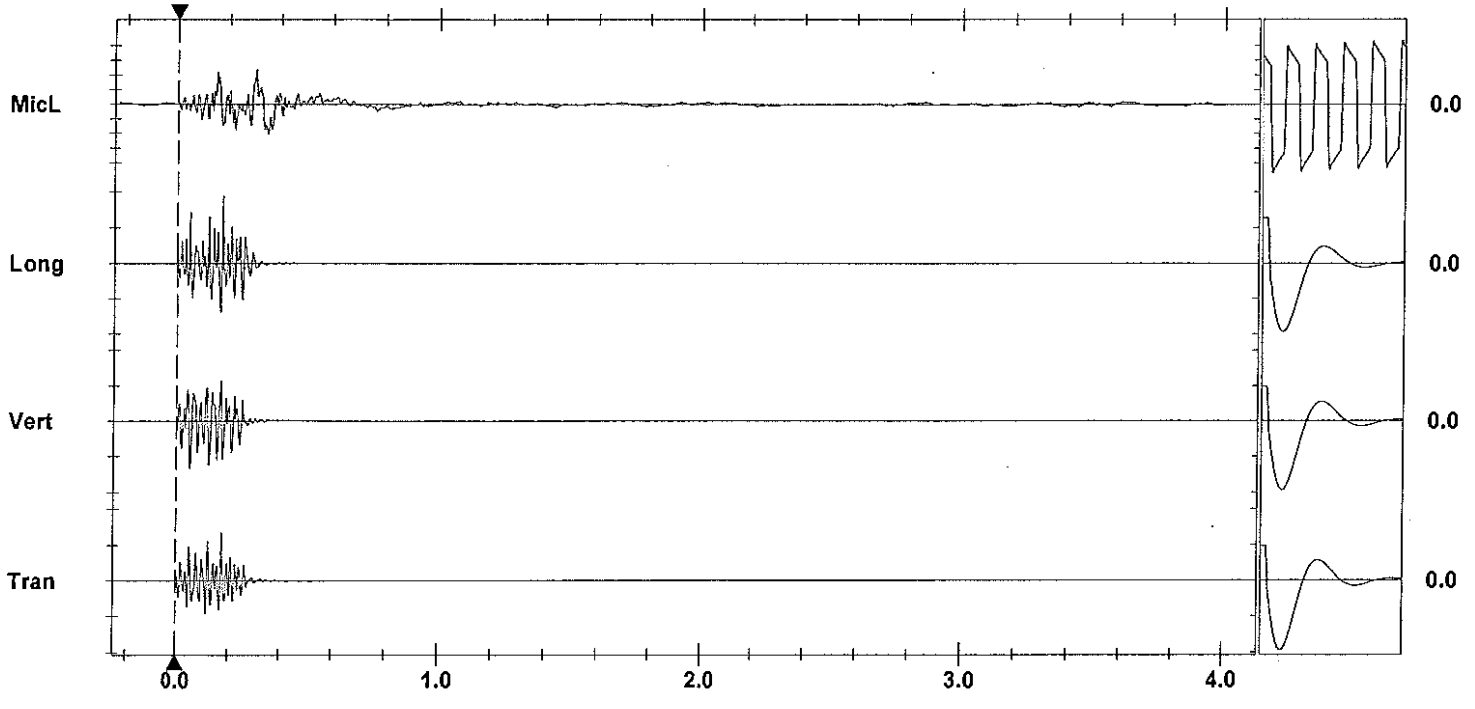
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00232 psi(L) at 0.303 sec			
ZC Freq	12 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 606 mv)			

	Tran	Vert	Long	
PPV	0.670	0.670	0.940	in/s
ZC Freq	57	39	64	Hz
Time (Rel. to Trig)	0.178	0.055	0.177	sec
Peak Acceleration	0.888	1.03	0.941	g
Peak Displacement	0.00153	0.00266	0.00254	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.3	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 1.13 in/s at 0.177 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 12:27 PM
BLAST # MW-0219

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+05 - 128+15 to subgrade

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot masked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 4.0 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 44 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5.5 (11×0.5)
TOTAL NUMBER OF DELAYS 11

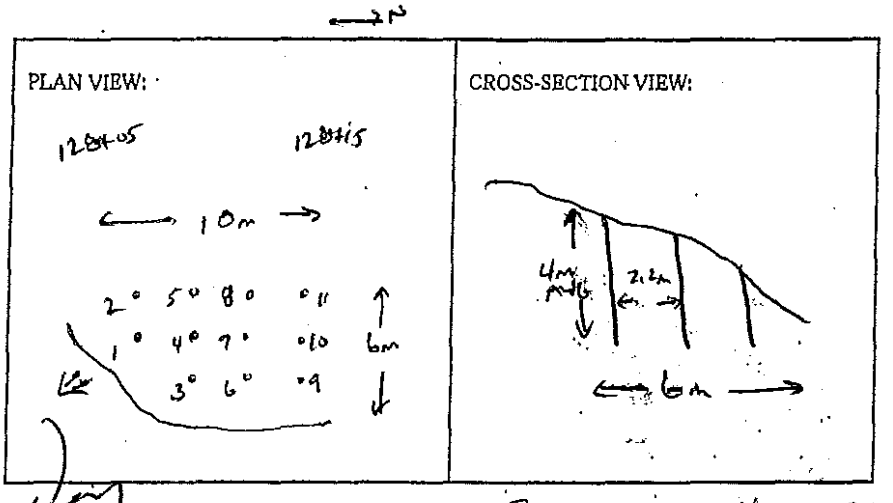
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

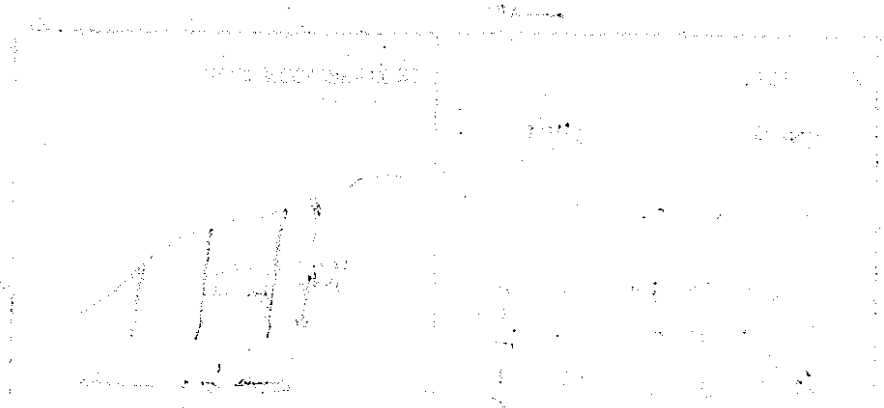
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 1.02 ips / 47 Hz *
@ 13117 Cliffstone Crt - 0.14 ips / 47 Hz

Seismograph @ 13073 located as per previous shot *.

4'-6' ANFO/1Hole + 0.5 count 1½" x 16" DYNAMITE Primer



Instantel

Event Report

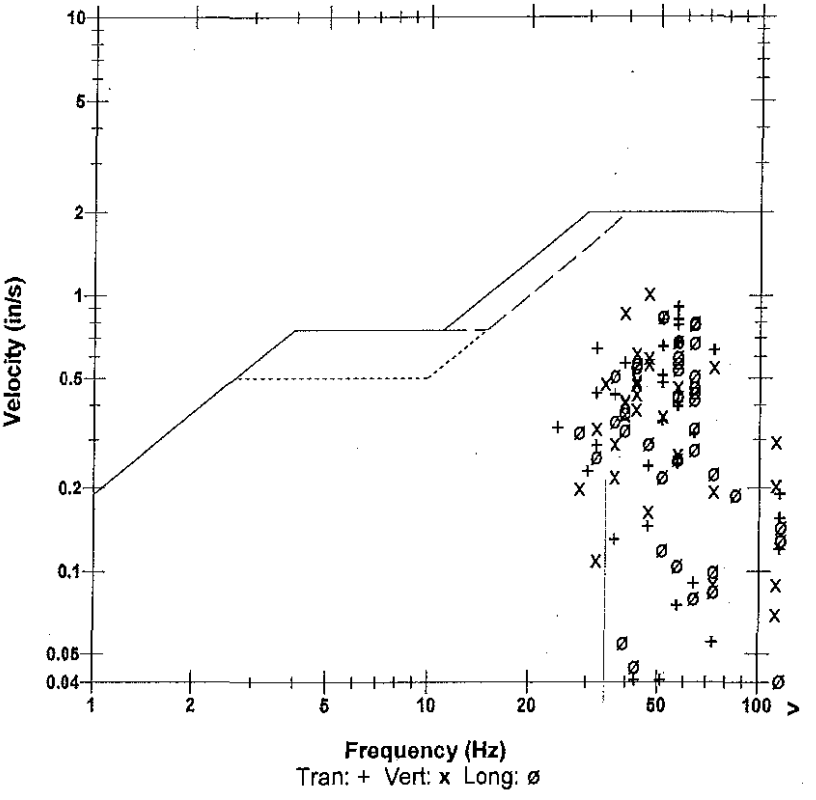
Date/Time	Vert at 12:27:42 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAZU.M60

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

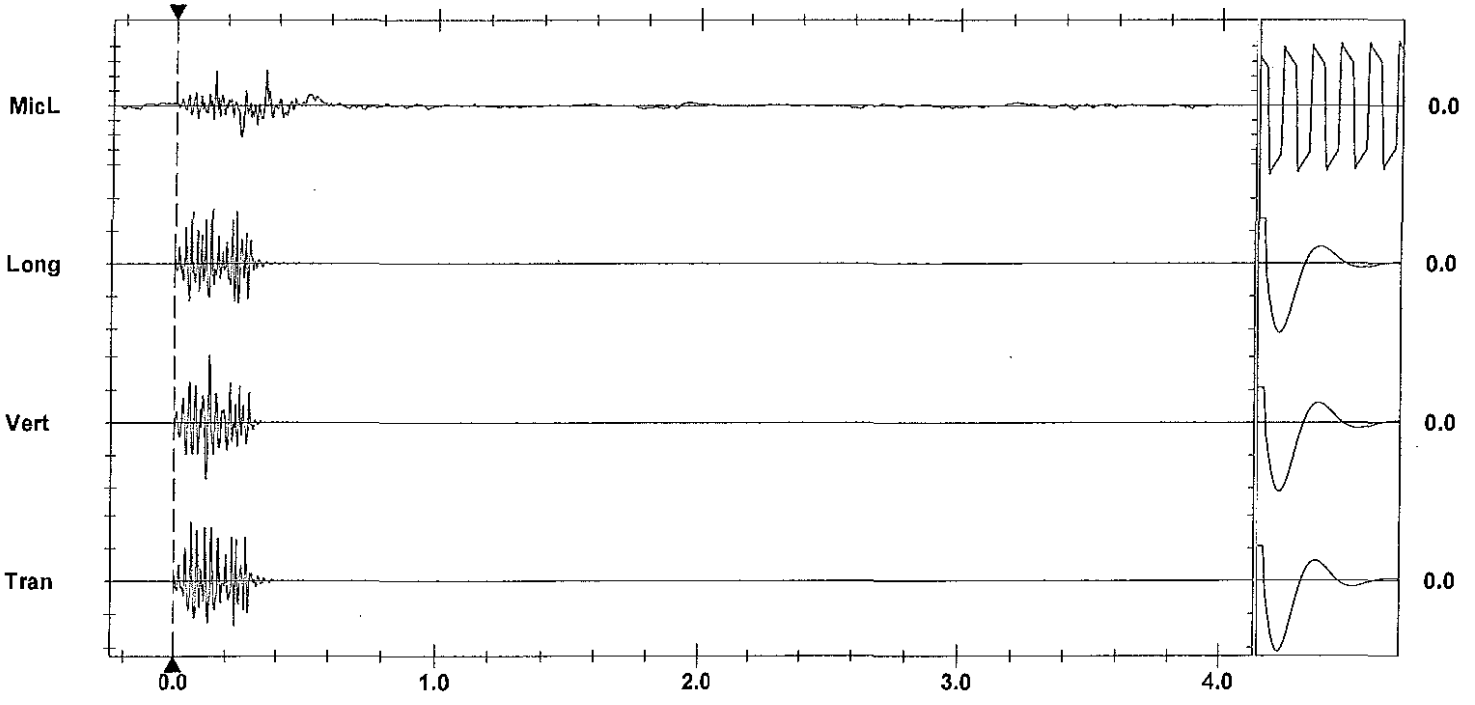
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.905	1.02	0.840	in/s
ZC Freq	57	47	51	Hz
Time (Rel. to Trig)	0.068	0.138	0.145	sec
Peak Acceleration	1.06	0.848	1.09	g
Peak Displacement	0.00287	0.00360	0.00258	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.3	Hz
Overswing Ratio	3.5	3.6	4.1	

Microphone Linear Weighting
PSPL 0.00236 psi(L) at 0.151 sec
ZC Freq 47 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 556 mv)

Peak Vector Sum 1.21 in/s at 0.122 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 12:28:04 May 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAZU.MS0
Job Number:	1		

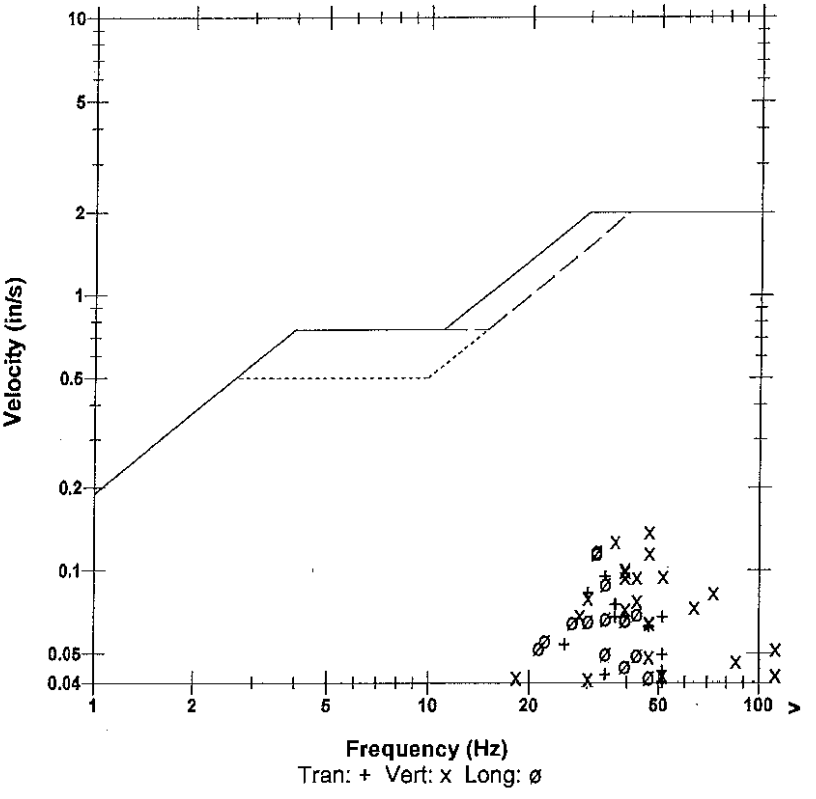
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

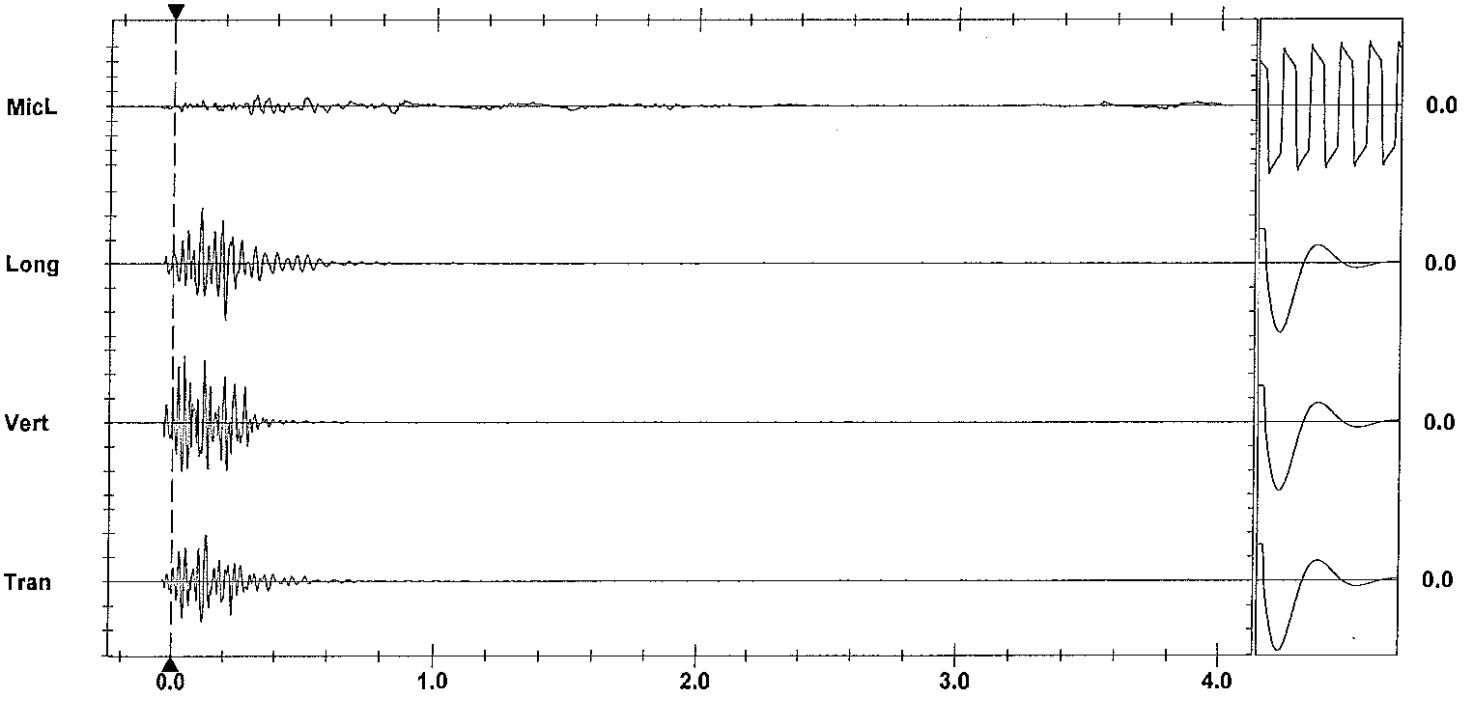
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00073 psi(L) at 0.322 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 550 mv)

	Tran	Vert	Long	
PPV	0.0950	0.138	0.117	in/s
ZC Freq	34	47	32	Hz
Time (Rel. to Trig)	0.134	0.046	0.204	sec
Peak Acceleration	0.0845	0.123	0.0696	g
Peak Displacement	0.00046	0.00048	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.152 in/s at 0.125 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 1:43 PM
BLAST # MW-0220

HIGHWAY# 97
BLAST LOCATION AT: 127+90 - 129+95 LS (top of grade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot Matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 3 Buffer / 7 BL
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 2" Blasex
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 0

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

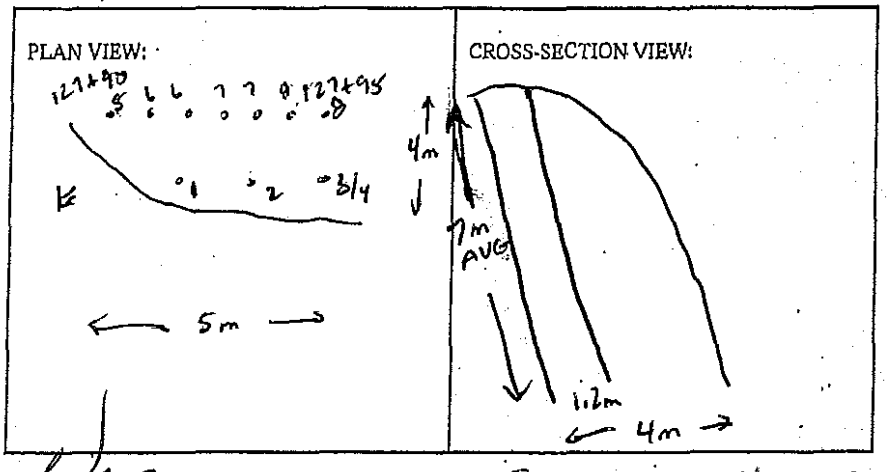
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 140 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffton Ct. - 0.30 ips/43Hz *
" @ 13117 Cliffton Ct. - 0.067 ips/27Hz

* Seismograph @ 13073 located as per previous shot.

Bypass Holes - Bottom Deck - 2-4 cartridges
2 x 6 Blasters

- 1 Top Deck - 1 Cart 2x6 Blasters

B/L Holes - 1 Cart 2x6 Dynamite + 200gr. det. cord to 4' collar

Instantel

Event Report

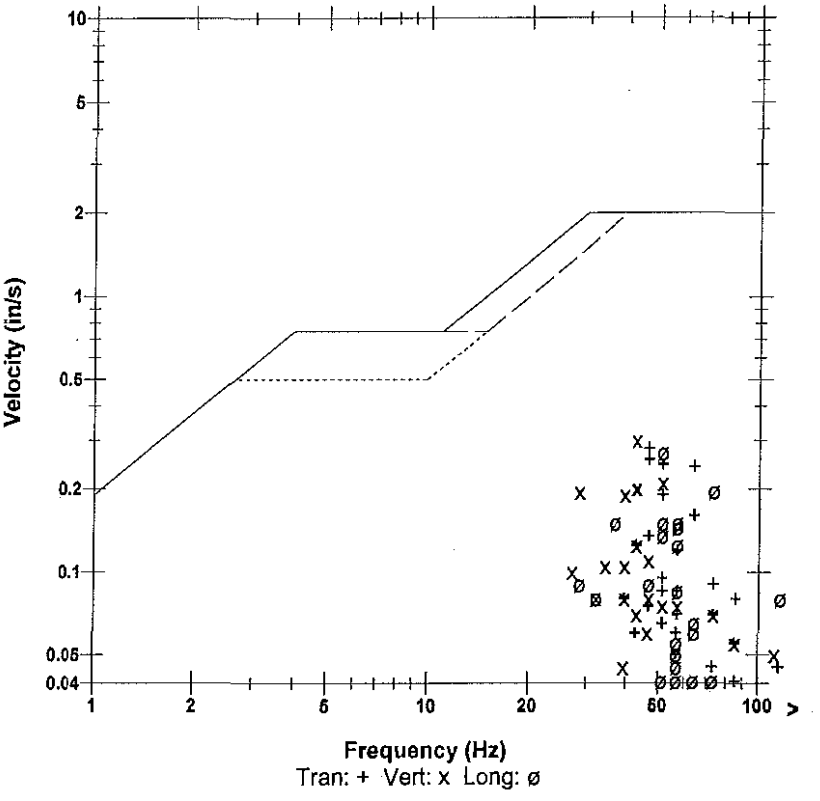
Date/Time	Vert at 13:43:12 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EAZY.400

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

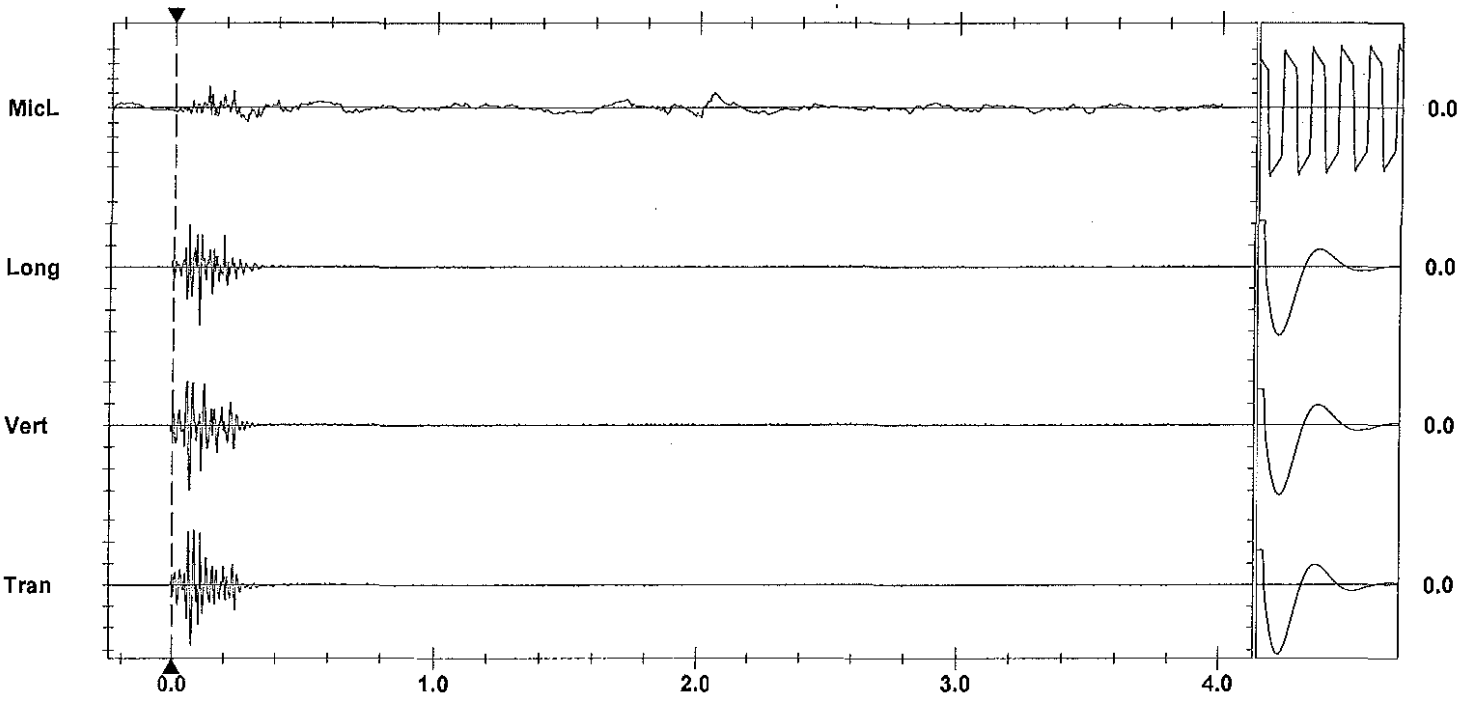
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.133 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 572 mv)

	Tran	Vert	Long	
PPV	0.280	0.300	0.270	in/s
ZC Freq	47	43	51	Hz
Time (Rel. to Trig)	0.076	0.067	0.104	sec
Peak Acceleration	0.278	0.265	0.278	g
Peak Displacement	0.00096	0.00114	0.00082	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.4	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.382 in/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 13:43:34 May 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EAZY.4M0
Job Number:	1		

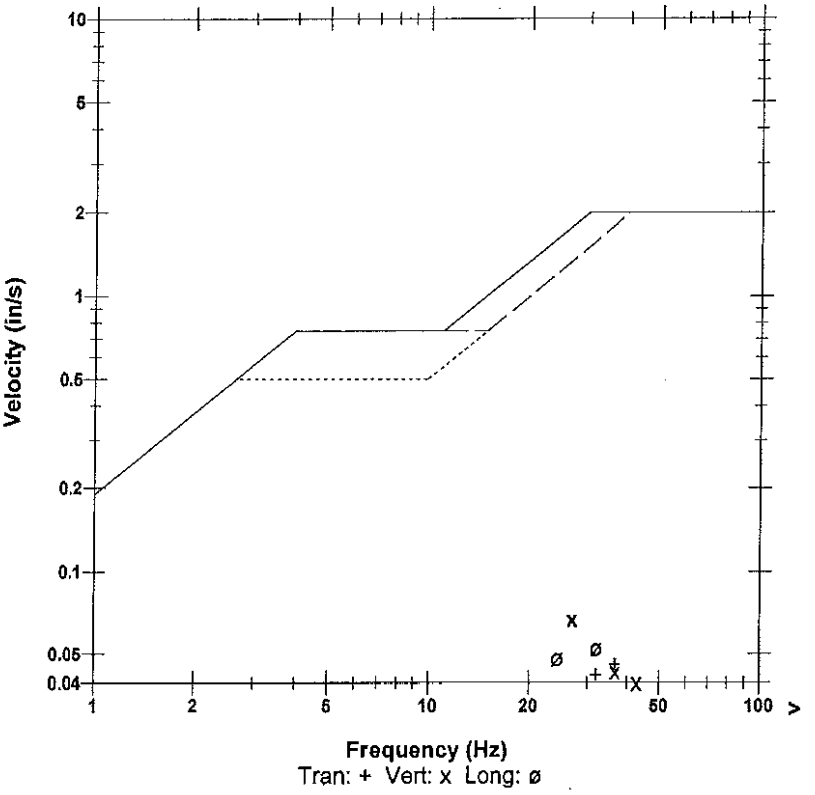
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

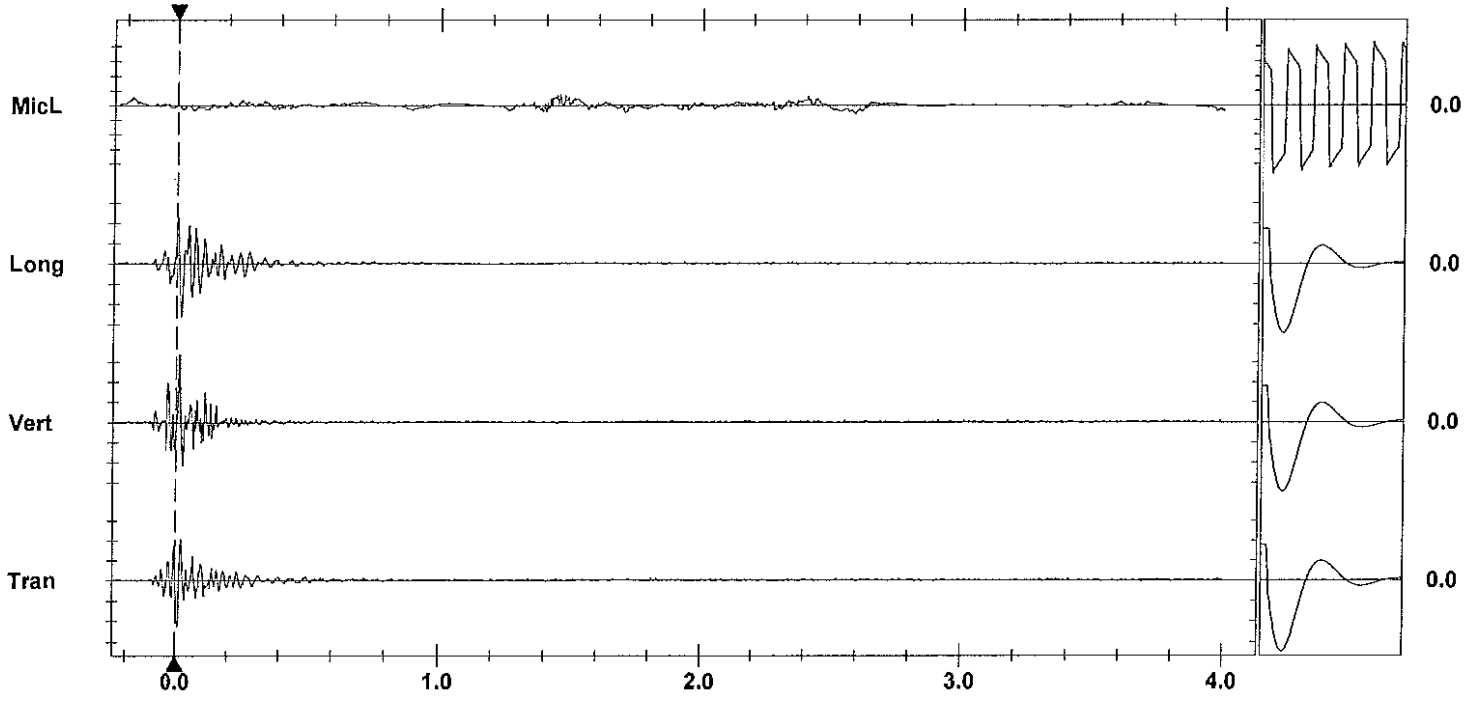
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00080 psi(L) at 1.451 sec
ZC Freq	4.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0456	0.0669	0.0525	in/s
ZC Freq	37	27	32	Hz
Time (Rel. to Trig)	0.009	0.014	0.019	sec
Peak Acceleration	0.0365	0.0414	0.0282	g
Peak Displacement	0.00022	0.00025	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.0741 in/s at 0.014 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 2:54 PM
BLAST # MW-0521

HIGHWAY # 97
BLAST LOCATION AT: SW 128+95 - 128+00 CS to Subgrade

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot metted

HEIGHT ABOVE HWY 14 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 7 BL / 3 Buffer / 2 Stab
HOLE DIAMETER 96 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Magnum ite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 72

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

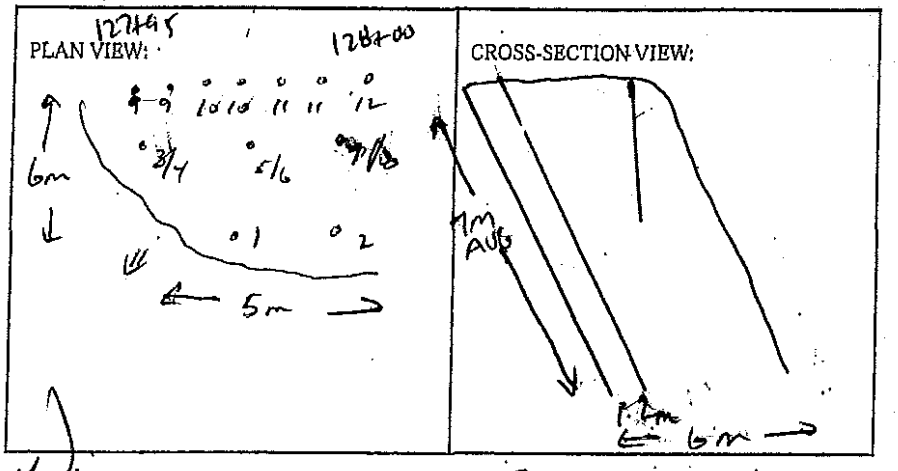
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HH3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 210 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.55 ips / 43Hz *
" @ 13117 Cliffstone Crt - 0.086 ips / 26Hz

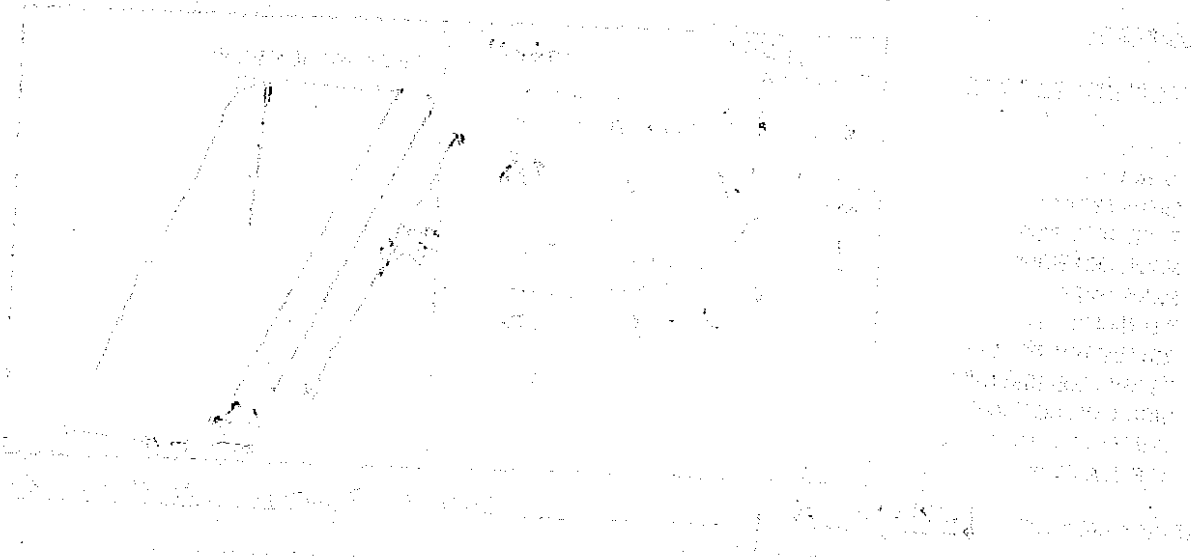
Seismograph @ 13073 located as per previous shot*

Primed w/ .5 cart 1½ x 16 DUN.

Buffer Holes - Bottom Deck 3-4 Cartridges 2x16 Blasted
- Top Deck 1-2 Cart. 2x16 Blasted

Stab Holes - 1' ANFO

B/L - 2 Cart. 2x16 Dynamite + 200' det. cord to 4' collar.



Instantel

Event Report

Date/Time	Vert at 14:54:36 May 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB01.F00
Job Number:	1		

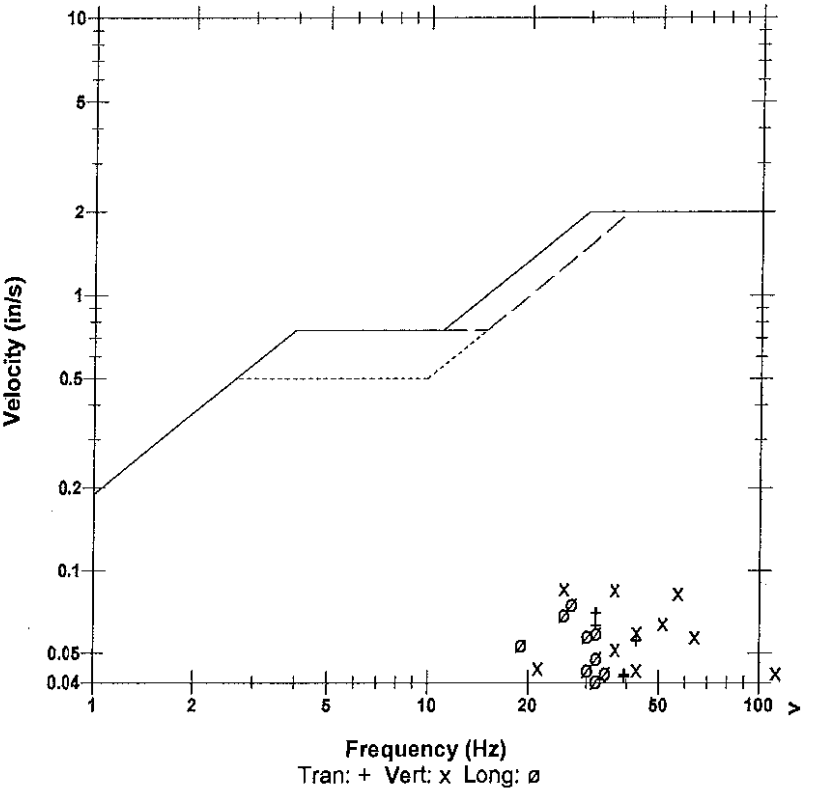
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

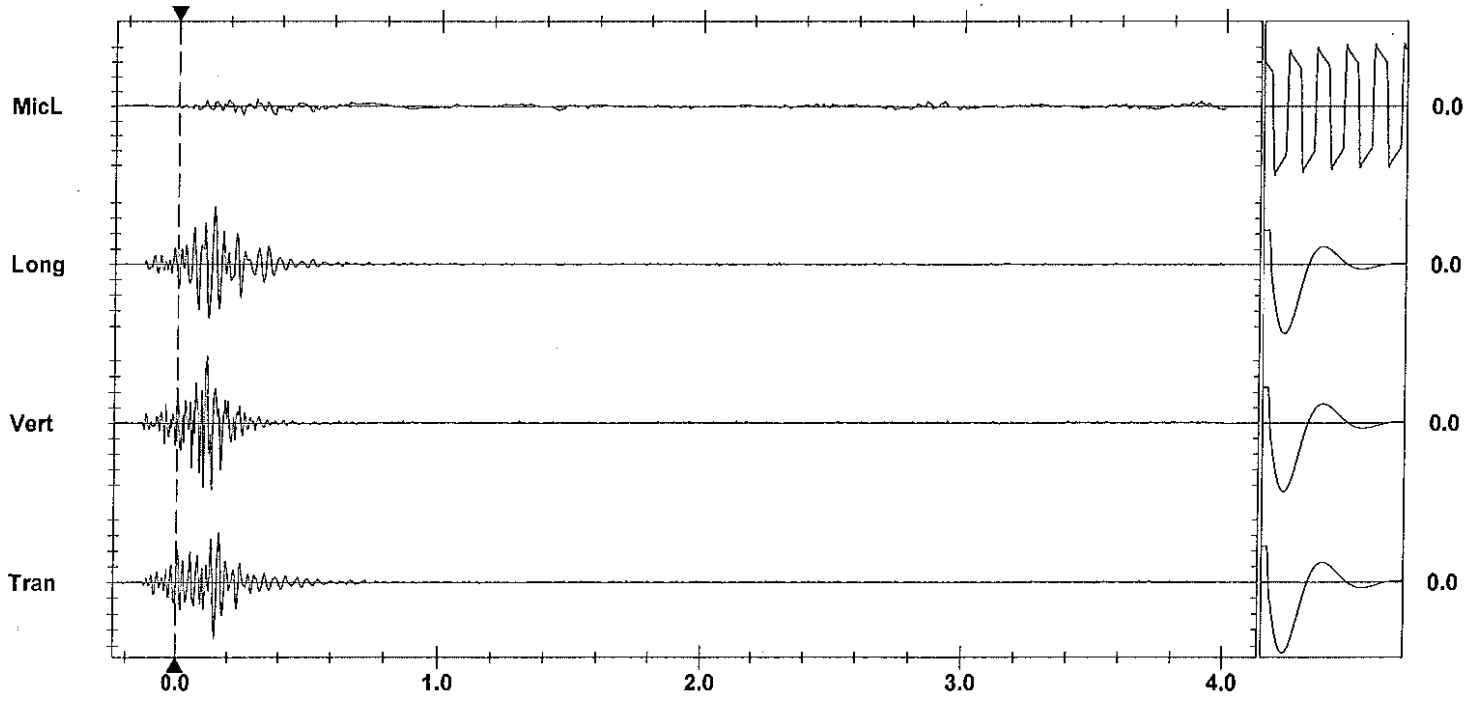
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00054 psi(L) at 0.249 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 585 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0862	0.0756	in/s
ZC Freq	32	26	27	Hz
Time (Rel. to Trig)	0.151	0.138	0.146	sec
Peak Acceleration	0.0398	0.0829	0.0414	g
Peak Displacement	0.00034	0.00041	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.107 in/s at 0.138 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

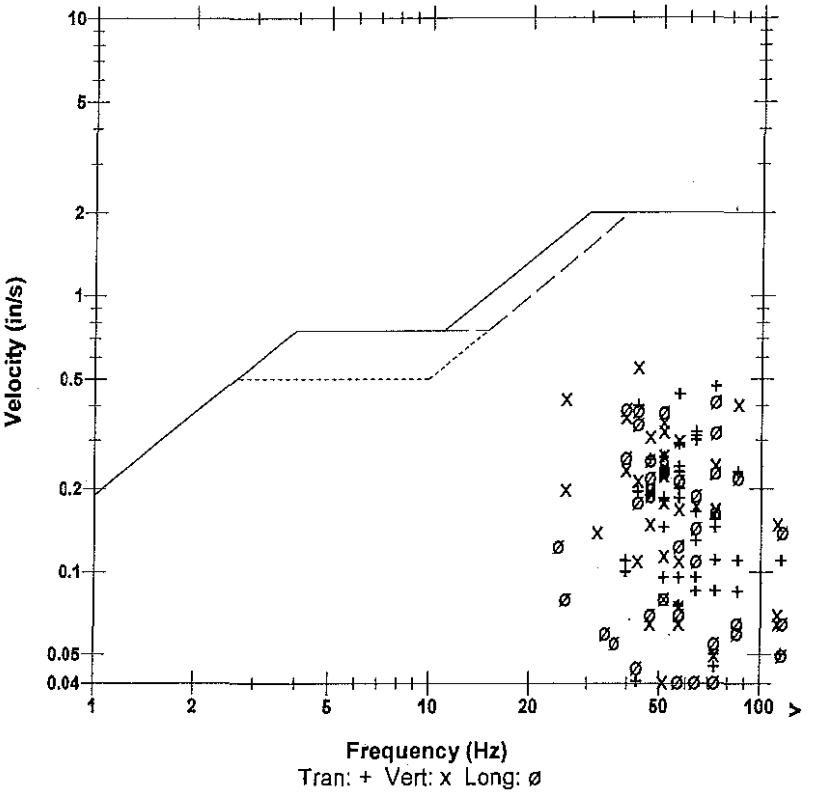
Date/Time	Vert at 14:54:14 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB01.EE0

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

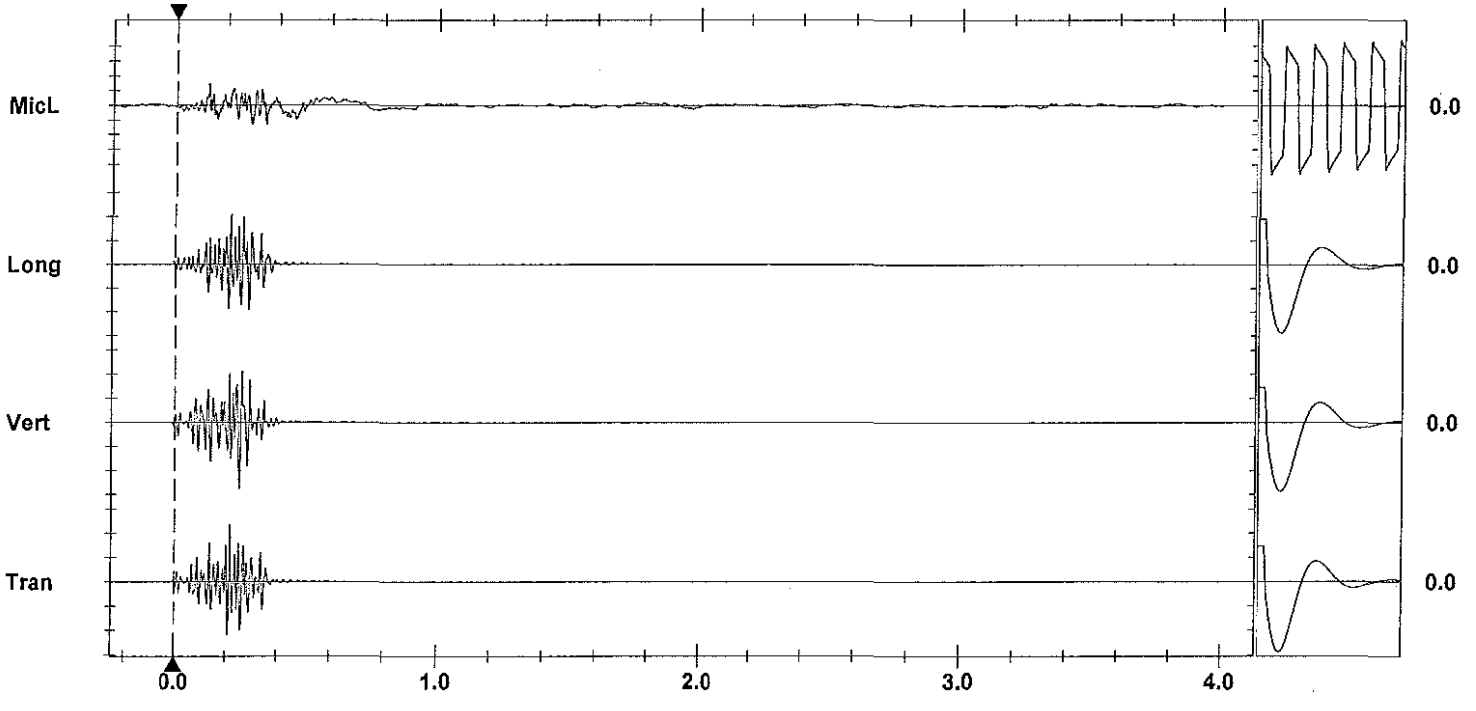
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.127 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	0.470	0.555	0.415	in/s
ZC Freq	73	43	73	Hz
Time (Rel. to Trig)	0.218	0.253	0.217	sec
Peak Acceleration	0.490	0.597	0.437	g
Peak Displacement	0.00143	0.00207	0.00135	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.4	Hz
Overswing Ratio	3.5	3.6	4.0	

Peak Vector Sum 0.627 in/s at 0.252 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 30/12
ACTUAL BLAST DATE May 30/12 3:50 PM
BLAST # MW-022

HIGHWAY# 97
BLAST LOCATION AT: STN 128+00 - 128+07.65 (105 subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 9m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 5.5 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 5.0 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.4 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 9B/L / 38 Main / 2 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75* (kg)
DELAY TYPE AND LENGTH 25 (ms)

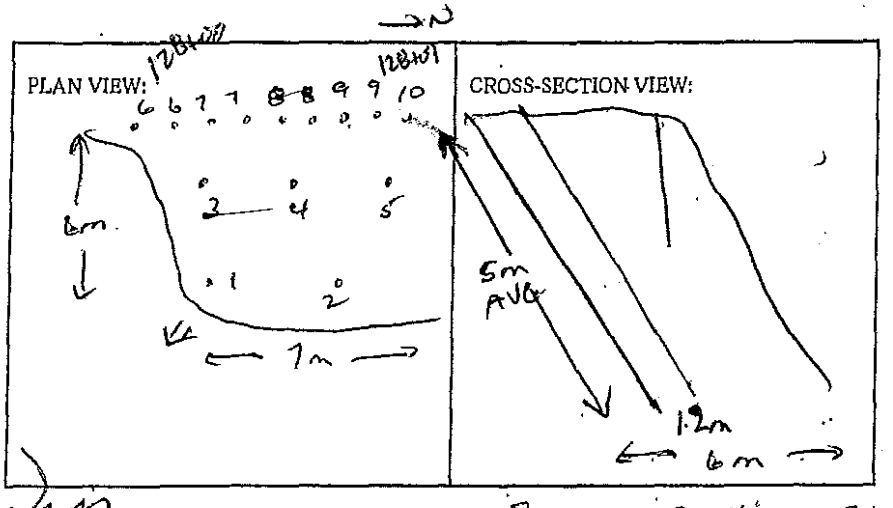
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.651PS/ 64Hz
@ 13117 Cliffstone Crt - 0.073IPS/ 47Hz

* Seismograph @ 13073 Located as per previous shot

Primed w/ Kent 1½ x 16 dyn.

Burden Holes 3-4 carr 2x16 Blasters

Stab Holes 1' ANFO

B/c Holes 1 carr 2x16 Dynamite + 200gr det cord + 4' collar

Instantel

Event Report

Date/Time	Vert at 15:50:38 May 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB04.0E0
Job Number:	1		

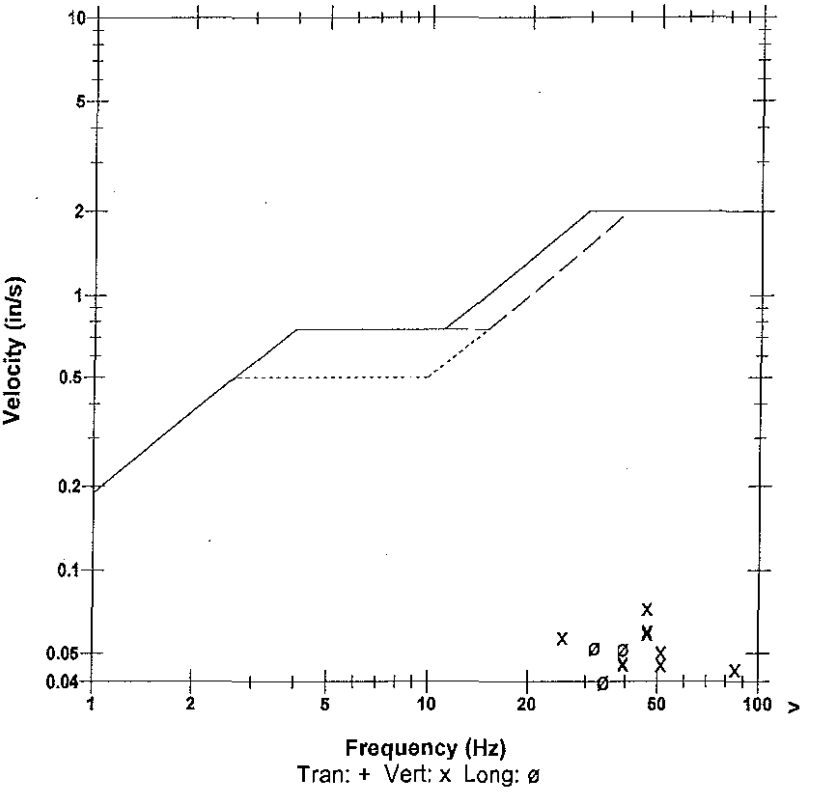
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

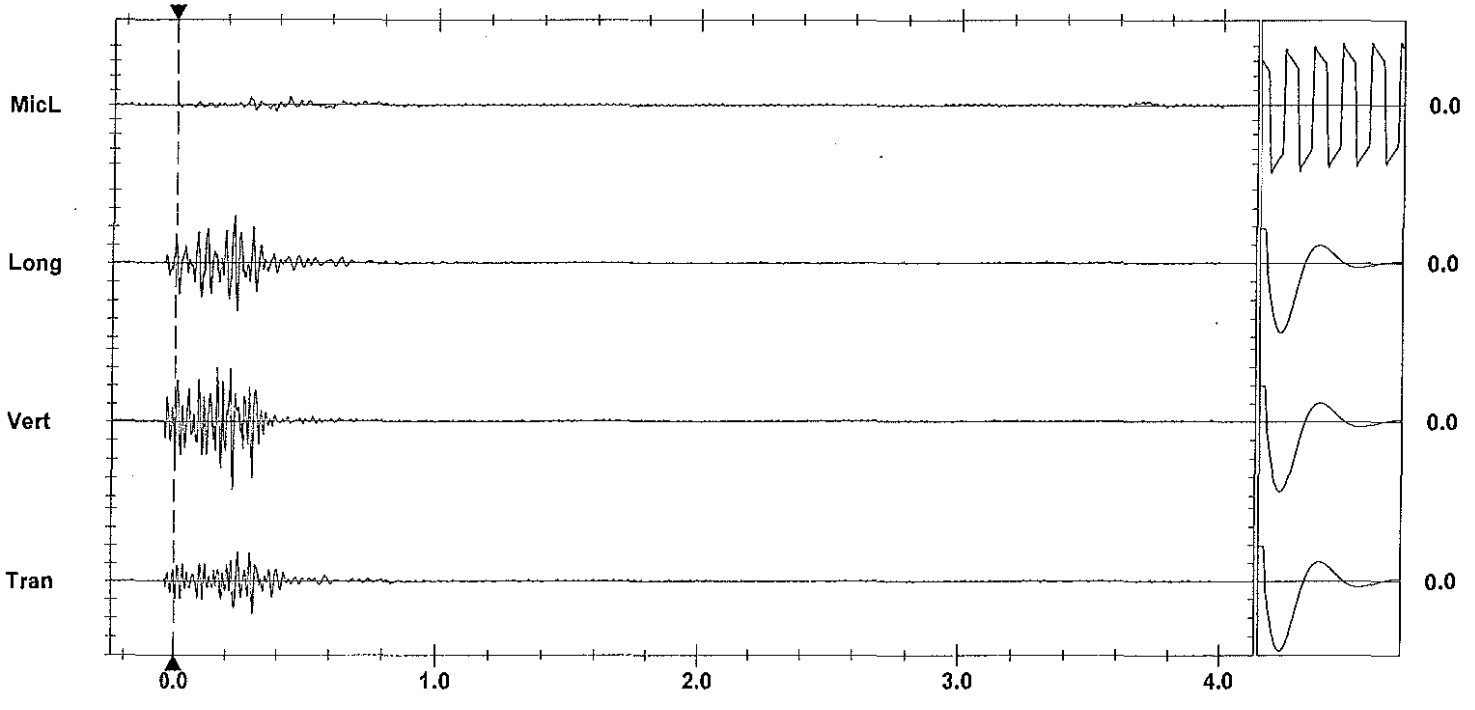
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00051 psi(L) at 0.287 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.0362	0.0731	0.0525	in/s
ZC Freq	43	47	32	Hz
Time (Rel. to Trig)	0.309	0.225	0.229	sec
Peak Acceleration	0.0282	0.0663	0.0365	g
Peak Displacement	0.00014	0.00026	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.0836 in/s at 0.225 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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Instantel

Event Report

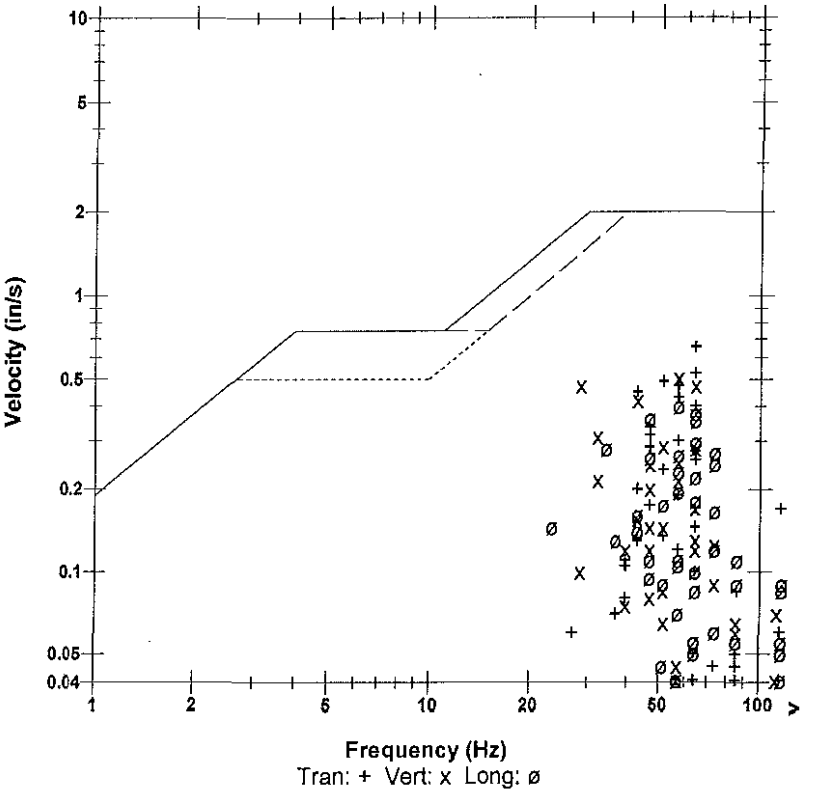
Date/Time	Vert at 15:50:16 May 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB03.ZS0

Notes
location:13073 Cliffstone Crt on
bedrock approx 30m se of rear patio
User Name:Wayne V
General:

Extended Notes

Post Event Notes

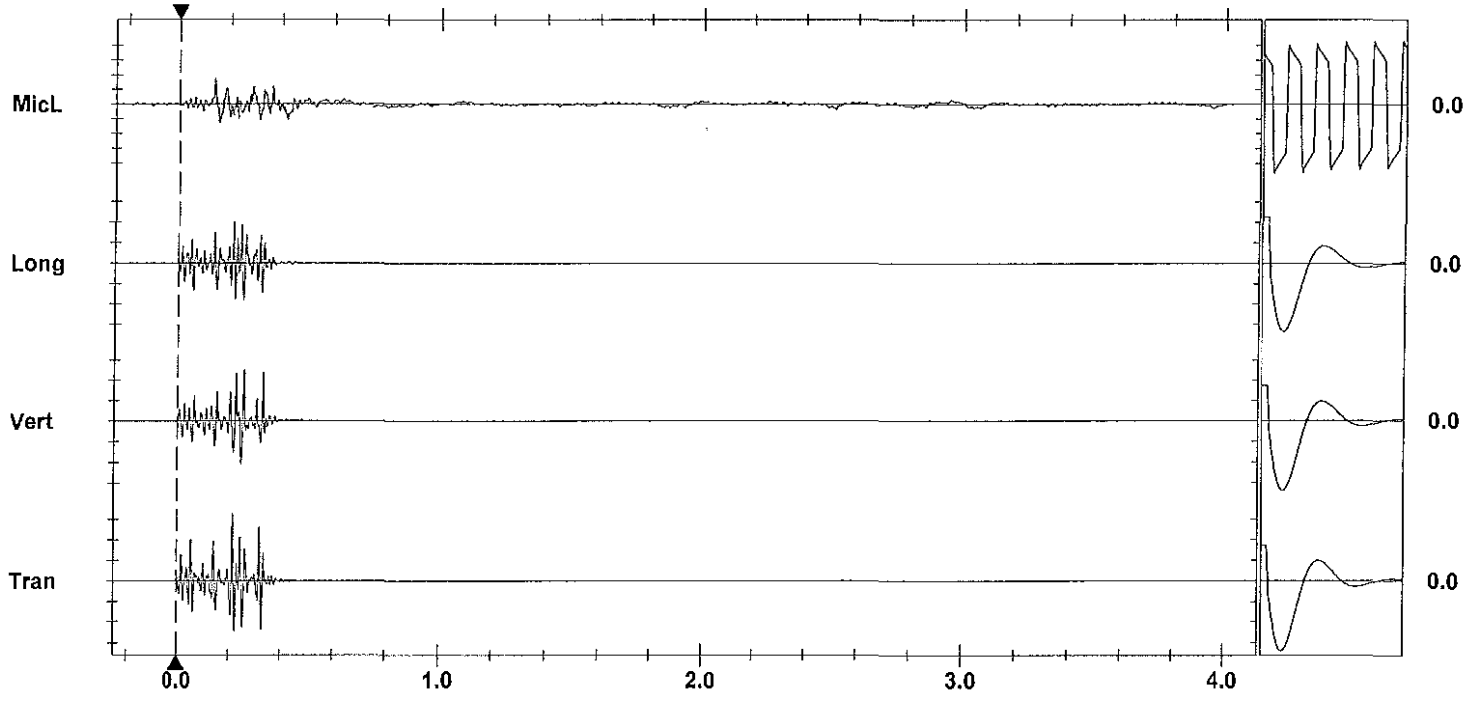
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00174 psi(L) at 0.138 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 565 mv)

	Tran	Vert	Long	
PPV	0.655	0.505	0.400	in/s
ZC Freq	64	57	57	Hz
Time (Rel. to Trig)	0.216	0.259	0.214	sec
Peak Acceleration	0.795	0.597	0.610	g
Peak Displacement	0.00162	0.00155	0.00128	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.4	Hz
Overswing Ratio	3.5	3.6	4.0	

Peak Vector Sum 0.751 in/s at 0.216 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAY 31/12
ACTUAL BLAST DATE MAY 31/12 9:44 AM
BLAST # MW-0223

HIGHWAY# 97
BLAST LOCATION AT: 128+60 - 128+64 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 12 P250
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

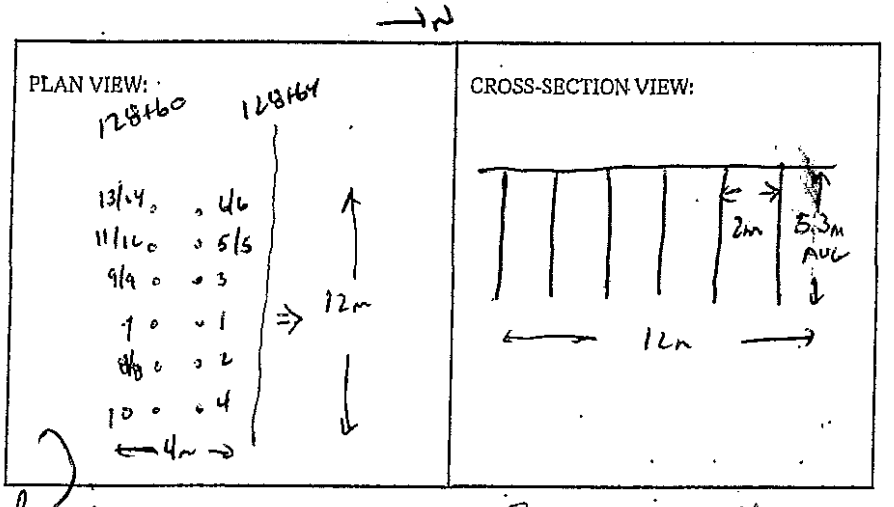
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Ct - 0.481 ips/ 57 Hz
& @ 13117 Cliffstone Ct - 0.29 ips/ 47 Hz

Bottom Deck 5'-6' ANFO

Top Deck 1'-3' ANFO

Primed w/ 1 each 1½# Dynamite

Instantel

Event Report

Date/Time	Vert at 09:44:48 May 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB1H.QO0
Job Number:	1		

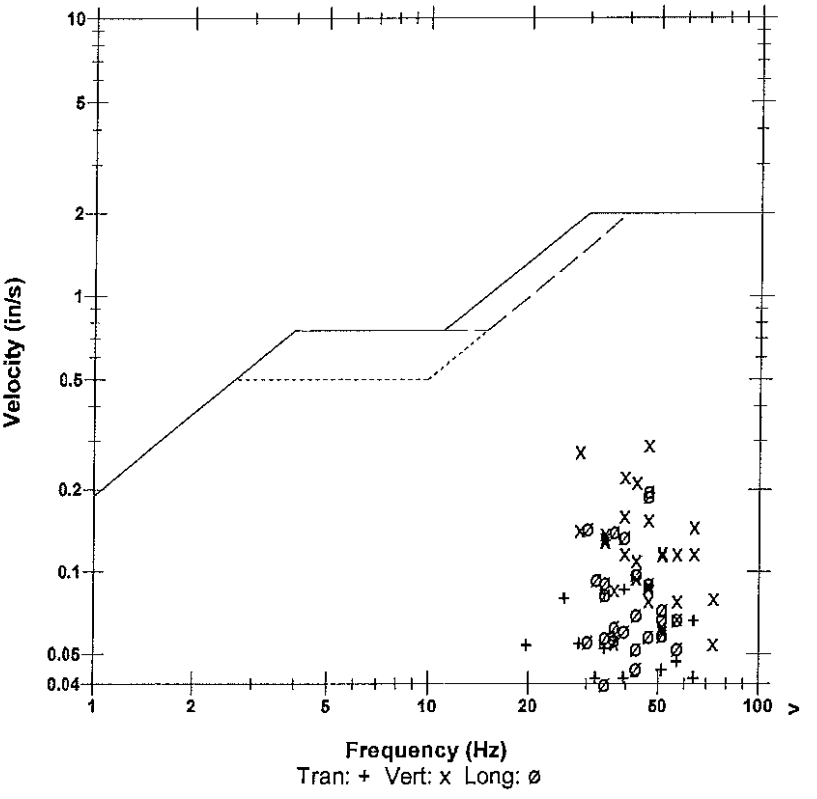
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

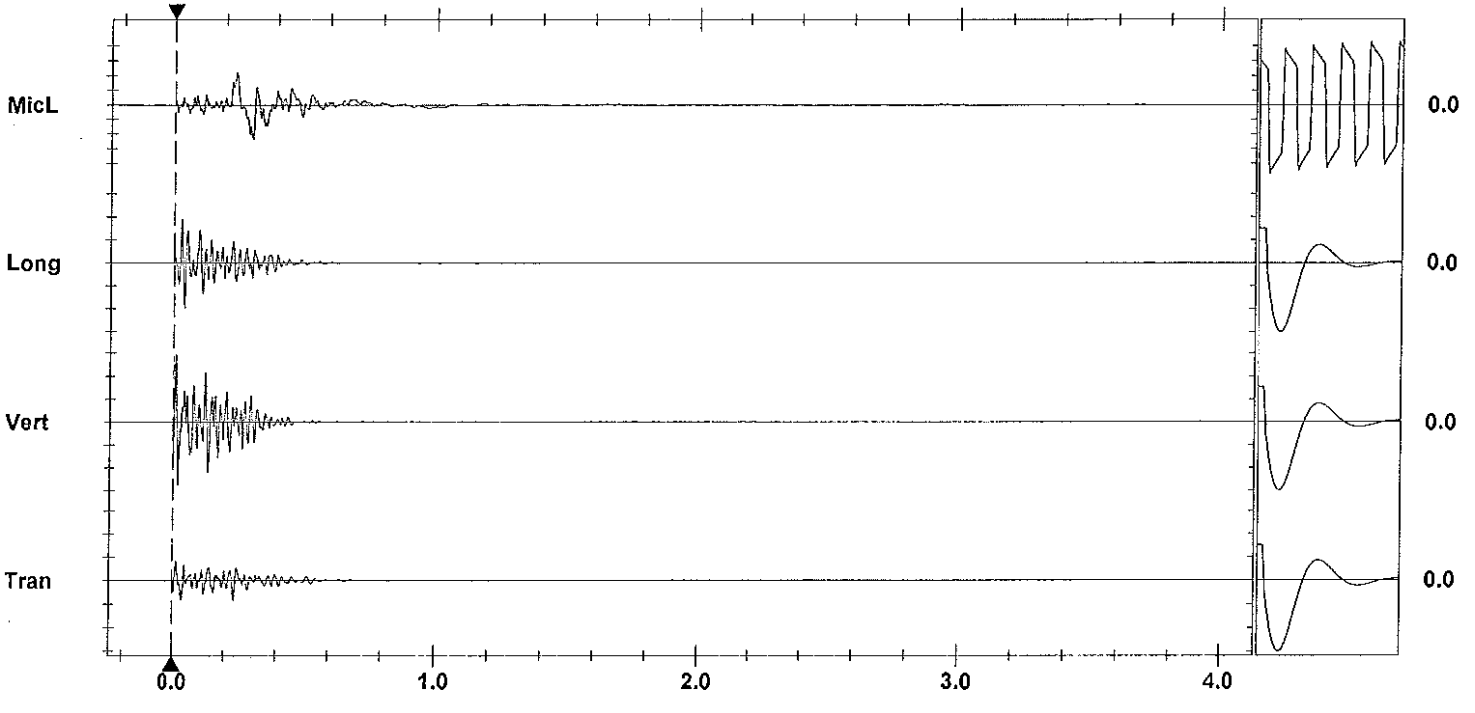
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00239 psi(L) at 0.303 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 582 mv)

	Tran	Vert	Long	
PPV	0.0856	0.290	0.197	in/s
ZC Freq	39	47	47	Hz
Time (Rel. to Trig)	0.238	0.011	0.041	sec
Peak Acceleration	0.0646	0.209	0.161	g
Peak Displacement	0.00039	0.00104	0.00069	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.292 in/s at 0.011 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger ≈ ▶— — — ◀

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Instantel

Event Report

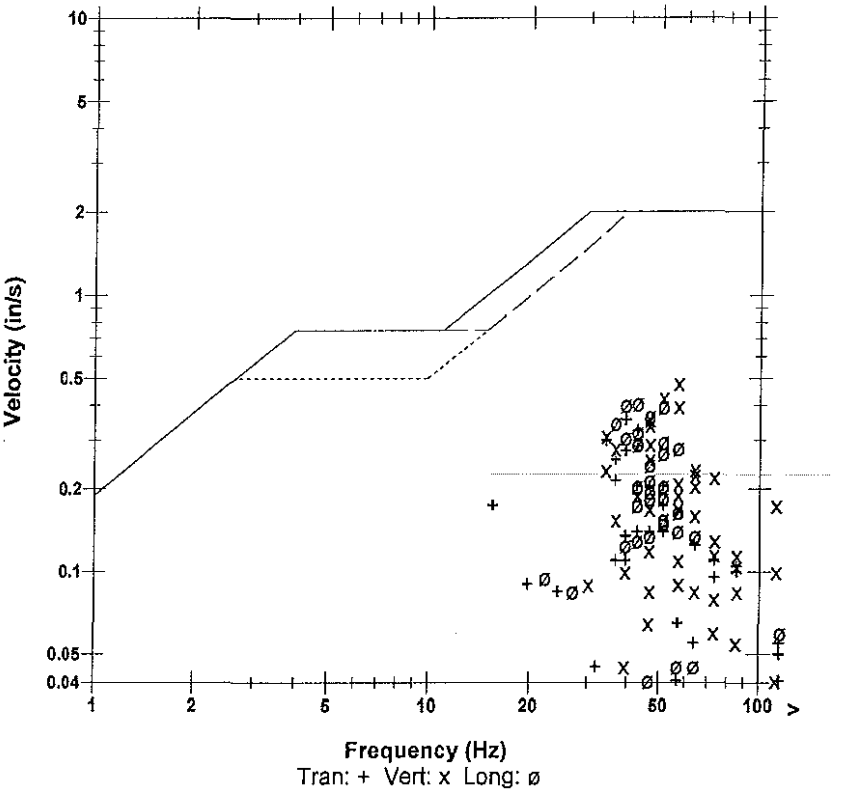
Date/Time	Vert at 09:44:26 May 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0700 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB1H.Q20

Notes
location:13073 Cliffstone Crt on
rear sidewalk ne corner of foundation
User Name:Wayne V
General:

Extended Notes

Post Event Notes

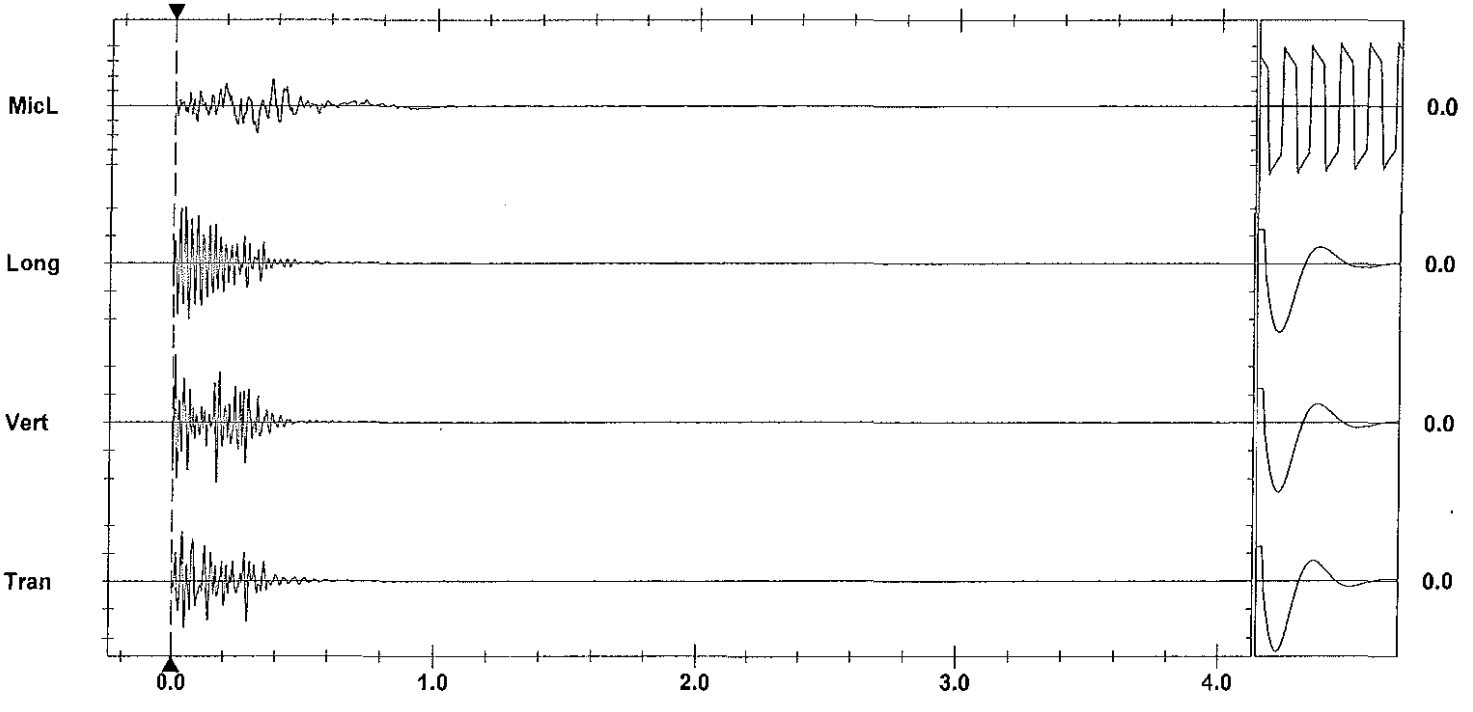
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00189 psi(L) at 0.316 sec		
ZC Freq	15 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 596 mv)		

	Tran	Vert	Long	
PPV	0.355	0.480	0.405	in/s
ZC Freq	39	57	43	Hz
Time (Rel. to Trig)	0.040	0.010	0.049	sec
Peak Acceleration	0.292	0.597	0.345	g
Peak Displacement	0.00150	0.00145	0.00150	in
Sensorcheck	Passed	Passed	Passed	
Frequency	8.1	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.547 in/s at 0.017 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 3, 2013 (V 8.04 - 8.04) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAY 31/12
ACTUAL BLAST DATE MAY 31/12 11:03 AM
BLAST # MW-0224

HIGHWAY# 97
BLAST LOCATION AT: STN 128+64 - 128+70 LS BENCH 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: 4" shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 61 (m)

TOTAL NUMBER OF HOLES 8 BH / 400 Tons / 5 Trips
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Blasto
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

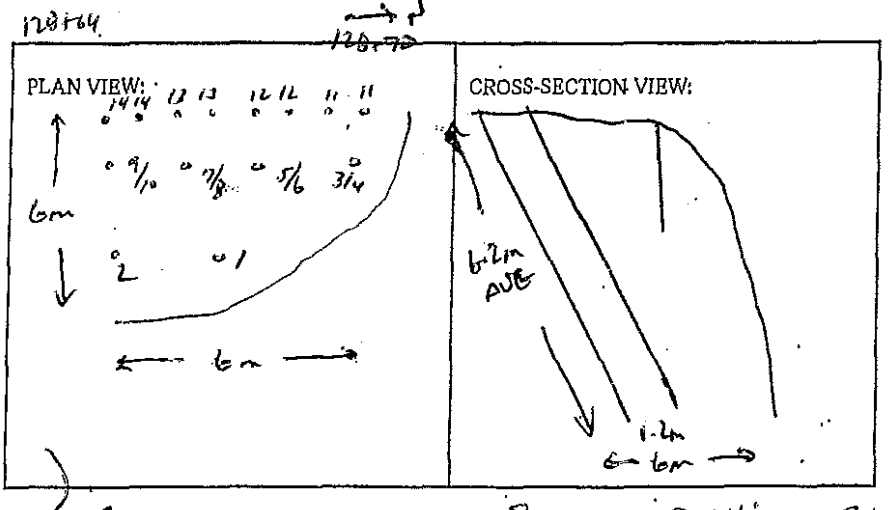
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Cut - 0.401 ips / 47 Hz
@ 13117 Cliffstone Cut - 0.21 ips / 51 Hz

Stab Holes - 1' Ammo + 1 [illegible] Dynamite Primer

Bobber Holes - Bottom Deck - 4-5 cartridges 2x16 Blastrex

Top Deck - 2-3 Cart 2x16 Blastrex

B/L Holes - 1 Cart 2x16 Dynamite + 250gr det Cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 11:03:45 May 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB1L.E90
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

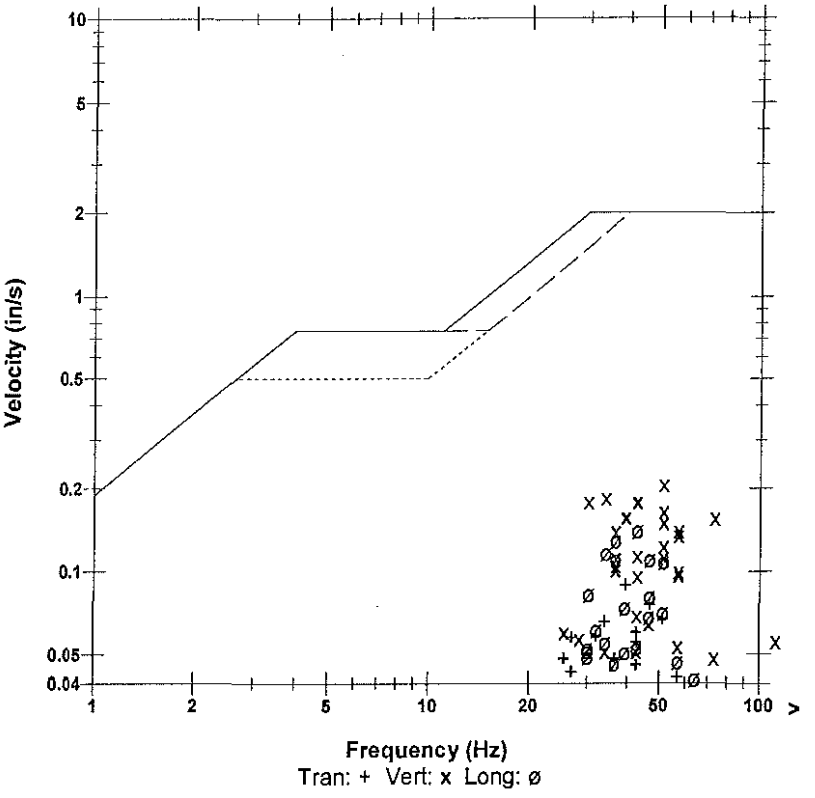
Post Event Notes

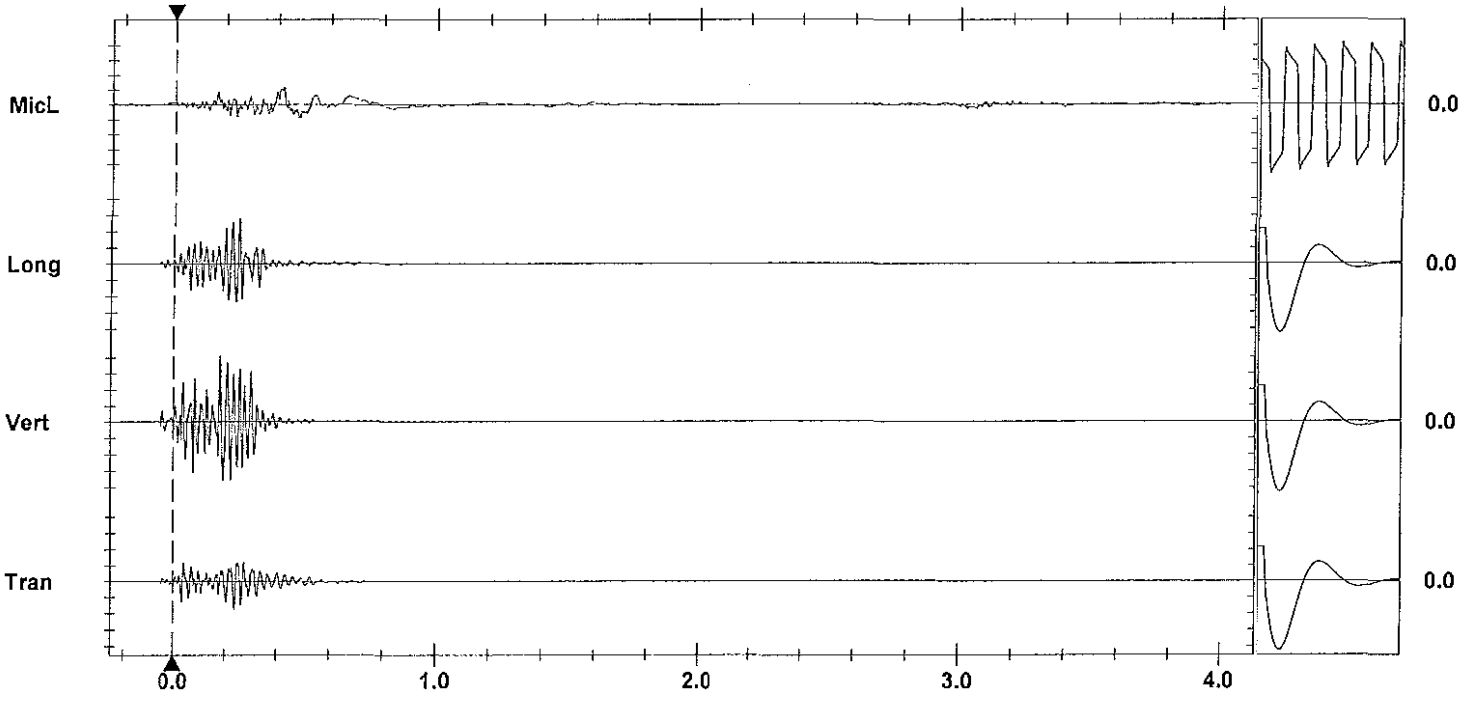
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 0.418 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 615 mv)

	Tran	Vert	Long	
PPV	0.0887	0.206	0.141	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.239	0.183	0.255	sec
Peak Acceleration	0.0713	0.171	0.108	g
Peak Displacement	0.00034	0.00085	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.215 in/s at 0.210 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

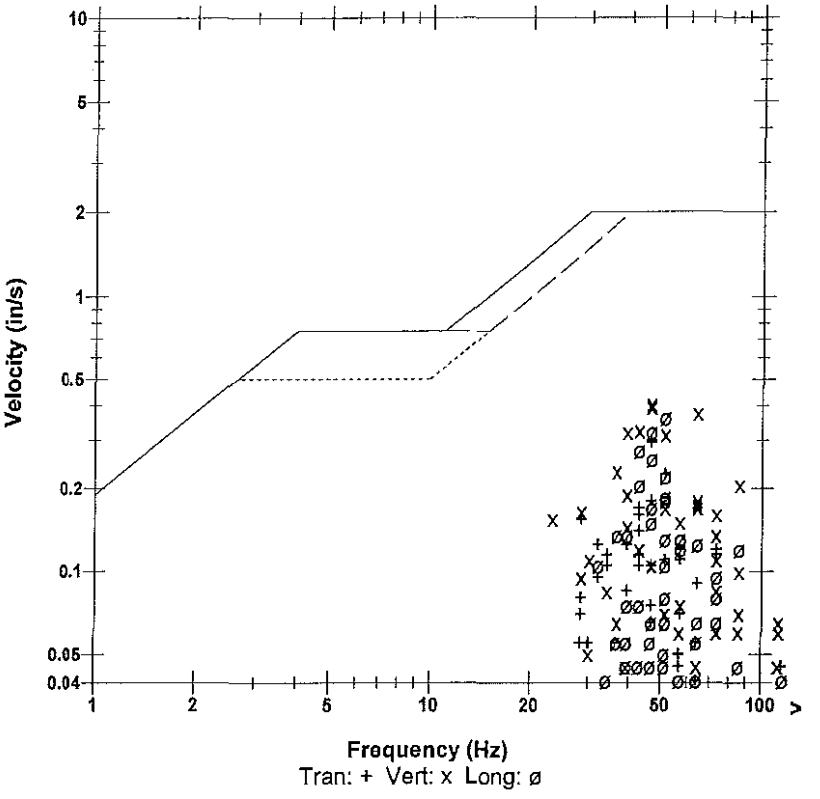
Date/Time	Tran at 11:03:22 May 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0700 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB1L.DM0

Notes
location:13073 Cliffstone Crt on
rear sidewalk ne corner of foundation
User Name:Wayne V
General:

Extended Notes

Post Event Notes

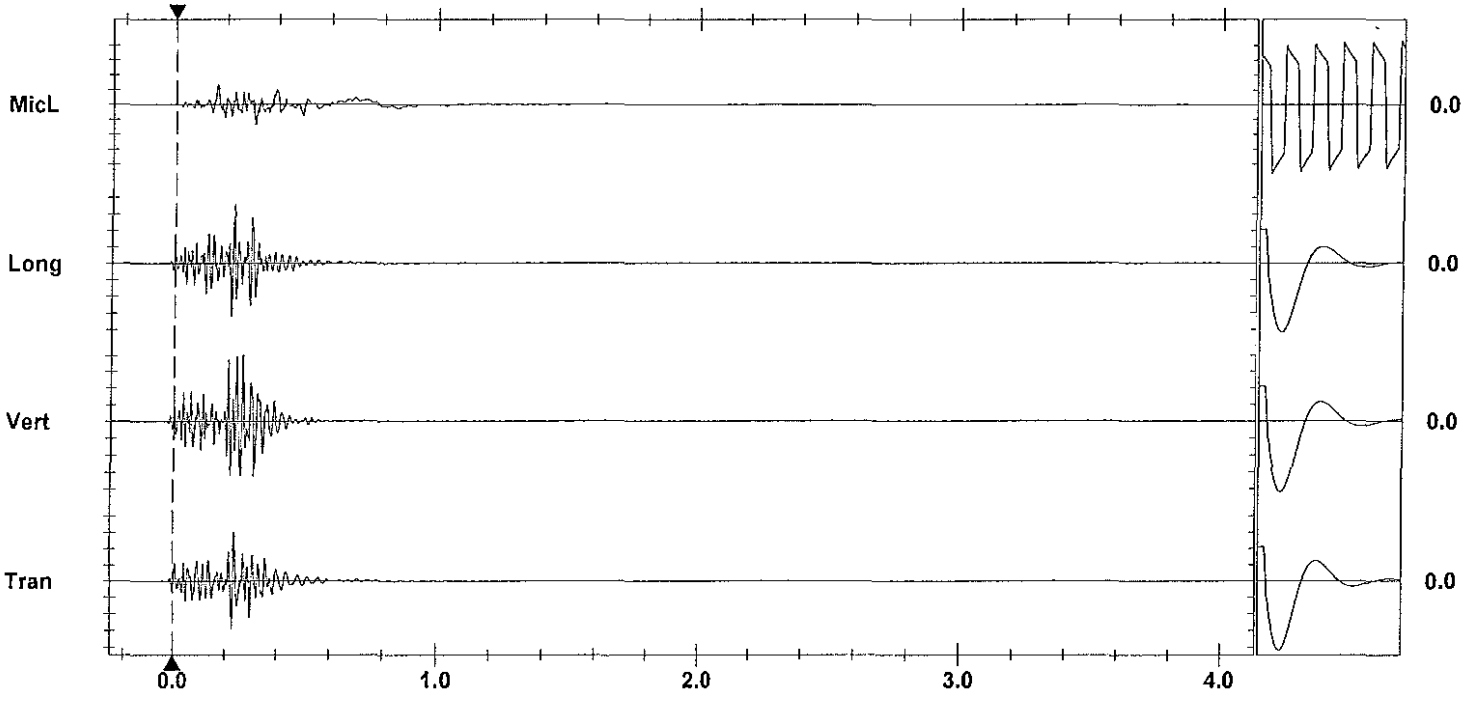
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.309 sec
ZC Freq 22 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.300	0.405	0.360	in/s
ZC Freq	47	47	51	Hz
Time (Rel. to Trig)	0.238	0.269	0.230	sec
Peak Acceleration	0.252	0.437	0.305	g
Peak Displacement	0.00104	0.00139	0.00103	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.469 in/s at 0.229 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 31/12
ACTUAL BLAST DATE May 31/12 12:53 PM
BLAST # MW-0229

HIGHWAY# 97
BLAST LOCATION AT: STA 1291+17 - 1291+25 RS (to Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

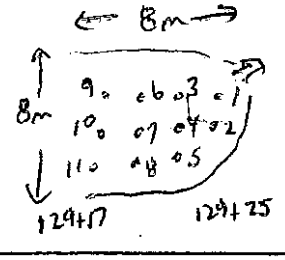
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HP3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 175 (m^3)

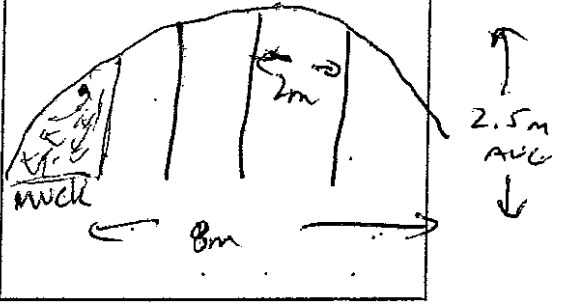
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffston Cst - No Trigger (< 0.07 ips)
" @ 13117 Cliffston Cst - 0.11 ips / 57 Hz

4'-6' ANFO/HOLE Primed w/ 1 ONCE 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 12:53:10 May 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB1Q.GM0
Job Number:	1		

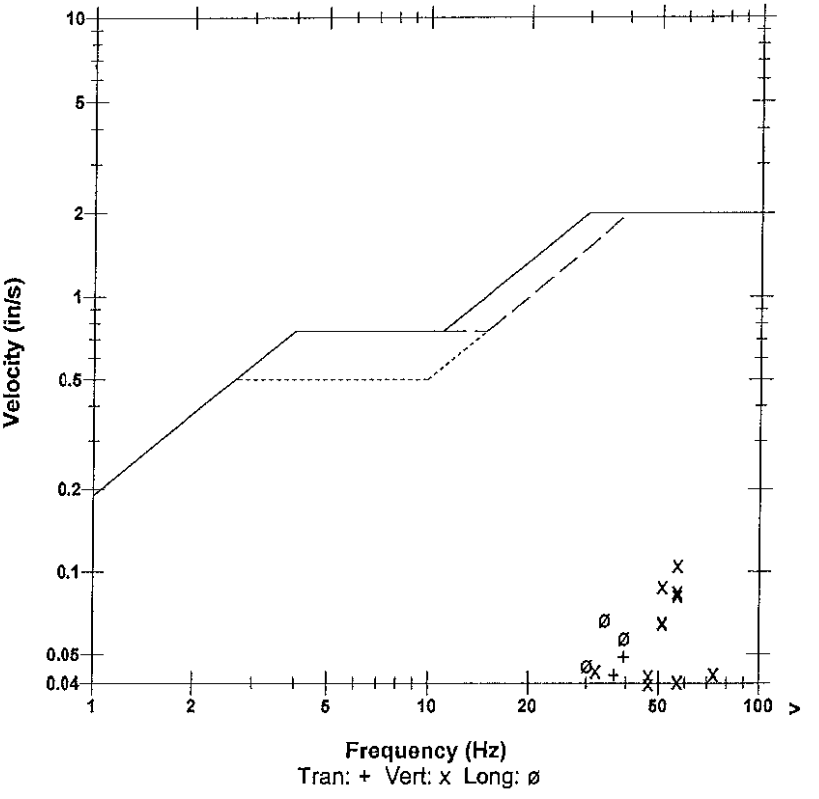
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

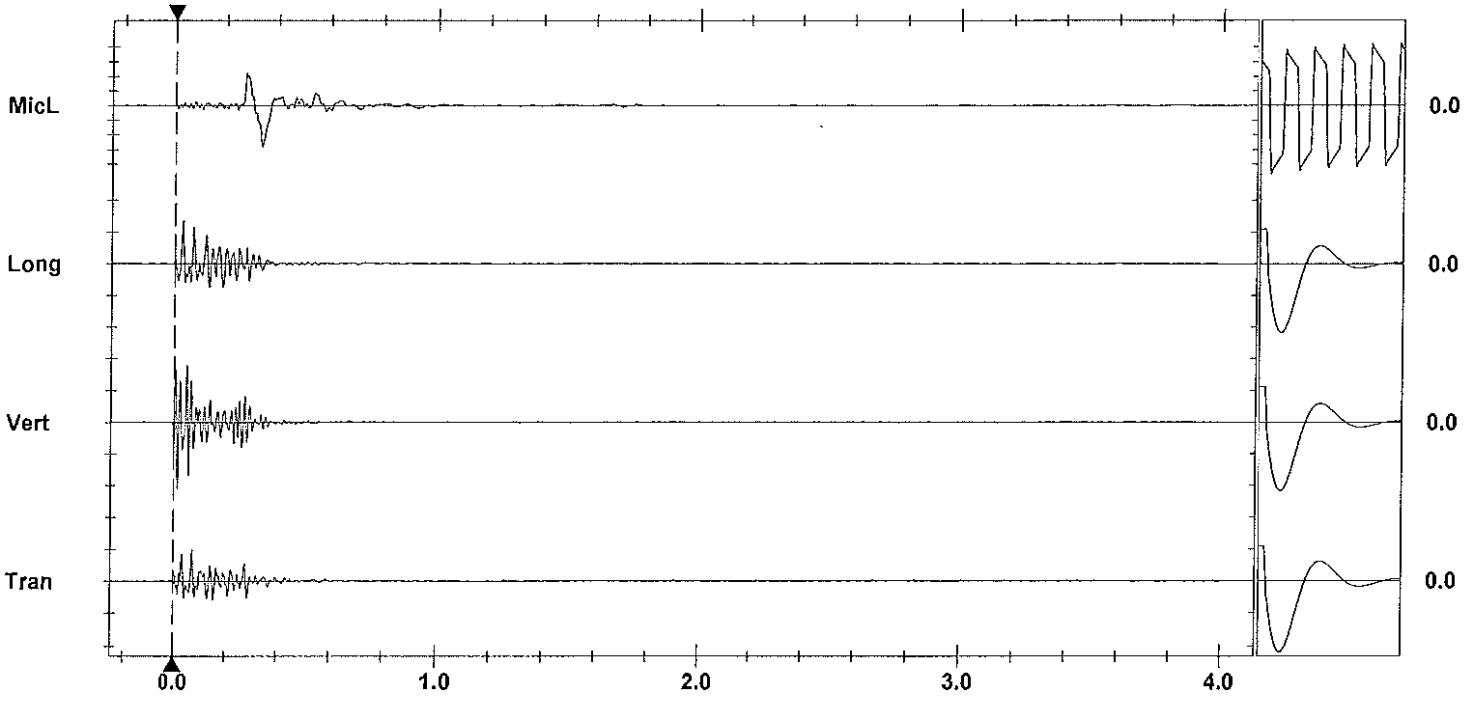
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00283 psi(L) at 0.338 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 608 mv)

	Tran	Vert	Long	
PPV	0.0487	0.106	0.0669	in/s
ZC Freq	39	57	34	Hz
Time (Rel. to Trig)	0.075	0.015	0.031	sec
Peak Acceleration	0.0365	0.0978	0.0464	g
Peak Displacement	0.00020	0.00028	0.00028	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.108 in/s at 0.015 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: June 2, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 31/11
ACTUAL BLAST DATE May 31/11 3:42PM
BLAST # MW-022

HIGHWAY# 97
BLAST LOCATION AT: STN 129+06 → 129+11 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * slot drilled

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 91 (m)

TOTAL NUMBER OF HOLES 13 PROD / 2 STEMS
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

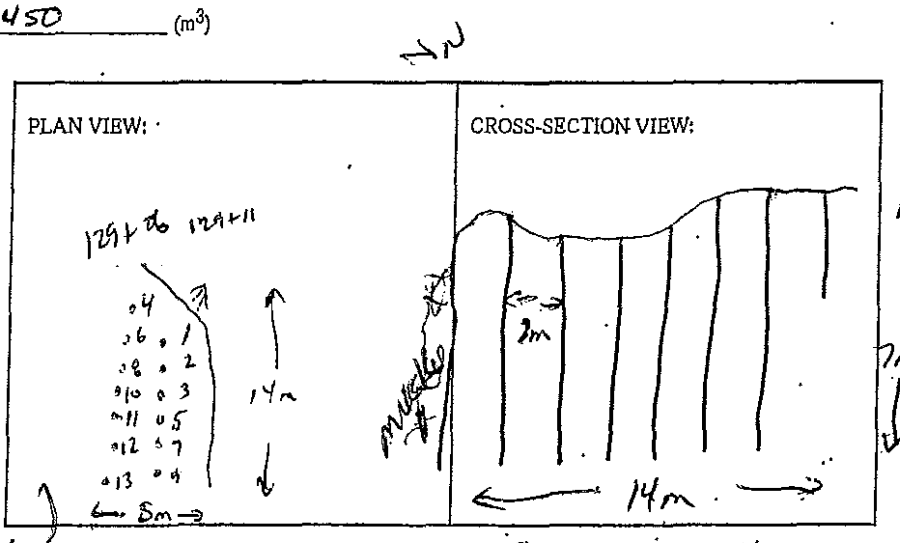
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HMB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cnt - 0.13 ips | 48 Hz
" @ 13117 Cliffstone Cnt - 0.16 ips | 5 Hz

PROD. 10'-12' ANFO/Hole
STAB - 1'-2' ANFO/Hole
} Primed w/ 1 each 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 15:42:27 May 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB1Y.AR0
Job Number:	1		

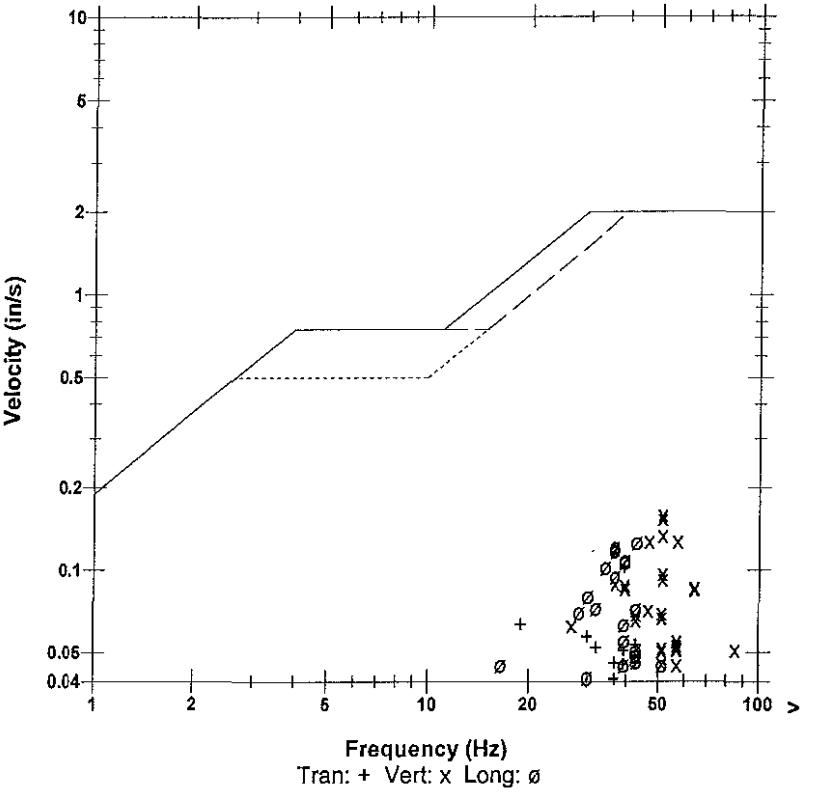
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

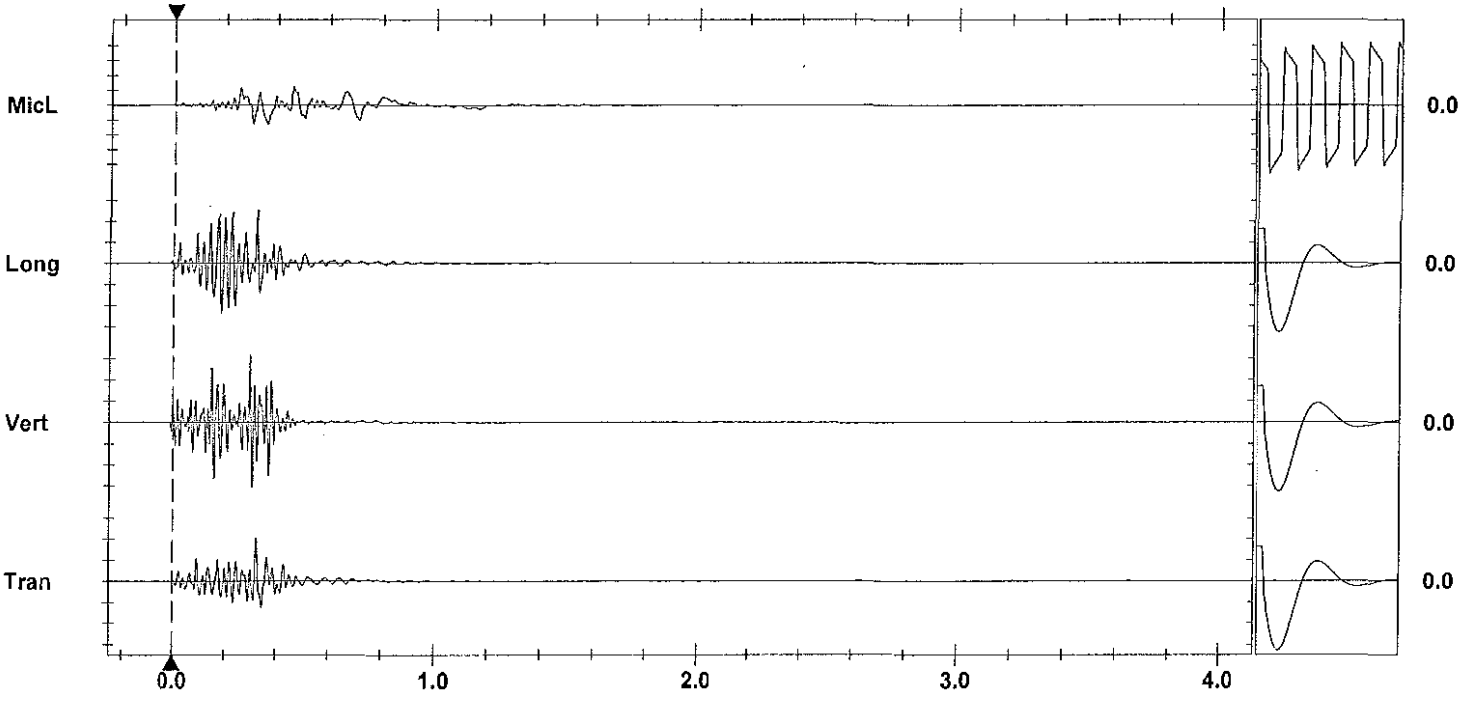
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.357 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 584 mv)

	Tran	Vert	Long	
PPV	0.102	0.159	0.126	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.327	0.301	0.324	sec
Peak Acceleration	0.0597	0.169	0.0911	g
Peak Displacement	0.00042	0.00048	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.175 in/s at 0.326 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

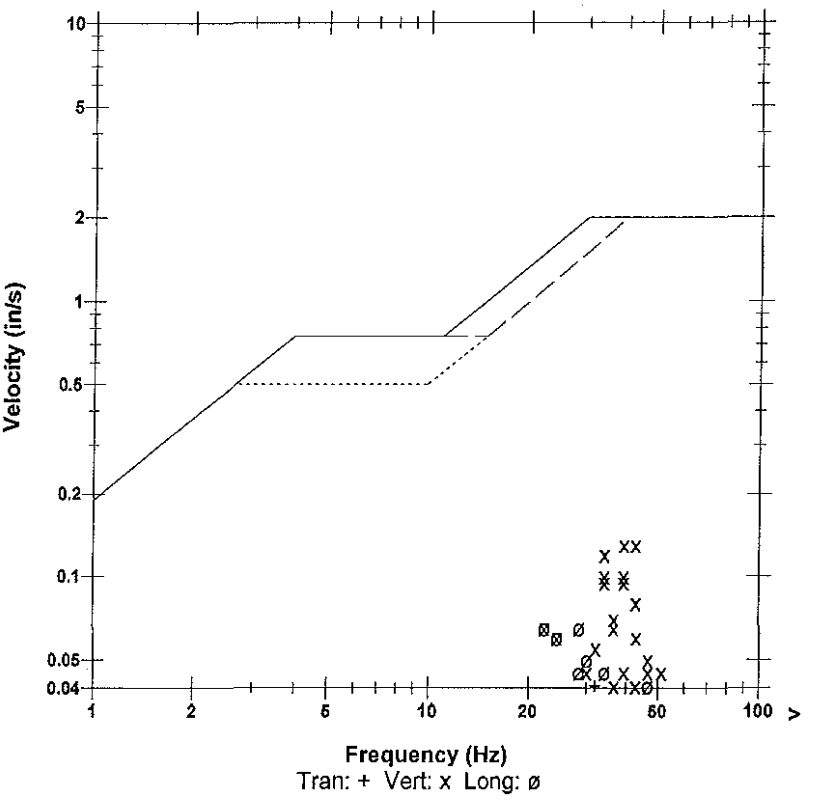
Date/Time	Vert at 15:42:04 May 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0700 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB1Y.A40

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

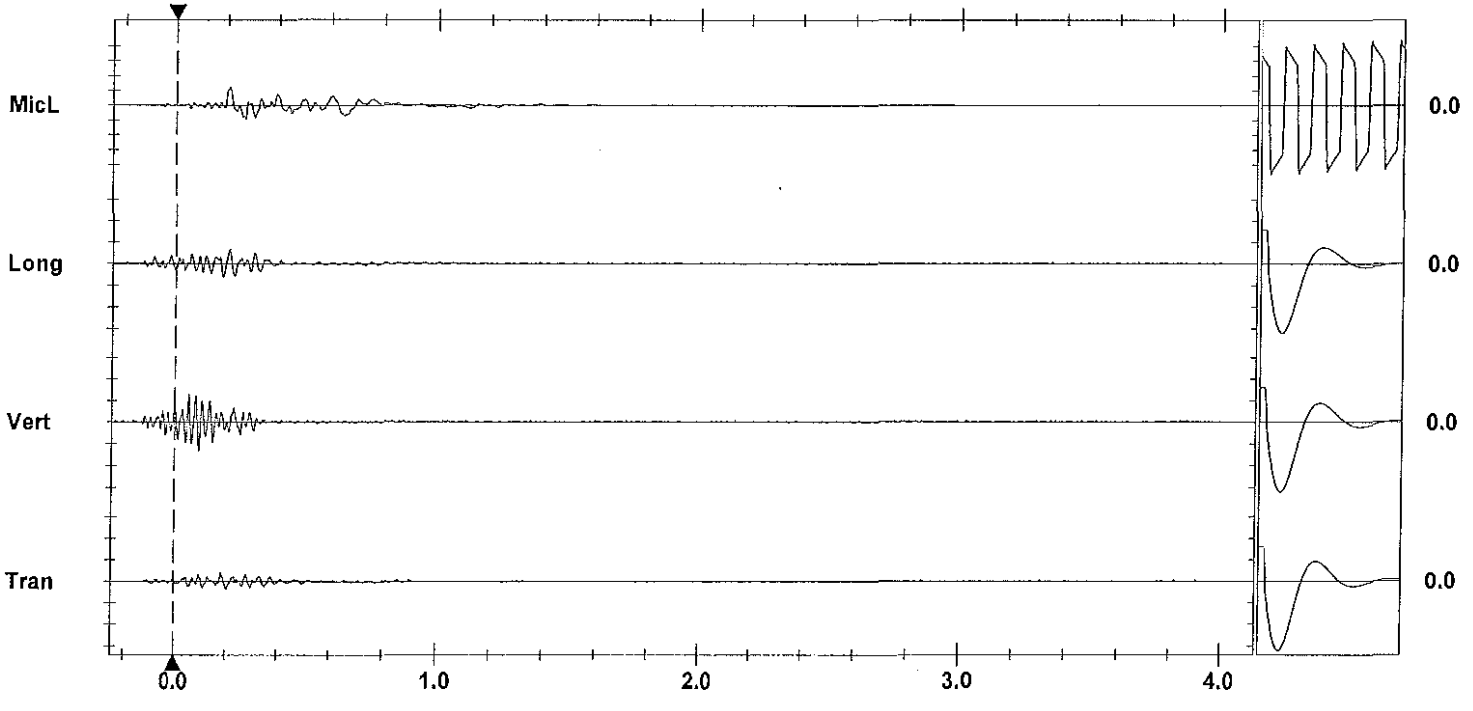
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.208 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0400	0.130	0.0650	in/s
ZC Freq	32	43	28	Hz
Time (Rel. to Trig)	0.185	0.054	0.184	sec
Peak Acceleration	0.0265	0.0928	0.0398	g
Peak Displacement	0.00022	0.00052	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.135 in/s at 0.096 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED May 31/12
ACTUAL BLAST DATE May 31/12 1:59 PM
BLAST # Minor 6

HIGHWAY# 97
BLAST LOCATION AT: 129+11 - 129+17 RS (toe subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 (ms)

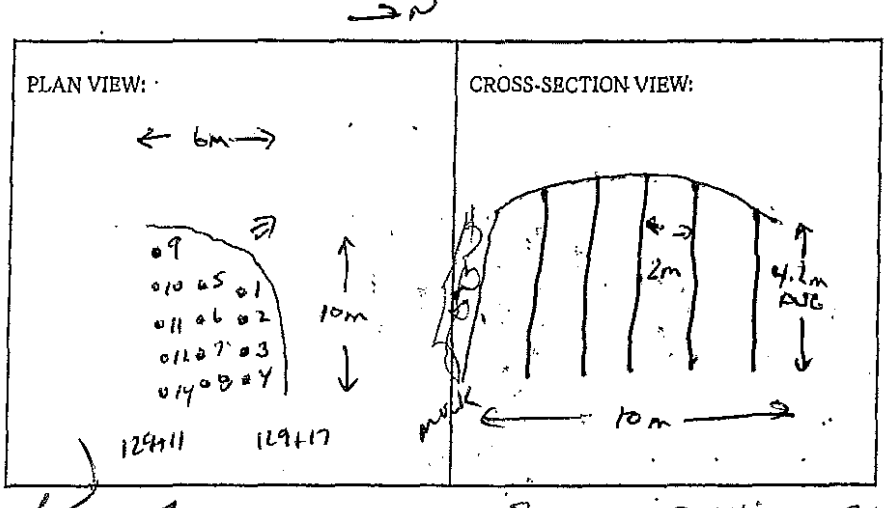
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone ent. 0.070 ips/ 39 m
" @ 13117 cliffstone ent. 0.10 ips/ 47 m

Production Holes – 3'–7' ANFO

Primed w/ 1 CWT 1X8 Dynamite

Instantel

Event Report

Date/Time	Vert at 13:59:12 May 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB1T.IO0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

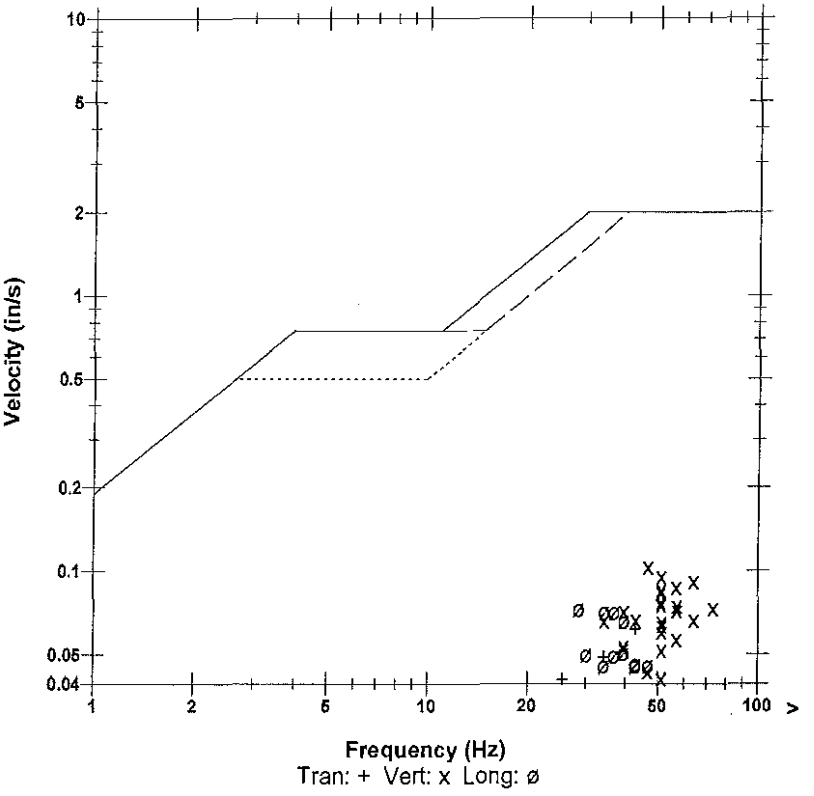
Post Event Notes

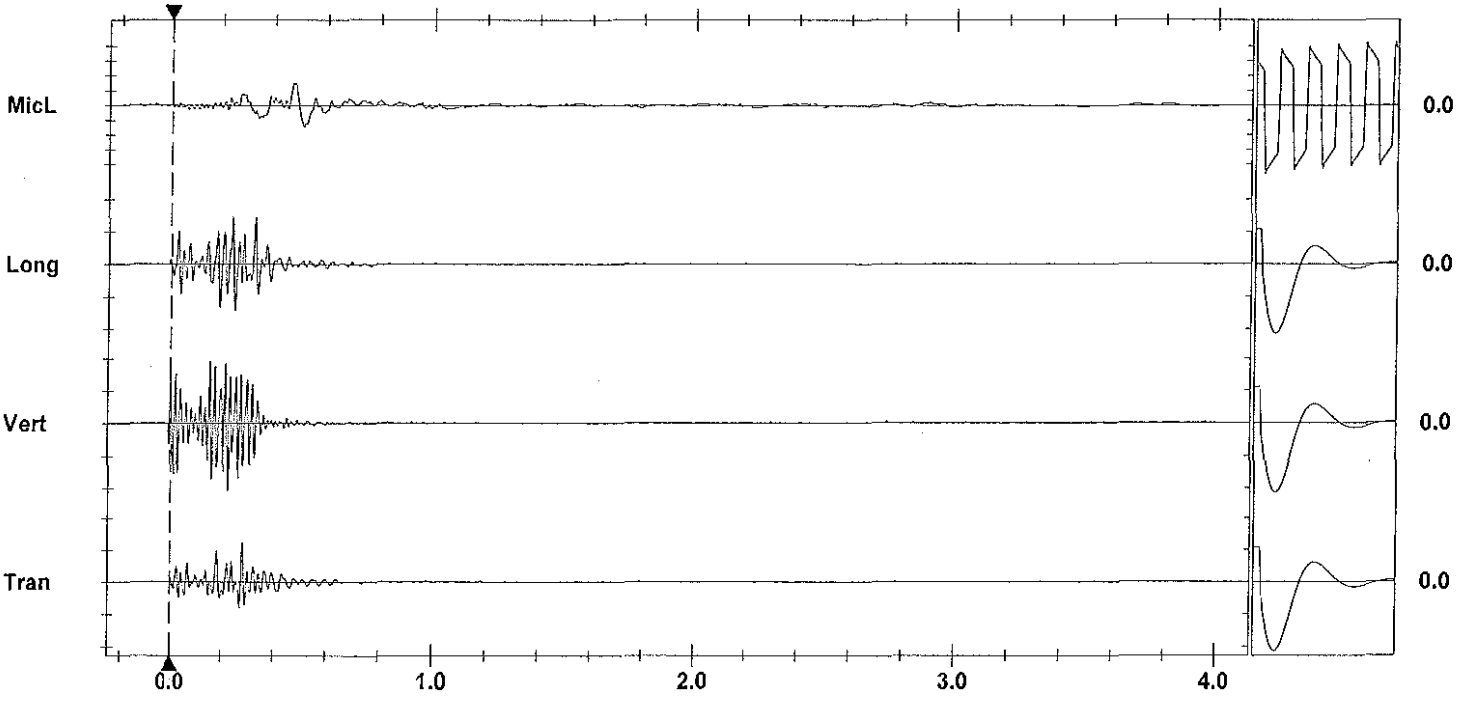
Microphone Linear Weighting
PSPL 0.00152 psi(L) at 0.467 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	0.0619	0.104	0.0731	in/s
ZC Freq	43	47	28	Hz
Time (Rel. to Trig)	0.283	0.225	0.238	sec
Peak Acceleration	0.0414	0.0945	0.0563	g
Peak Displacement	0.00022	0.00034	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.107 in/s at 0.225 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: June 3, 2013 07:8:01 - 8.01
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Instantel

Event Report

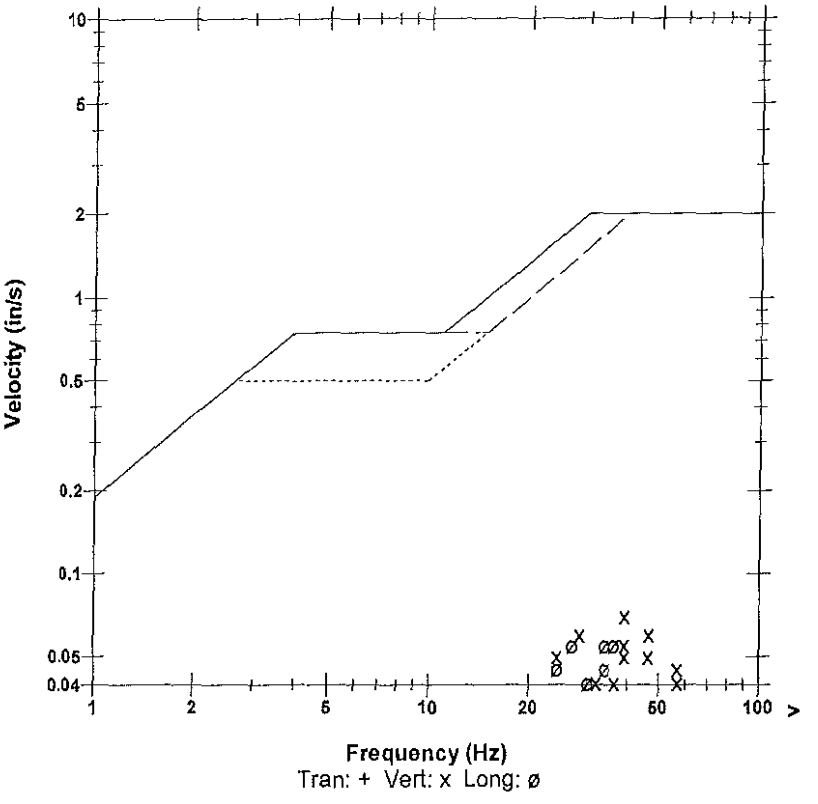
Date/Time	Vert at 13:58:50 May 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0700 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB1T.I20

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

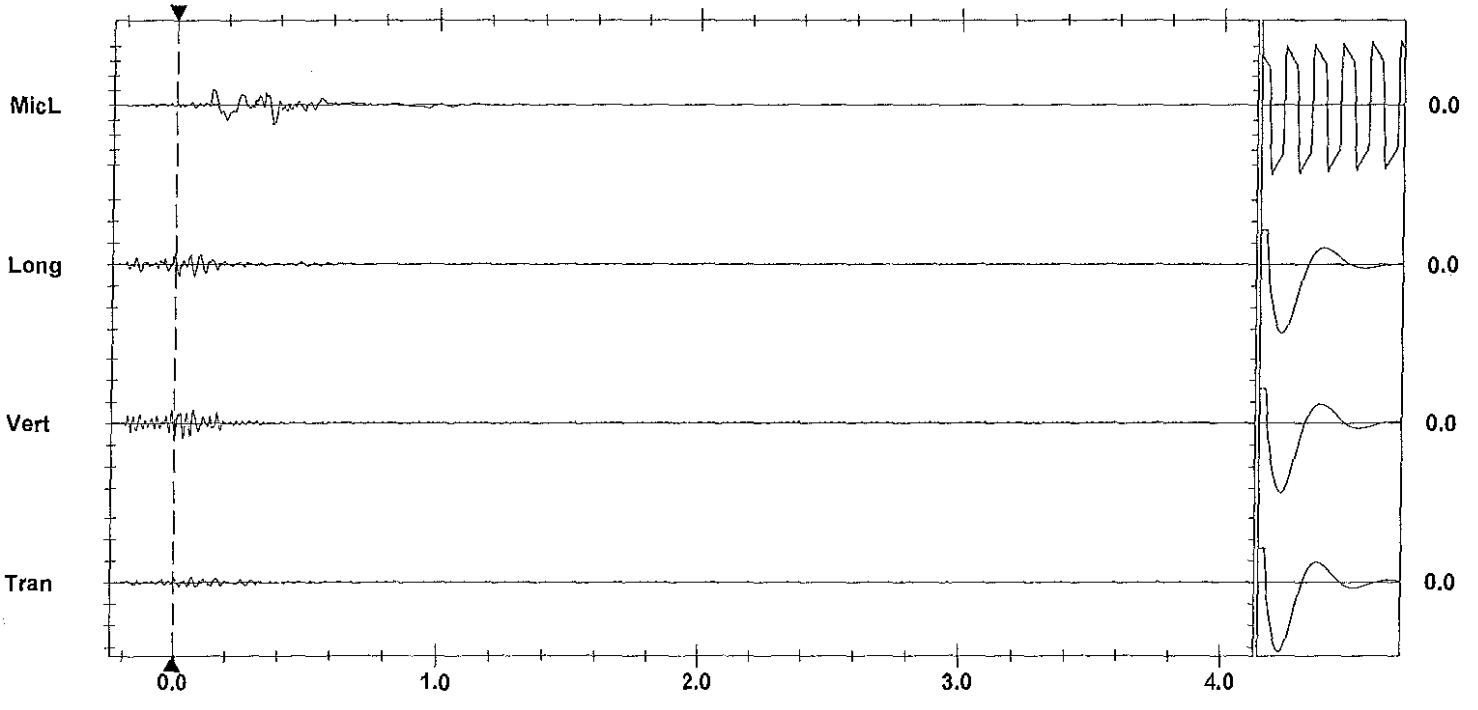
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.374 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 590 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0700	0.0550	in/s
ZC Freq	34	39	34	Hz
Time (Rel. to Trig)	0.070	0.000	-0.004	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00014	0.00038	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0851 in/s at 0.072 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3487

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 10:24 AM
BLAST # MW-0228

HIGHWAY # 97
BLAST LOCATION AT: STN 129+02 — 129+06 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 8.2 (m)

TOTAL NUMBER OF HOLES 11 Pb00/2 snap
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

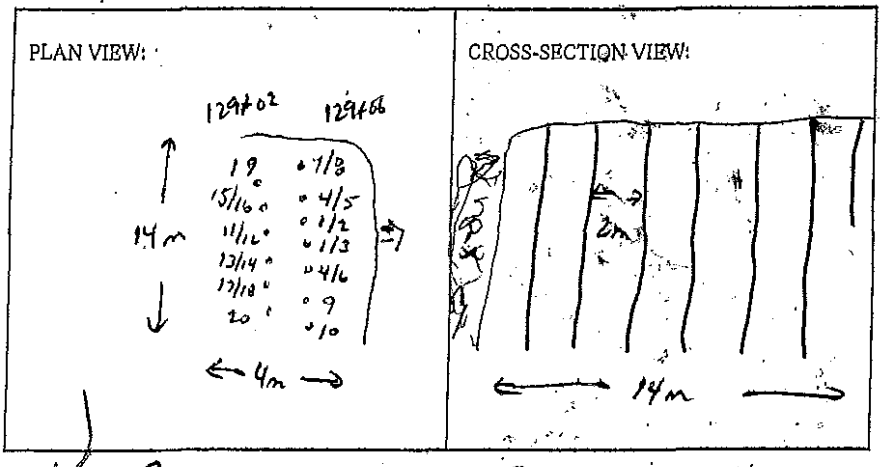
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 375 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13263 Cliffstone Crt - 0.11 ips/43Hz
" @ 13117 Cliffstone Crt - 0.18 ips/51Hz

PRODUCTION HOLES - BOTTOM DECK - 5' - 8' ANFO

- TOP DECK - 2' - 3' ANFO

STOPE HOLES - 2' ANFO

ALL PRIMED W/ 1 CART 1X9 DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:15:24 June 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB3G.LO0
Job Number:	1		

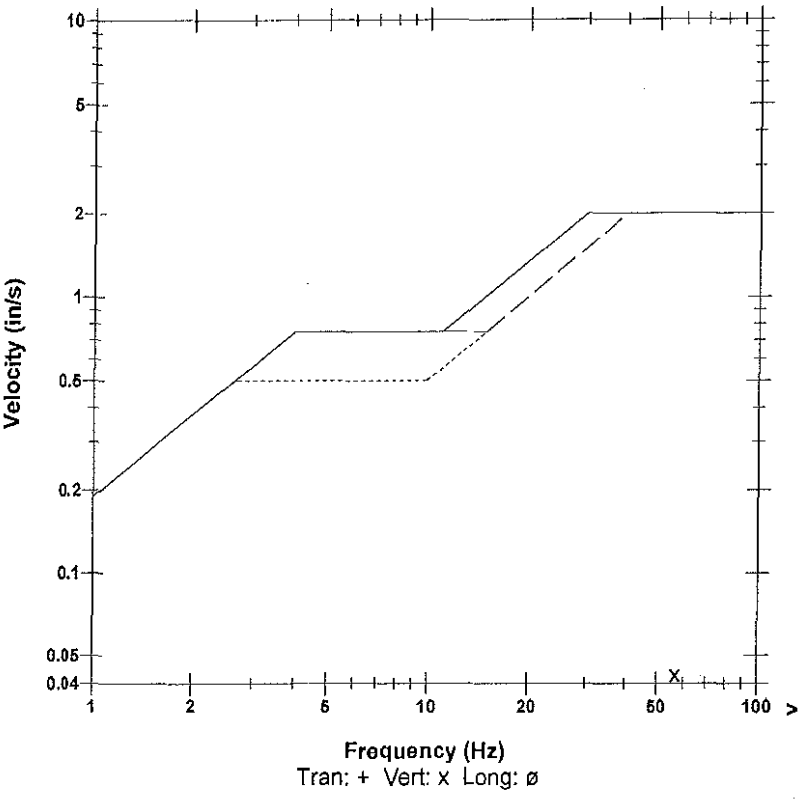
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

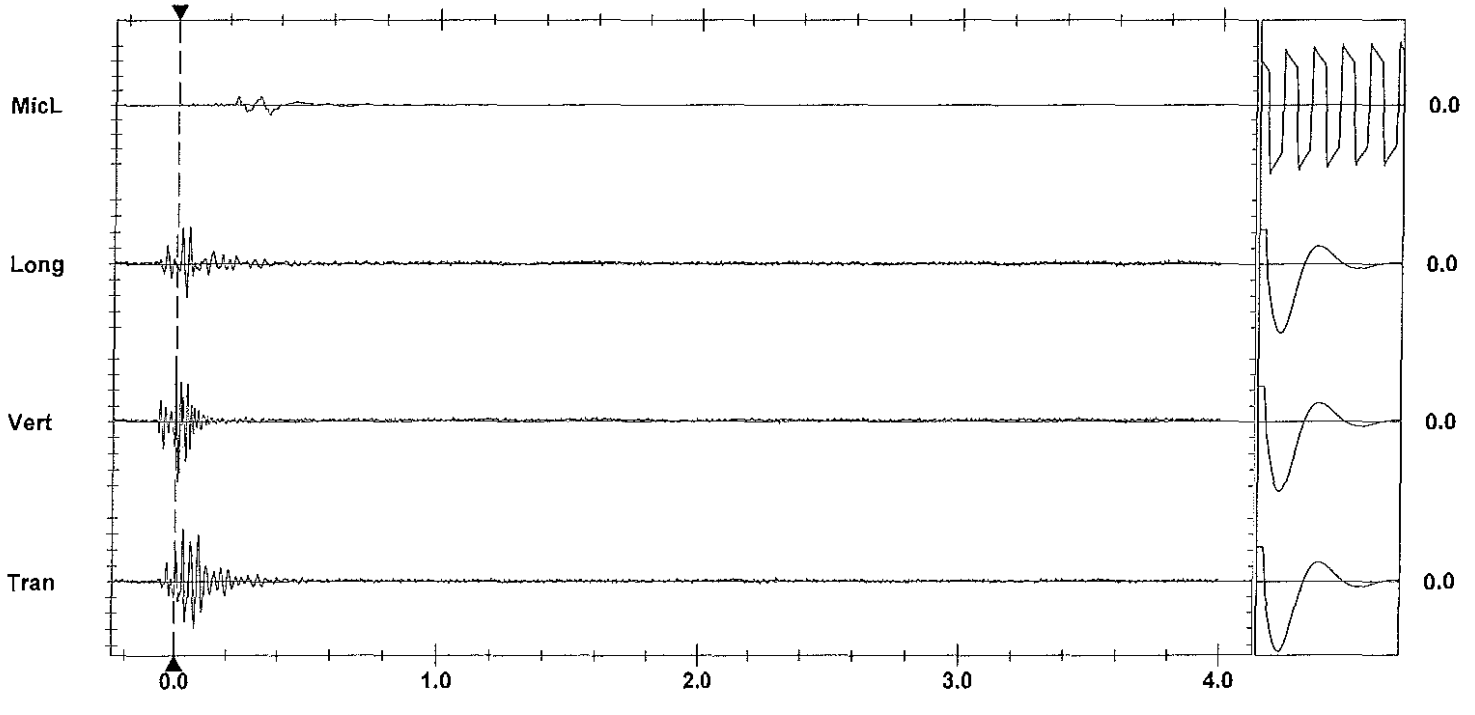
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00065 psi(L) at 0.357 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.0331	0.0425	0.0231	in/s
ZC Freq	43	57	37	Hz
Time (Rel. to Trig)	0.032	0.001	0.053	sec
Peak Acceleration	0.0249	0.0398	0.0166	g
Peak Displacement	0.00014	0.00012	0.00009	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0437 in/s at 0.001 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

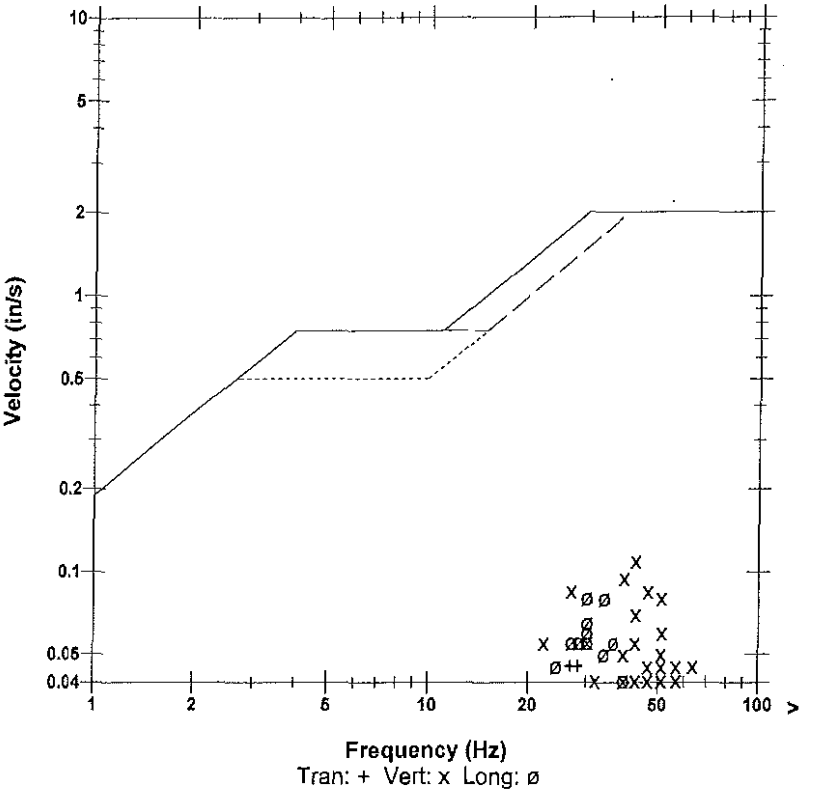
Date/Time	Vert at 10:24:39 June 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB3E.930

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

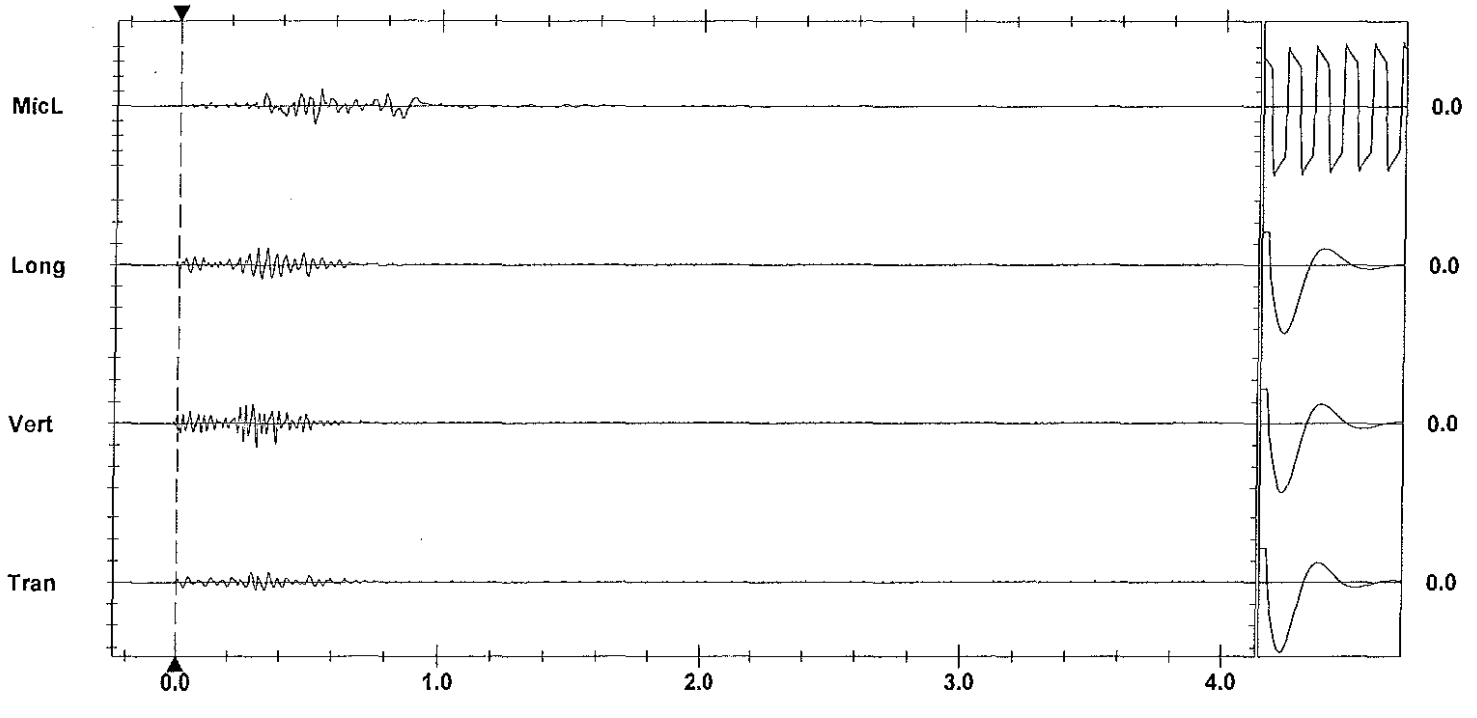
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.521 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 607 mv)

	Tran	Vert	Long	
PPV	0.0450	0.110	0.0800	in/s
ZC Freq	27	43	34	Hz
Time (Rel. to Trig)	0.292	0.308	0.309	sec
Peak Acceleration	0.0398	0.0795	0.0530	g
Peak Displacement	0.00028	0.00044	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.2	

Peak Vector Sum 0.139 in/s at 0.309 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶———◀

Sensorcheck

Printed: June 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 12:57pm
BLAST # MW-0230

HIGHWAY# 97
BLAST LOCATION AT: 128+98 - 129+02

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot modified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.8 (m)
TOTAL DEPTH 83 (m)

TOTAL NUMBER OF HOLES 11 PRSO
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

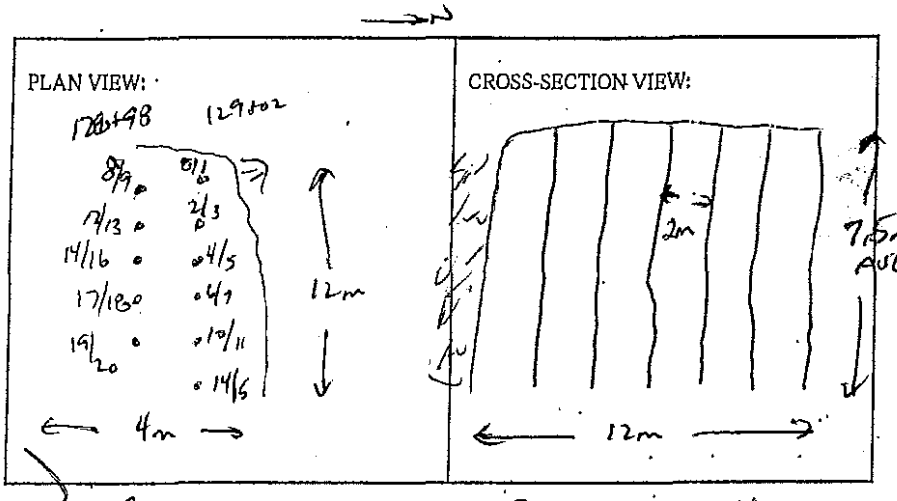
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.095 ips / 39 Hz
" @ 13117 Cliffstone Crt - 0.11 ips / 39 Hz

Bottom Decks - 6'-8' ANFO

Top Decks - 2'-3.5' ANFO

Primed w/ center 1"x8" dynamite

Instantel

Event Report

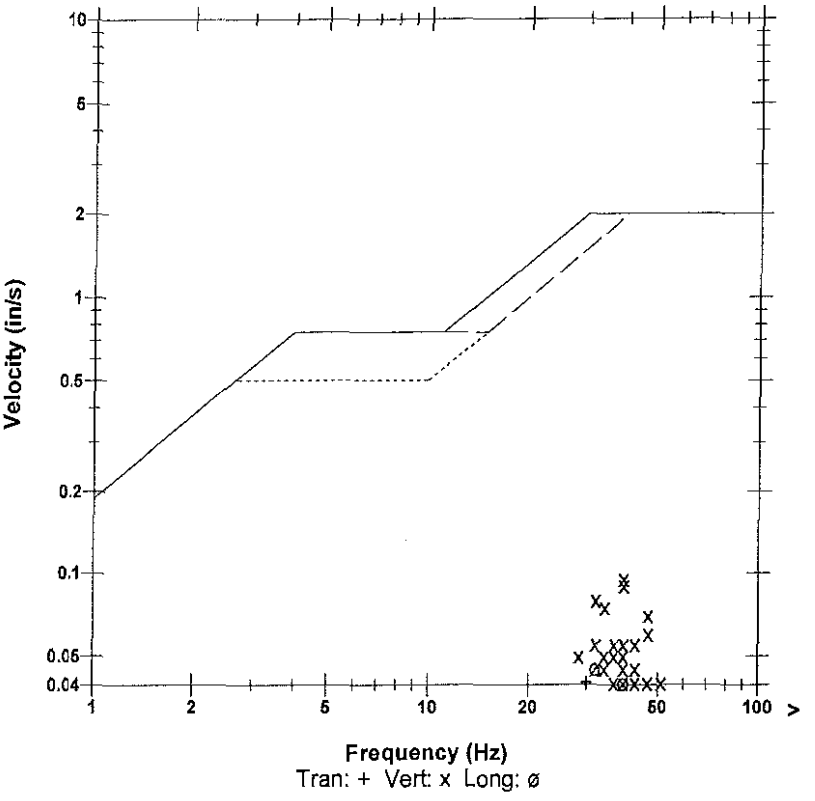
Date/Time	Vert at 12:57:50 June 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB3L.CE0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

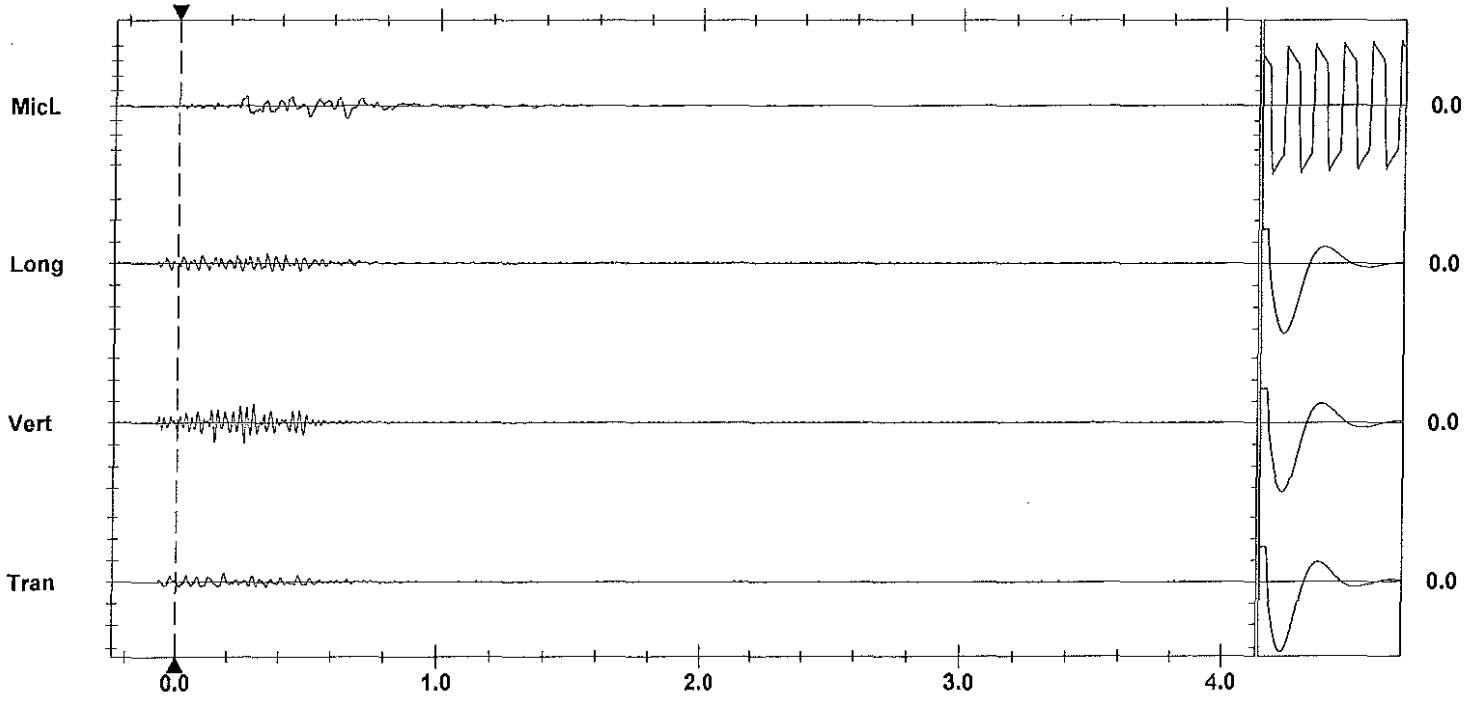
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00083 psi(L) at 0.648 sec
ZC Freq	9.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 588 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0950	0.0450	in/s
ZC Freq	30	39	32	Hz
Time (Rel. to Trig)	0.186	0.261	0.348	sec
Peak Acceleration	0.0265	0.0663	0.0398	g
Peak Displacement	0.00022	0.00037	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0955 in/s at 0.262 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 12:57:49 June 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB3L.CD0
Job Number:	1		

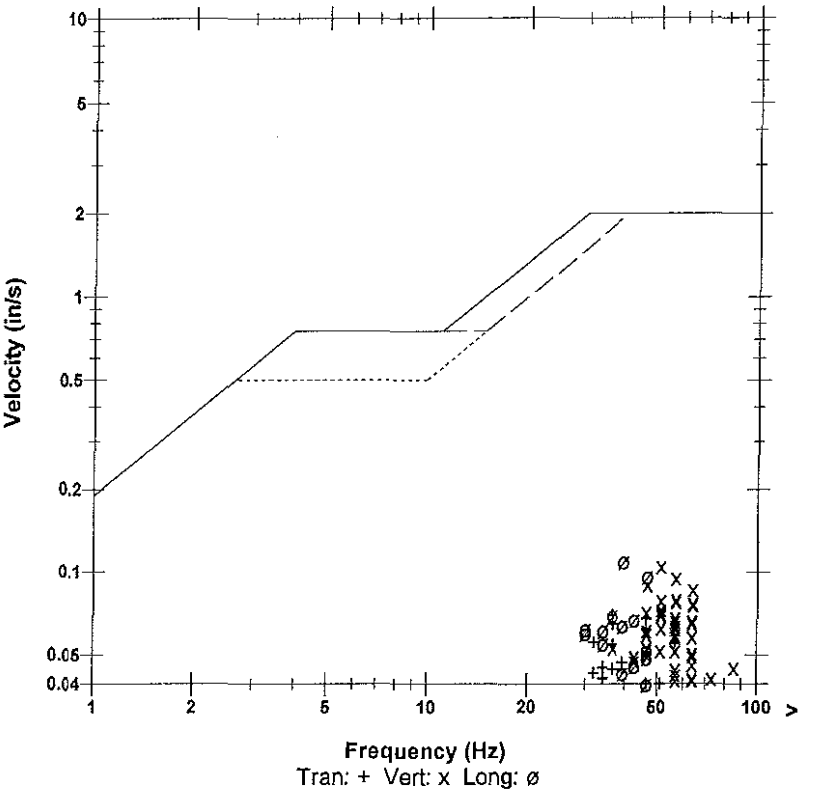
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

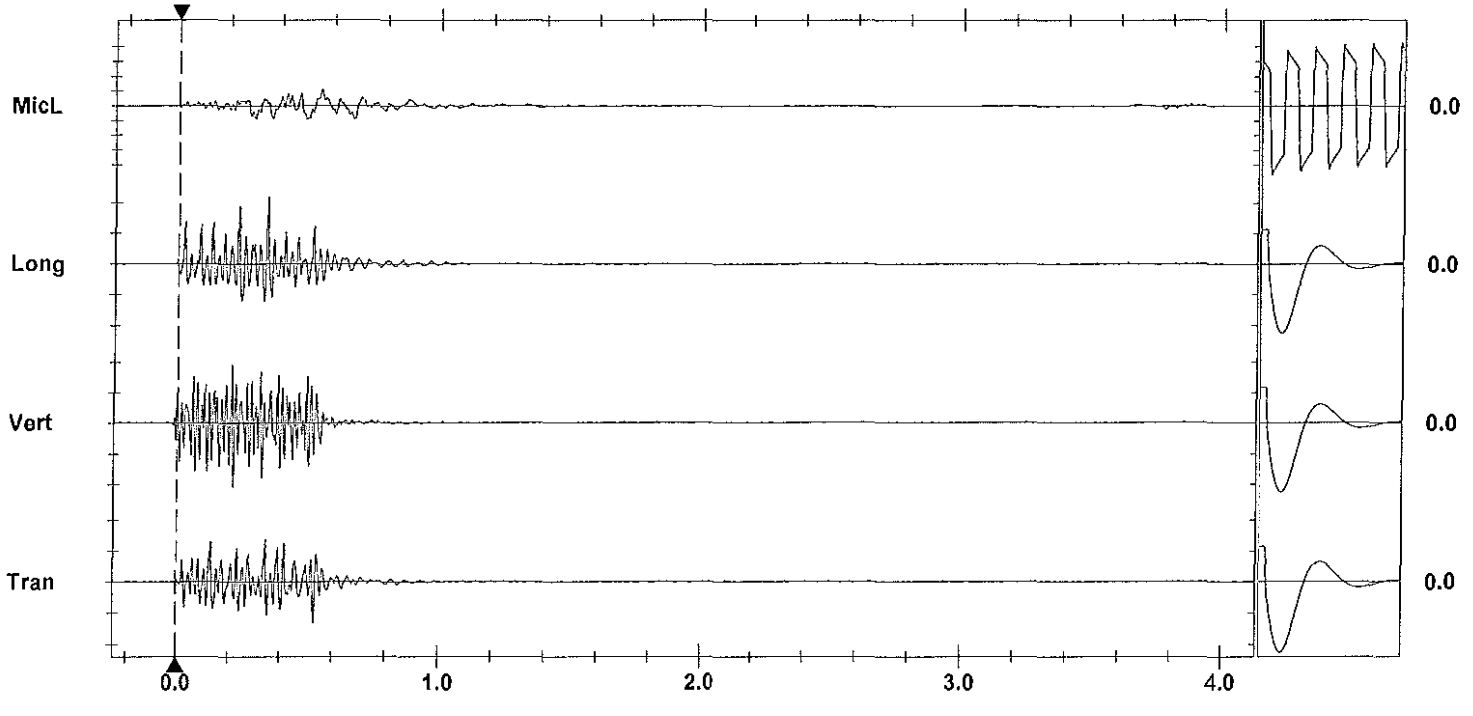
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.551 sec
ZC Freq	9.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	0.0694	0.105	0.109	in/s
ZC Freq	37	51	39	Hz
Time (Rel. to Trig)	0.347	0.220	0.347	sec
Peak Acceleration	0.0613	0.104	0.0679	g
Peak Displacement	0.00028	0.00031	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.131 in/s at 0.347 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3483

DATE PREPARED June 1/12
ACTUAL BLAST DATE June 1/12 3:20 PM
BLAST # MW-0231

HIGHWAY# 97
BLAST LOCATION AT: STN 128+98 - 128+98

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot modified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 Pairs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

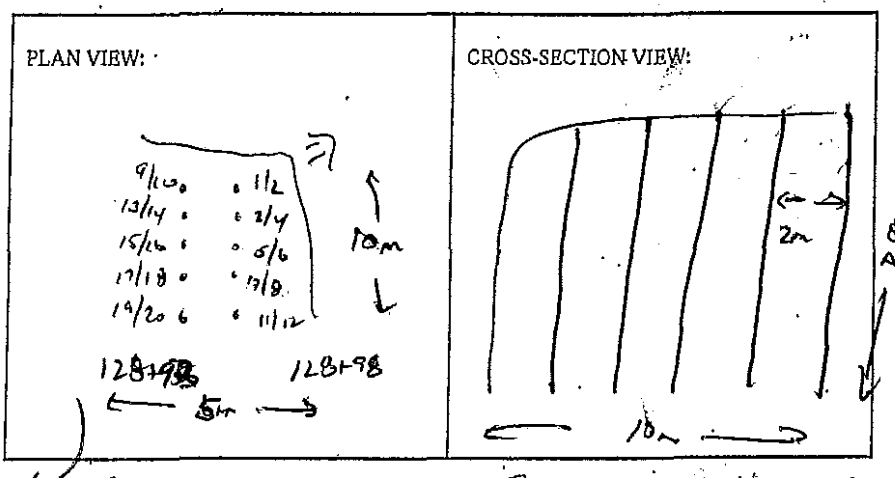
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting Inc

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone Crt - 0.14 ips / 34 Hz
" @ 13117 cliffstone Crt - 0.17 ips / 43 Hz

Instantel

Event Report

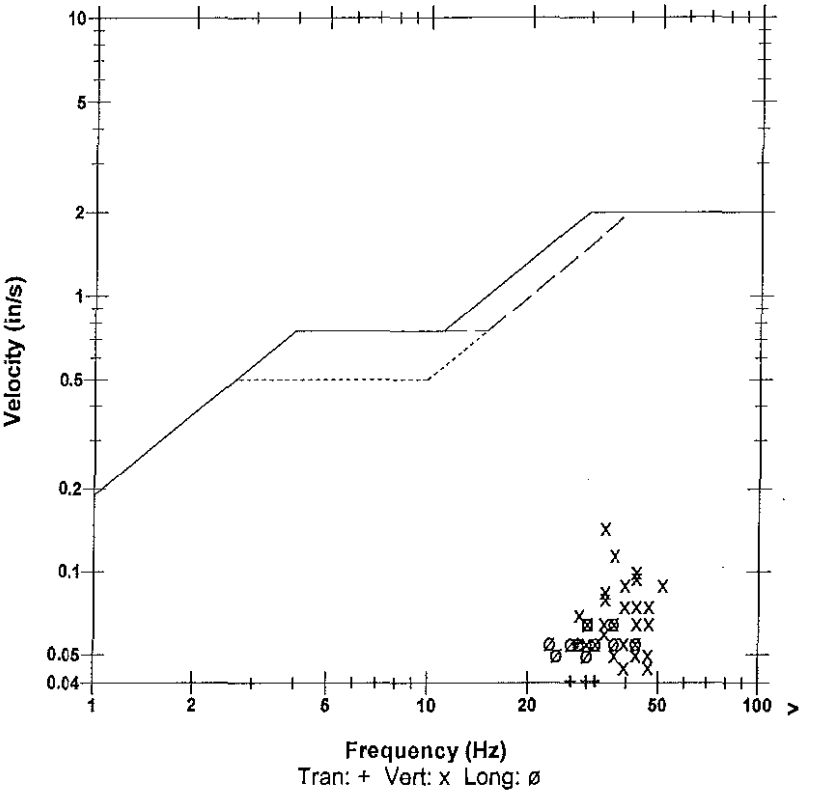
Date/Time	Vert at 15:20:38 June 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB3R.YE0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

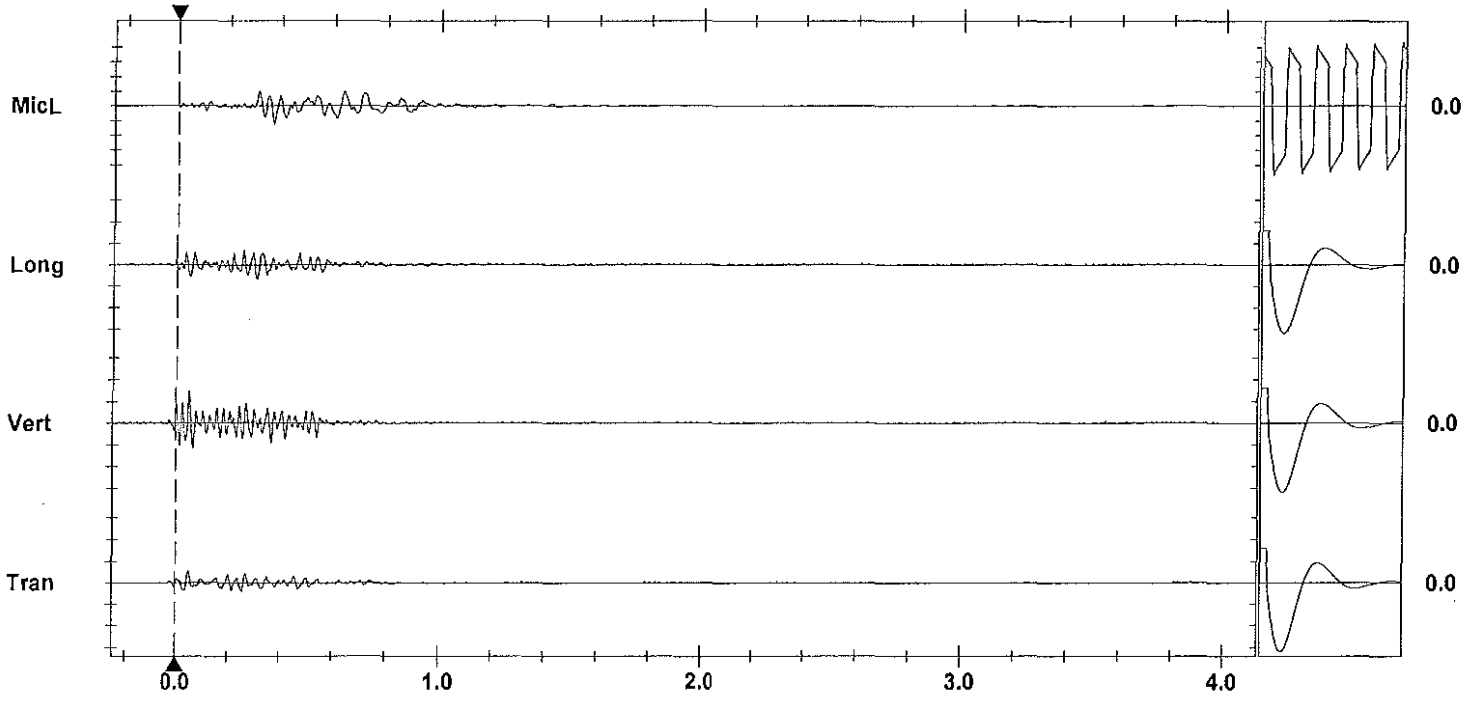
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.369 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	0.0550	0.145	0.0650	in/s
ZC Freq	28	34	37	Hz
Time (Rel. to Trig)	0.053	0.054	0.259	sec
Peak Acceleration	0.0265	0.0663	0.0530	g
Peak Displacement	0.00031	0.00063	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.165 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 15:20:37 June 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB3R.YD0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

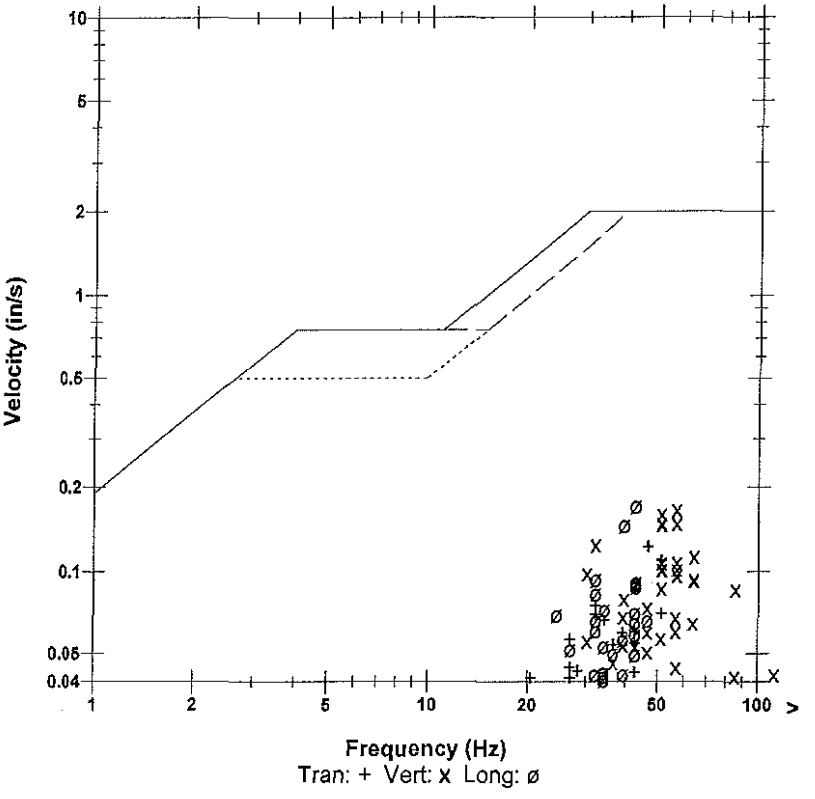
Post Event Notes

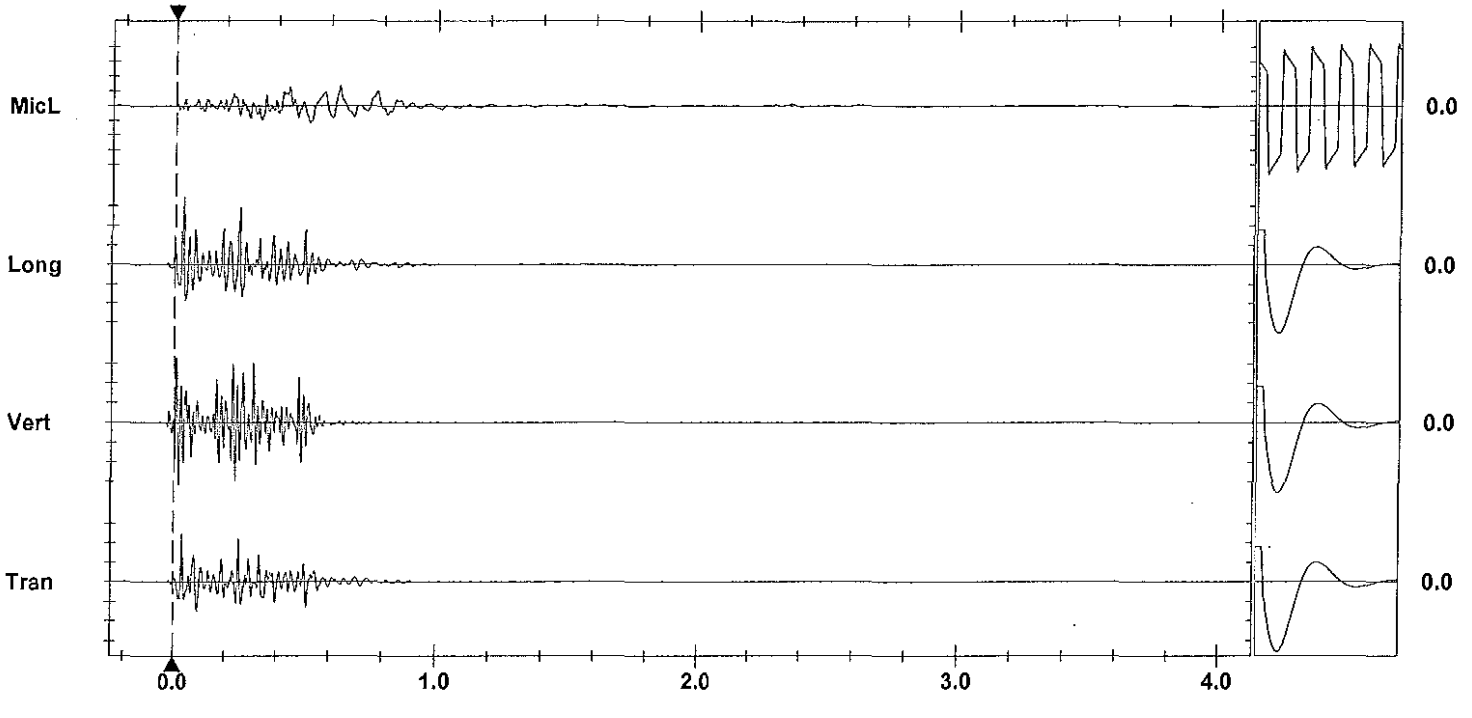
Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.632 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	0.122	0.166	0.171	in/s
ZC Freq	47	57	43	Hz
Time (Rel. to Trig)	0.035	0.009	0.033	sec
Peak Acceleration	0.0862	0.157	0.116	g
Peak Displacement	0.00038	0.00051	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.222 in/s at 0.034 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 553489

DATE PREPARED June 4/12
ACTUAL BLAST DATE June 4/12 3:17 PM
BLAST # MW-0272

HIGHWAY# 97
BLAST LOCATION AT: 128+87 - 128+93

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: *

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10 (m)
TOTAL DEPTH 168 (m)

TOTAL NUMBER OF HOLES 12 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

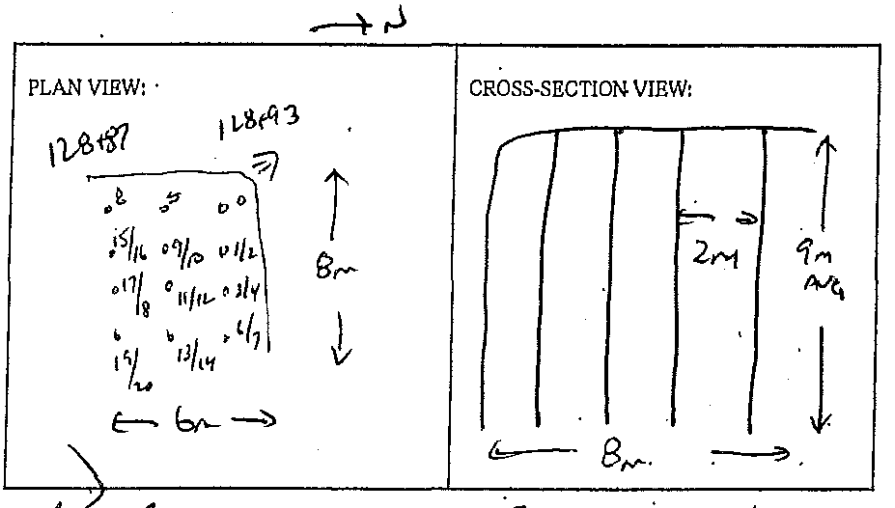
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

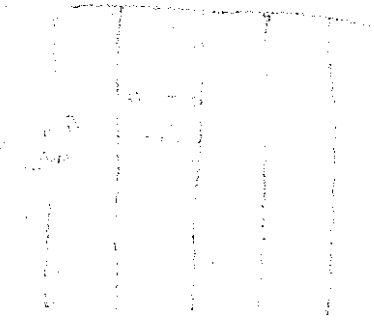
(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.22 ips/ 32 Hz
" @ 13117 Cliffstone Crt. 0.37 ips/ 47 Hz

Bottom row

Prod. Holes Top Row 5'-6.5' apart

Primed w/ 1 char 1"x8" Dynamite



Instantel

Event Report

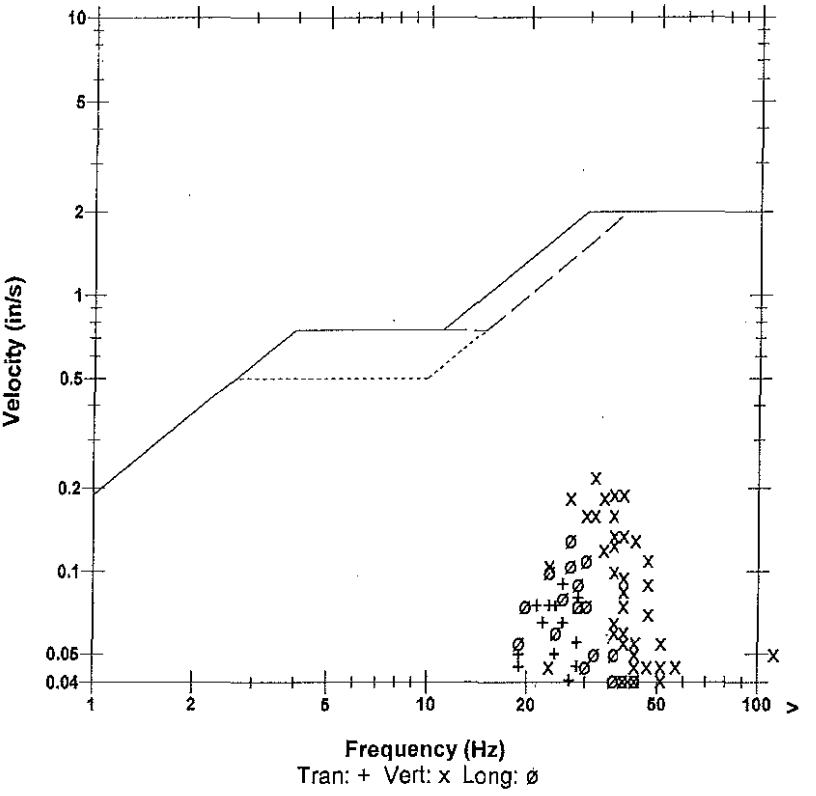
Date/Time	Vert at 15:17:16 June 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EB9B.SS0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

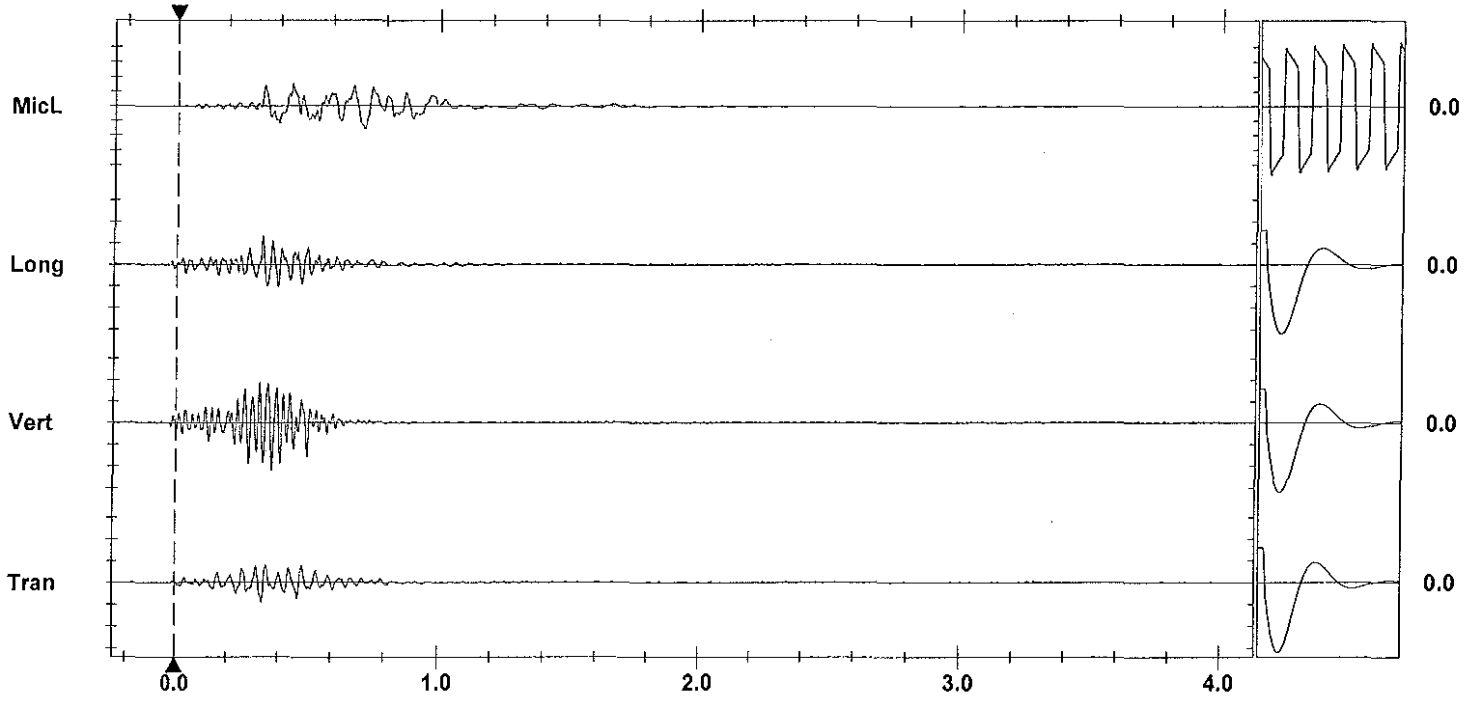
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.718 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 606 mv)

	Tran	Vert	Long	
PPV	0.0900	0.220	0.130	in/s
ZC Freq	26	32	27	Hz
Time (Rel. to Trig)	0.339	0.373	0.336	sec
Peak Acceleration	0.0530	0.133	0.0663	g
Peak Displacement	0.00057	0.00112	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.246 in/s at 0.373 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 15:17:19 June 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EB9B.SV0
Job Number:	1		

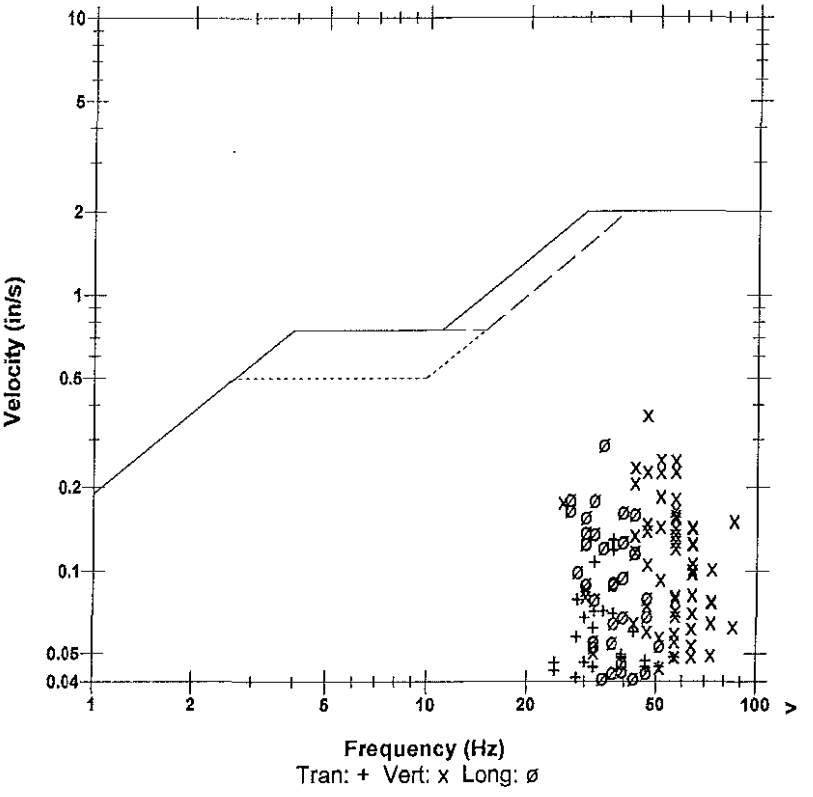
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

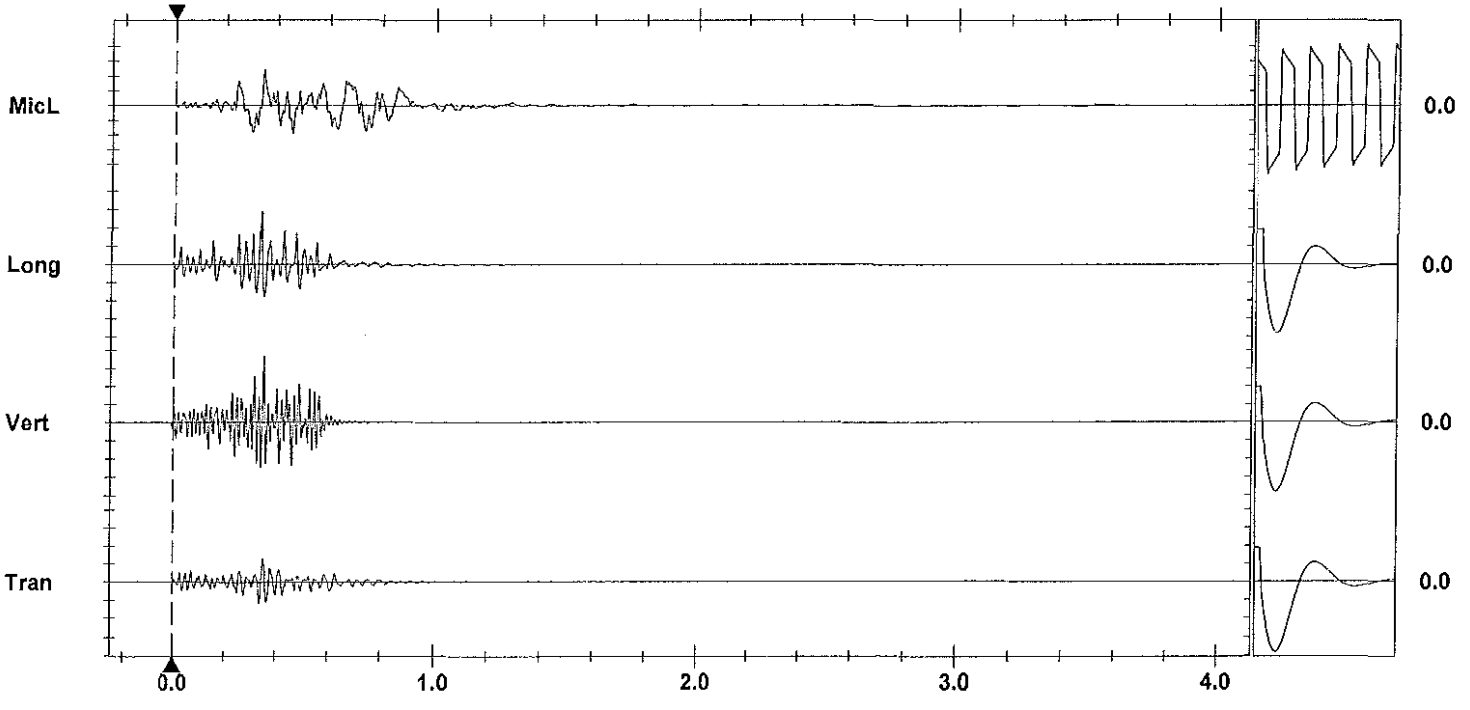
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00239 psi(L) at 0.346 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 584 mv)

	Tran	Vert	Long	
PPV	0.129	0.369	0.288	in/s
ZC Freq	37	47	34	Hz
Time (Rel. to Trig)	0.356	0.354	0.341	sec
Peak Acceleration	0.0928	0.277	0.172	g
Peak Displacement	0.00059	0.00121	0.00120	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.427 in/s at 0.354 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 19, 2012 9:01:01 AM
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 11:59
BLAST # MW-D233

HIGHWAY# 97
BLAST LOCATION AT: STN 128+81 - 128+87 Bench 2 of 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 115 (m)

TOTAL NUMBER OF HOLES 23 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 115
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 145 (kg)
DELAY TYPE AND LENGTH 25 (ms)

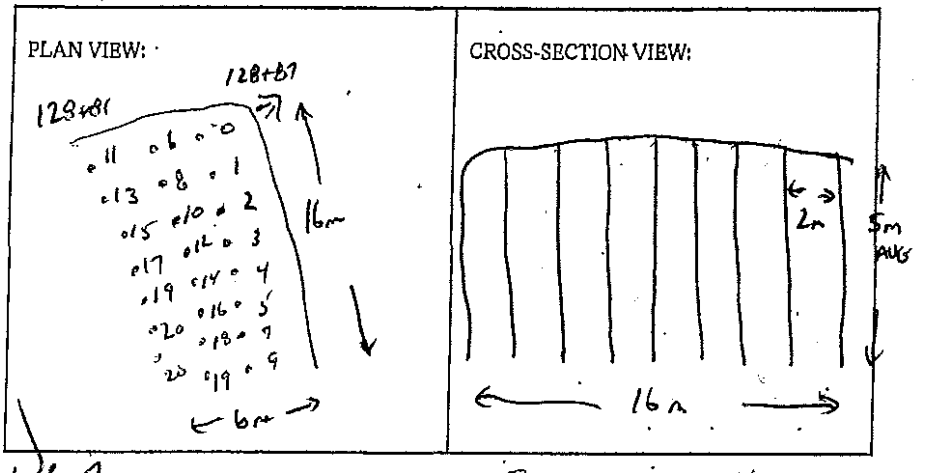
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 480 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone Crt. 0.14 ips / 30Hz
@ 13117 cliffstone Crt - 0.27 ips / 5Hz

PRODUCTION HOLES – 5'-6' ANFO PER HOLE – SINGLE DECK

Primed w/ .5 CAST 1½"x16" ULTIMAX DYNAMITE

MAX 2 Holes/ DELAY

Instantel

Event Report

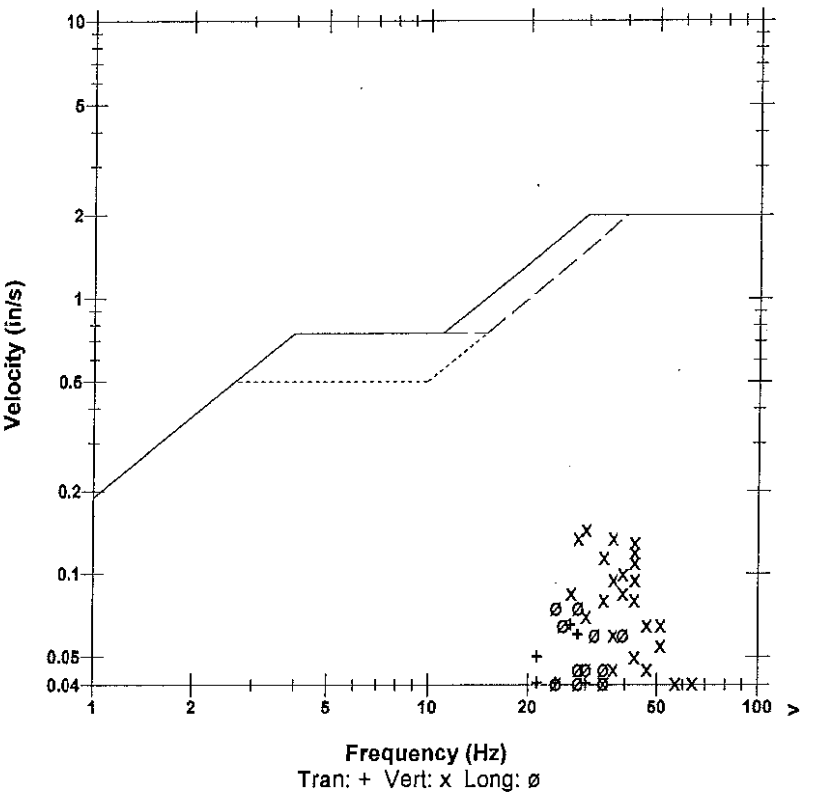
Date/Time	Vert at 11:59:41 June 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBAX.BH0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

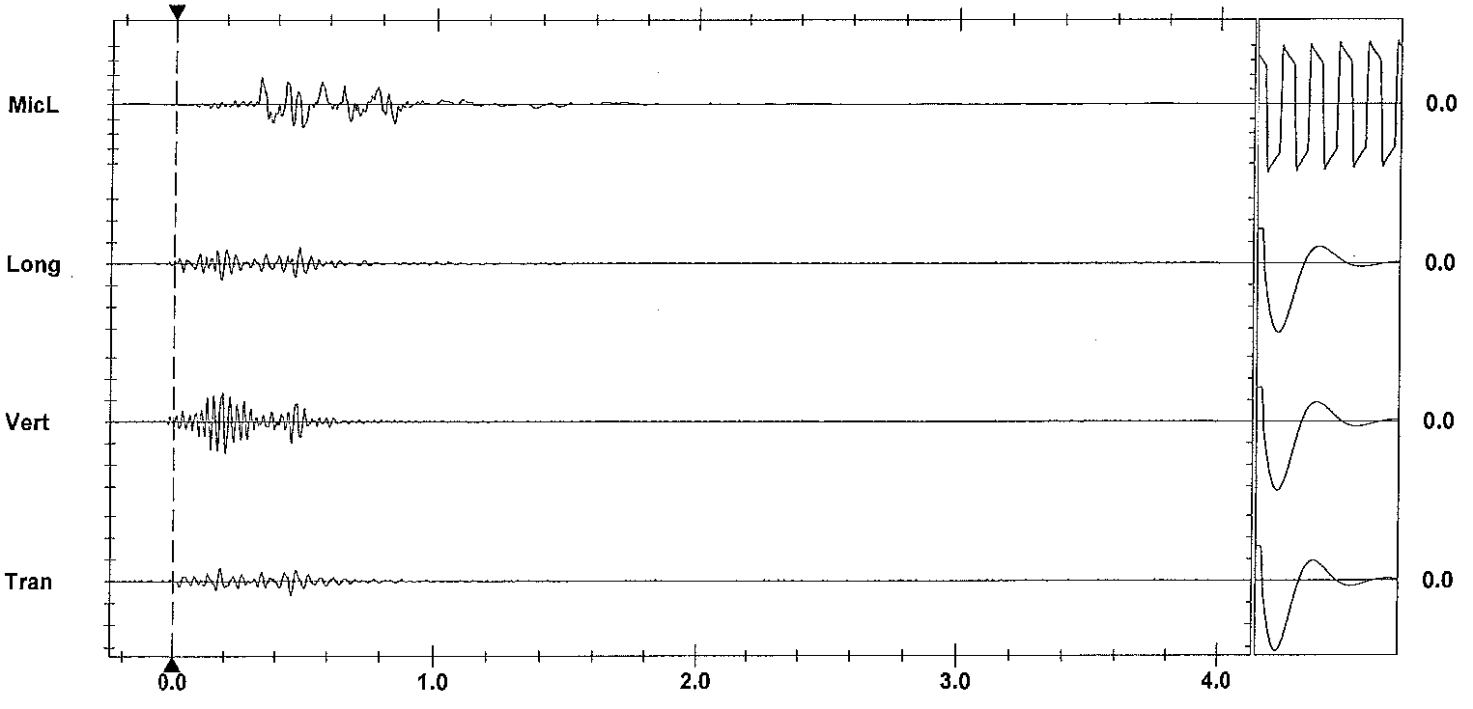
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00185 psi(L) at 0.336 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 584 mv)

	Tran	Vert	Long	
PPV	0.0650	0.145	0.0750	in/s
ZC Freq	27	30	28	Hz
Time (Rel. to Trig)	0.461	0.203	0.185	sec
Peak Acceleration	0.0265	0.119	0.0530	g
Peak Displacement	0.00037	0.00081	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.162 in/s at 0.203 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:59:44 June 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBAX.BK0
Job Number:	1		

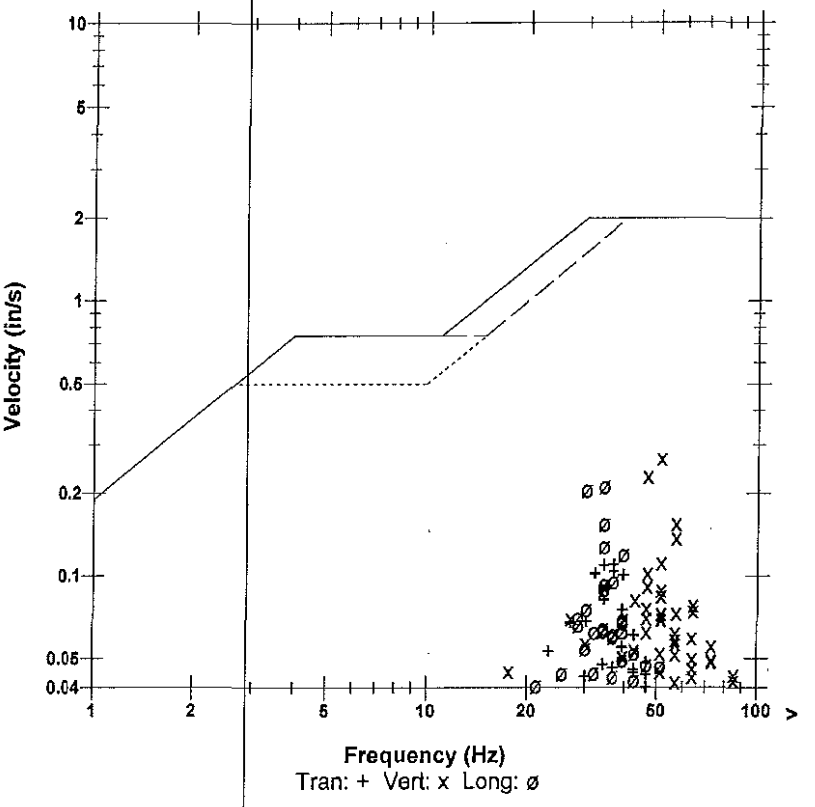
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

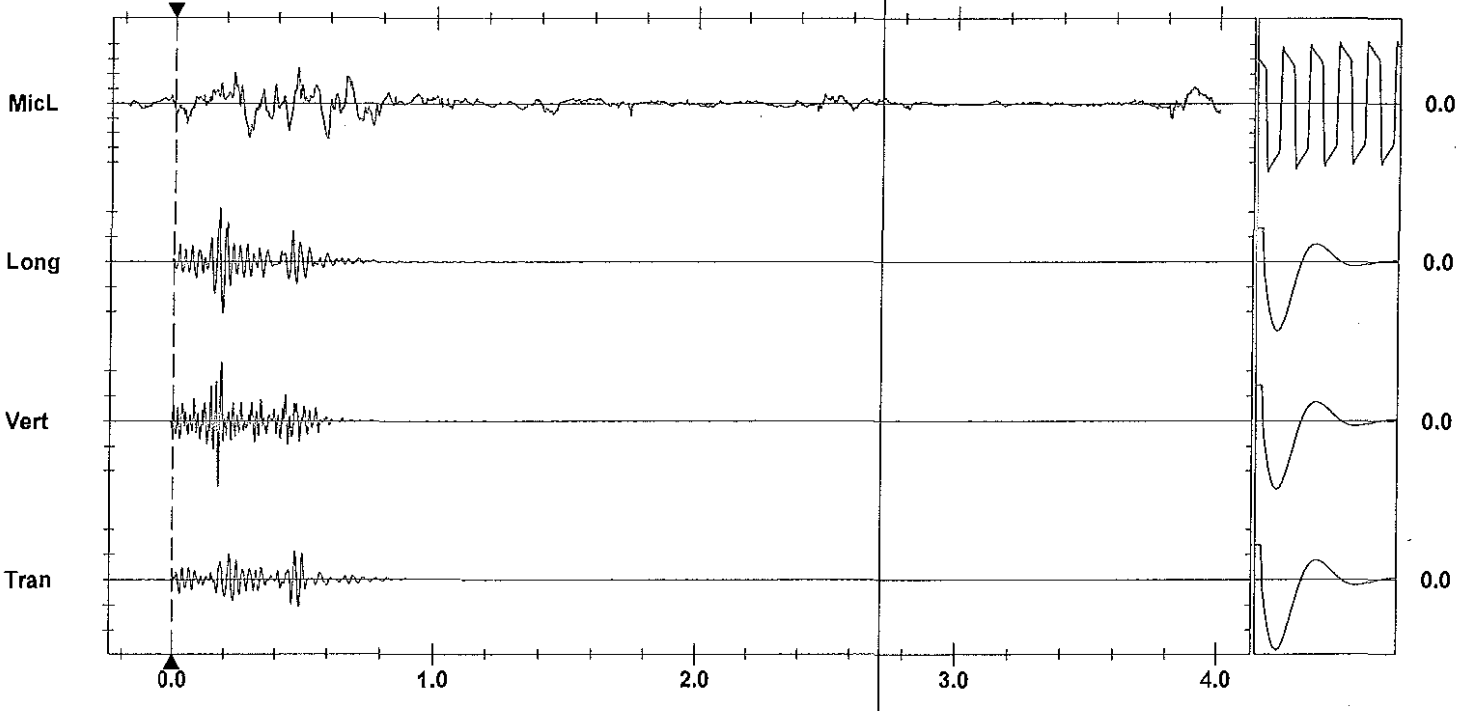
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00243 psi(L) at 0.589 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 631 mv)

	Tran	Vert	Long	
PPV	0.110	0.267	0.212	in/s
ZC Freq	37	51	34	Hz
Time (Rel. to Trig)	0.476	0.177	0.176	sec
Peak Acceleration	0.0679	0.214	0.128	g
Peak Displacement	0.00050	0.00079	0.00108	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.336 in/s at 0.177 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 10, 2012 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 1:33 PM
BLAST # MW-0234

HIGHWAY# 97
BLAST LOCATION AT: 128+60 - 128+64 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

* shot netted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.8 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 10 Proo.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) ~~BURDEN~~ 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

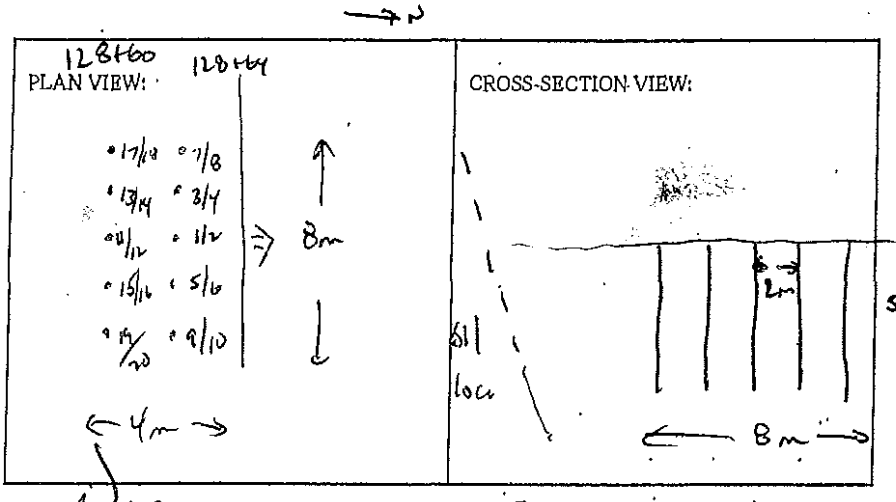
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone ent. - 0.16 ips / 39 Hz
" @ 13167 Cliffstone ent - 0.23 ips / 5 Hz

Prod. Holes - Bottom Deck 5'-6' ANFO

- Top Deck 1.5'-3' ANFO

Primed w/ 0.5 Count 1½" x 16 Unimax Dynamite

Instantel

Event Report

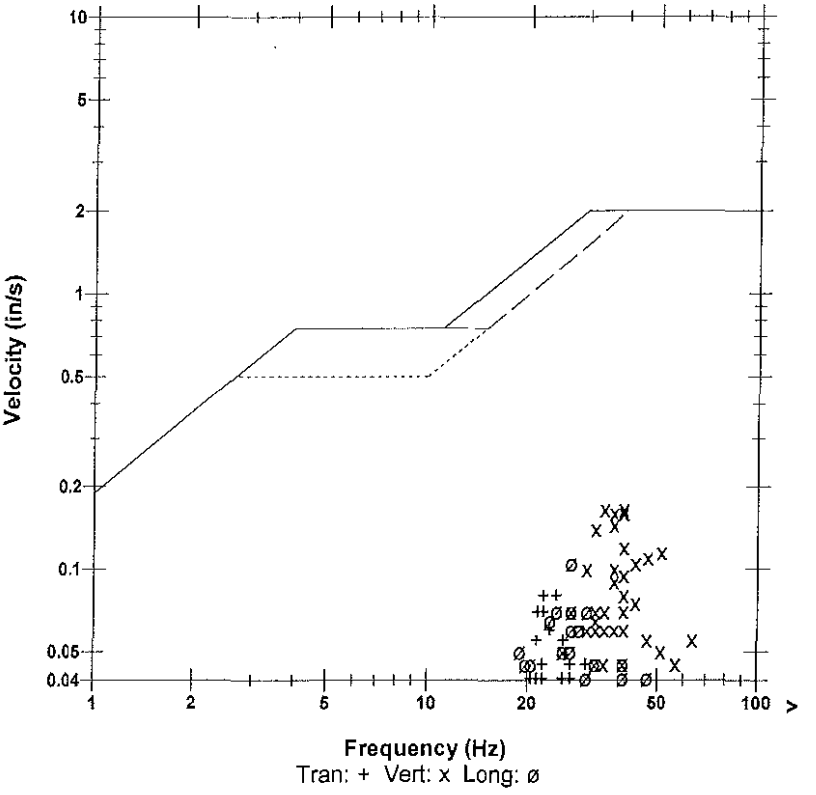
Date/Time	Vert at 13:33:31 June 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBB1.NV0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

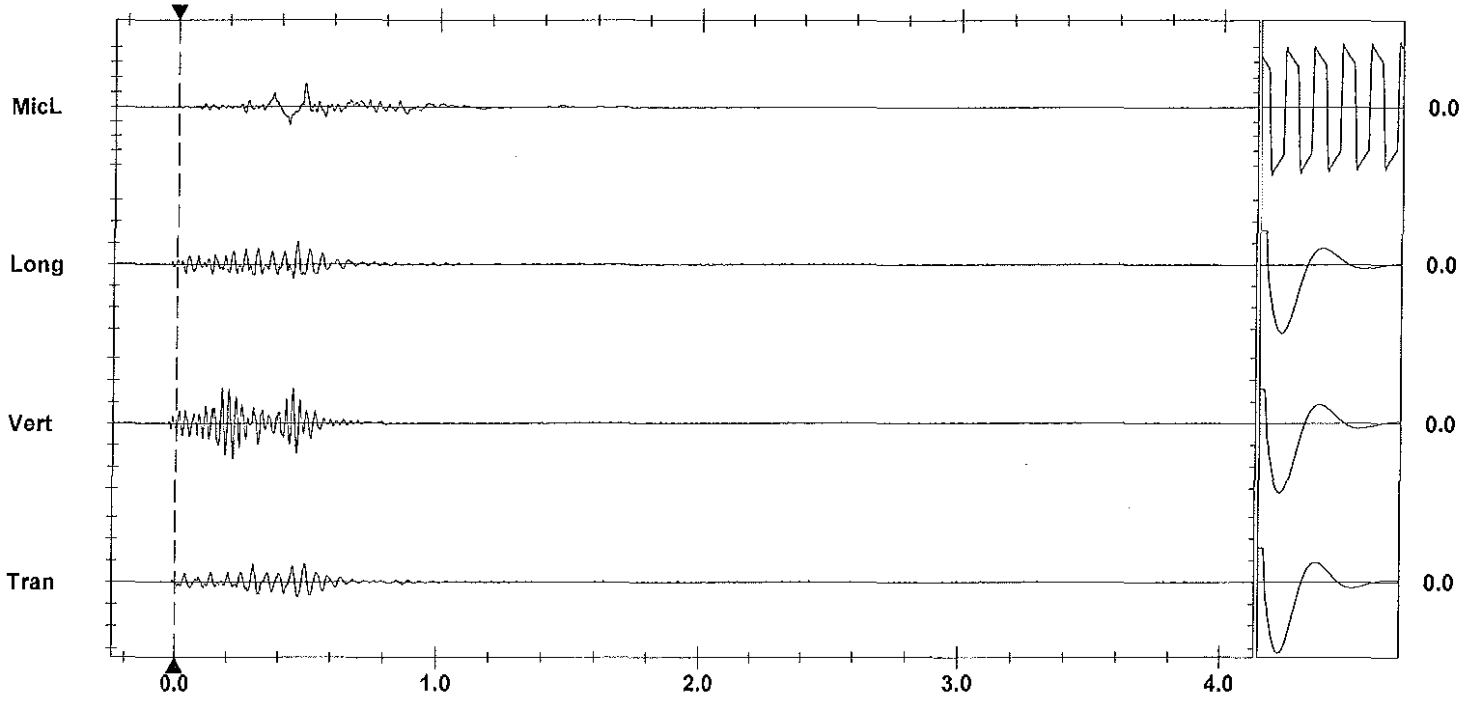
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00160 psi(L) at 0.489 sec			
ZC Freq	14 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 580 mv)			

	Tran	Vert	Long	
PPV	0.0800	0.165	0.105	in/s
ZC Freq	24	39	27	Hz
Time (Rel. to Trig)	0.305	0.178	0.465	sec
Peak Acceleration	0.0398	0.106	0.0530	g
Peak Displacement	0.00055	0.00067	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.176 in/s at 0.451 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 13:33:34 June 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBB1.NY0
Job Number:	1		

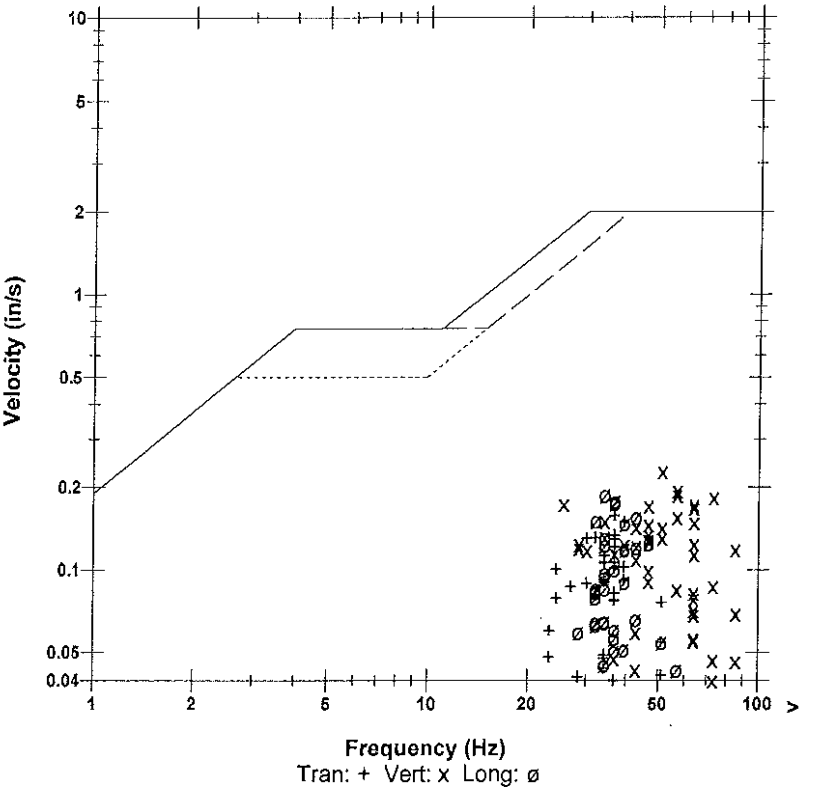
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

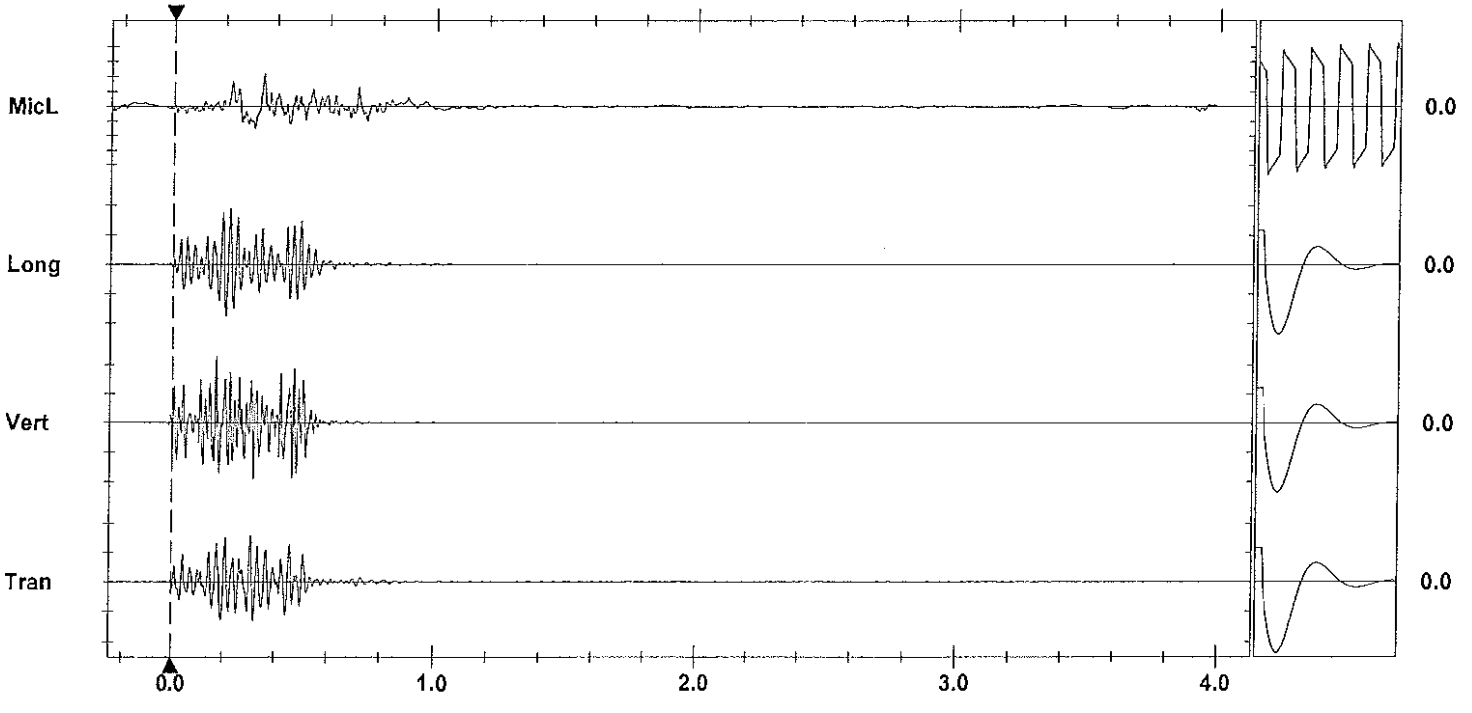
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00218 psi(L) at 0.350 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 618 mv)

	Tran	Vert	Long	
PPV	0.157	0.229	0.187	in/s
ZC Freq	37	51	34	Hz
Time (Rel. to Trig)	0.309	0.173	0.222	sec
Peak Acceleration	0.119	0.212	0.141	g
Peak Displacement	0.00068	0.00070	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.248 in/s at 0.207 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: June 10, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 5/12
ACTUAL BLAST DATE June 5/12 2:51PM
BLAST # MW-0235

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+57 - 128+62 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 BH
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.7 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 5 BH / 3 Burden
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2x16 Blanex
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

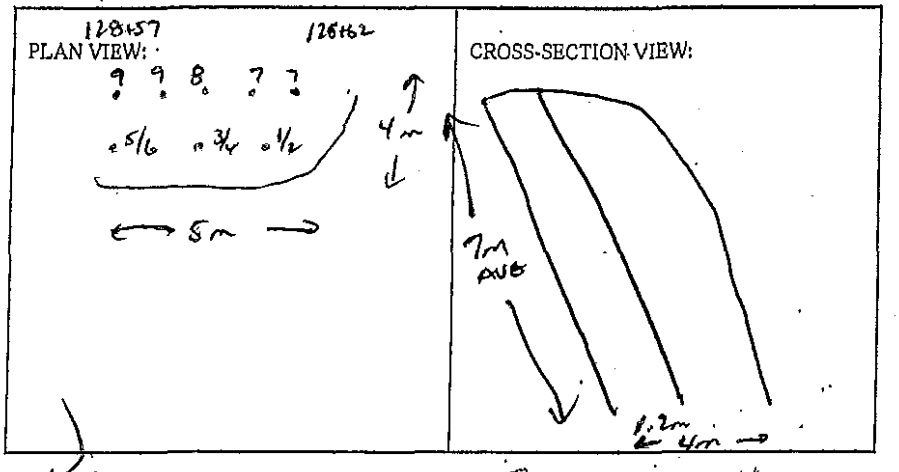
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 130 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt 0.085 ips / 34Hz
@ 13117 Cliffstone Crt - 0.15 ips / 57Hz

Buffer Holes – Toe Load 4/case 2x16 Blastex

– Top Deck 1-2 case 2x16 Blastex

Primed w/ .5 case 1½"x16" Unimax Dynamite

B/L Holes. 1 case 2x16 Unimax + 200gr. det. cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 14:51:47 June 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBB5.AB0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

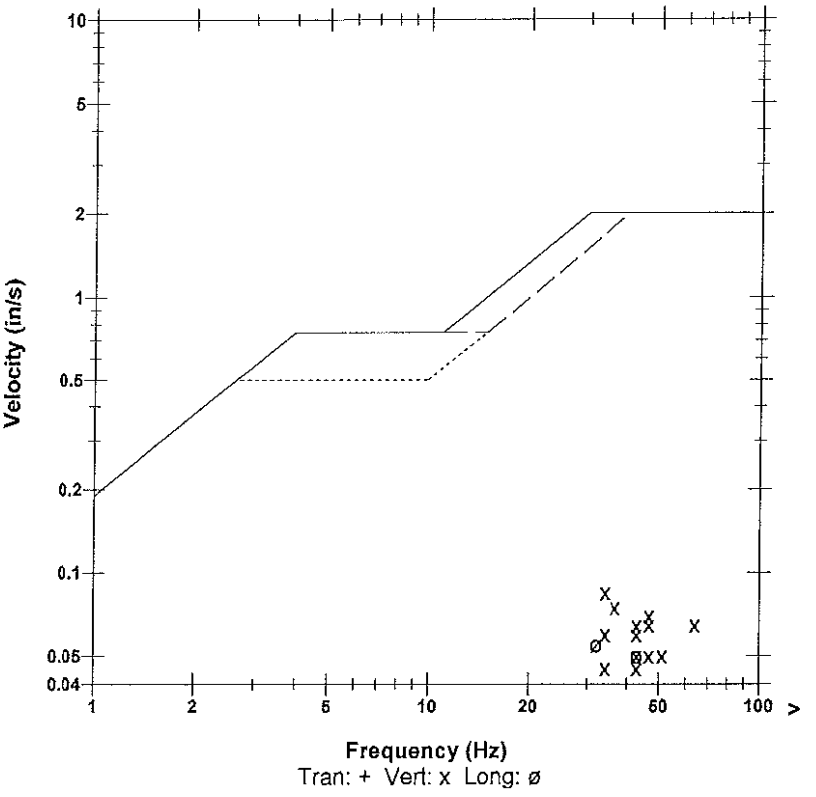
Extended Notes

Post Event Notes

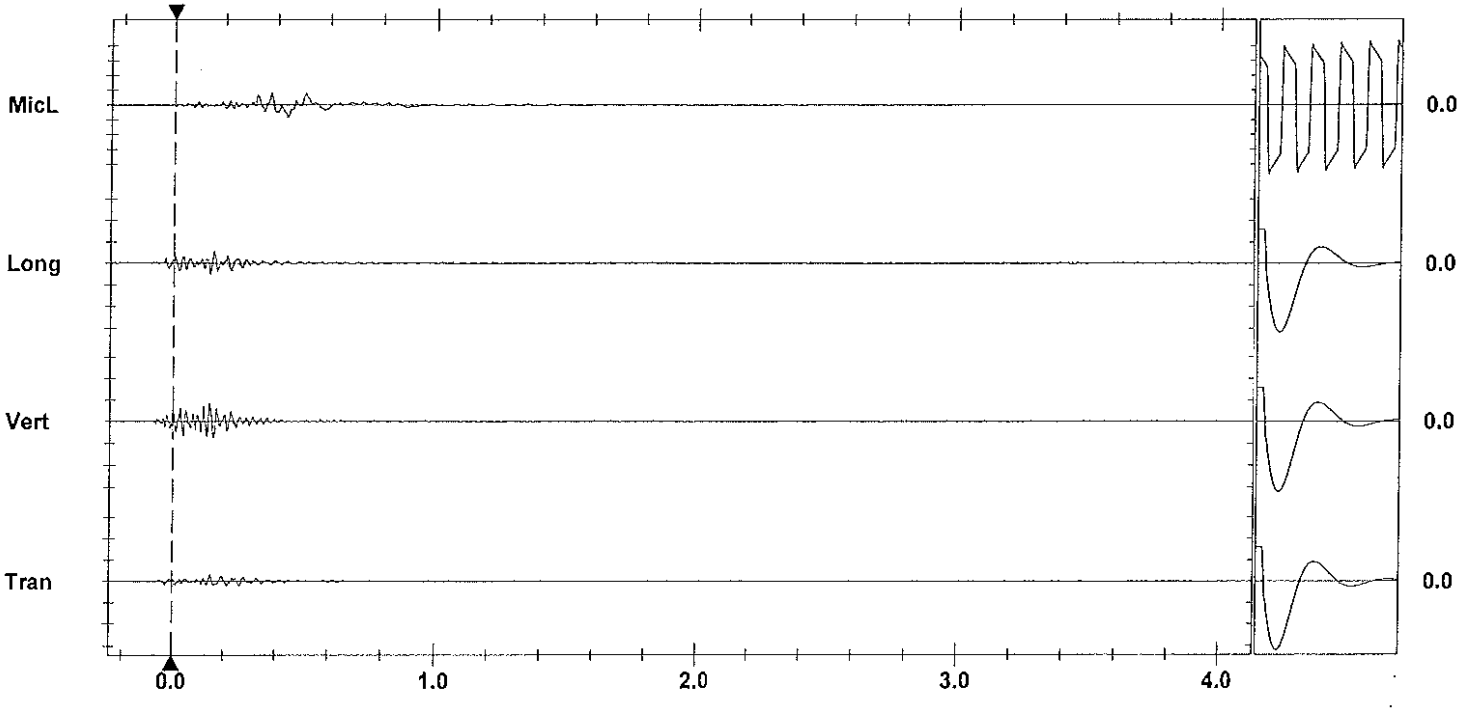
Microphone Linear Weighting
PSPL 0.00083 psi(L) at 0.438 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 604 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0850	0.0550	in/s
ZC Freq	37	34	32	Hz
Time (Rel. to Trig)	0.152	0.145	0.158	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00013	0.00035	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0987 in/s at 0.145 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:51:50 June 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBB5.AE0
Job Number:	1		

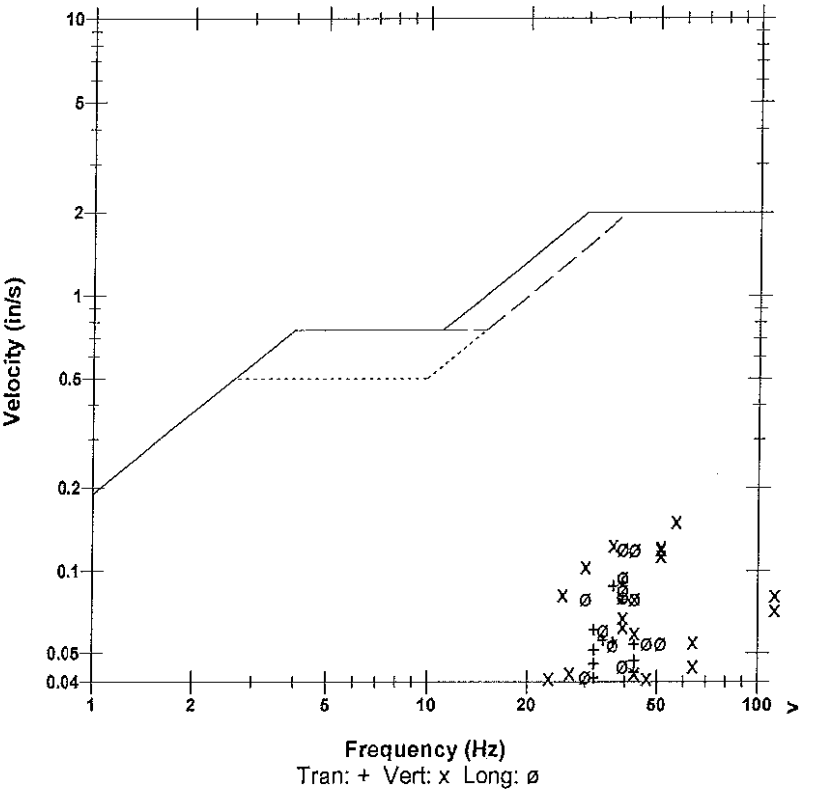
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

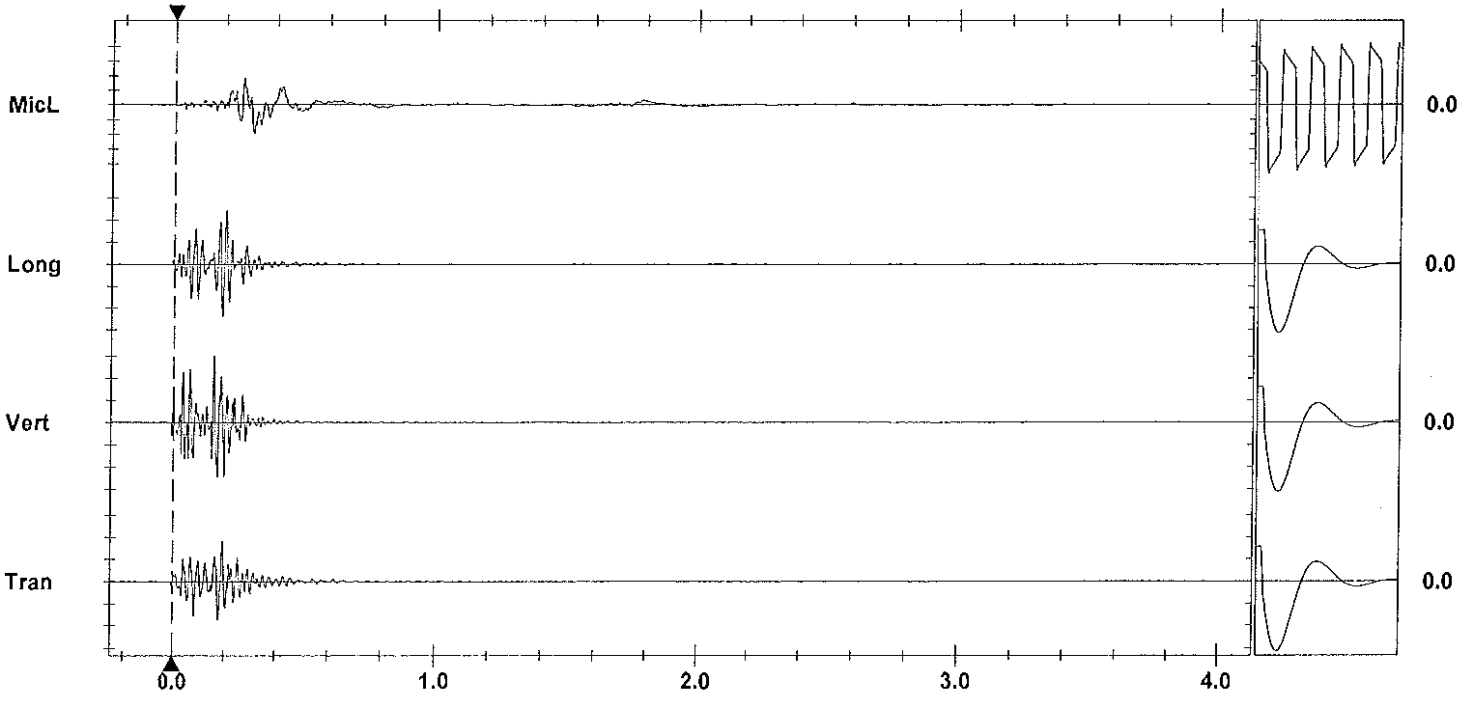
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00196 psi(L) at 0.308 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 618 mv)

	Tran	Vert	Long	
PPV	0.0912	0.152	0.121	in/s
ZC Freq	39	57	39	Hz
Time (Rel. to Trig)	0.195	0.159	0.203	sec
Peak Acceleration	0.0729	0.147	0.103	g
Peak Displacement	0.00036	0.00052	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.152 in/s at 0.159 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834199

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 11:22 AM
BLAST # MW-0236

HIGHWAY# 97
BLAST LOCATION AT: STN 128+52 - 128+57 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 78 (m)

TOTAL NUMBER OF HOLES 13 Proc
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 83
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

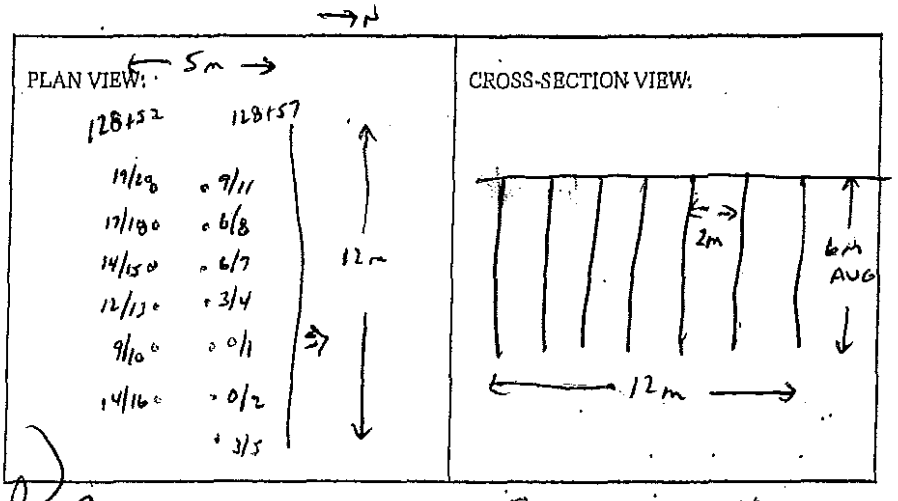
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs 13167 Cliffstone cnt - 0.201PS/39 Hz
" C 13117 Cliffstone cnt - 0.32ips/34 Hz

BOTTOM DECK - 5'-6.5' ANFO

TOP DECK - 2'-3' ANFO

PRIMED W/ 0.5 GRAM 14" VIC UNIMAX DYNAMITE

Instantel

Event Report

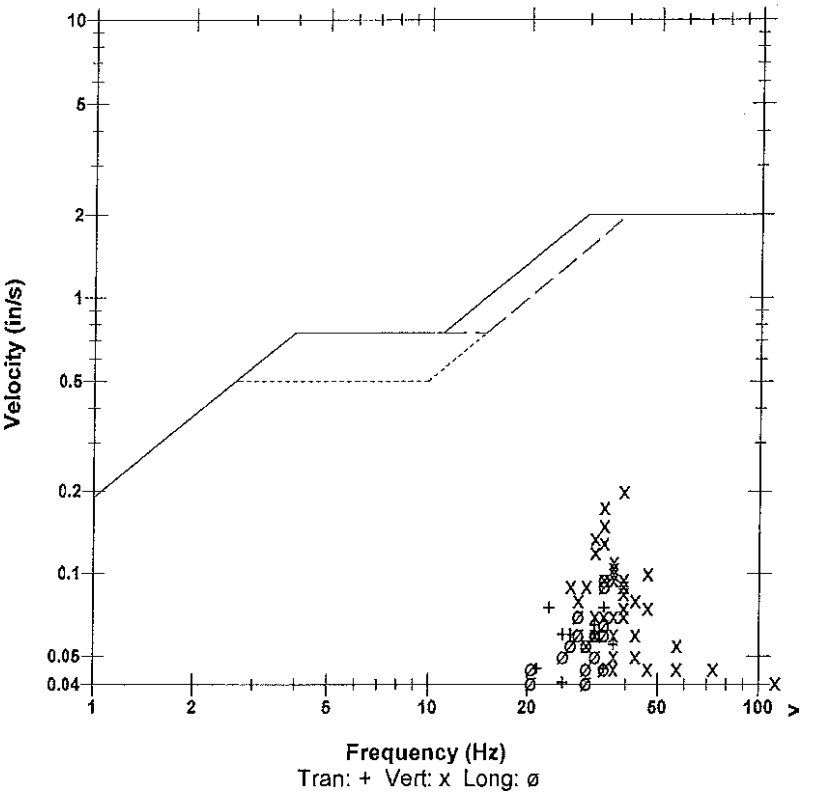
Date/Time	Vert at 11:22:53 June 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBCQ.A50

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

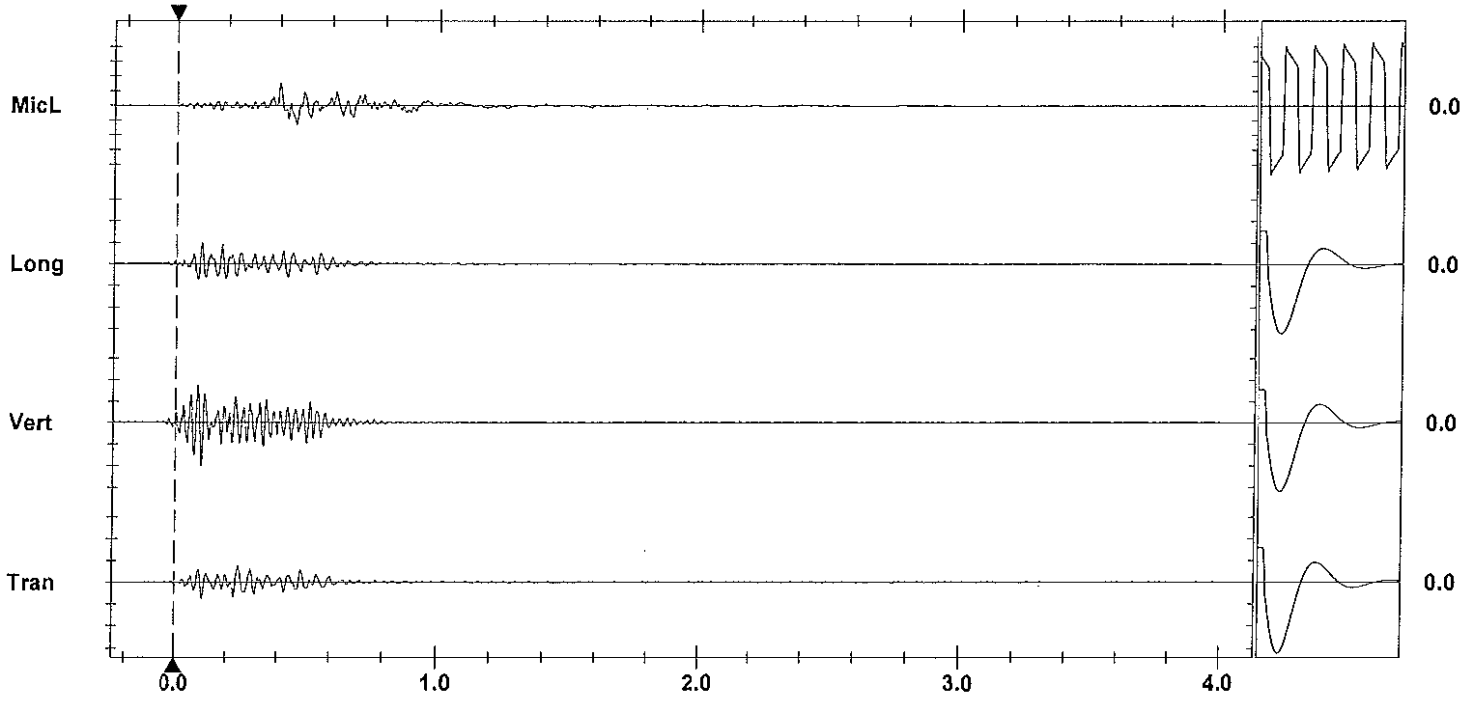
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00149 psi(L) at 0.400 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 619 mv)

	Tran	Vert	Long	
PPV	0.0750	0.200	0.0950	in/s
ZC Freq	34	39	34	Hz
Time (Rel. to Trig)	0.111	0.104	0.103	sec
Peak Acceleration	0.0398	0.119	0.0530	g
Peak Displacement	0.00052	0.00081	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.219 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 11:22:58 June 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBCQ.AA0
Job Number:	1		

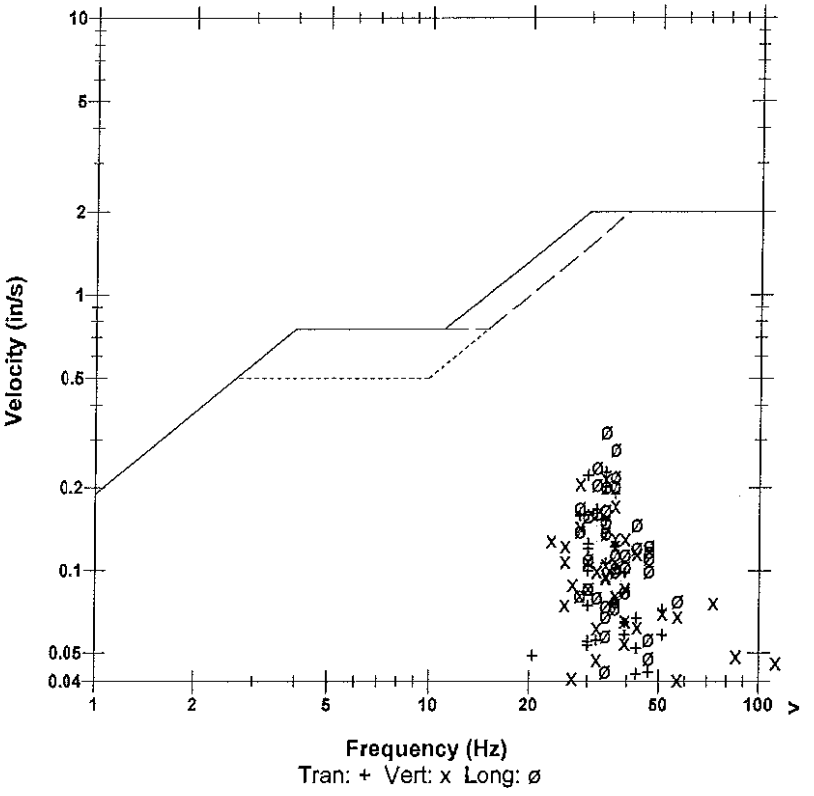
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

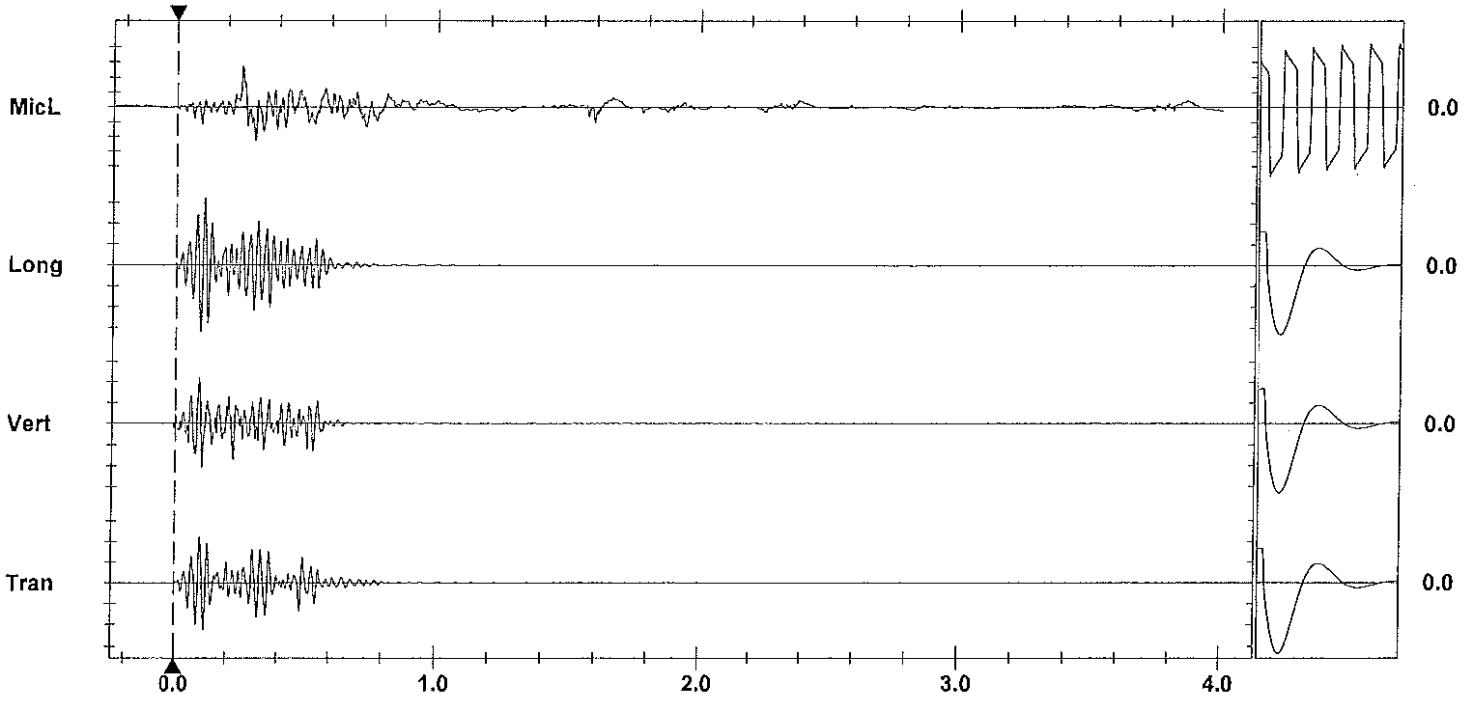
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00272 psi(L) at 0.256 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 651 mv)

	Tran	Vert	Long	
PPV	0.228	0.217	0.322	in/s
ZC Freq	34	34	34	Hz
Time (Rel. to Trig)	0.119	0.096	0.100	sec
Peak Acceleration	0.144	0.151	0.201	g
Peak Displacement	0.00107	0.00105	0.00154	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.400 in/s at 0.100 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 12:44 Am
BLAST # MW-0237

HIGHWAY# 97
BLAST LOCATION AT: STA 128+52 - 128+57 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Blast method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 4 B/L / 2 Buffer / 1 MAB
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + 2"x16" Blastex
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

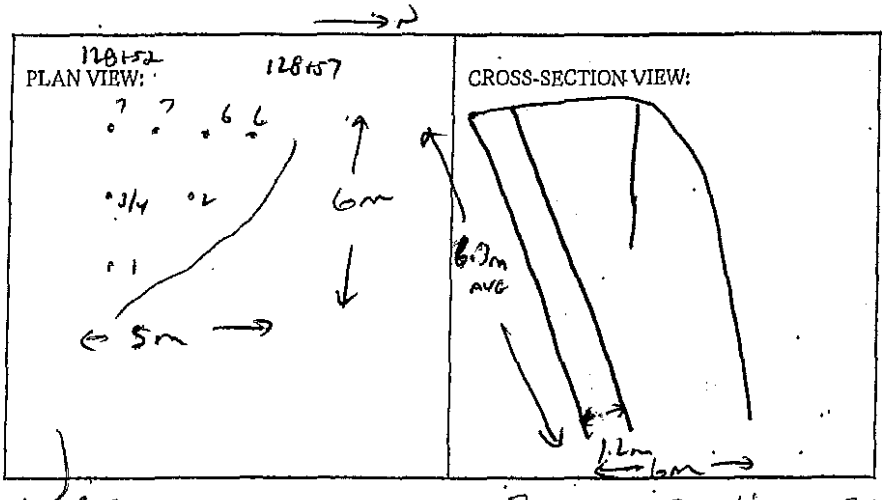
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.055 IPS / 47 Hz ~~0.04~~
@ 13117 Cliffstone Crt - 0.12 IPS / 47 Hz

B/L Holes – 1 CART 2x6 UNIMAX DYNAMITE + 200gm det. Cord to 4' collar

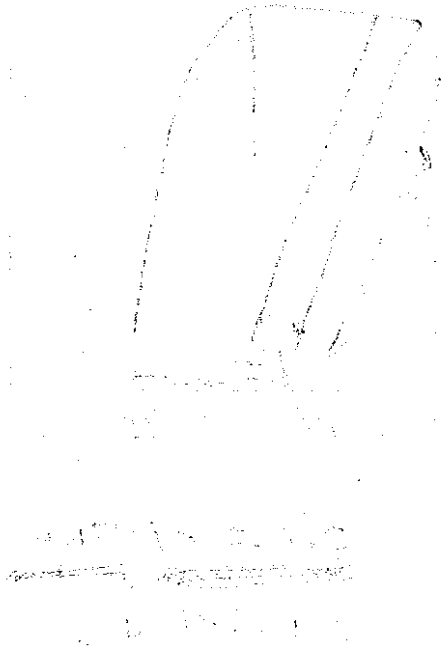
BUFFER HOLES – FRONT HOLE – 5 CART 2x6 BLASTEX IN TOP

– BACK HOLE – 5 CART 2x6 BLASTEX IN TOP

– 2 CART 1x6 BLASTEX IN TOP BENCH

STEMS – 1.5 CART 2x6 BLASTEX

ALL PRIMED W/ 0.5 CART 1½"x16" UNIMAX DYN.



Instantel

Event Report

Date/Time	Vert at 12:44:02 June 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBCU.1E0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

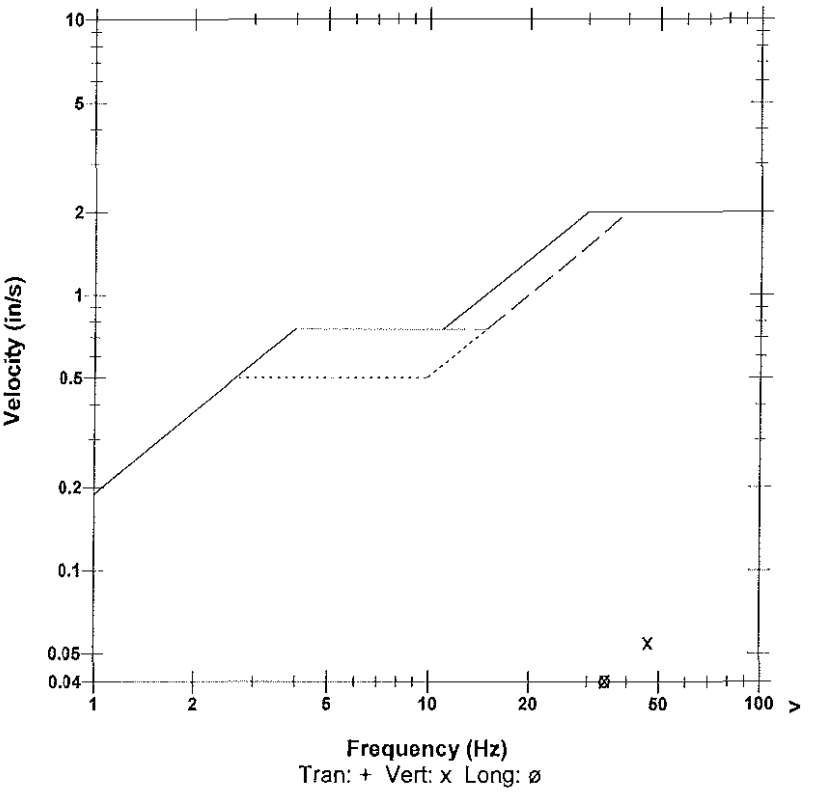
Extended Notes

Post Event Notes

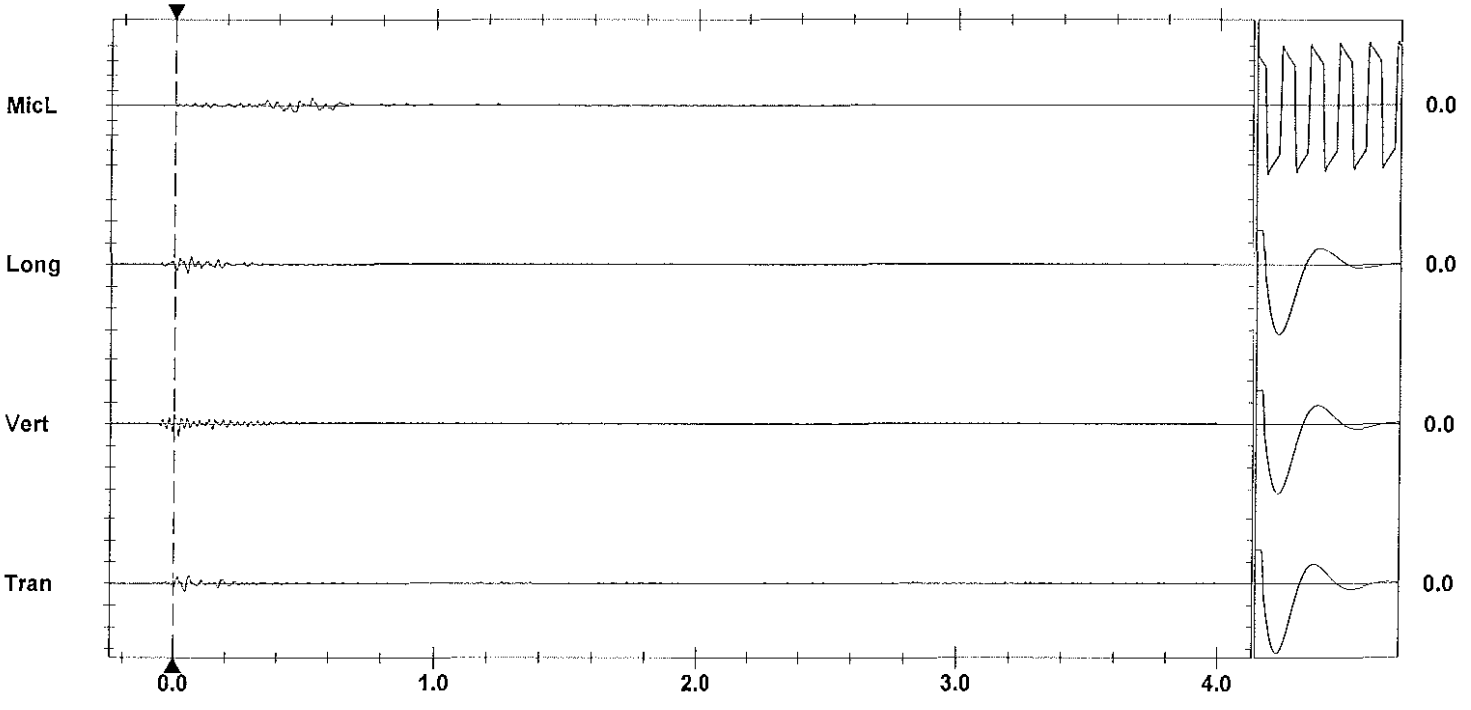
Microphone Linear Weighting
PSPL 0.00051 psi(L) at 0.527 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 613 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0550	0.0400	in/s
ZC Freq	30	47	34	Hz
Time (Rel. to Trig)	0.042	0.017	0.048	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00021	0.00019	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0675 in/s at 0.017 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 12:44:06 June 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBCU.1I0
Job Number:	1		

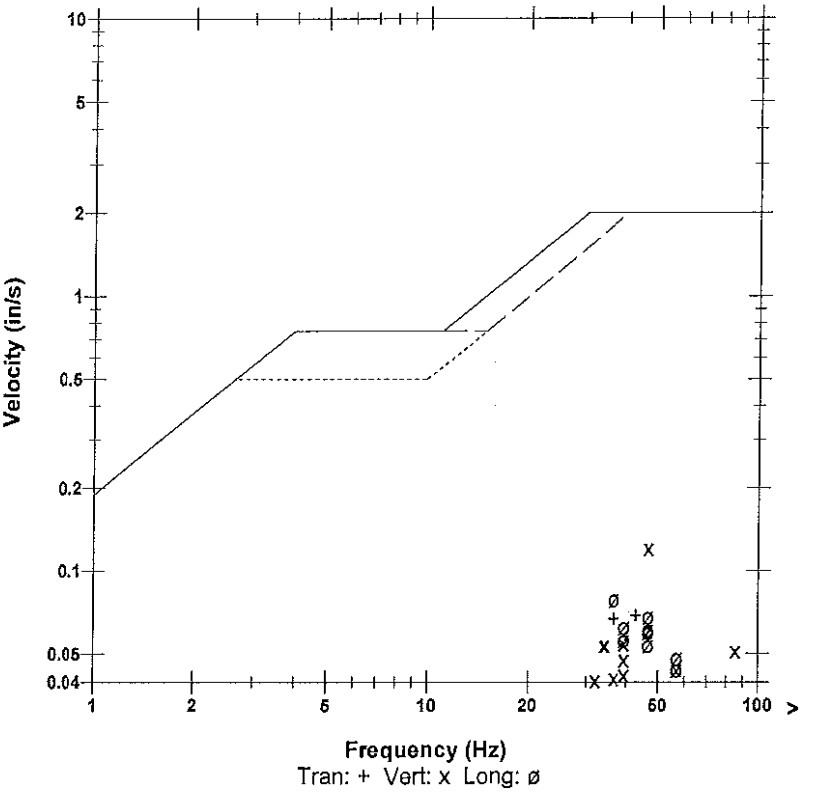
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

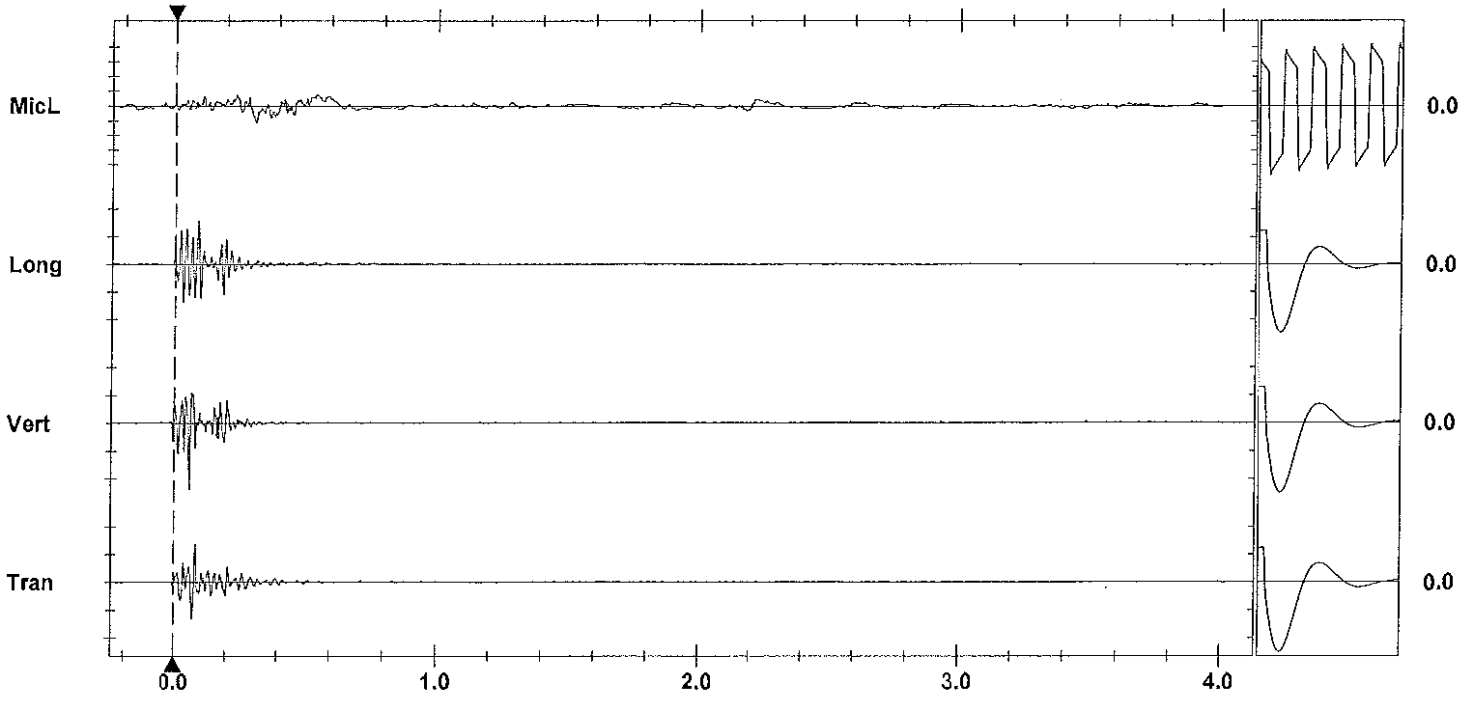
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00116 psi(L) at 0.312 sec
ZC Freq	8.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 618 mv)

	Tran	Vert	Long	
PPV	0.0687	0.121	0.0787	in/s
ZC Freq	43	47	37	Hz
Time (Rel. to Trig)	0.086	0.062	0.092	sec
Peak Acceleration	0.0481	0.106	0.0613	g
Peak Displacement	0.00028	0.00036	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.126 in/s at 0.062 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

Printed: June 19, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veerman
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 2:16 PM
BLAST # MW-0238

HIGHWAY# 97
BLAST LOCATION AT: STN 128+85 - 128+93 TOP CUT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Layered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 24 P000
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

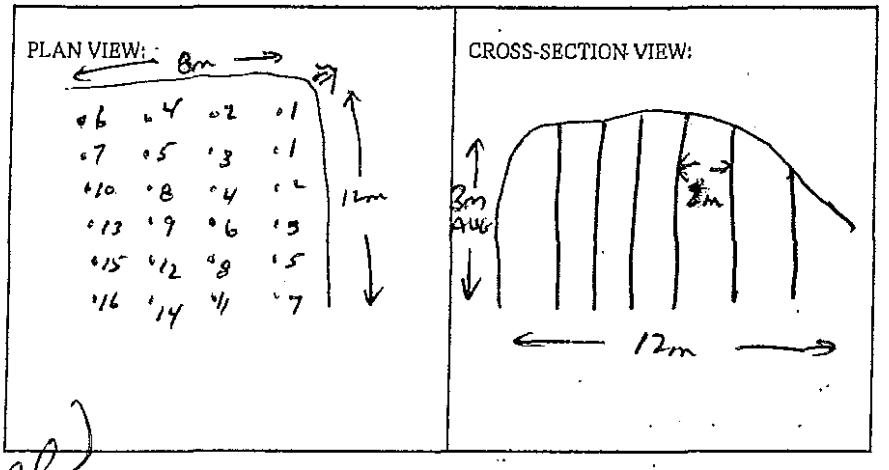
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veerman COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone entr — No release (<0.04 ips)
" @ 13117 Cliffstone entr — No release (<0.04 ips)

24 Production Holes - 1.5'-3' ANFO / Hole

MAX 2 Holes / Delay

Primers w/ 0.5 Cast. 1½" x 16" Unimax Dyn.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED June 6/12
ACTUAL BLAST DATE June 6/12 3:39 PM
BLAST # MW-0239

HIGHWAY # 97
BLAST LOCATION AT: SW 128+77 - 128+85 TOP CUT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 12 shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.4 (m)
TOTAL DEPTH 57 (m)

TOTAL NUMBER OF HOLES 19 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 90
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

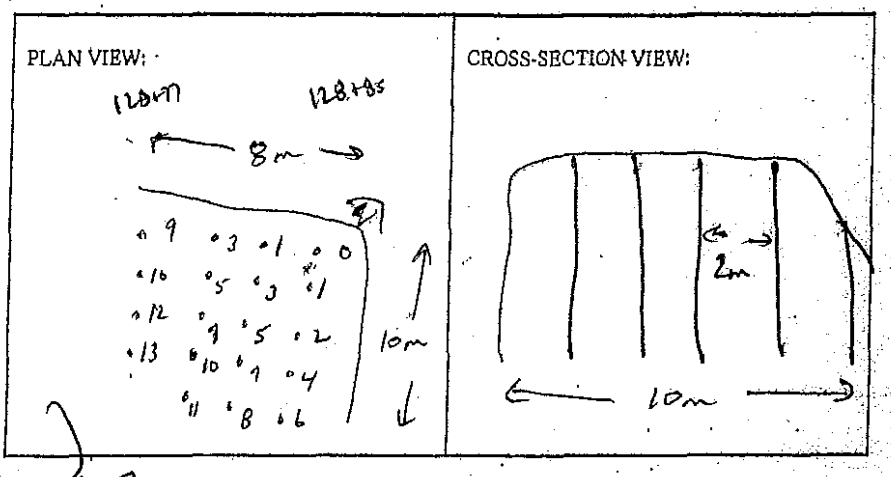
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAP

VOLUME OF ROCK BLASTED 260 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY _____

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

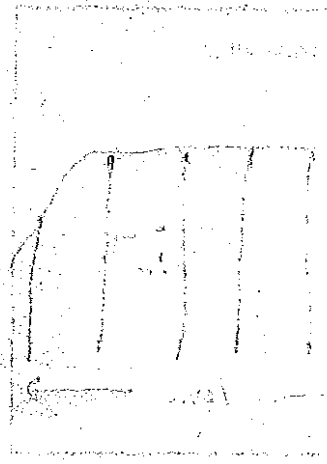
(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.040 ips / 47Hz
@ 13417 Cliffstone Cut - 0.082 ips / 32Hz

19 Prod Holes — 15' – 3' ANFO

Max 2 Holes / Delay

Primed w/ 0.5 CAST 1½" x 16" UNIMAX DYNAMITE



Instantel

Event Report

Date/Time	Vert at 15:39:49 June 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBD2.6D0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

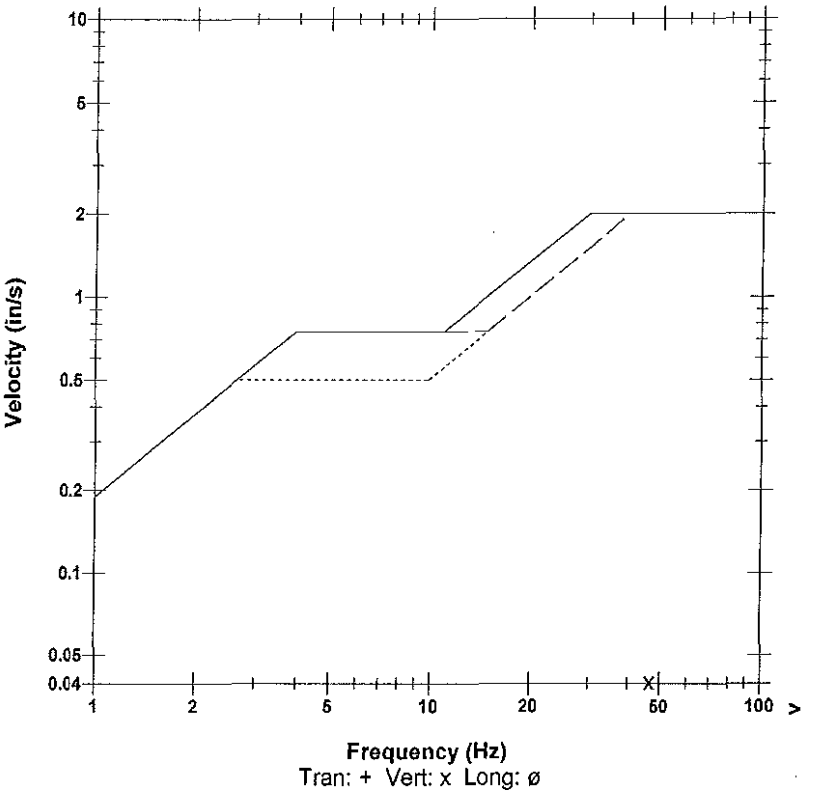
Extended Notes

Post Event Notes

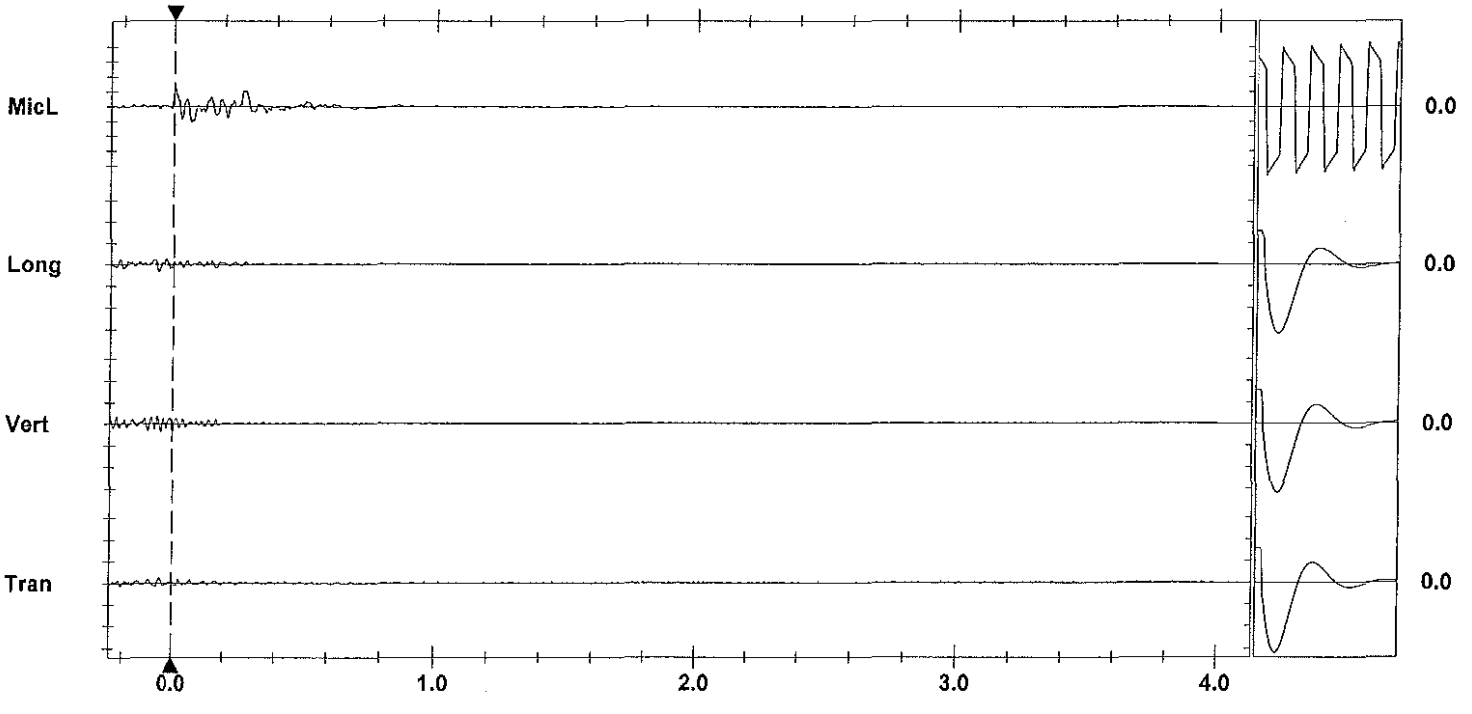
Microphone Linear Weighting
PSPL 0.00123 psi(L) at 0.004 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 629 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0400	0.0350	in/s
ZC Freq	32	47	30	Hz
Time (Rel. to Trig)	-0.053	0.000	-0.063	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00013	0.00015	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0497 in/s at -0.062 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Long at 15:39:53 June 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBD2.6H0
Job Number:	1		

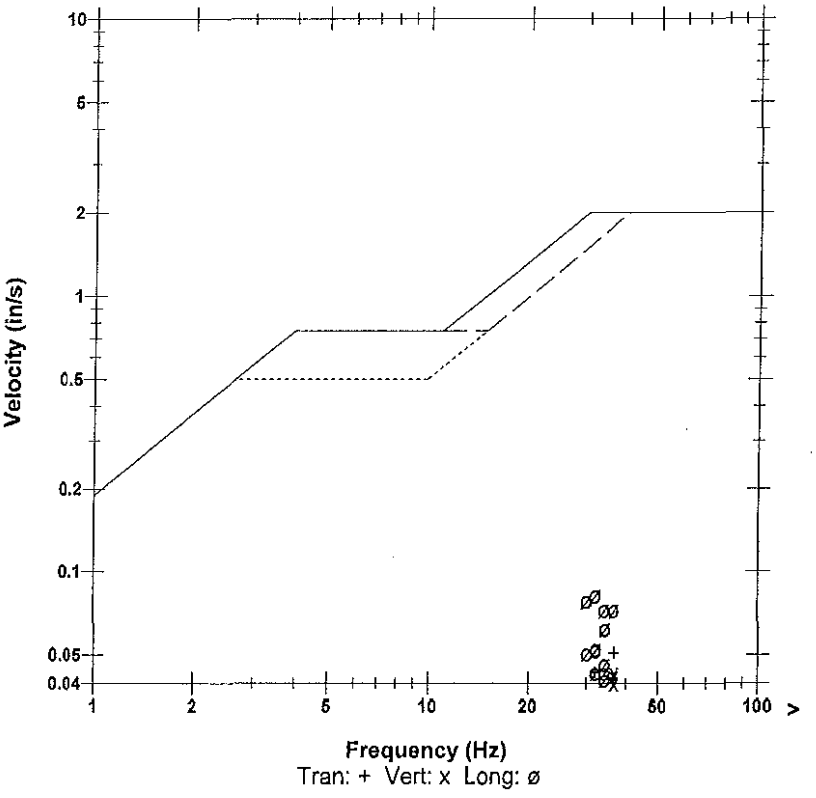
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

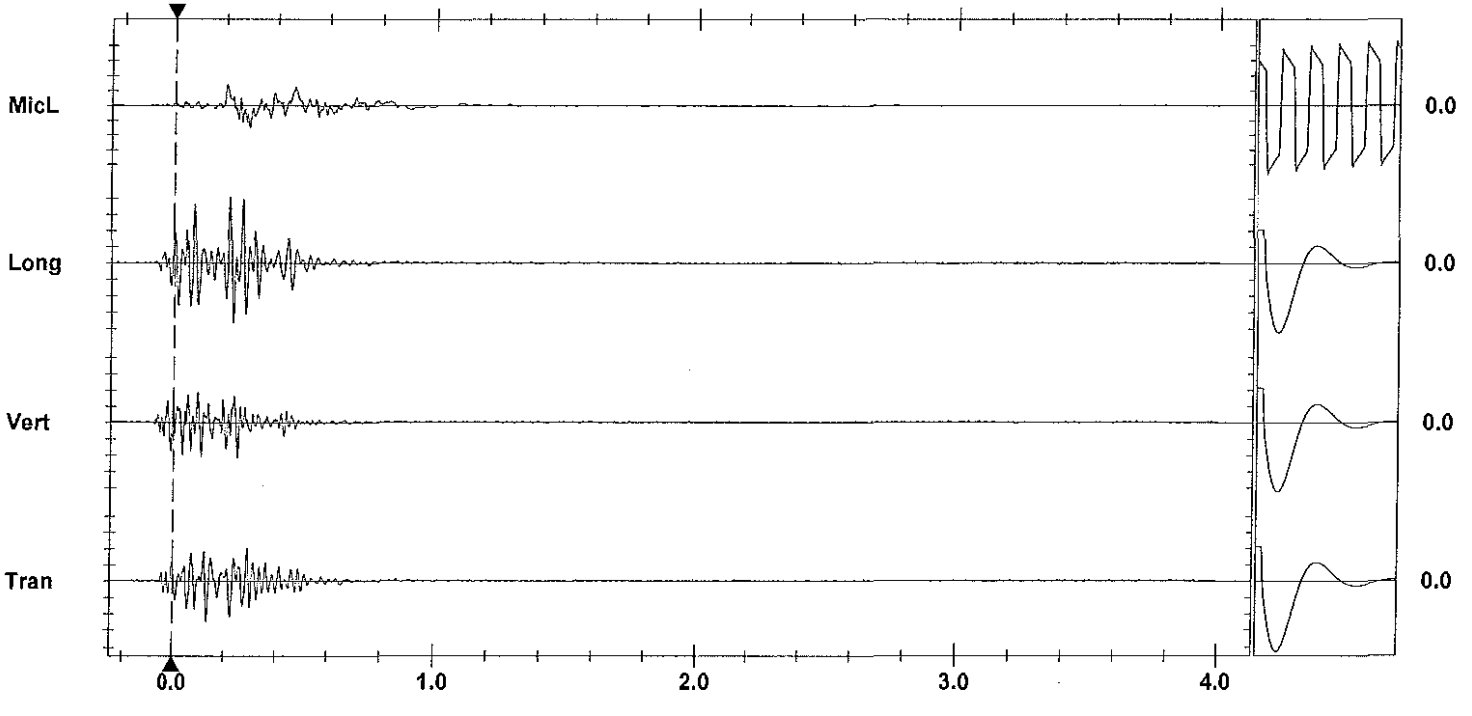


Tran: + Vert: x Long: ø

Microphone	Linear Weighting		
PSPL	0.00149 psi(L) at 0.291 sec		
ZC Freq	7.4 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 633 mv)		

	Tran	Vert	Long	
PPV	0.0506	0.0431	0.0819	in/s
ZC Freq	37	37	32	Hz
Time (Rel. to Trig)	0.137	0.250	0.217	sec
Peak Acceleration	0.0348	0.0315	0.0547	g
Peak Displacement	0.00022	0.00018	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0822 in/s at 0.218 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 12:23 PM
BLAST # MW-0240

HIGHWAY# 97
BLAST LOCATION AT: STN 128+67 – 128+77 C/L TRUCK

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 71 (m)

TOTAL NUMBER OF HOLES 11 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

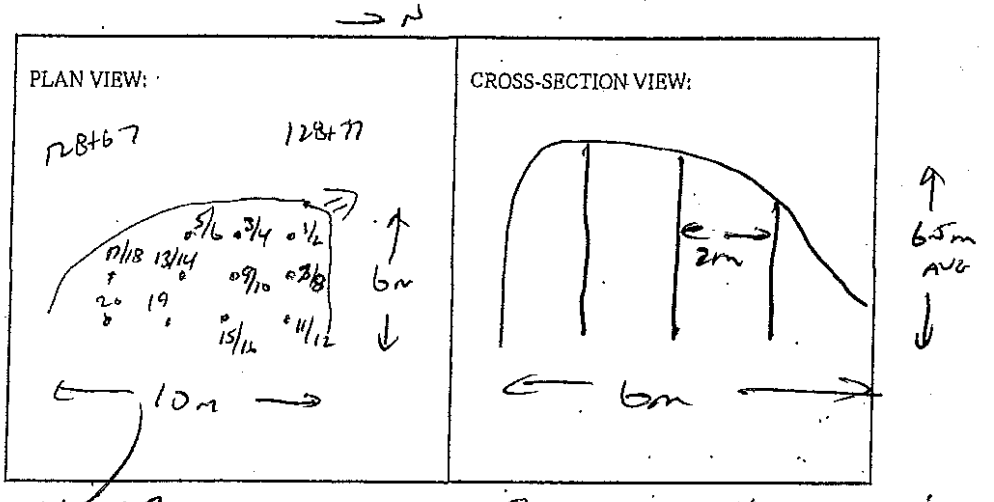
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HF5320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 380 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

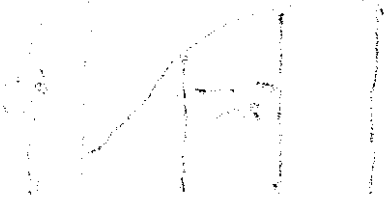
(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone crt – 0.080 ips / 39Hz
@ 13093 Cliffstone crt 0.141 ips / 34Hz

BOTTOM ROCK - 5'-6.5' ANFO

TOP ROCK - 1.5'-3' ANFO

Primed w/ 0.5 CAST 1¼ LBS 16 UNIMAX DYNAMITE



Instantel

Event Report

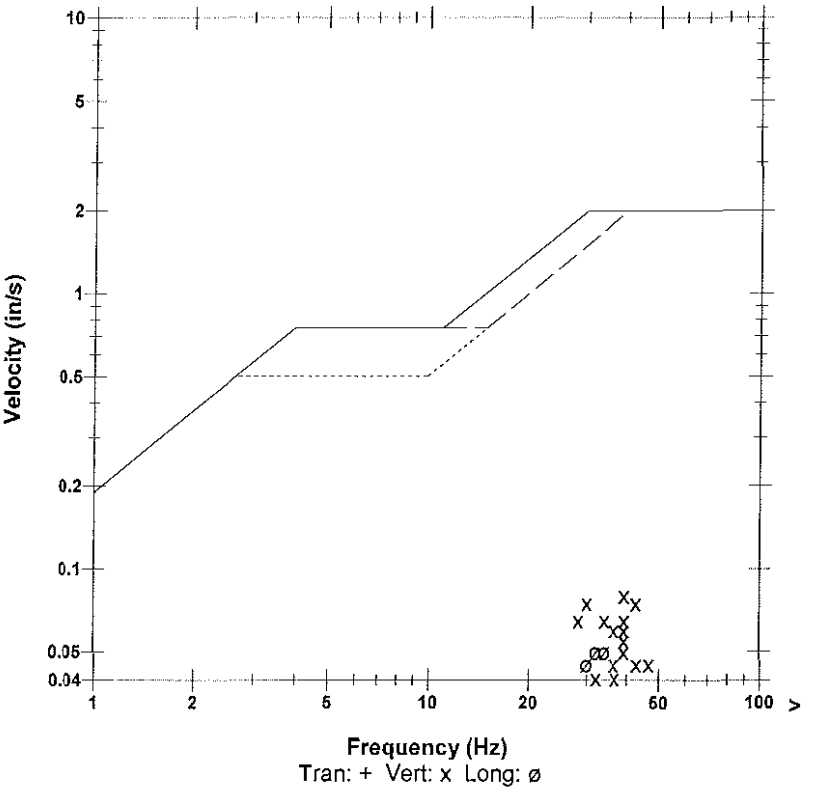
Date/Time	Vert at 12:23:00 June 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBEN.QC0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

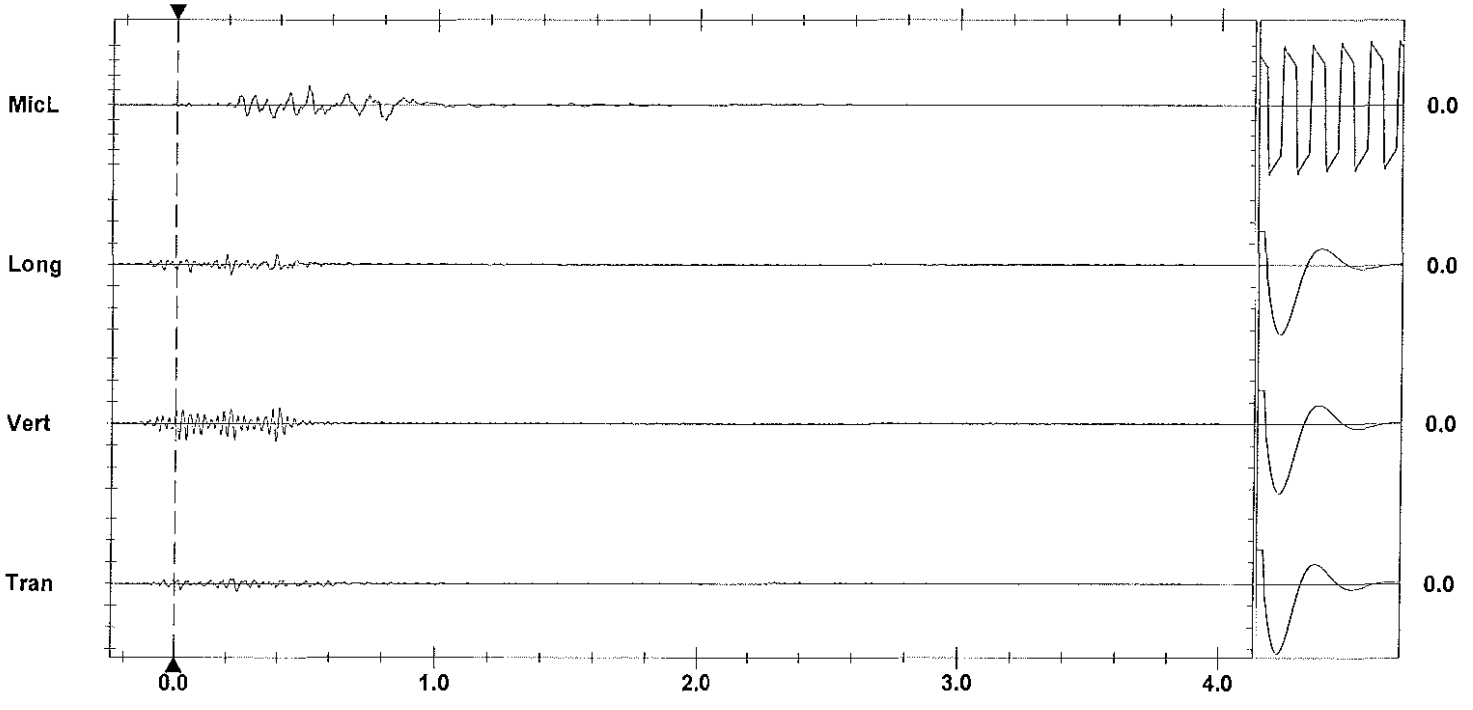
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.511 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 602 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0800	0.0500	in/s
ZC Freq	30	39	34	Hz
Time (Rel. to Trig)	0.242	0.390	0.196	sec
Peak Acceleration	0.0265	0.0663	0.0398	g
Peak Displacement	0.00020	0.00038	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.3	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0945 in/s at 0.390 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

Date/Time	Vert at 12:23:05 June 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBEN.QH0
Job Number:	1		

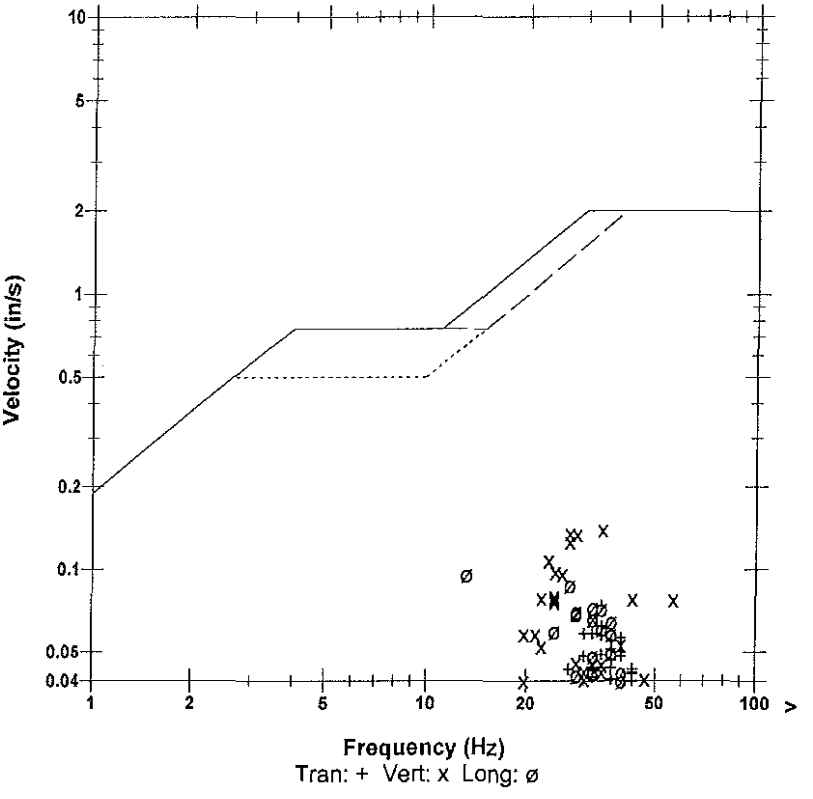
Notes
location:13093 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

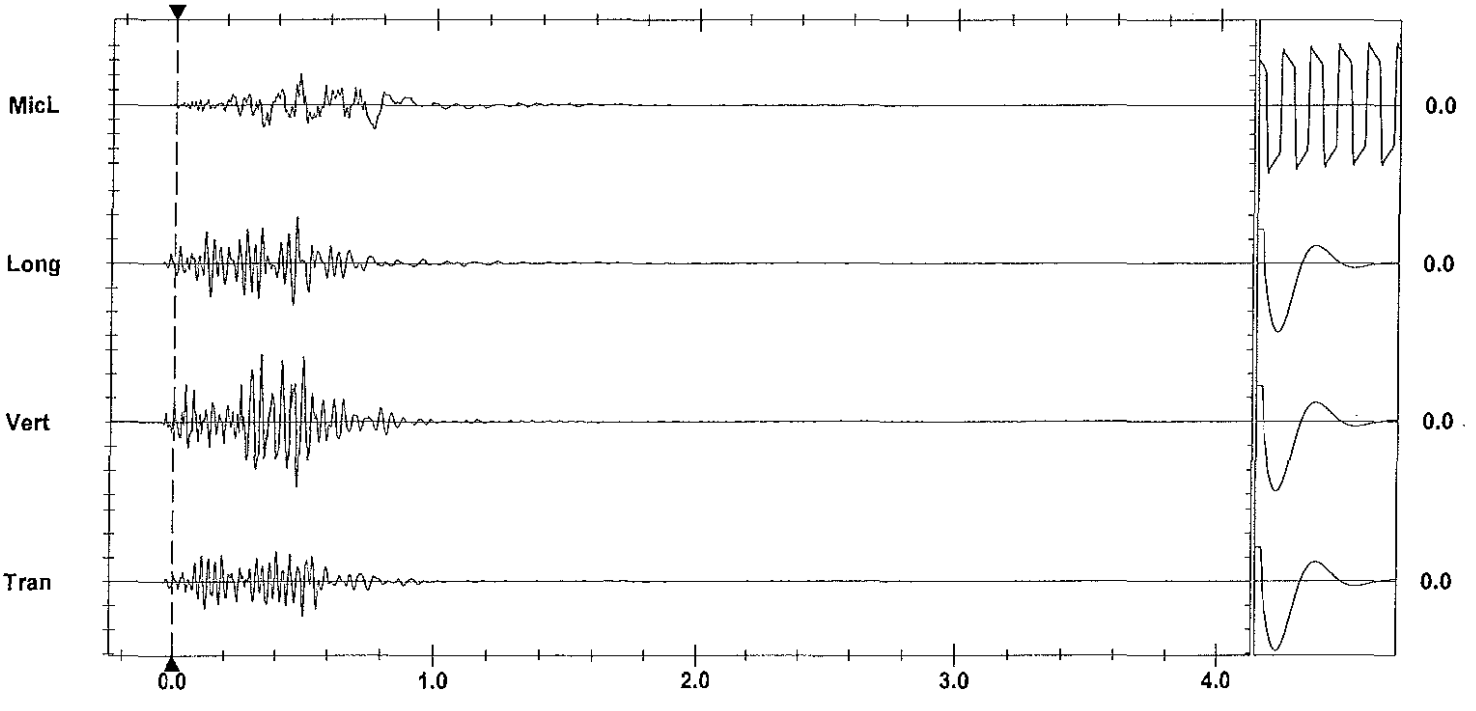
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00203 psi(L) at 0.480 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	0.0737	0.139	0.0956	in/s
ZC Freq	34	34	13	Hz
Time (Rel. to Trig)	0.505	0.340	0.474	sec
Peak Acceleration	0.0381	0.0746	0.0547	g
Peak Displacement	0.00030	0.00072	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.159 in/s at 0.340 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: June 10, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12
BLAST # MW-0241

1:54 PM

HIGHWAY# 97
BLAST LOCATION AT: SBD 128+48 - 128+52 Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alberco Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 52 (m)

TOTAL NUMBER OF HOLES 8 Pre-Split
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 410 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

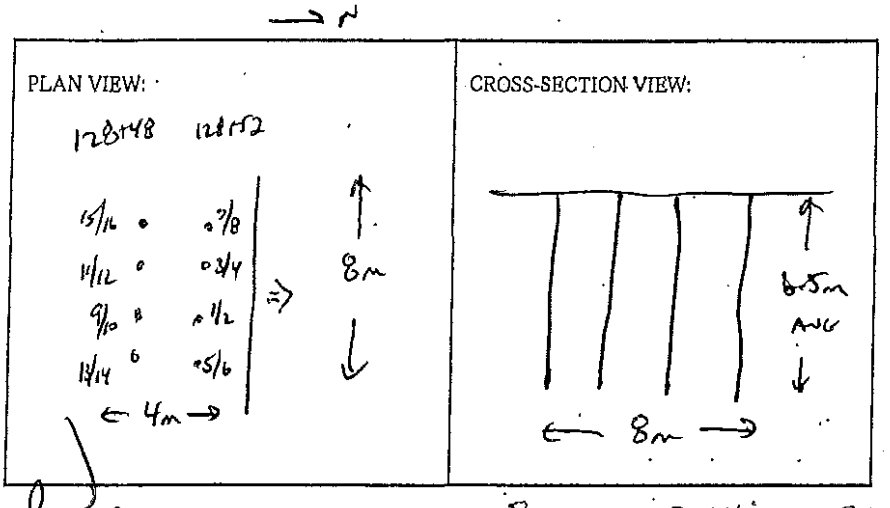
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crf - 0.11ips / 28Hz
@ 13093 cliffstone crf - 0.33ips / 27Hz

Bottom Deck - 6' - 6.5' ANFO

Top Deck - 1.5' - 2' ANFO

Primed w/ 0.5 Carr 1½"x16" Unimax Dynamite

Instantel

Event Report

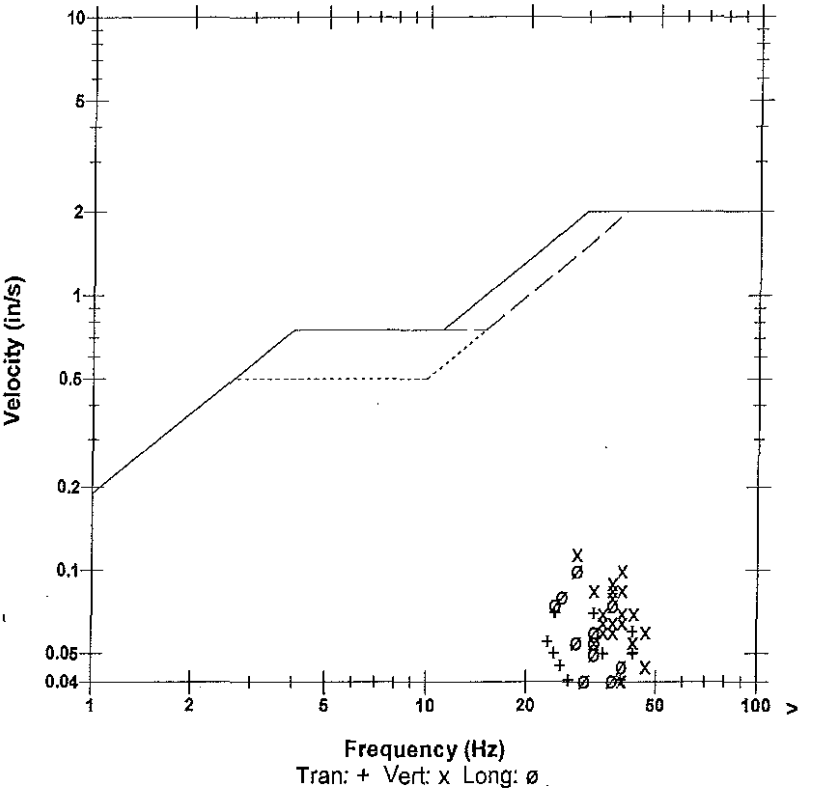
Date/Time	Vert at 13:54:23 June 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBER.YN0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

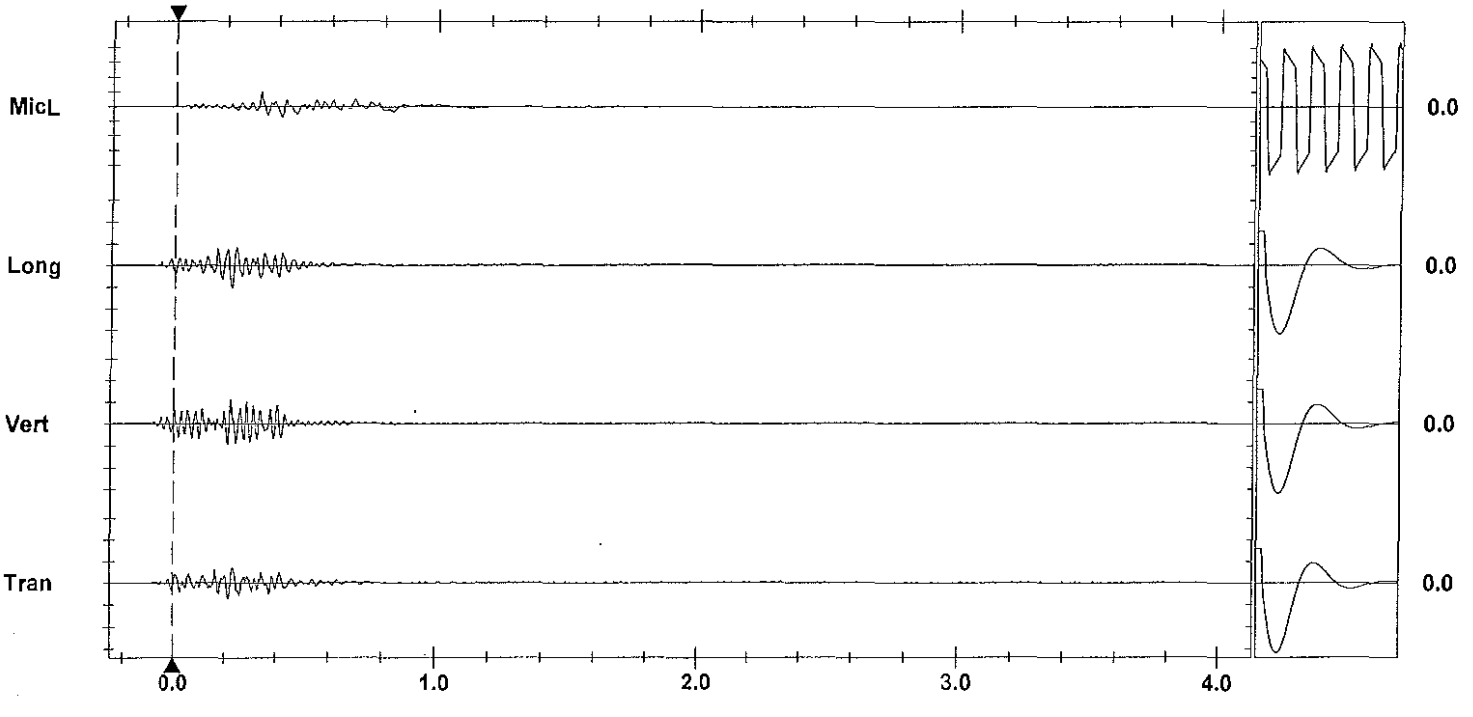
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.332 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 636 mv)

	Tran	Vert	Long	
PPV	0.0700	0.115	0.1000	in/s
ZC Freq	32	28	28	Hz
Time (Rel. to Trig)	0.217	0.225	0.225	sec
Peak Acceleration	0.0398	0.0663	0.0530	g
Peak Displacement	0.00047	0.00049	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.154 in/s at 0.225 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Tran at 13:54:28 June 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBER.YS0
Job Number:	1		

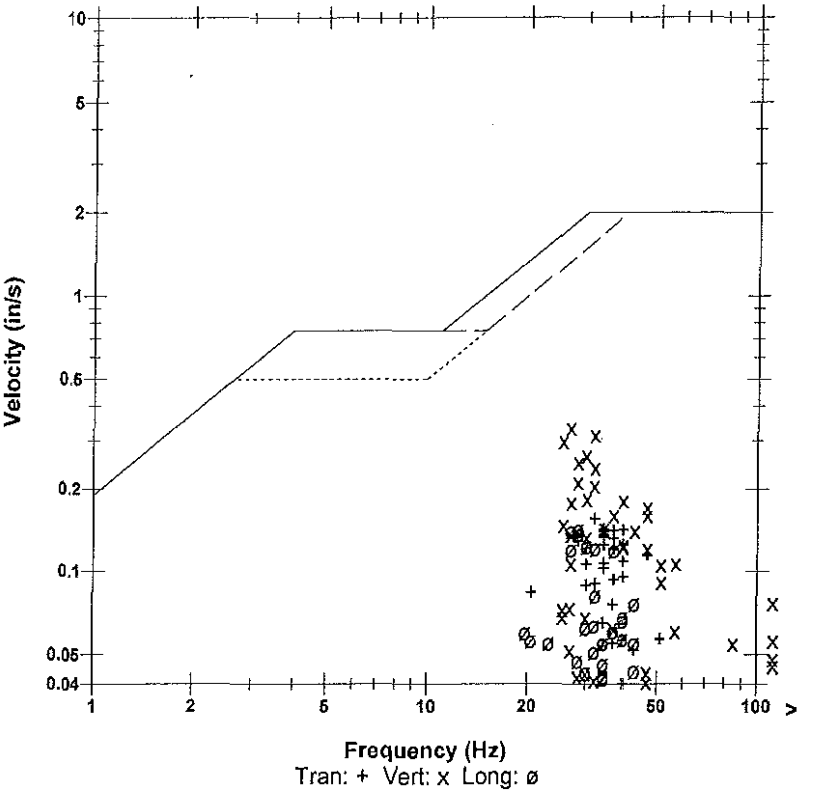
Notes
location:13093 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

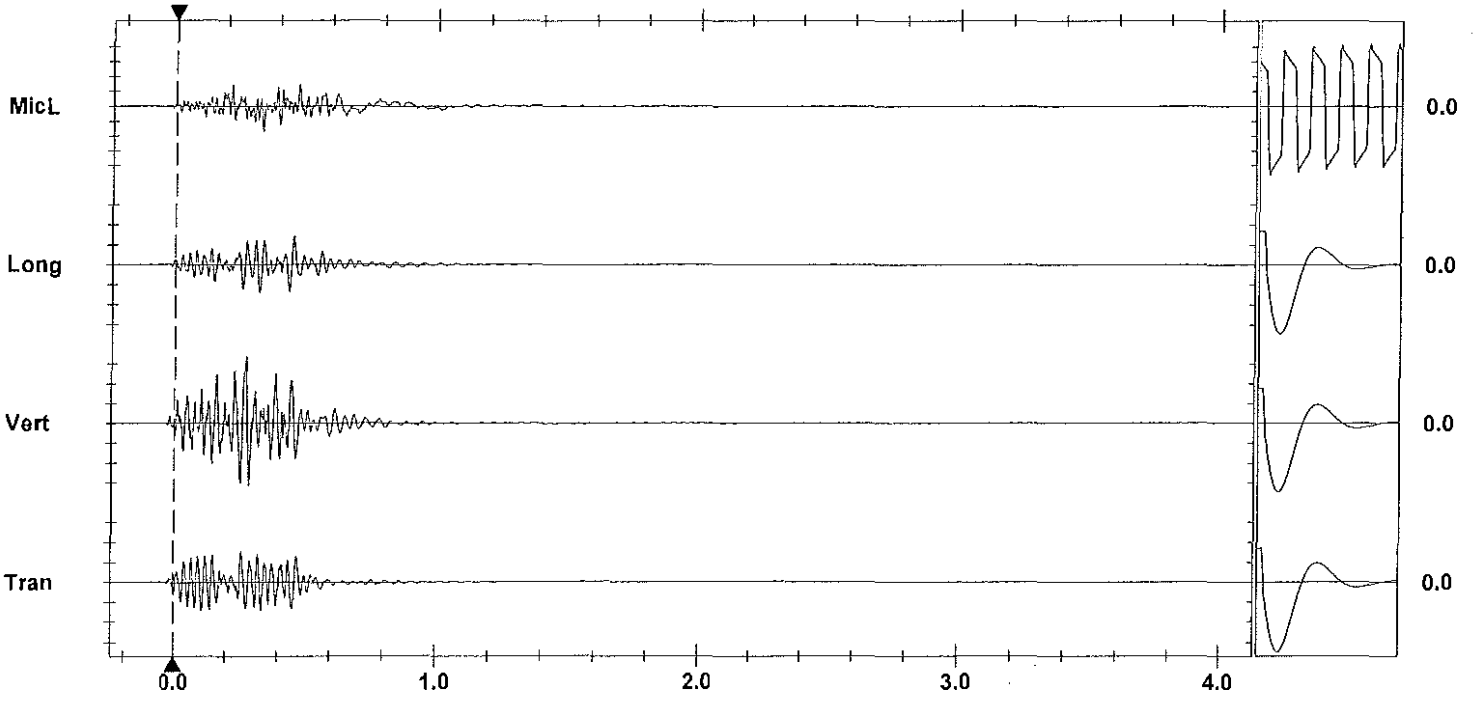
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.335 sec
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 641 mv)

	Tran	Vert	Long	
PPV	0.156	0.334	0.142	in/s
ZC Freq	32	27	28	Hz
Time (Rel. to Trig)	0.265	0.277	0.326	sec
Peak Acceleration	0.118	0.210	0.0829	g
Peak Displacement	0.00076	0.00197	0.00077	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.366 in/s at 0.278 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 2:53 PM
BLAST # MW-0242

HIGHWAY# 97
BLAST LOCATION AT: STN 128+48 - 128+52 LS (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
ok shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 3
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 3 BH / 2 Burden
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2x16 Blasthole
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

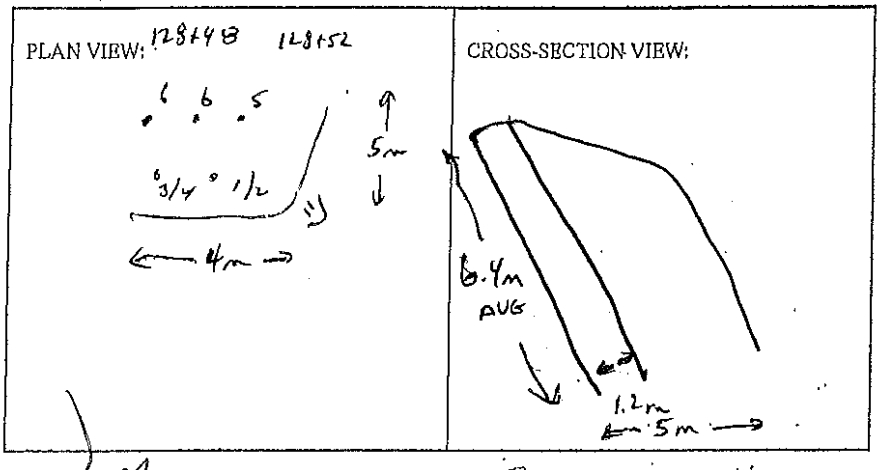
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.055 ips / 47 Hz
@ 13093 Cliffstone Crt. 0.24 ips / 34 Hz

BUFFER HOLES - TOE LOAD 4 CART. 2X16 BLASTEX

- TOP DECK 1-2 CART 2X16 BLASTEX

Primed w/ 0.5 CART 1½X16 UNIMAX DYNAMITE

B/L HOLES - 1 CART - 2X16 UNIMAX DYNAMITE + 200 gr det. cord to 4' collar.

Instantel

Event Report

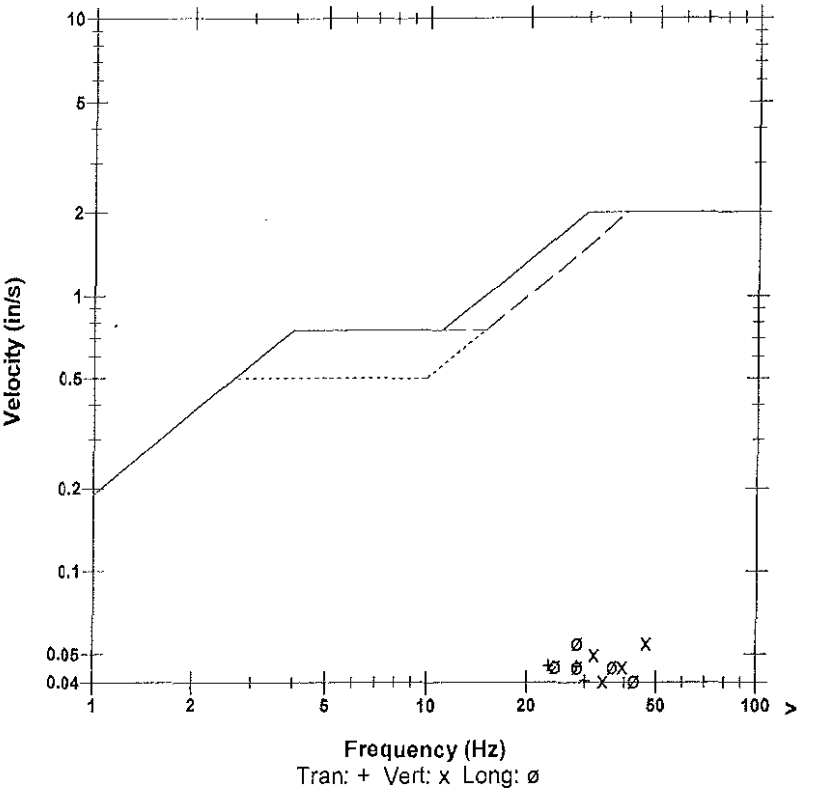
Date/Time	Long at 14:53:15 June 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBEU.OR0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

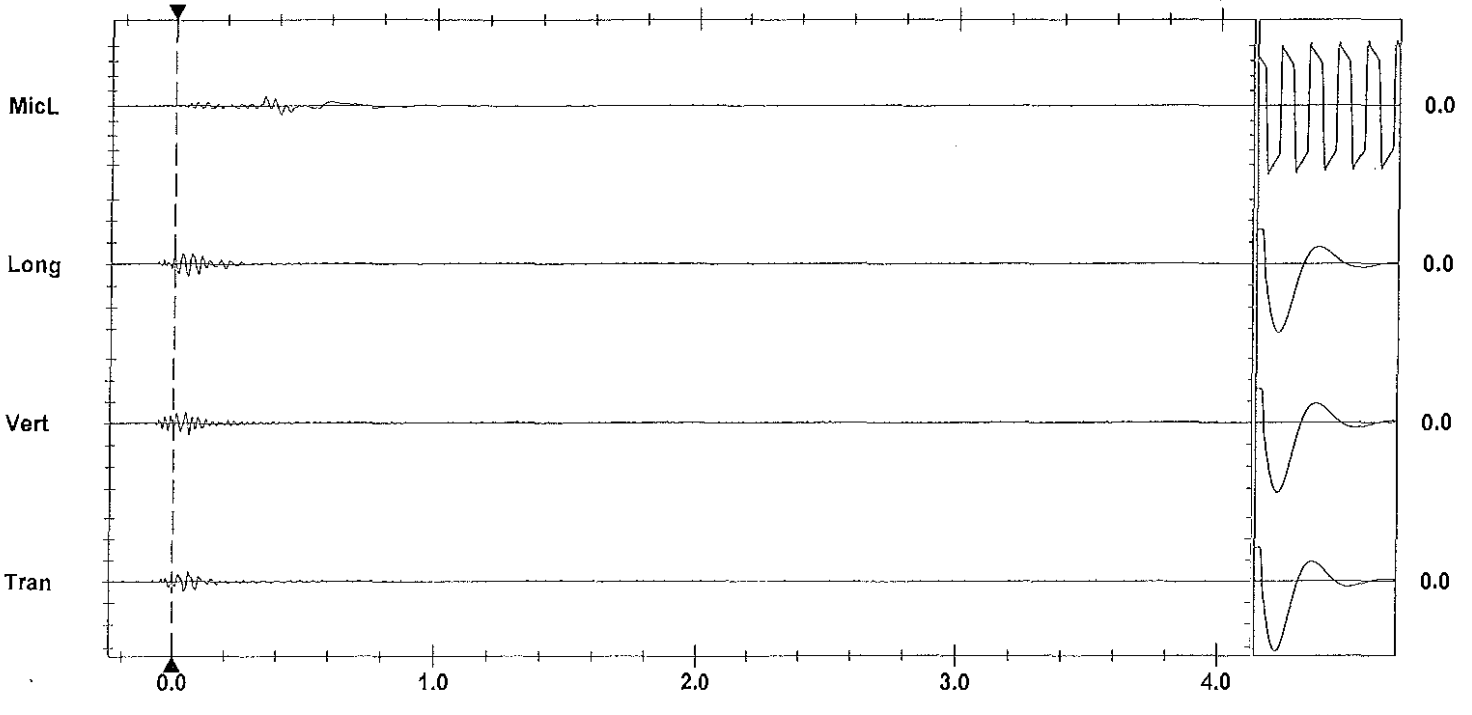
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00062 psi(L) at 0.347 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 641 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0550	0.0550	in/s
ZC Freq	28	47	28	Hz
Time (Rel. to Trig)	0.046	0.063	0.053	sec
Peak Acceleration	0.0265	0.0398	0.0398	g
Peak Displacement	0.00028	0.00024	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0783 in/s at 0.049 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 14:53:21 June 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBEU.OX0
Job Number:	1		

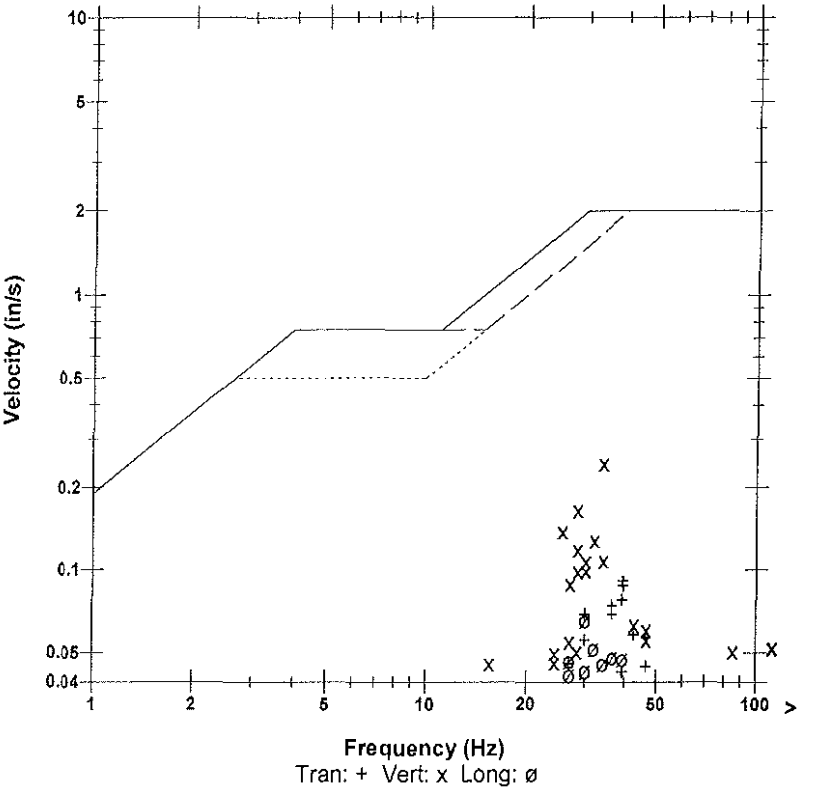
Notes
location:13093 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

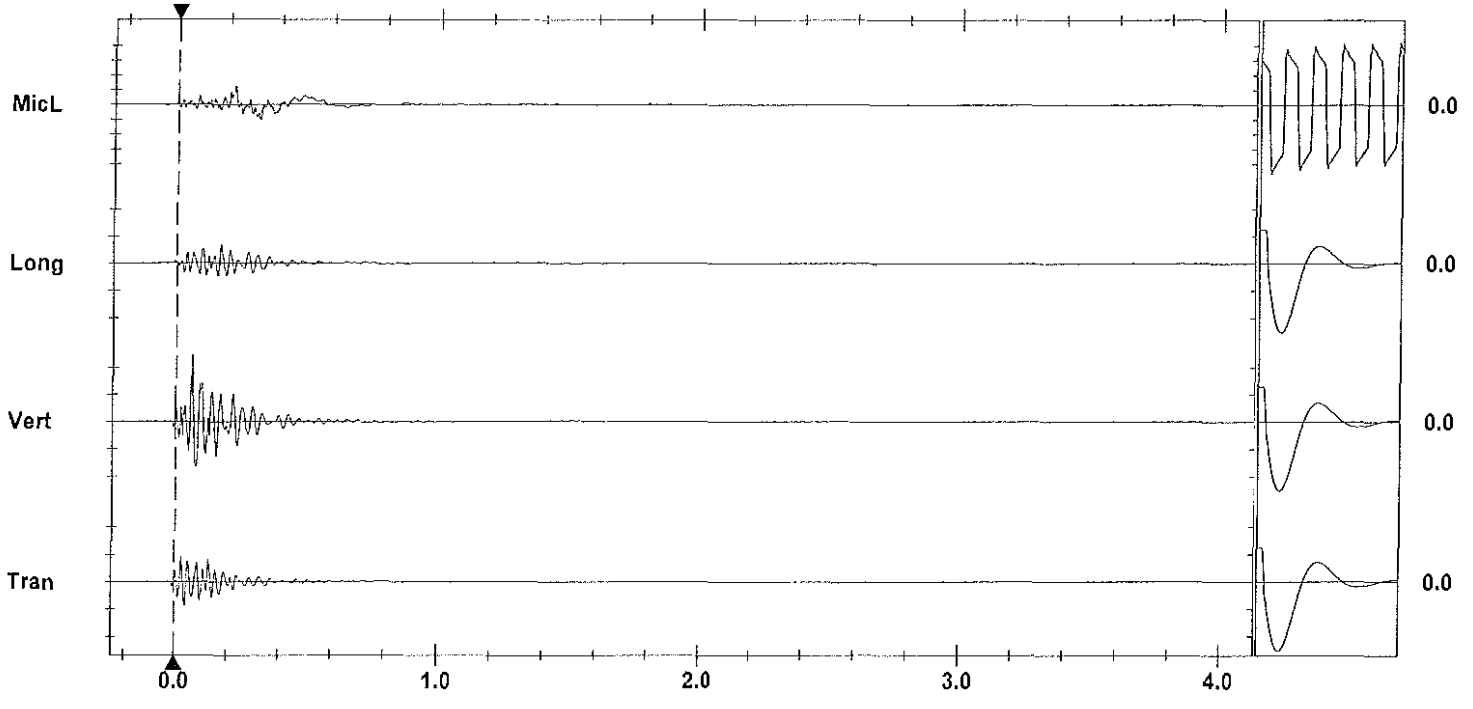
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.220 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 645 mv)

	Tran	Vert	Long	
PPV	0.0906	0.244	0.0656	in/s
ZC Freq	39	34	30	Hz
Time (Rel. to Trig)	0.027	0.063	0.171	sec
Peak Acceleration	0.0646	0.129	0.0431	g
Peak Displacement	0.00034	0.00102	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.250 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 10, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED June 7/12
ACTUAL BLAST DATE June 7/12 4:04 PM
BLAST # MV-0243

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+85 c/l (High seat)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.9 (m)
TOTAL DEPTH 39 (m)

TOTAL NUMBER OF HOLES 15 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

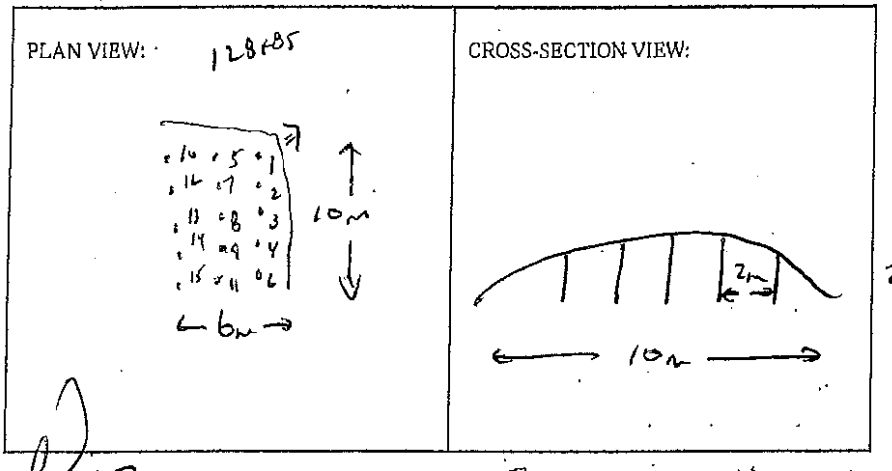
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED Nil (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.050 in/s/ 47 Hz
@ ~~13084~~ 13093 Cliffstone Crt - 0.043 in/s/ 26 Hz

2.5' to 3.5' ANFO/Hole + 0.5 CAST 1½" x 16" DYNAMITE PRIMER.

Event Report

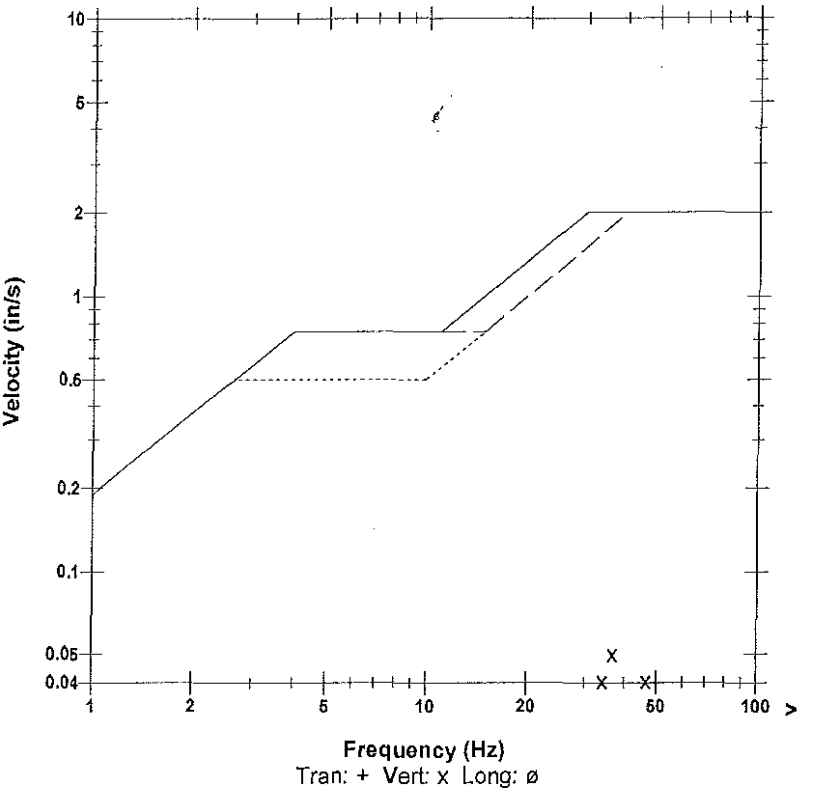
Date/Time	Vert at 16:04:05 June 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBEX.YT0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

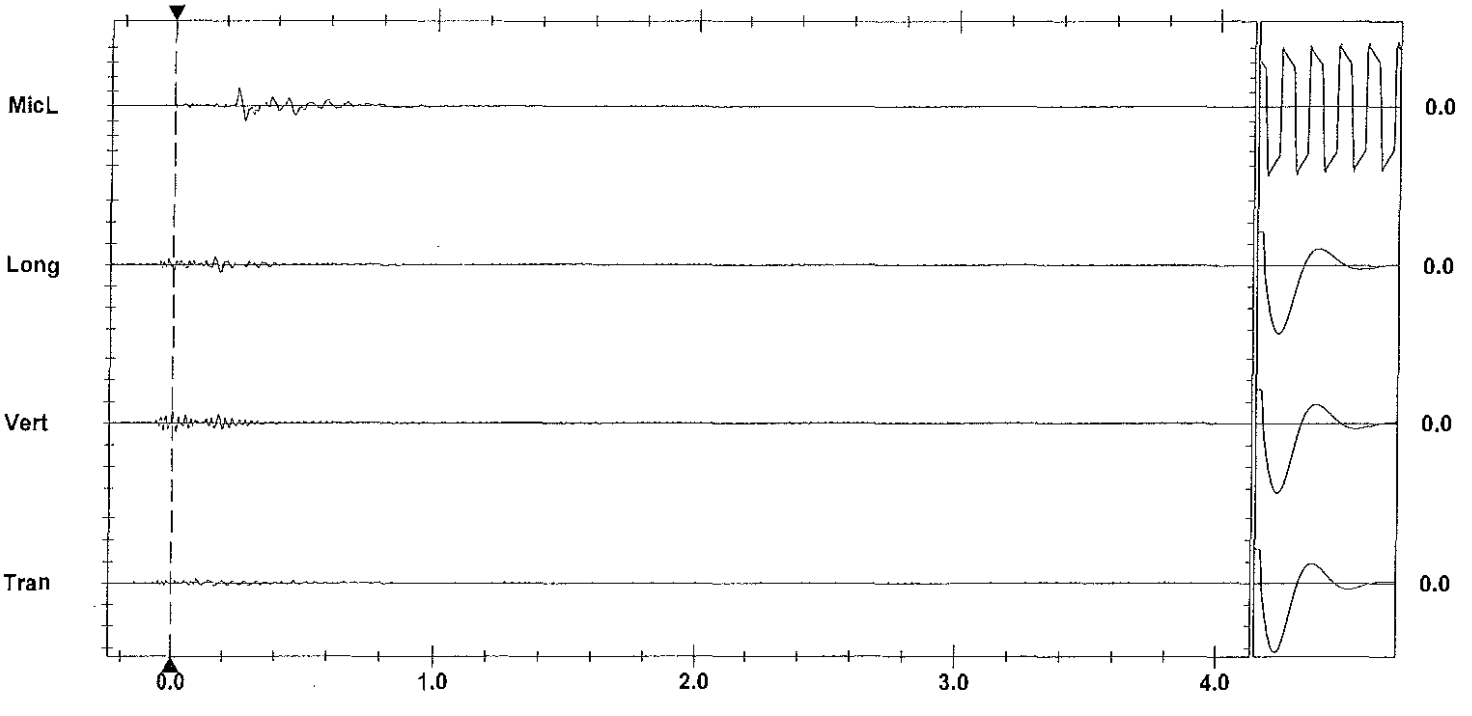
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00123 psi(L) at 0.248 sec			
ZC Freq	13 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 589 mv)			

	Tran	Vert	Long	
PPV	0.0150	0.0500	0.0350	in/s
ZC Freq	43	37	30	Hz
Time (Rel. to Trig)	0.099	0.002	0.163	sec
Peak Acceleration	0.0133	0.0398	0.0265	g
Peak Displacement	0.00007	0.00020	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0561 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 16:04:11 June 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBEX.YZ0
Job Number:	1		

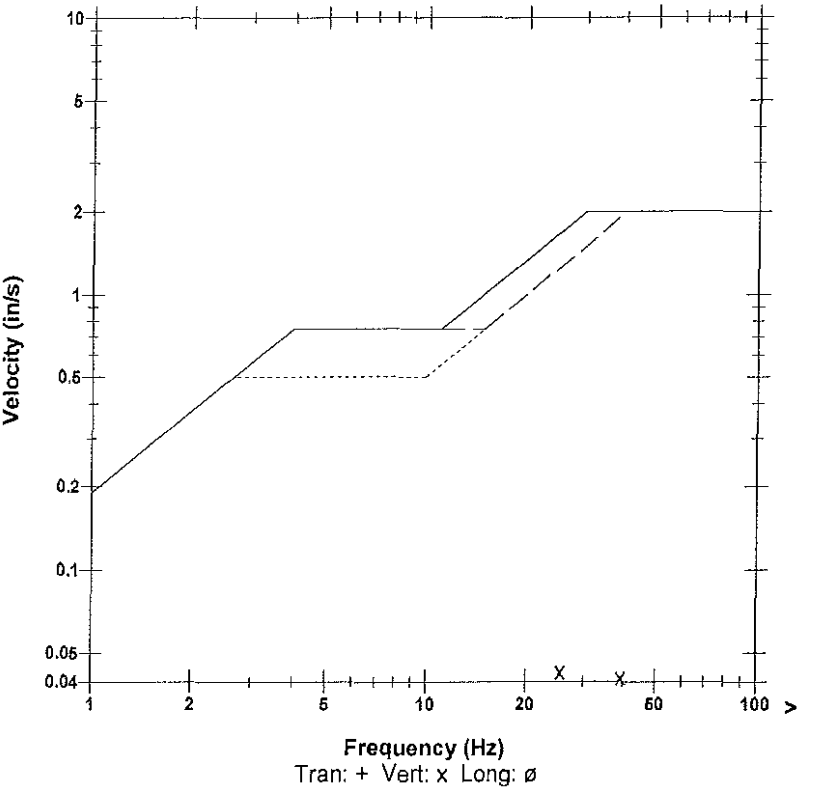
Notes
location:13093 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

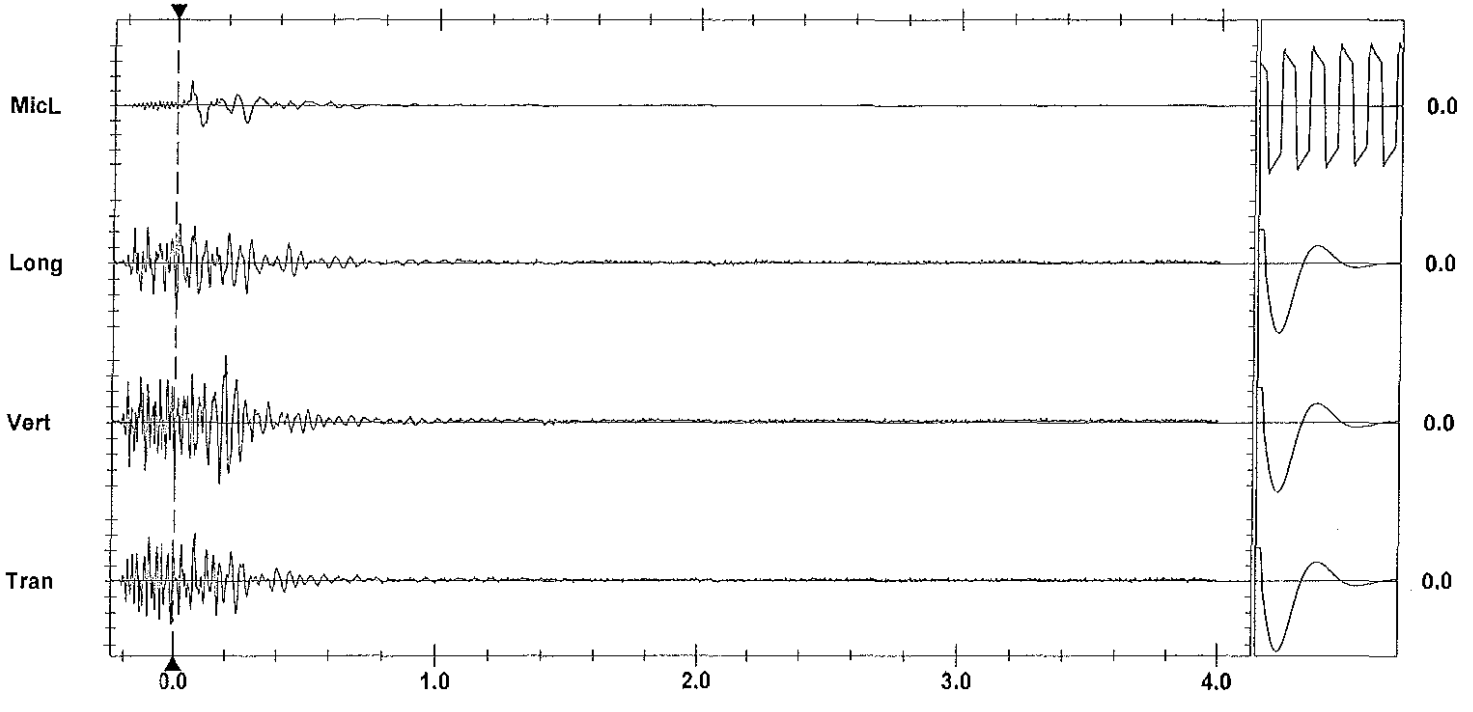
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.059 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 628 mv)

	Tran	Vert	Long	
PPV	0.0306	0.0431	0.0287	in/s
ZC Freq	34	26	30	Hz
Time (Rel. to Trig)	0.083	0.196	0.002	sec
Peak Acceleration	0.0249	0.0365	0.0215	g
Peak Displacement	0.00014	0.00025	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.0535 in/s at 0.000 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 10, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting Inc
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583487

DATE PREPARED June 8/12
ACTUAL BLAST DATE June 8/12 10:11 AM
BLAST # MUD-0044

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+35 LS (Hook's Pot)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 9 Pads.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 2½" Blastex
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 9

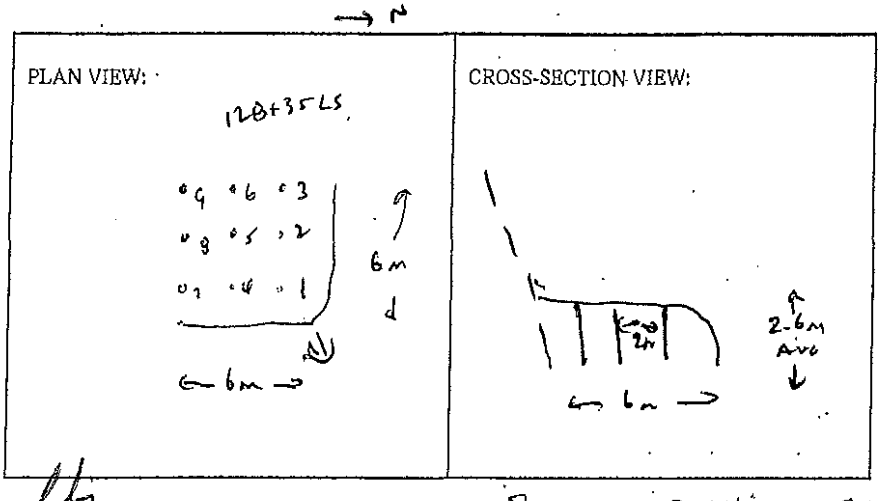
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting Inc

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13169 Cliffstone Cut – No Tribber (< 0.04 ips)
" @ 13119 Cliffstone Cut – 0.067 ips/57 Hz

- 1-2 CART. 2x16 BLASTEX per hole
+ 0.5 CART 1¼"x16" UNMAN DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 10:11:23 June 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBGC.AZ0
Job Number:	1		

Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

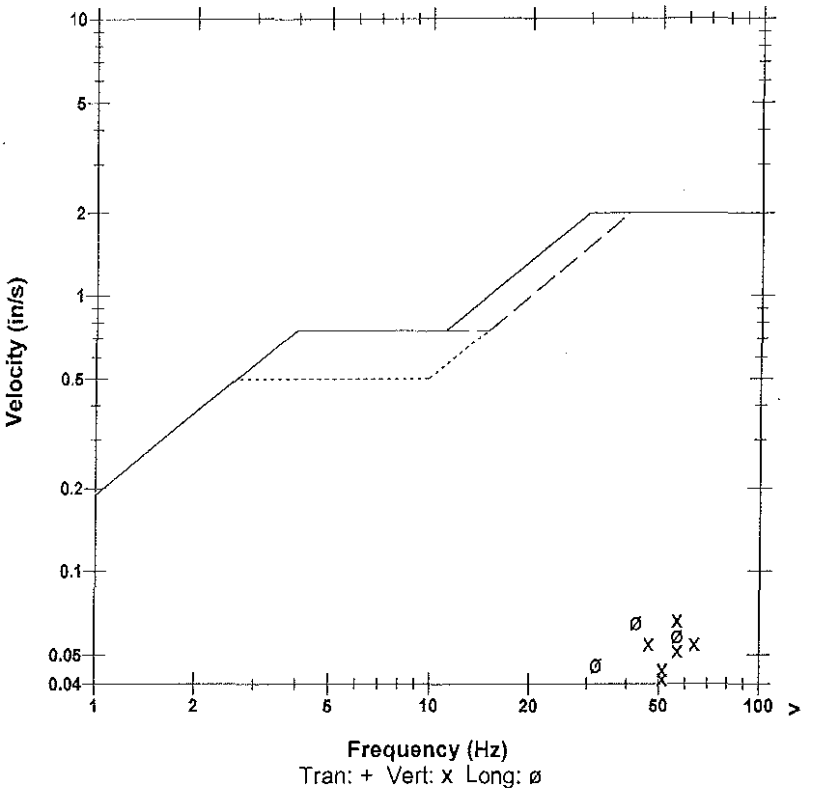
Post Event Notes

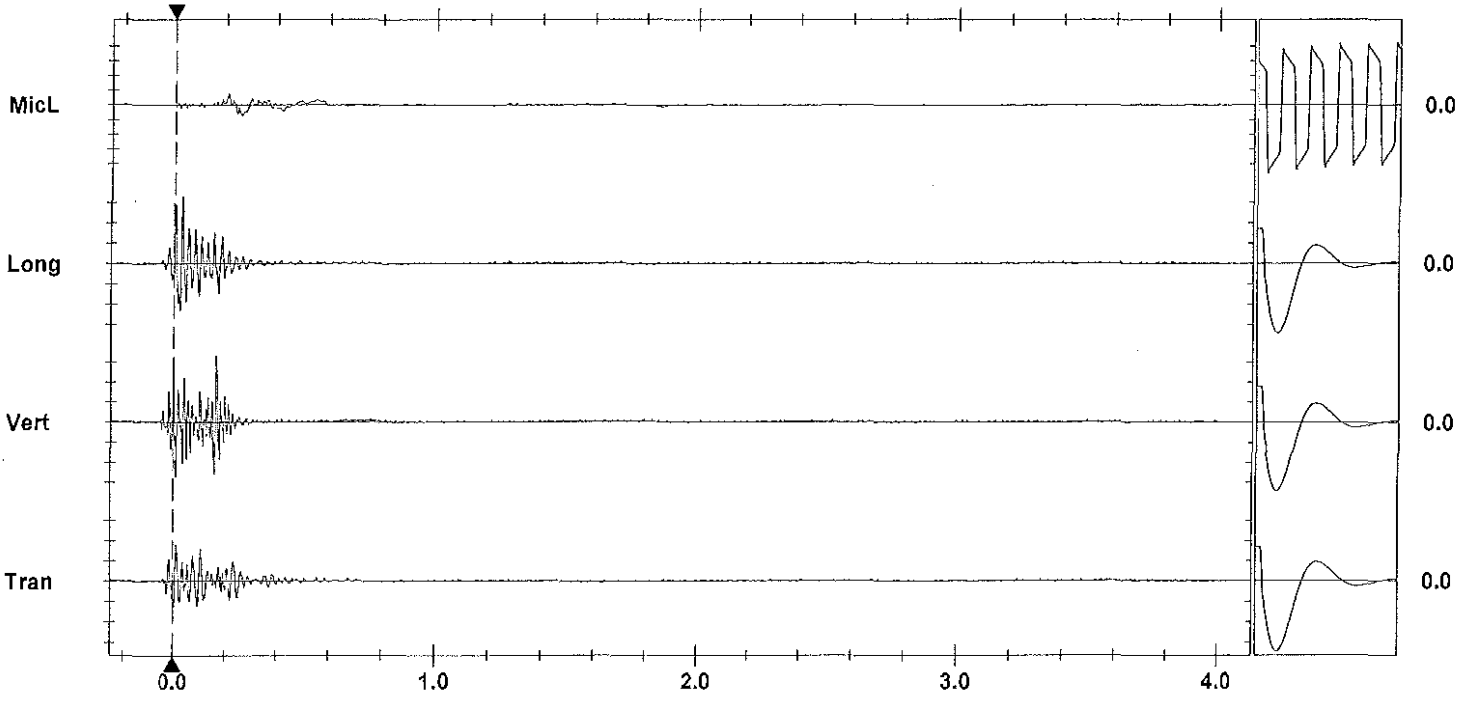
Microphone Linear Weighting
PSPL 0.00076 psi(L) at 0.207 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 642 mv)

	Tran	Vert	Long	
PPV	0.0362	0.0669	0.0656	in/s
ZC Freq	37	57	43	Hz
Time (Rel. to Trig)	0.014	0.167	0.033	sec
Peak Acceleration	0.0315	0.114	0.0580	g
Peak Displacement	0.00014	0.00019	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.0797 in/s at 0.009 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834487

DATE PREPARED June 11/12
ACTUAL BLAST DATE June 11/12 11:42 AM
BLAST # MW - 0245

HIGHWAY# 97
BLAST LOCATION AT: STN 128+98 - 129+02 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Blast matted

SITE DETAILS:

HEIGHT ABOVE HWY 9/0 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE ALBERGO GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 4.6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 4.8 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 5 B/L / 3 BUFFER / 3 STAB / STRAD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 13

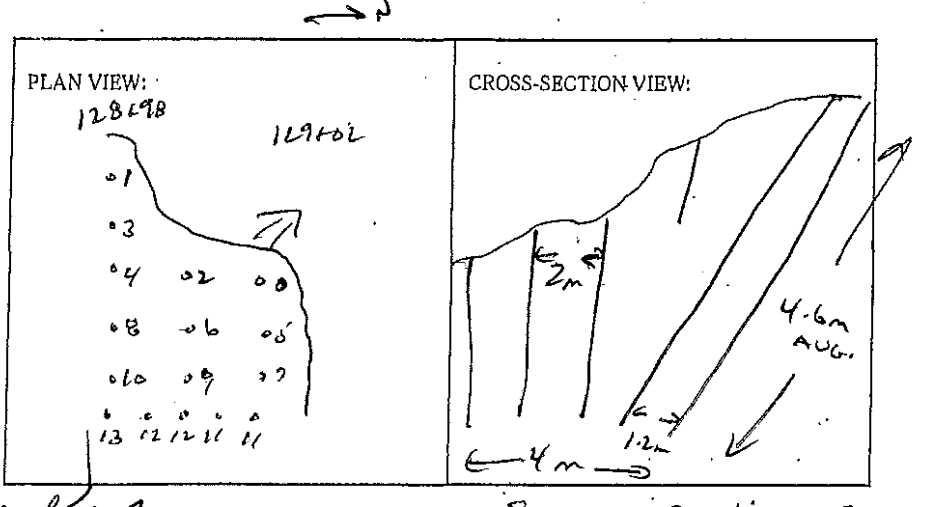
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13/07 Cliffstone Crt - 0.045 ips / 34 Hz
" @ 13/17 Cliffstone Crt - 0.079 ips / 43 Hz

B/L Holes - 1 Cart 2x16 DYNAMITE + 200 gr det. cord to 4' collar

Buffer Holes - 2-3 Cart 2x16 Blastex primed w/ 0.5 cart 1½x16' Dynamite

Stope Holes - 2' ANFO primed w/ 0.5 cart 1½" x16" Dynamite

Prod Holes - 3'-6' ANFO primed w/ 0.5 cart 1½x16' DYNAMITE

Instantel

Event Report

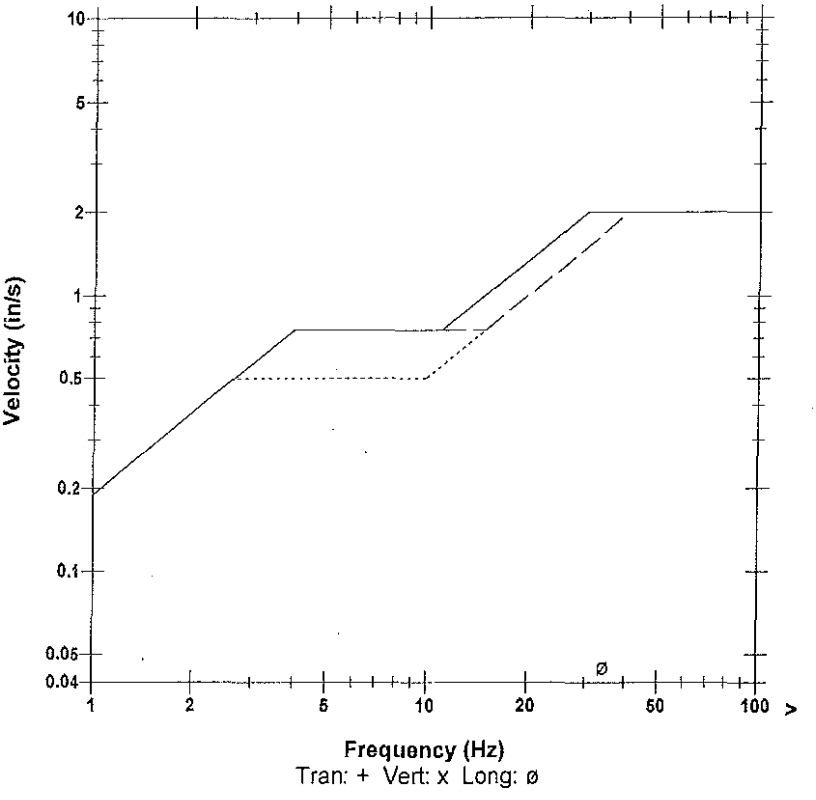
Date/Time	Long at 11:41:58 June 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBM0.HY0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

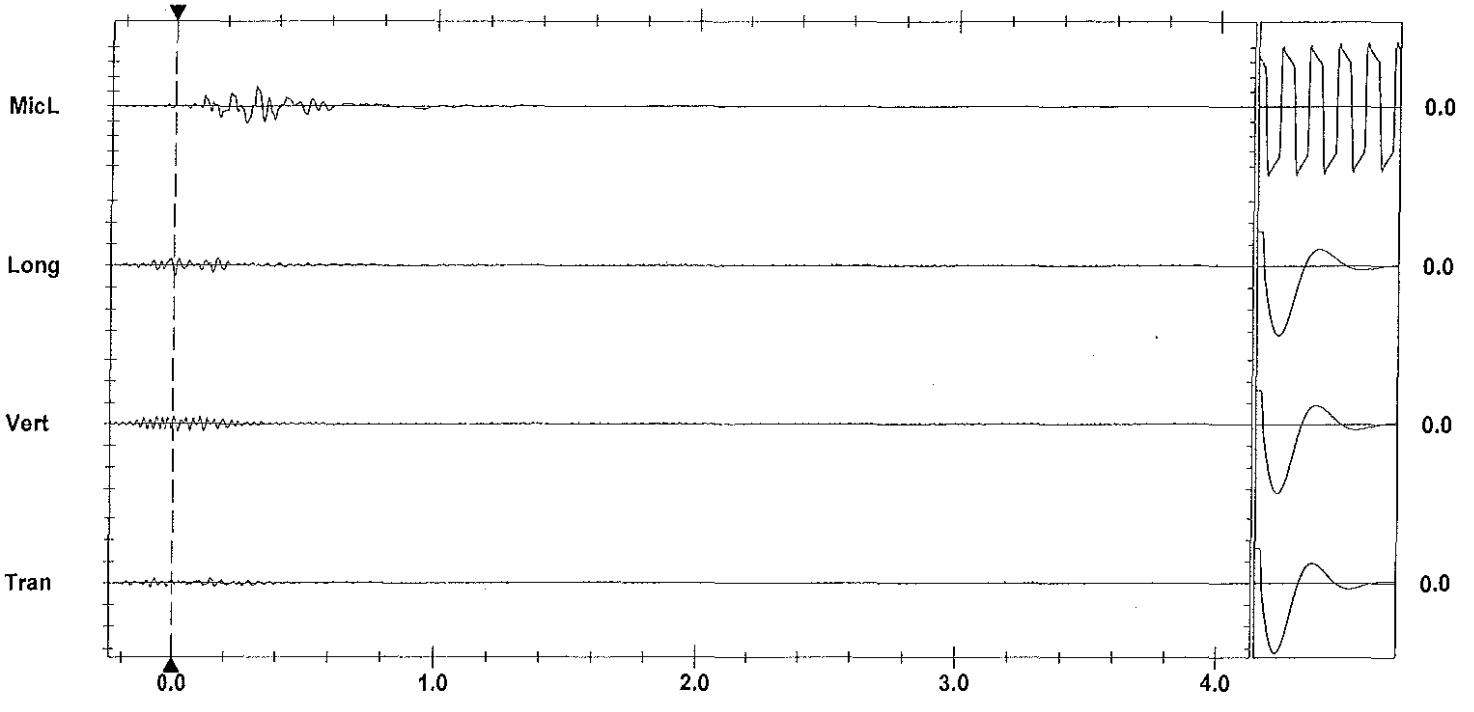
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.313 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 490 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0350	0.0450	in/s
ZC Freq	51	37	34	Hz
Time (Rel. to Trig)	-0.088	0.019	0.002	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00011	0.00015	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0550 in/s at 0.003 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 11:42:07 June 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBM0.I70
Job Number:	1		

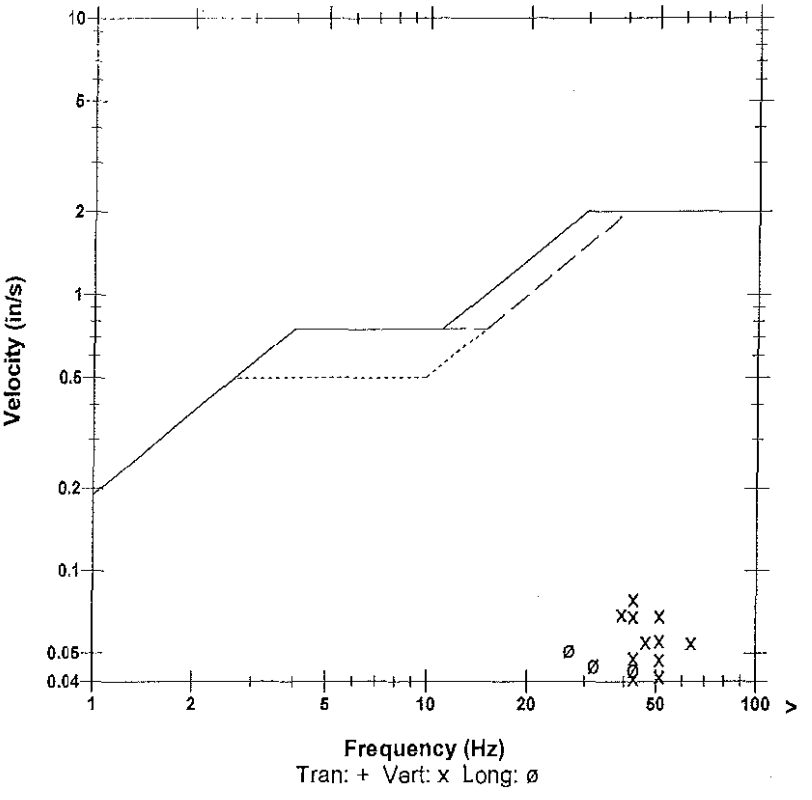
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

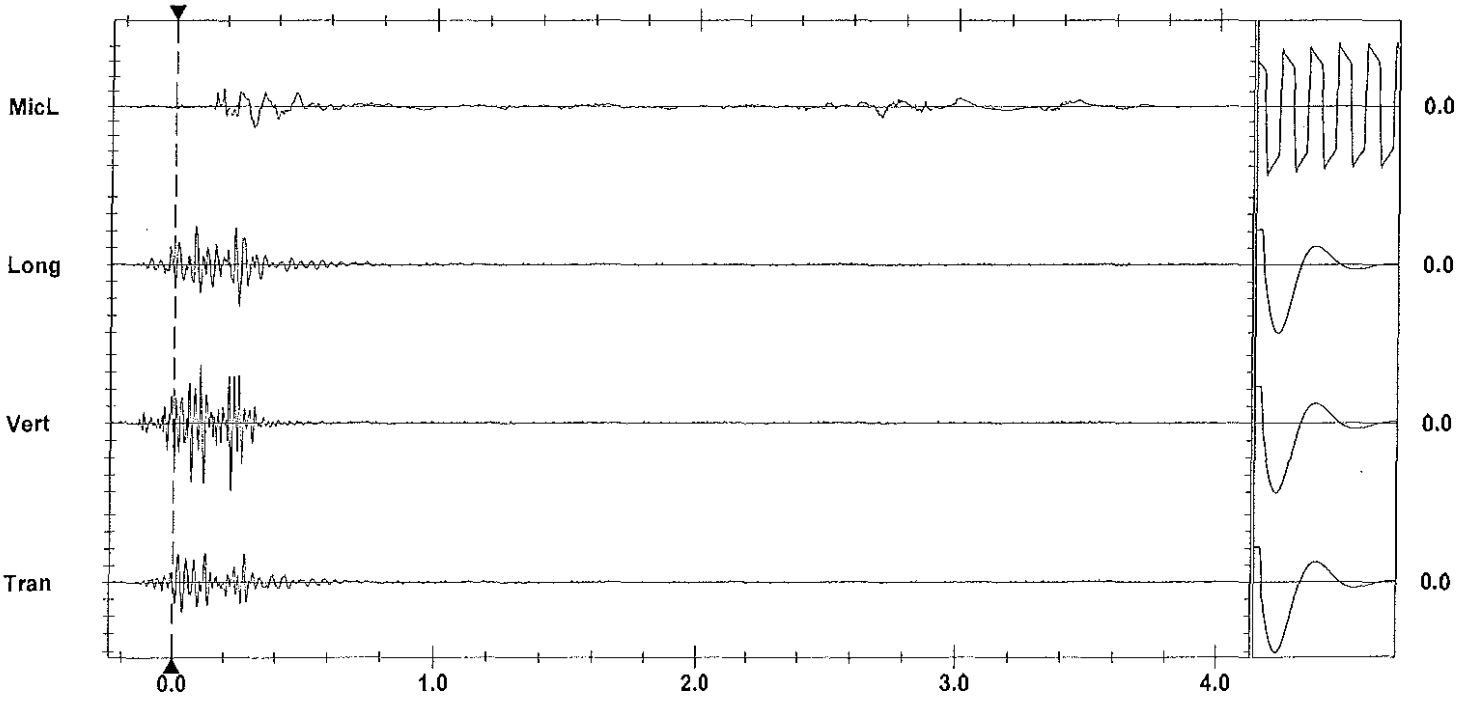
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00141 psi(L) at 0.306 sec		
ZC Freq	11 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 505 mv)		

	Tran	Vert	Long	
PPV	0.0356	0.0787	0.0512	in/s
ZC Freq	32	43	27	Hz
Time (Rel. to Trig)	0.040	0.226	0.252	sec
Peak Acceleration	0.0249	0.0630	0.0331	g
Peak Displacement	0.00018	0.00027	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.7	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.0810 in/s at 0.226 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 16, 2012 07:01:01
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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 11/12
ACTUAL BLAST DATE June 11/12 4:33 PM
BLAST # MW-0246 0246

HIGHWAY# 97
BLAST LOCATION AT: SBN 128+90 - 128+98 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 92 (m)

TOTAL NUMBER OF HOLES 8 BL / 5 Buffer / 5 SMB / 1 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

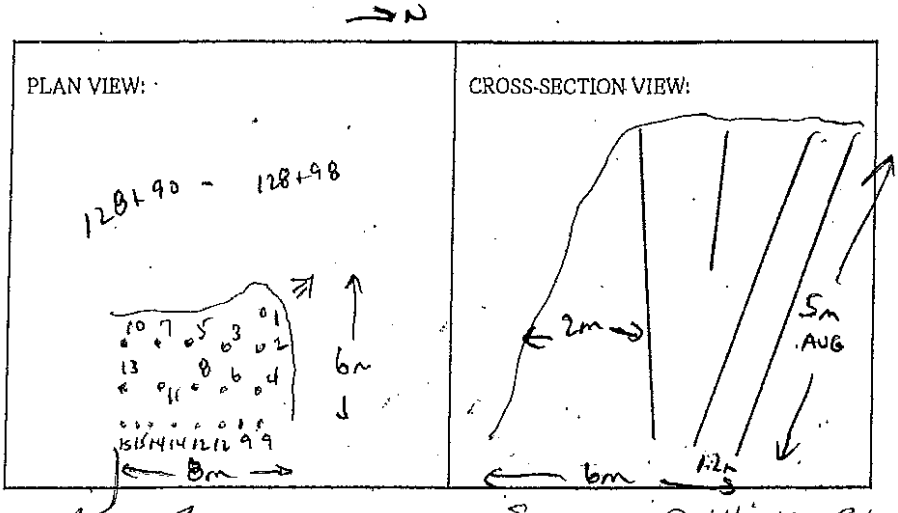
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HTB 320 CAPACITY 30 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.12 ips / 37 Hz
" @ 13117 Cliffstone Crt - 0.15 ips / 47 Hz

Primed w/ 0.5 count 2x16 Blastrex

- Prod. Hole 8' ANFO
- STAB Holes 3' ANFO
- Bottom Holes 4-5 Count 2x16 Blastrex

BL Holes - 1 Count 2x16 UNIMAX DYNAMITE + 200 grams tamped to 4' collar.

Instantel

Event Report

Date/Time	Vert at 16:33:13 June 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBMD.ZD0
Job Number:	1		

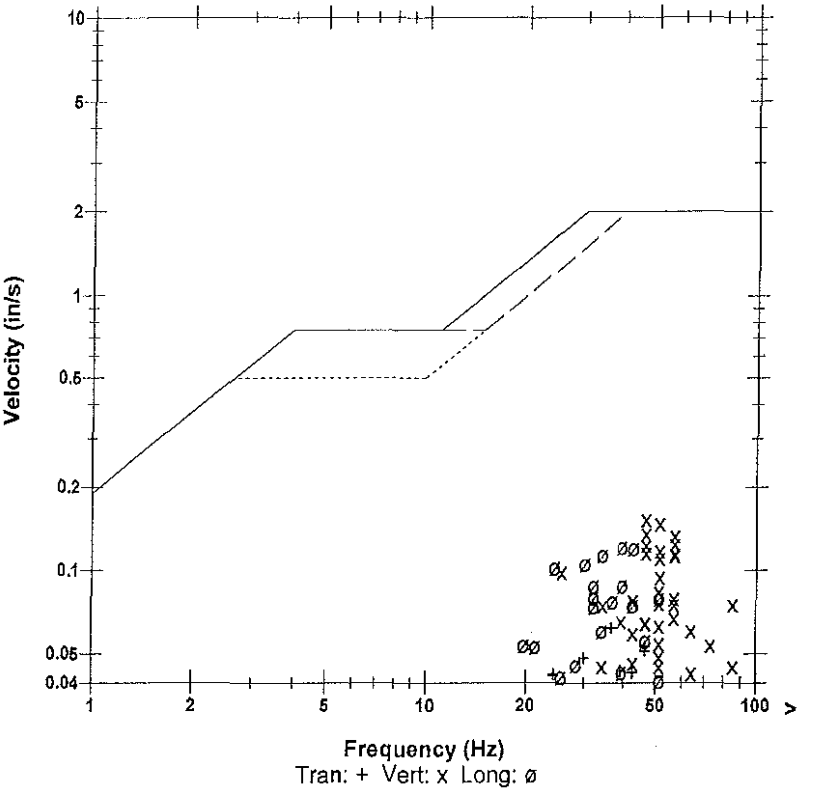
Notes
location:13117 Cliffstone Crt on rear patio slab ne cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

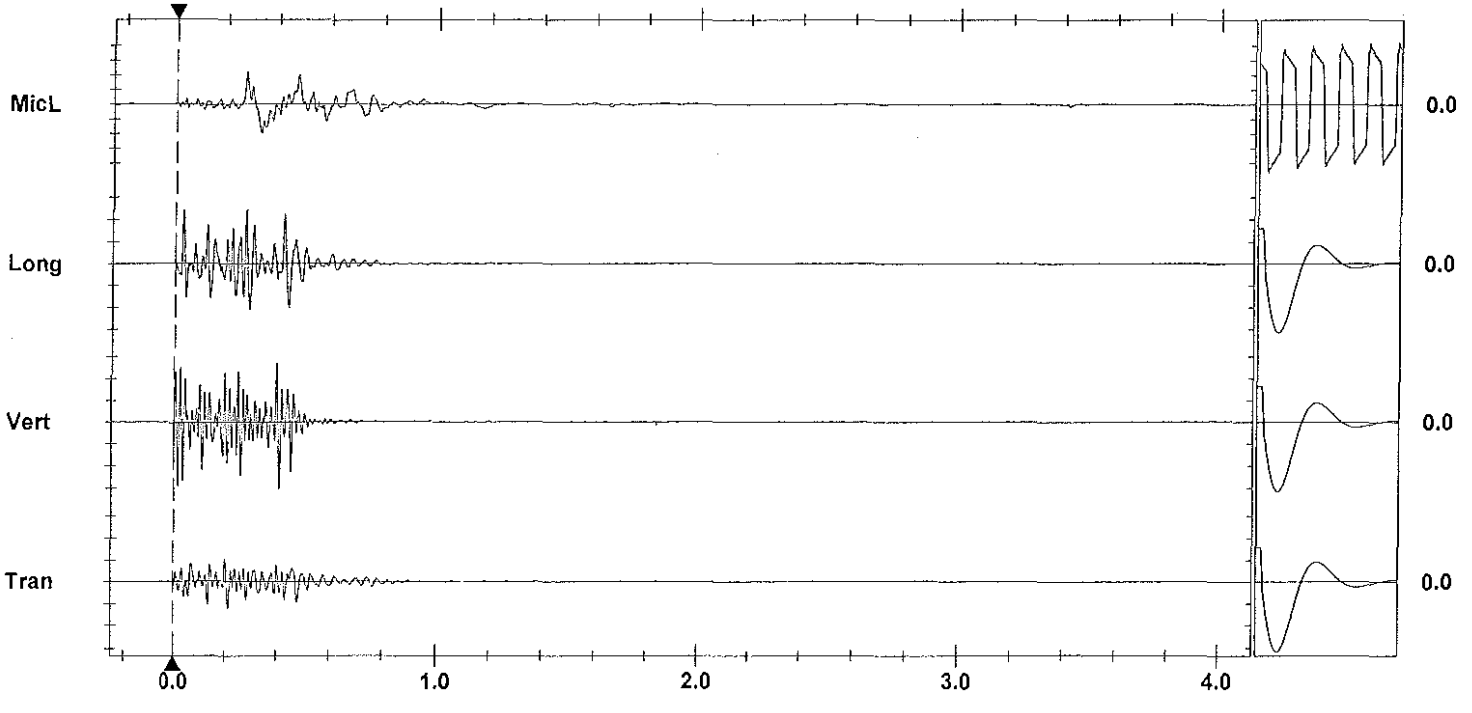
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00221 psi(L) at 0.274 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 539 mv)

	Tran	Vert	Long	
PPV	0.0619	0.152	0.121	in/s
ZC Freq	37	47	39	Hz
Time (Rel. to Trig)	0.215	0.411	0.032	sec
Peak Acceleration	0.0514	0.128	0.0829	g
Peak Displacement	0.00028	0.00052	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.169 in/s at 0.034 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶---◀

Sensorcheck

Printed: June 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

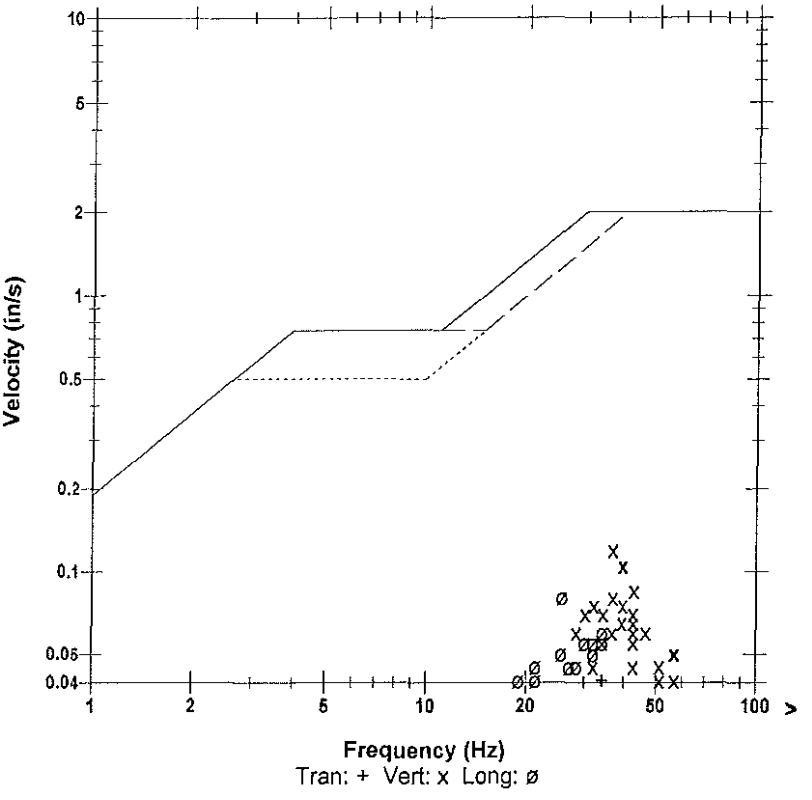
Date/Time	Vert at 16:33:03 June 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBMD.Z30

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

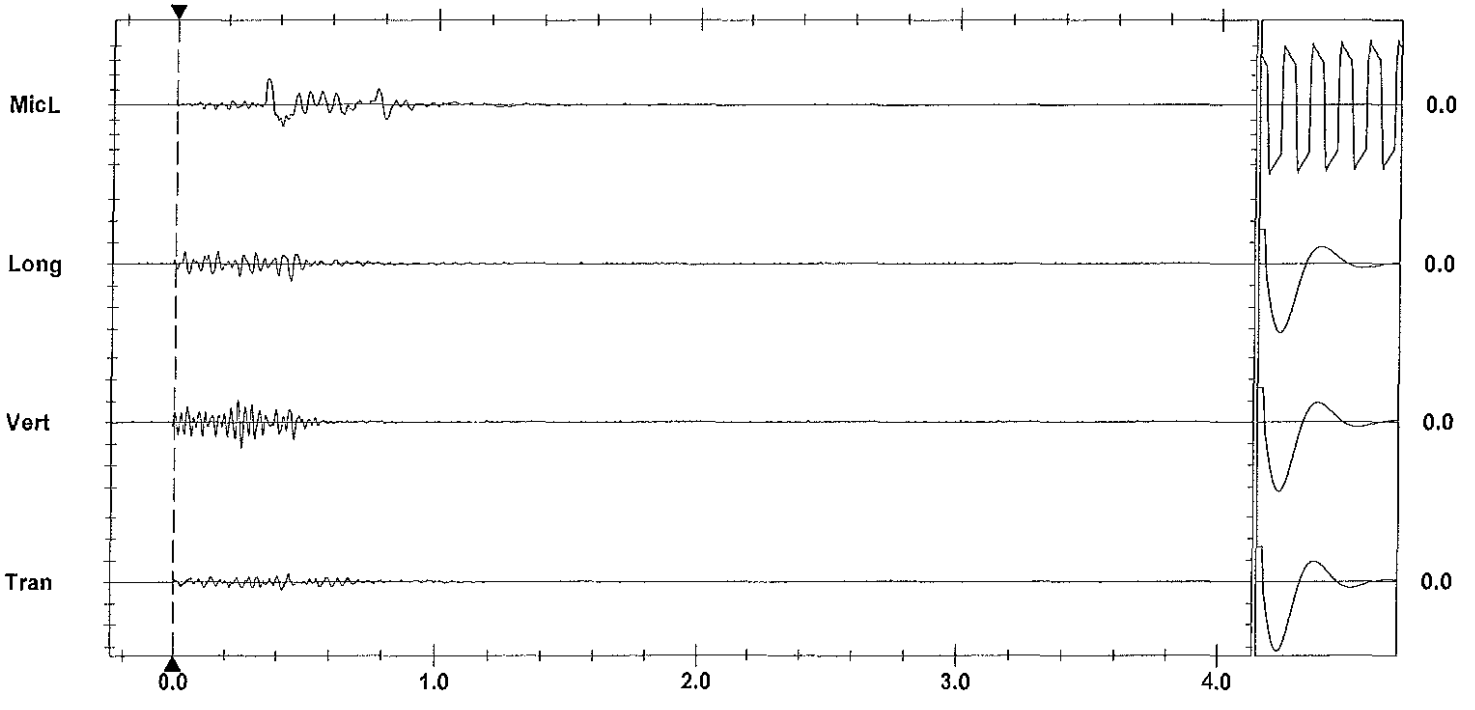
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00174 psi(L) at 0.358 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 565 mv)

	Tran	Vert	Long	
PPV	0.0400	0.120	0.0800	in/s
ZC Freq	34	37	26	Hz
Time (Rel. to Trig)	0.448	0.261	0.447	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00023	0.00050	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.127 in/s at 0.261 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 12/12
ACTUAL BLAST DATE June 11/12 10:54 Am
BLAST # MW-0247

HIGHWAY# 97
BLAST LOCATION AT: STN 128154 - 128460 c/L (Top cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 115 (m)

TOTAL NUMBER OF HOLES 21 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 135 (kg)
DELAY TYPE AND LENGTH 25 (ms)

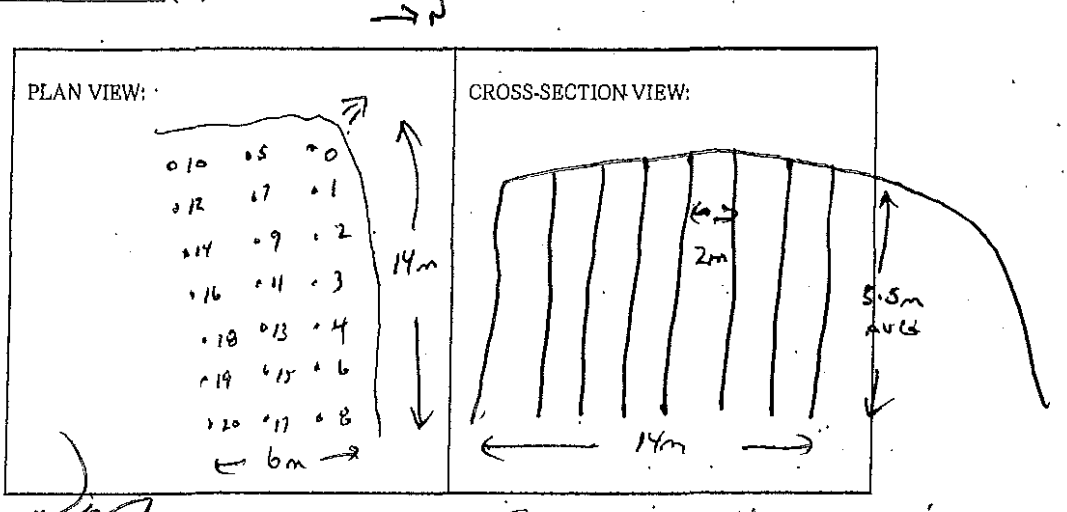
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 460 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.10 ips/ 39 Hz
" @ 13093 Cliffstone Crt - 0.31 ips/ 5 Hz

4'-8' ANFO Per Hole + 0.5 CAST, 1½"x16" DYNAMITE Prime

Instantel

Event Report

Date/Time	Vert at 10:54:11 June 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBNS.YB0
Job Number:	1		

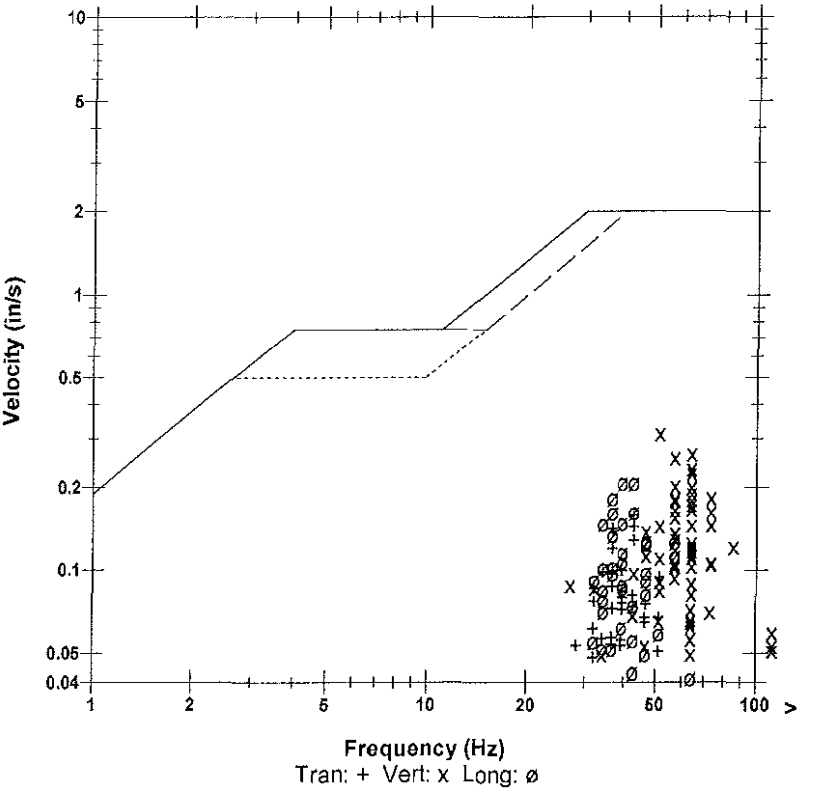
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

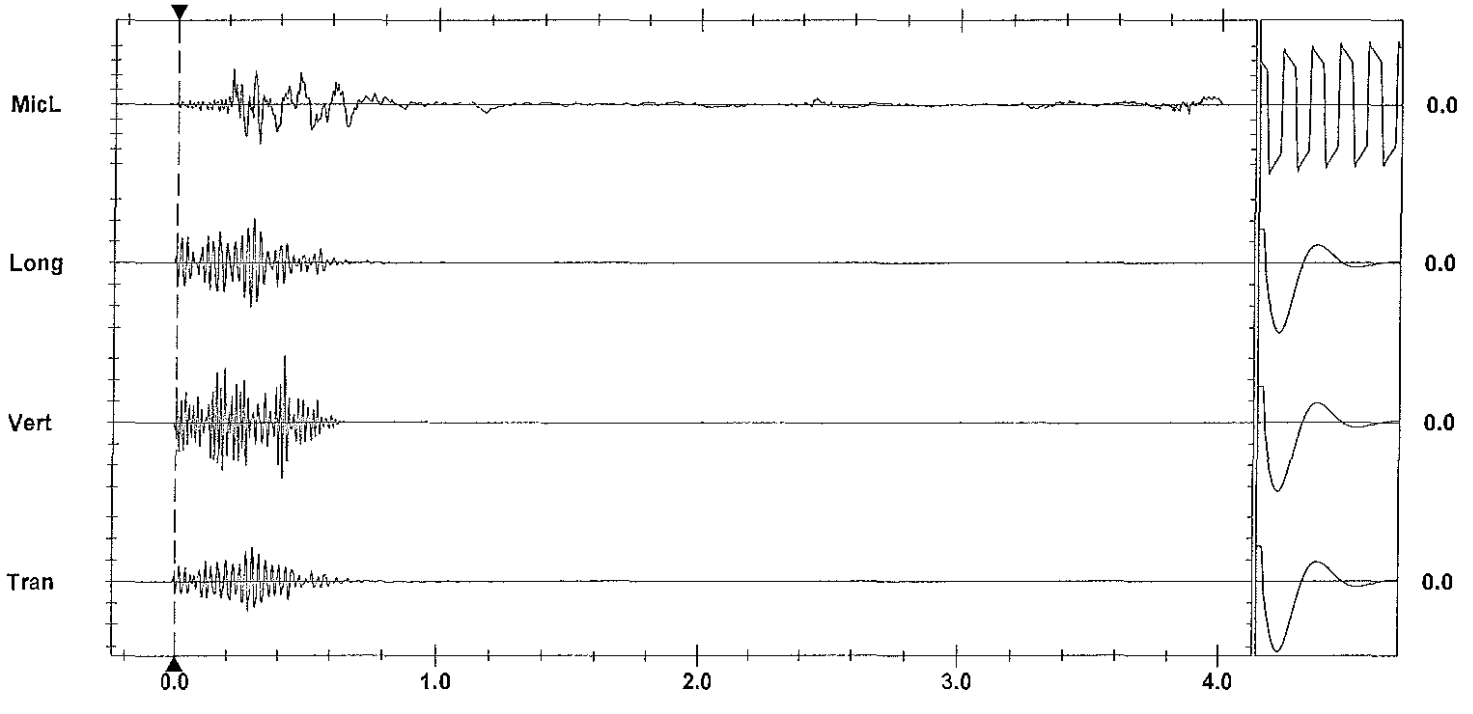
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00268 psi(L) at 0.318 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 555 mv)

	Tran	Vert	Long	
PPV	0.159	0.312	0.207	in/s
ZC Freq	43	51	43	Hz
Time (Rel. to Trig)	0.304	0.422	0.303	sec
Peak Acceleration	0.202	0.282	0.217	g
Peak Displacement	0.00059	0.00089	0.00084	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.314 in/s at 0.422 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — —◀

Sensorcheck

Instantel

Event Report

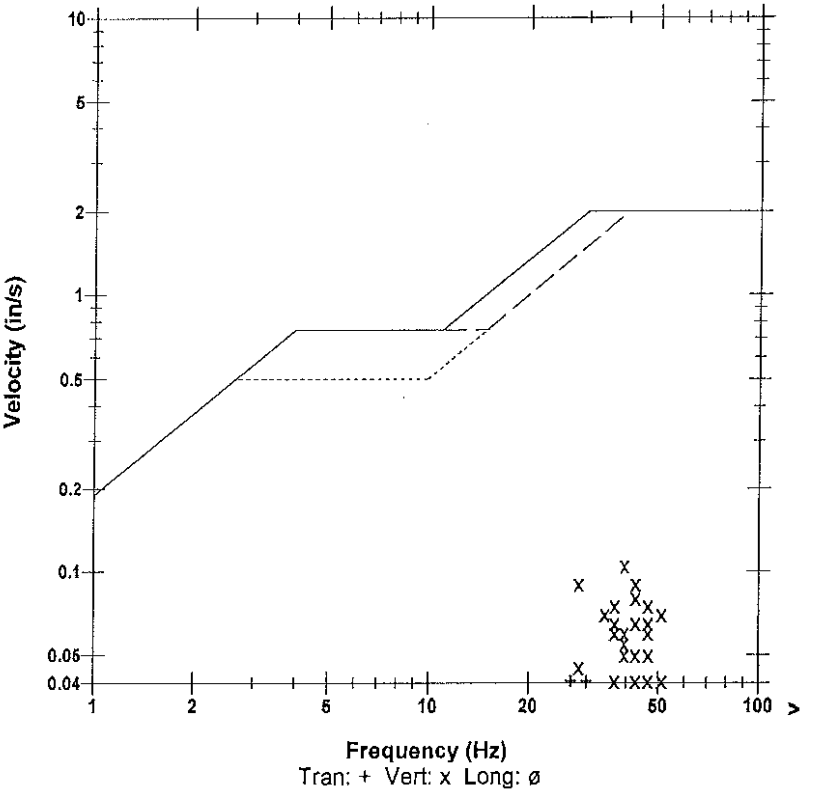
Date/Time	Vert at 10:54:01 June 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBNS.Y10

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

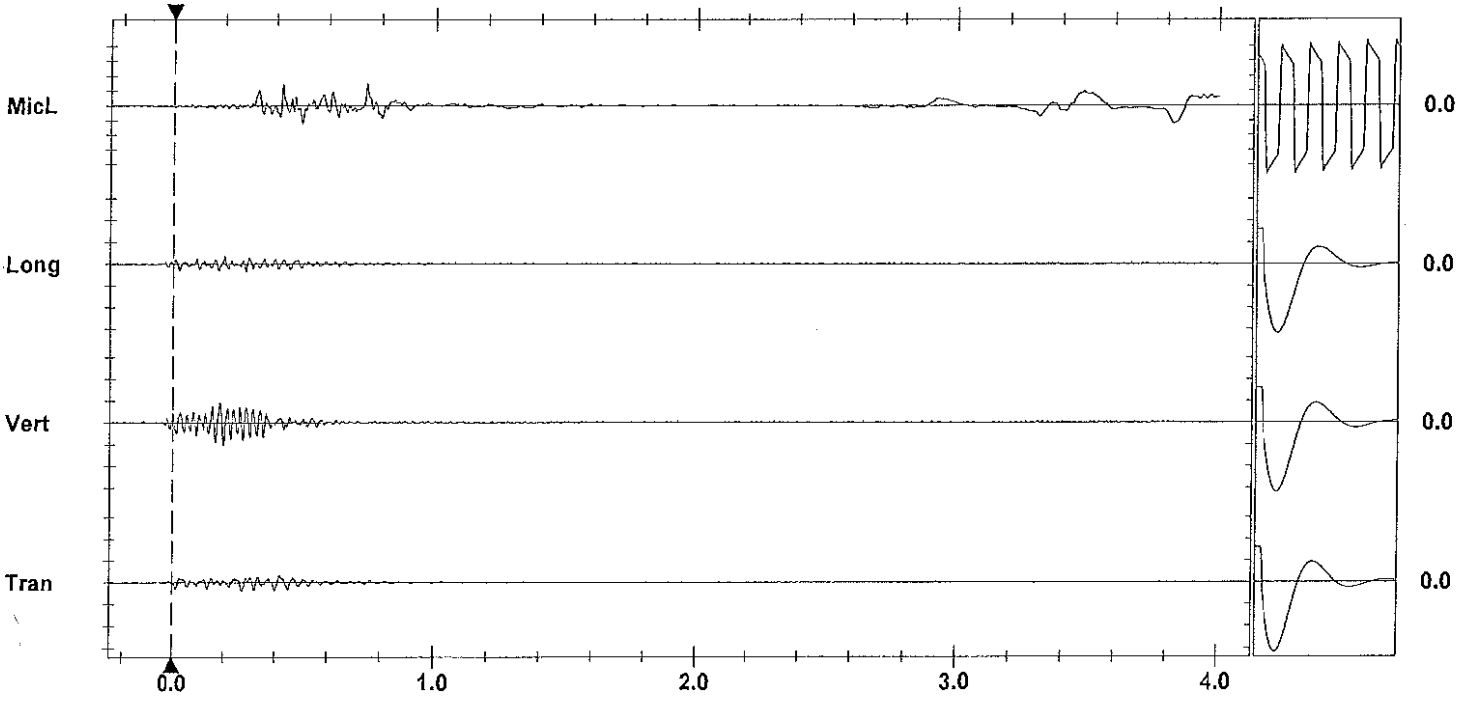
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.743 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 534 mv)

	Tran	Vert	Long	
PPV	0.0400	0.105	0.0350	in/s
ZC Freq	27	39	39	Hz
Time (Rel. to Trig)	0.271	0.198	0.199	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00024	0.00046	0.00015	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.108 in/s at 0.198 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: June 16, 2013 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED June 12/12
ACTUAL BLAST DATE June 12/12
BLAST # MW-0248

1:38 PM
1:38 PM

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+48 - 128+54 c/l (top cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot notified

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 126 (m)

TOTAL NUMBER OF HOLES 21 plan
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1/4" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

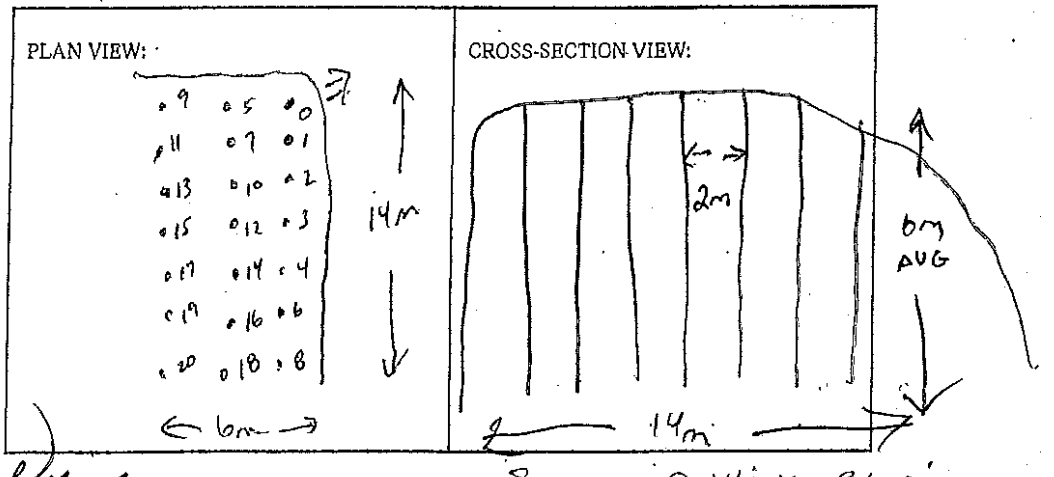
EXPLOSIVE SIZE 40 mm by 410 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.14 ips / 37 Hz
" @ 13093 Cliffstone Crt - 0.30 ips / 51 Hz

5' - 8' AND PORTABLE +

Instantel

Event Report

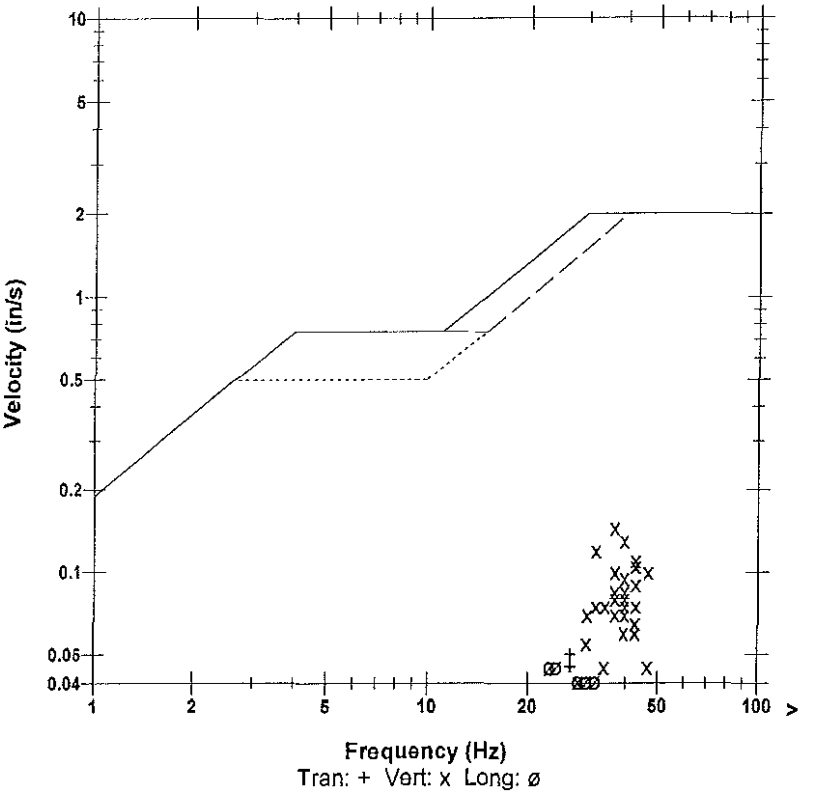
Date/Time	Vert at 13:38:46 June 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBO0.KM0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

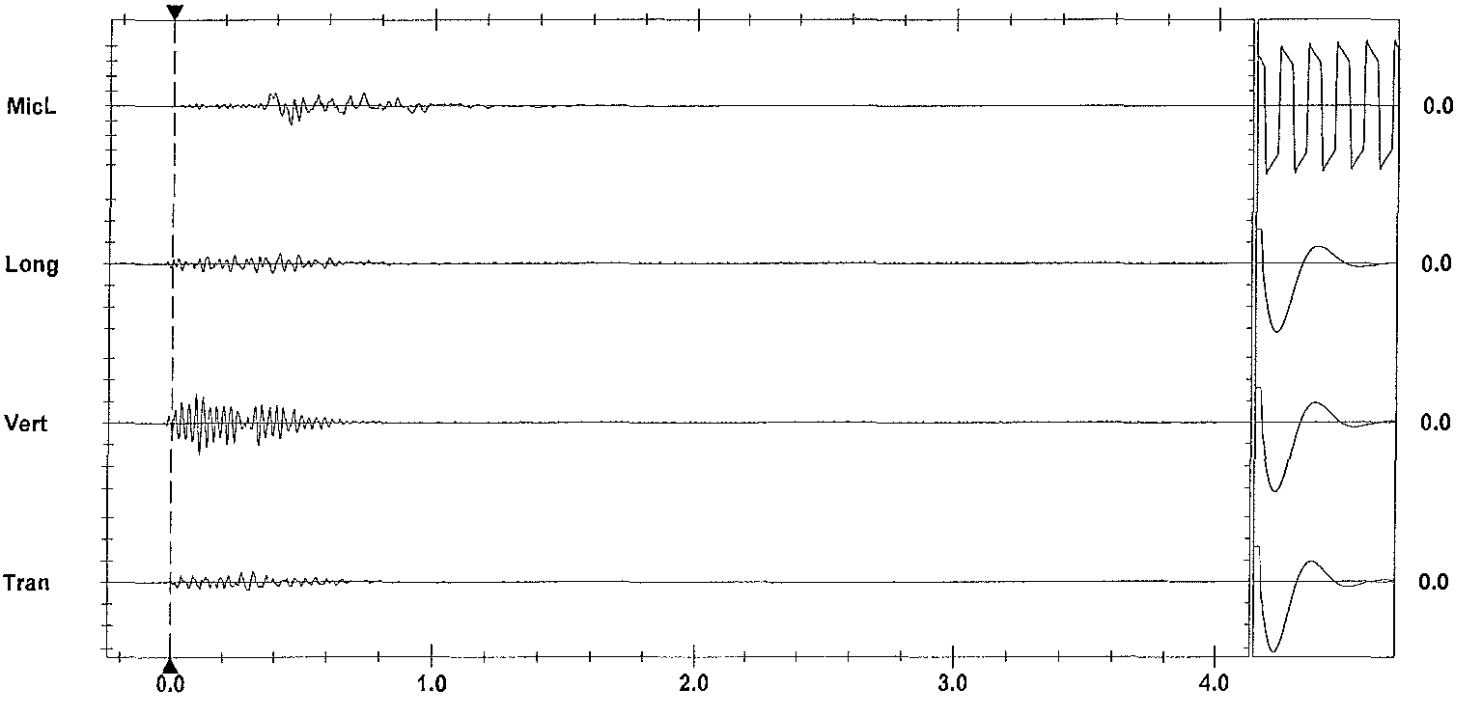
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.450 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0500	0.145	0.0450	in/s
ZC Freq	27	37	24	Hz
Time (Rel. to Trig)	0.320	0.107	0.386	sec
Peak Acceleration	0.0265	0.106	0.0398	g
Peak Displacement	0.00030	0.00061	0.00031	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.148 in/s at 0.107 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:38:56 June 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBO0.KW0
Job Number:	1		

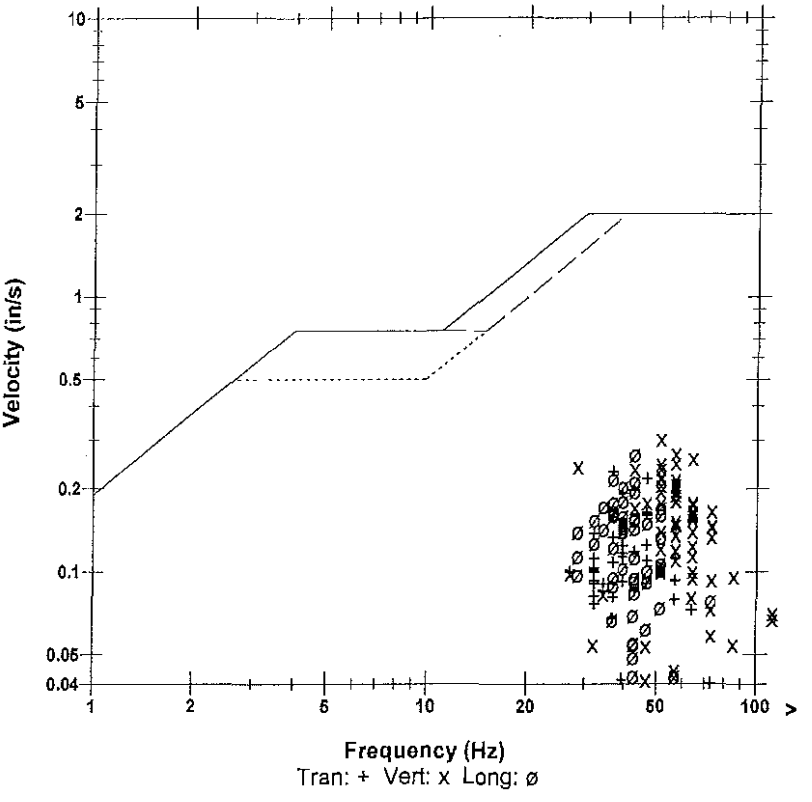
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

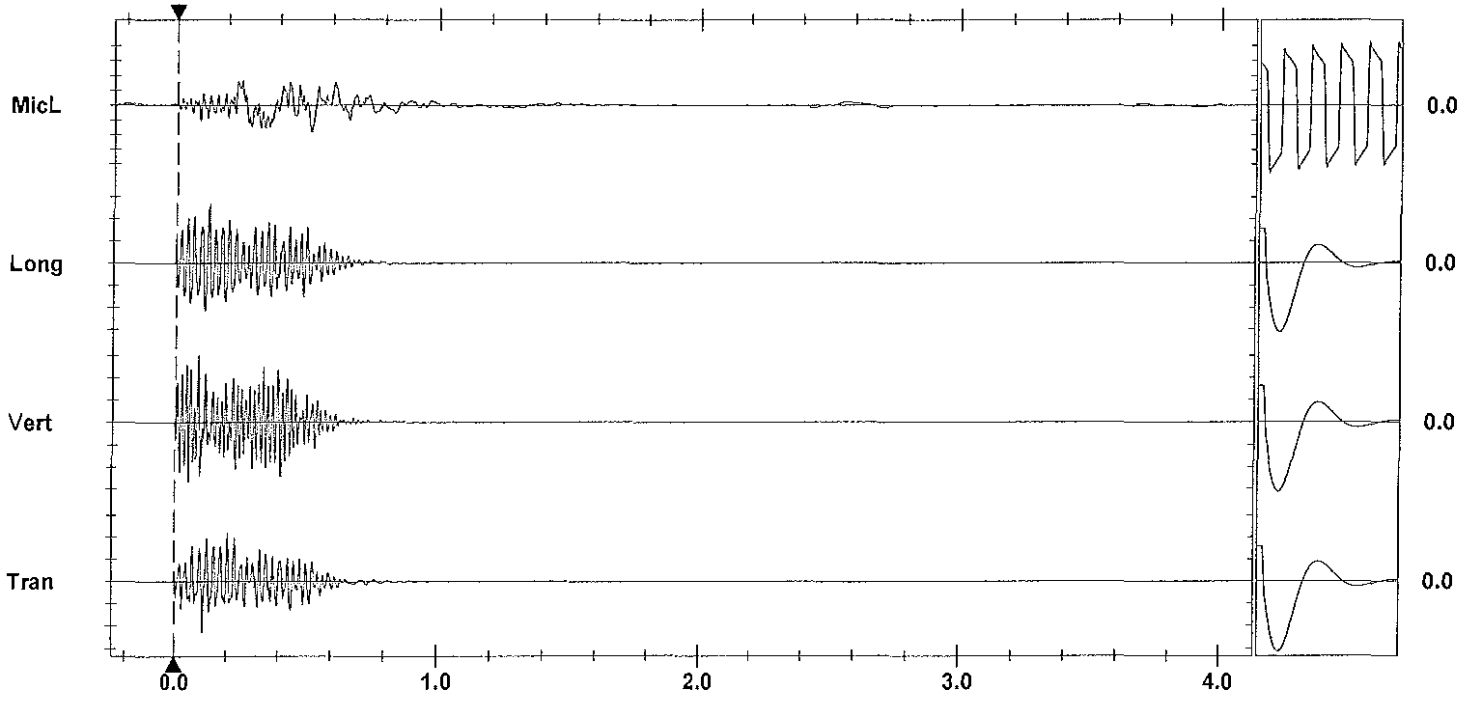
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00185 psi(L) at 0.516 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 575 mv)

	Tran	Vert	Long	
PPV	0.231	0.303	0.266	in/s
ZC Freq	37	51	43	Hz
Time (Rel. to Trig)	0.110	0.091	0.128	sec
Peak Acceleration	0.287	0.346	0.280	g
Peak Displacement	0.00081	0.00092	0.00105	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.334 in/s at 0.128 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED June 13/12
ACTUAL BLAST DATE June 13/12 10:27AM
BLAST # MW-0249

HIGHWAY# 97
BLAST LOCATION AT: STN 128+77 - 128+84 ES (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot omitted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 136 (m)

TOTAL NUMBER OF HOLES 50/L / 3 BUFFER / 3 STAG / 15 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 200 (kg)
DELAY TYPE AND LENGTH 25 (ms)

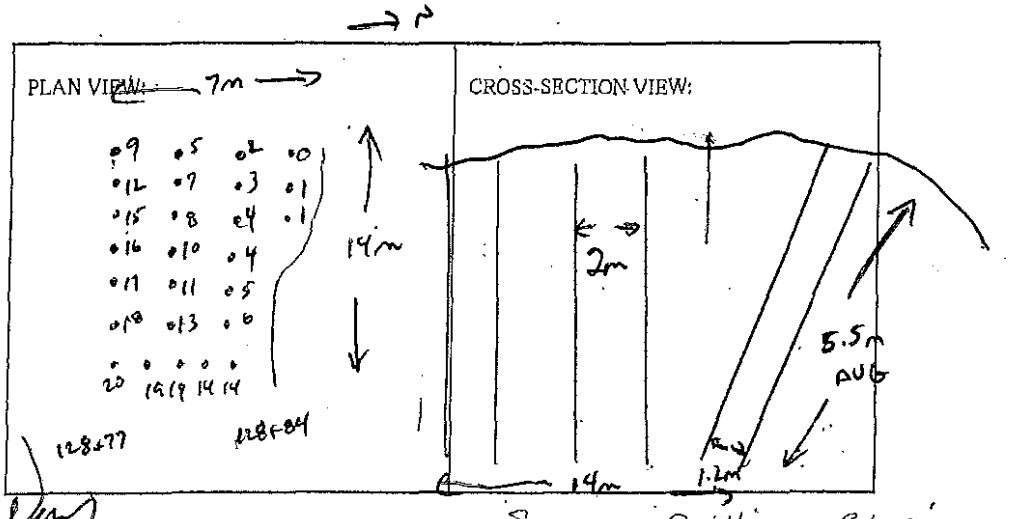
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HBB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD MISSION RD – 1.10 ips / 30Hz
" @ 13167 Cliffstone Crt – 0.13 ips / 32Hz
" @ 13093 Cliffstone Crt – 0.30 ips / 32Hz

Prod Holes – 3'-8' ANFO + 1 CART 1½"x16" DYNAMITE PRIMER

Buffer Holes – 3-4 CART 2"x16" BLASTEX + 1 CART 1½"x16" DYNAMITE PRIMER

Stab Holes – 1'-2' ANFO + 0.5 CART 1½"x16" DYNAMITE PRIMER

B/L Holes – 1 CART 2x16 DYNAMITE + 2000 g. deck cord to 4' collar.

Instantel

Event Report

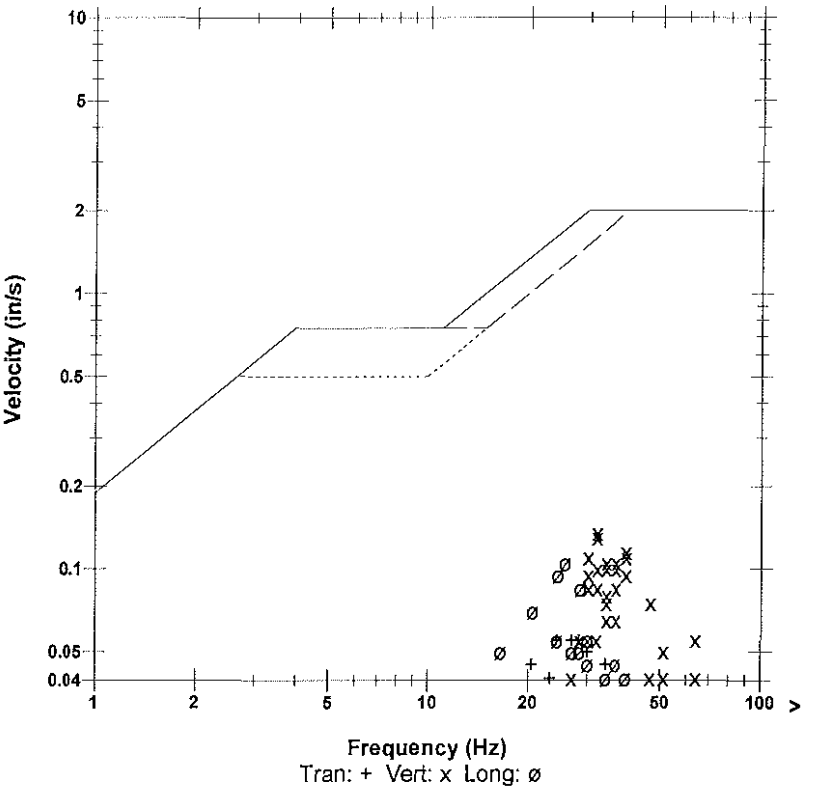
Date/Time	Long at 10:27:44 June 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBPM.E80

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

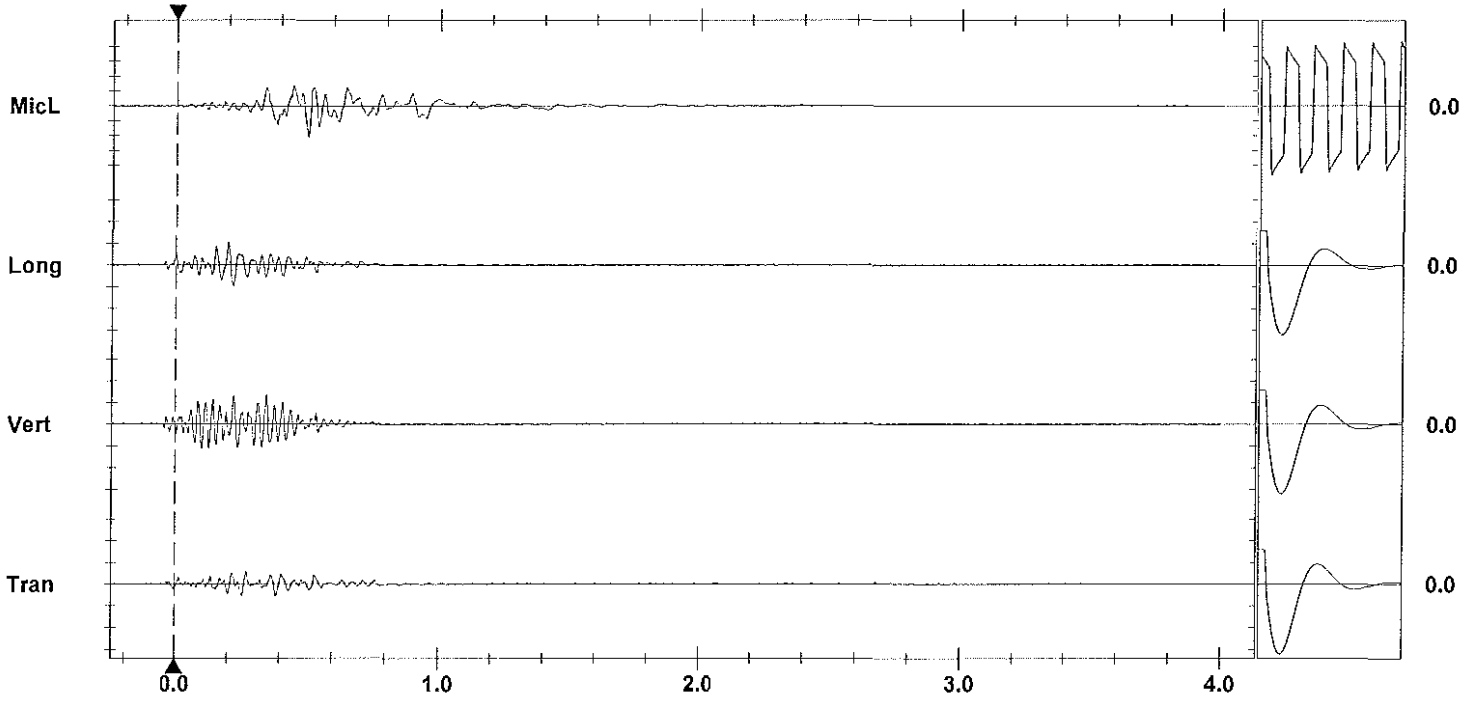
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00207 psi(L) at 0.503 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 631 mv)

	Tran	Vert	Long	
PPV	0.0550	0.135	0.105	in/s
ZC Freq	24	32	26	Hz
Time (Rel. to Trig)	0.260	0.351	0.200	sec
Peak Acceleration	0.0265	0.0928	0.0530	g
Peak Displacement	0.00032	0.00061	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.162 in/s at 0.223 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶---◀

Printed: June 16, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 10:27:42 June 13, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBPM.E60

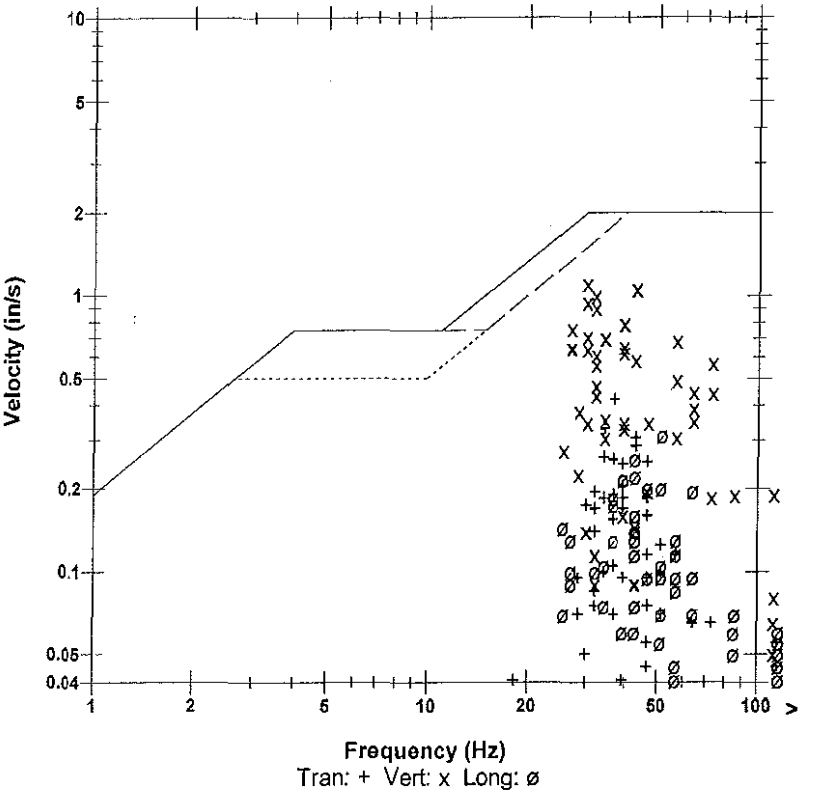
Notes

Location: 13050 old misson rd
sandbagged on the cement walkway at corner of house north entrance
General:

Extended Notes

Post Event Notes

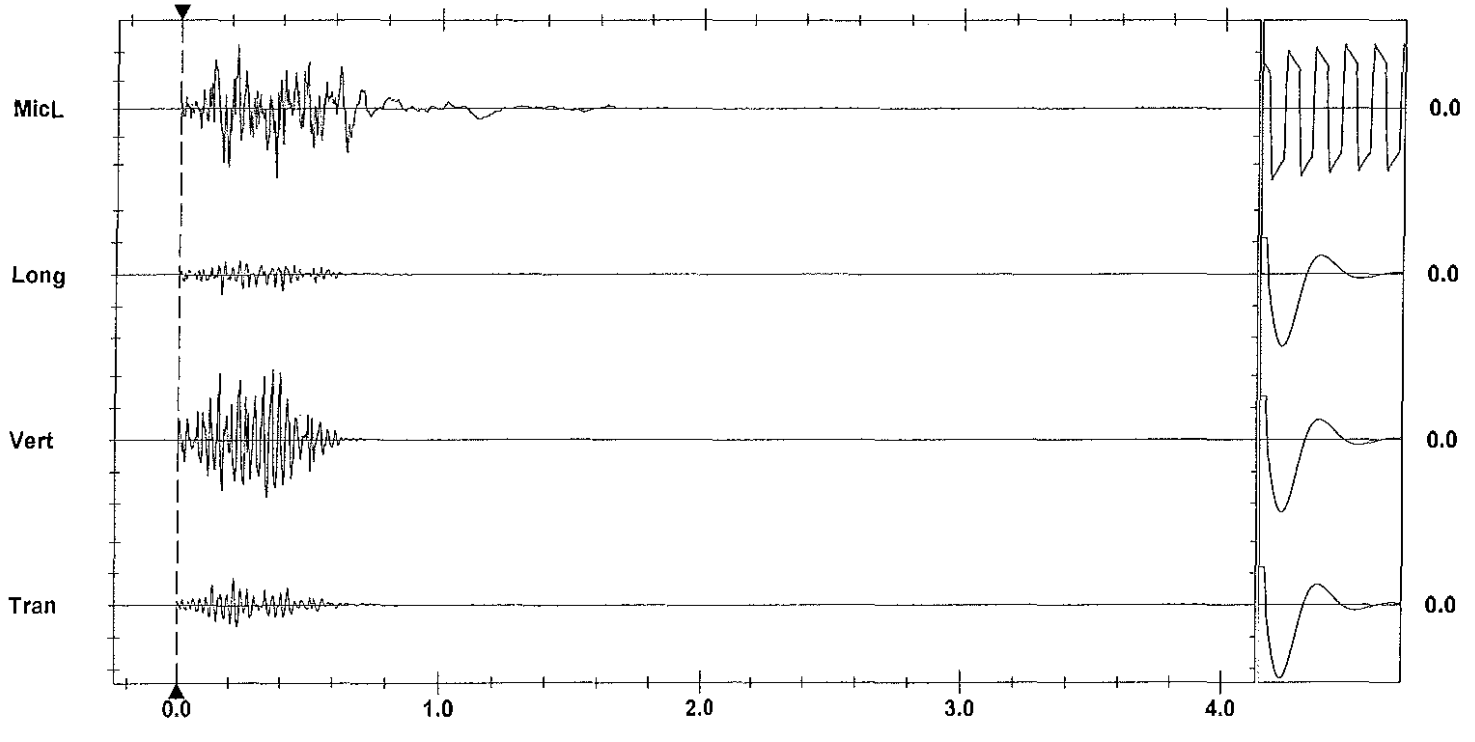
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.420	1.10	0.310	in/s
ZC Freq	37	30	51	Hz
Time (Rel. to Trig)	0.221	0.367	0.168	sec
Peak Acceleration	0.292	0.901	0.212	g
Peak Displacement	0.00165	0.00488	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Microphone Linear Weighting
PSPL 0.00500 psi(L) at 0.374 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 610 mv)

Peak Vector Sum 1.10 in/s at 0.367 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 10:27:55 June 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBPM.EJ0
Job Number:	1		

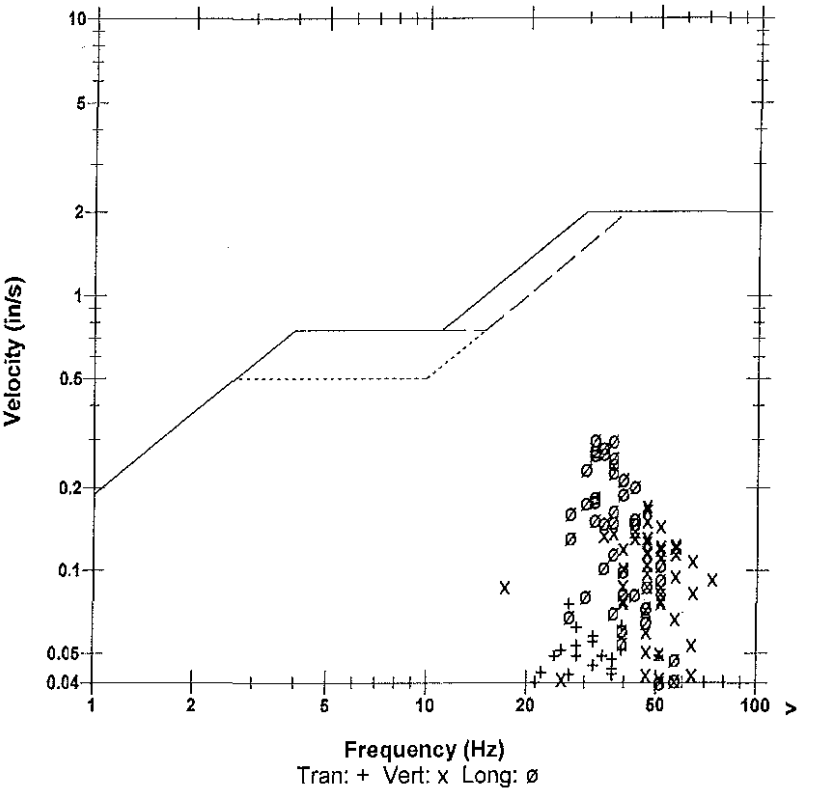
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

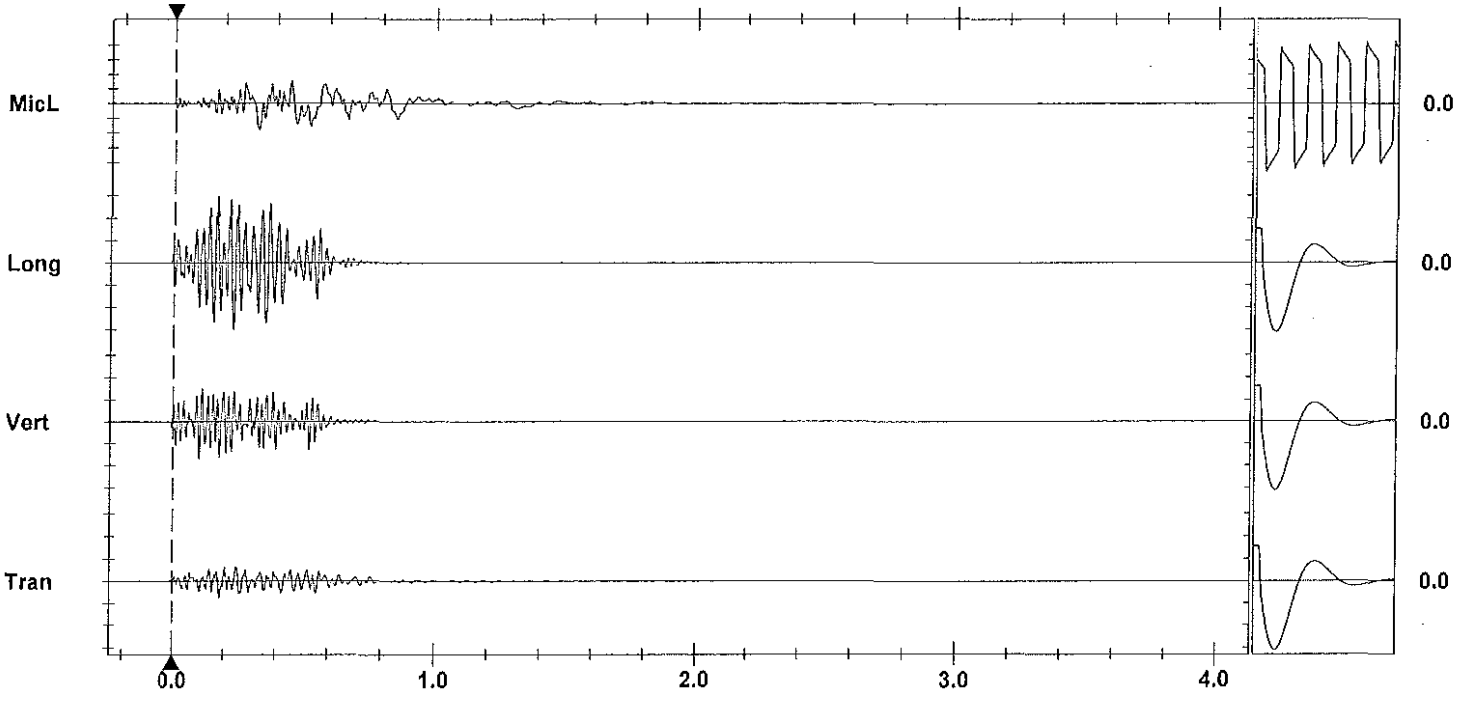
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.328 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 638 mv)

	Tran	Vert	Long	
PPV	0.0750	0.172	0.300	in/s
ZC Freq	27	47	32	Hz
Time (Rel. to Trig)	0.187	0.105	0.235	sec
Peak Acceleration	0.0530	0.139	0.191	g
Peak Displacement	0.00034	0.00061	0.00149	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.303 in/s at 0.235 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 16, 2012 07:8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 13/12
ACTUAL BLAST DATE June 13/12 3:03 PM
BLAST # MW-0250

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+27 - 128+89 clk (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot metred

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.7 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

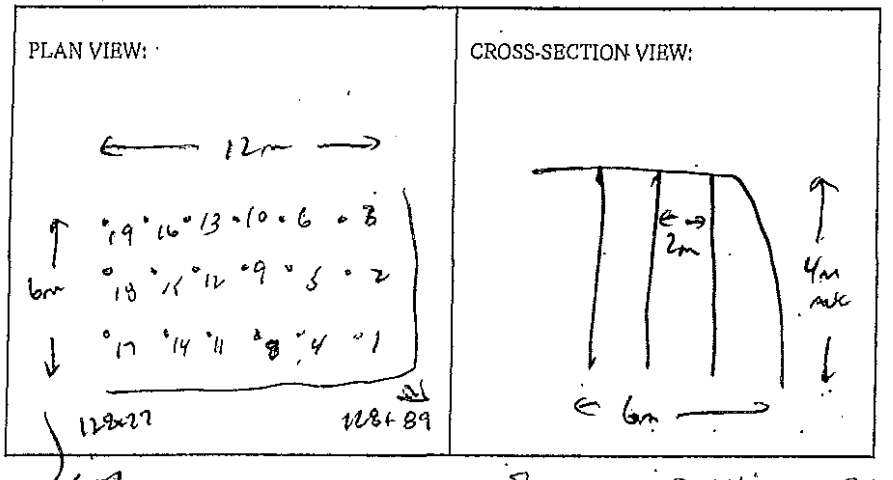
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph 13050 000 mission Rd - 0.39 ips/43 Hz
@ 13167 Cliffstonement - 0.14 ips/37 Hz
@ 13093 Cliffstone crt - 0.26 ips/34 Hz

2'-6' ANFO Per hole + 1 each 1½" x 16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Long at 15:03:36 June 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBPZ.600

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

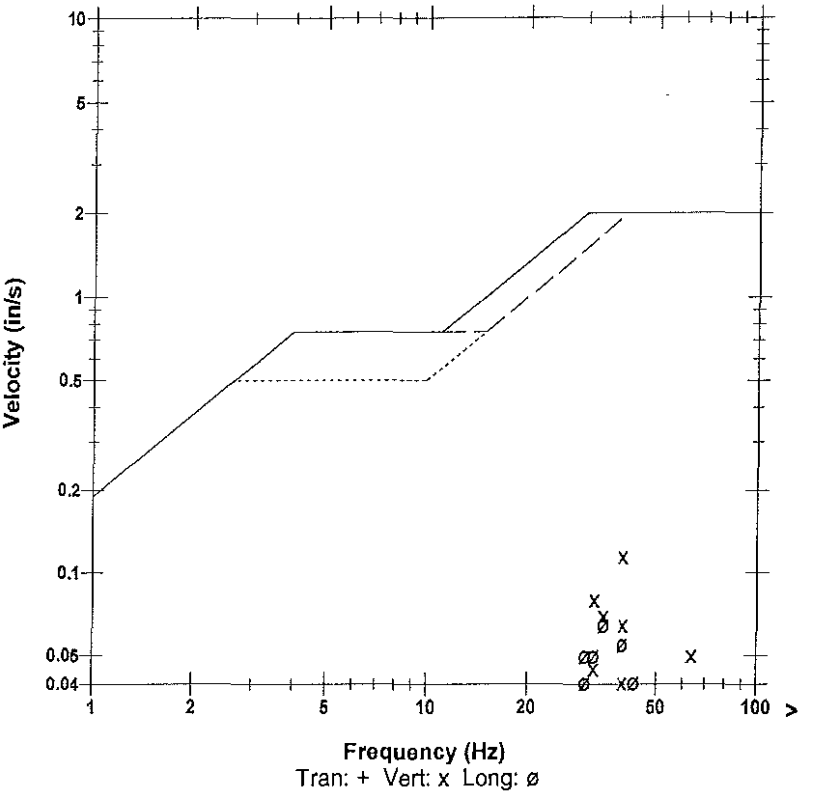
Extended Notes

Post Event Notes

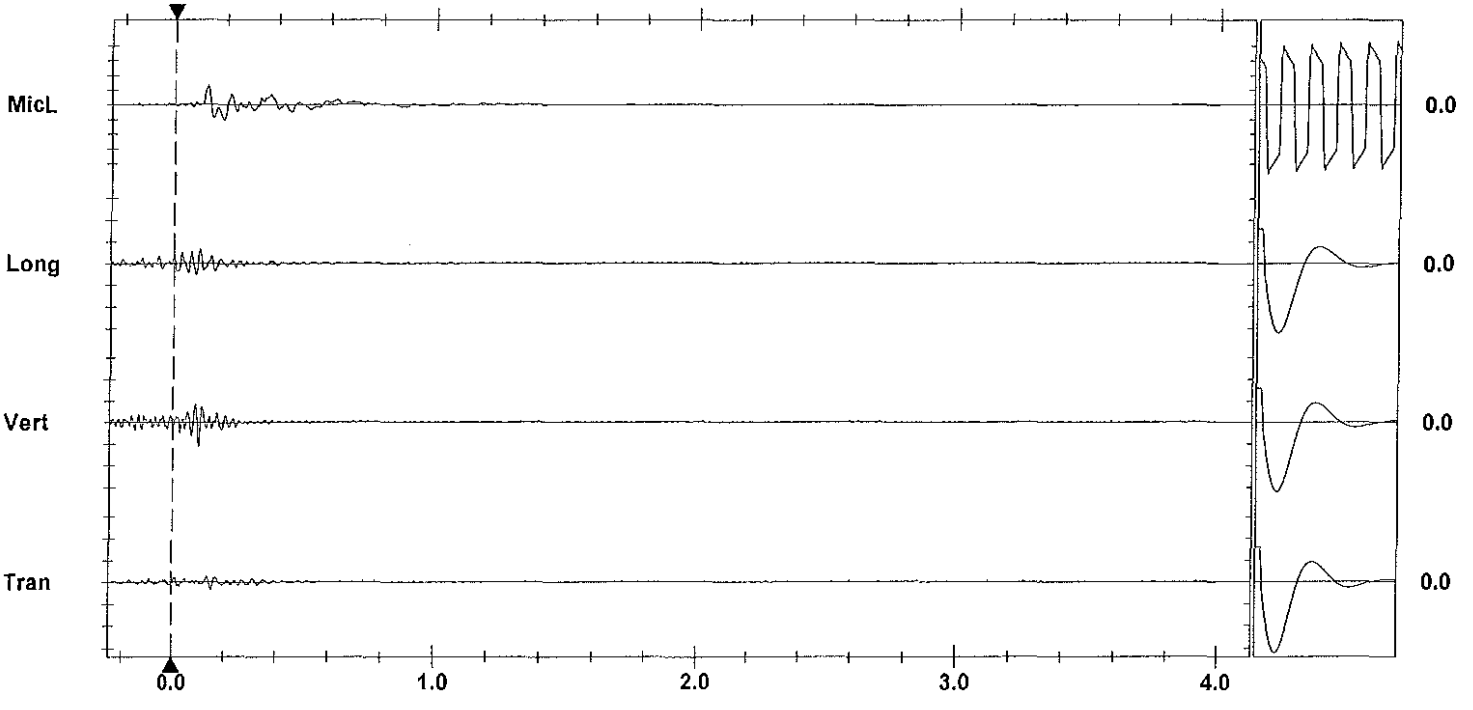
Microphone Linear Weighting
PSPL 0.00127 psi(L) at 0.129 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.0350	0.115	0.0650	in/s
ZC Freq	37	39	34	Hz
Time (Rel. to Trig)	0.153	0.102	0.103	sec
Peak Acceleration	0.0265	0.0795	0.0530	g
Peak Displacement	0.00016	0.00047	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.132 in/s at 0.103 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 15:03:47 June 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBPZ.6B0
Job Number:	1		

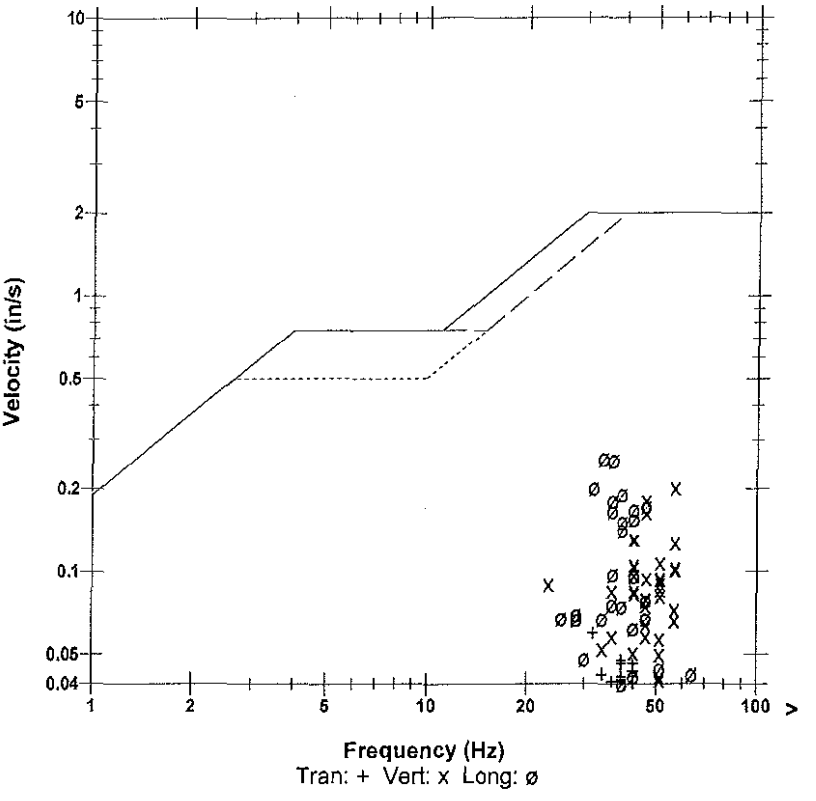
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

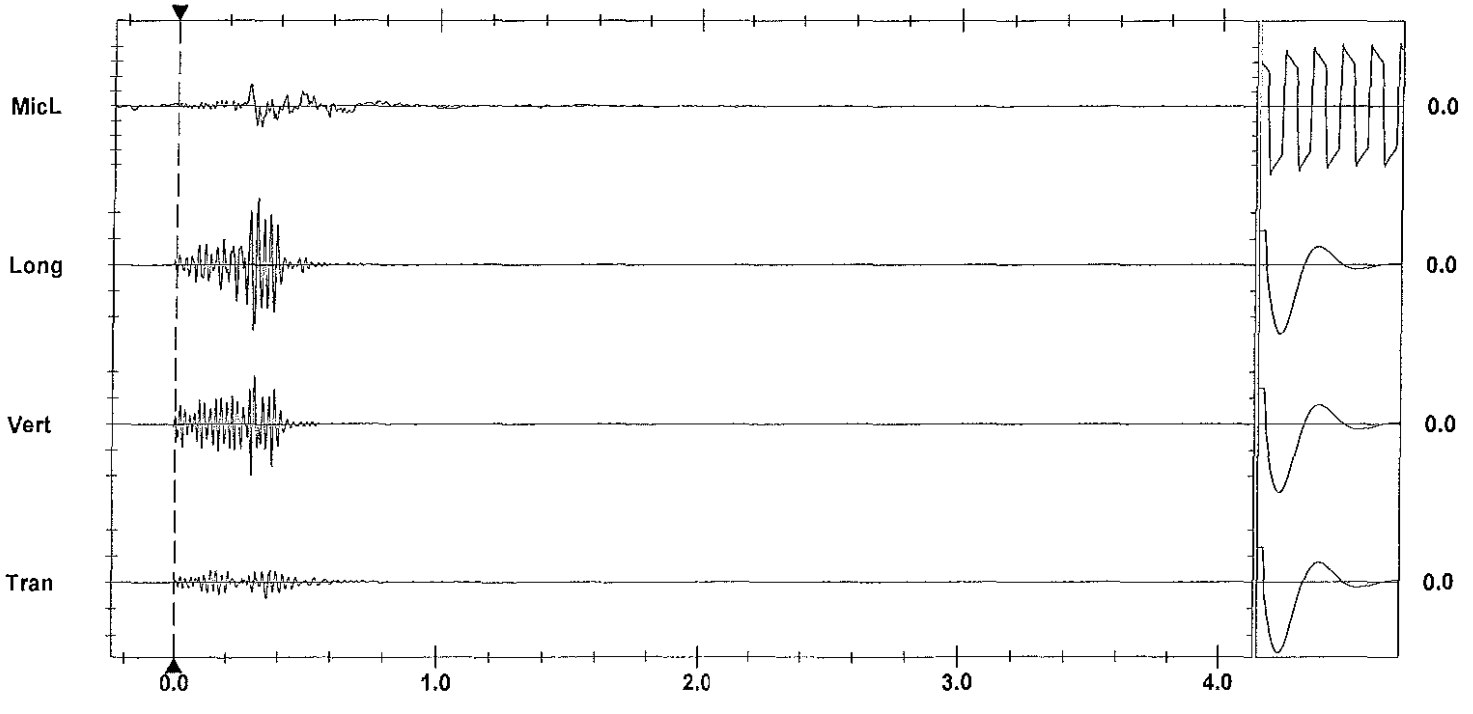
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.285 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 571 mv)

	Tran	Vert	Long	
PPV	0.0594	0.201	0.256	in/s
ZC Freq	32	57	34	Hz
Time (Rel. to Trig)	0.358	0.298	0.303	sec
Peak Acceleration	0.0414	0.174	0.157	g
Peak Displacement	0.00030	0.00064	0.00118	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.270 in/s at 0.316 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 15:03:34 June 13, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBPZ.5Y0

Notes
Location: 13050 old misson rd
sandbagged on the cement walkway at corner of house
north entrance
General:

Extended Notes

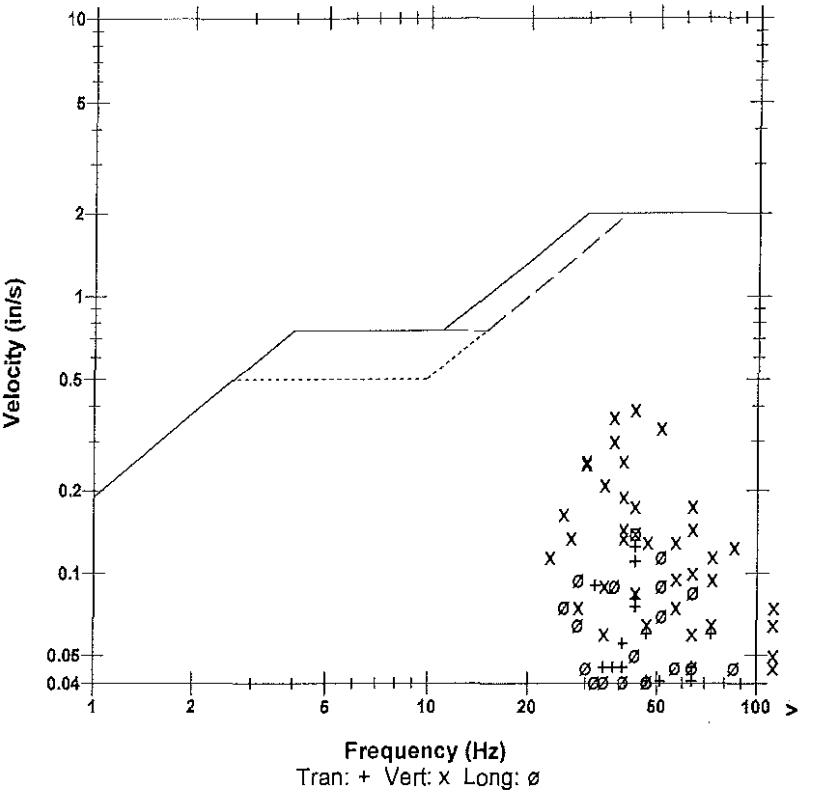
Post Event Notes

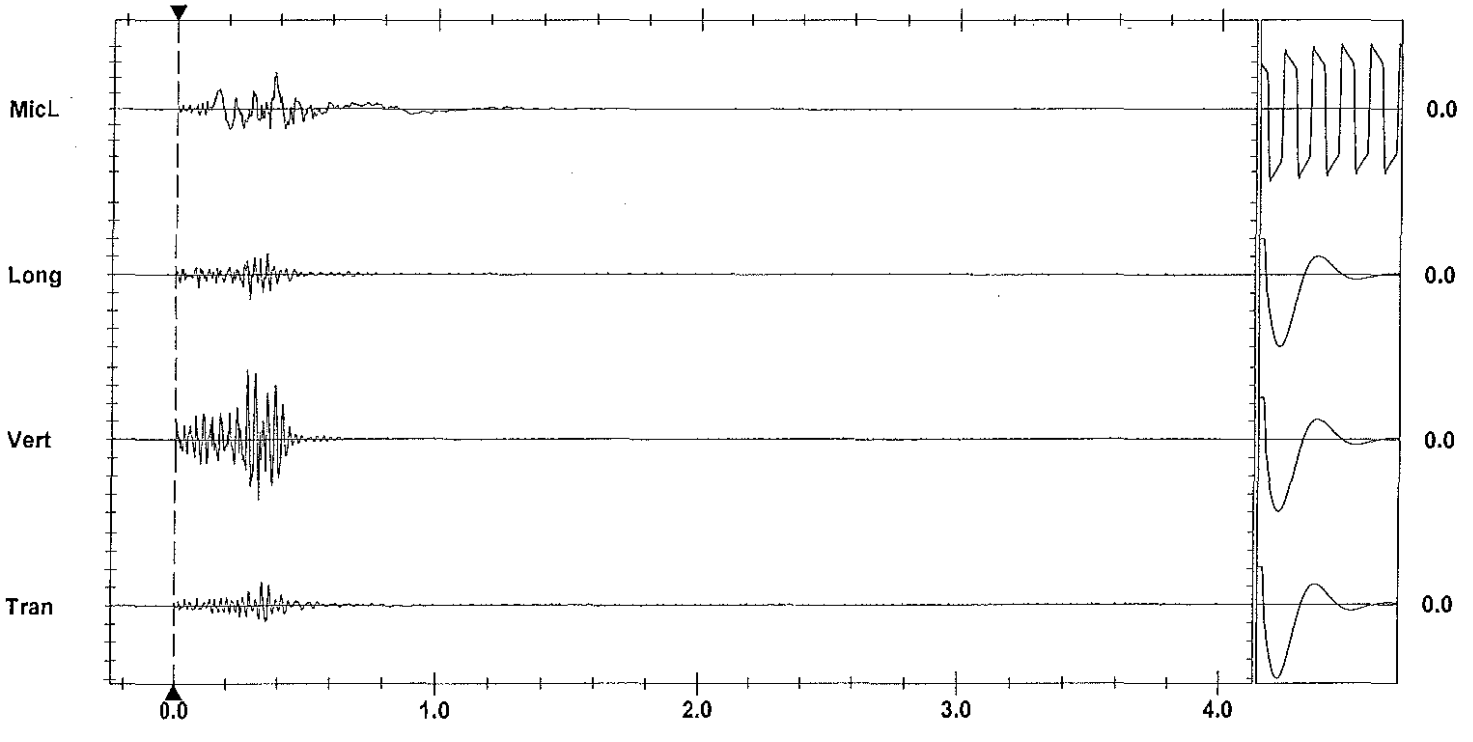
Microphone Linear Weighting
PSPL 0.00228 psi(L) at 0.382 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	0.125	0.390	0.140	in/s
ZC Freq	43	43	43	Hz
Time (Rel. to Trig)	0.339	0.279	0.290	sec
Peak Acceleration	0.119	0.358	0.106	g
Peak Displacement	0.00045	0.00159	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.398 in/s at 0.279 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21377-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 9:34AM
BLAST # MW-0251

HIGHWAY# 97
BLAST LOCATION AT: SW 128+49 - 128+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 16 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

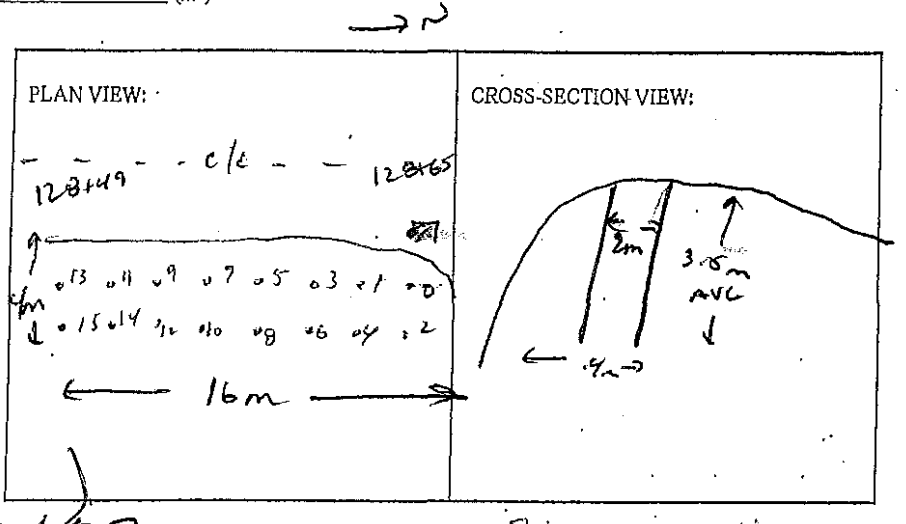
EXPLOSIVE SIZE 40 mm by 4250 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HBS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Skimmgate @ 13050 old mission RD - 0.37ips/39HZ
" @ 13167 cliffstone crt - 0.090ips/34HZ
" @ 13093 cliffstone crt - 0.19ips/57HZ

2'-5' ANFO + 0.5 CHEZ 1½"x16" DYNAMITE PRIMERS

Instantel

Event Report

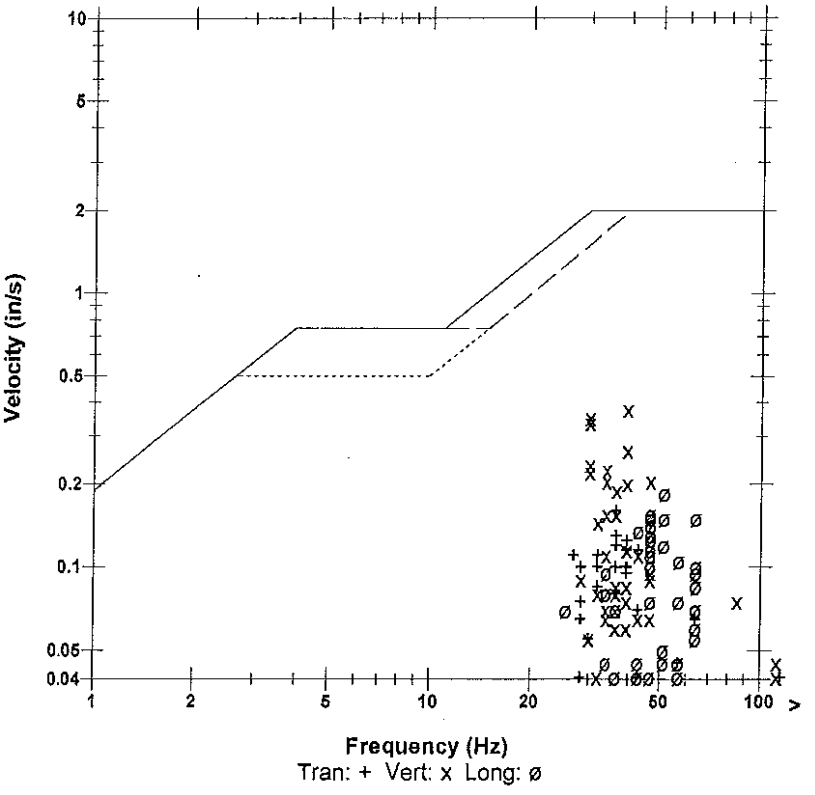
Date/Time	Long at 09:34:29 June 14, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBRE.LH0

Notes
Location: 13050 old misson rd
sandbagged cn the cement walkway at corner of house
north entrance
General:

Extended Notes

Post Event Notes

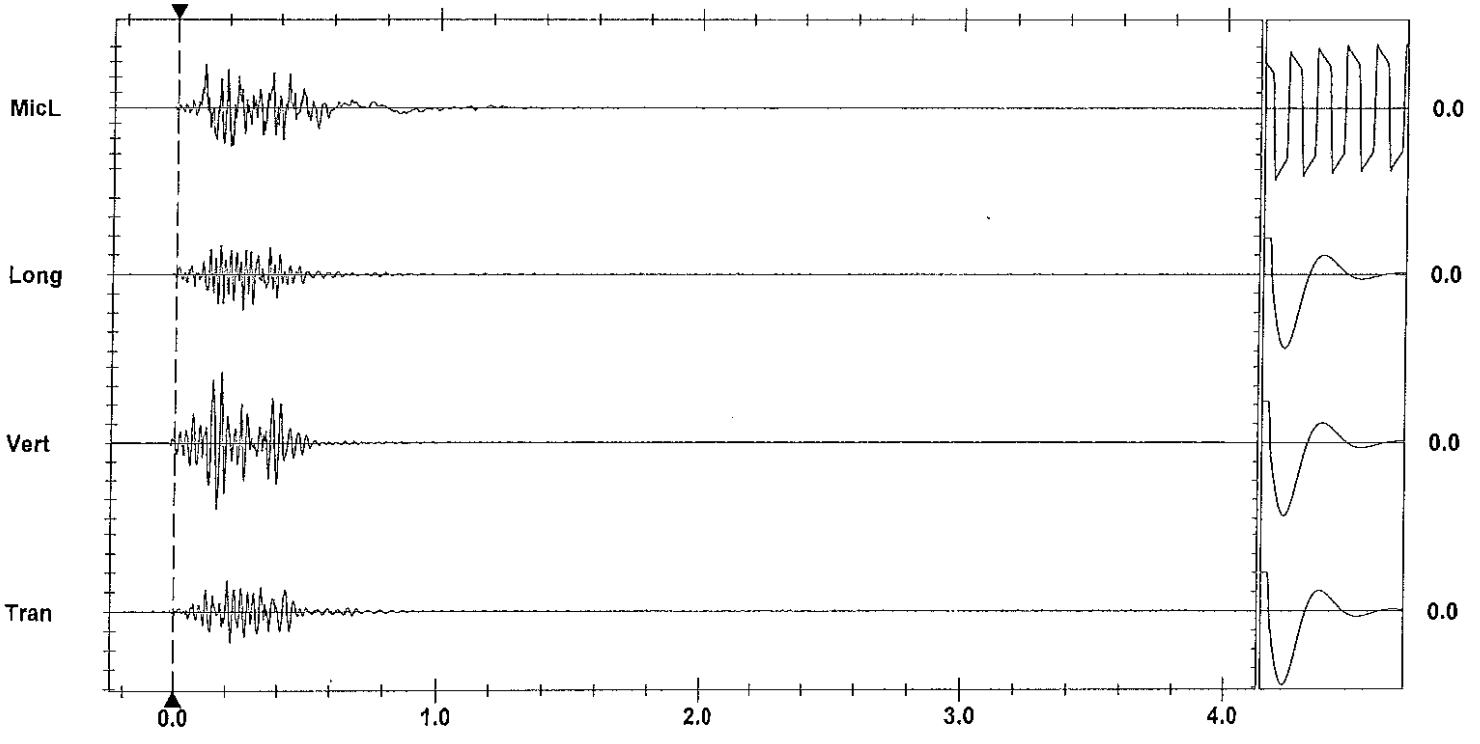
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00283 psi(L) at 0.106 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.160	0.375	0.185	in/s
ZC Freq	37	39	51	Hz
Time (Rel. to Trig)	0.207	0.180	0.259	sec
Peak Acceleration	0.106	0.199	0.133	g
Peak Displacement	0.00066	0.00167	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.396 in/s at 0.180 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: June 16, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

Date/Time	Long at 09:34:42 June 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBRE.LU0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

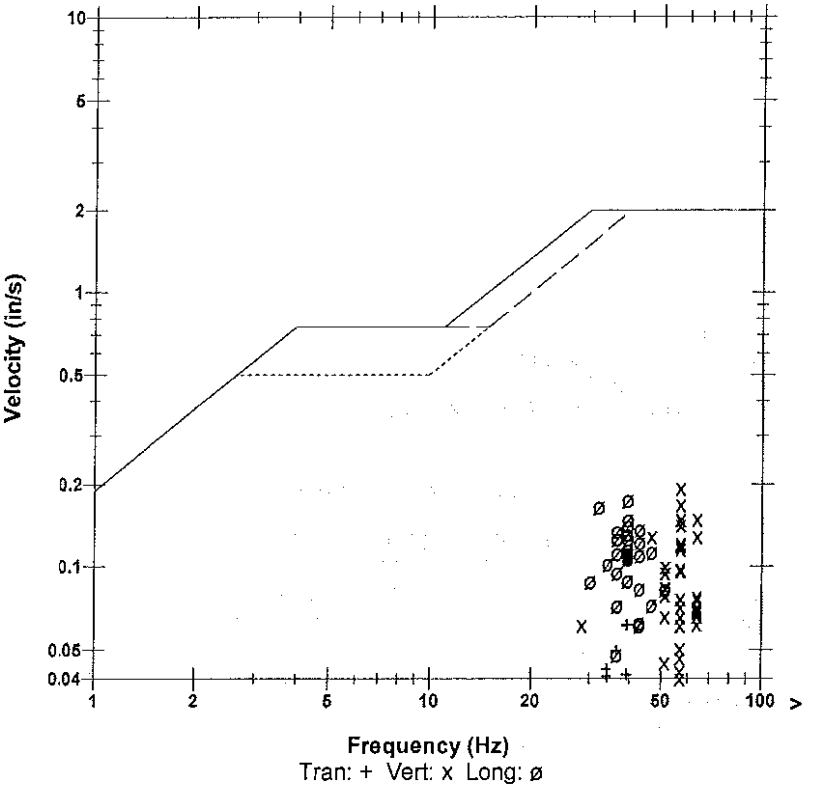
Post Event Notes

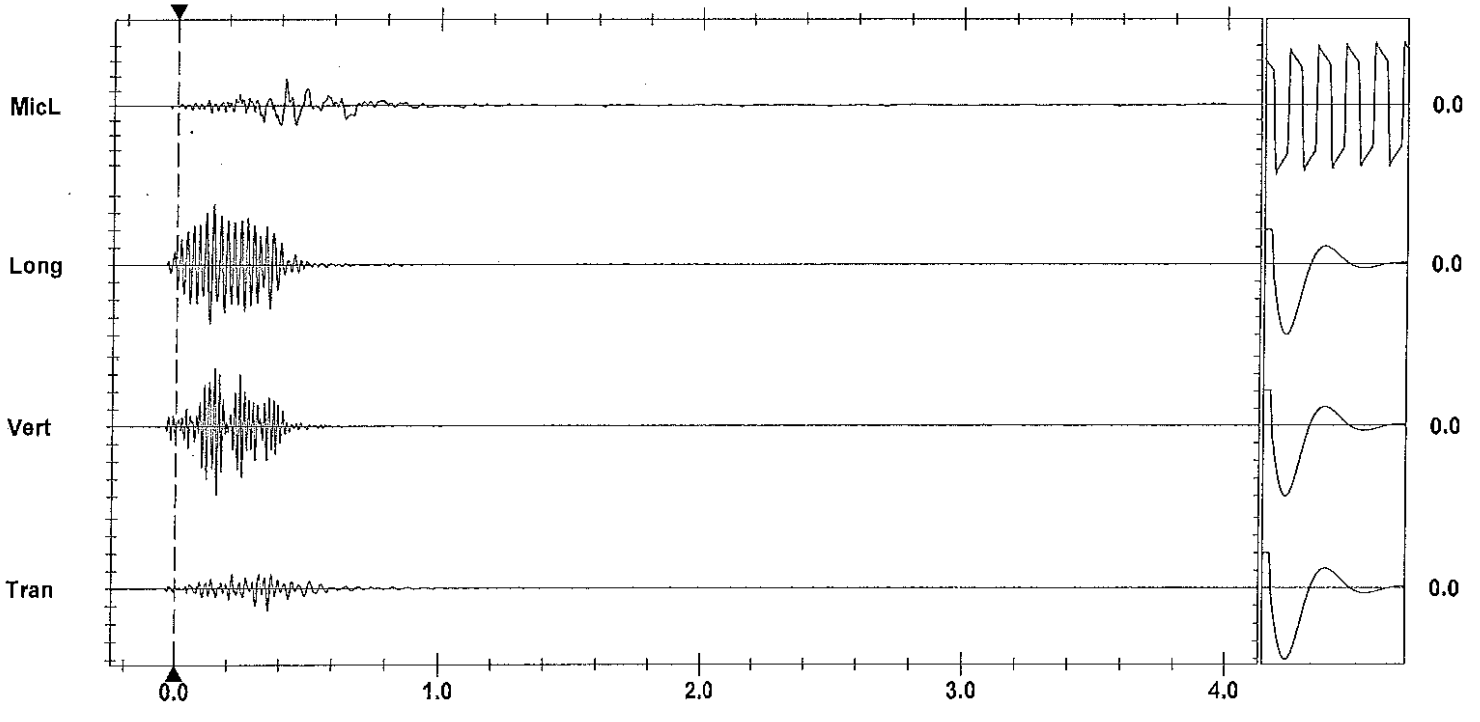
Microphone Linear Weighting
PSPL 0.00181 psi(L) at 0.416 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 606 mv)

	Tran	Vert	Long	
PPV	0.0612	0.194	0.176	in/s
ZC Freq	39	57	39	Hz
Time (Rel. to Trig)	0.359	0.158	0.143	sec
Peak Acceleration	0.0348	0.194	0.106	g
Peak Displacement	0.00024	0.00055	0.00081	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.216 in/s at 0.158 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

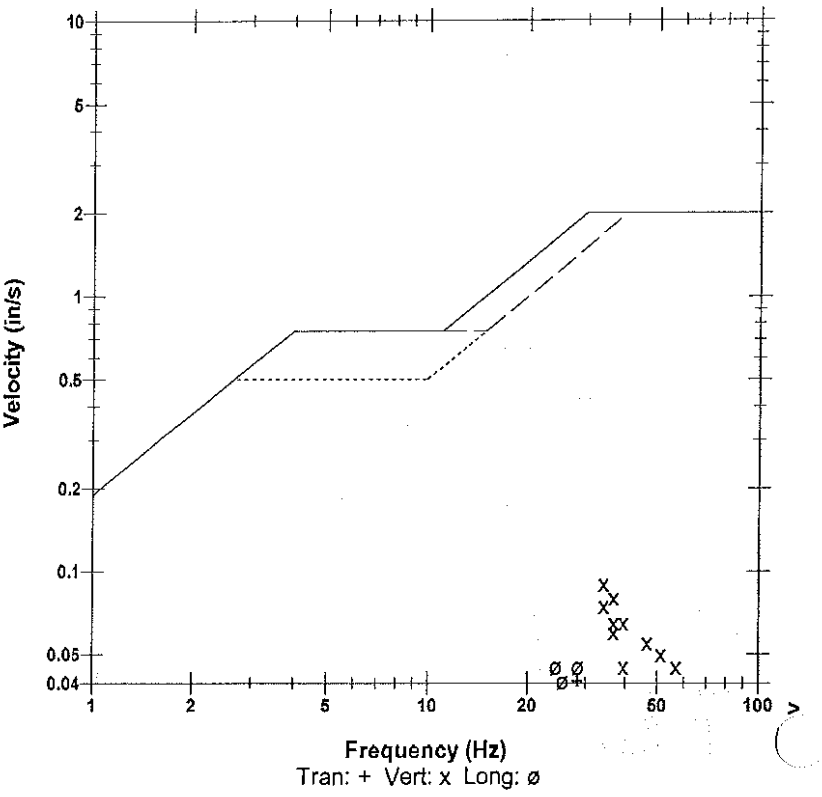
Date/Time	Vert at 09:34:30 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBRE.LI0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

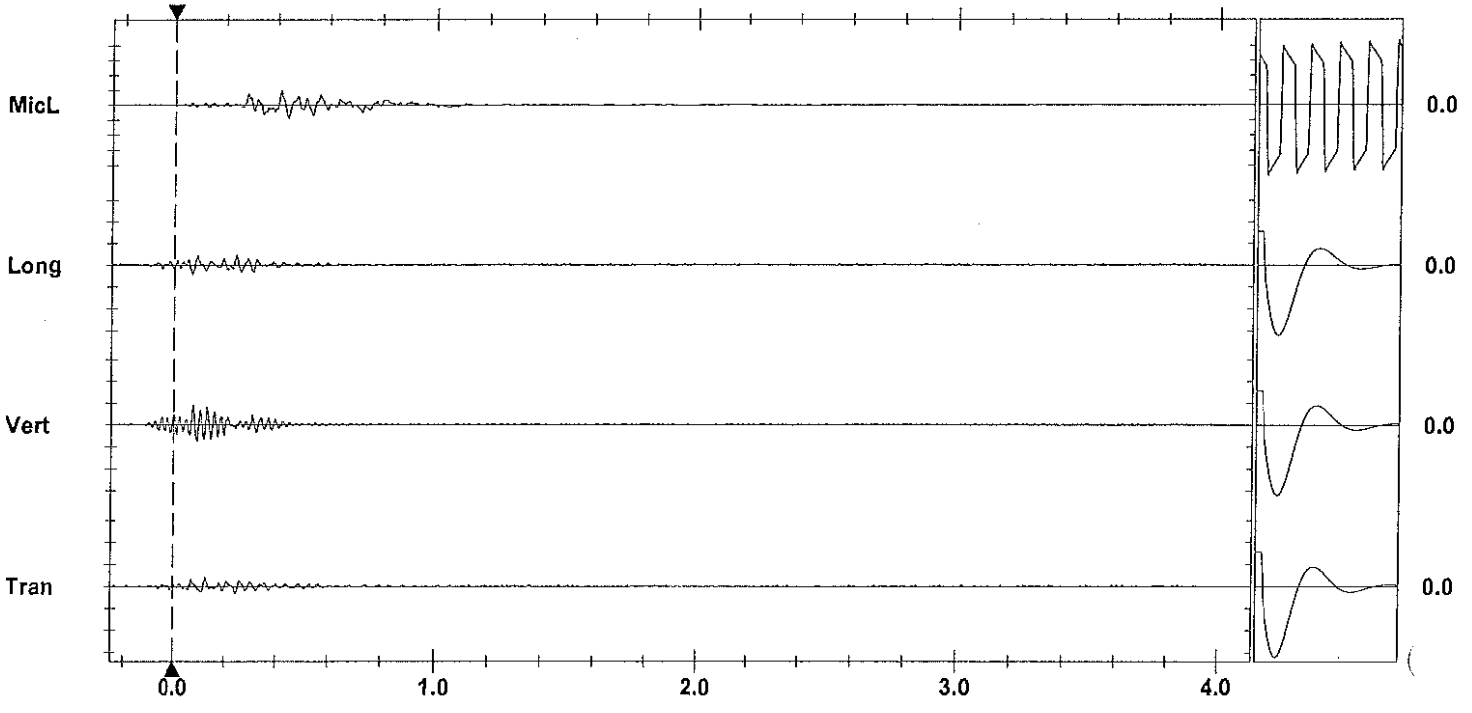
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.411 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0900	0.0450	in/s
ZC Freq	28	34	24	Hz
Time (Rel. to Trig)	0.128	0.078	0.071	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00021	0.00039	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0943 in/s at 0.078 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 09:34:30 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBRE.LI0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

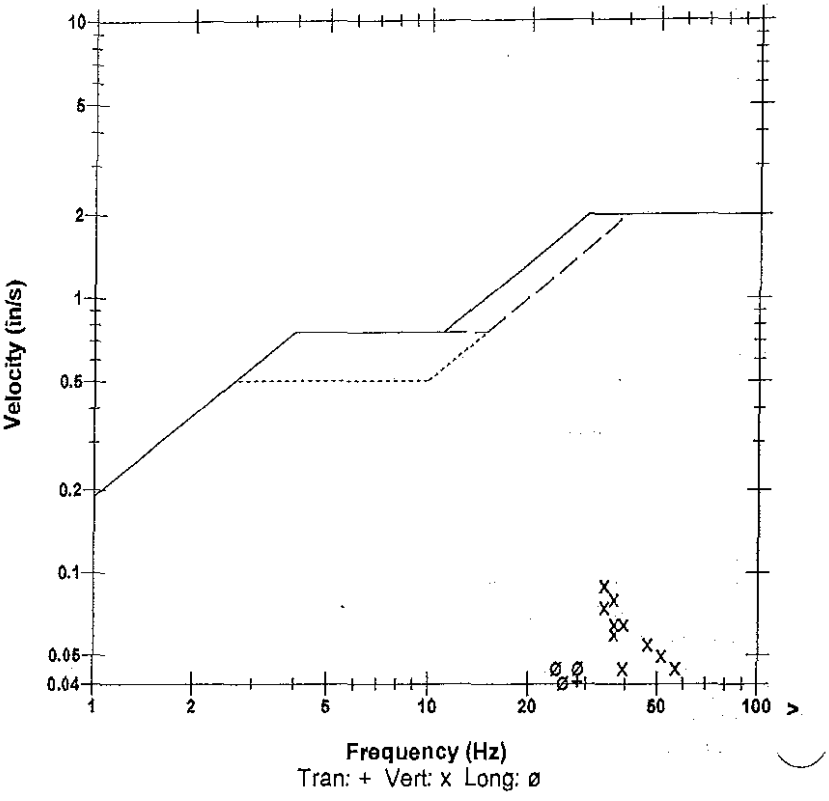
Extended Notes

Post Event Notes

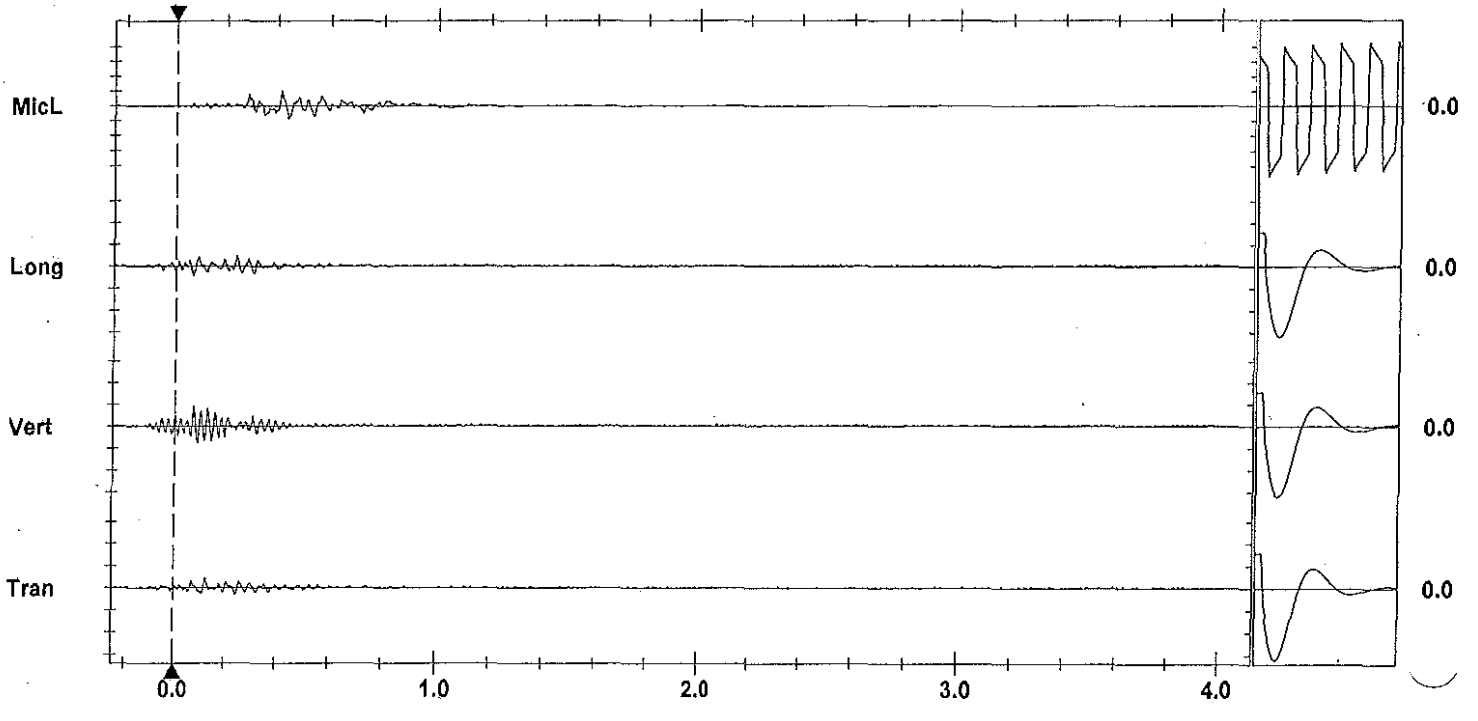
Microphone Linear Weighting
PSPL 0.00098 psi(L) at 0.411 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0900	0.0450	in/s
ZC Freq	28	34	24	Hz
Time (Rel. to Trig)	0.128	0.078	0.071	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00021	0.00039	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0943 in/s at 0.078 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 16, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834189

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 11:41 AM
BLAST # MW-0252

HIGHWAY# 97
BLAST LOCATION AT: STN 128+76 - 128+80 (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot melted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 11 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 105
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 4600 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

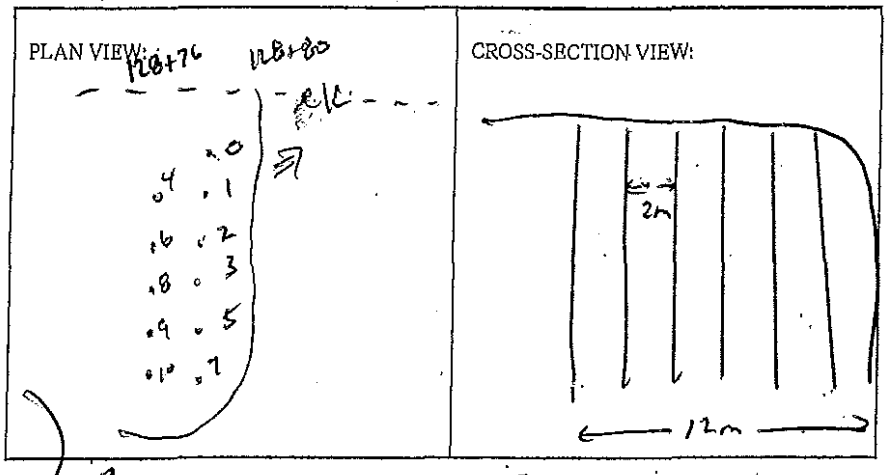
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.63 ips/34 Hz
" @ 13167 Cliffstone Crt - 0.18 ips/32 Hz
" @ 13093 Cliffstone Crt - 0.31 ips/34 Hz

3'-6' ANFO PER HOLE + 0.5 CWT 1½" x 16" DYNAMITE PRIMER.

Date/Time	Vert at 11:41:56 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBRK.HW0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

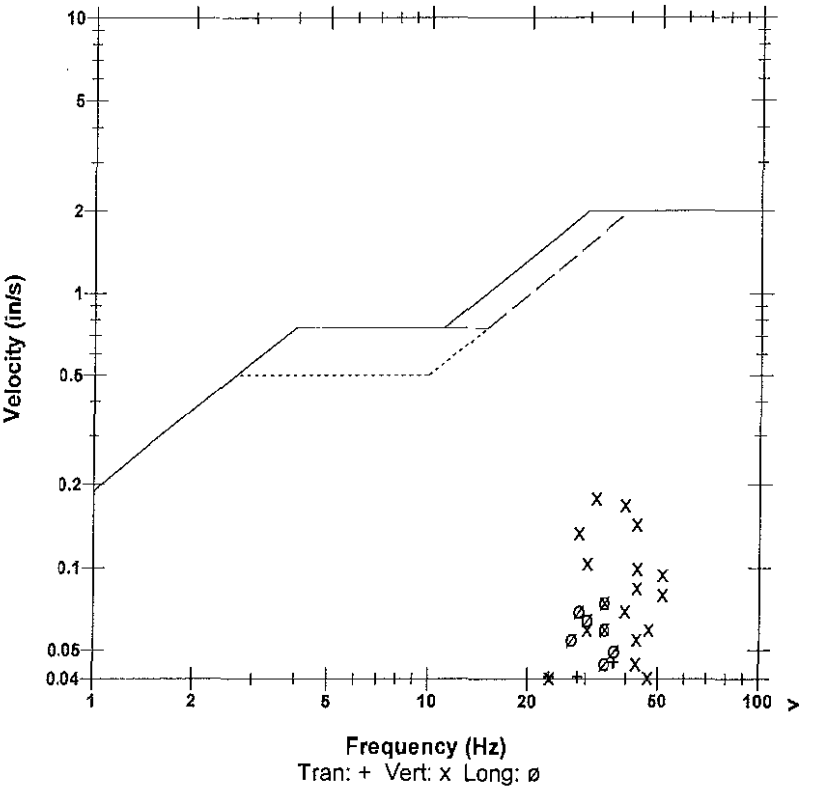
Post Event Notes

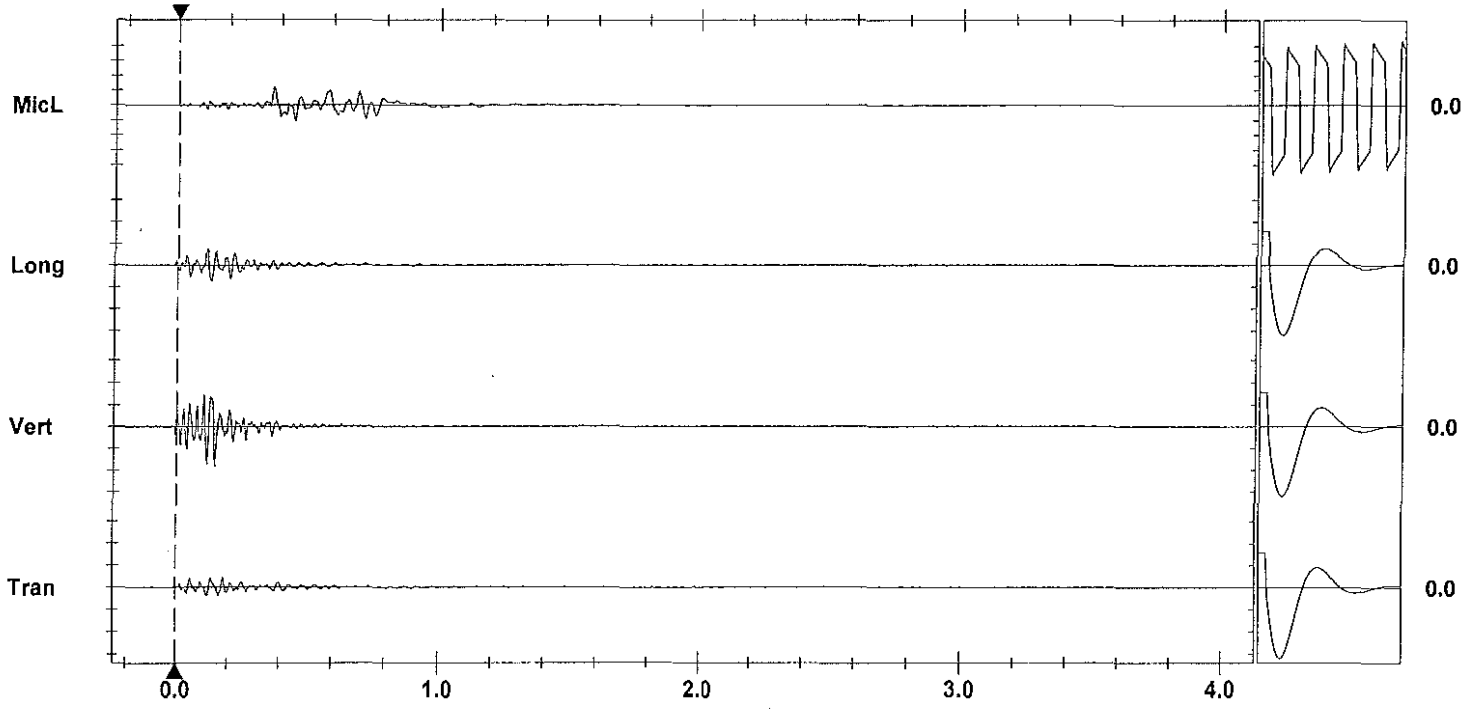
Microphone Linear Weighting
PSPL 0.00120 psi(L) at 0.369 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.0450	0.180	0.0750	in/s
ZC Freq	37	32	34	Hz
Time (Rel. to Trig)	0.185	0.149	0.115	sec
Peak Acceleration	0.0265	0.146	0.0530	g
Peak Displacement	0.00025	0.00092	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.2	

Peak Vector Sum 0.192 in/s at 0.149 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:42:08 June 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBRK.I80
Job Number:	1		

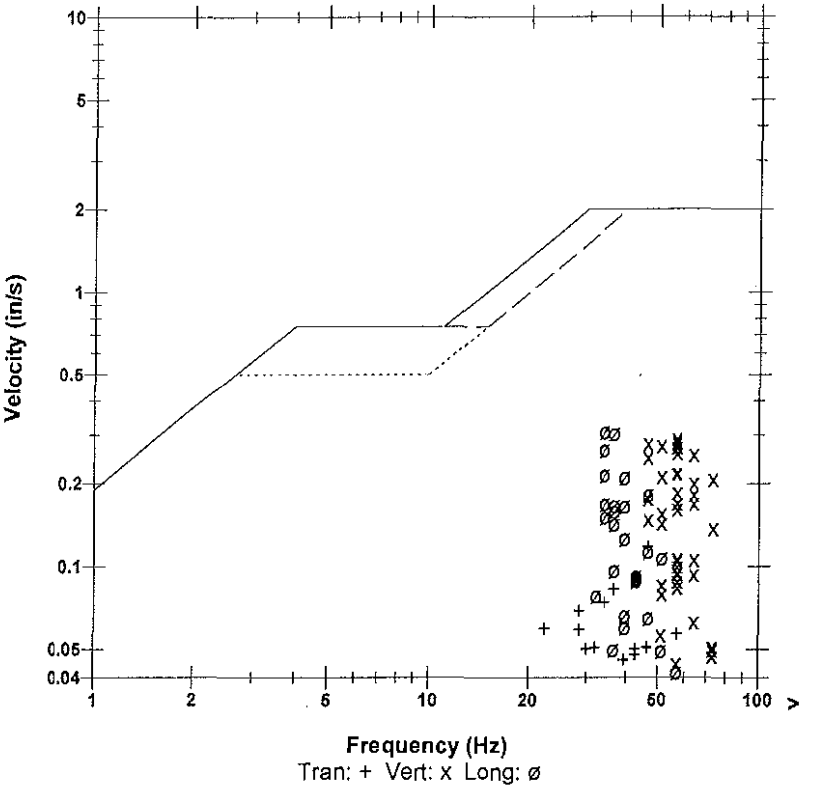
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

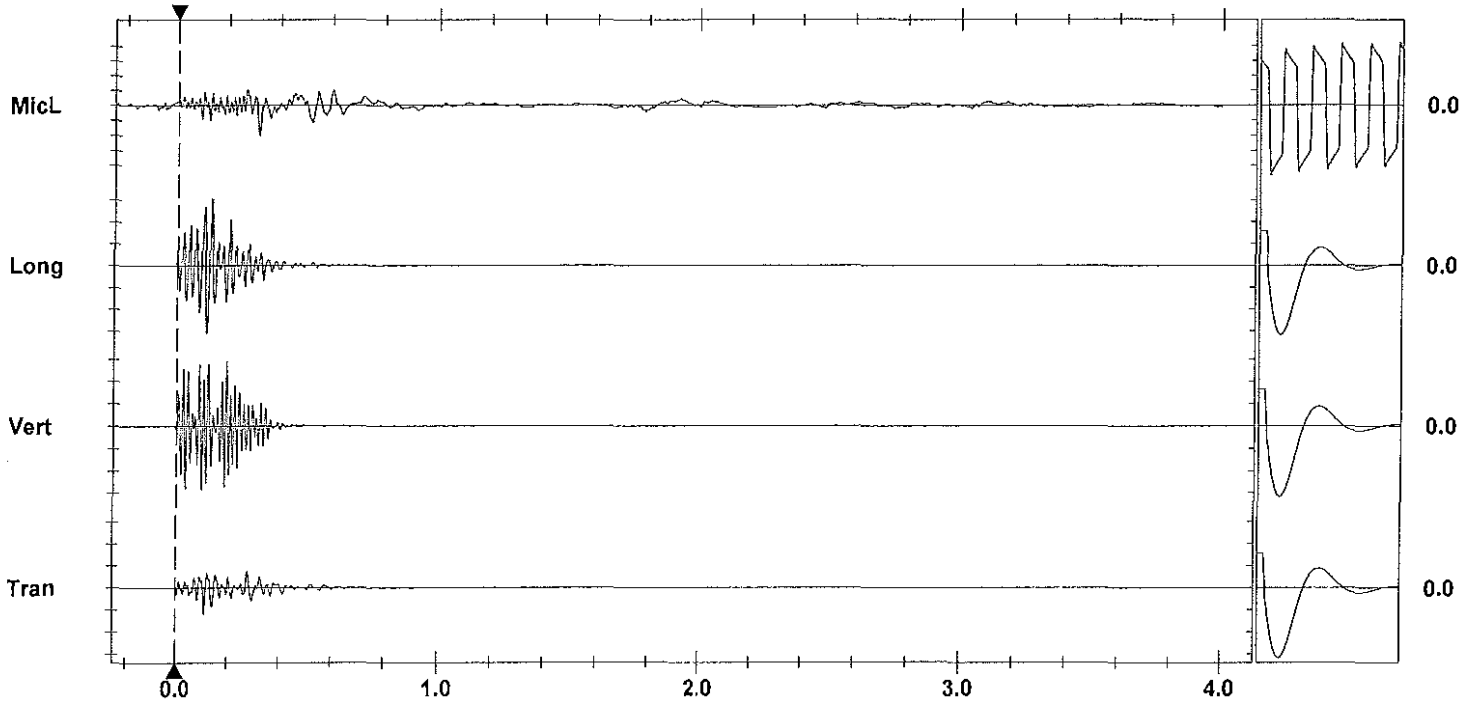
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00199 psi(L) at 0.316 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 615 mv)

	Tran	Vert	Long	
PPV	0.118	0.291	0.307	in/s
ZC Freq	47	57	34	Hz
Time (Rel. to Trig)	0.113	0.195	0.115	sec
Peak Acceleration	0.0862	0.290	0.326	g
Peak Displacement	0.00041	0.00096	0.00144	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.407 in/s at 0.115 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 11:41:55 June 14, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBRK.HV0

Notes
Location: 13050 old misson rd
sandbagged on the cement walkway at corner of house
north entrance
General:

Extended Notes

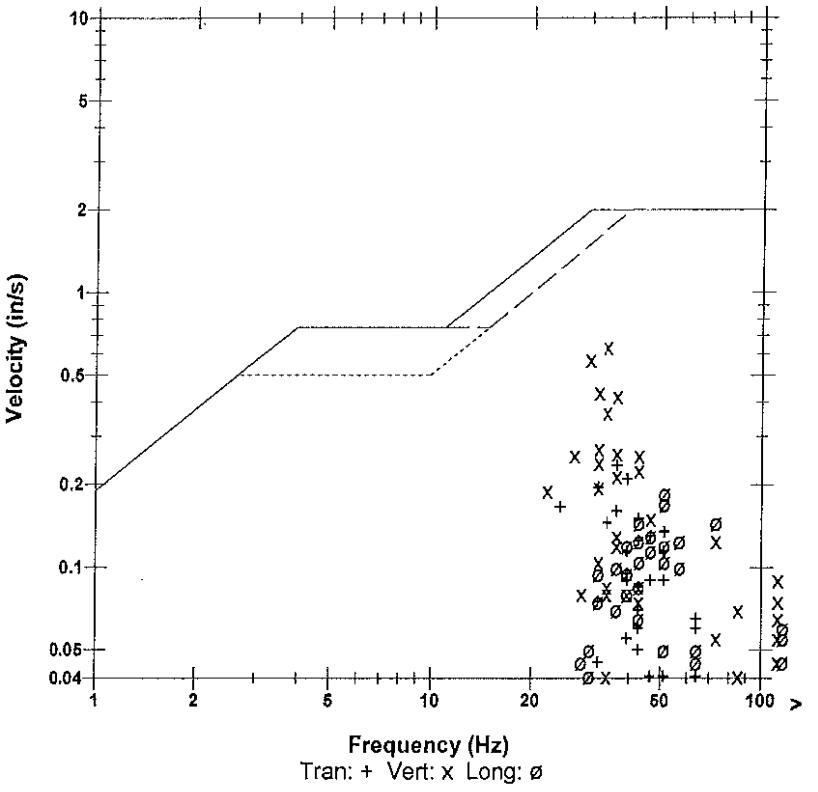
Post Event Notes

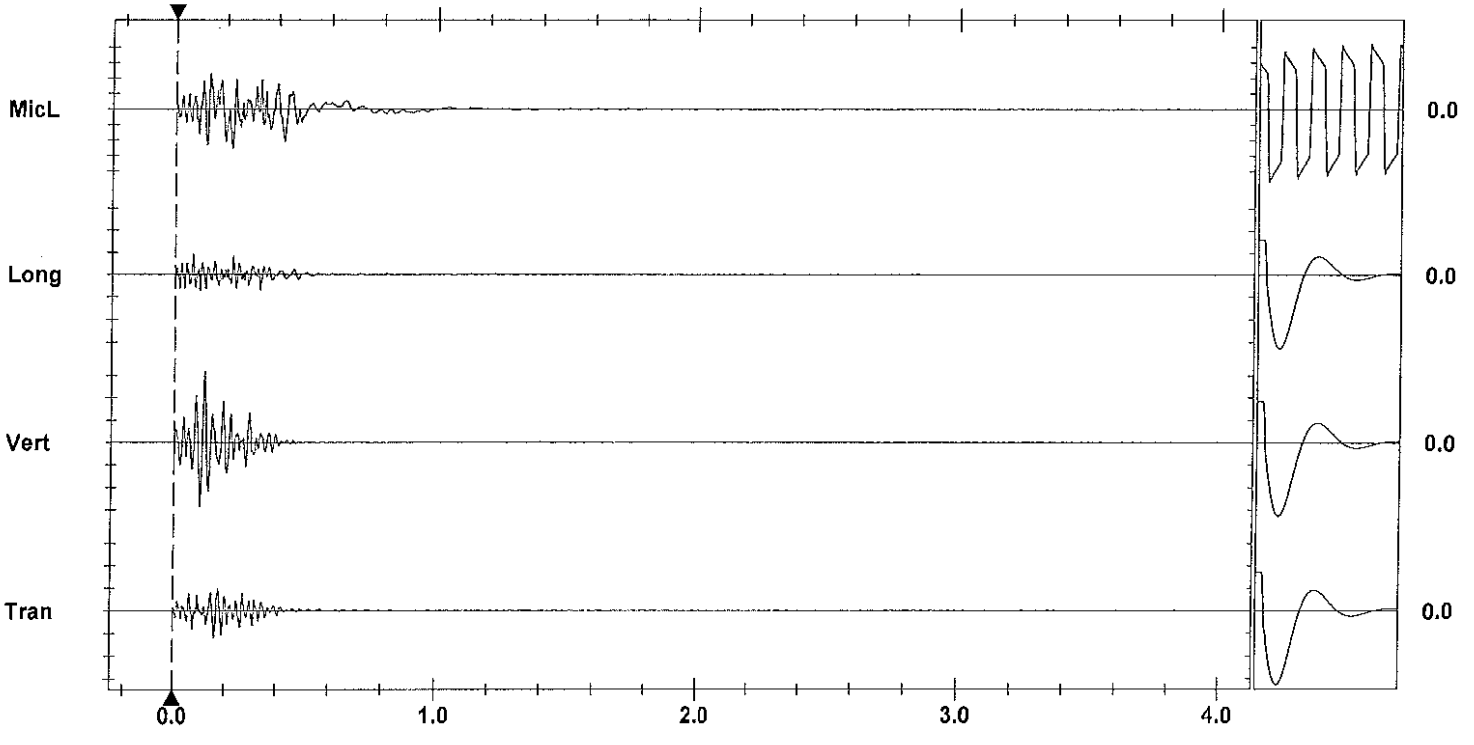
Microphone Linear Weighting
PSPL 0.00254 psi(L) at 0.221 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.235	0.635	0.185	in/s
ZC Freq	37	34	51	Hz
Time (Rel. to Trig)	0.162	0.119	0.072	sec
Peak Acceleration	0.199	0.331	0.159	g
Peak Displacement	0.00099	0.00290	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.645 in/s at 0.119 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 2:58 PM
BLAST # MW-0253

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+70 - 128+76 c/l (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: Pre shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/L
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.8 (m)
TOTAL DEPTH 51 (m)

TOTAL NUMBER OF HOLES 17 / 200
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8.5"
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 35 (ms)

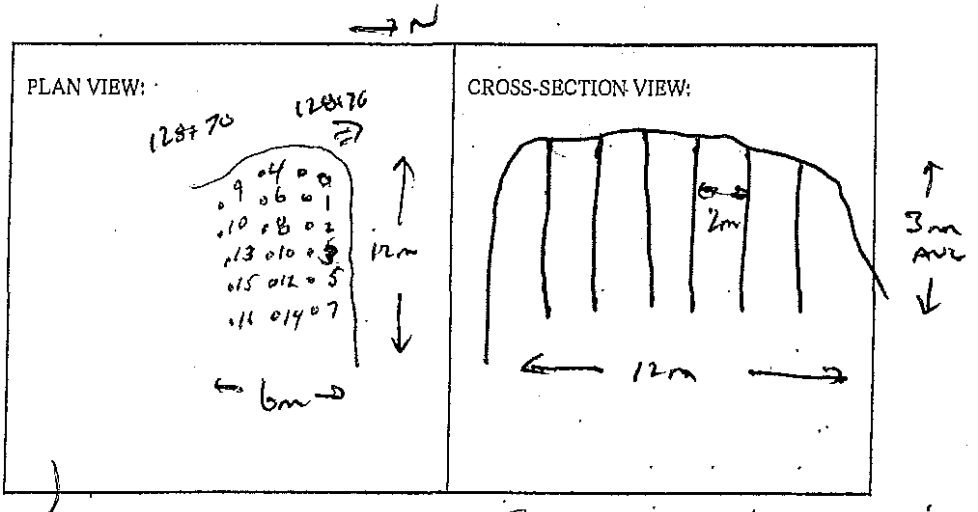
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.090 ips/34 Hz
" @ 13167 Cliffstone Crt - 0.045 ips/37 Hz
" @ 13093 Cliffstone Crt. 0.12 ips/57 Hz

1.5' – 4' ANFO per hole + 0.5 cart 1½" x 16" Dynamite Primer

Instantel

Event Report

Date/Time	Vert at 14:58:34 June 14, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBRT.LM0

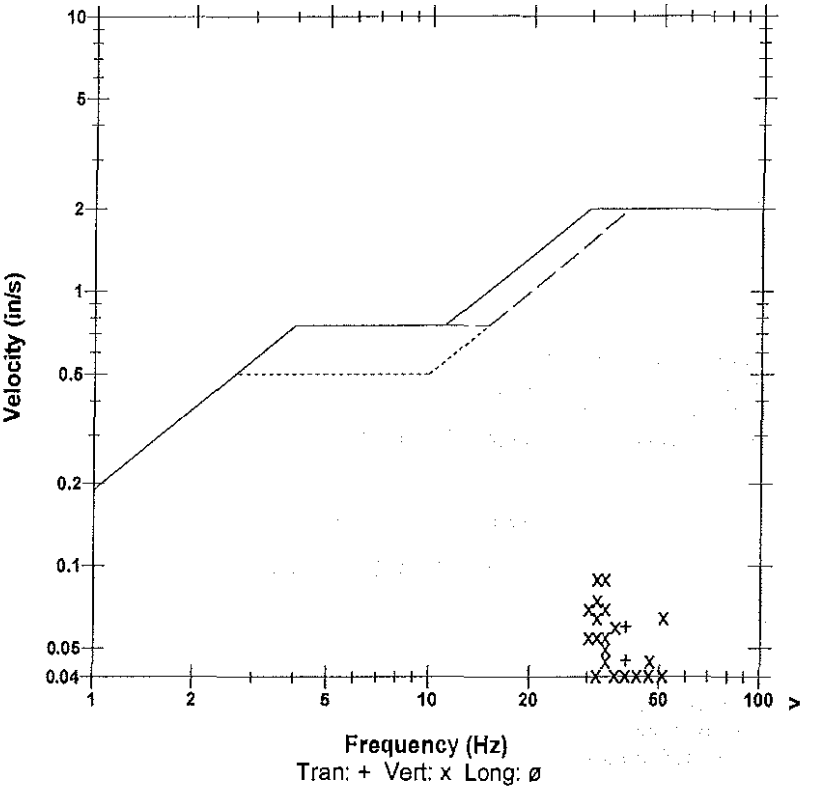
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

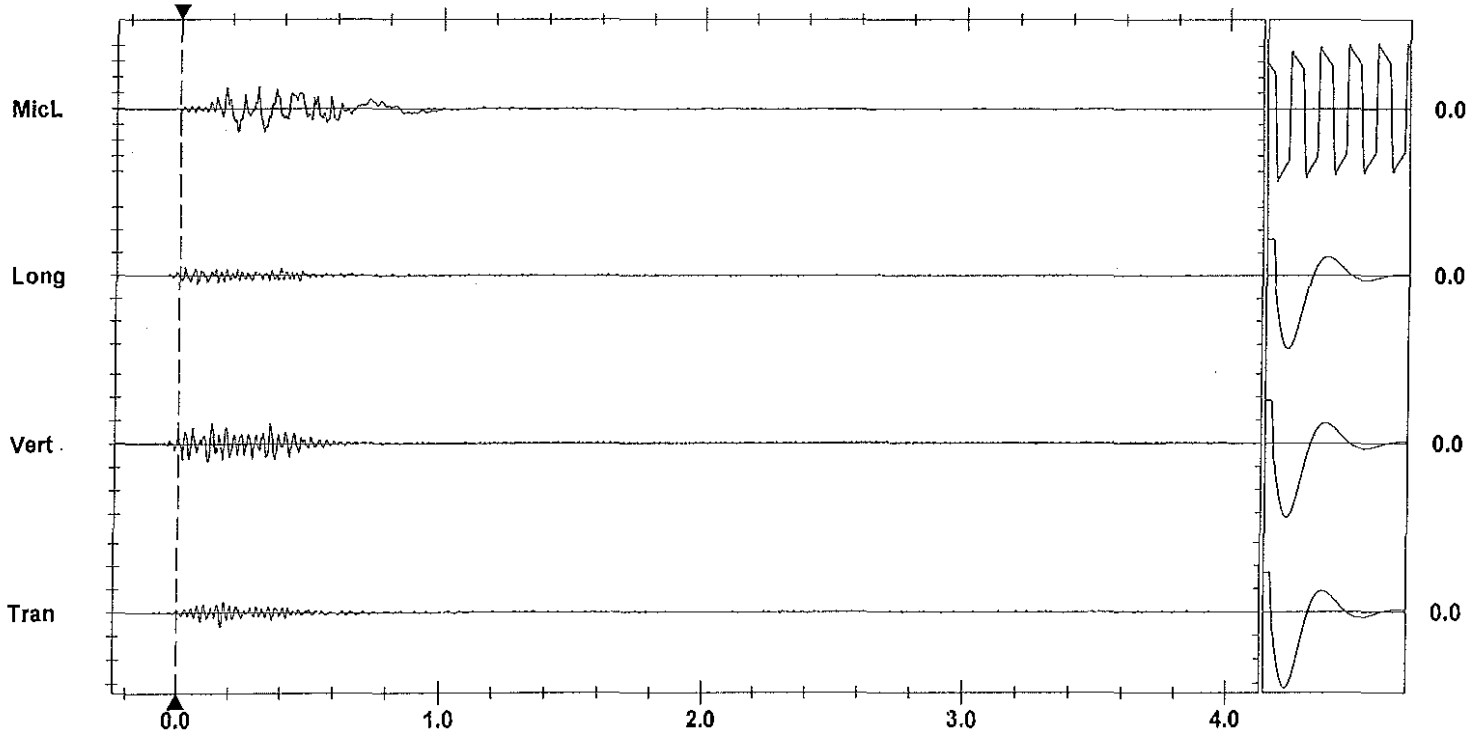
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.323 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 573 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0900	0.0350	in/s
ZC Freq	39	34	43	Hz
Time (Rel. to Trig)	0.170	0.131	0.020	sec
Peak Acceleration	0.0398	0.0663	0.0265	g
Peak Displacement	0.00025	0.00041	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0955 in/s at 0.355 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

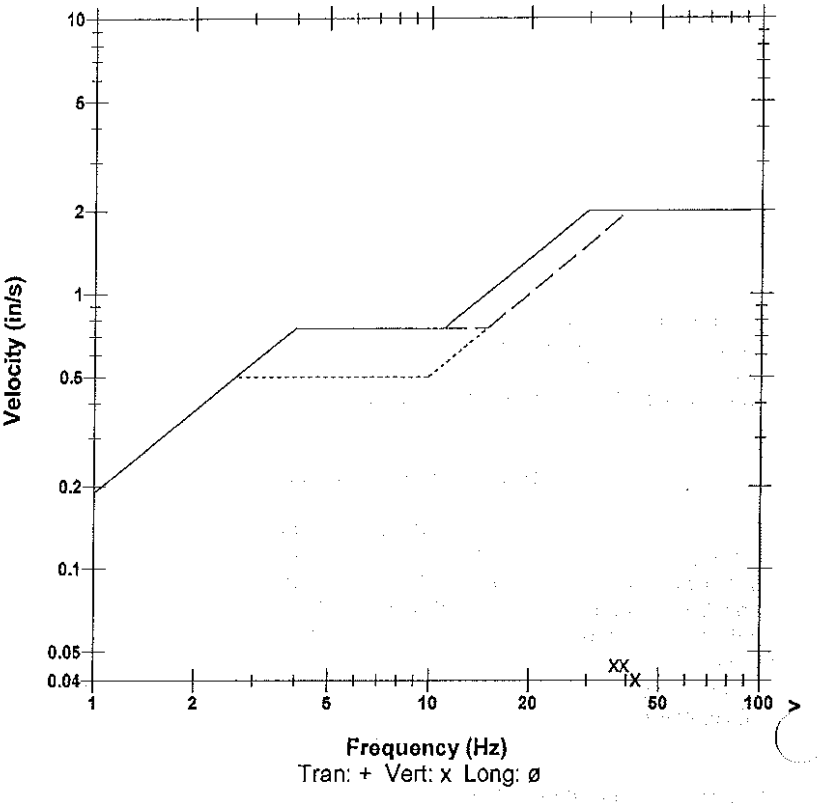
Date/Time	Vert at 14:58:34 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBRT.LM0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

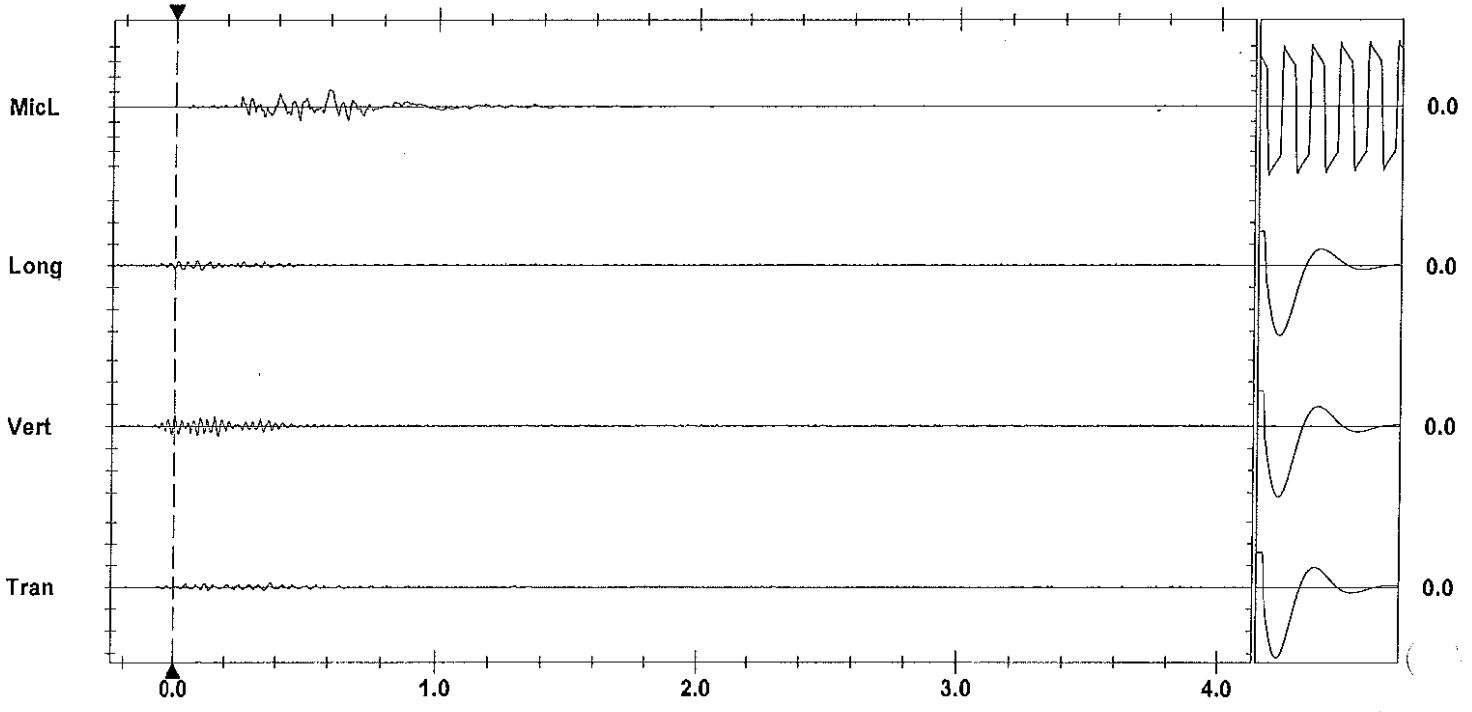
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.594 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 571 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0450	0.0200	in/s
ZC Freq	28	37	34	Hz
Time (Rel. to Trig)	0.378	0.001	0.013	sec
Peak Acceleration	0.0133	0.0398	0.0265	g
Peak Displacement	0.00012	0.00019	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.2	

Peak Vector Sum 0.0464 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Long at 14:58:47 June 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBRT.LZ0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

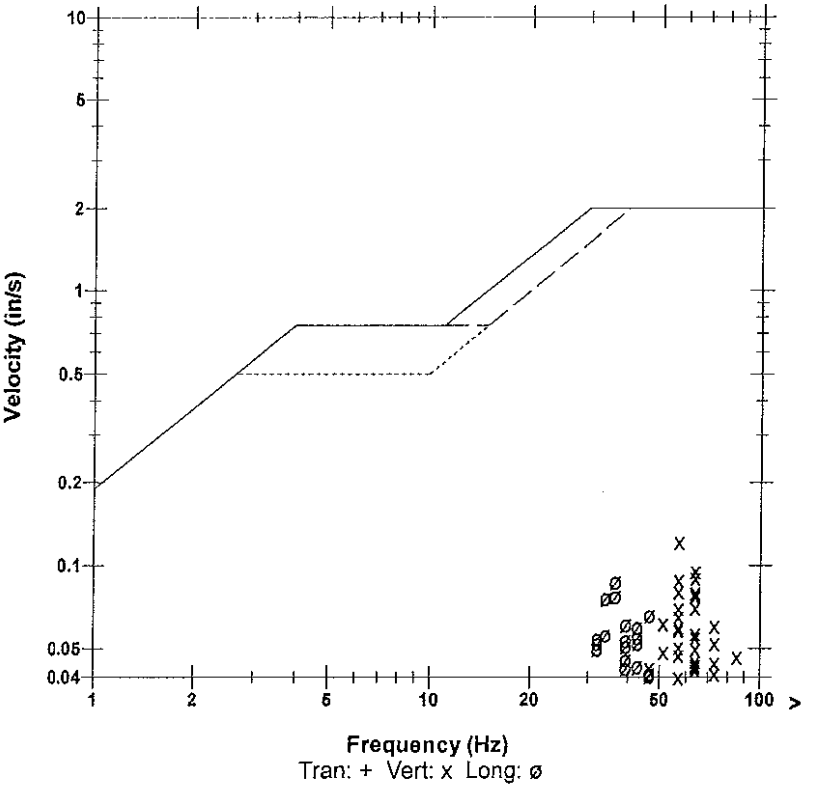
Post Event Notes

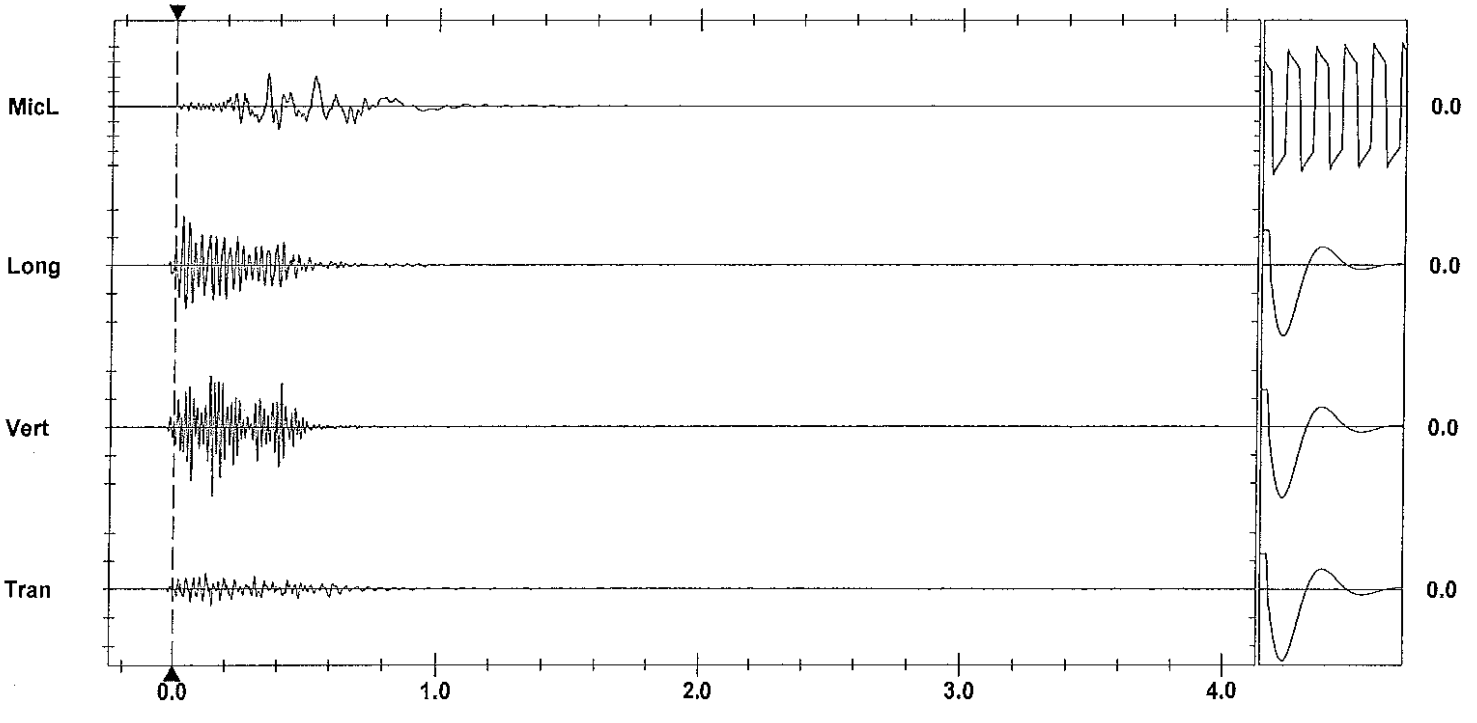
Microphone Linear Weighting
PSPL 0.00218 psi(L) at 0.356 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 587 mv)

	Tran	Vert	Long	
PPV	0.0287	0.122	0.0875	in/s
ZC Freq	51	57	37	Hz
Time (Rel. to Trig)	0.148	0.147	0.031	sec
Peak Acceleration	0.0232	0.101	0.0696	g
Peak Displacement	0.00011	0.00032	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.137 in/s at 0.147 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:58:34 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
cord Time	4.0 sec at 1024 sps	**File Name**	M866EBRT.LM0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

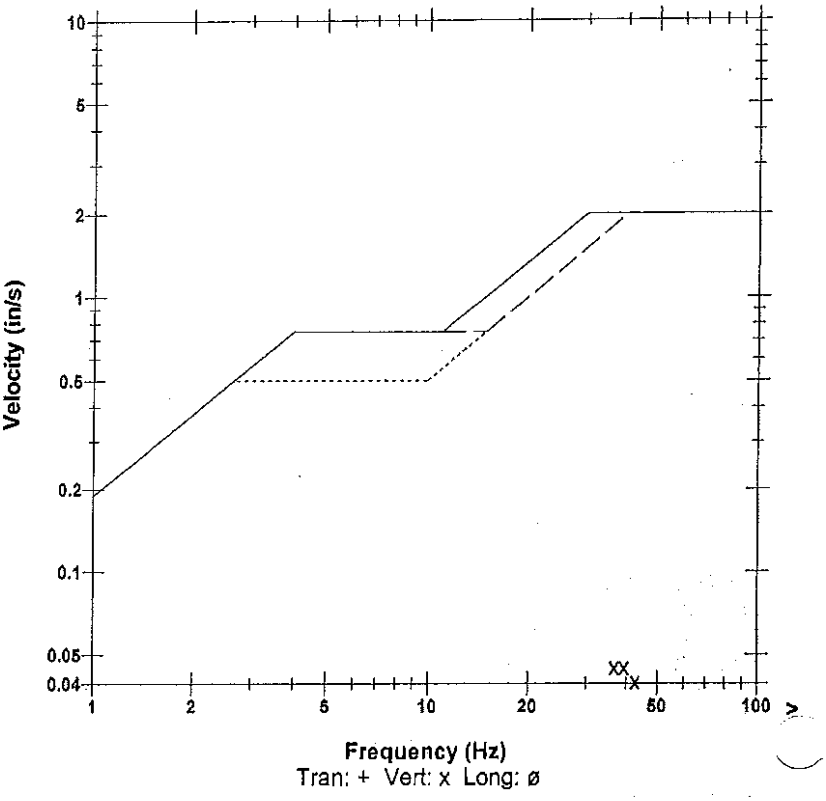
Extended Notes

Post Event Notes

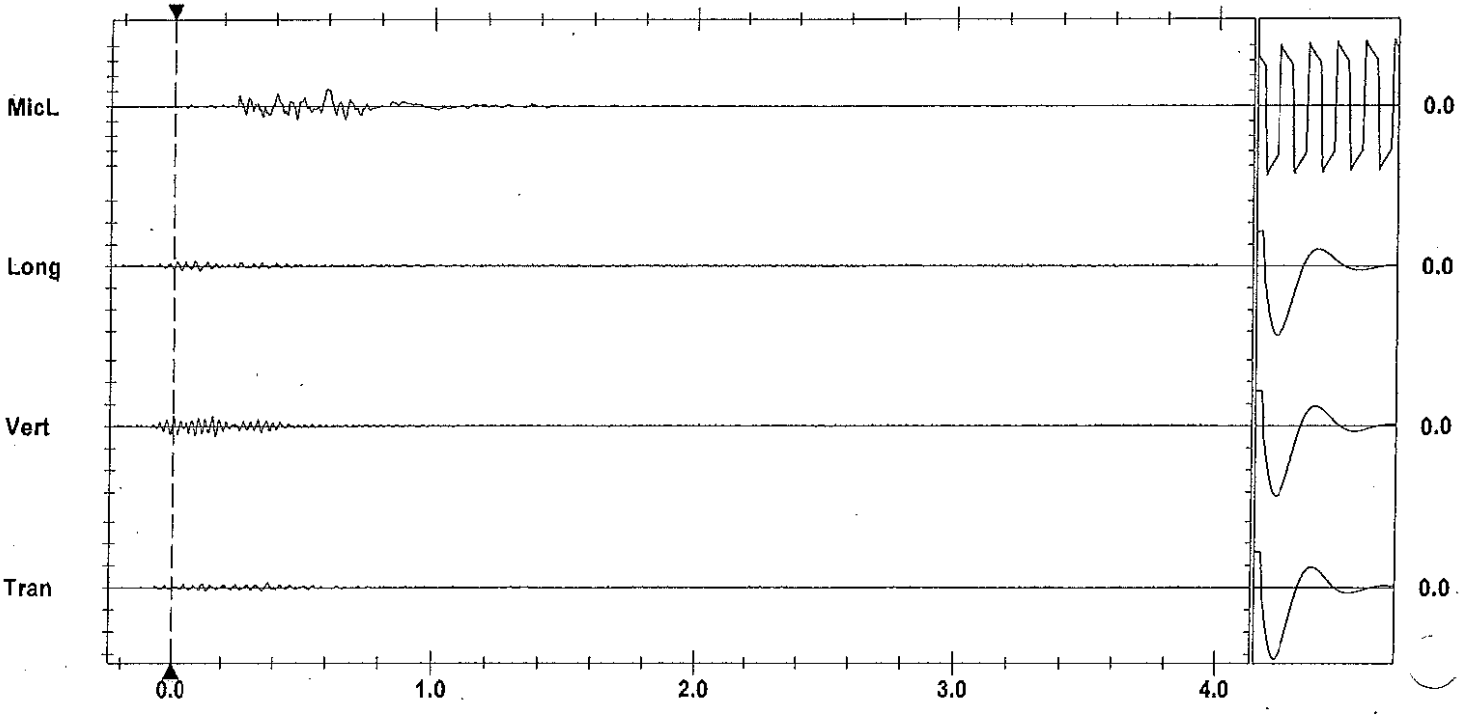
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 0.594 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 571 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0450	0.0200	in/s
ZC Freq	28	37	34	Hz
Time (Rel. to Trig)	0.378	0.001	0.013	sec
Peak Acceleration	0.0133	0.0398	0.0265	g
Peak Displacement	0.00012	0.00019	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0464 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 16, 2012 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 14/12
ACTUAL BLAST DATE June 14/12 4:06PM
BLAST # MW-0254

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+72 - 128+76 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
see shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 10 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

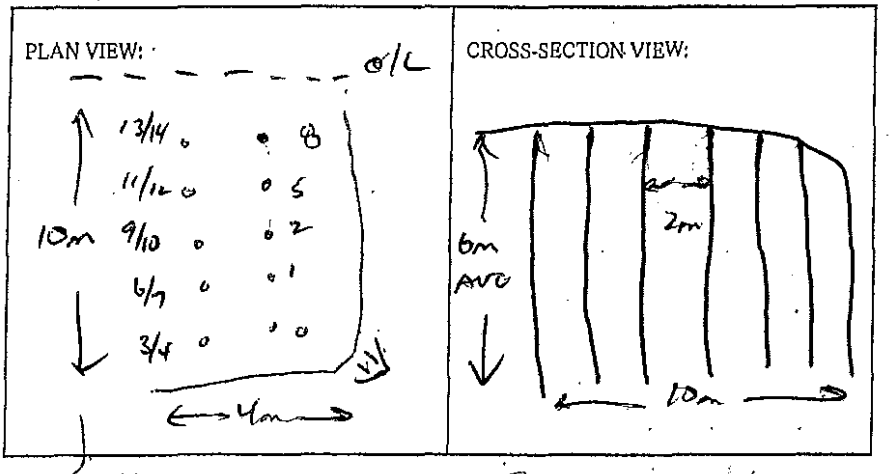
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.62 ips / 28 Hz
" @ 13167 Cliffstone Crt - 0.16 ips / 39 Hz
" @ 13093 Cliffstone Crt - 0.73 ips / 5 Hz

TOE LOAD – 5'-7' ANFO

TOP DECK – 2'-4' ANFO

ALL DECKS PRIMED W/ 0.5 GRAM 1½"x16" DYNAMITE

Instantel

Event Report

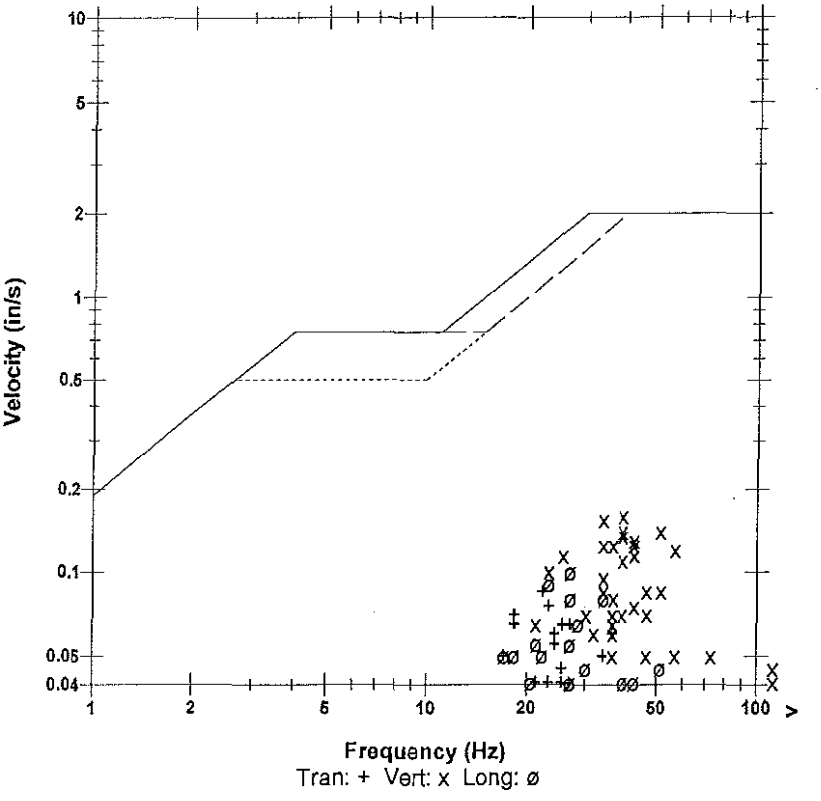
Date/Time	Vert at 16:06:13 June 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBRW.QD0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

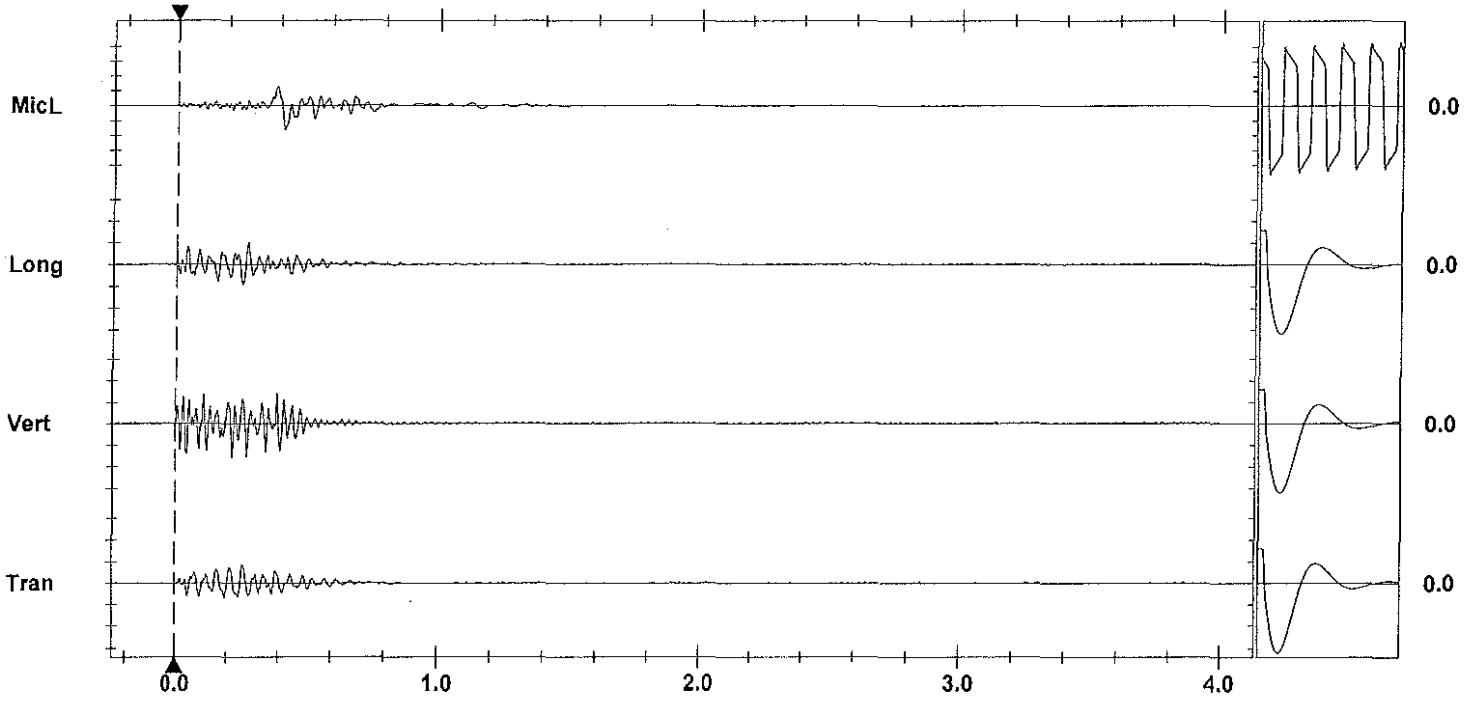
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.414 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 558 mv)

	Tran	Vert	Long	
PPV	0.0850	0.160	0.1000	in/s
ZC Freq	22	39	27	Hz
Time (Rel. to Trig)	0.263	0.221	0.278	sec
Peak Acceleration	0.0398	0.133	0.0530	g
Peak Displacement	0.00060	0.00069	0.00063	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.4	7.1	Hz
Overswing Ratio	3.6	3.7	4.2	

Peak Vector Sum 0.182 in/s at 0.277 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 16:06:12 June 14, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBRW.QC0

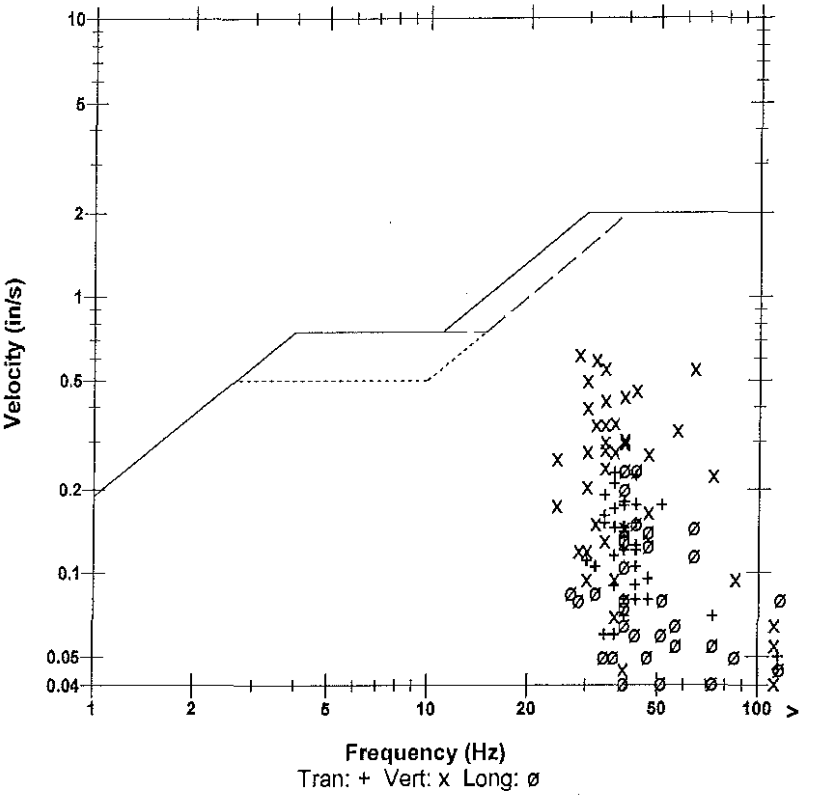
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

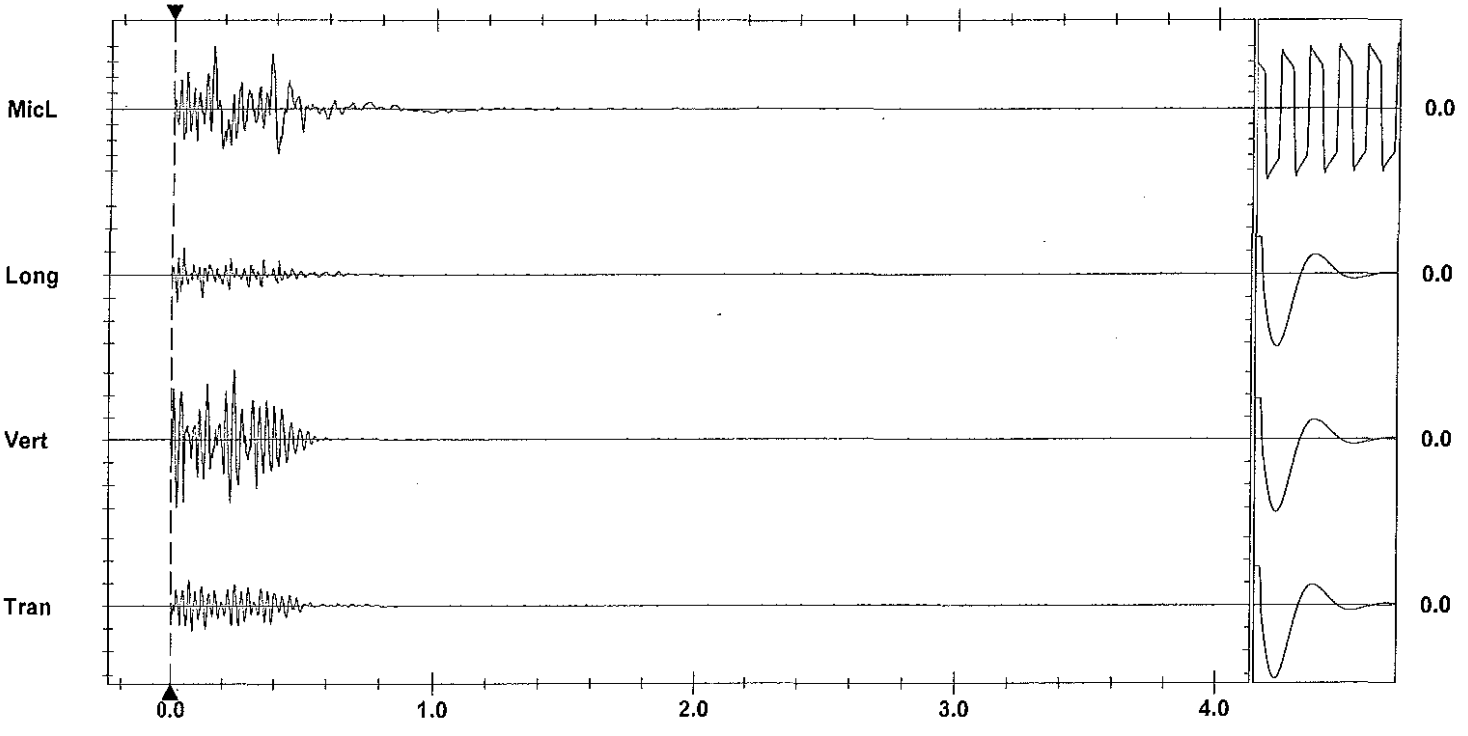
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00399 psi(L) at 0.157 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 547 mv)

	Tran	Vert	Long	
PPV	0.230	0.620	0.235	in/s
ZC Freq	37	28	43	Hz
Time (Rel. to Trig)	0.072	0.245	0.021	sec
Peak Acceleration	0.172	0.557	0.278	g
Peak Displacement	0.00094	0.00315	0.00079	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.629 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 16:06:25 June 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBRW.QP0
Job Number:	1		

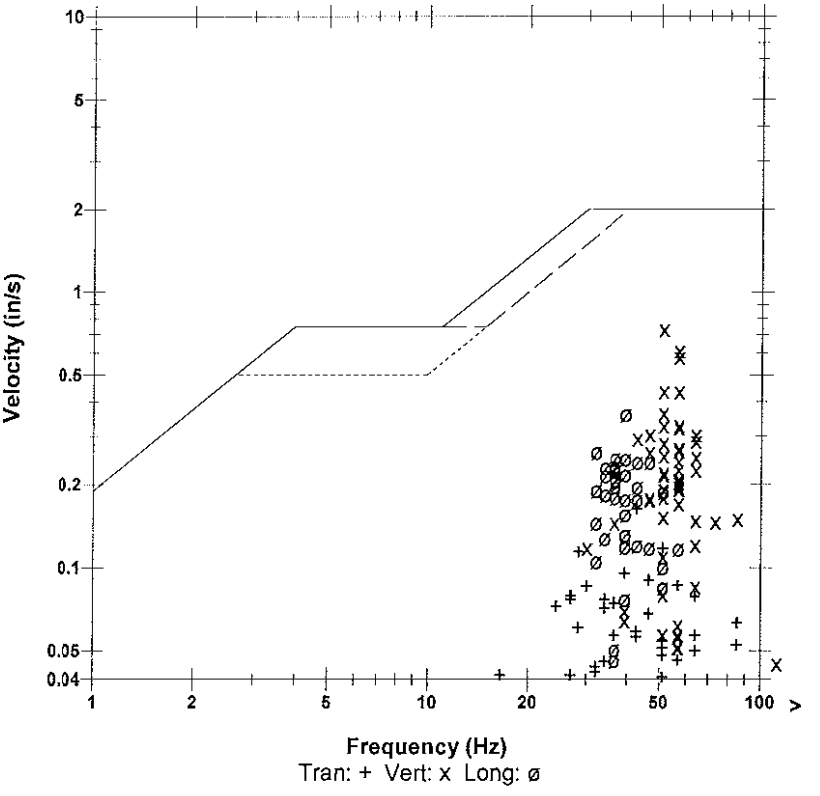
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

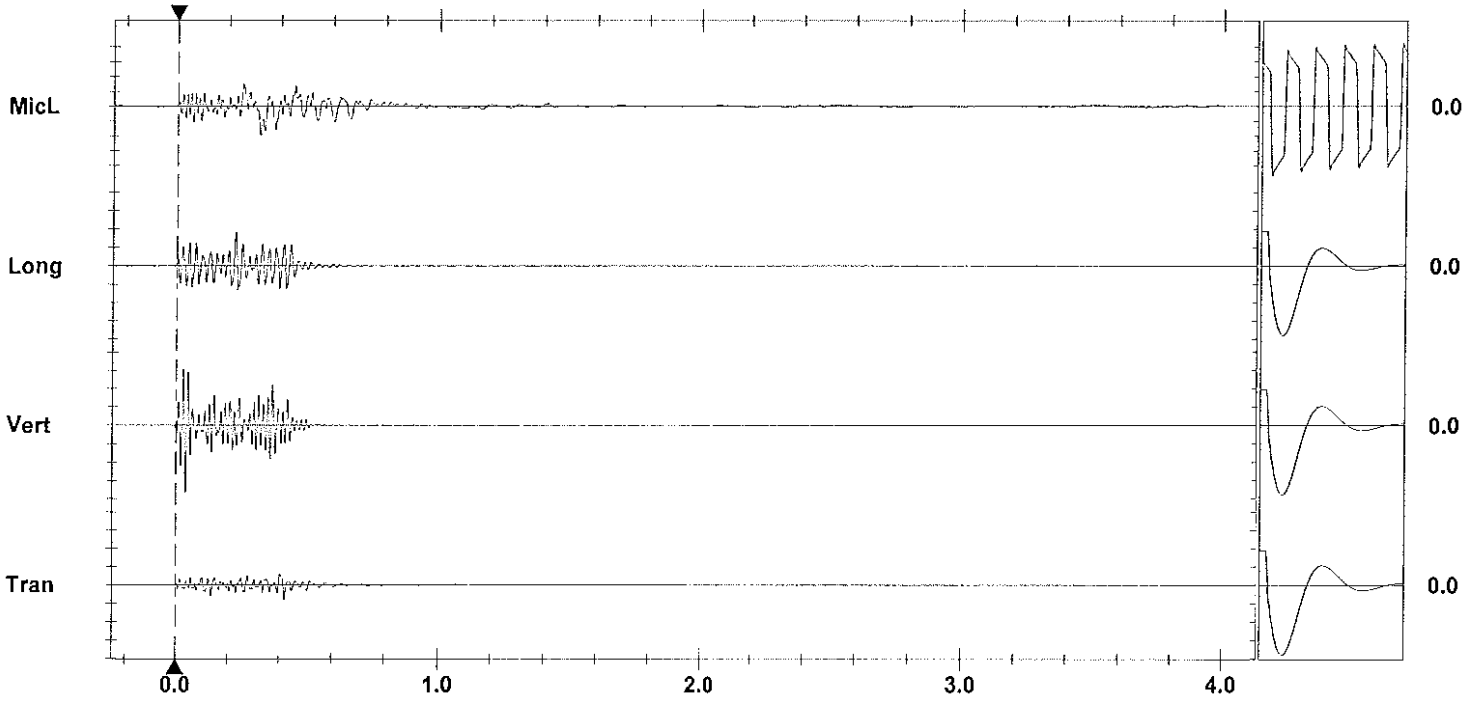
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00196 psi(L) at 0.319 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 582 mv)

	Tran	Vert	Long	
PPV	0.163	0.732	0.361	in/s
ZC Freq	43	51	39	Hz
Time (Rel. to Trig)	0.422	0.037	0.228	sec
Peak Acceleration	0.118	0.666	0.414	g
Peak Displacement	0.00066	0.00216	0.00149	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.765 in/s at 0.037 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 10:00AM
BLAST # MW-0255

HIGHWAY# 97
BLAST LOCATION AT: STN 128+54 - 128+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES _____
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

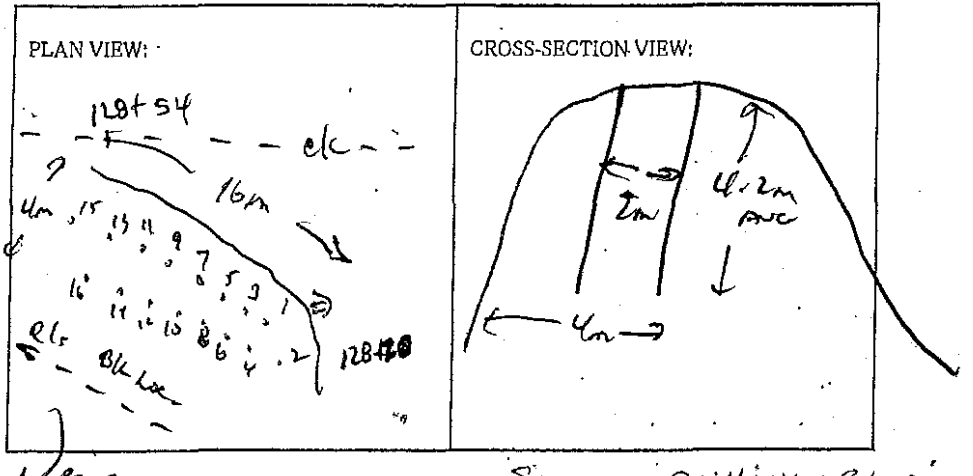
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



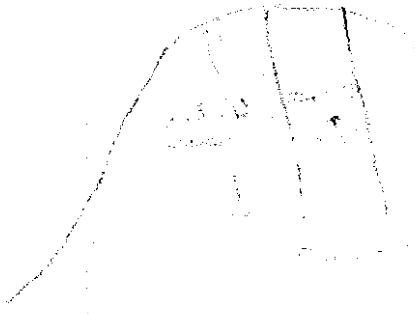
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.261 ips / 34 Hz
" @ 13067 Cliffstone Crt – 0.060 ips / 37 Hz
" @ 13093 Cliffstone Crt – 0.15 ips / 5 Hz

2'-5' ANFO PER HOLE + DISCRET 1½"x16" DENSMITE PRIMER



Instantel

Event Report

Date/Time	Vert at 10:00:46 June 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBTA.HA0
Job Number:	1		

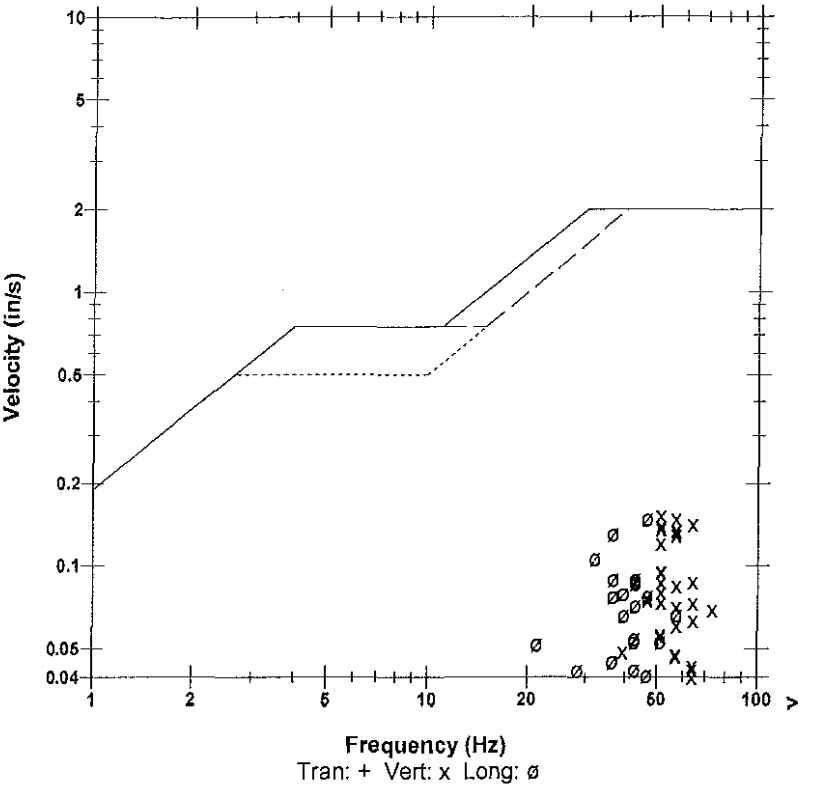
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

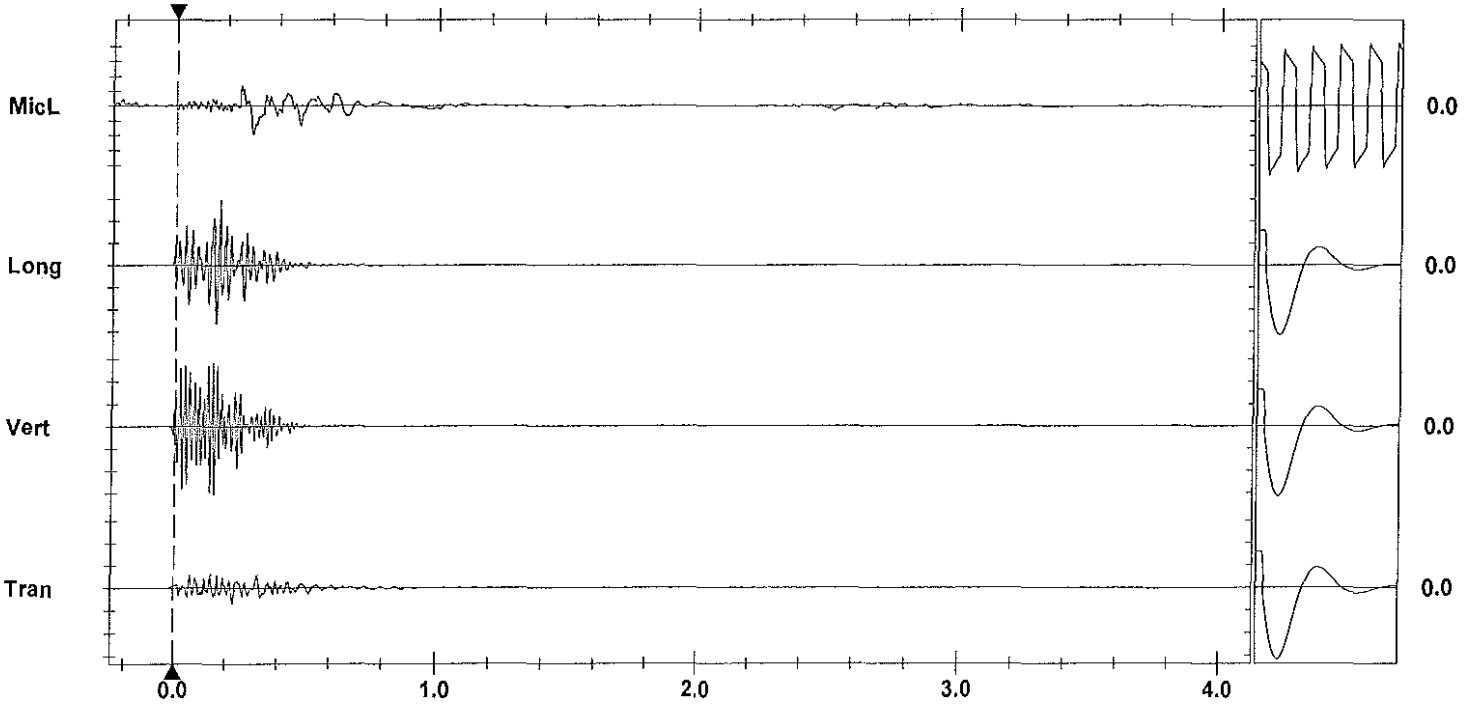
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00196 psi(L) at 0.298 sec			
ZC Freq	8.7 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 578 mv)			

	Tran	Vert	Long	
PPV	0.0356	0.152	0.149	in/s
ZC Freq	37	51	47	Hz
Time (Rel. to Trig)	0.233	0.154	0.171	sec
Peak Acceleration	0.0282	0.161	0.123	g
Peak Displacement	0.00016	0.00044	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.180 in/s at 0.155 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 16, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 10:00:33 June 15, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBTA.GX0

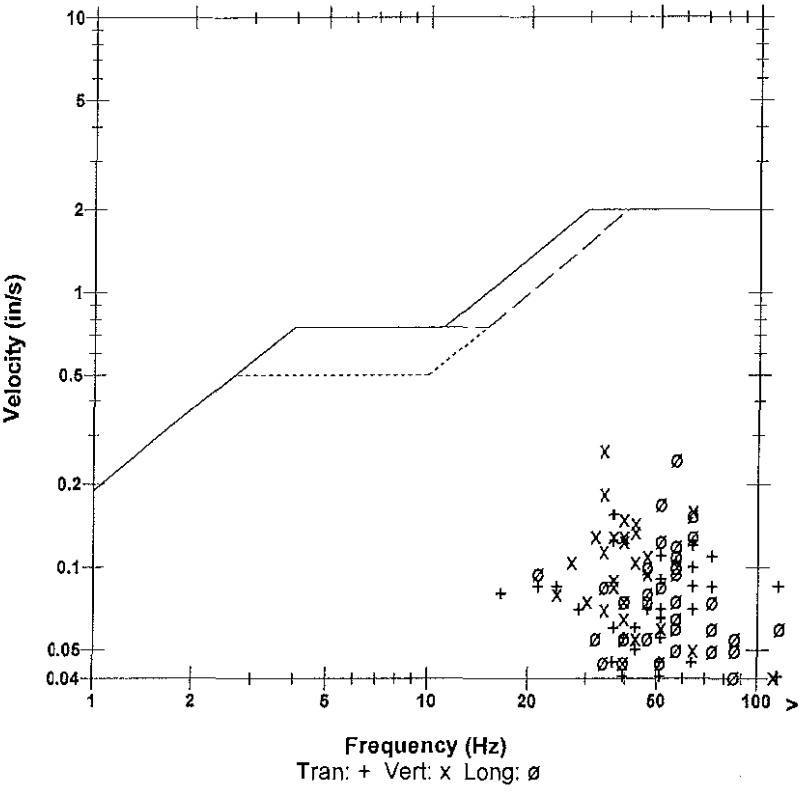
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

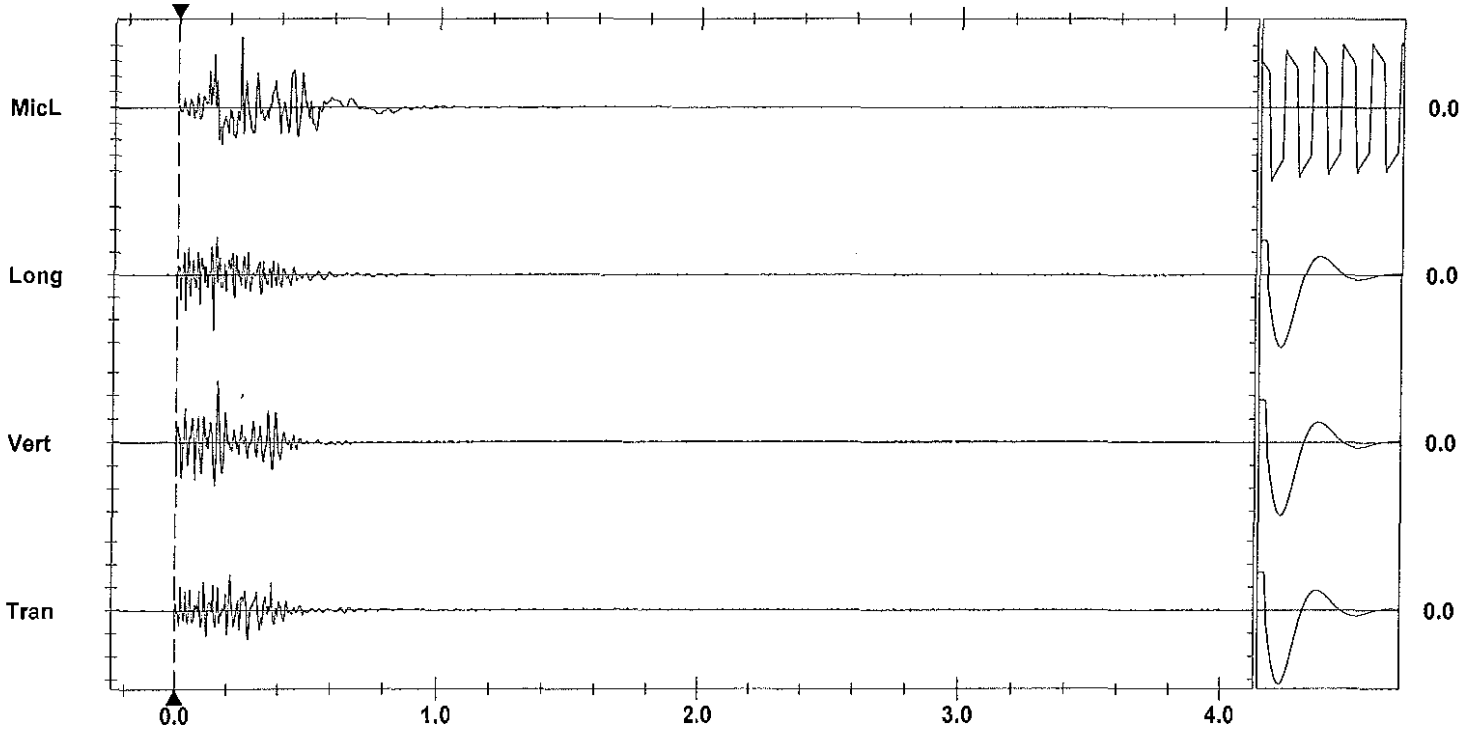
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00453 psi(L) at 0.247 sec			
ZC Freq	51 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 576 mv)			

	Tran	Vert	Long	
PPV	0.155	0.265	0.245	in/s
ZC Freq	37	34	57	Hz
Time (Rel. to Trig)	0.216	0.161	0.142	sec
Peak Acceleration	0.133	0.186	0.239	g
Peak Displacement	0.00062	0.00105	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 0.268 in/s at 0.161 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: June 16, 2012 (V 8.01 - 6.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 10:00:33 June 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBTA.GX0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

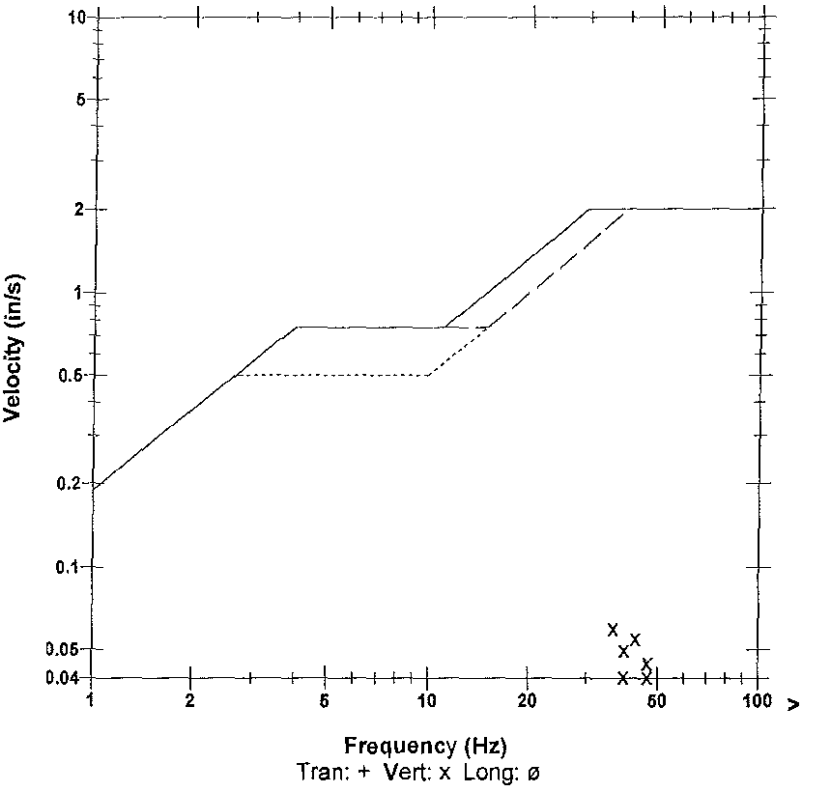
Post Event Notes

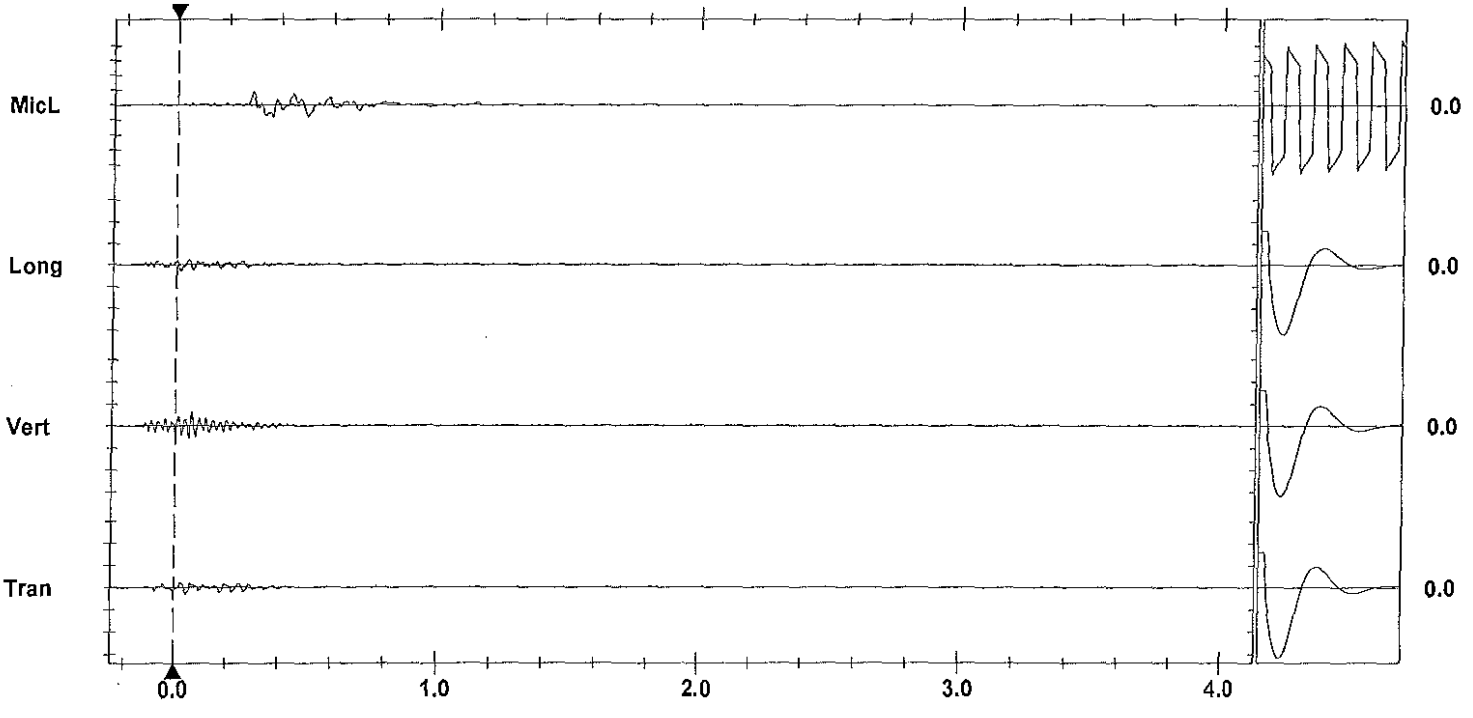
Microphone Linear Weighting
PSPL 0.00091 psi(L) at 0.288 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 602 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0600	0.0250	in/s
ZC Freq	28	37	32	Hz
Time (Rel. to Trig)	0.047	0.065	0.012	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00019	0.00026	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0650 in/s at 0.065 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: June 16, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 11:44AM
BLAST # MW-0256

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+42 - 128+54

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 102 (m)

TOTAL NUMBER OF HOLES 17 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 85
TOTAL NUMBER OF DELAYS 17

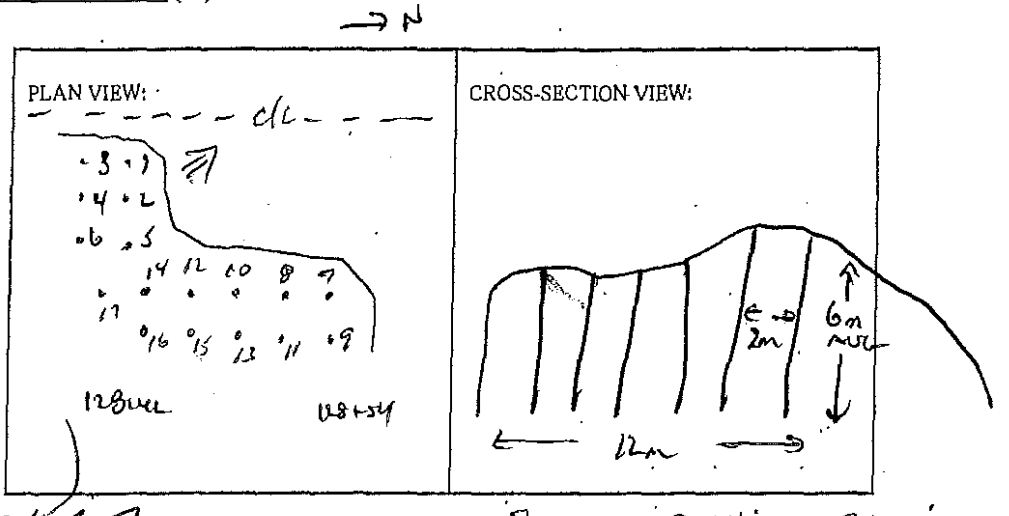
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 550 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13+50 Okanagan Rd — 0.30 Hz / 30 Hz
" @ 13167 Cliffstone Crt — 0.090 ips / 43 Hz
" @ 13093 Cliffstone Crt. 0.29 ips / 47 Hz

4 - 7' AP FOR VER HOLE + D-3 CHART 12X16

Instantel

Event Report

Date/Time	Vert at 11:44:31 June 15, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBTF.A70

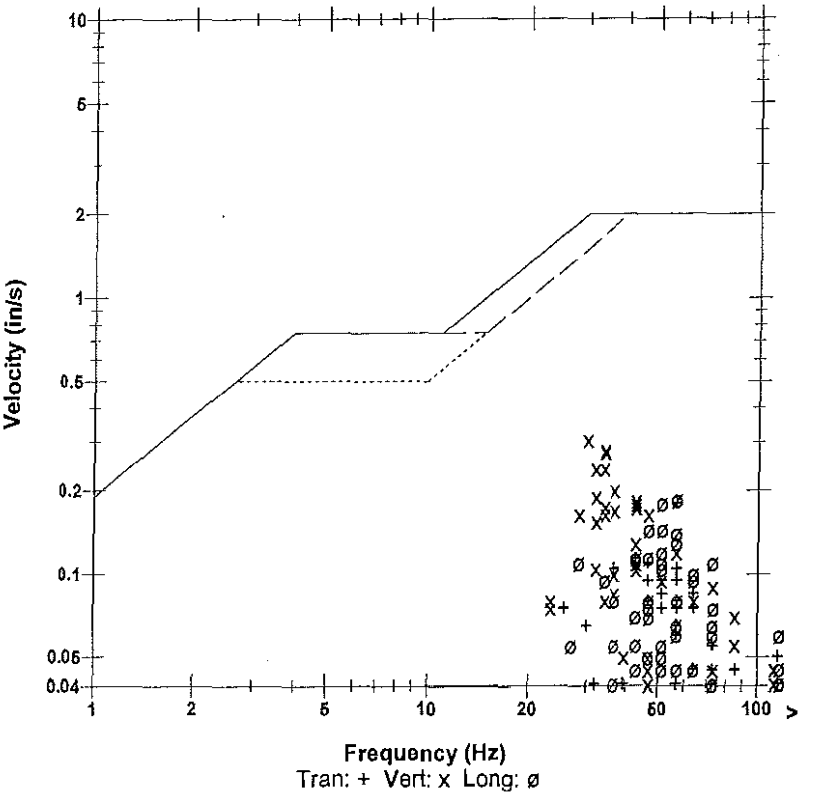
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

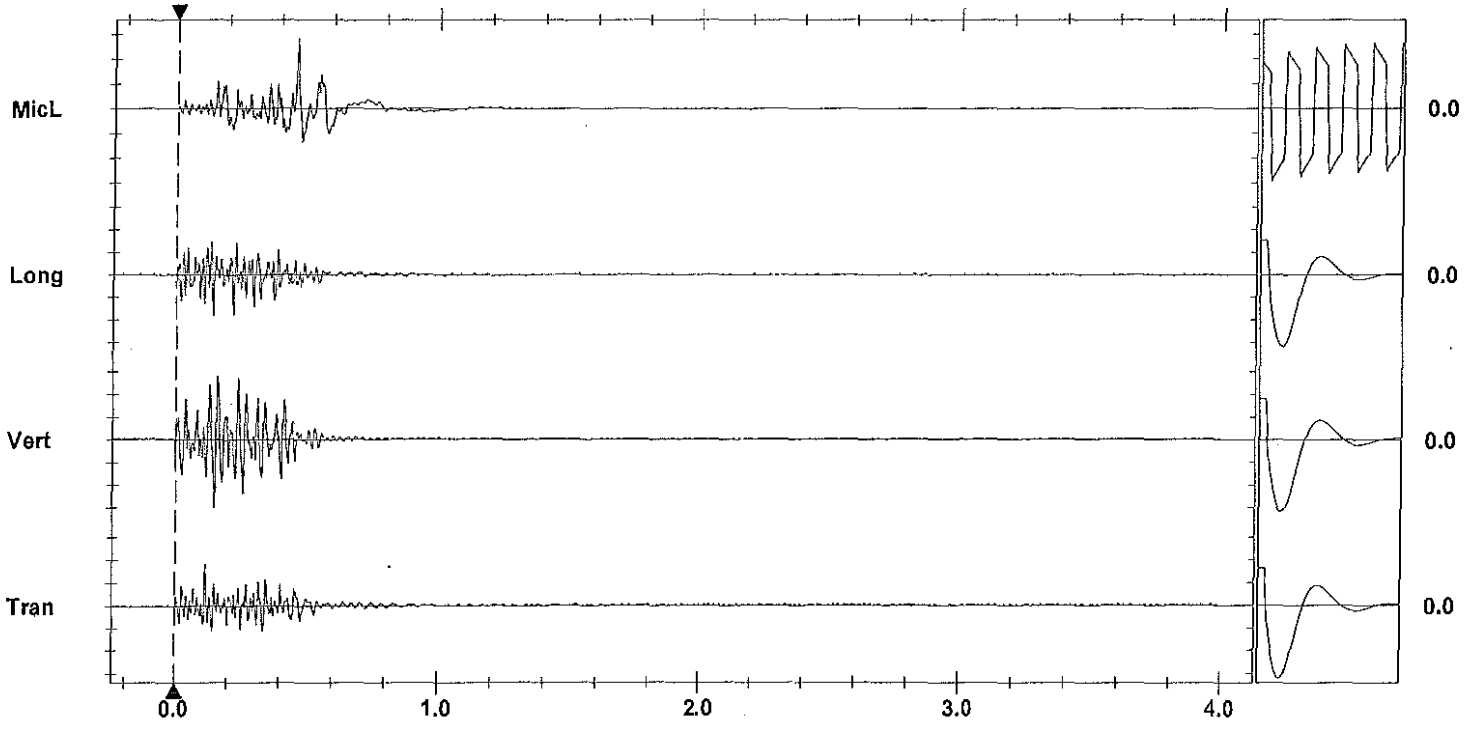
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00569 psi(L) at 0.459 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 591 mv)

	Tran	Vert	Long	
PPV	0.180	0.305	0.185	in/s
ZC Freq	57	30	57	Hz
Time (Rel. to Trig)	0.120	0.151	0.144	sec
Peak Acceleration	0.172	0.212	0.186	g
Peak Displacement	0.00051	0.00132	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.6	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.325 in/s at 0.152 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶———◀

Instantel

Event Report

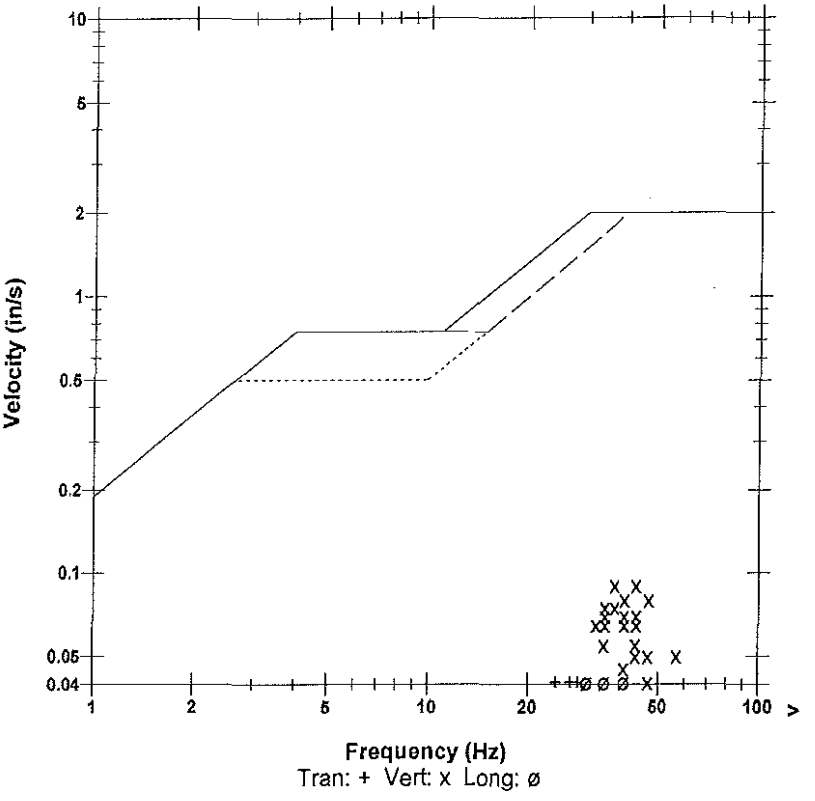
Date/Time	Vert at 11:44:31 June 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EBTF.A70

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

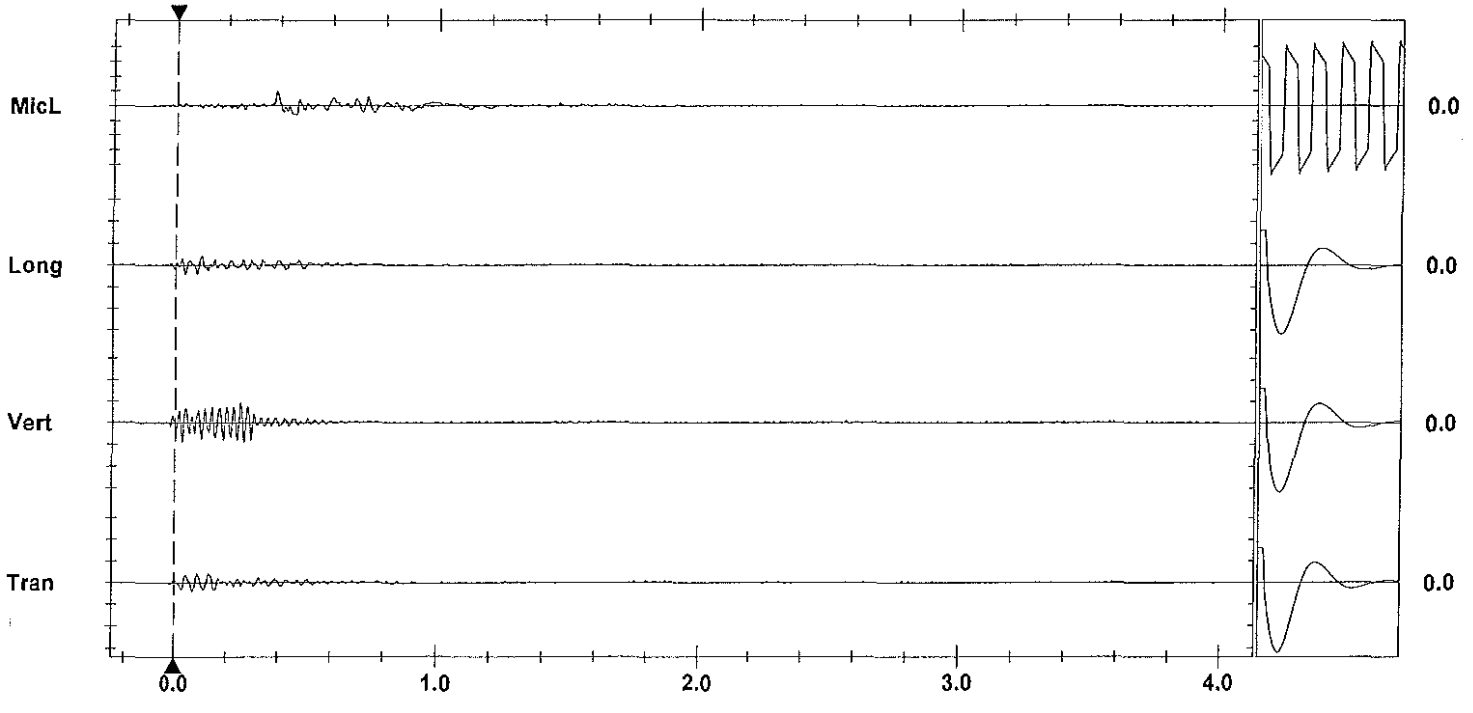
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00094 psi(L) at 0.386 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 518 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0900	0.0400	in/s
ZC Freq	28	43	39	Hz
Time (Rel. to Trig)	0.070	0.027	0.036	sec
Peak Acceleration	0.0265	0.0663	0.0265	g
Peak Displacement	0.00027	0.00040	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0995 in/s at 0.027 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel®

Event Report

Date/Time	Vert at 11:44:44 June 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBTF.AK0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

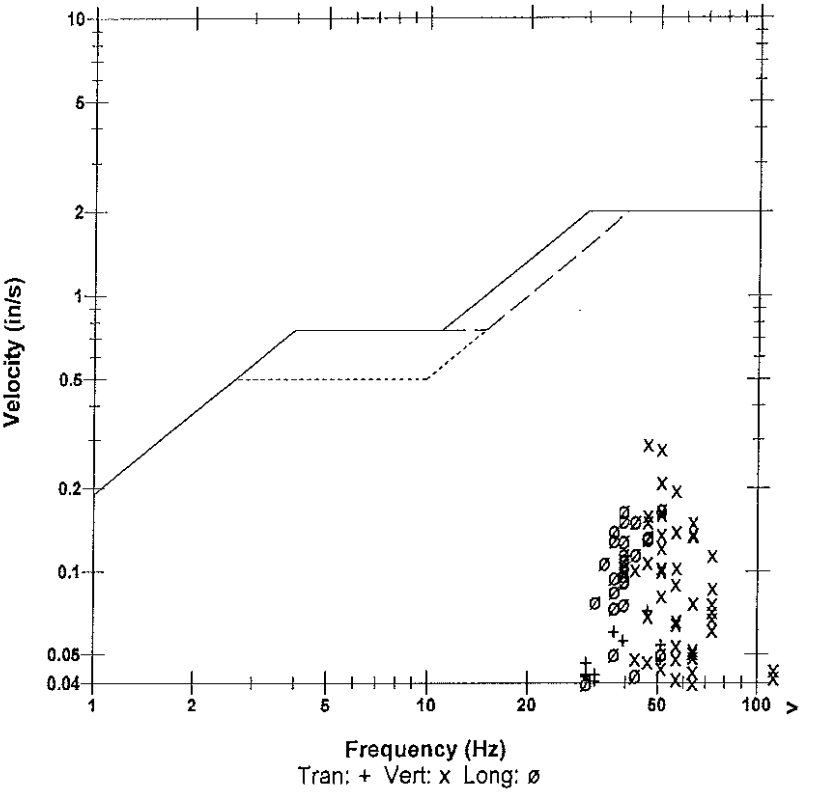
Post Event Notes

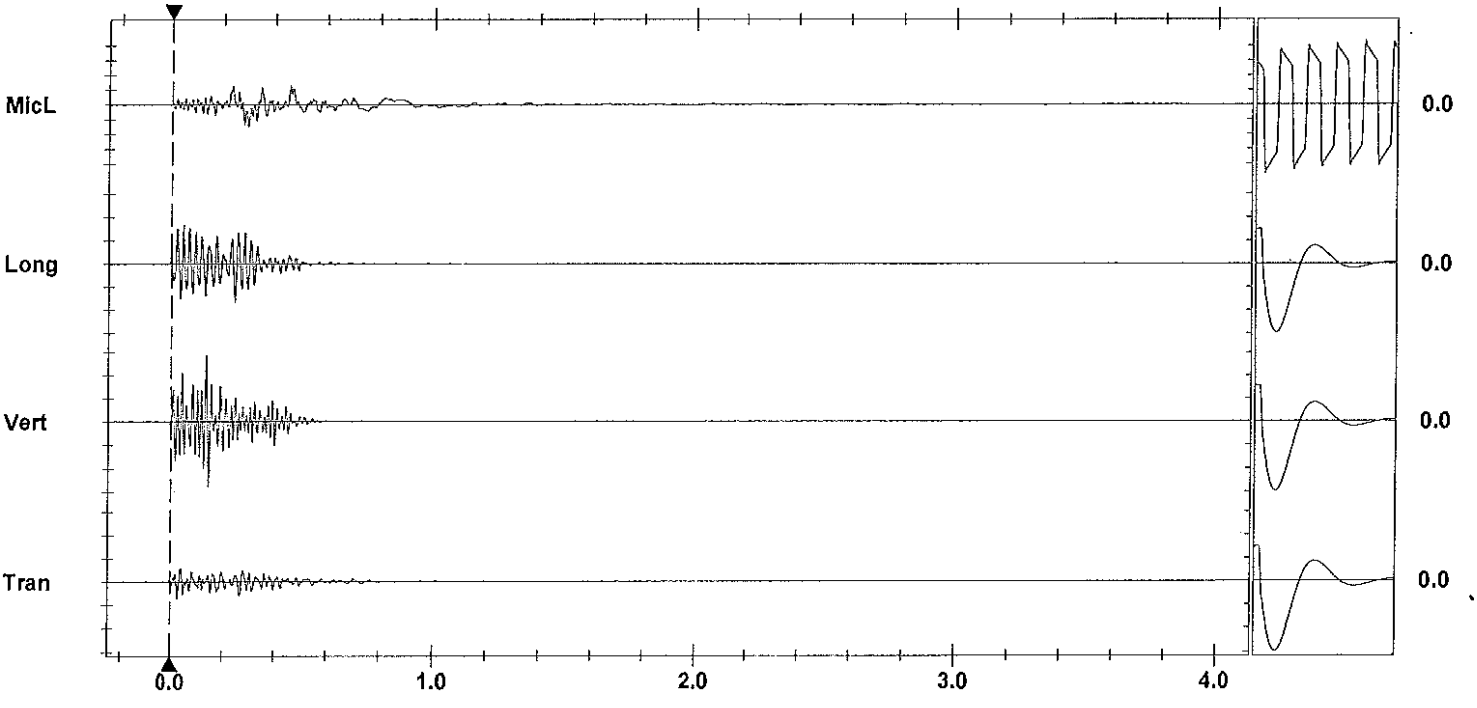
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.295 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 540 mv)

	Tran	Vert	Long	
PPV	0.0712	0.288	0.167	in/s
ZC Freq	47	47	51	Hz
Time (Rel. to Trig)	0.028	0.138	0.047	sec
Peak Acceleration	0.0597	0.254	0.134	g
Peak Displacement	0.00027	0.00092	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.293 in/s at 0.138 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— —— —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 15/12
ACTUAL BLAST DATE June 15/12 3:68PM
BLAST # mw-0257

HIGHWAY# 97
BLAST LOCATION AT: S+N 128+36 - 128+42 c/l

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot notified

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4.8 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 20 Pass
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 60 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

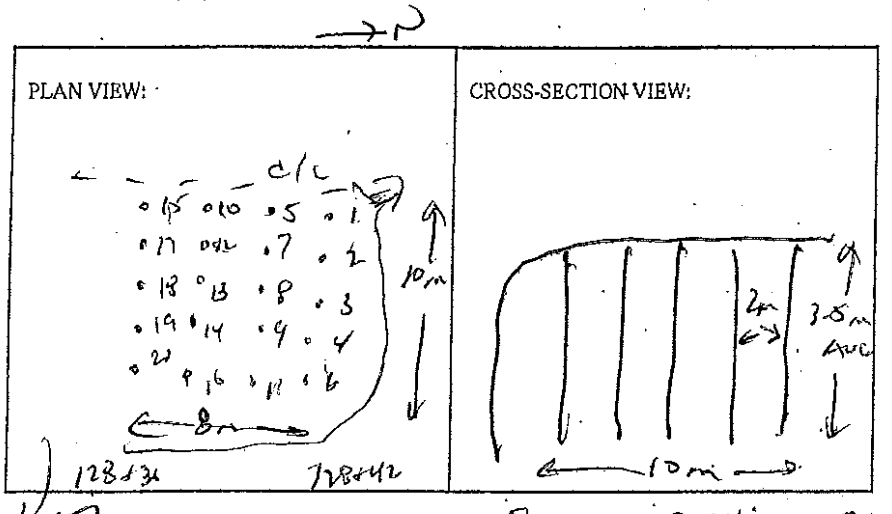
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HH3320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 280 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD MISSION RD - 0.11 ips | 39Hz
" @ 13167 Cliffstone Ct. - NO TRIGGER (< 0.04 ips)
" @ 13093 Cliffstone Ct - 0.083 ips | 51Hz

2'-4' ANFO / ANE + 0.5 CAST 1½"x16" DYNAMITE PRIMER.

Instantel

Event Report

Date/Time	Vert at 15:08:36 June 15, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EBTO.QC0

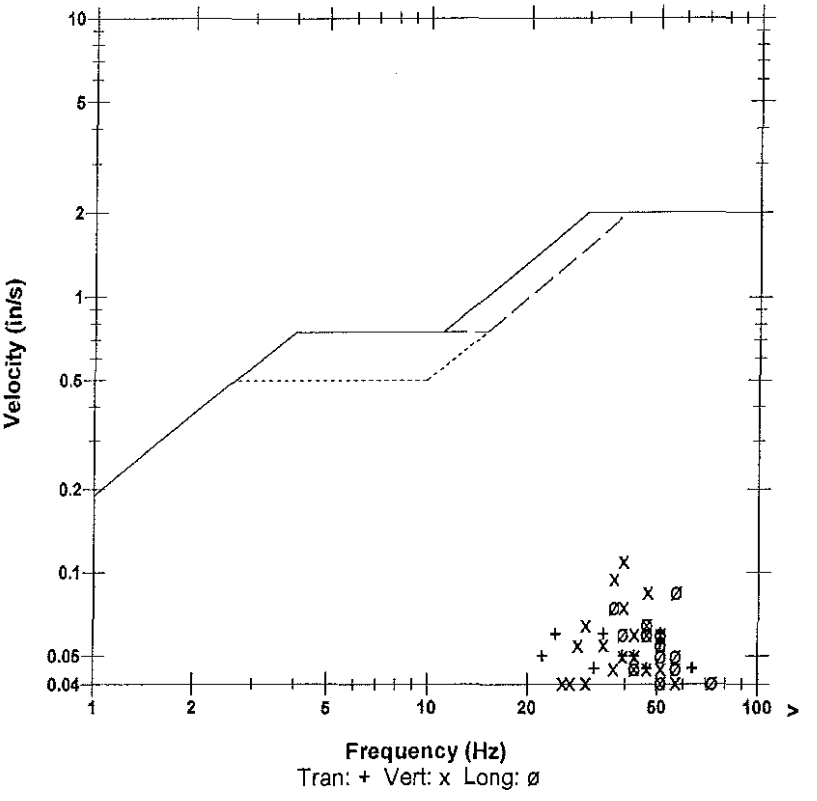
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

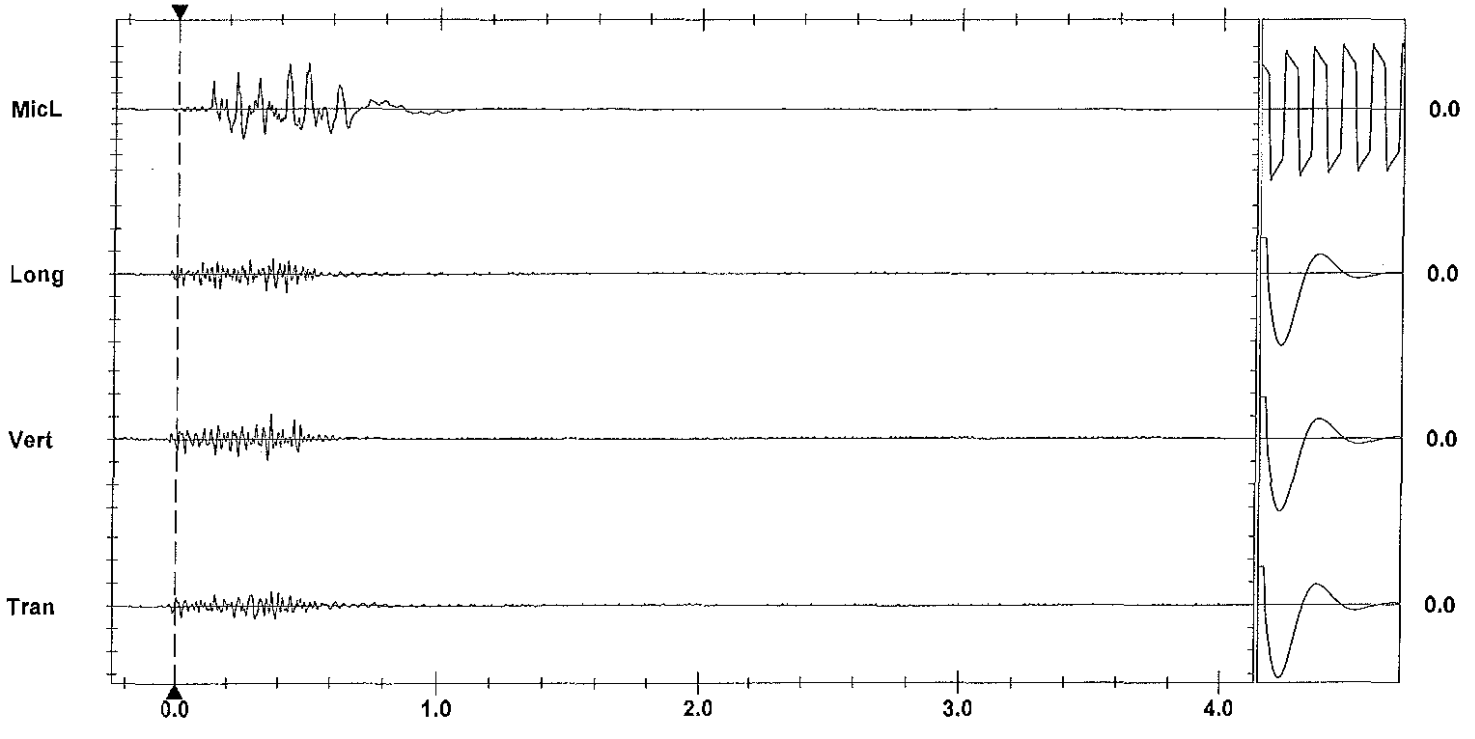
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00290 psi(L) at 0.506 sec		
ZC Freq	16 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 564 mv)		

	Tran	Vert	Long	
PPV	0.0600	0.110	0.0850	in/s
ZC Freq	24	39	57	Hz
Time (Rel. to Trig)	0.313	0.369	0.425	sec
Peak Acceleration	0.0530	0.0663	0.0795	g
Peak Displacement	0.00038	0.00038	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.6	7.5	Hz
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.115 in/s at 0.369 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— —— —◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 15:08:49 June 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EBTO.QP0
Job Number:	1		

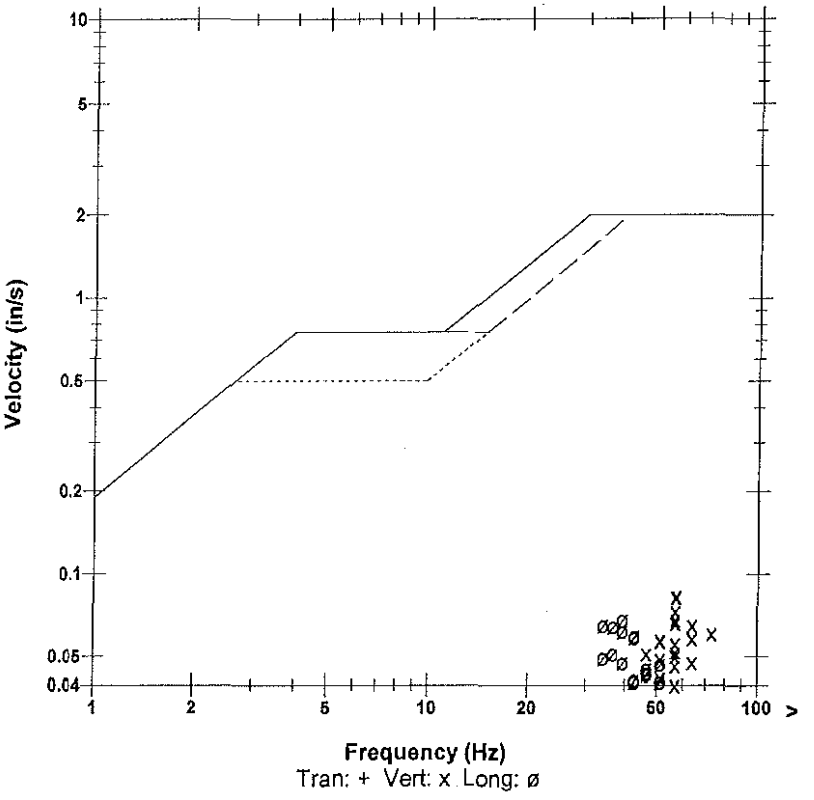
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

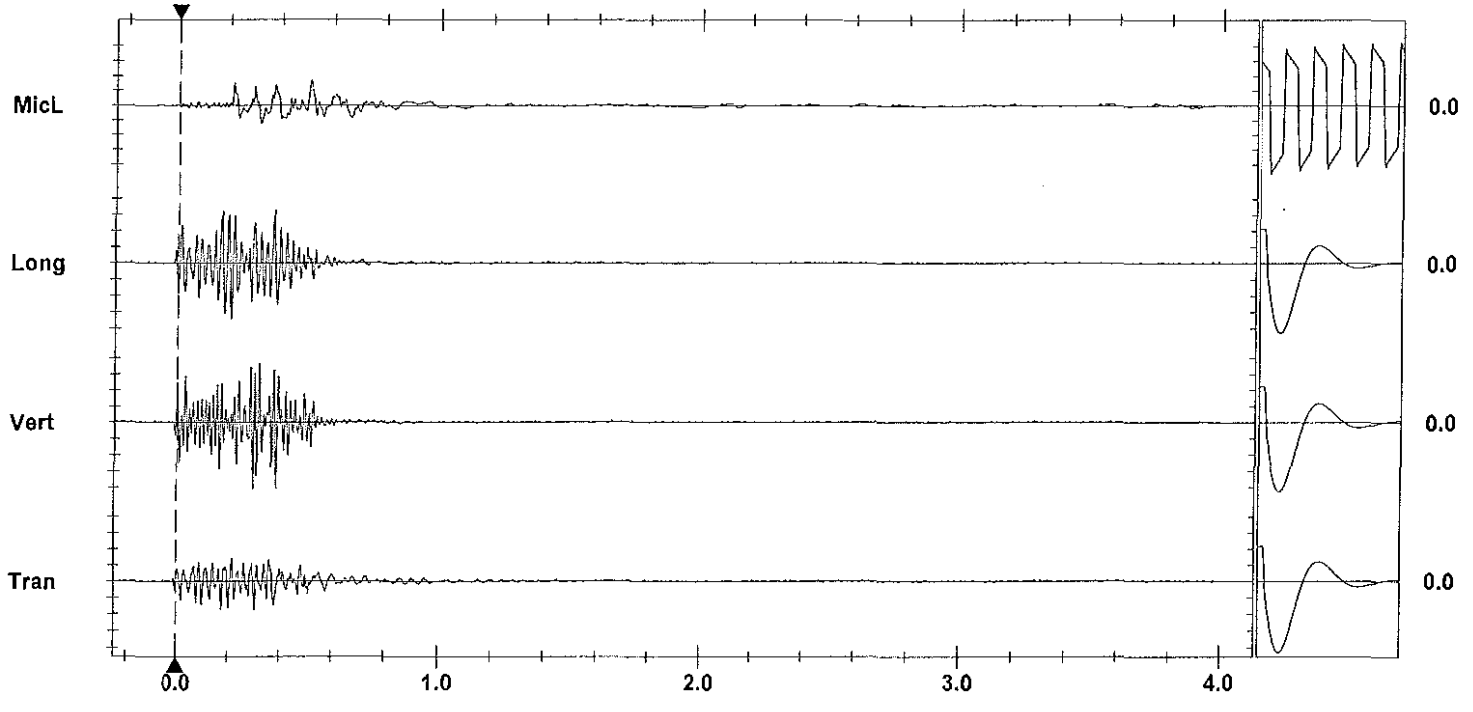
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.510 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	0.0356	0.0831	0.0681	in/s
ZC Freq	47	57	39	Hz
Time (Rel. to Trig)	0.309	0.297	0.208	sec
Peak Acceleration	0.0298	0.0829	0.0580	g
Peak Displacement	0.00016	0.00023	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0962 in/s at 0.385 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: June 18, 2012 04:04:08 PM
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/82

DATE PREPARED June 19/12
ACTUAL BLAST DATE June 19/12 12:31 PM
BLAST # MW-0258

HIGHWAY# 97
BLAST LOCATION AT: SW 128+66 - 128+72 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # Shot-metted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5.9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 94 (m)

TOTAL NUMBER OF HOLES 16 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 21

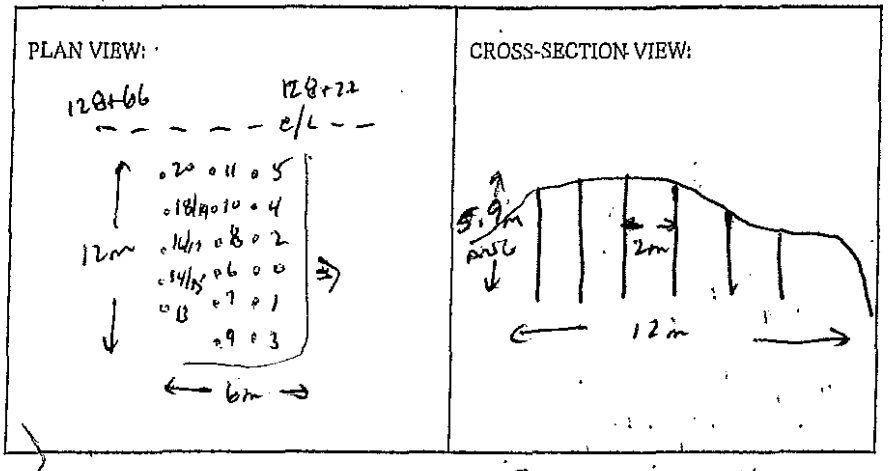
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HH3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 385 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.491ips/39Hz
@ 13167 Cliffstone Crt - 0.090ips/47Hz
@ 13093 Cliffstone Crt - 0.361ips/64Hz

BOTTOM DECK – 4'-6' ANFO

TOP DECK – 2'-3' ANFO

ALL DECKS PRIMED W/ 0.5 GRAIN 1½ x 16 DYNAMITE

Instantel

Event Report

Date/Time	Vert at 12:31:42 June 19, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC0W.4U0

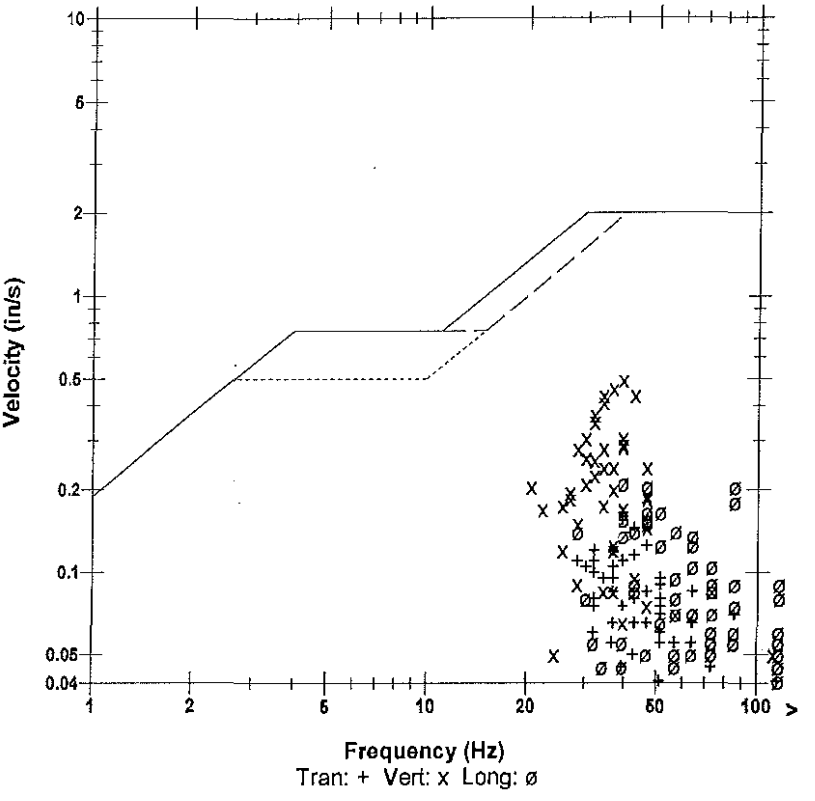
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

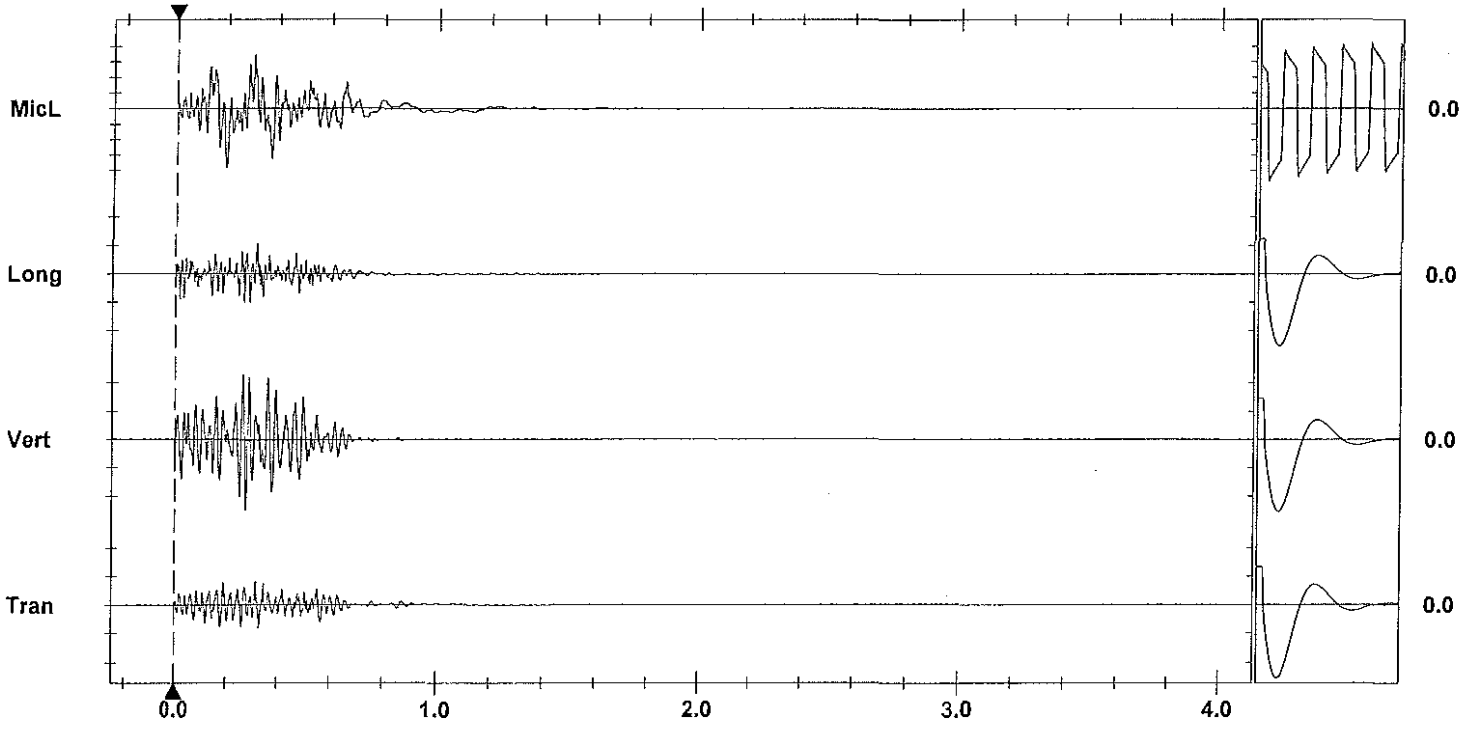
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00384 psi(L) at 0.192 sec			
ZC Freq	22 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 605 mv)			

	Tran	Vert	Long	
PPV	0.165	0.495	0.210	in/s
ZC Freq	39	39	39	Hz
Time (Rel. to Trig)	0.333	0.278	0.320	sec
Peak Acceleration	0.146	0.318	0.239	g
Peak Displacement	0.00060	0.00199	0.00072	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.514 in/s at 0.278 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

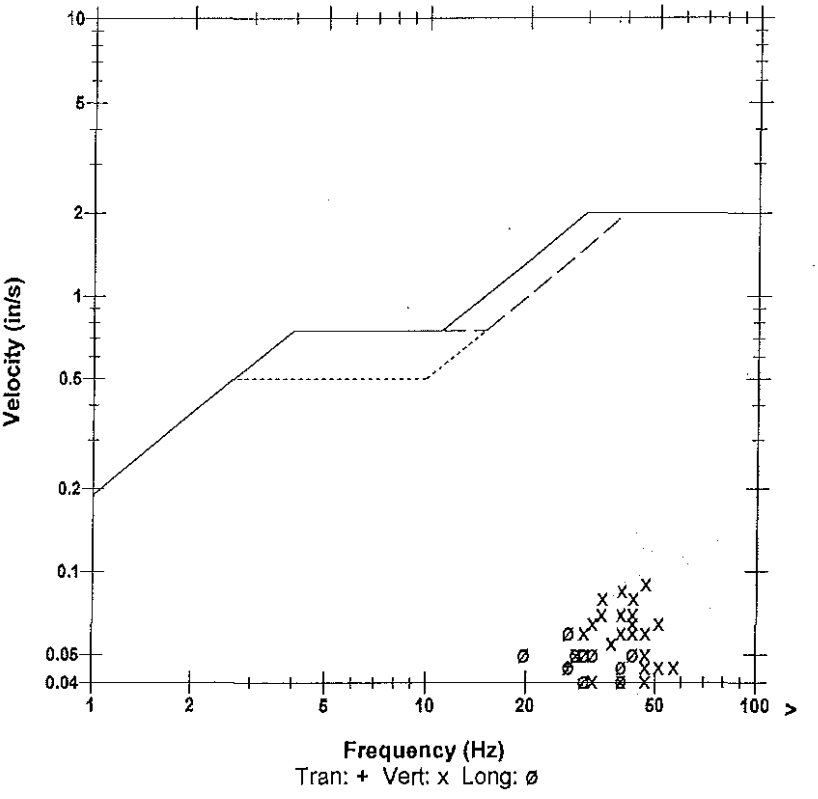
Date/Time	Vert at 12:31:37 June 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC0W.4P0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

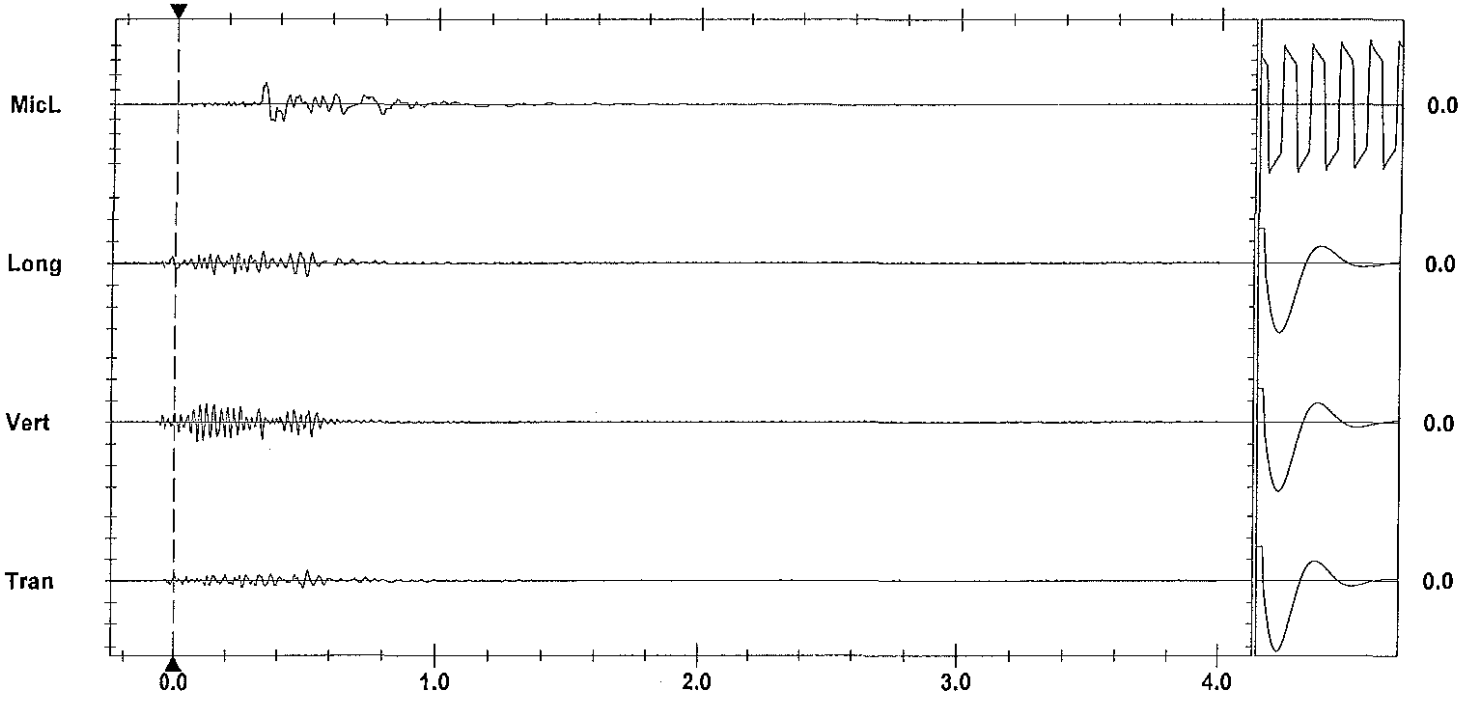
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00149 psi(L) at 0.343 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 605 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0900	0.0600	in/s
ZC Freq	27	47	27	Hz
Time (Rel. to Trig)	0.518	0.091	0.508	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00025	0.00039	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0964 in/s at 0.343 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 24, 2012 07:8:01 -8:01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:31:55 June 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC0W.570
Job Number:	1		

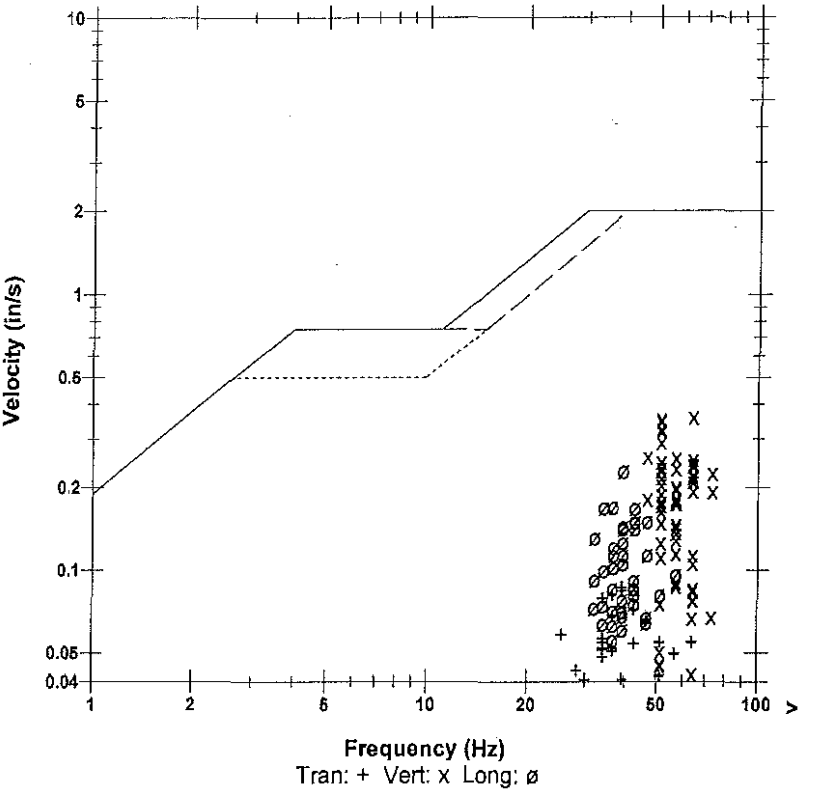
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

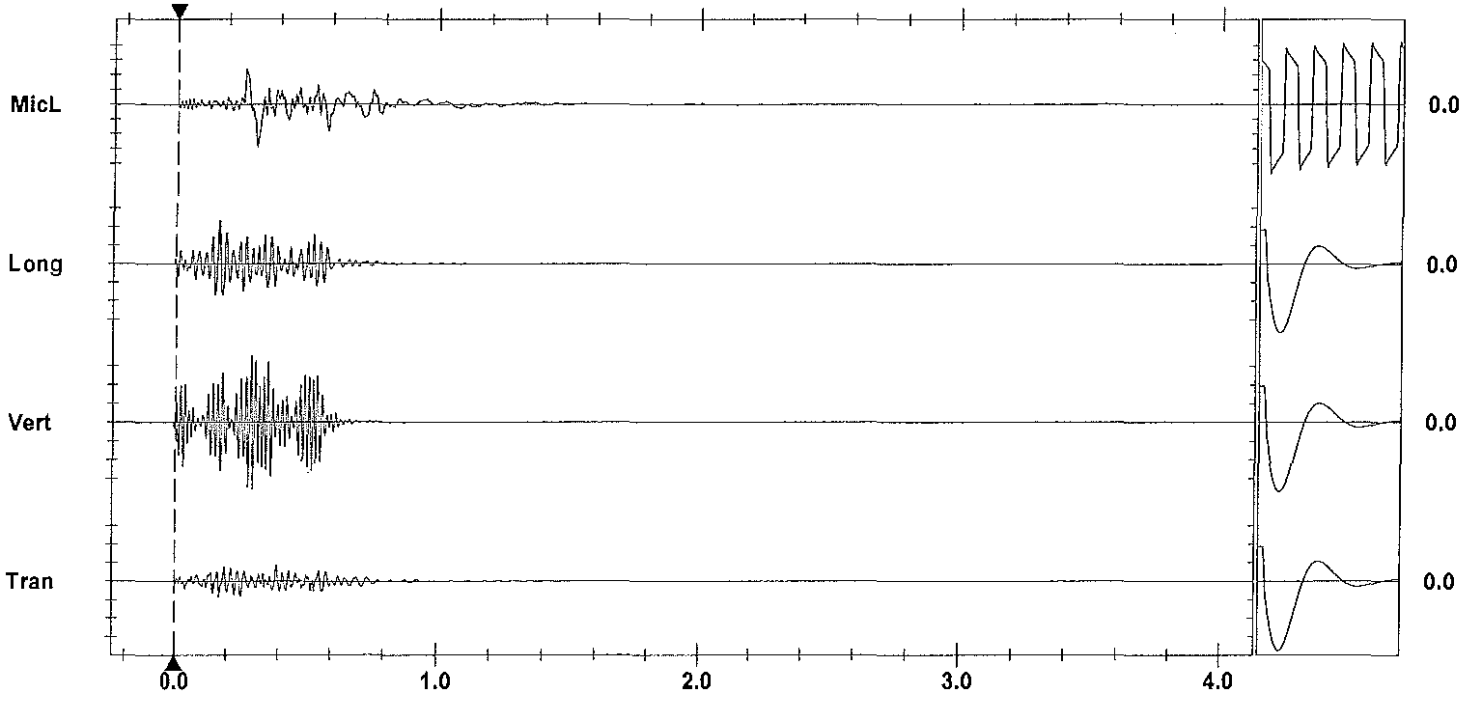
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00294 psi(L) at 0.311 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 572 mv)

	Tran	Vert	Long	
PPV	0.0862	0.359	0.229	in/s
ZC Freq	39	64	39	Hz
Time (Rel. to Trig)	0.175	0.303	0.169	sec
Peak Acceleration	0.111	0.356	0.235	g
Peak Displacement	0.00033	0.00105	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.362 in/s at 0.303 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED June 19/12
ACTUAL BLAST DATE June 19/12 2:14PM
BLAST # MW-0259

HIGHWAY# 97
BLAST LOCATION AT: 128+40 - 128+50 (TOP CUT)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot muted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10 Pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

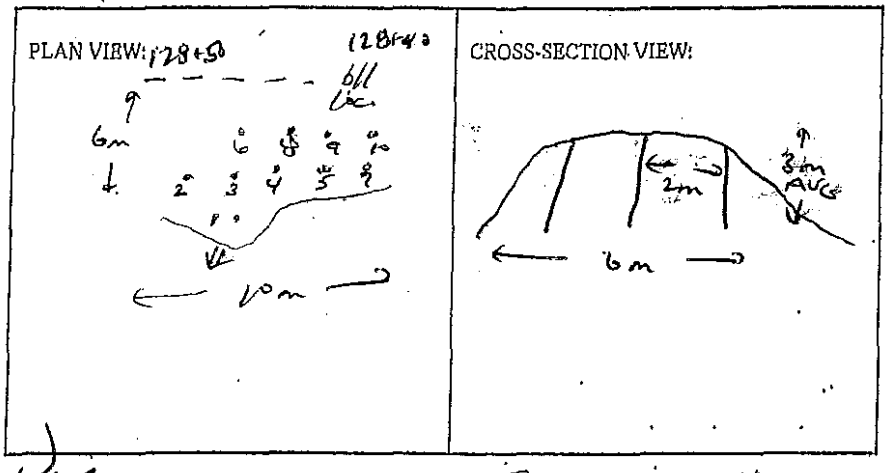
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE FP3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd. 0.33 ips / 39 Hz
@ 13167 Clayton Crt. 0.065 ips / 47 Hz
@ 13093 Clayton Crt. 0.19 ips / 57 Hz

1.5'-3' ANFO per hole @ 0.5 centers 1½"x16" dynamite primers

Instantel

Event Report

Date/Time	Vert at 14:14:35 June 19, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC10.WB0

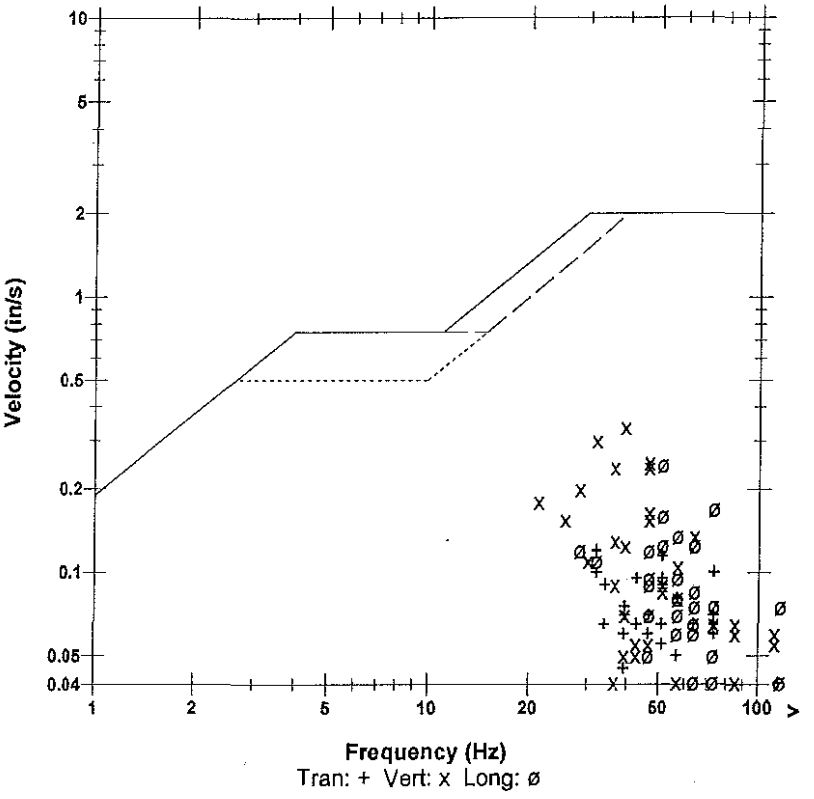
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

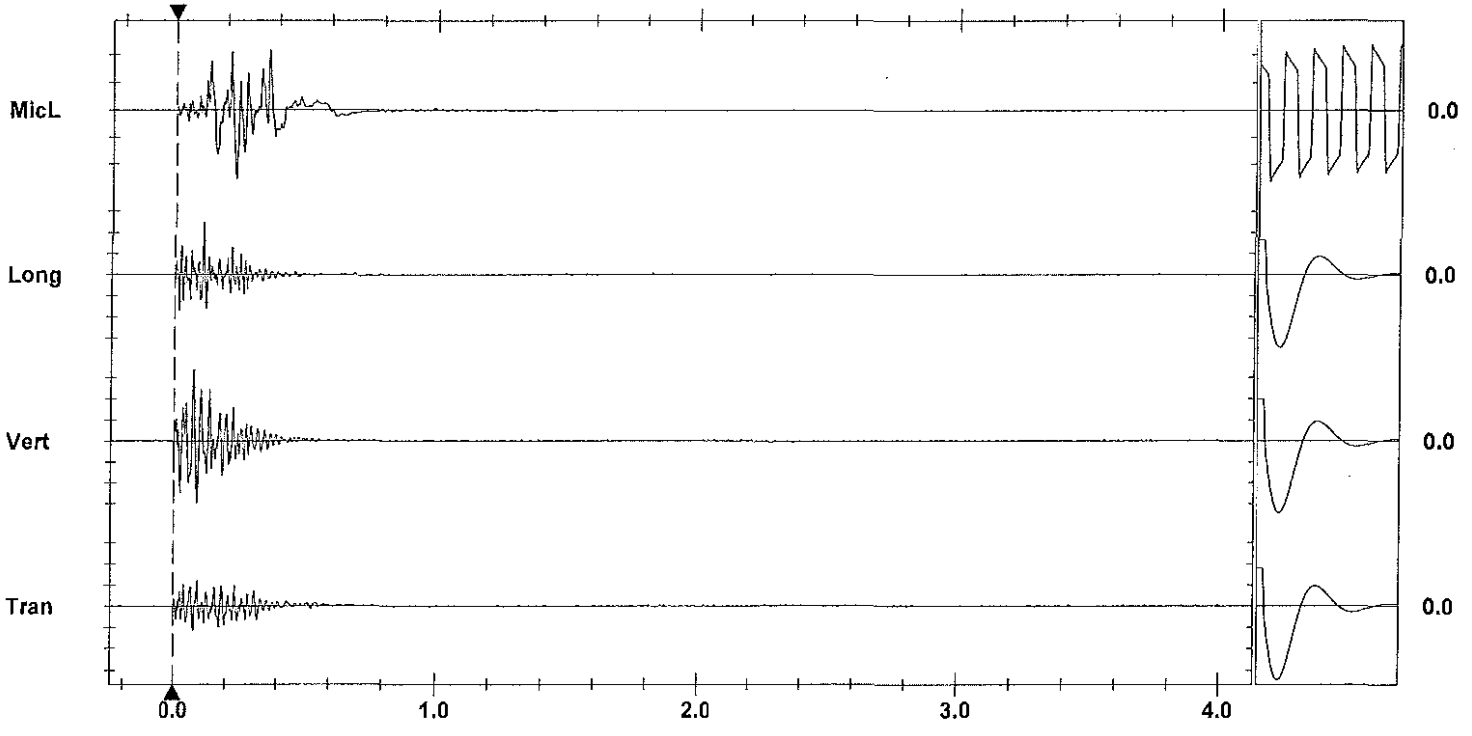
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00511 psi(L) at 0.232 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.120	0.335	0.245	in/s
ZC Freq	32	39	51	Hz
Time (Rel. to Trig)	0.096	0.078	0.112	sec
Peak Acceleration	0.119	0.239	0.239	g
Peak Displacement	0.00043	0.00132	0.00069	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.4	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.351 in/s at 0.078 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

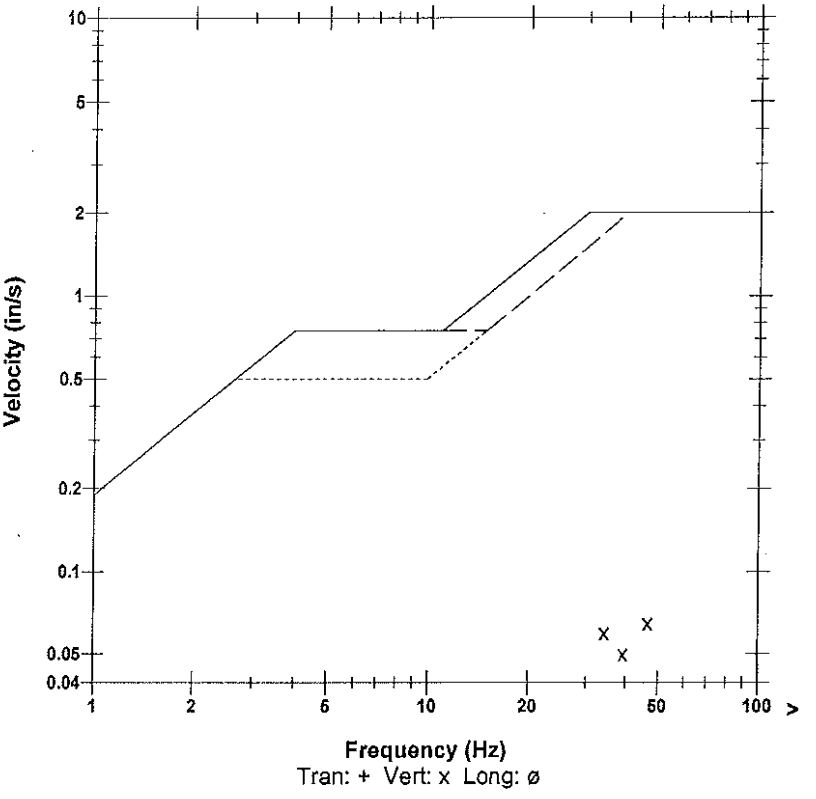
Date/Time	Vert at 14:14:30 June 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC10.W60

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

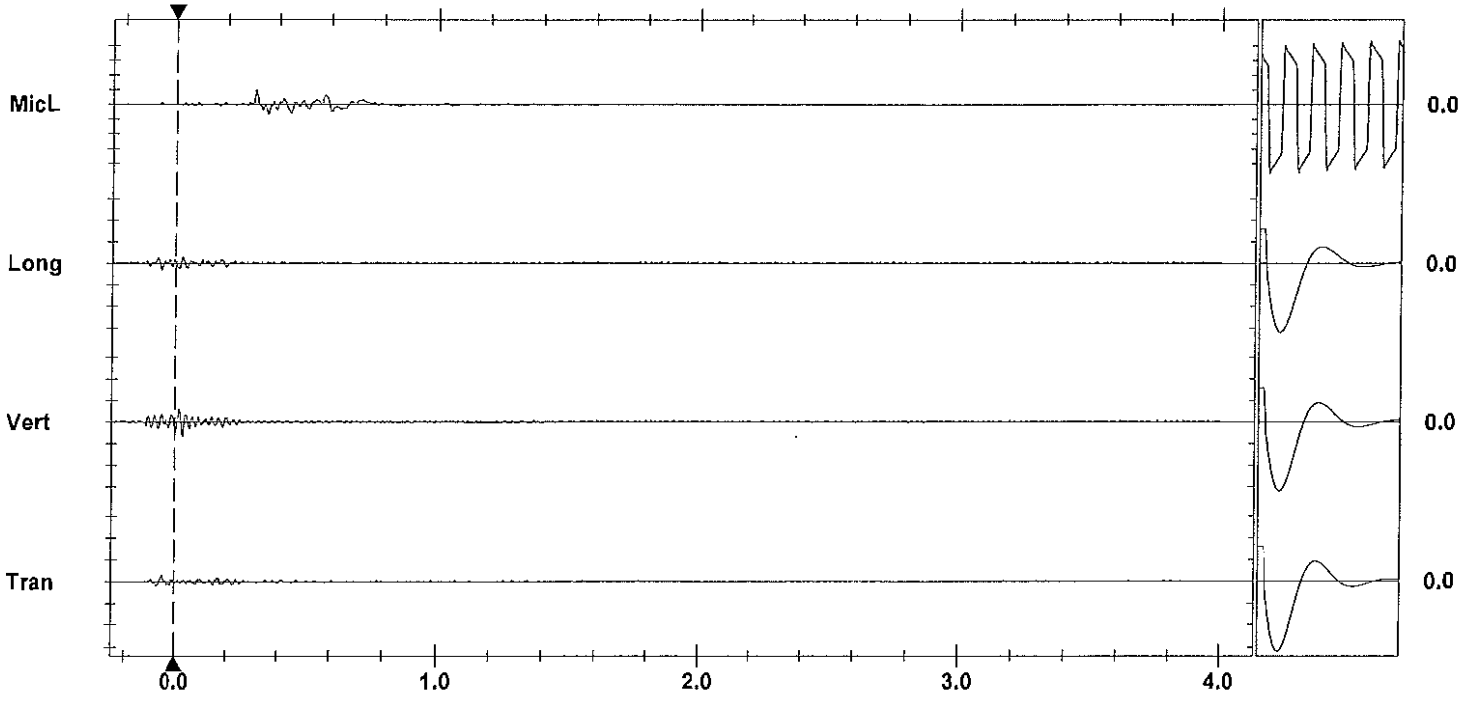


Tran: + Vert: x Long: ø

Microphone	Linear Weighting		
PSPL	0.00091 psi(L) at 0.309 sec		
ZC Freq	19 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 545 mv)		

	Tran	Vert	Long	
PPV	0.0300	0.0650	0.0300	in/s
ZC Freq	37	47	39	Hz
Time (Rel. to Trig)	-0.052	0.030	-0.059	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00012	0.00027	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0698 in/s at 0.030 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Instantel

Event Report

Date/Time	Vert at 14:14:48 June 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC10.WO0
Job Number:	1		

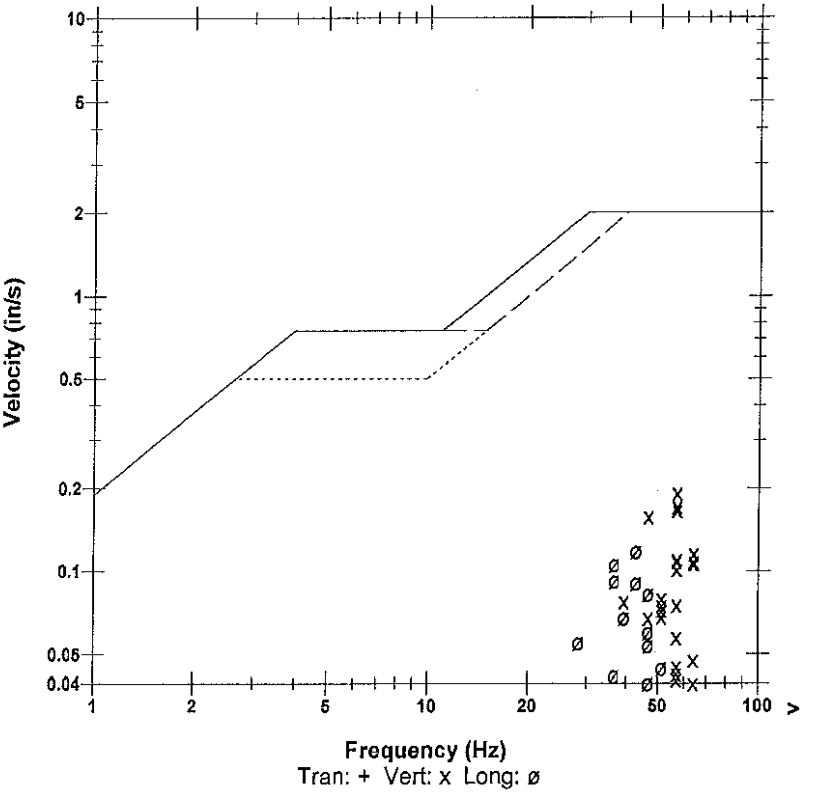
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

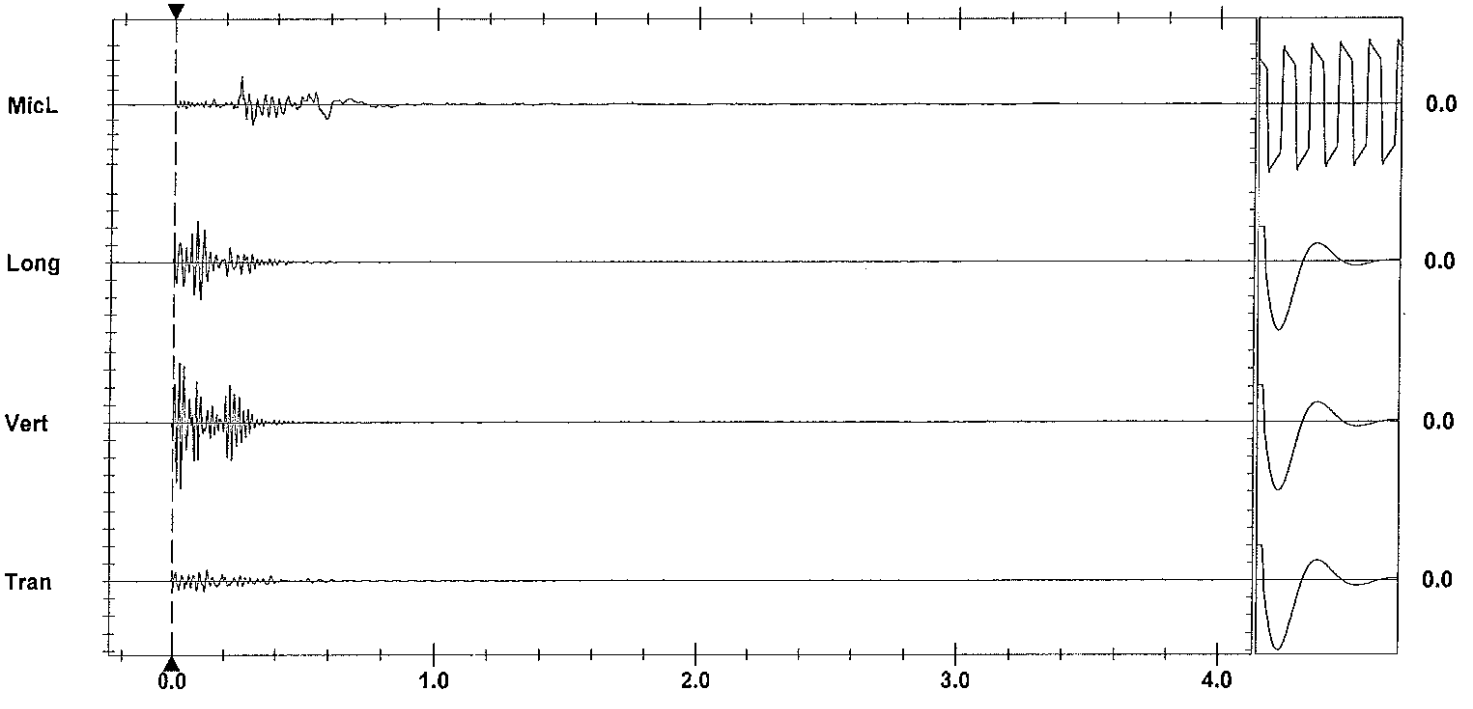
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.258 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.0312	0.192	0.118	in/s
ZC Freq	39	57	43	Hz
Time (Rel. to Trig)	0.138	0.032	0.093	sec
Peak Acceleration	0.0315	0.217	0.0829	g
Peak Displacement	0.00012	0.00049	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.192 in/s at 0.032 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶——————◀

Printed: June 24, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 9:18 AM
BLAST # MW-0260

HIGHWAY# 97
BLAST LOCATION AT: STN 128+66 ~ 128+72 (+ subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: de slot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

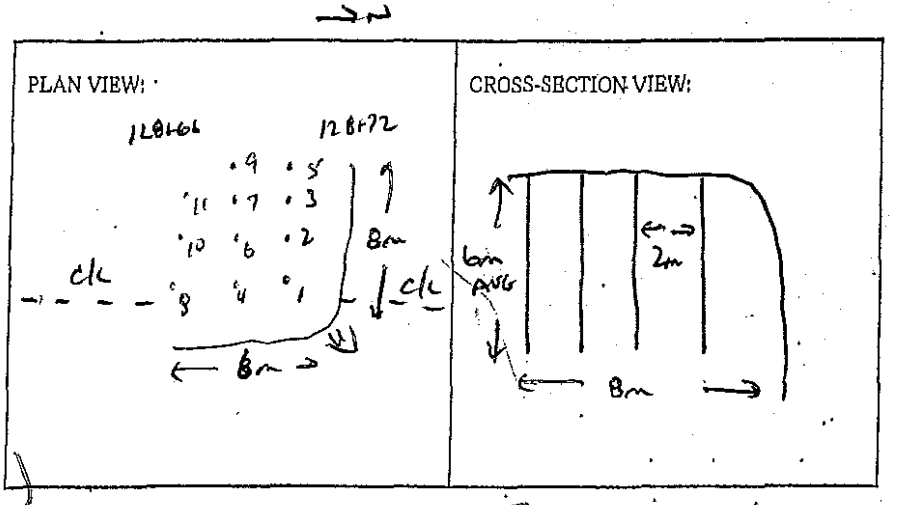
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 275 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



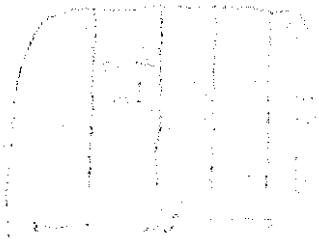
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD Mission Rd - 0.37 ips/32 Hz
" @ 13167 Cl: Astor Crt - 0.12 ips/39 Hz
" @ 13093 Cl: Astor Crt - 0.38 ips/43 Hz

5 - 7' ANFO / 1½ + 0.5 CAST 1½ & 1¼ DYNAMITE 1 C. MEN



Instantel®

Event Report

Date/Time	Vert at 09:18:41 June 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC2H.V50

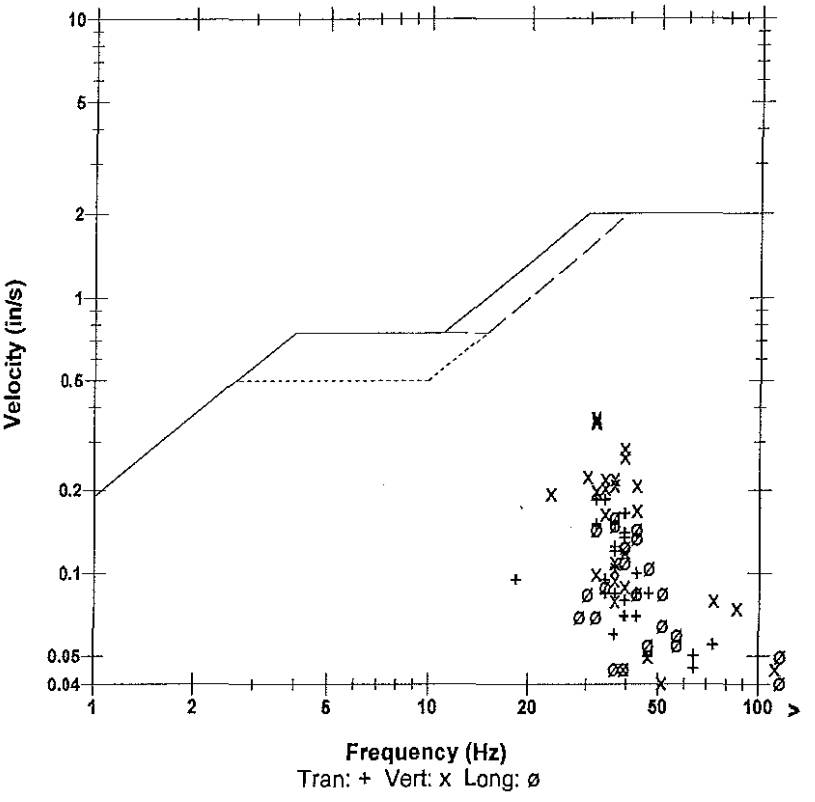
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

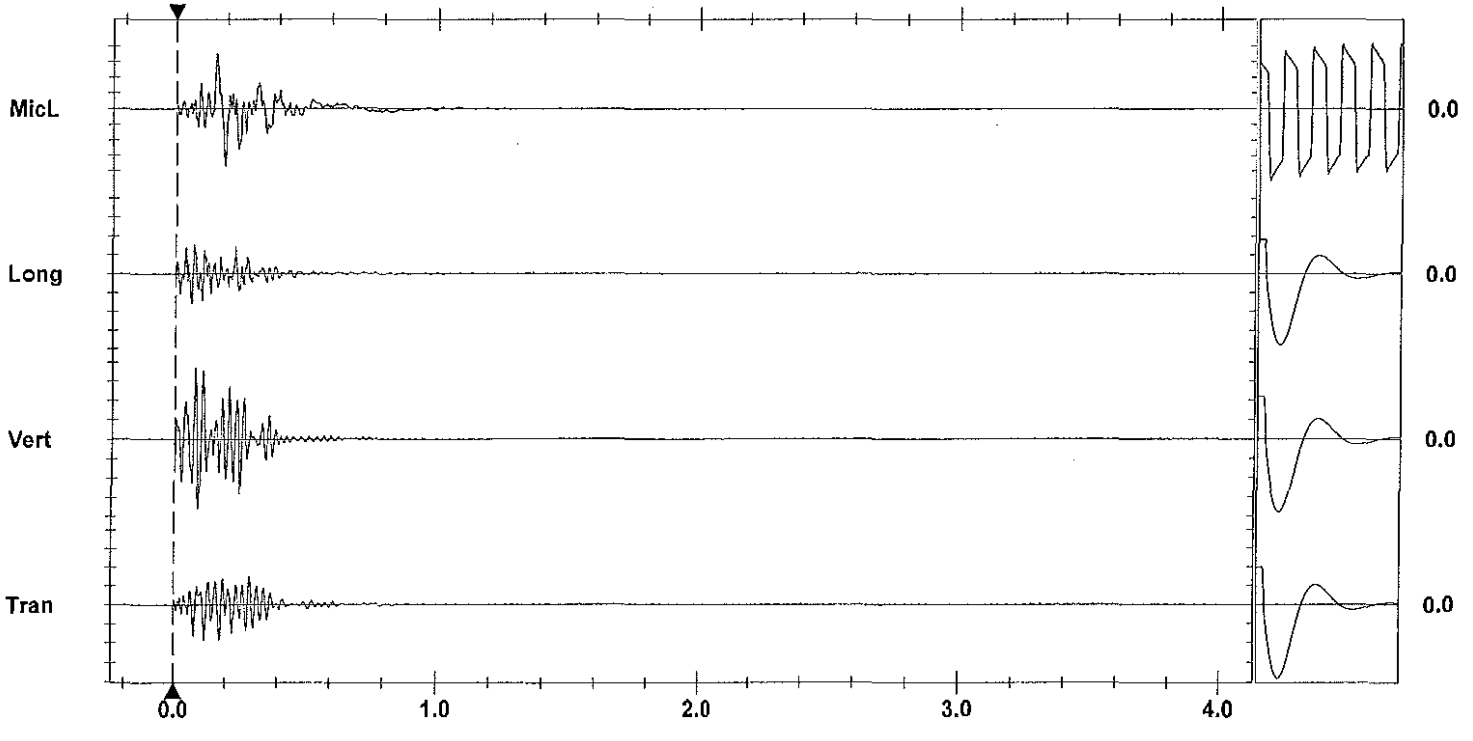
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00373 psi(L) at 0.189 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.185	0.370	0.160	in/s
ZC Freq	32	32	37	Hz
Time (Rel. to Trig)	0.122	0.081	0.063	sec
Peak Acceleration	0.119	0.252	0.133	g
Peak Displacement	0.00083	0.00181	0.00064	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.413 in/s at 0.081 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶———◀

Sensorcheck

Instantel

Event Report

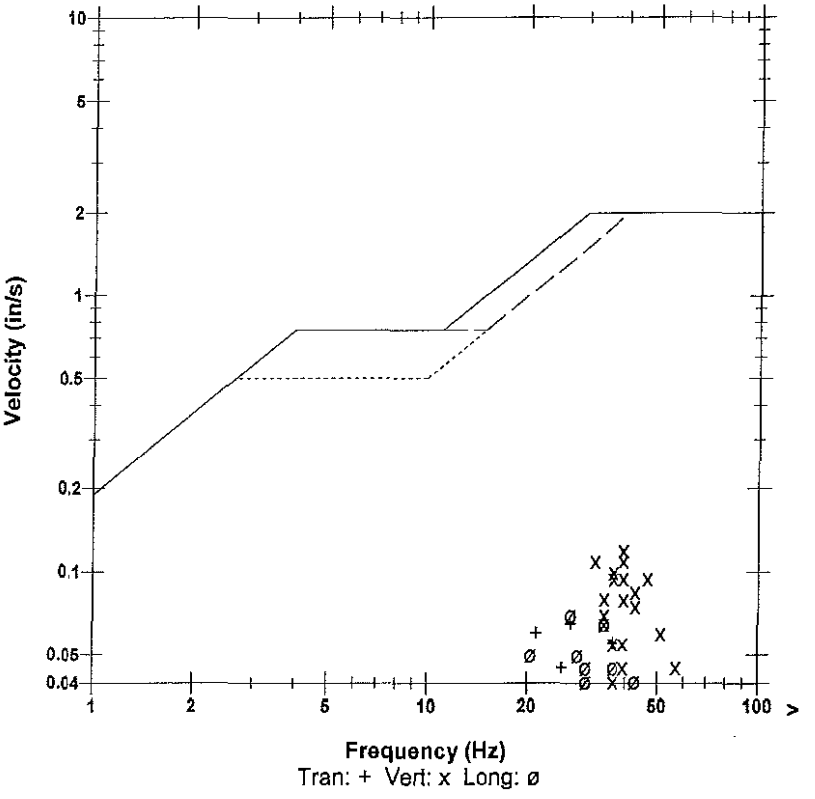
Date/Time	Long at 09:18:36 June 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC2H.V00

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

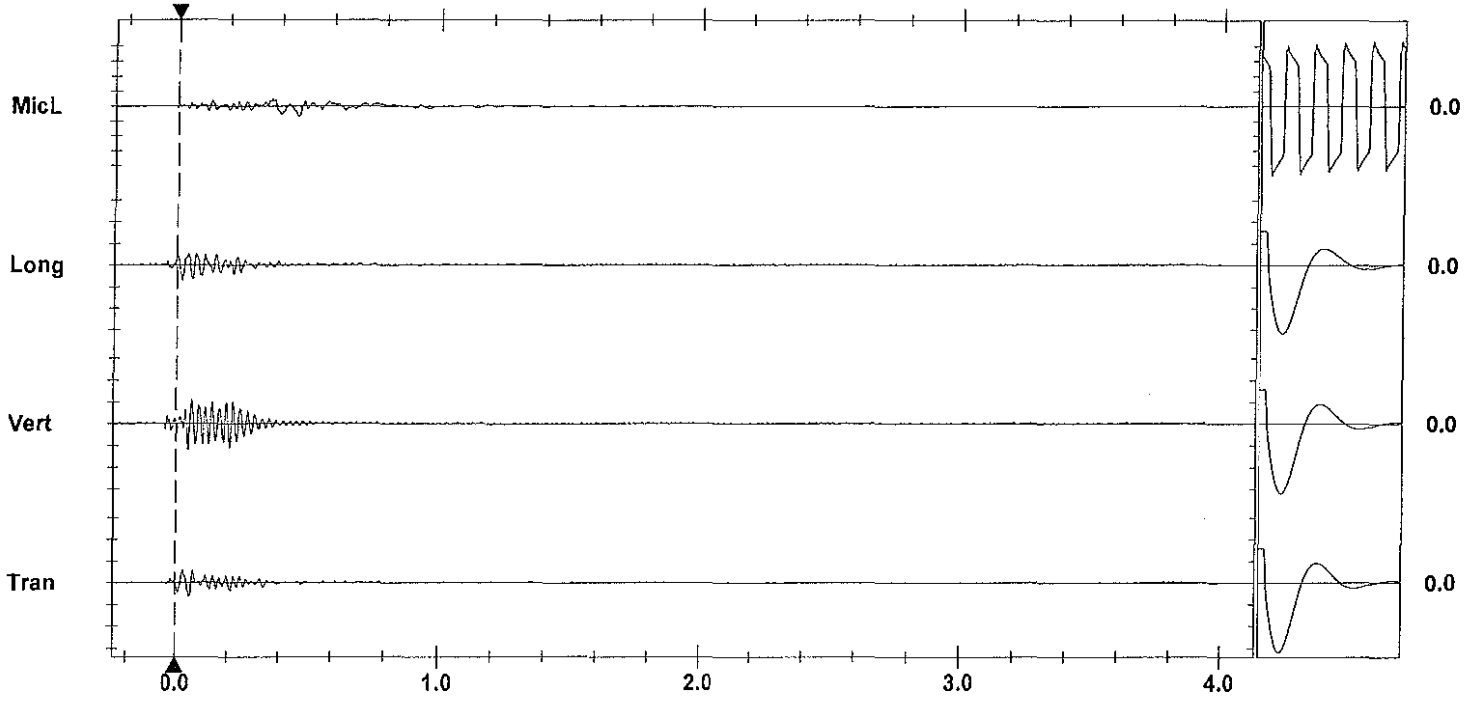
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00065 psi(L) at 0.459 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 549 mv)

	Tran	Vert	Long	
PPV	0.0650	0.120	0.0700	in/s
ZC Freq	27	39	27	Hz
Time (Rel. to Trig)	0.056	0.049	0.021	sec
Peak Acceleration	0.0398	0.0795	0.0530	g
Peak Displacement	0.00041	0.00050	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.6	3.6	4.3	

Peak Vector Sum 0.132 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 09:18:54 June 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC2H.VI0
Job Number:	1		

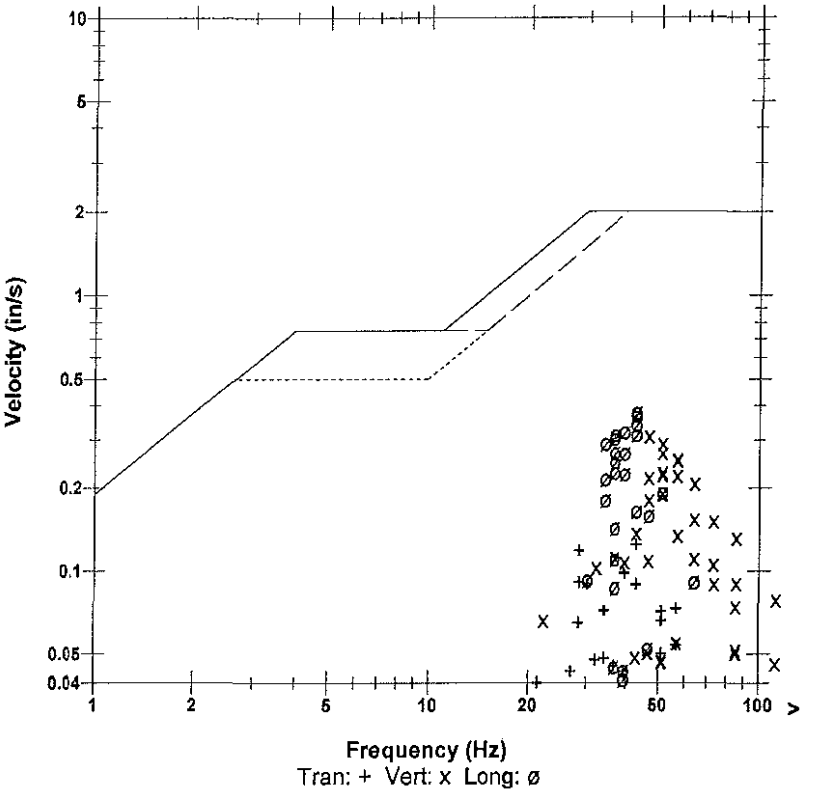
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

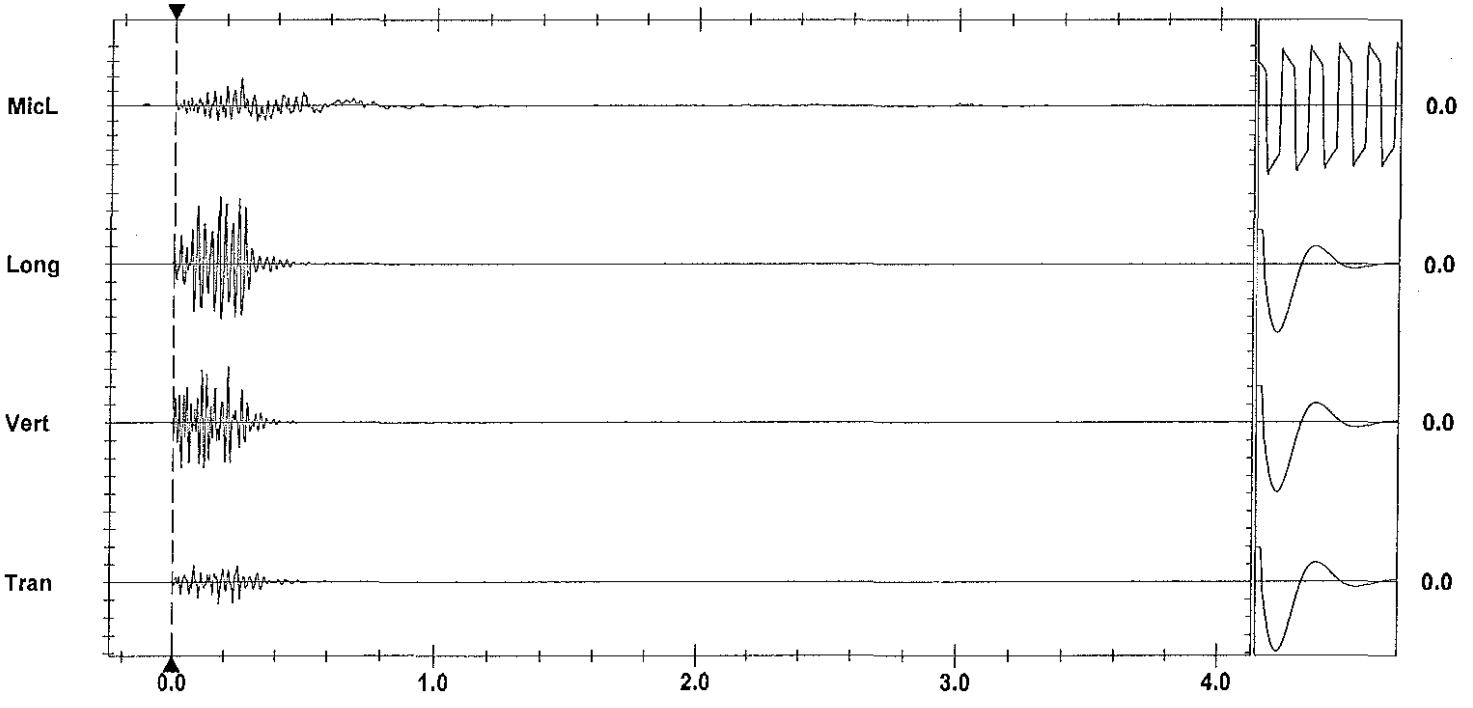
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.257 sec
ZC Freq	30 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 568 mv)

	Tran	Vert	Long	
PPV	0.125	0.311	0.378	in/s
ZC Freq	43	47	43	Hz
Time (Rel. to Trig)	0.181	0.212	0.175	sec
Peak Acceleration	0.113	0.247	0.394	g
Peak Displacement	0.00046	0.00100	0.00142	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.395 in/s at 0.255 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED June 20/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE June 27/12 10:06A
BLASTER'S NAME Wayne Verney
BLAST # MW-0261
BLASTER'S CERTIFICATE NUMBER SB3482

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+50 - 128+58 (TOP Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 45 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

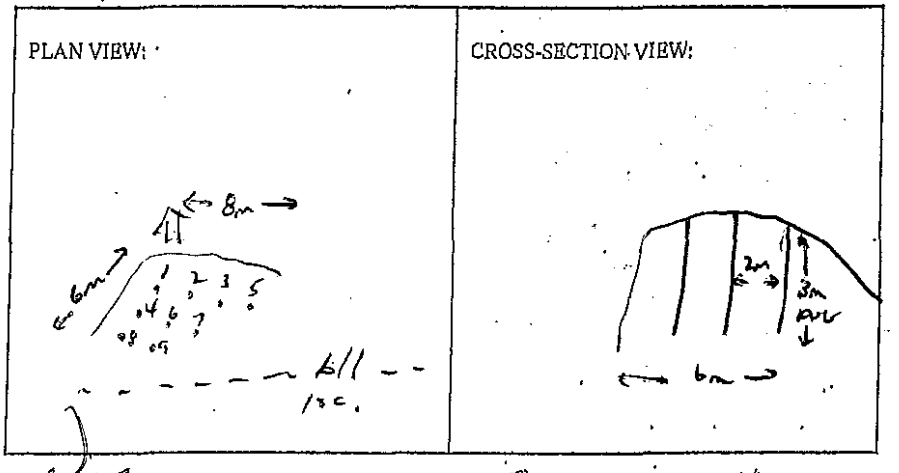
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HPB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 130 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 old mission RD = 0.12 ips / 4BH
" @ 13167 Cliffstone Crt - No Trigger (<0.04 ips)
" @ 13093 Cliffstone Crt - No Trigger (<0.04 ips)

1' – 2.5' ANFO / Hole + 0.5 CAST 1½ x 10 DYNAMITE (1½ in.)

Instantel

Event Report

Date/Time	Vert at 10:06:07 June 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC2K.270

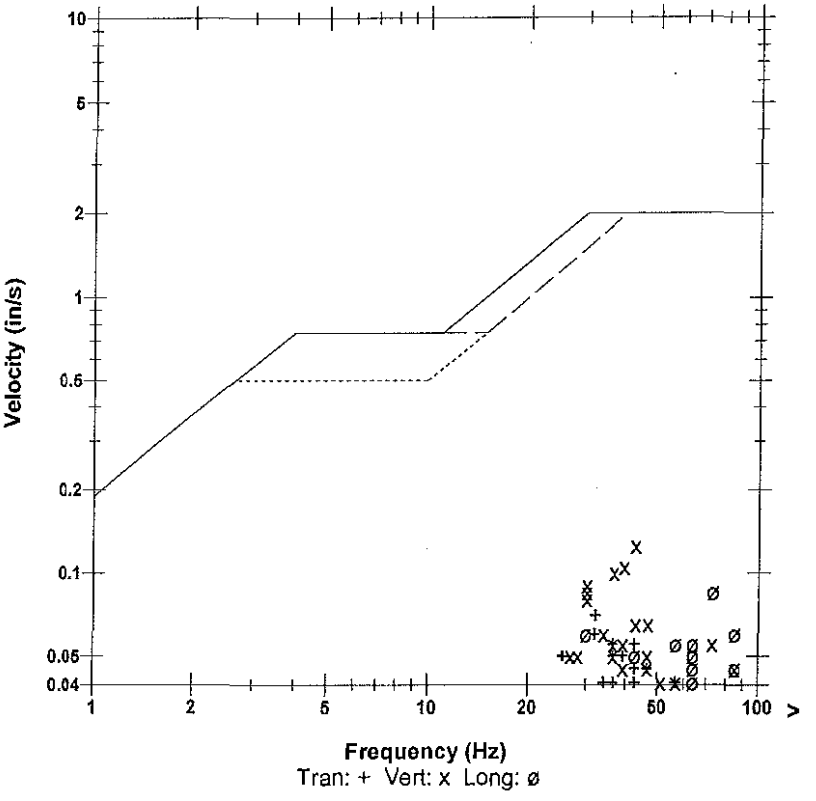
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

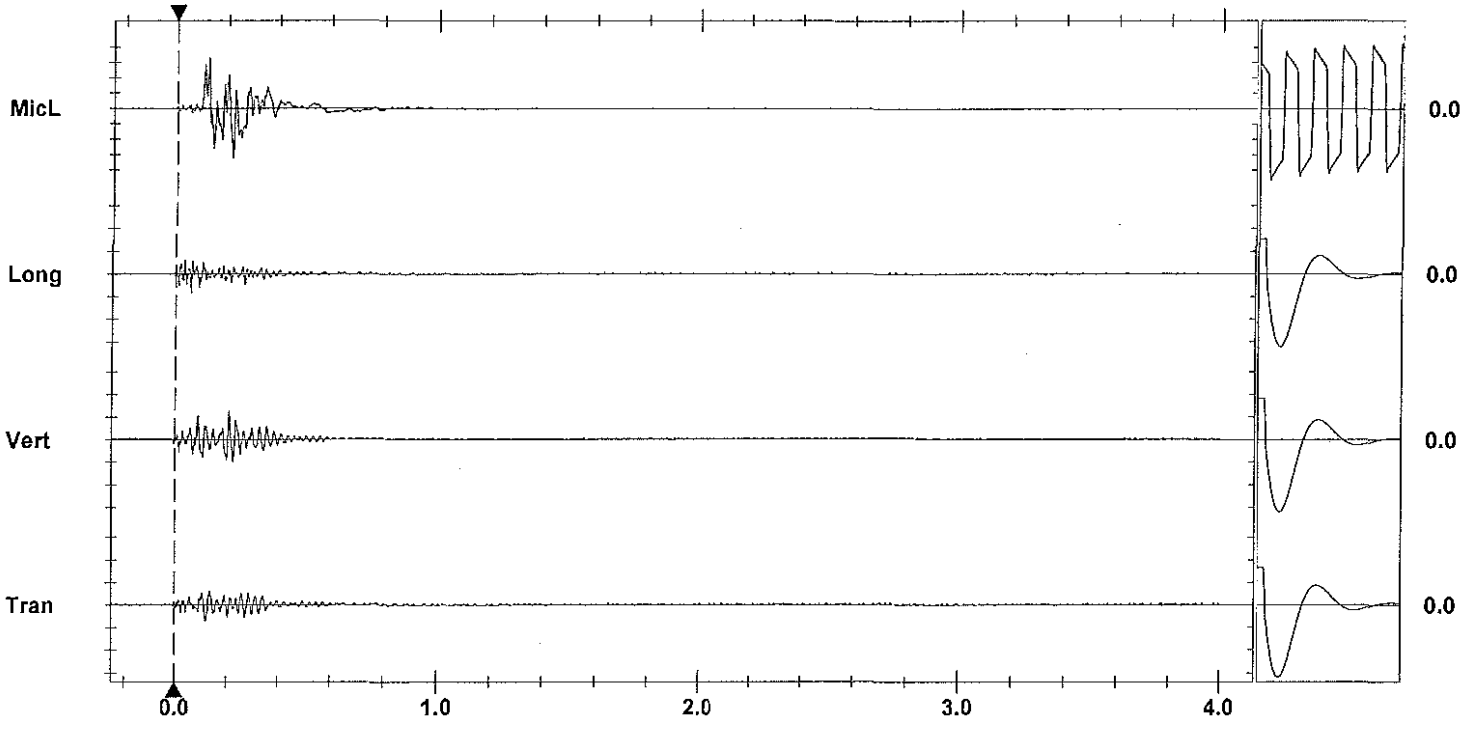
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00330 psi(L) at 0.122 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.0700	0.125	0.0850	in/s
ZC Freq	32	43	73	Hz
Time (Rel. to Trig)	0.121	0.211	0.061	sec
Peak Acceleration	0.0530	0.0795	0.119	g
Peak Displacement	0.00035	0.00046	0.00022	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.128 in/s at 0.211 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶—— —— —◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3488

DATE PREPARED Jun 26/12
ACTUAL BLAST DATE Jun 26/12 11:35AM
BLAST # MW-0262

HIGHWAY# 97
BLAST LOCATION AT: STN 128+58 - 128+72 (top cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 9 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 9

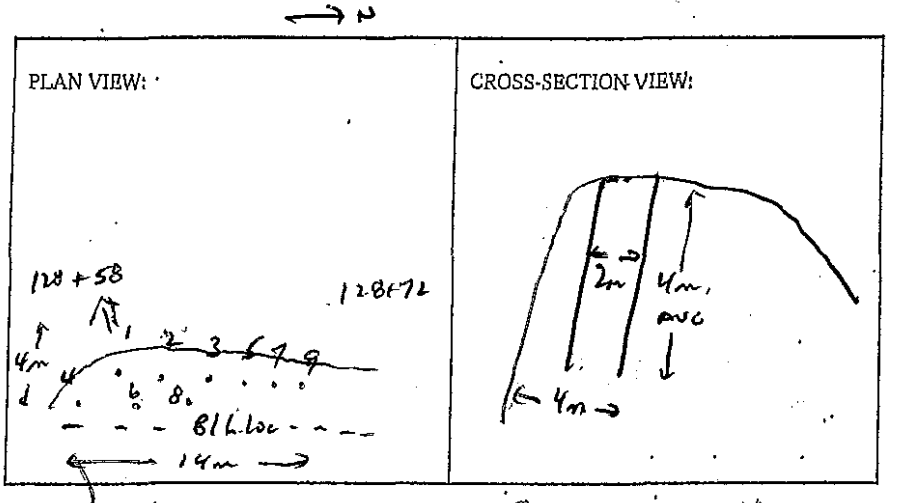
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



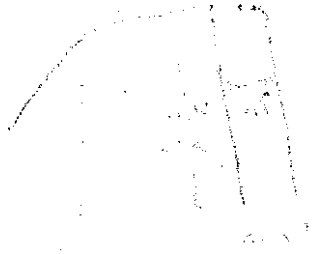
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13050 Old Mission Rd - 0.411 PPV/32Hz
" @ 13167 Clearstone Crt - 0.070 PPV/37Hz
" @ 13093 Clearstone Crt - 0.151 PPV/87Hz

1' - 7' ANFO / HOLE + 0.5 CAST 1½" x 16" DYNAMITE PRIMER



Instantel

Event Report

Date/Time Vert at 11:35:52 June 20, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11746 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration January 7, 2011 by Instantel
File Name M746EC2O.7S0

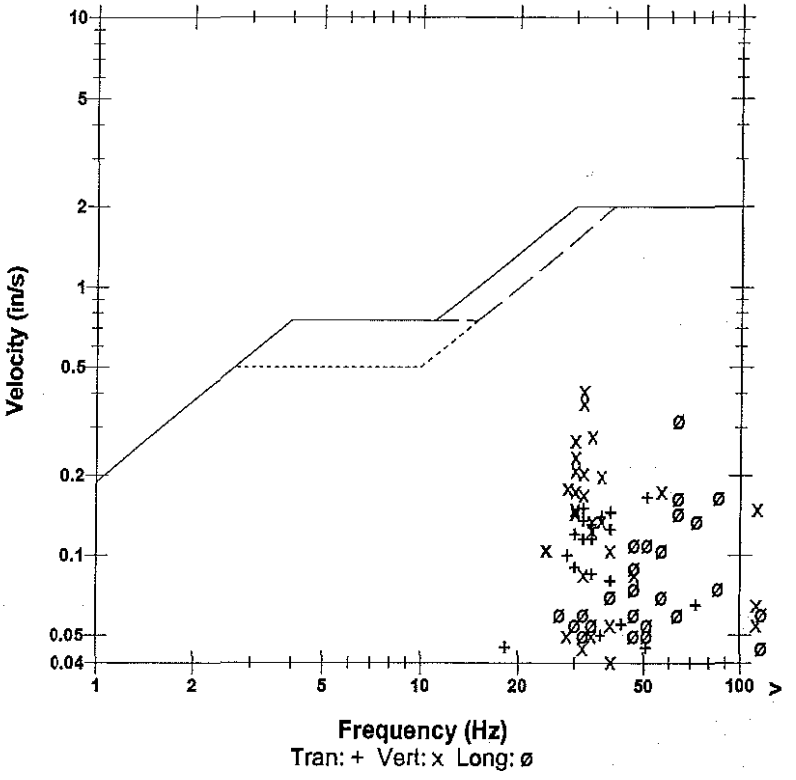
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

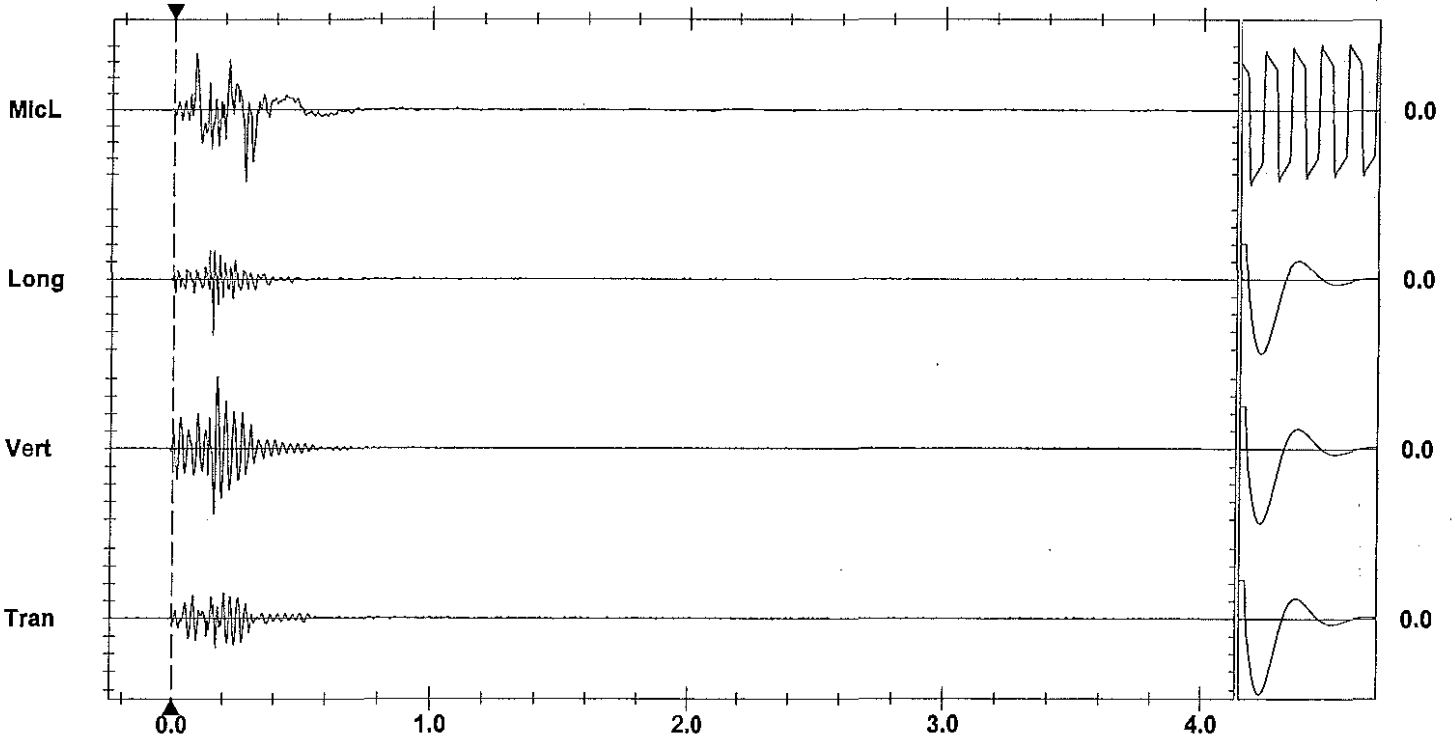
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00453 psi(L) at 0.282 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 547 mv)

	Tran	Vert	Long	
PPV	0.165	0.410	0.320	in/s
ZC Freq	51	32	64	Hz
Time (Rel. to Trig)	0.174	0.173	0.154	sec
Peak Acceleration	0.172	0.305	0.345	g
Peak Displacement	0.00075	0.00198	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.461 in/s at 0.174 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: April 21, 2013 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:35:47 June 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC2O.7N0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

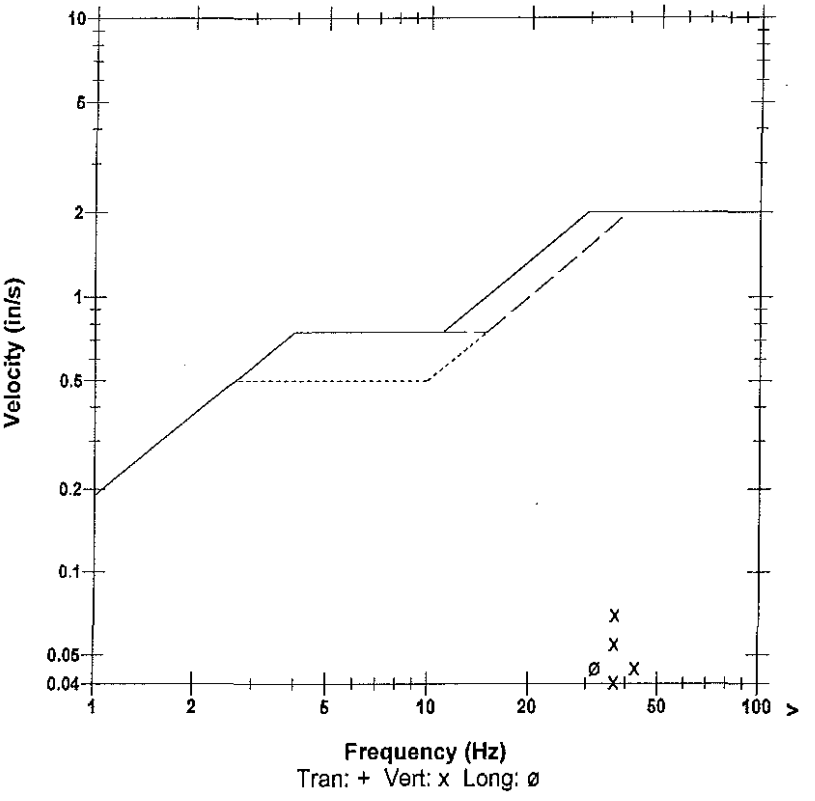
Post Event Notes

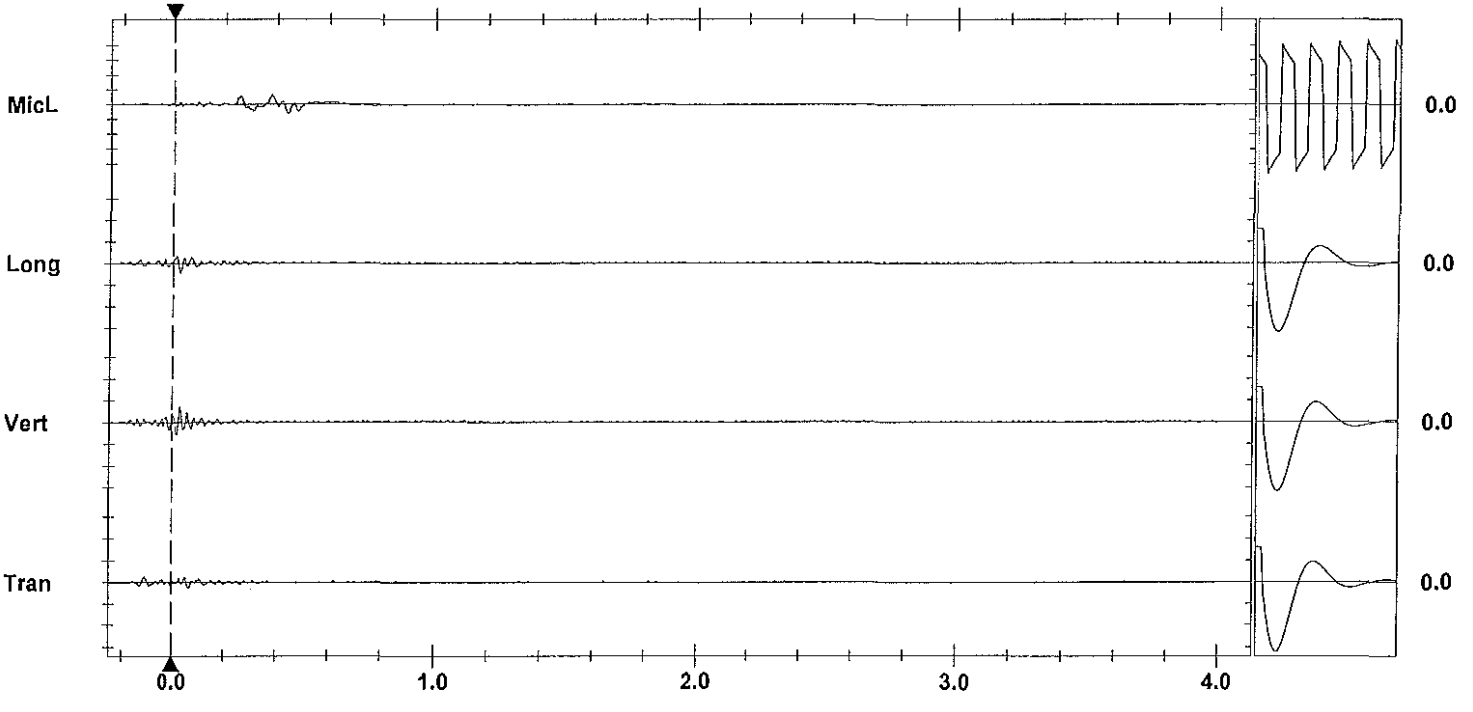
Microphone Linear Weighting
PSPL 0.00065 psi(L) at 0.376 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 497 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0700	0.0450	in/s
ZC Freq	30	37	32	Hz
Time (Rel. to Trig)	-0.109	0.030	0.026	sec
Peak Acceleration	0.0133	0.0530	0.0265	g
Peak Displacement	0.00014	0.00030	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0820 in/s at 0.030 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 11:36:05 June 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC2O.850
Job Number:	1		

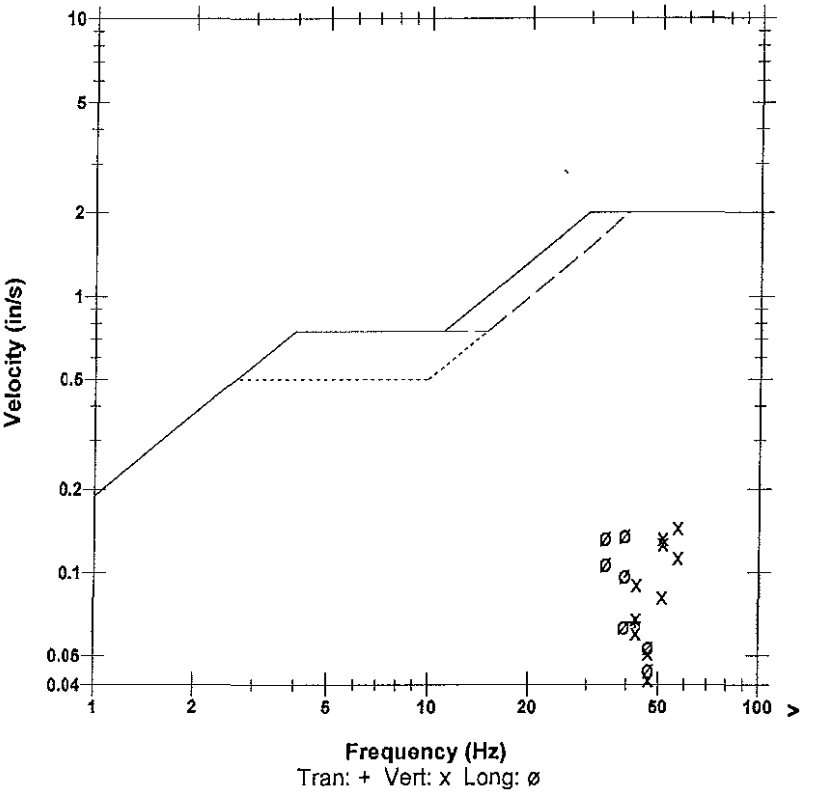
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

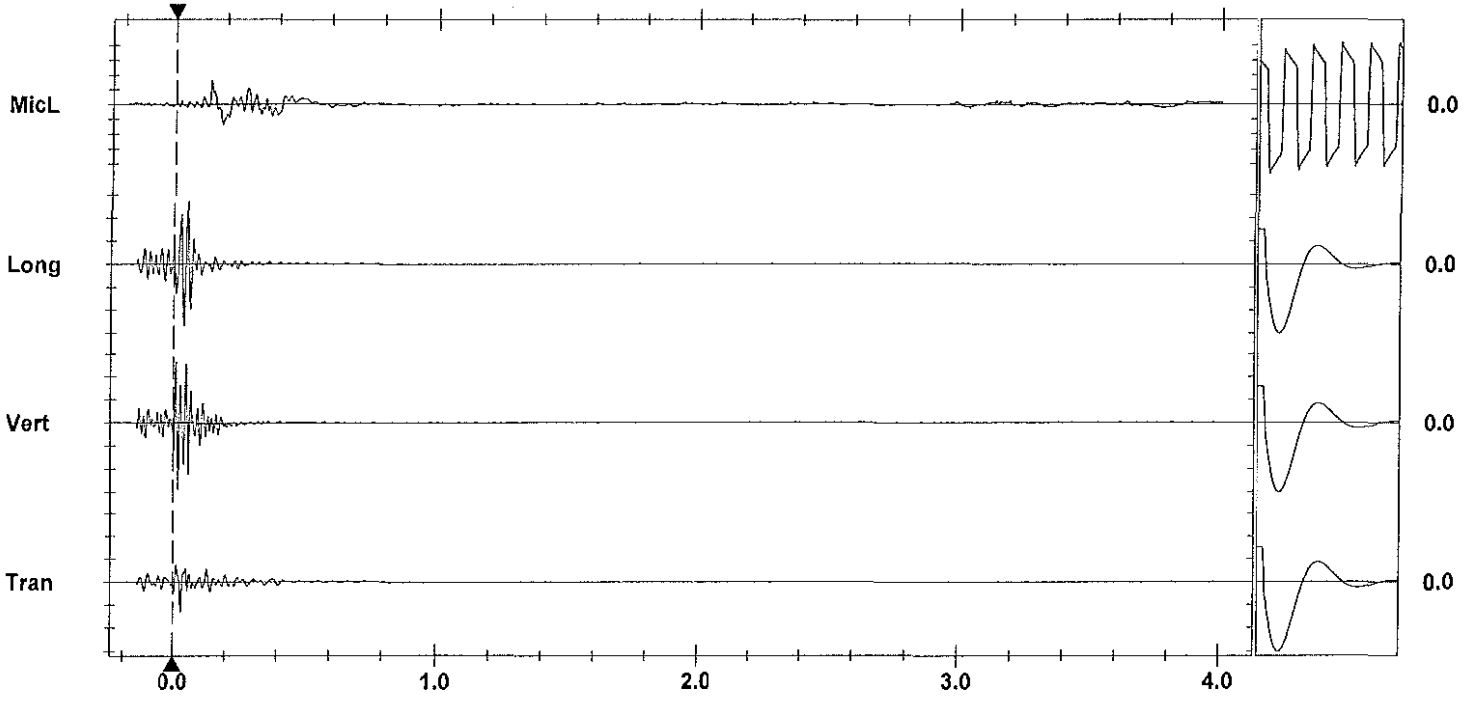
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00160 psi(L) at 0.138 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 536 mv)

	Tran	Vert	Long	
PPV	0.0656	0.146	0.136	in/s
ZC Freq	43	57	39	Hz
Time (Rel. to Trig)	0.030	0.020	0.053	sec
Peak Acceleration	0.0481	0.131	0.0845	g
Peak Displacement	0.00022	0.00040	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.179 in/s at 0.052 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3483

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 1:36PM
BLAST # MW-0263

HIGHWAY # 97
BLAST LOCATION AT: STH 128+71 – 128+78 RS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: de shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7m (m)
ROCK TYPE Fractured Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 B/L
AVERAGE DEPTH 4.8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 7 B/L / 4 Buffer / 4 SMB / 4 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 Cart. 1x16 Dynamite + 200gr det cord to 4' collar in B/L

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite +
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 6
TOTAL WEIGHT 75 (kg)
TOTAL NUMBER OF DELAYS 16
DELAY TYPE AND LENGTH 25 (ms)

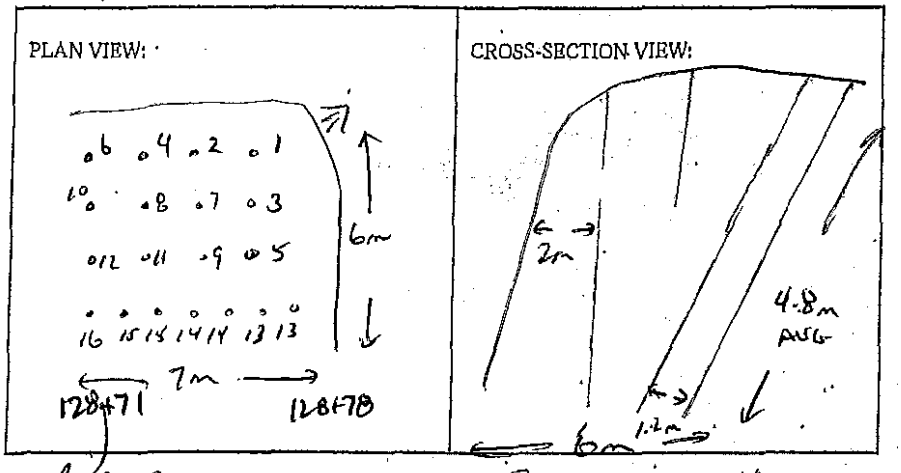
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.40 ips / 28 Hz
@ 13169 Cliffstone Crt – 0.045 ips / 37 Hz
@ 13093 Cliffstone Crt – 0.131 ips / 57 Hz

Prod Holes - 6'-7' ANFO
Stab Holes - 2'-3' ANFO
Buffer Holes - 3-4 CART 2x16 BLASTEX

} ALL Primed w/ 0.5 CART 1½"x16" DYNAMITE

B/L Holes - 1 CART 2x16 UNIMAX DYNAMITE + 200gr det cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 13:36:52 June 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC2T.TG0

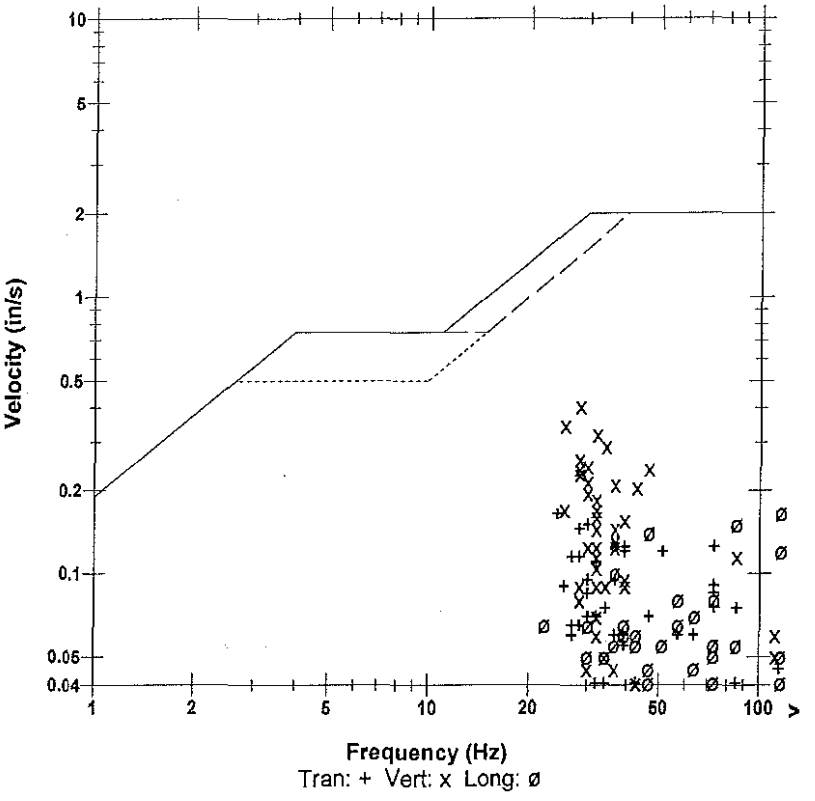
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

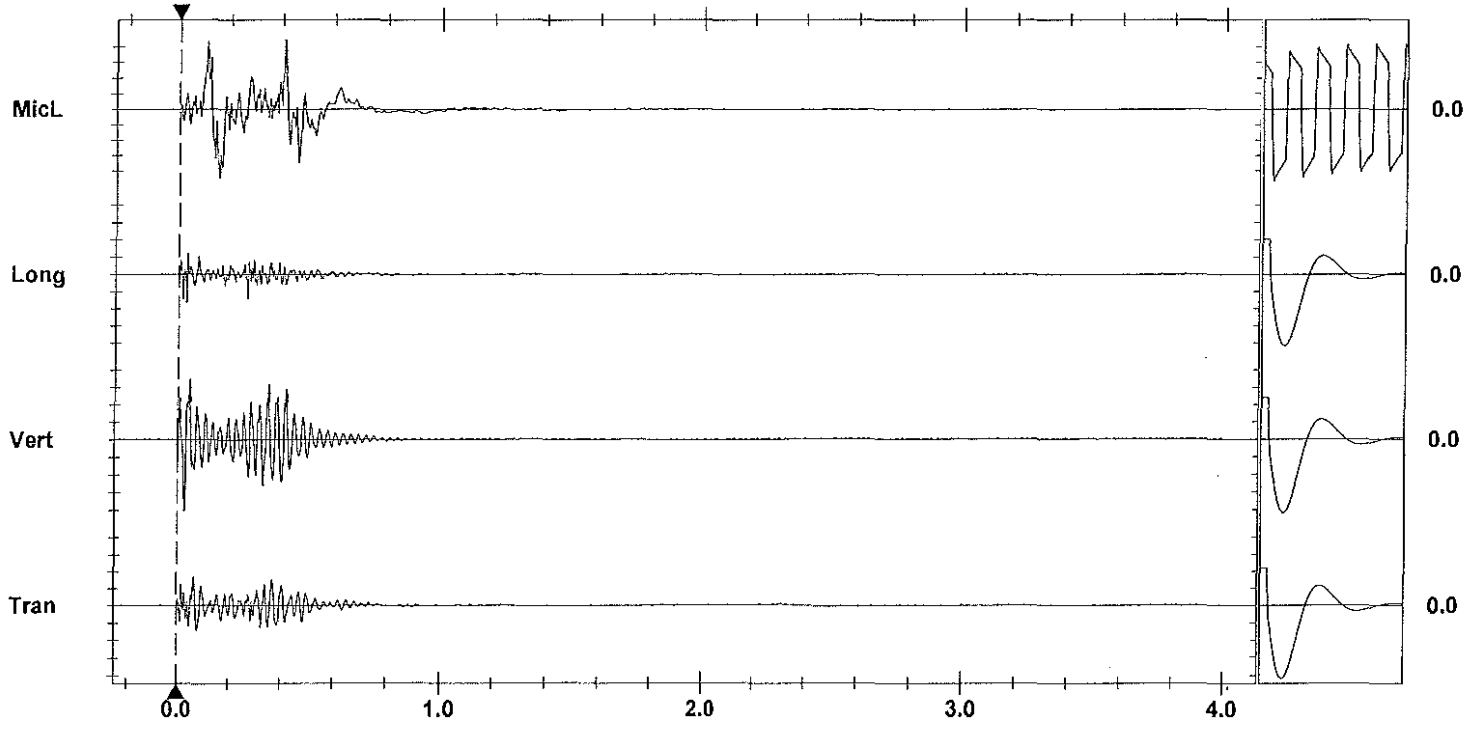
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00450 psi(L) at 0.155 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 520 mv)

	Tran	Vert	Long	
PPV	0.165	0.405	0.165	in/s
ZC Freq	24	28	>100	Hz
Time (Rel. to Trig)	0.068	0.027	0.030	sec
Peak Acceleration	0.172	0.305	0.278	g
Peak Displacement	0.00083	0.00201	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.4	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.406 in/s at 0.028 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel

Event Report

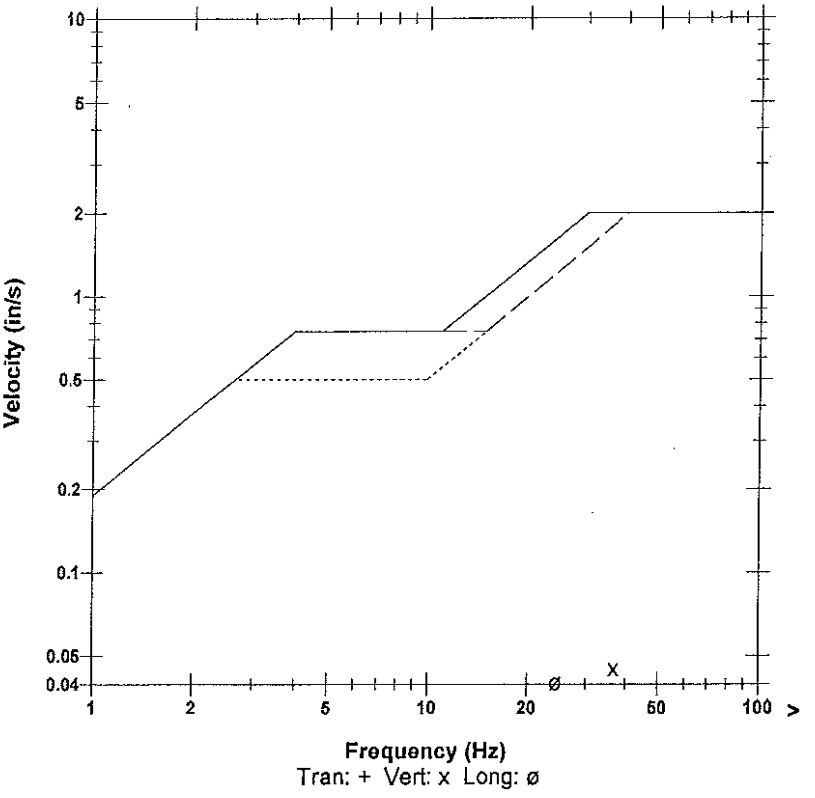
Date/Time	Long at 13:36:46 June 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC2T.TA0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

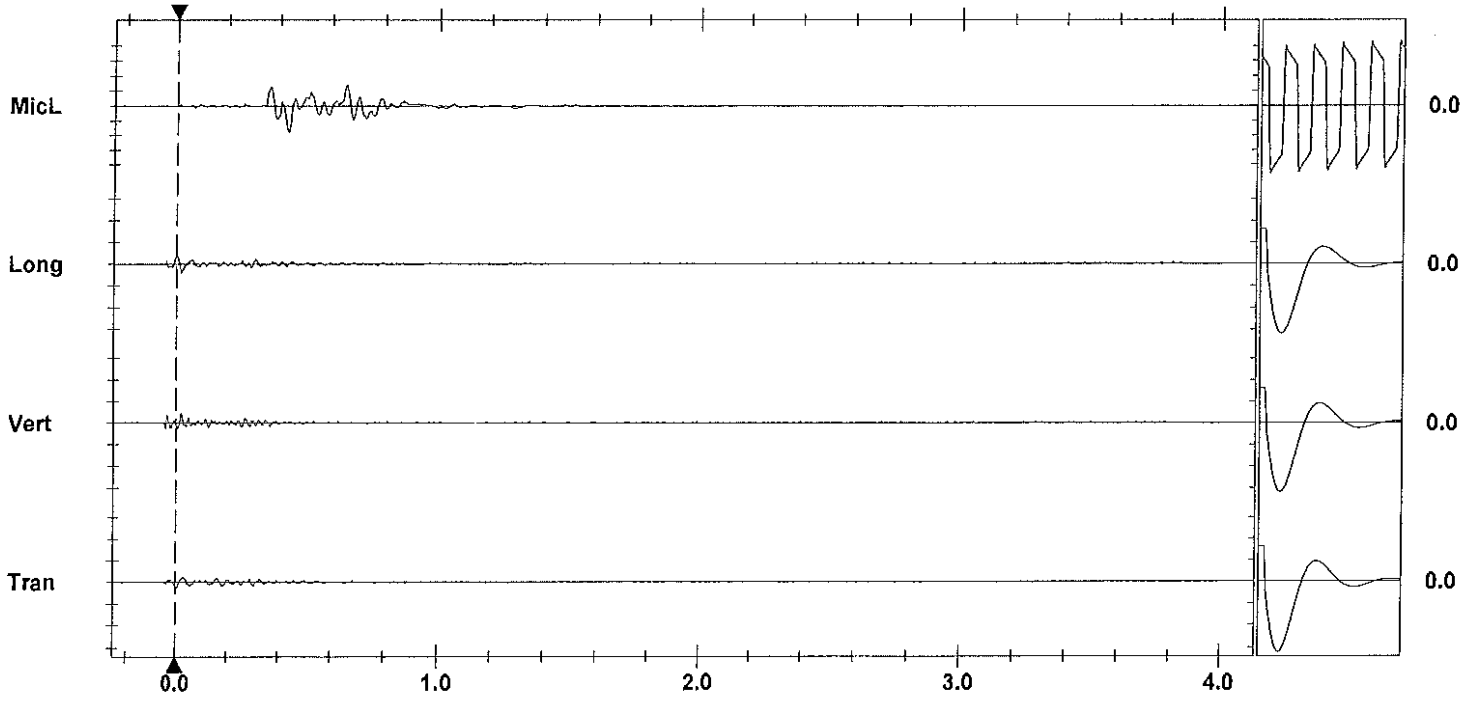
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.432 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0450	0.0400	in/s
ZC Freq	27	37	24	Hz
Time (Rel. to Trig)	0.001	0.021	0.000	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00018	0.00019	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0579 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 13:37:05 June 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC2T.TT0
Job Number:	1		

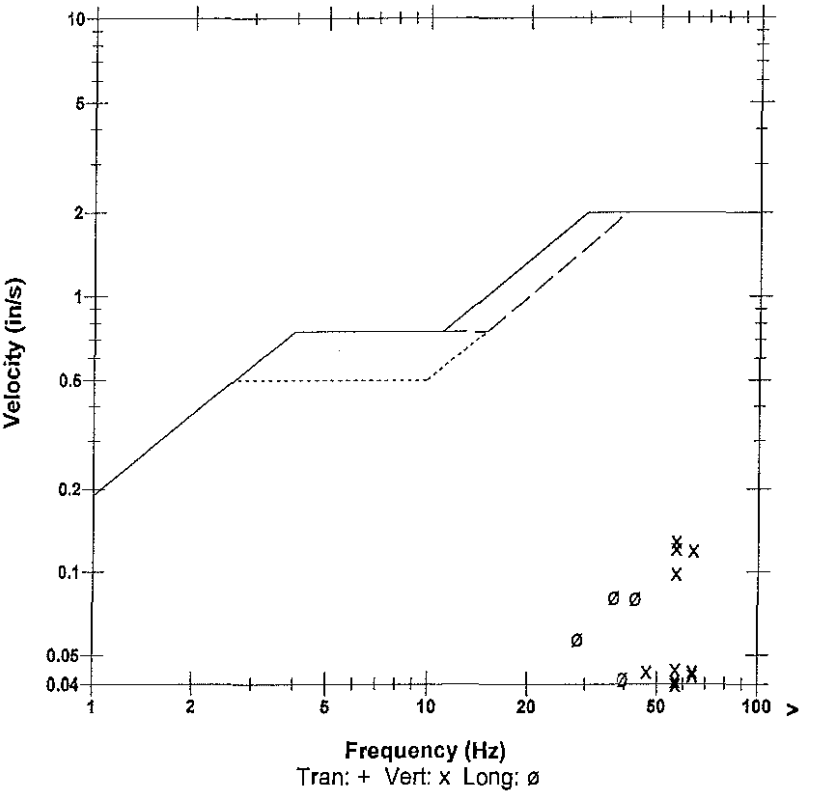
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

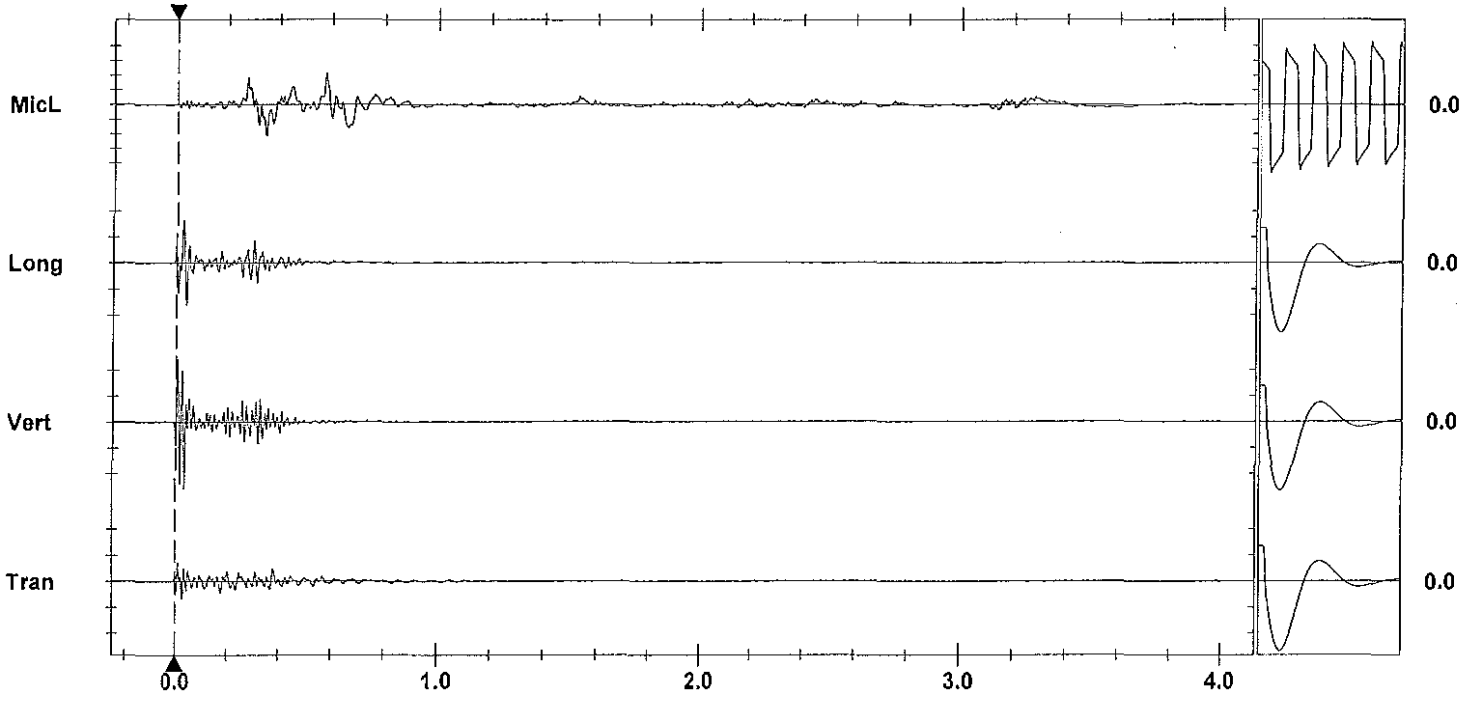
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00218 psi(L) at 0.345 sec
ZC Freq	6.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 546 mv)

	Tran	Vert	Long	
PPV	0.0356	0.129	0.0812	in/s
ZC Freq	30	57	37	Hz
Time (Rel. to Trig)	0.012	0.033	0.028	sec
Peak Acceleration	0.0365	0.133	0.0563	g
Peak Displacement	0.00011	0.00034	0.00035	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.134 in/s at 0.008 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3487

DATE PREPARED June 20/12
ACTUAL BLAST DATE June 20/12 2:46PM
BLAST # MW-0264

HIGHWAY # 97
BLAST LOCATION AT: STN 128+68 - 128+71 RS (TO Submade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 22 (m)

TOTAL NUMBER OF HOLES 4 B/L / 1 overdrill
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.7 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 3" Dynamite + 200gr detonator
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 3

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

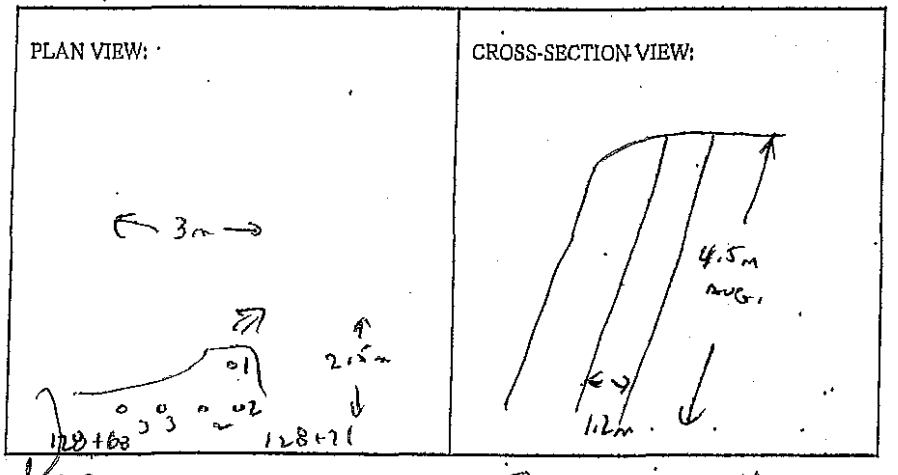
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 640 Mission Rd – 0.14 ips / 43Hz
" @ 13167 Cliffstone Crt – NO TRIGGER (< 0.04 ips)
" @ 13093 Cliffstone Crt – 0.041 ips / 57Hz

Buffer Holes - 3 cast 2016 unloaded + 0.5 cast 1½" x 16" Dynamite Primer

Bl Holes - 1 cast 2416 Dynamite + 200g/t det-Cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 14:46:36 June 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC2X.1O0

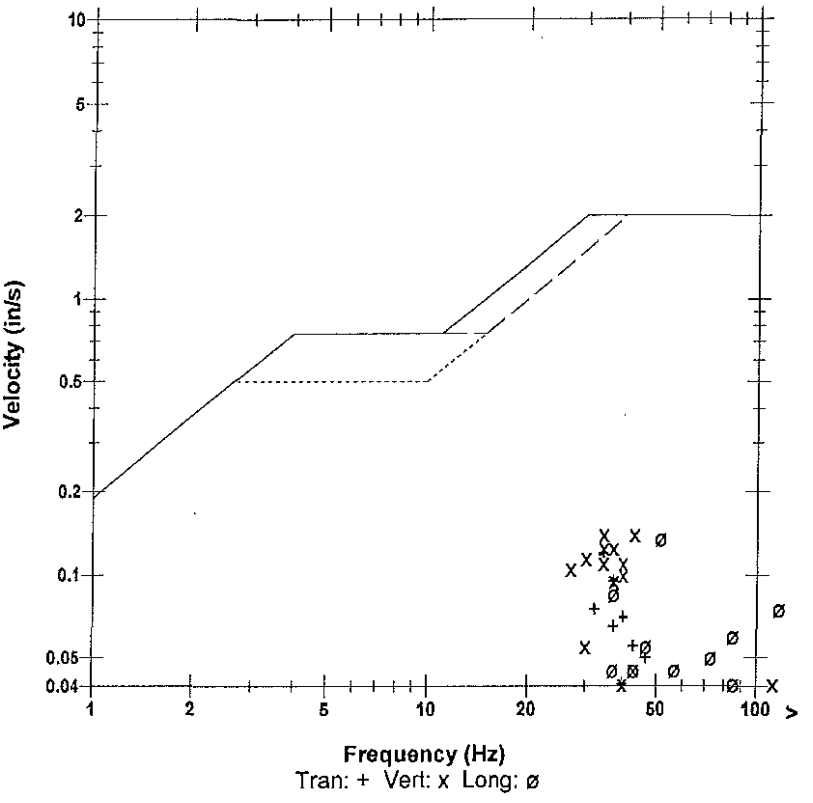
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

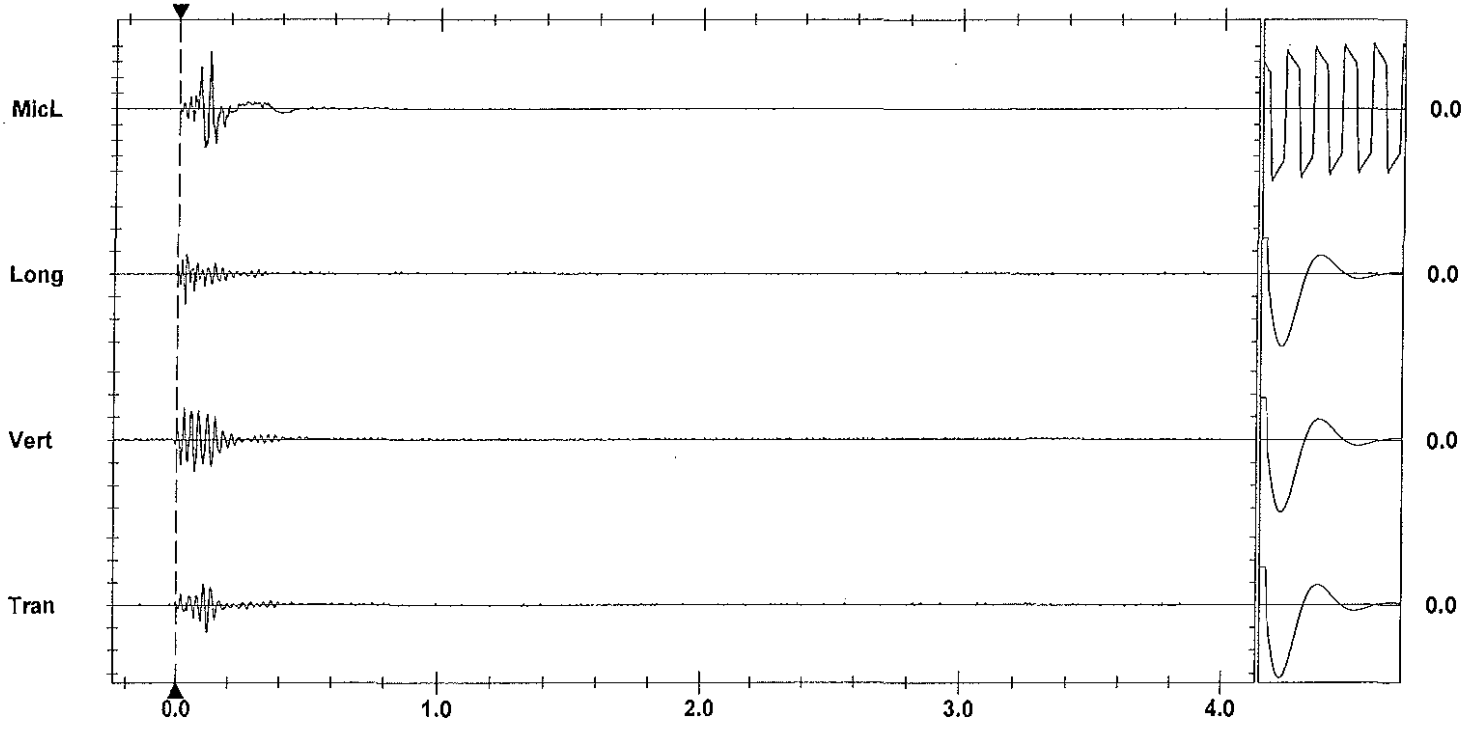
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00363 psi(L) at 0.122 sec
ZC Freq	32 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 511 mv)

	Tran	Vert	Long	
PPV	0.120	0.140	0.135	in/s
ZC Freq	34	43	51	Hz
Time (Rel. to Trig)	0.120	0.028	0.029	sec
Peak Acceleration	0.0663	0.106	0.186	g
Peak Displacement	0.00054	0.00068	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.193 in/s at 0.029 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 14:46:49 June 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC2X.210
Job Number:	1		

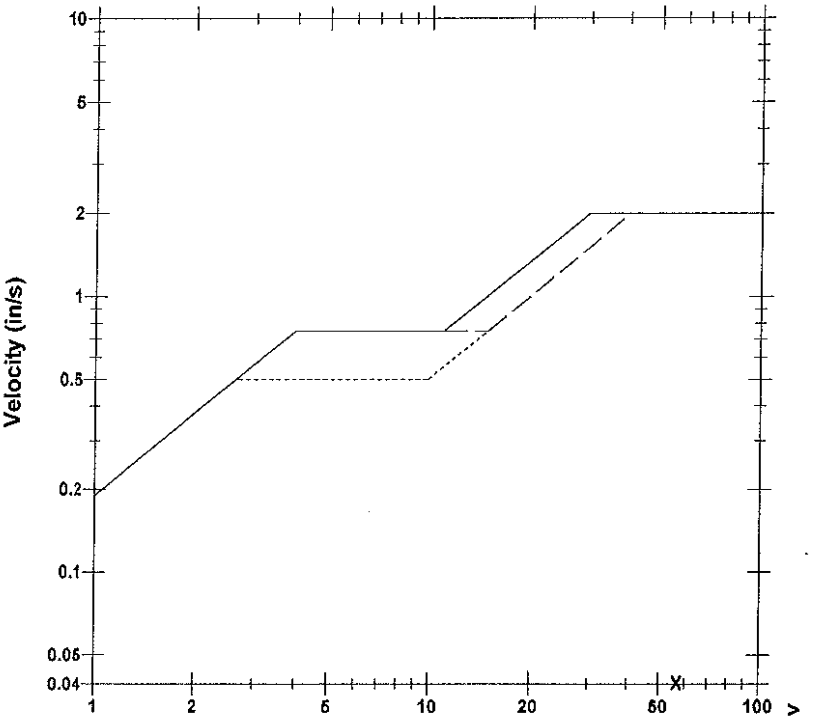
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

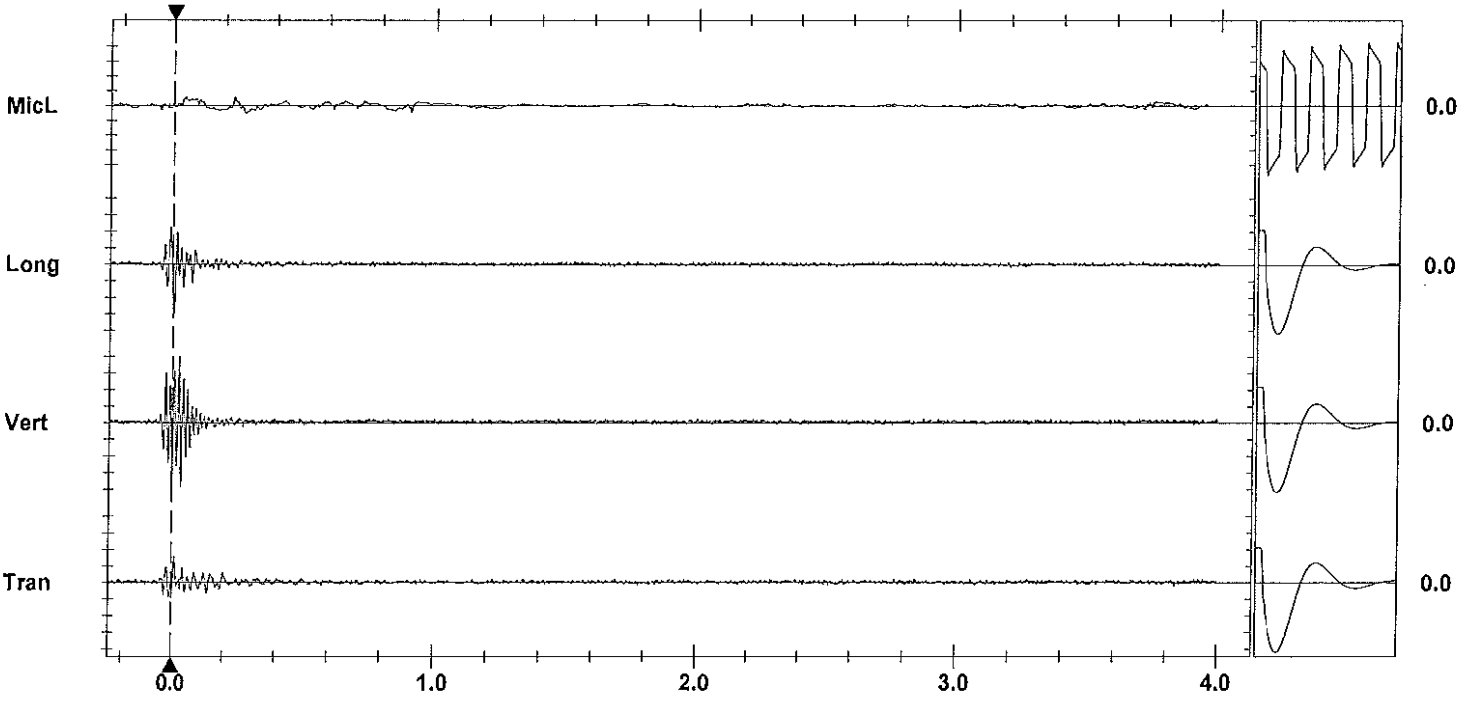
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00058 psi(L) at 0.045 sec
ZC Freq	5.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.0156	0.0406	0.0300	in/s
ZC Freq	39	57	37	Hz
Time (Rel. to Trig)	0.012	0.000	0.005	sec
Peak Acceleration	0.0116	0.0398	0.0182	g
Peak Displacement	0.00006	0.00011	0.00012	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.0454 in/s at 0.001 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 1100 hrs
BLAST # MW-0265

HIGHWAY# 97
BLAST LOCATION AT: SW 128+70 - 128+80 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 19 (m)

TOTAL NUMBER OF HOLES 7 plus
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 7

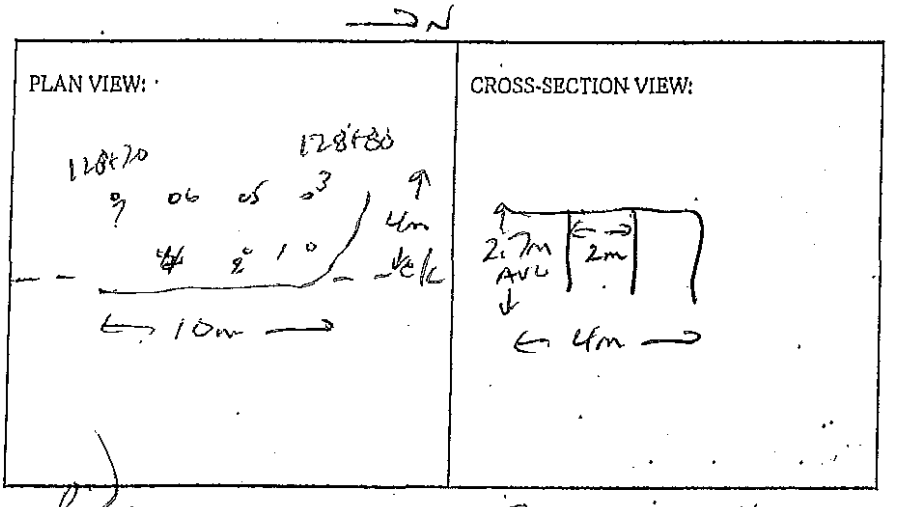
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.075 ips / 32 Hz
" @ 13167 Cliffstone Crt – NOT Recorded < 0.04 ips
" @ 13093 Cliffstone Crt – 0.091 ips / 57 Hz

1'-2' ANFO/Slurry + 0.5 cast 1¼" x 16" Dynamite Primer

Instantel

Event Report

Date/Time	Long at 13:00:43 June 21, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC4M.T70

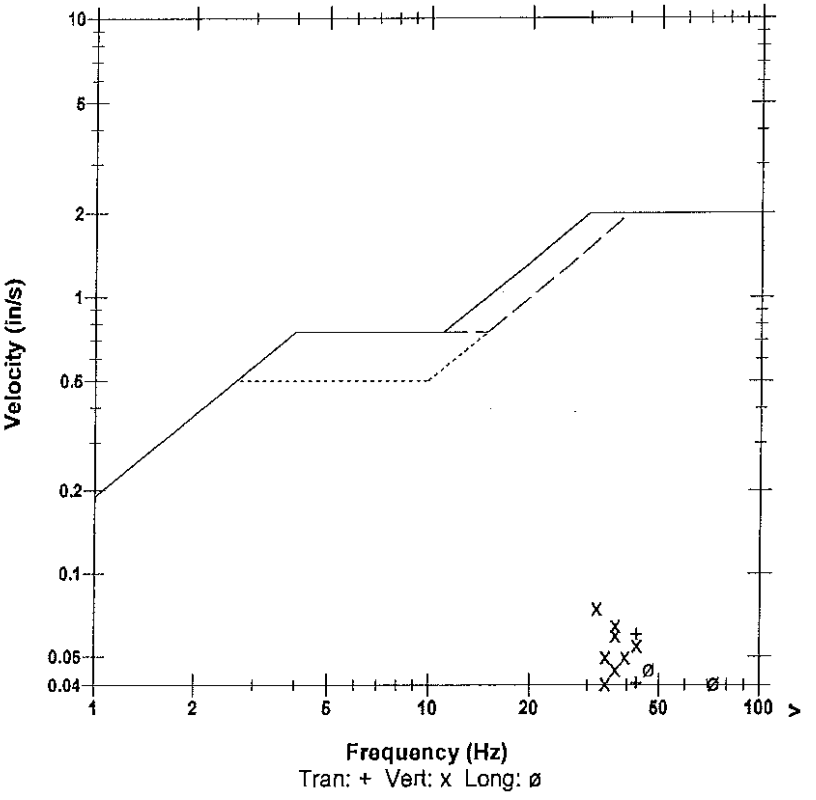
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

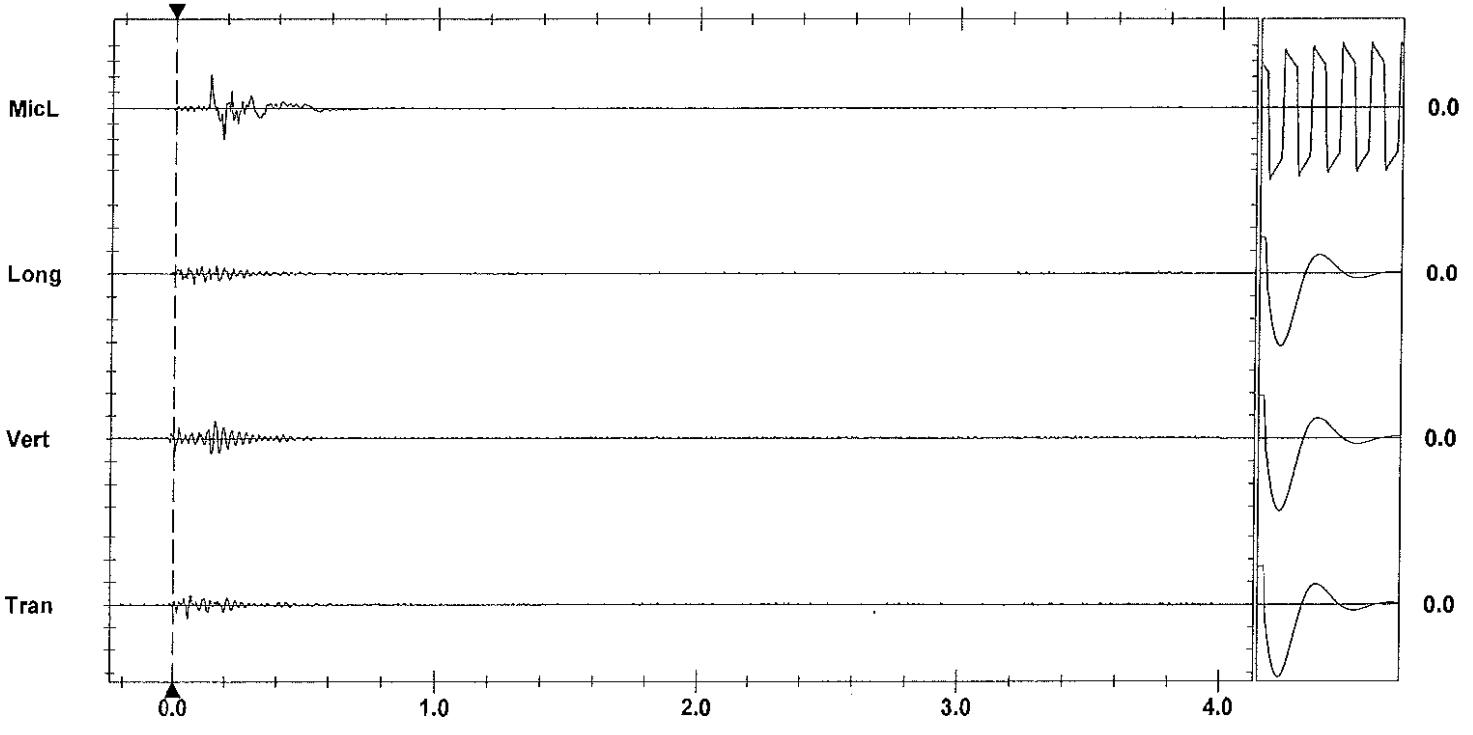
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00210 psi(L) at 0.138 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0750	0.0450	in/s
ZC Freq	43	32	47	Hz
Time (Rel. to Trig)	0.057	0.161	0.073	sec
Peak Acceleration	0.0398	0.0530	0.0398	g
Peak Displacement	0.00021	0.00039	0.00015	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0841 in/s at 0.163 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶— — —◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 13:00:56 June 21, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC4M.TK0
Job Number:	1		

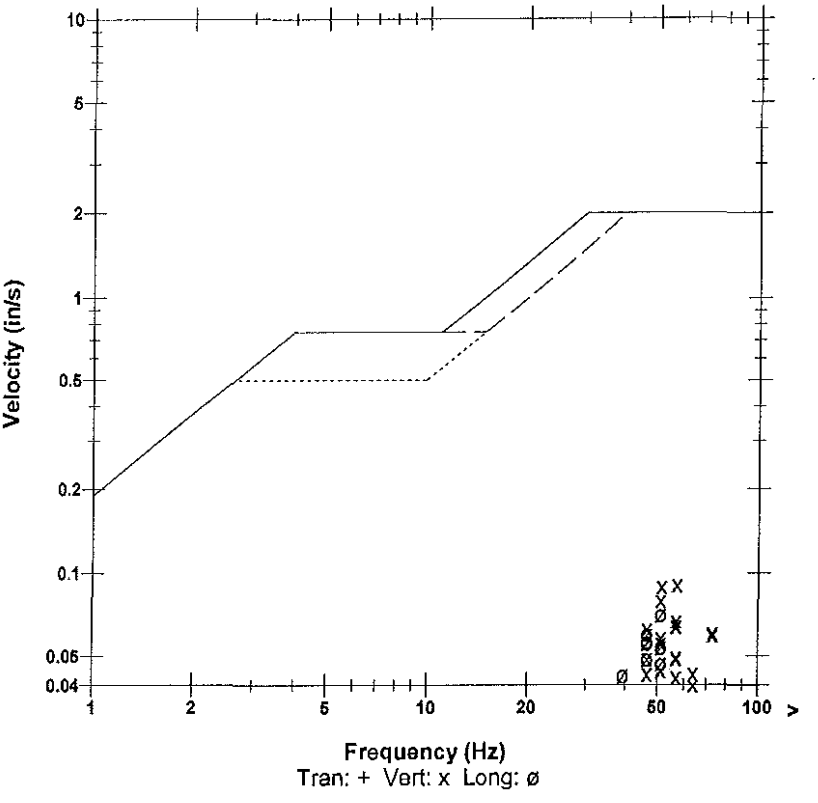
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

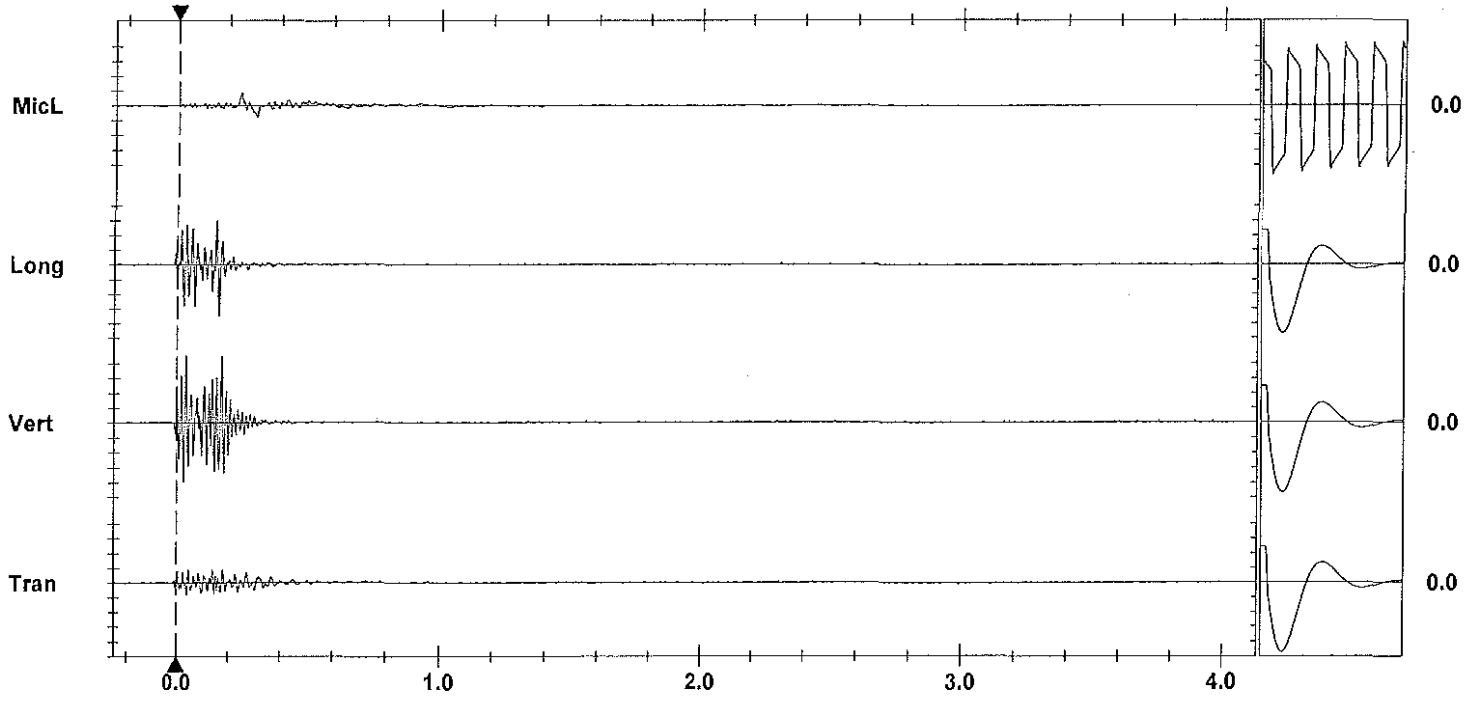
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00080 psi(L) at 0.242 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 539 mv)

	Tran	Vert	Long	
PPV	0.0181	0.0906	0.0706	in/s
ZC Freq	64	57	51	Hz
Time (Rel. to Trig)	0.048	0.037	0.164	sec
Peak Acceleration	0.0232	0.0762	0.0613	g
Peak Displacement	0.00006	0.00026	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.105 in/s at 0.037 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 2:16 PM
BLAST # MW-0266

HIGHWAY# 97
BLAST LOCATION AT: STN 128+60 - 128+66 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: 4 shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 86 (m)

TOTAL NUMBER OF HOLES 15 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 95
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

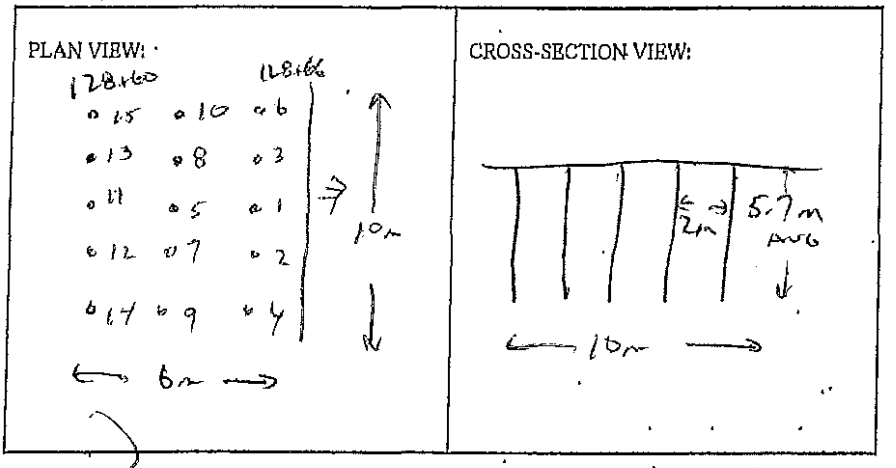
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.391 in/s / 37Hz
" @ 13167 Cliffstone Crt - 0.111 in/s / 37Hz
" @ 13093 Cliffstone Crt - 0.301 in/s / 57Hz

5'-7' ANFO/Hole + 0.5 cast 17½" x 16" PYRAMETEX Primer

Instantel

Event Report

Date/Time	Vert at 14:18:42 June 21, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC4Q.F60

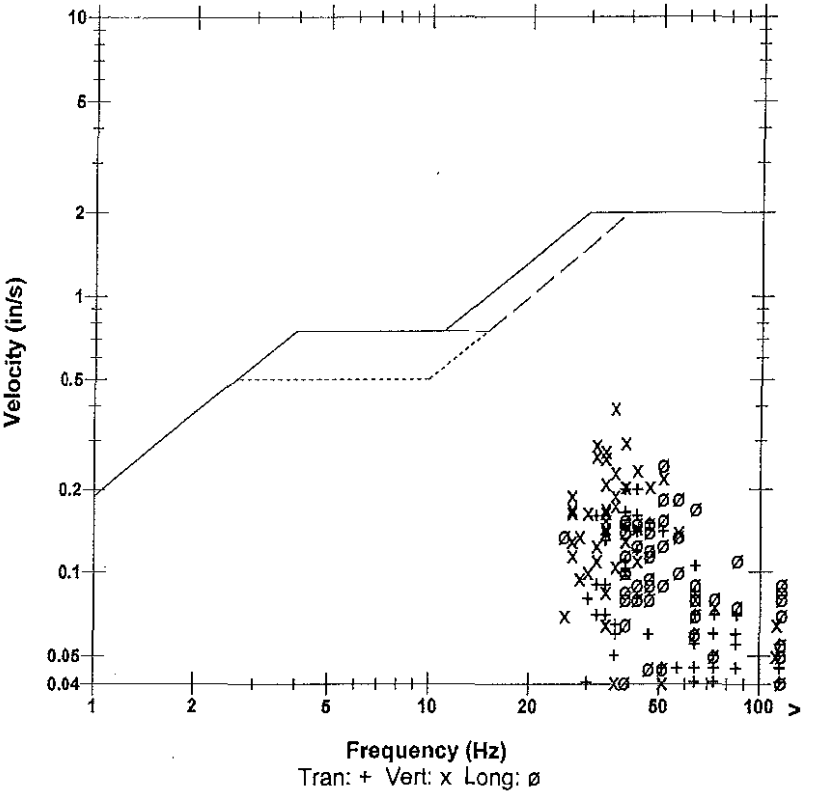
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

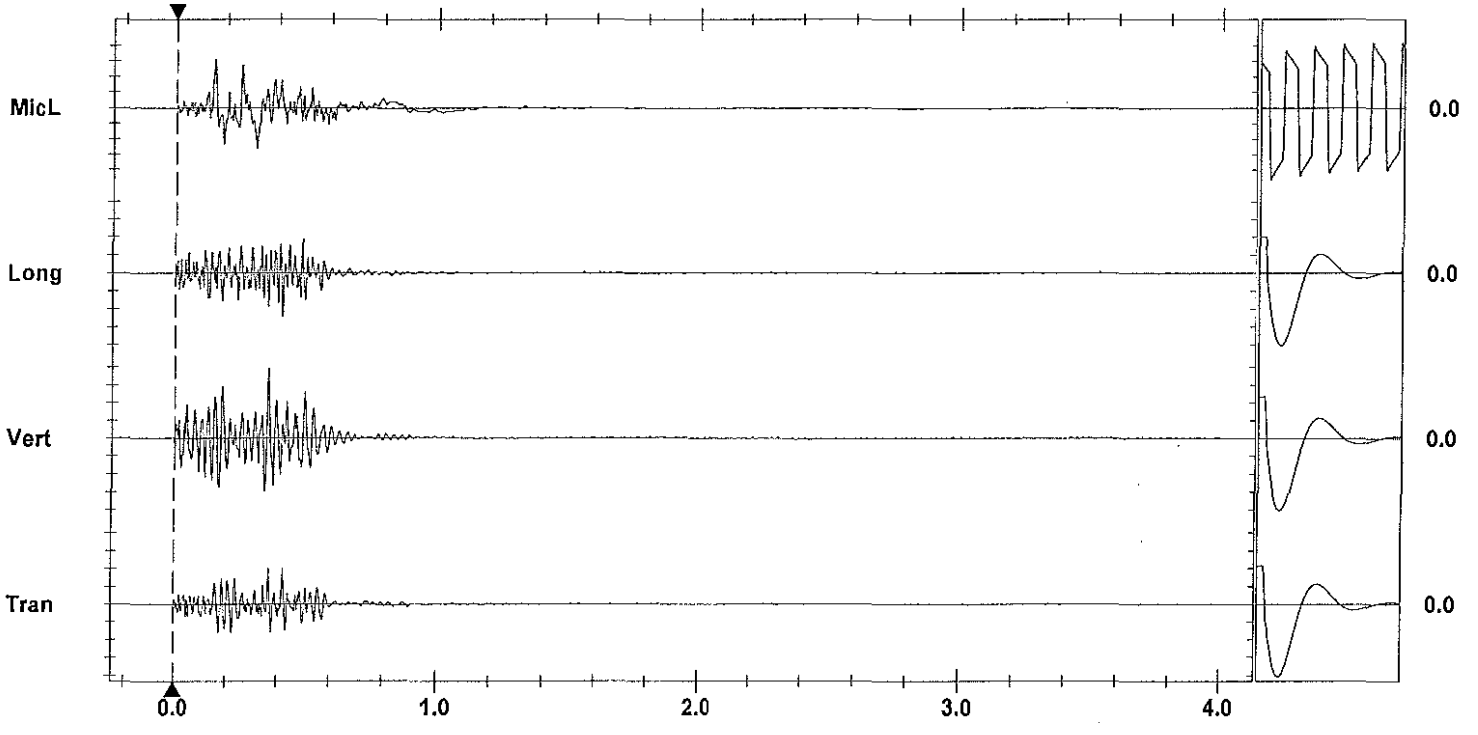
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00312 psi(L) at 0.149 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 533 mv)

	Tran	Vert	Long	
PPV	0.200	0.395	0.245	in/s
ZC Freq	43	37	51	Hz
Time (Rel. to Trig)	0.370	0.365	0.417	sec
Peak Acceleration	0.159	0.212	0.239	g
Peak Displacement	0.00066	0.00152	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.415 in/s at 0.364 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:18:36 June 21, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC4Q.F00

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

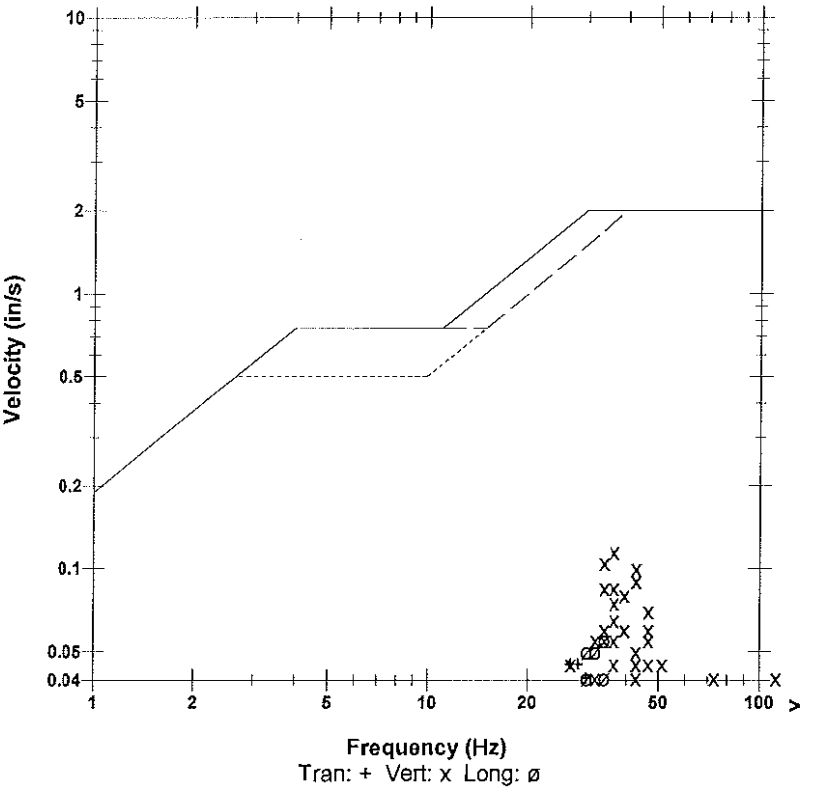
Post Event Notes

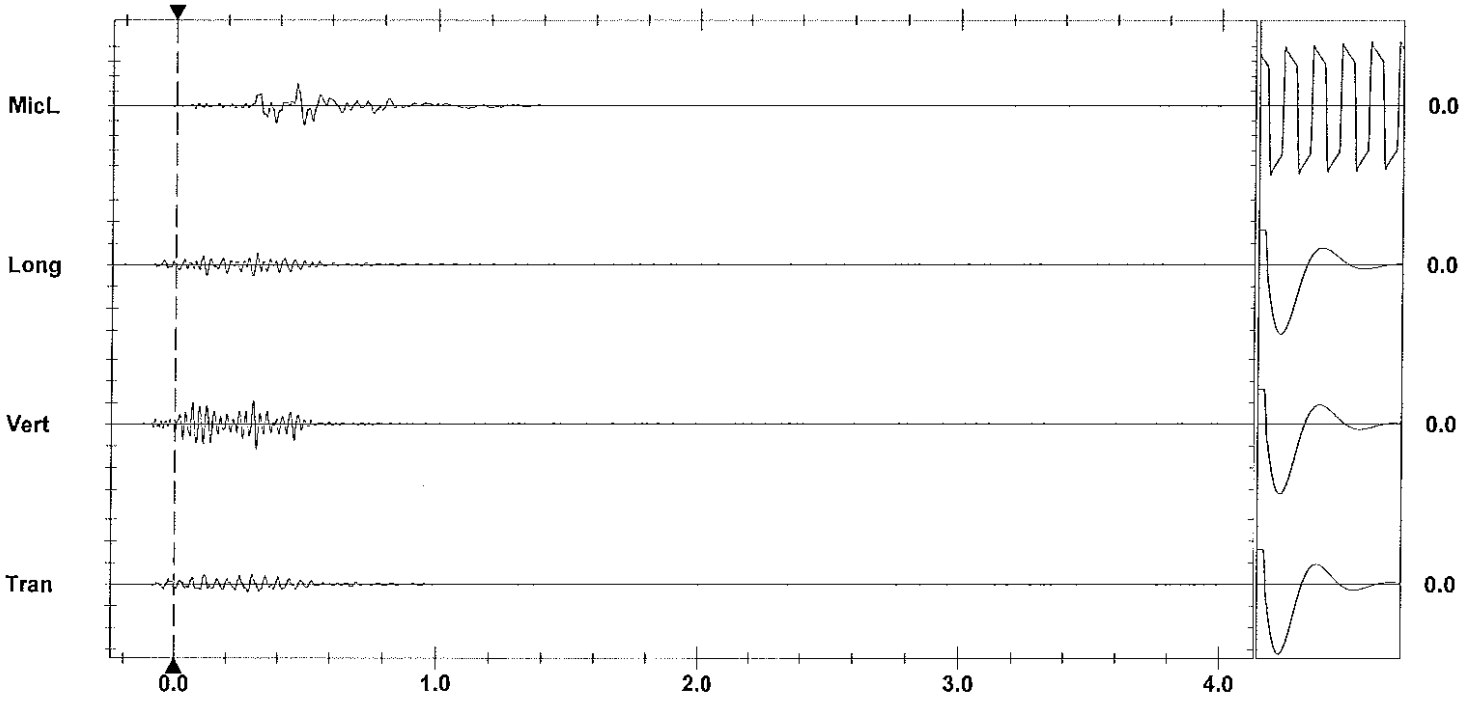
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.466 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 504 mv)

	Tran	Vert	Long	
PPV	0.0450	0.115	0.0550	in/s
ZC Freq	27	37	34	Hz
Time (Rel. to Trig)	0.118	0.315	0.314	sec
Peak Acceleration	0.0398	0.106	0.0398	g
Peak Displacement	0.00028	0.00048	0.00028	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.128 in/s at 0.315 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:18:55 June 21, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC4Q.FJ0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

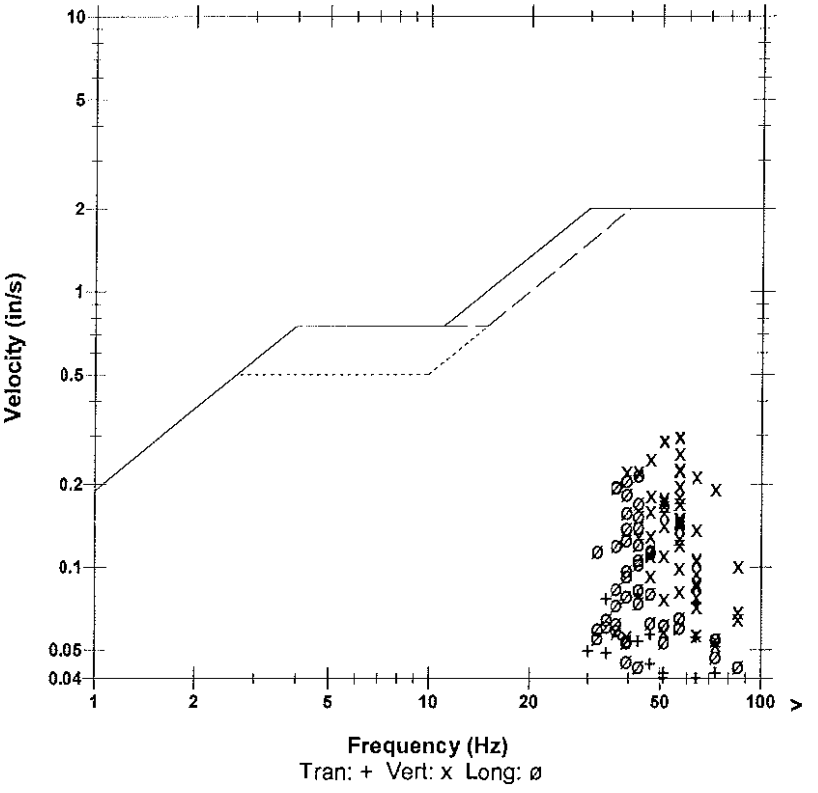
Post Event Notes

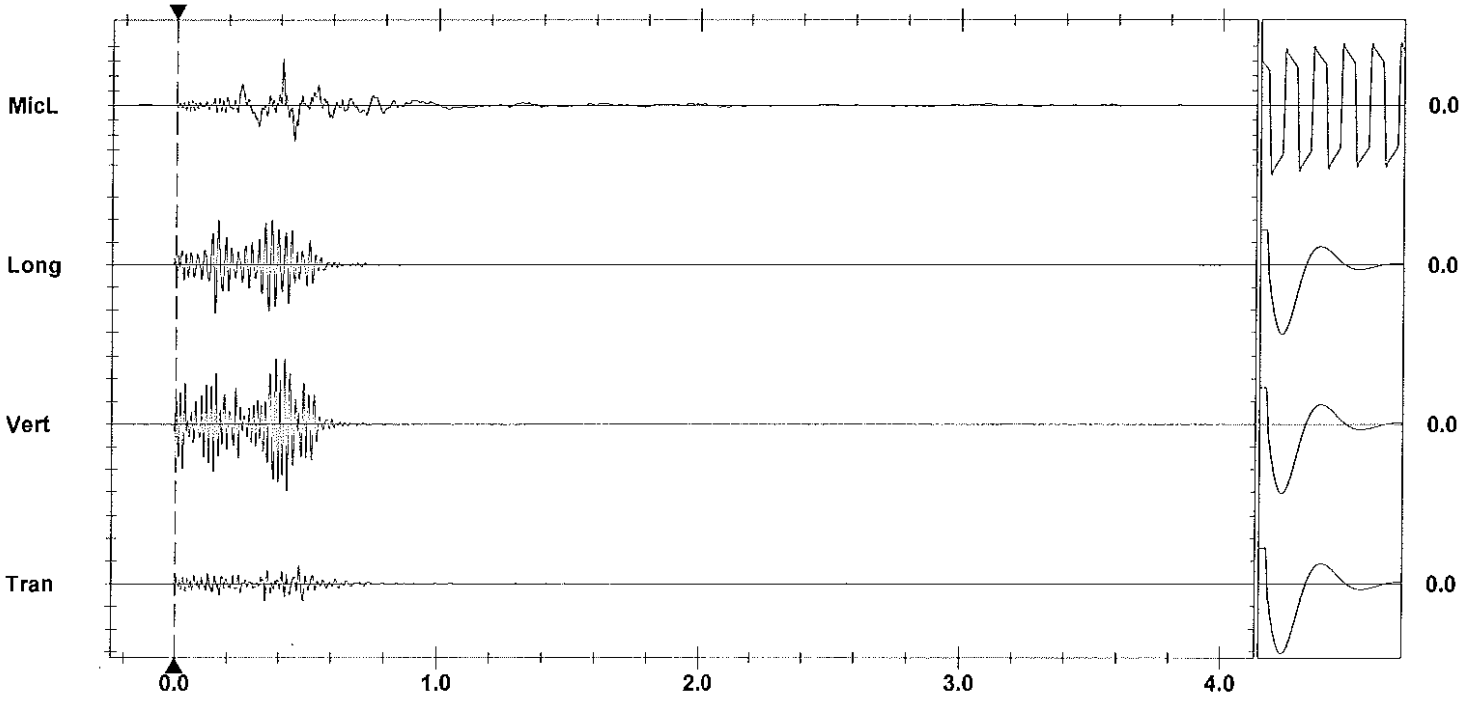
Microphone Linear Weighting
PSPL 0.00312 psi(L) at 0.409 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 551 mv)

	Tran	Vert	Long	
PPV	0.0794	0.297	0.217	in/s
ZC Freq	43	57	43	Hz
Time (Rel. to Trig)	0.477	0.430	0.149	sec
Peak Acceleration	0.0729	0.283	0.181	g
Peak Displacement	0.00034	0.00090	0.00086	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.318 in/s at 0.421 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 21/12
ACTUAL BLAST DATE June 21/12 3:02PM
BLAST # MW-0267

HIGHWAY # 97
BLAST LOCATION AT: Sta 128+60 - 128+68 (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

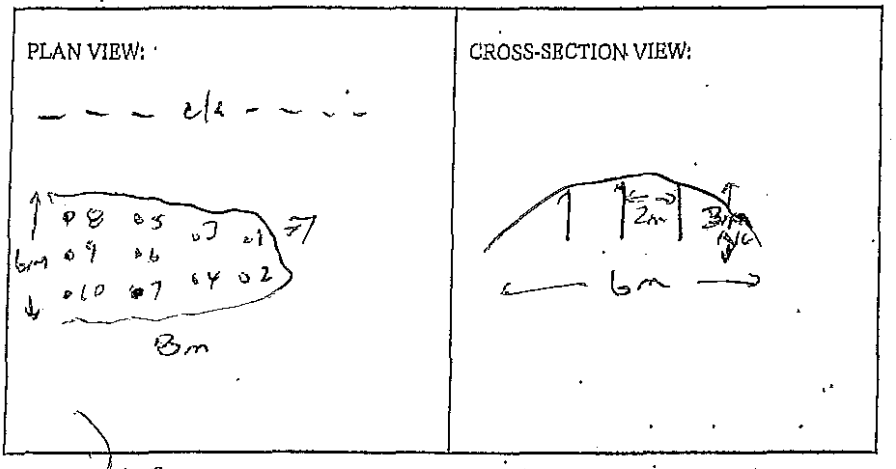
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.080 ips / 5.1 Hz
" @ 13167 Cliffstone Crt - No trigger (<0.04 ips)
" @ 13093 Cliffstone Crt - 0.044 ips / 5 Hz

1' - 3.5' ANFO / HOLE + 0.5 CAST 1½" x 16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 15:02:43 June 21, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC4S.GJ0
Job Number:	1		

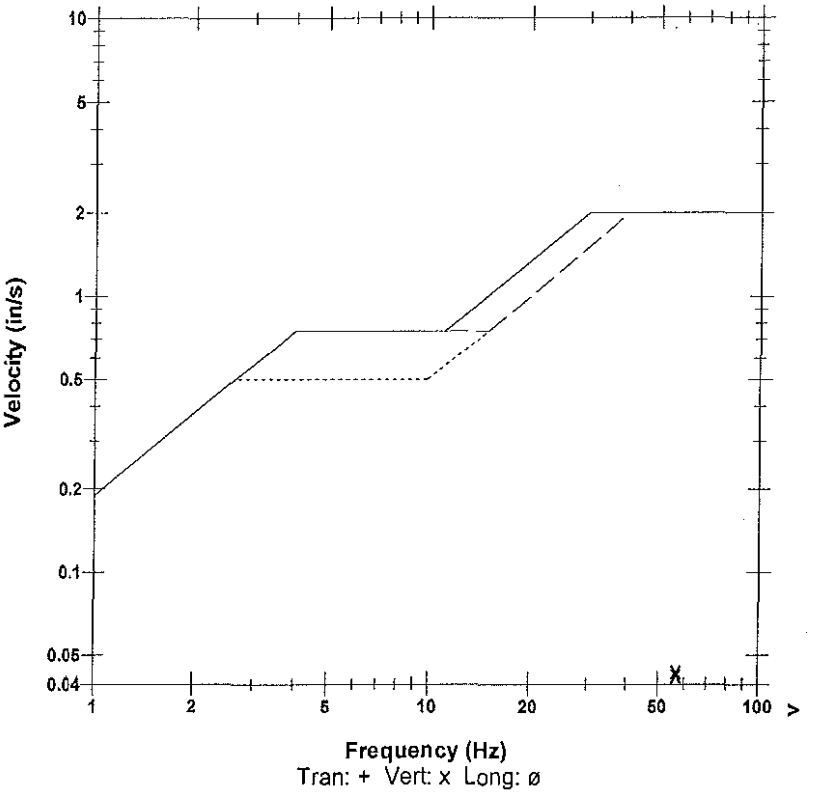
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

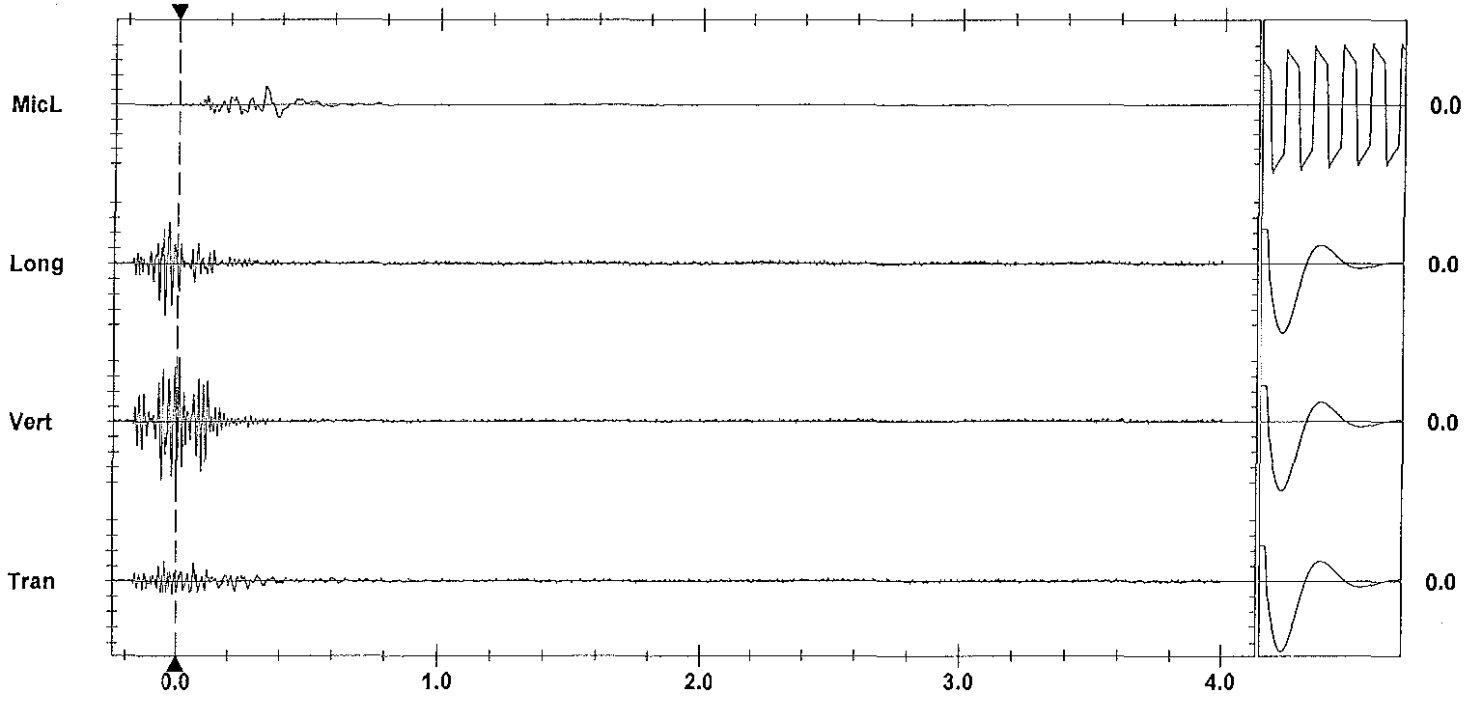
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.335 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 552 mv)

	Tran	Vert	Long	
PPV	0.0131	0.0437	0.0337	in/s
ZC Freq	73	57	47	Hz
Time (Rel. to Trig)	-0.044	0.001	-0.047	sec
Peak Acceleration	0.0133	0.0481	0.0315	g
Peak Displacement	0.00004	0.00012	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.0442 in/s at -0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 24, 2013 07:8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 15:02:30 June 21, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC4S.G60

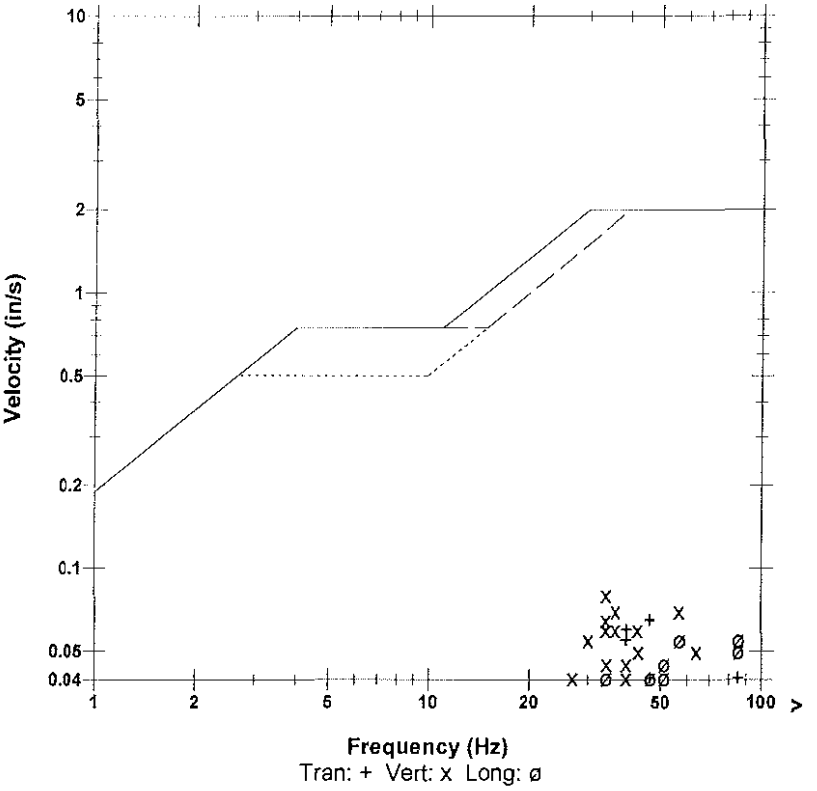
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

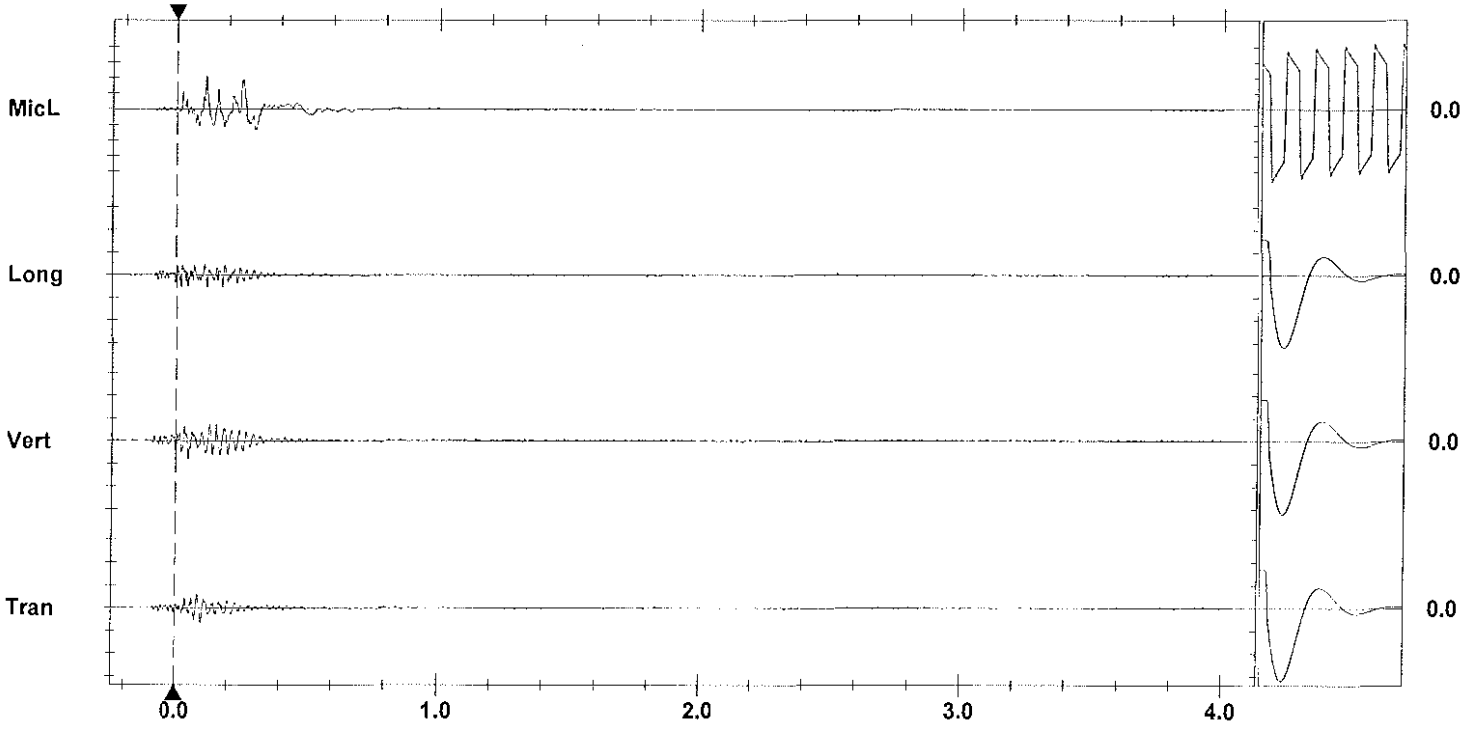
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00207 psi(L) at 0.113 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0800	0.0550	in/s
ZC Freq	47	34	85	Hz
Time (Rel. to Trig)	0.101	0.049	0.017	sec
Peak Acceleration	0.0530	0.0795	0.0795	g
Peak Displacement	0.00023	0.00030	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.5	7.4	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.0831 in/s at 0.049 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶— — — —◀

Printed: October 7, 2012 (V 8.01 - 8.01)

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SECTION 204 ROCK CUTS

As-Built Blast Record

~~PROPOSED BLAST DESIGN~~

File #:

PROJECT NO. 21347 - 0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vereggy
BLASTER'S CERTIFICATE NUMBER 5934 09

DATE PREPARED June 22/12
PROPOSED BLAST DATE June 22/12 11:08 AM
BLAST # MW-0268

HIGHWAY # 97
BLAST LOCATION AT: STN 128+60 - 128+66 (TO subgrade)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS: * slot matted

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 40 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 63 (m)
PROPOSED APPROX. NO. OF HOLES 21 Prod
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
APPROX. NUMBER OF CARTRIDGES 105
PROPOSED NUMBER OF DELAYS 21
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

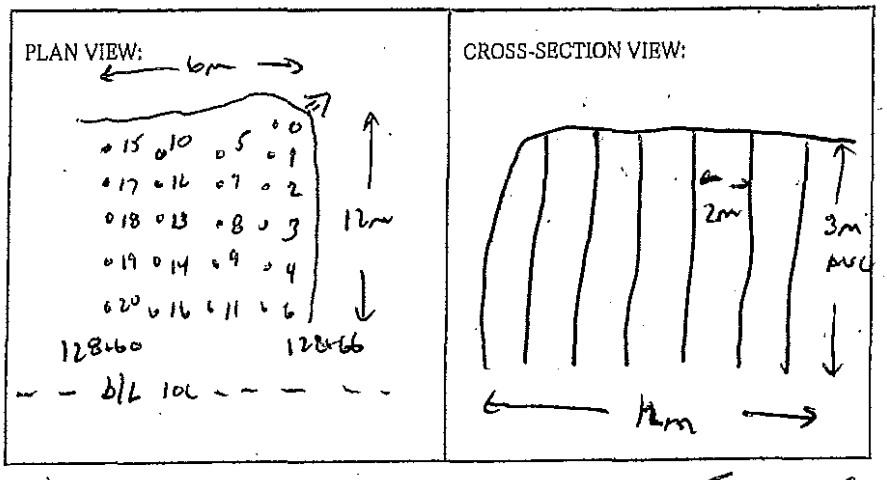
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Darrell Fleger SIGNATURE COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary) Seismograph @ 13050 OLD MISSION Rd - 0.26 ips/37Hz
" @ 13167 Cliffstone Crt - 0.065 ips/37Hz
" @ 13093 Cliffstone Crt - 0.12 ips/51Hz

TRA-2013-00119

2' - 4' ANFO/HOG + 0.5 CAST 1½"x16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 11:08:05 June 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC6C.9H0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

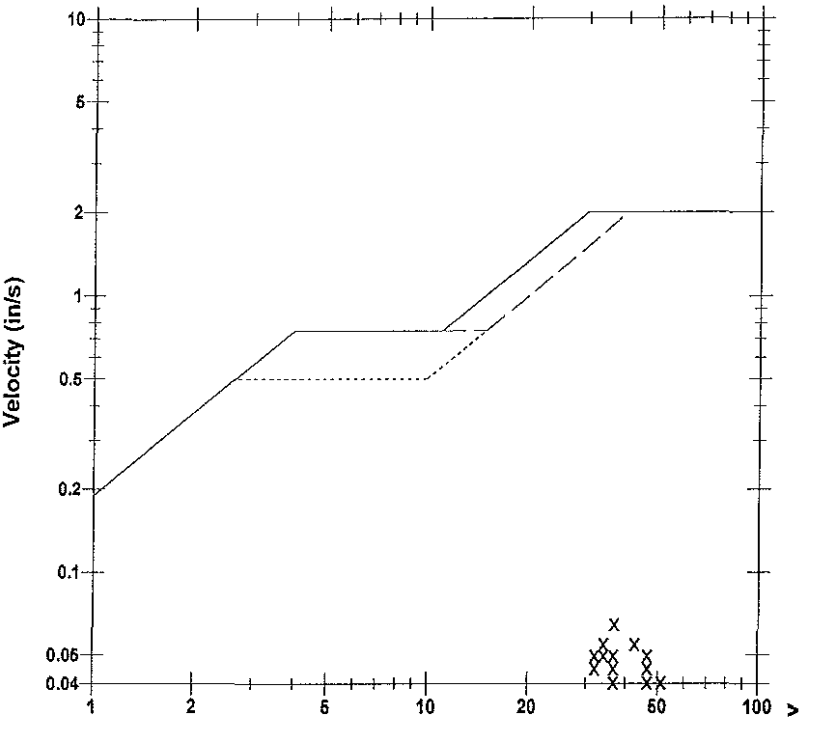
Extended Notes

Post Event Notes

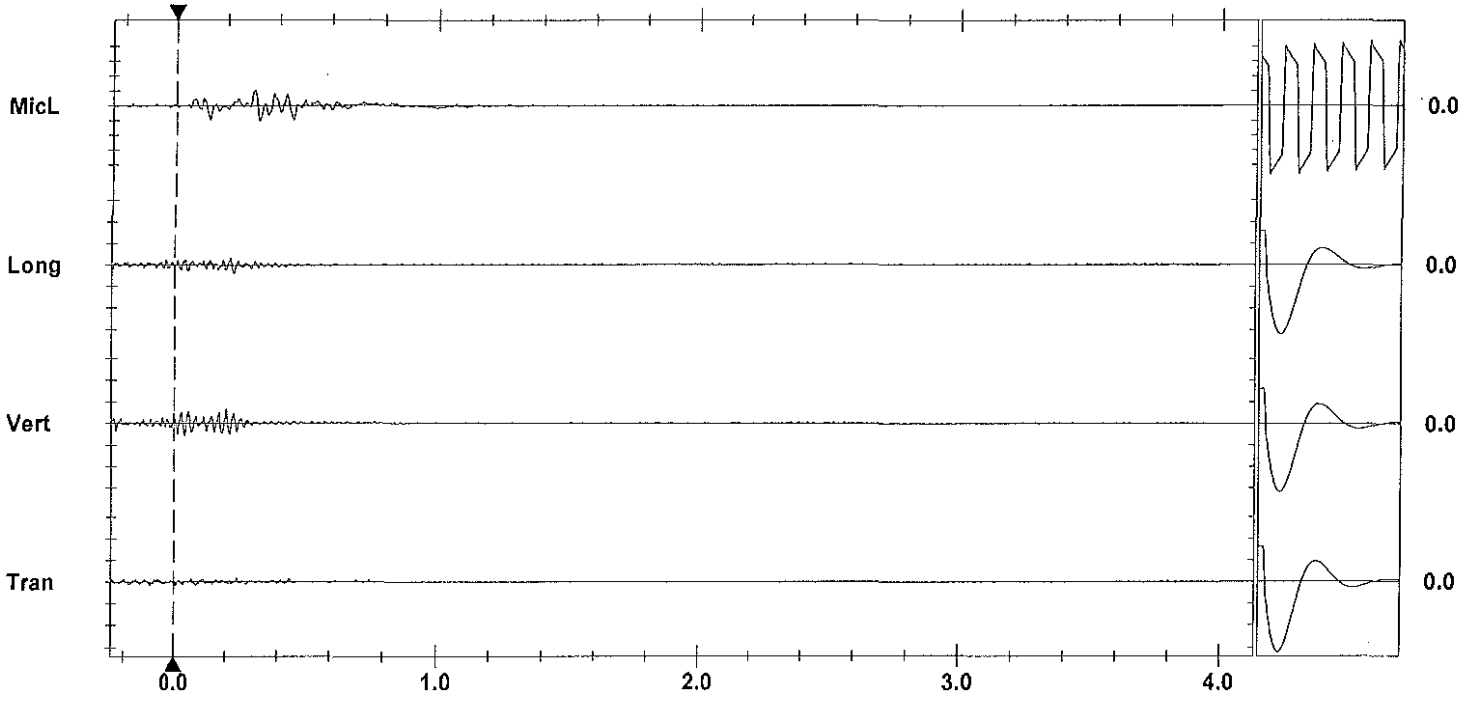
Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.323 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 527 mv)

	Tran	Vert	Long	
PPV	0.0150	0.0650	0.0350	in/s
ZC Freq	>100	37	34	Hz
Time (Rel. to Trig)	-0.096	0.202	0.217	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00005	0.00025	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0669 in/s at 0.202 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: June 24, 2012 (V 9.01 - 9.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:08:25 June 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC6C.A10
Job Number:	1		

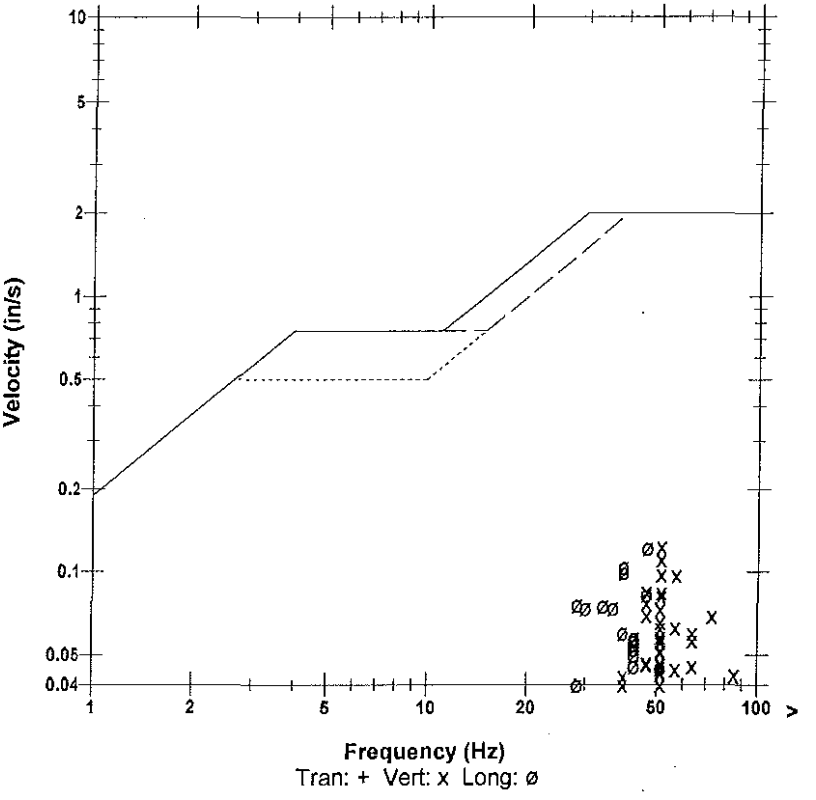
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

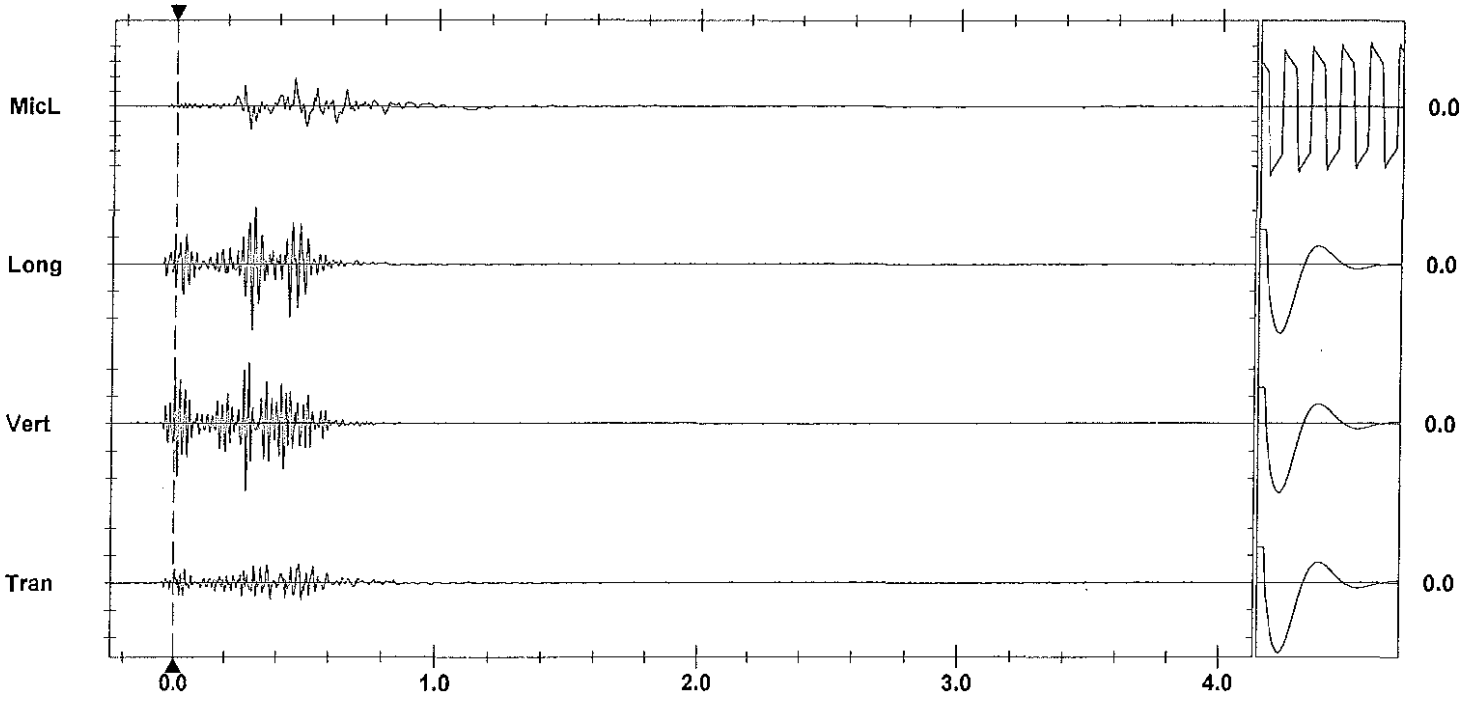
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00185 psi(L) at 0.459 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.0331	0.123	0.122	in/s
ZC Freq	30	51	47	Hz
Time (Rel. to Trig)	0.488	0.279	0.300	sec
Peak Acceleration	0.0365	0.114	0.106	g
Peak Displacement	0.00018	0.00036	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.133 in/s at 0.289 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: June 24, 2012 (V 8.01 - 8.01) Format Copyrighted 1999-2004 Instantel Inc.

Instantel

Event Report

Date/Time Vert at 11:08:12 June 22, 2012
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11746 V 10.10-8.17 BlastMate III
Battery Level 6.4 Volts
Calibration January 7, 2011 by Instantel
File Name M746EC6C.9O0

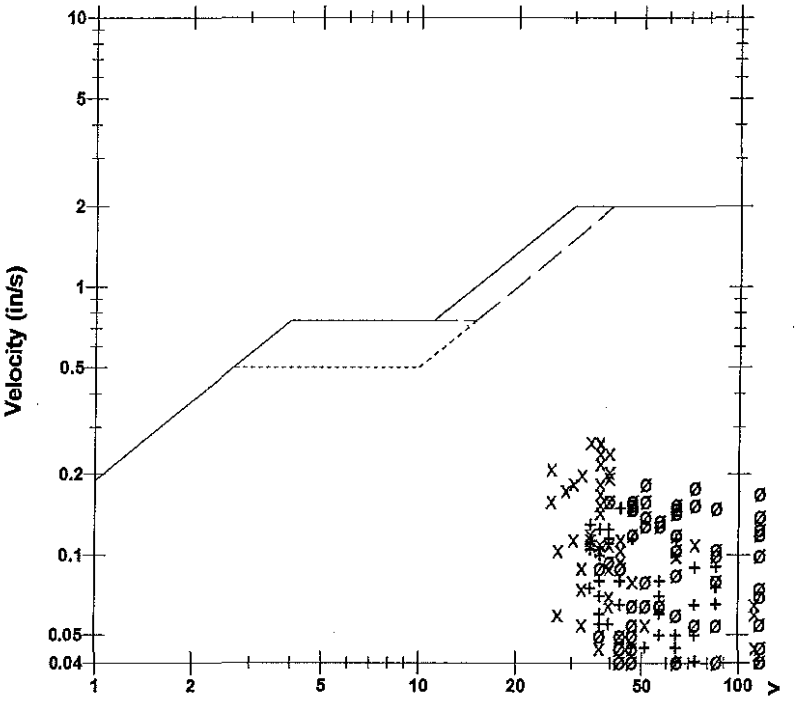
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

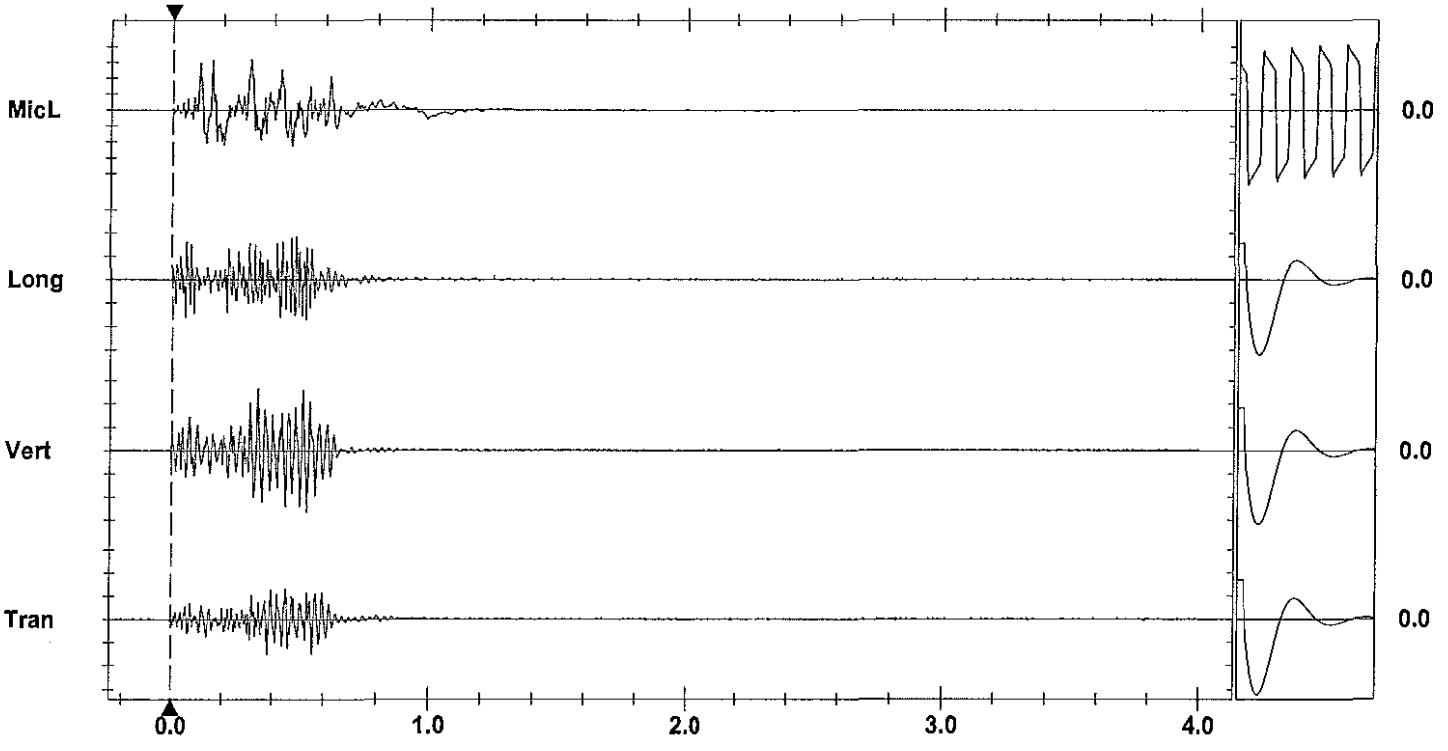
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00319 psi(L) at 0.310 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 511 mv)

	Tran	Vert	Long	
PPV	0.150	0.265	0.185	in/s
ZC Freq	43	37	51	Hz
Time (Rel. to Trig)	0.382	0.341	0.491	sec
Peak Acceleration	0.159	0.278	0.265	g
Peak Displacement	0.00057	0.00103	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.287 in/s at 0.534 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: April 21, 2013 (V 8.01 - 8.01)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 22/12
ACTUAL BLAST DATE June 22/12 2:37 PM
BLAST # MW-0269

HIGHWAY# 97
BLAST LOCATION AT: STN 128+60 - 128+64 c/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10 U
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

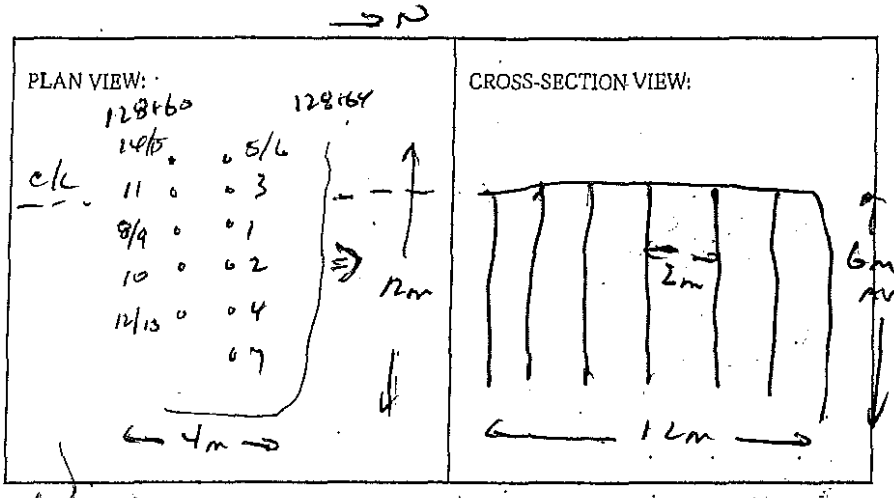
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.34 ips/ 34Hz
" @ 13167 Cliffstone Crt – 0.10 ips/ 30Hz
" @ 13093 Cliffstone Crt – 0.29 ips/ 43Hz

Bottom Holes - 5'-7' ANFO

Top Holes - 1'-3' ANFO

All Primed w/ 0.5 Cast 1½" x 16" Dynamite

Instantel

Event Report

Date/Time	Vert at 14:38:05 June 22, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EC6L.ZH0

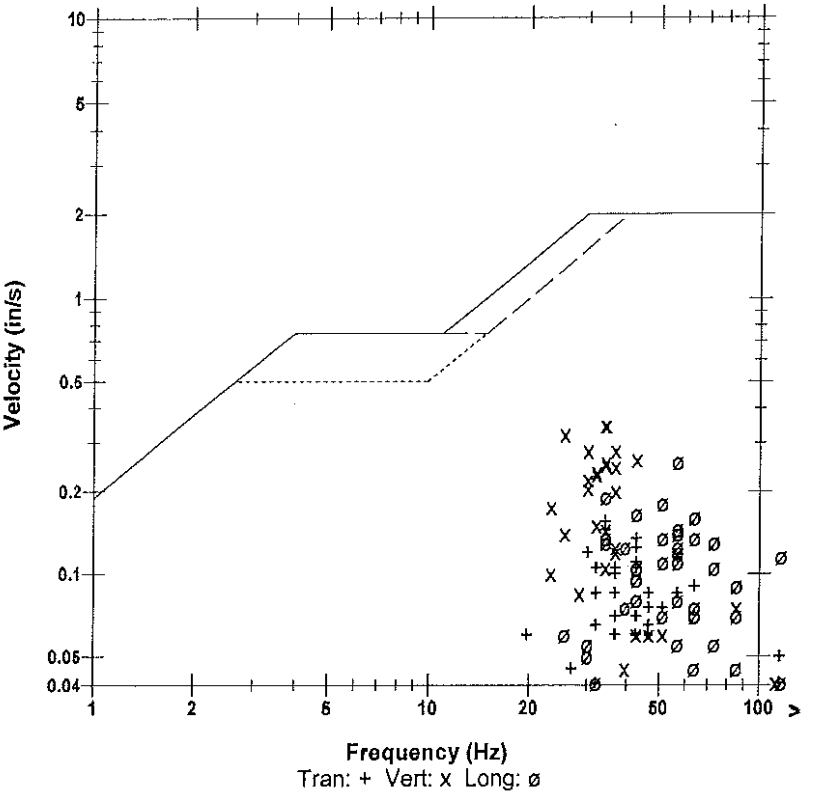
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

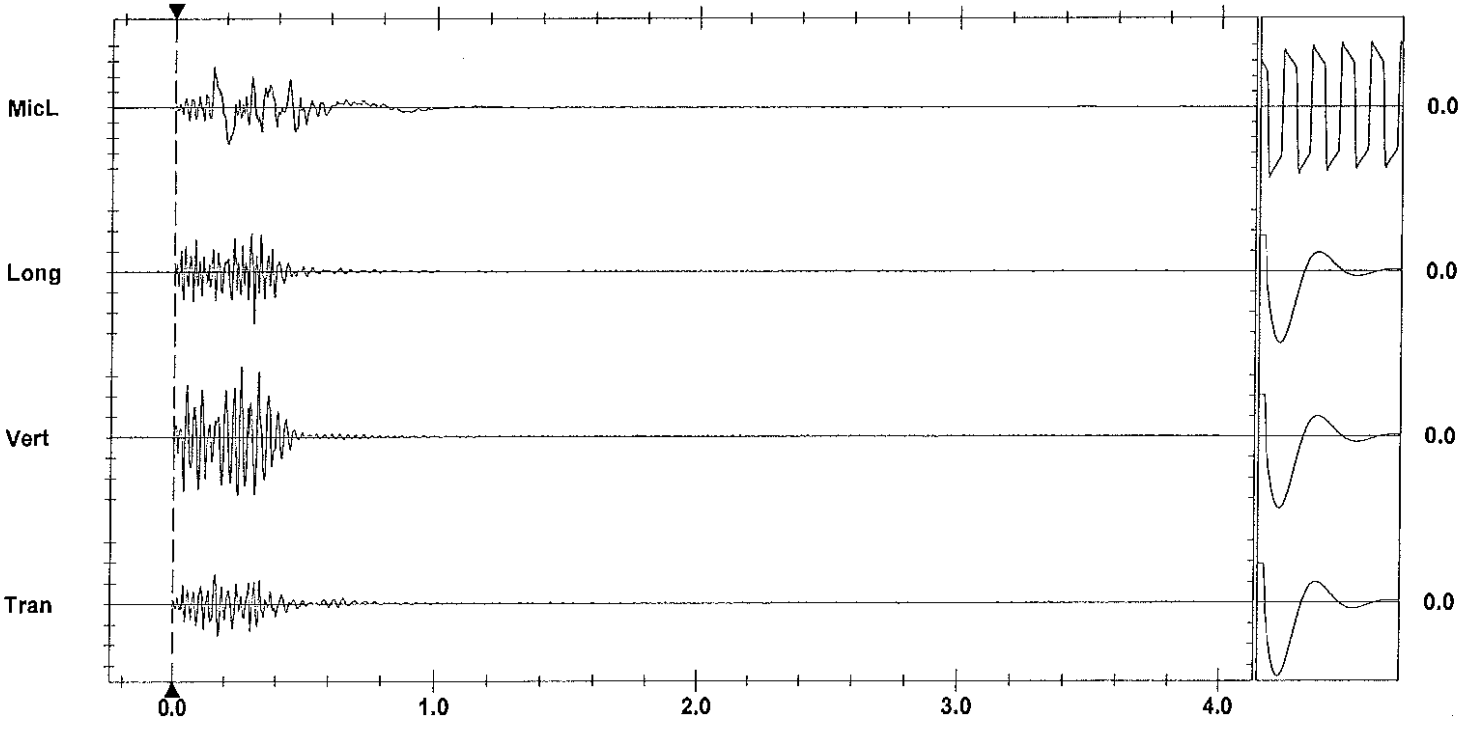
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00261 psi(L) at 0.151 sec			
ZC Freq	12 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 538 mv)			

	Tran	Vert	Long	
PPV	0.155	0.345	0.255	in/s
ZC Freq	34	34	57	Hz
Time (Rel. to Trig)	0.177	0.262	0.309	sec
Peak Acceleration	0.146	0.252	0.305	g
Peak Displacement	0.00070	0.00154	0.00074	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.354 in/s at 0.263 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

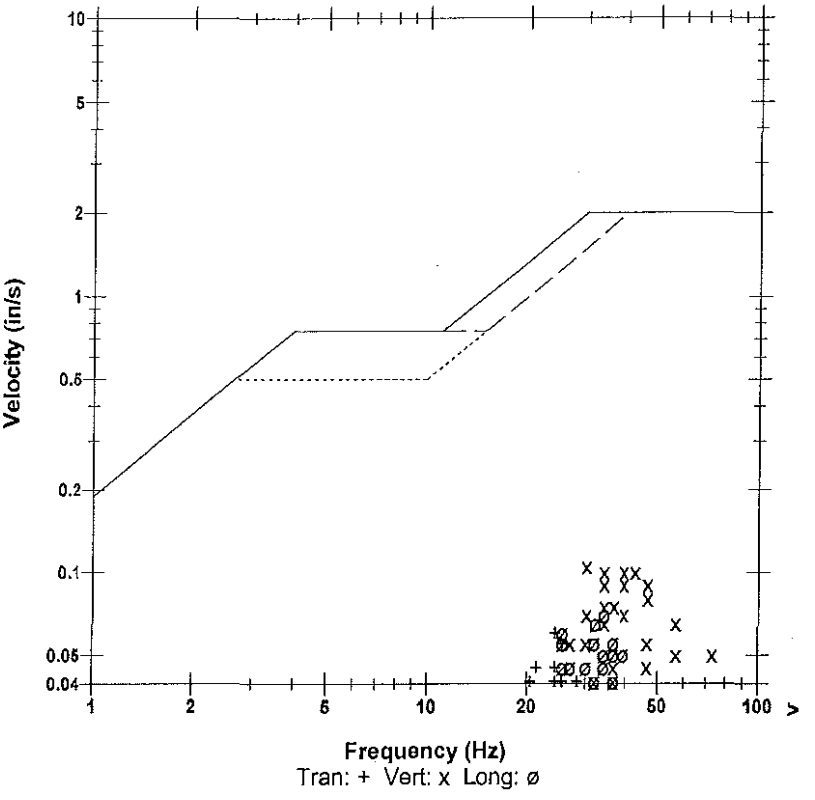
Date/Time	Vert at 14:37:58 June 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EC6L.ZA0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

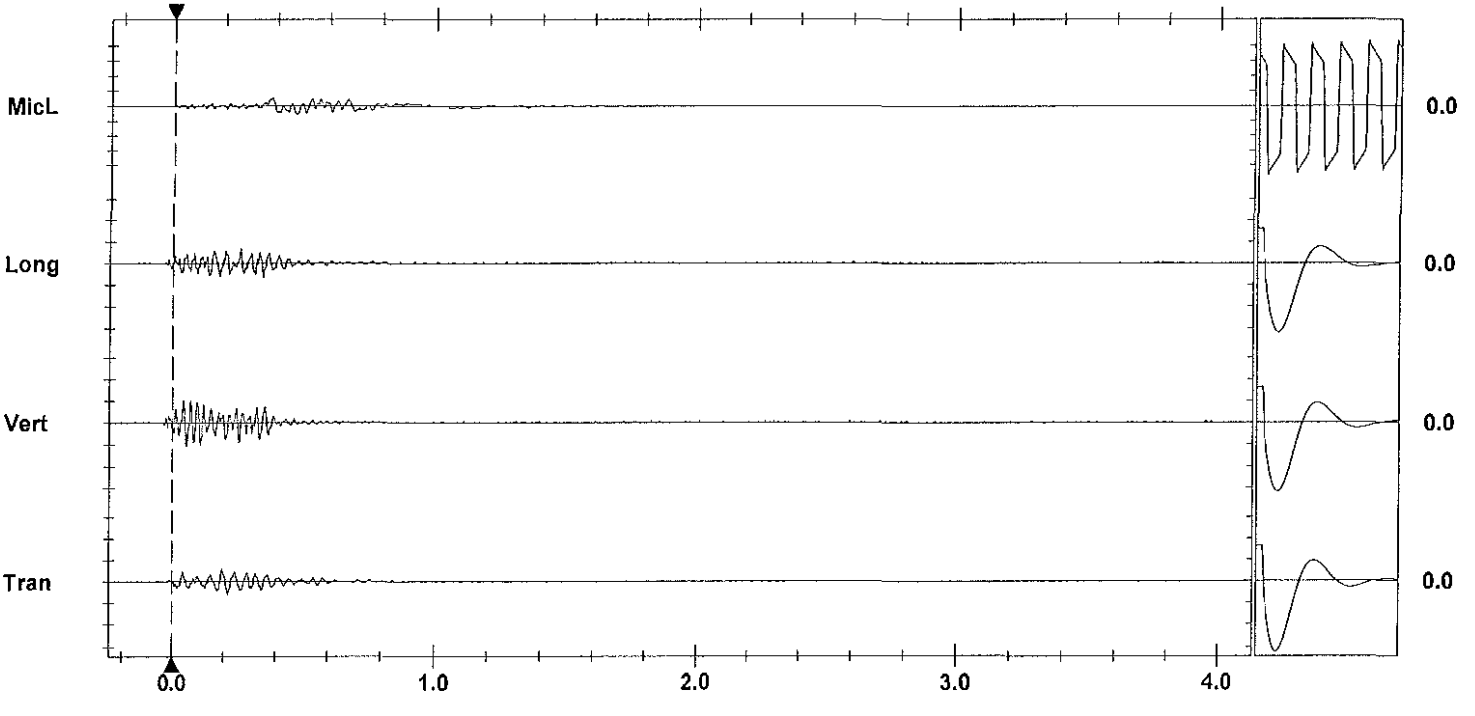
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00054 psi(L) at 0.471 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 478 mv)

	Tran	Vert	Long	
PPV	0.0600	0.105	0.0700	in/s
ZC Freq	24	30	34	Hz
Time (Rel. to Trig)	0.217	0.055	0.263	sec
Peak Acceleration	0.0398	0.0928	0.0663	g
Peak Displacement	0.00035	0.00045	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.4	3.6	4.2	

Peak Vector Sum 0.111 in/s at 0.055 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: June 24, 2012 07:8:01 -8:01 Format Copyrighted 1999-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:38:18 June 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EC6L.ZU0
Job Number:	1		

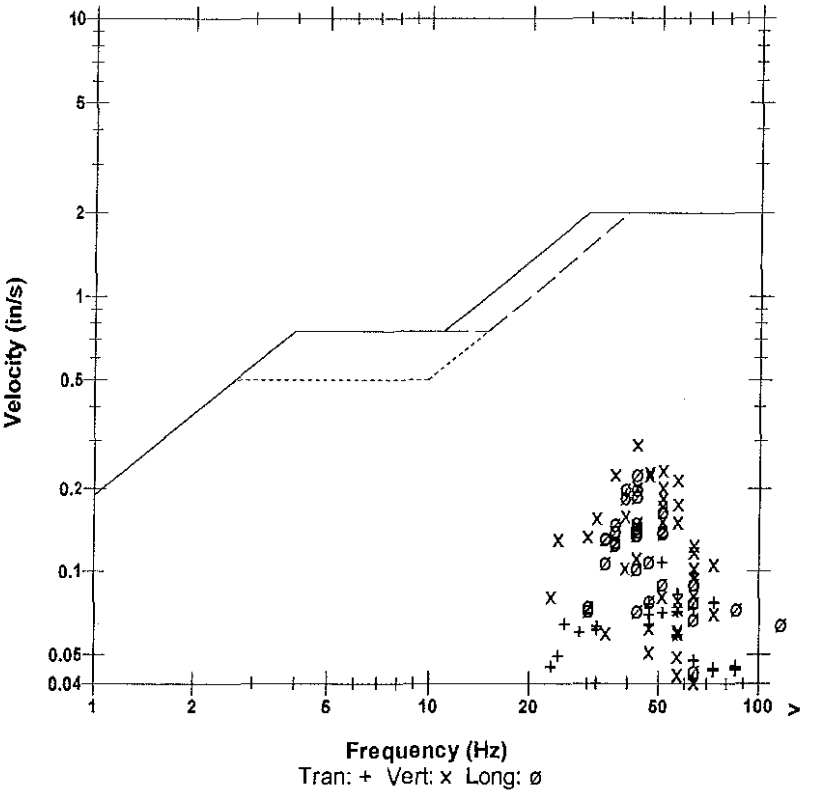
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

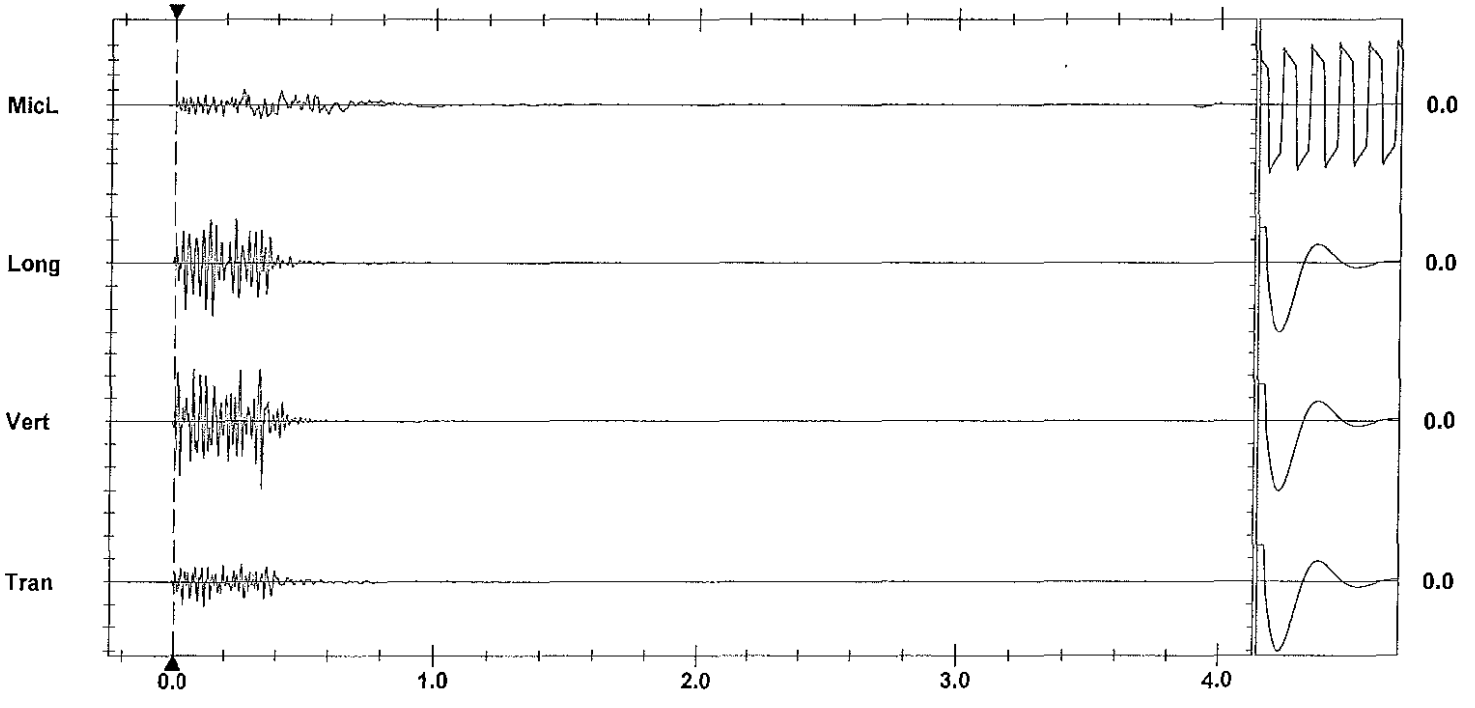
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00105 psi(L) at 0.264 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 514 mv)

	Tran	Vert	Long	
PPV	0.107	0.292	0.226	in/s
ZC Freq	51	43	43	Hz
Time (Rel. to Trig)	0.121	0.343	0.149	sec
Peak Acceleration	0.108	0.259	0.189	g
Peak Displacement	0.00029	0.00106	0.00080	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.294 in/s at 0.343 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: June 24, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 25/12
ACTUAL BLAST DATE June 25/12 12:08PM
BLAST # NW-027D

HIGHWAY# 97
BLAST LOCATION AT: STN 128+54 – 128+60 c/l (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* slot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.1 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 12 per d
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 45 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

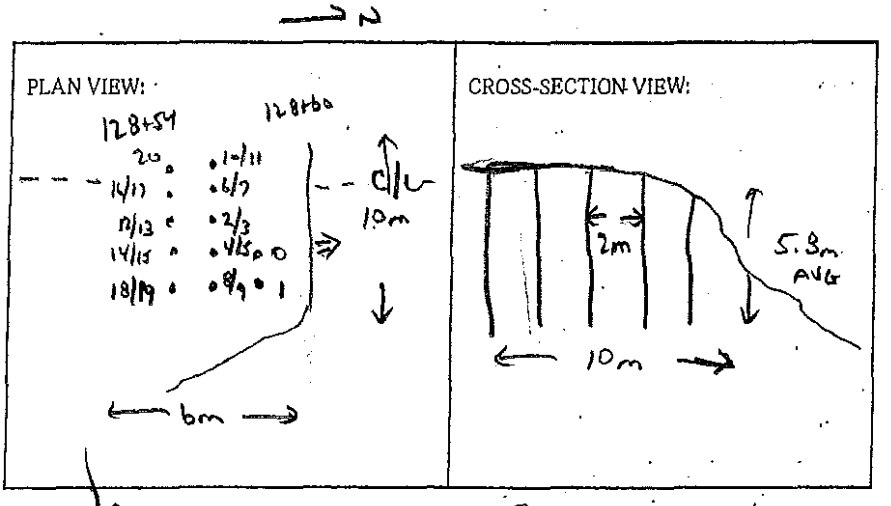
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HTS 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd – 0.39 ips / 32 Hz
" @ 13167 Cliffstone Crt – 0.12 ips / 43 Hz
" @ 13093 Cliffstone Crt – 0.41 ips / 57 Hz

BOTTOM DECKS – 5'–7' ANFO

TOP DECKS – 2'–4' ANFO

} ALL PRIMED W/ 0.5 GRAM 1½" x 16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 12:08:31 June 25, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECBZ.270

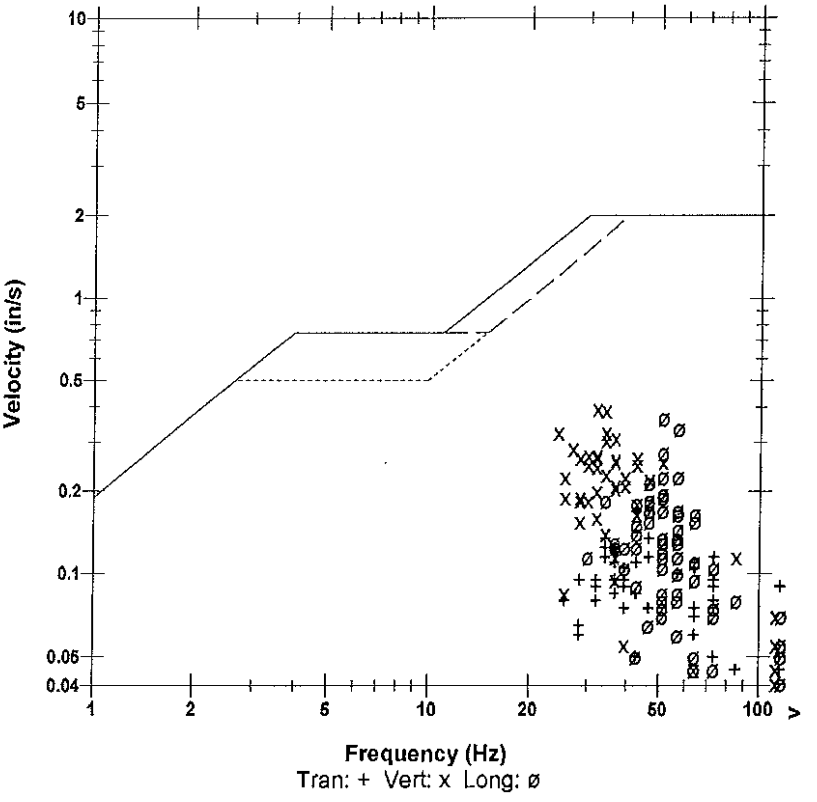
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

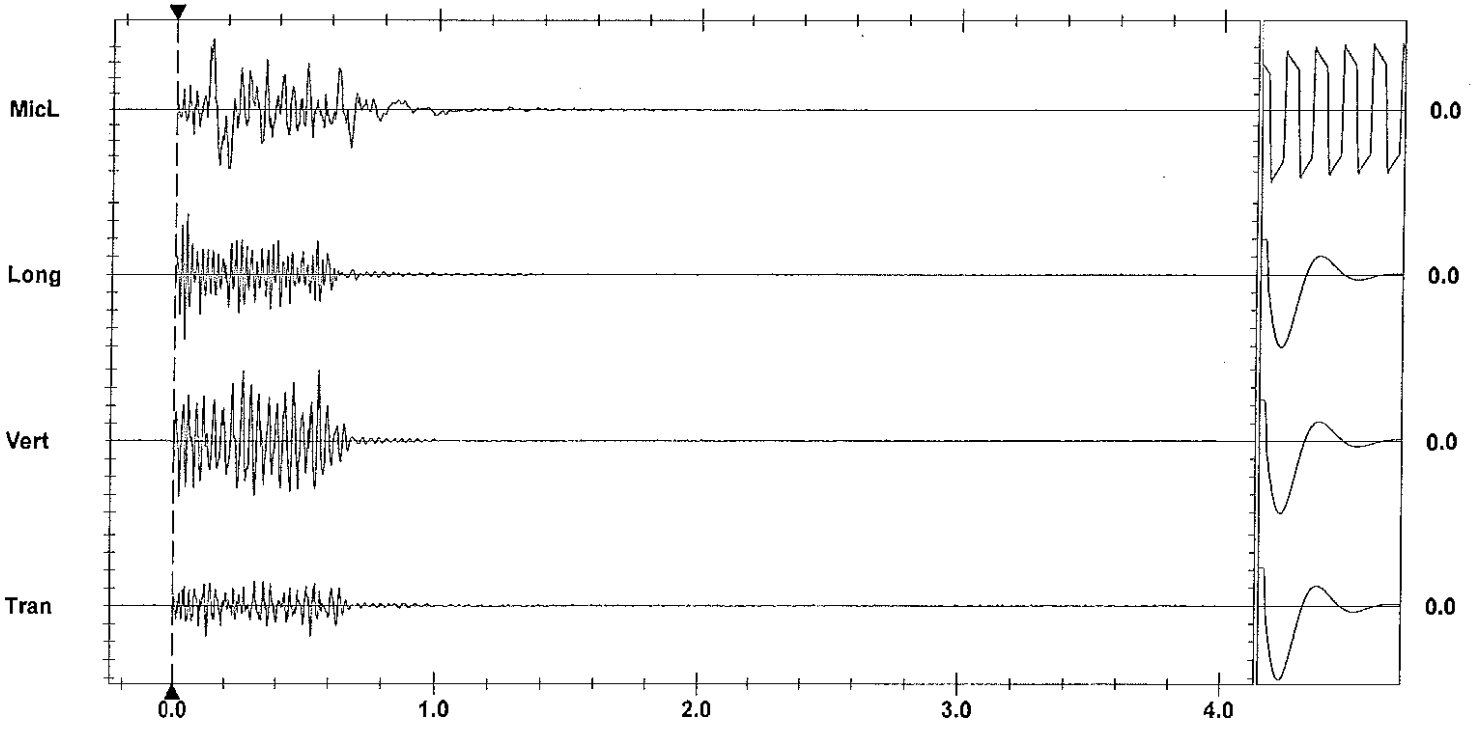
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00450 psi(L) at 0.143 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.170	0.395	0.365	in/s
ZC Freq	47	32	51	Hz
Time (Rel. to Trig)	0.132	0.269	0.038	sec
Peak Acceleration	0.172	0.252	0.371	g
Peak Displacement	0.00062	0.00168	0.00096	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.431 in/s at 0.269 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

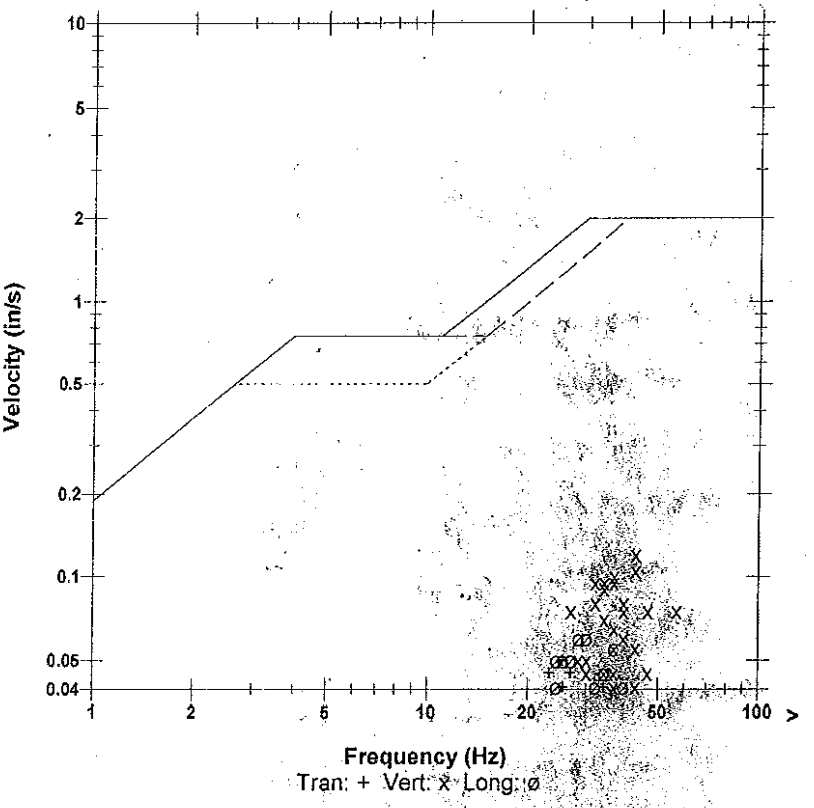
Date/Time	Vert at 12:08:20 June 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.1 Volts
Range	Geo : 10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECBZ.1W0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

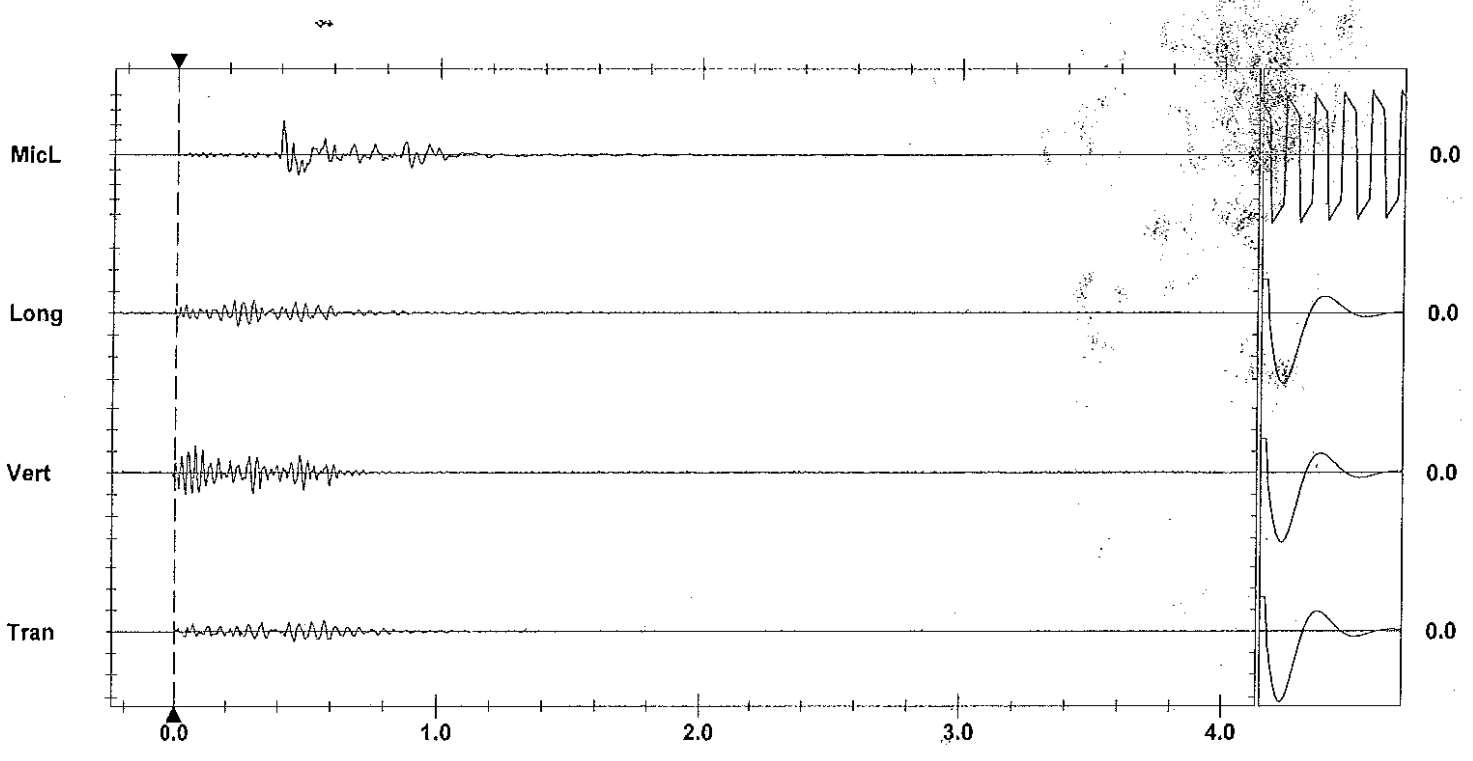
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00225 psi(L) at 0.407 sec		
ZC Freq	21 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 584 mv)		

	Tran	Vert	Long	
PPV	0.0500	0.120	0.0600	in/s
ZC Freq	26	43	30	Hz
Time (Rel. to Trig)	0.576	0.081	0.238	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00032	0.00048	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.6	3.6	4.3	

Peak Vector Sum 0.123 in/s at 0.081 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:08:43 June 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECBZ.2J0
Job Number:	1		

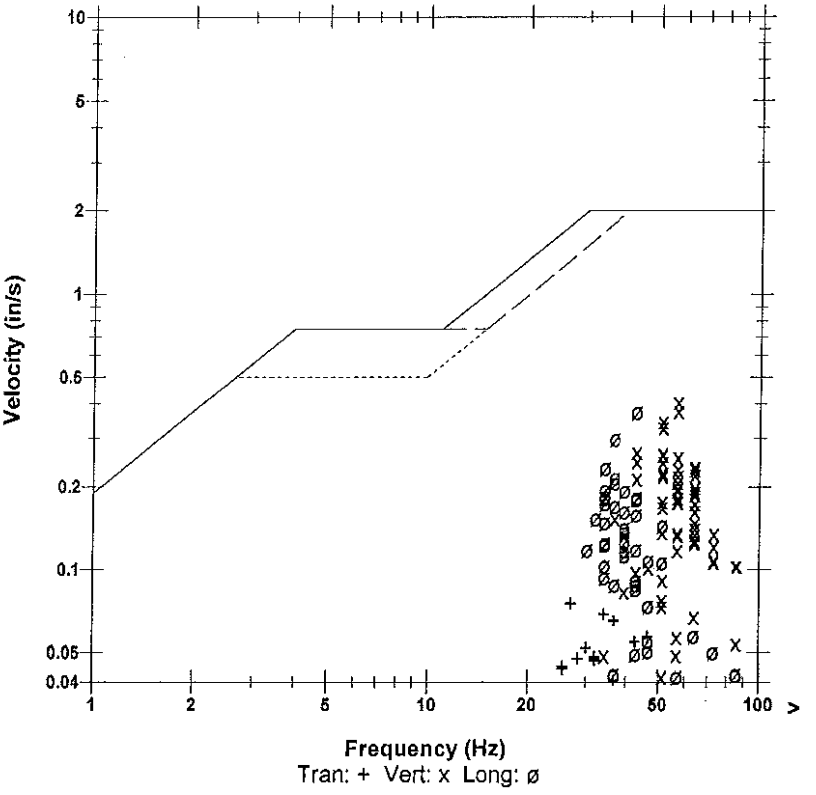
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

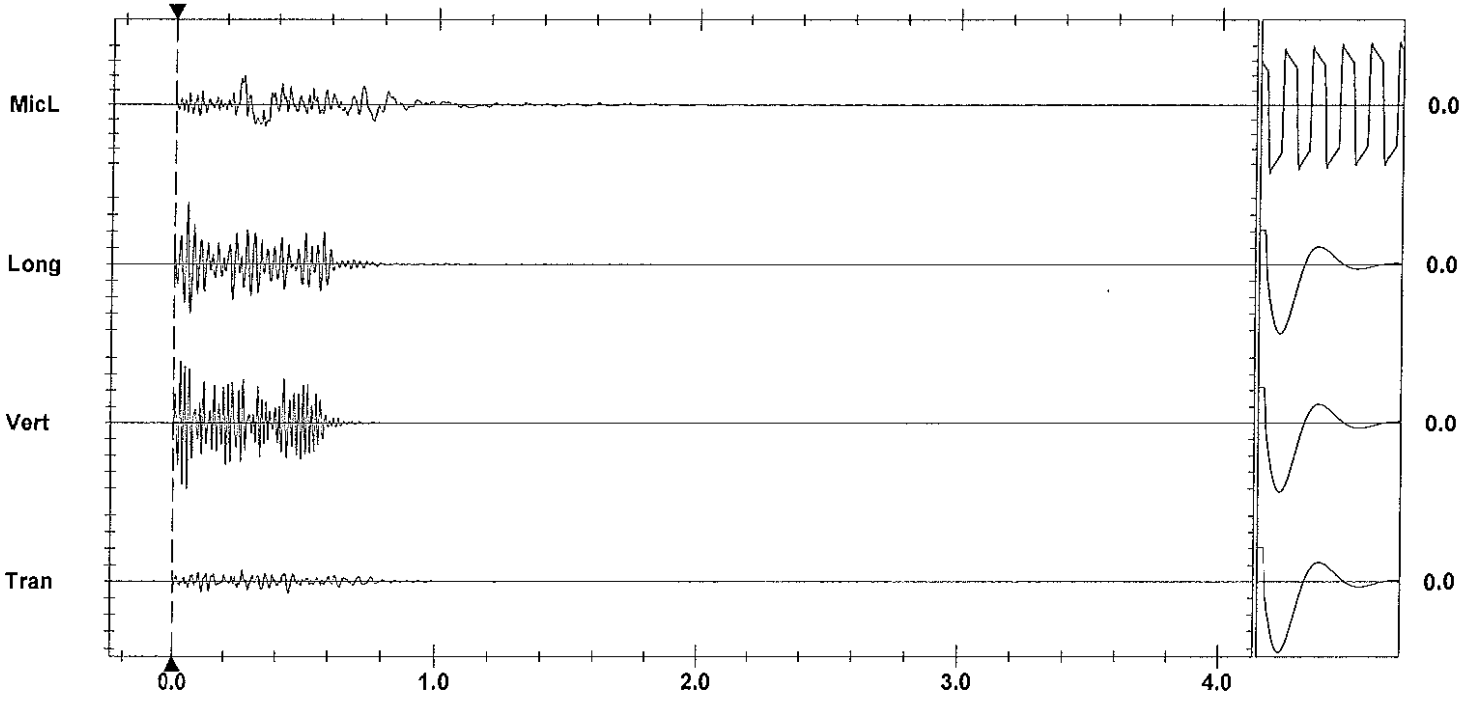
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00196 psi(L) at 0.268 sec			
ZC Freq	17 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 600 mv)			

	Tran	Vert	Long	
PPV	0.0750	0.407	0.374	in/s
ZC Freq	27	57	43	Hz
Time (Rel. to Trig)	0.451	0.055	0.053	sec
Peak Acceleration	0.0762	0.416	0.262	g
Peak Displacement	0.00037	0.00107	0.00136	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.6	7.5	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.541 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 25/12
ACTUAL BLAST DATE June 25/12 2:10 PM
BLAST # MW-0271

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+50 - 128+54 c/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 10 prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

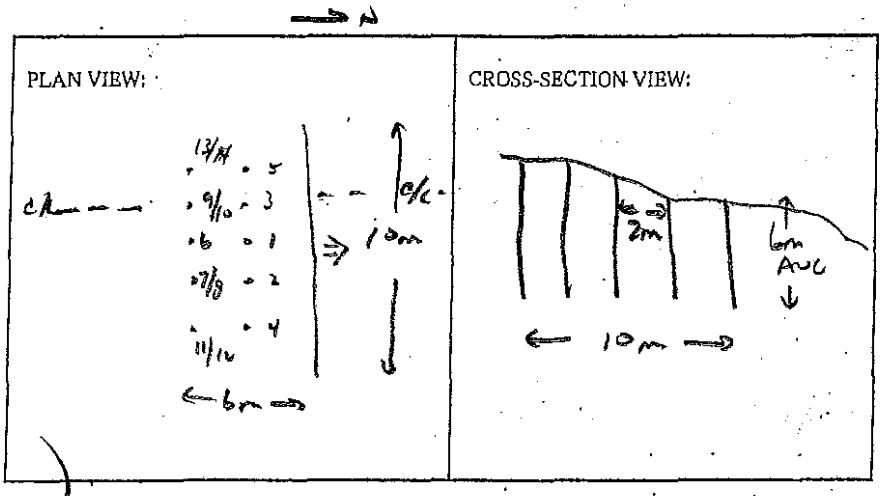
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13050 old mission Rd - 0.45 ips / 30 Hz
" @ 13147 cliffstone crt - 0.101 ips / 26 Hz
" @ 13093 cliffstone crt - 0.32 ips / 47 Hz

BOTTOM DECKS - 4'-7" ANFO

TOP DECKS - 2'-4' ANFO

} ALL PRIMED W/ DISTANCE, 1½" x 16' DYNAMITE

Instantel

Event Report

Date/Time	Vert at 14:10:38 June 25, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECC4.PQ0

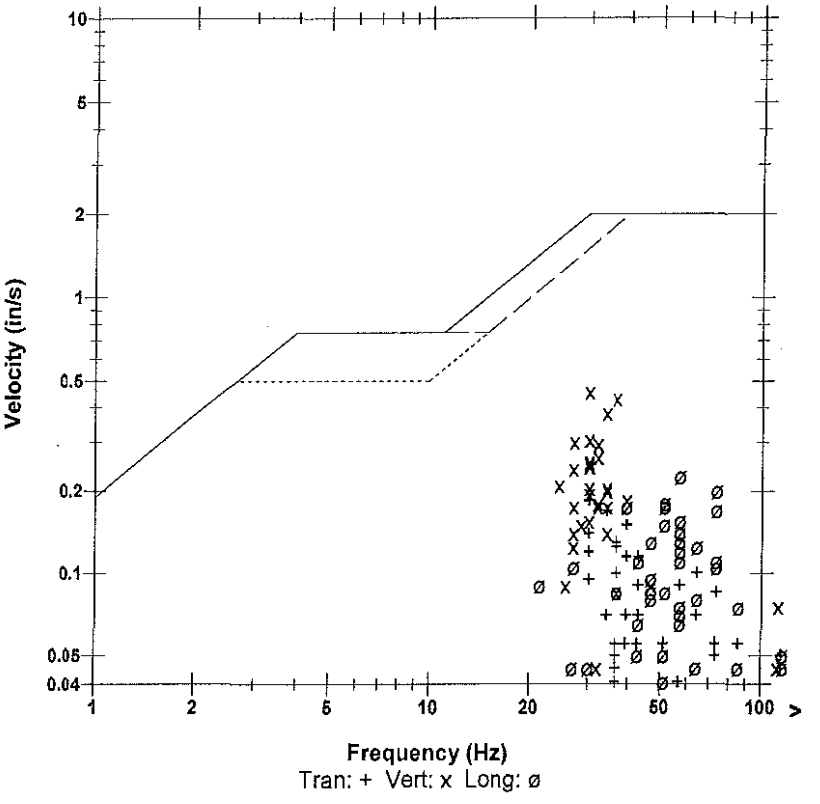
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

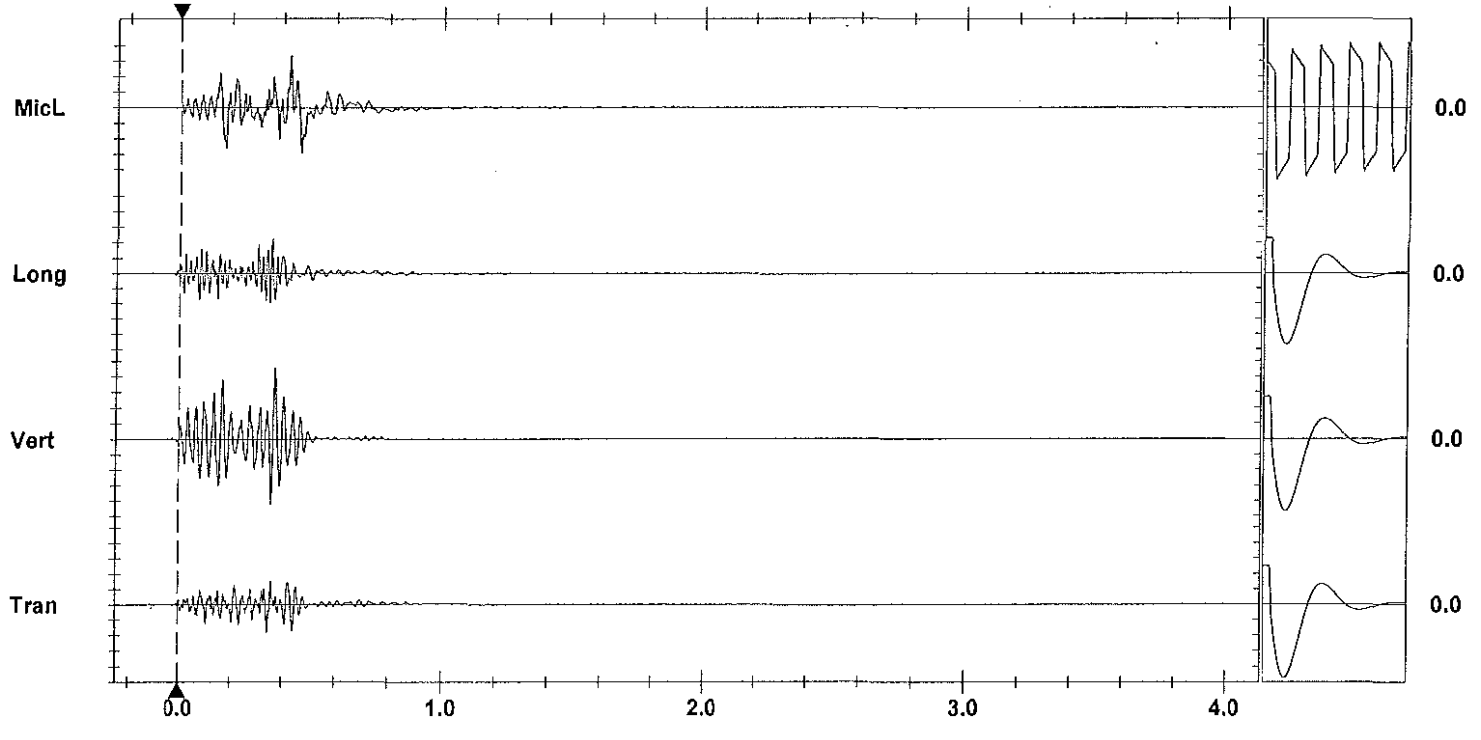
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00334 psi(L) at 0.424 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 581 mv)

	Tran	Vert	Long	
PPV	0.185	0.455	0.225	in/s
ZC Freq	30	30	57	Hz
Time (Rel. to Trig)	0.346	0.372	0.359	sec
Peak Acceleration	0.159	0.305	0.278	g
Peak Displacement	0.00080	0.00217	0.00072	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.498 in/s at 0.359 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

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Instantel

Event Report

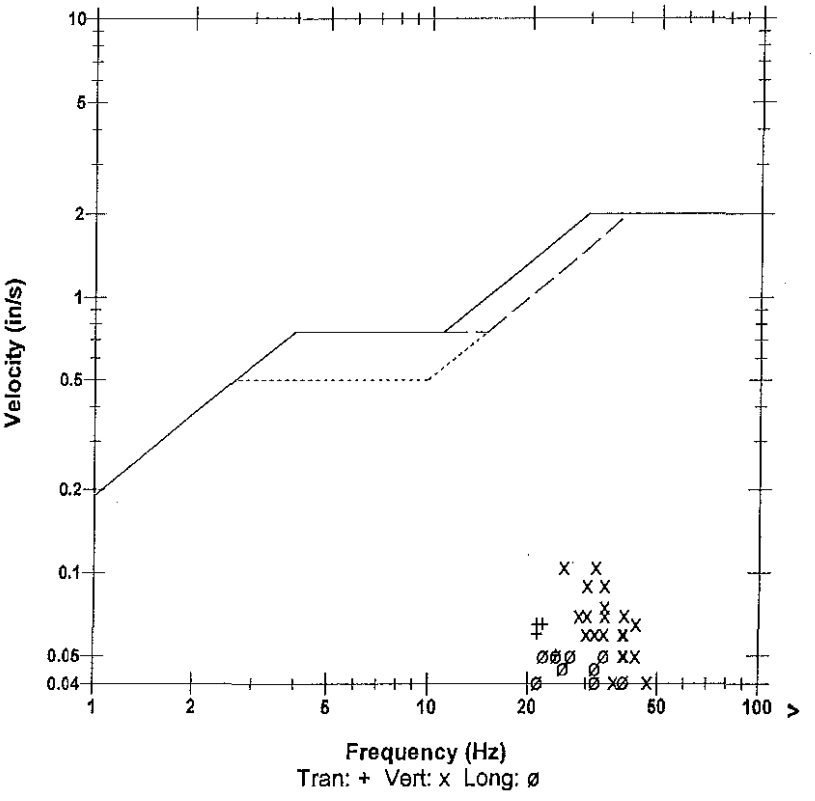
Date/Time	Vert at 14:10:28 June 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECC4.PG0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

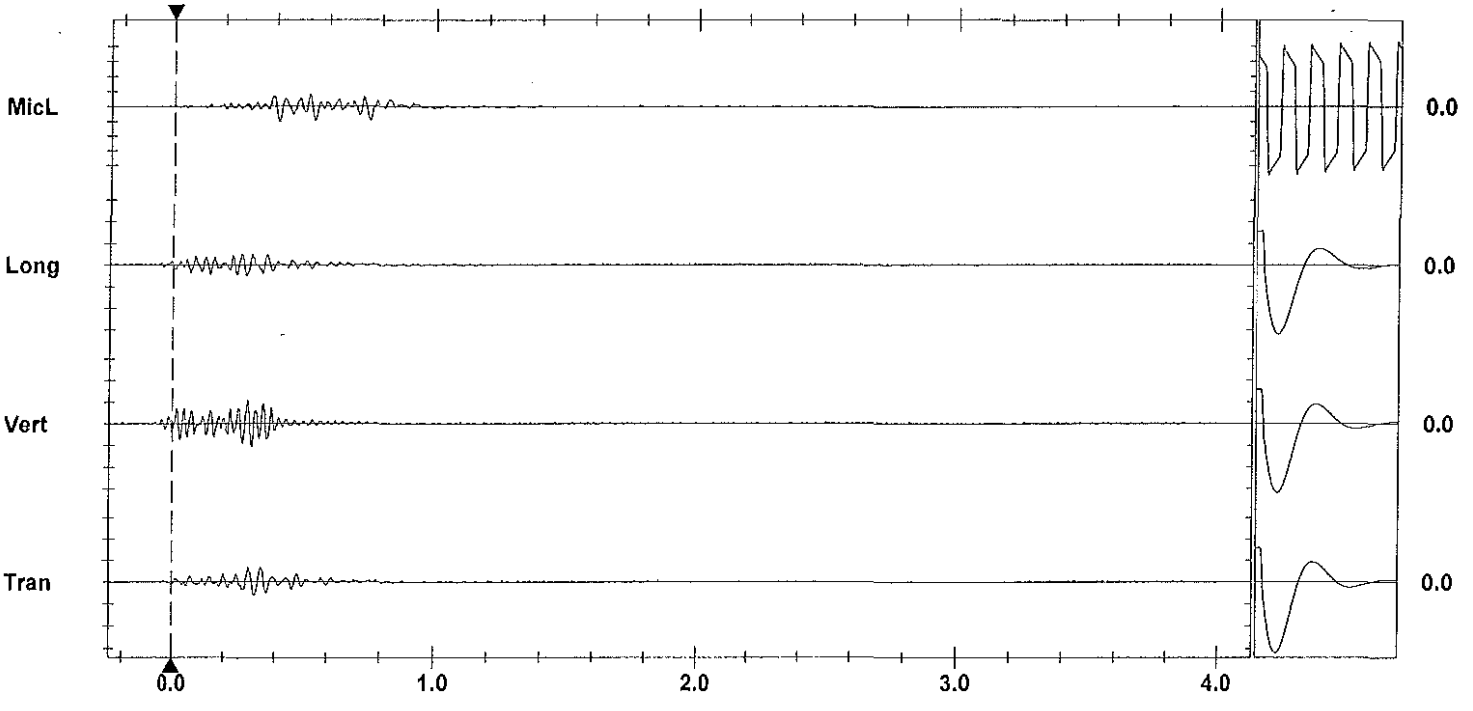
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00102 psi(L) at 0.406 sec		
ZC Freq	21 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 581 mv)		

	Tran	Vert	Long	
PPV	0.0650	0.105	0.0500	in/s
ZC Freq	21	26	34	Hz
Time (Rel. to Trig)	0.299	0.294	0.249	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00048	0.00059	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.6	4.3	

Peak Vector Sum 0.118 in/s at 0.310 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 15, 2012 07:8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 14:10:51 June 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECC4.Q30
Job Number:	1		

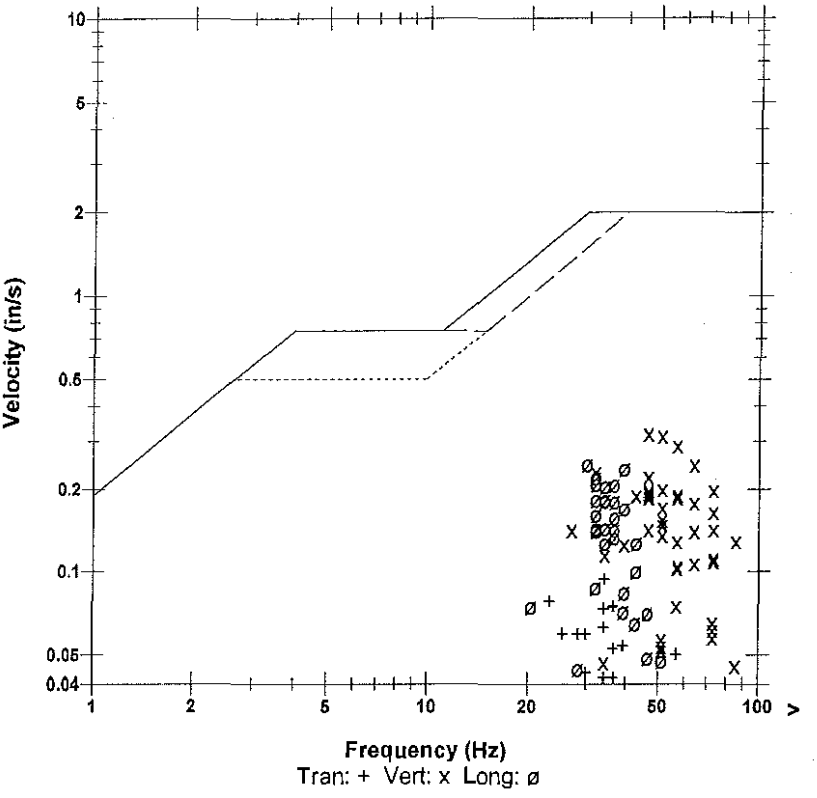
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

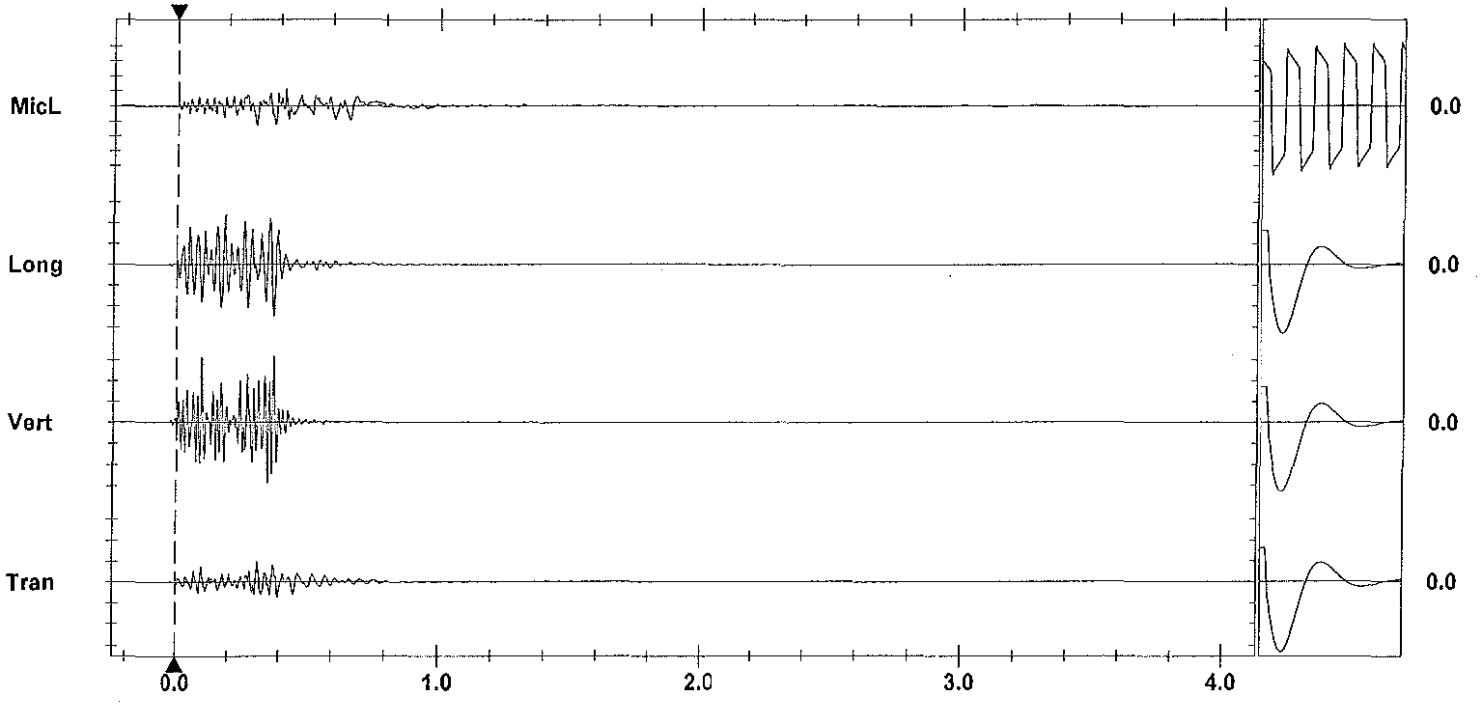
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.306 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	0.0931	0.319	0.247	in/s
ZC Freq	34	47	30	Hz
Time (Rel. to Trig)	0.319	0.378	0.376	sec
Peak Acceleration	0.106	0.283	0.154	g
Peak Displacement	0.00044	0.00106	0.00125	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.403 in/s at 0.378 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 26/12
ACTUAL BLAST DATE June 26/12 10:27 AM
BLAST # MW-0272

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+50 - 128+56 (TOS Ubag mark)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.7 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 15 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Hand
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

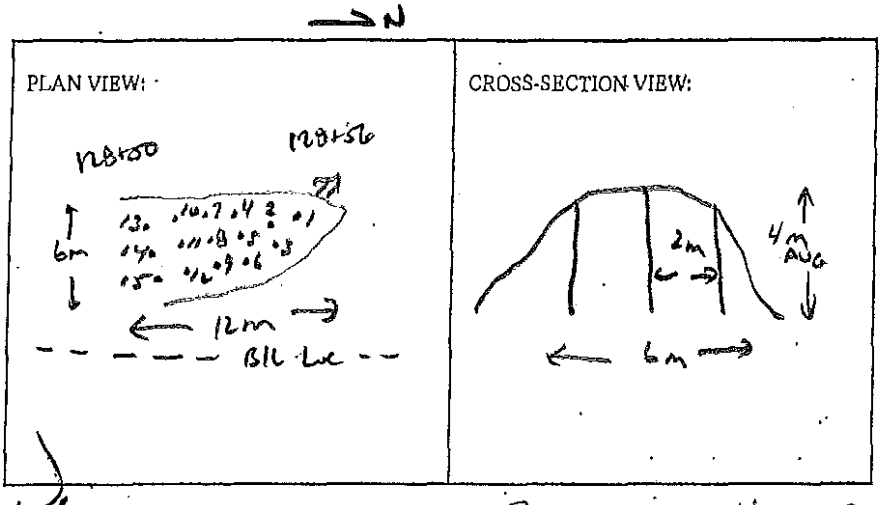
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 350 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 250 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old mission Rd - 0.28 ips / 37 Hz
" @ 13167 cliffstone crt - 0.065 ips / 39 Hz
" @ 13093 cliffstone crt. 0.201 ps / 43 Hz

2'-5' ANFO/HOLE + 0.5 CART 1½"x16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 10:27:54 June 26, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECDP.2I0

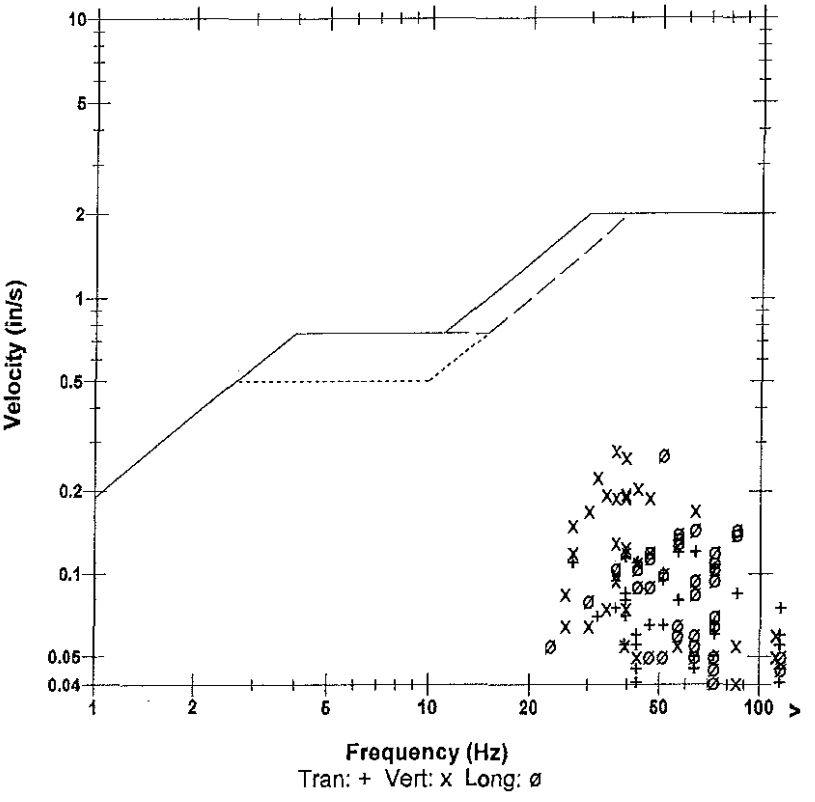
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

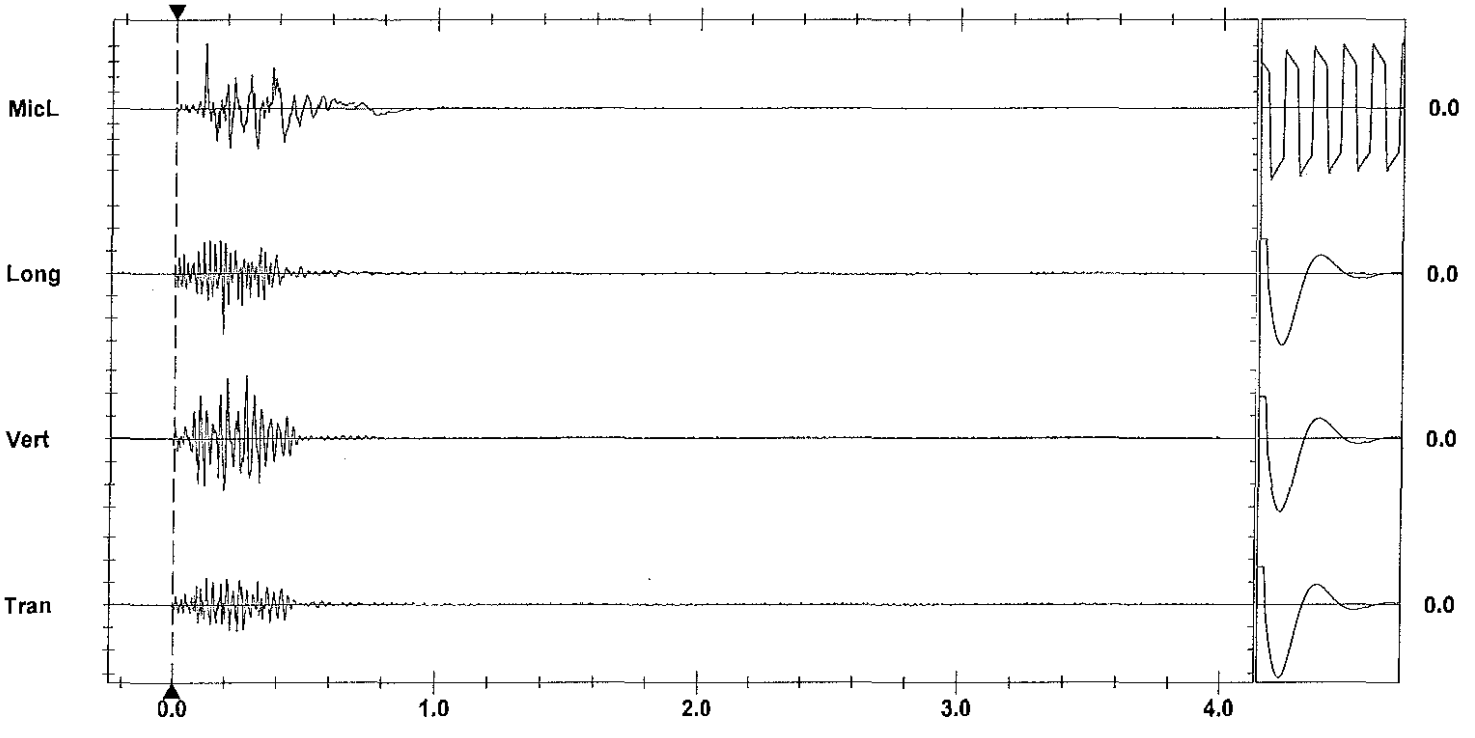
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00417 psi(L) at 0.117 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 564 mv)

	Tran	Vert	Long	
PPV	0.120	0.280	0.270	in/s
ZC Freq	57	37	51	Hz
Time (Rel. to Trig)	0.133	0.279	0.188	sec
Peak Acceleration	0.159	0.265	0.278	g
Peak Displacement	0.00061	0.00112	0.00070	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.302 in/s at 0.188 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

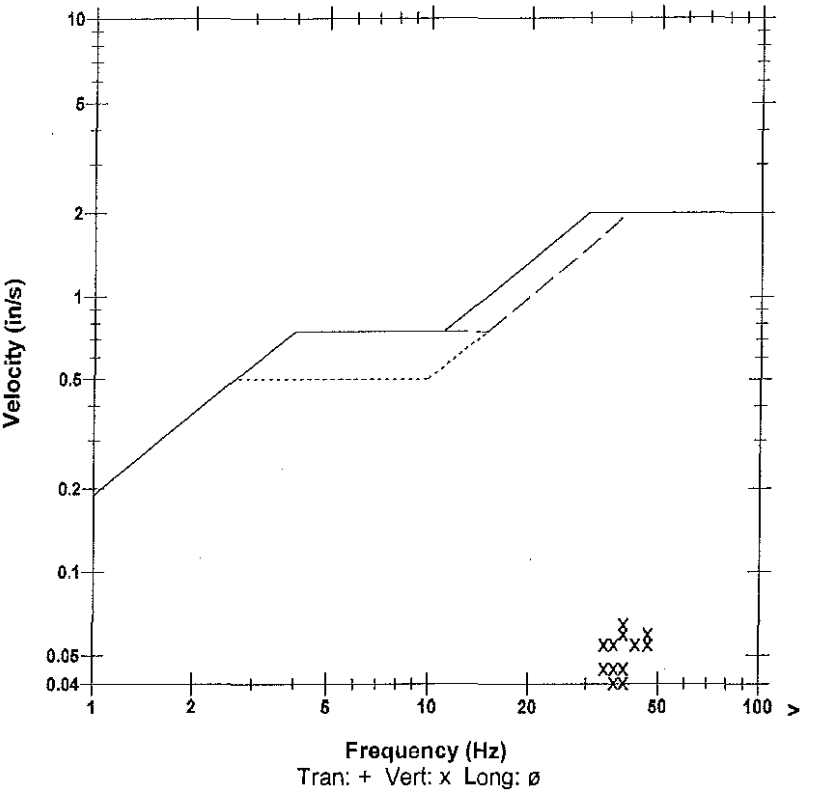
Date/Time	Vert at 10:27:42 June 26, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECDP.260

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

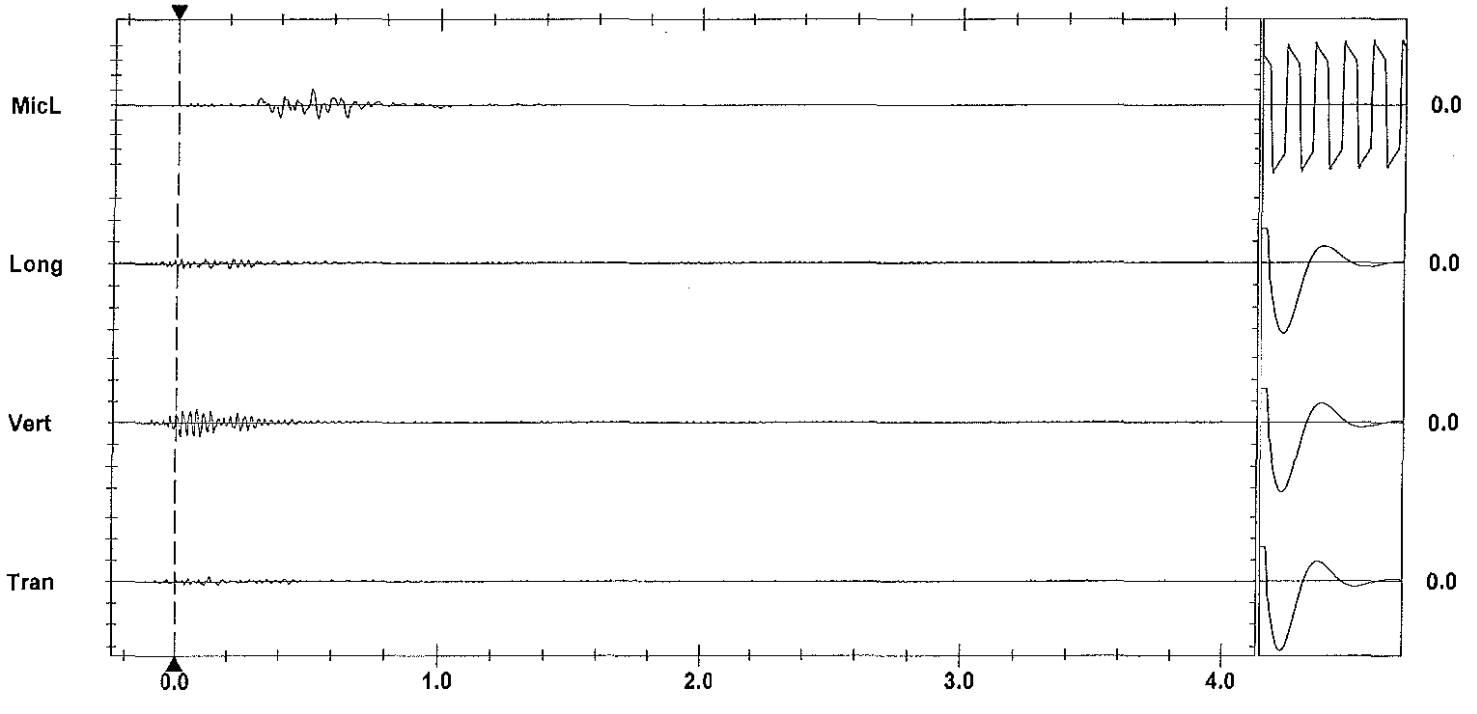
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.514 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0650	0.0200	in/s
ZC Freq	39	39	57	Hz
Time (Rel. to Trig)	0.134	0.080	0.016	sec
Peak Acceleration	0.0133	0.0530	0.0265	g
Peak Displacement	0.00010	0.00027	0.00010	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.0658 in/s at 0.080 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 10:28:06 June 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECDP.2U0
Job Number:	1		

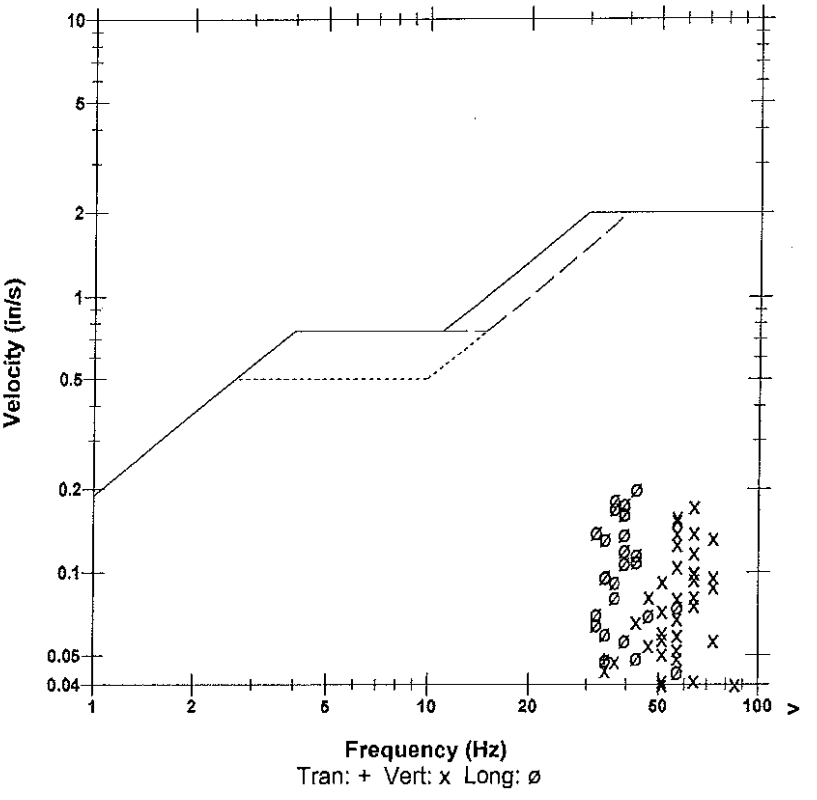
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

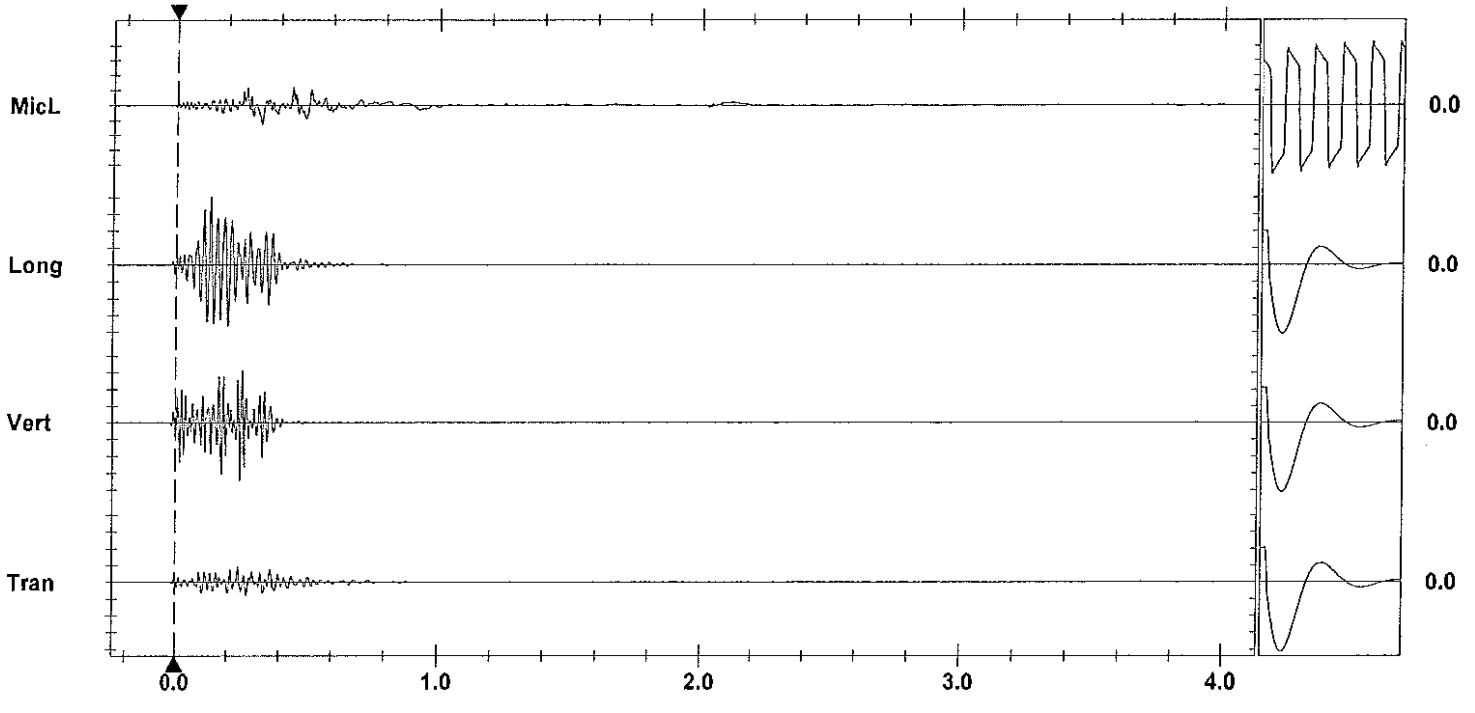
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00127 psi(L) at 0.326 sec		
ZC Freq	18 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 587 mv)		

	Tran	Vert	Long	
PPV	0.0481	0.172	0.199	in/s
ZC Freq	34	64	43	Hz
Time (Rel. to Trig)	0.244	0.250	0.135	sec
Peak Acceleration	0.0315	0.179	0.136	g
Peak Displacement	0.00017	0.00044	0.00078	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.200 in/s at 0.136 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 15, 2012 07:8:01 - 8.01
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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED June 26/11
ACTUAL BLAST DATE June 26/11 11:21 AM
BLAST # MW-0273

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+44 - 128+50 RS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 2.9 (m)
TOTAL DEPTH 33 (m)

TOTAL NUMBER OF HOLES 13 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 13

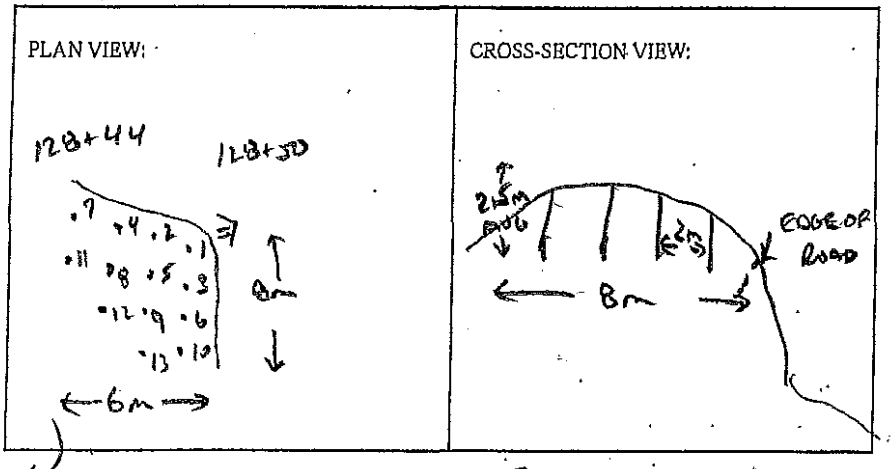
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.23 ips/37Hz
" @ 13169 Cliffstone Crt - No Trigger (< 0.04 ips)
" @ 13093 Cliffstone Crt - 0.10 ips/57Hz

1'-2' ANFO/Hole + 0.5 CART 1½ x 16 DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 11:21:46 June 26, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECDR.KA0

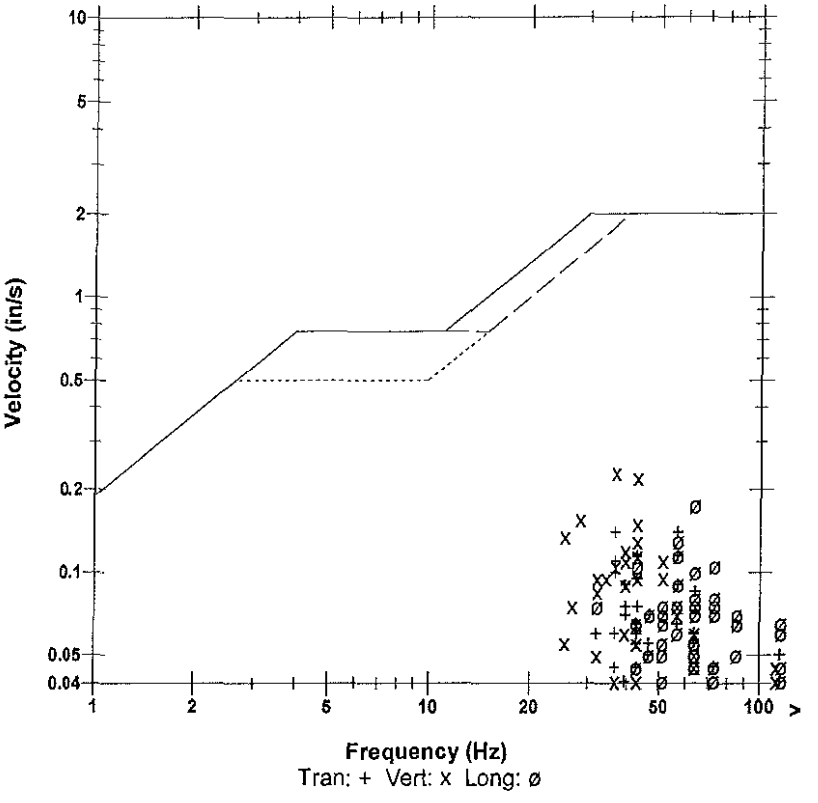
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

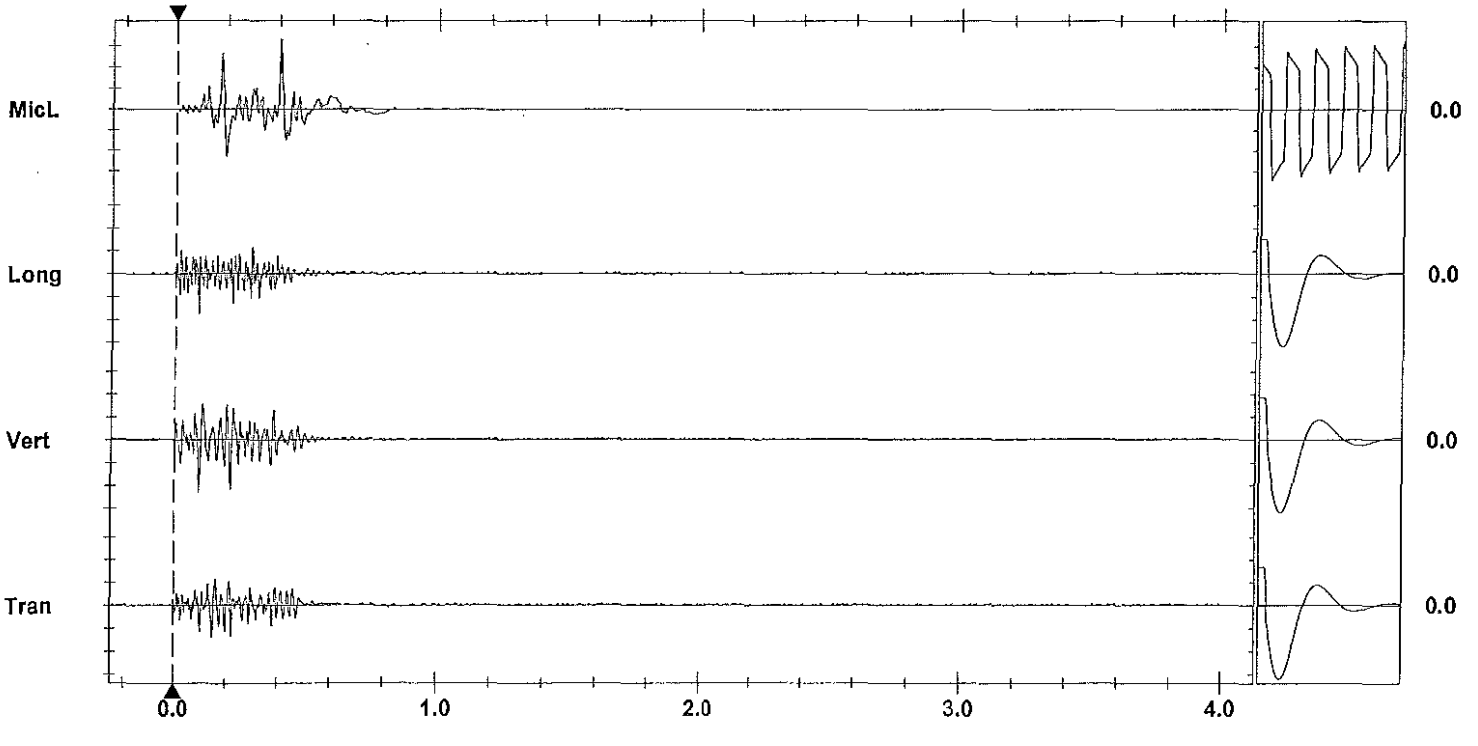
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00664 psi(L) at 0.401 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 580 mv)

	Tran	Vert	Long	
PPV	0.140	0.230	0.175	in/s
ZC Freq	37	37	64	Hz
Time (Rel. to Trig)	0.151	0.098	0.091	sec
Peak Acceleration	0.119	0.159	0.212	g
Peak Displacement	0.00057	0.00086	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.247 in/s at 0.216 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:21:59 June 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECDR.KN0
Job Number:	1		

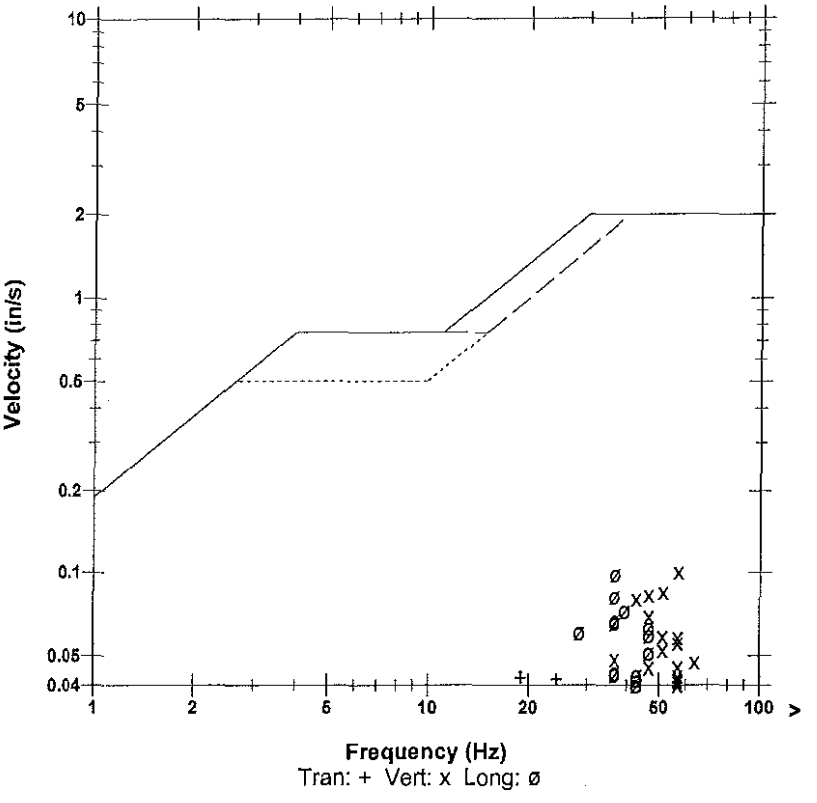
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

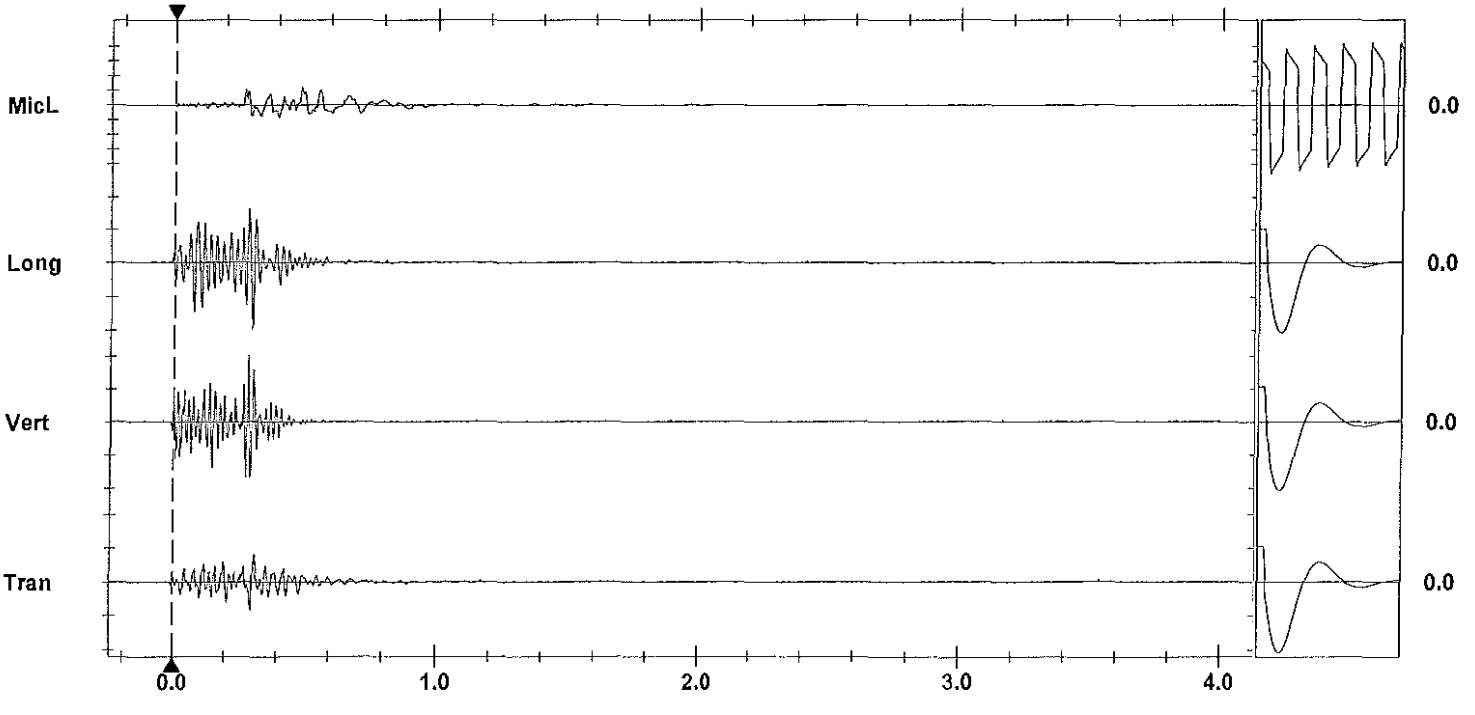
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00116 psi(L) at 0.489 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 598 mv)

	Tran	Vert	Long	
PPV	0.0419	0.101	0.0987	in/s
ZC Freq	19	57	37	Hz
Time (Rel. to Trig)	0.304	0.292	0.304	sec
Peak Acceleration	0.0298	0.111	0.0630	g
Peak Displacement	0.00022	0.00032	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.130 in/s at 0.292 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JUNE 26/12
CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
ACTUAL BLAST DATE JUNE 26/12 12:18 PM
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 5B3489
BLAST # MW-0273

HIGHWAY# 97
BLAST LOCATION AT: STA 128+40 - 128+44 (to subgrade) RS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALASKO GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 15 (m)

TOTAL NUMBER OF HOLES 6 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 3
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

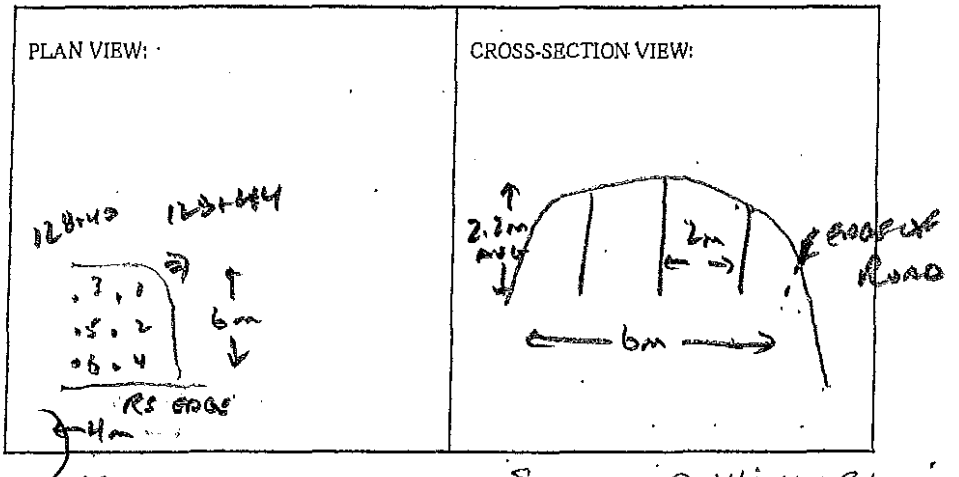
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 OLD MISSION RD - 0.090 ips / 64 Hz
" @ 13167 CLIFFSTONE CT - NO TRIGGER (< 0.04 ips)
" @ 13093 CLIFFSTONE CT - 0.072 ips / 47 Hz

2' - 3.5' ANFO / Hole primed w/ DIS CAST 1½" x 16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 12:18:07 June 26, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECDU.670

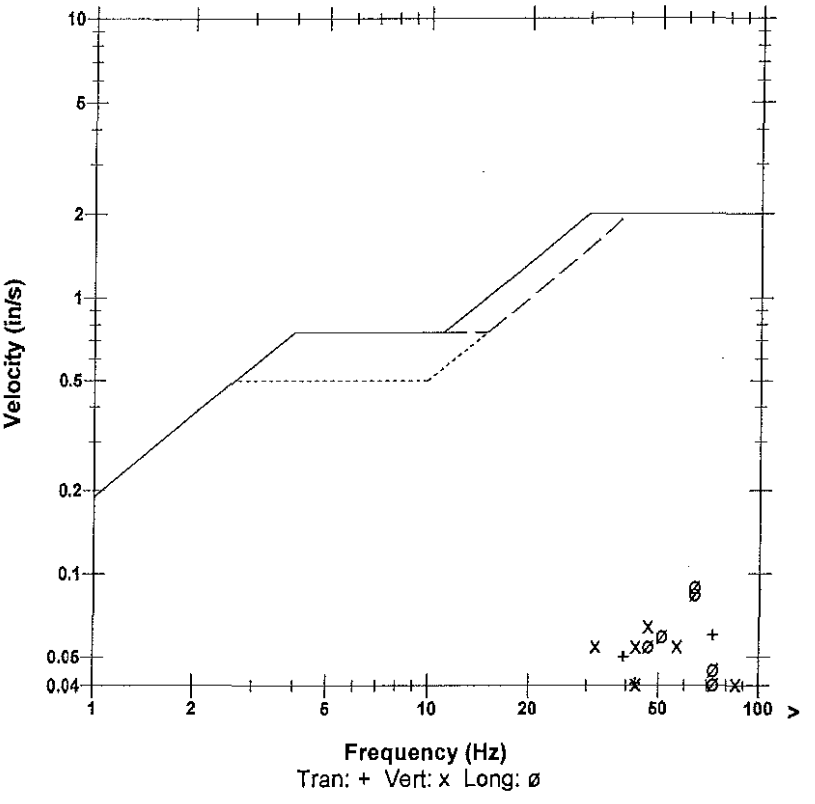
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

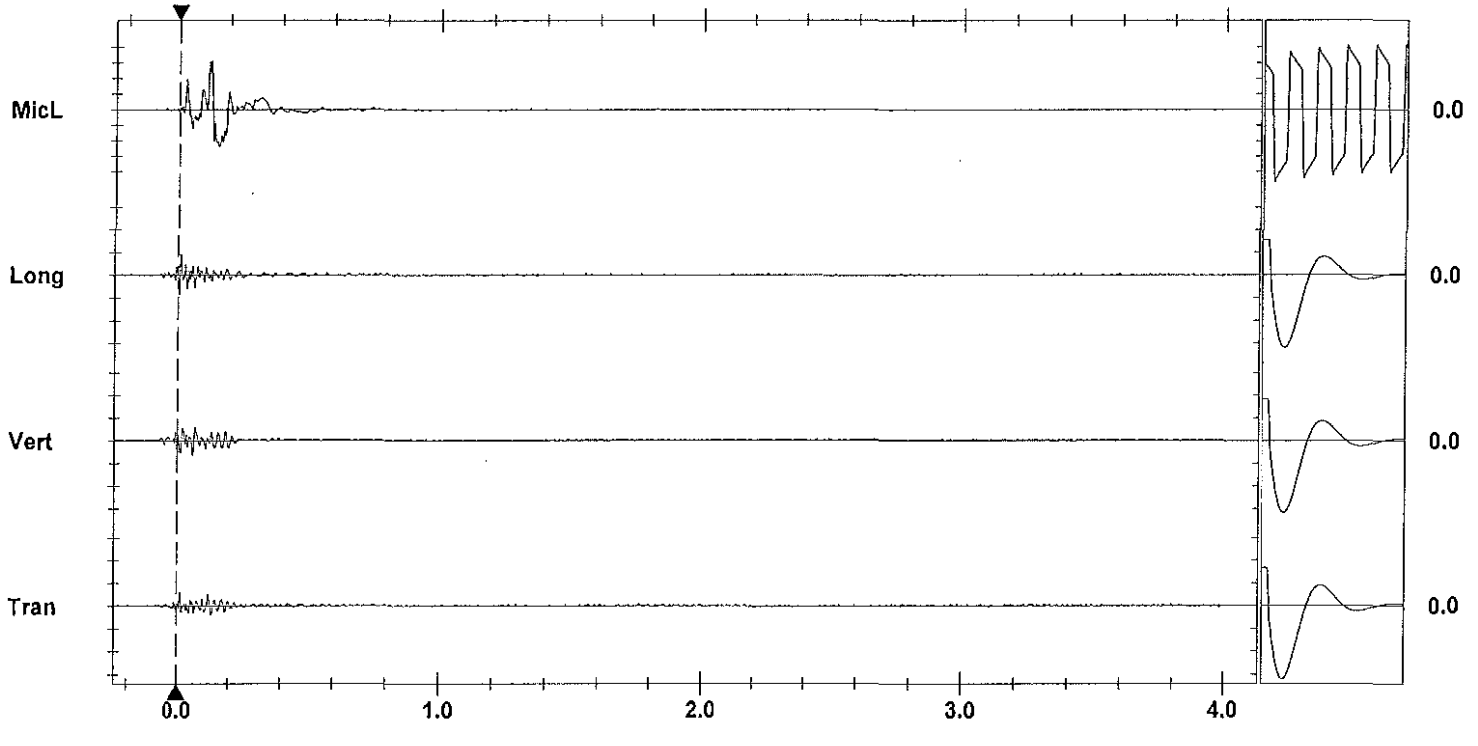
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00312 psi(L) at 0.125 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0650	0.0900	in/s
ZC Freq	73	47	64	Hz
Time (Rel. to Trig)	0.014	0.061	0.012	sec
Peak Acceleration	0.0795	0.0663	0.119	g
Peak Displacement	0.00018	0.00025	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.110 in/s at 0.012 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 12:18:20 June 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECDU.6K0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

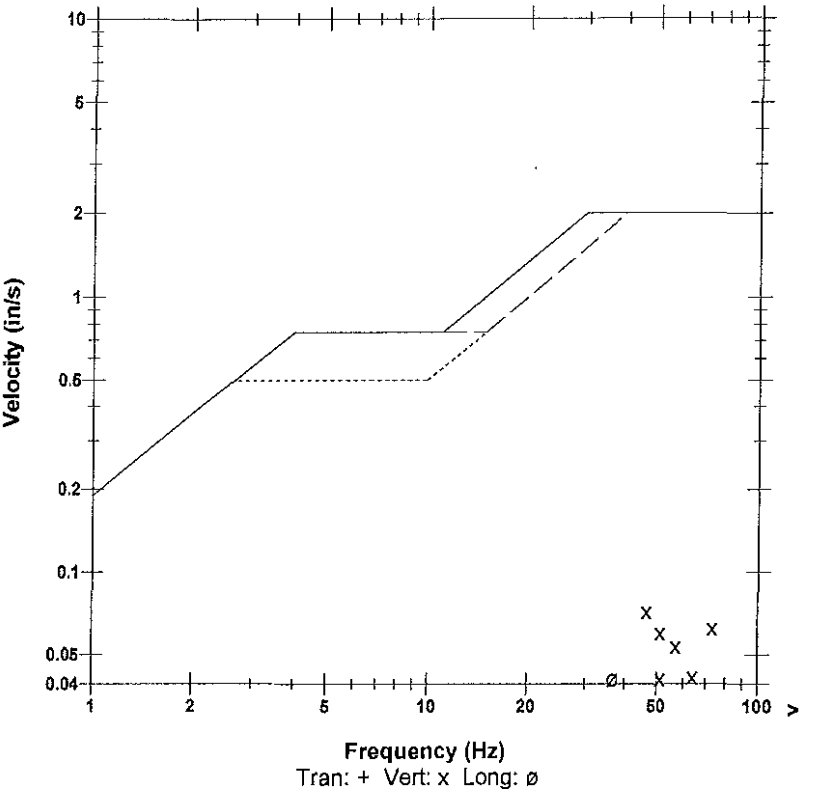
Post Event Notes

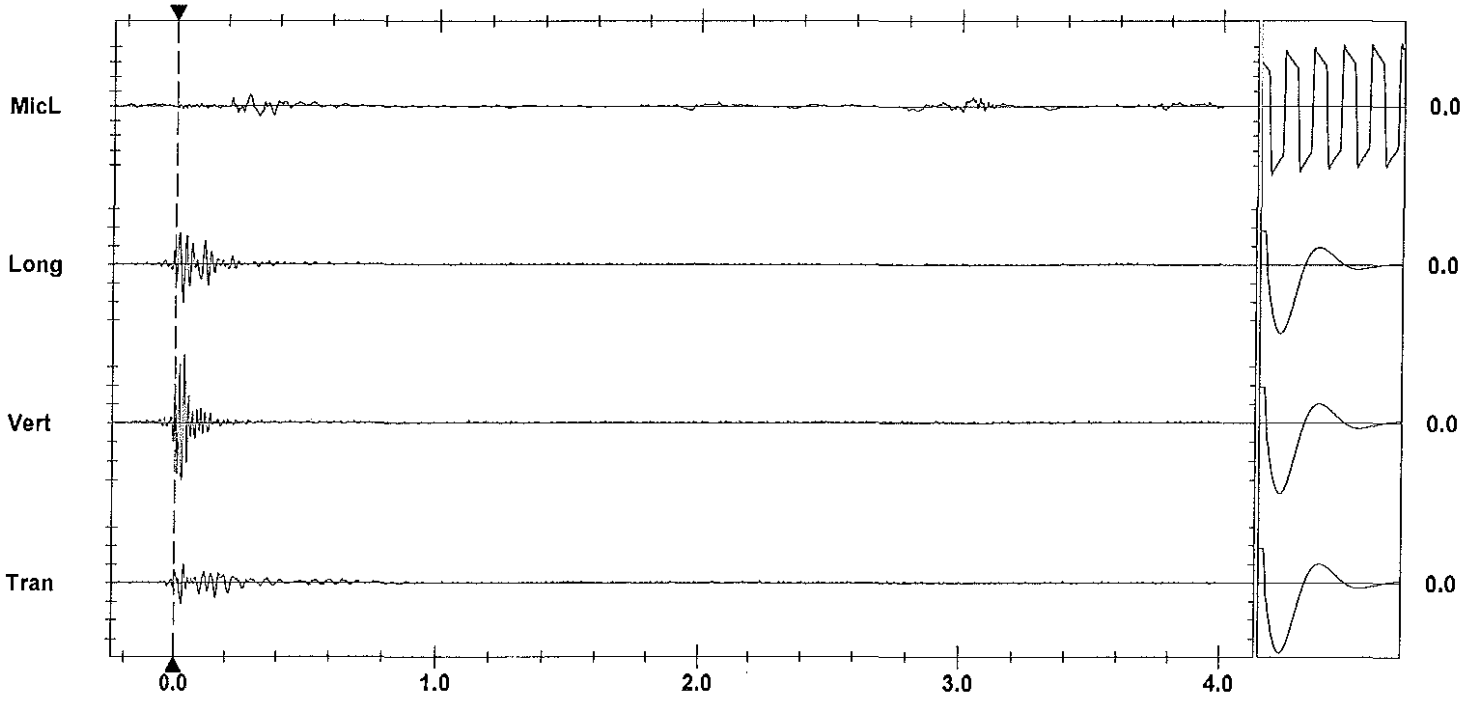
Microphone Linear Weighting
PSPL 0.00073 psi(L) at 0.282 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 556 mv)

	Tran	Vert	Long	
PPV	0.0231	0.0719	0.0412	in/s
ZC Freq	34	47	37	Hz
Time (Rel. to Trig)	0.028	0.036	0.028	sec
Peak Acceleration	0.0215	0.0713	0.0232	g
Peak Displacement	0.00011	0.00022	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.0741 in/s at 0.036 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: July 15, 2012 07:8:01 - 8.01
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 22/12
ACTUAL BLAST DATE June 22/12 12:MAM
BLAST # MW-0274

HIGHWAY# 97
BLAST LOCATION AT: Cut 128+45 - 128+51 c/l (Top Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

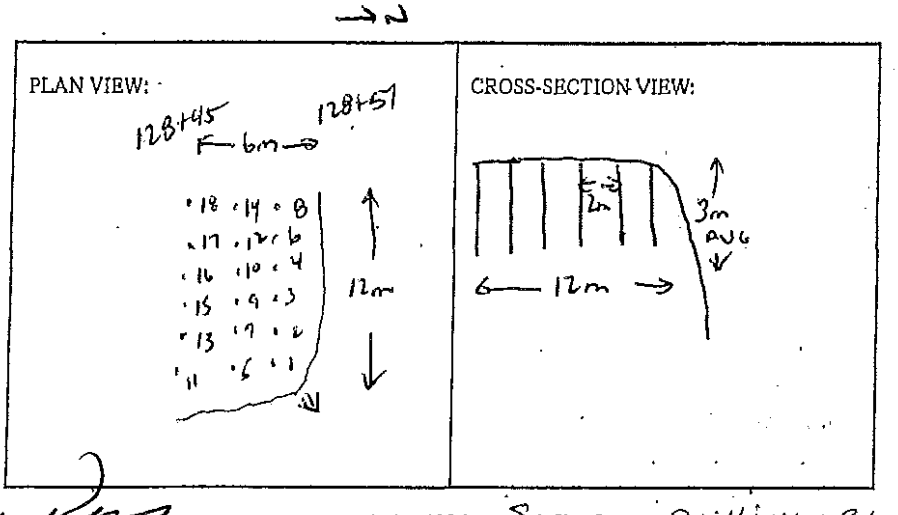
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HW320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.12 ips/47Hz
" @ 13167 Cliffstone Cut - No Trigger (<0.04 ips)
" @ 13093 Cliffstone Cut - 0.13 ips/57Hz

2' - 3' ANFO / HOLE + DIS CHARGE 1½" x 16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Long at 12:13:53 June 27, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECFO.N50

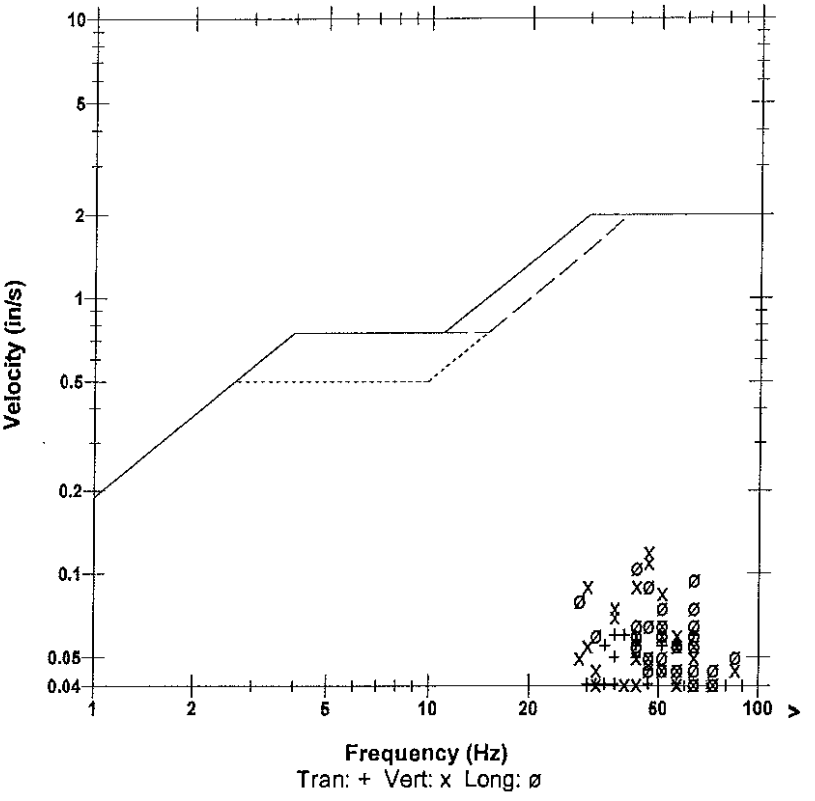
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

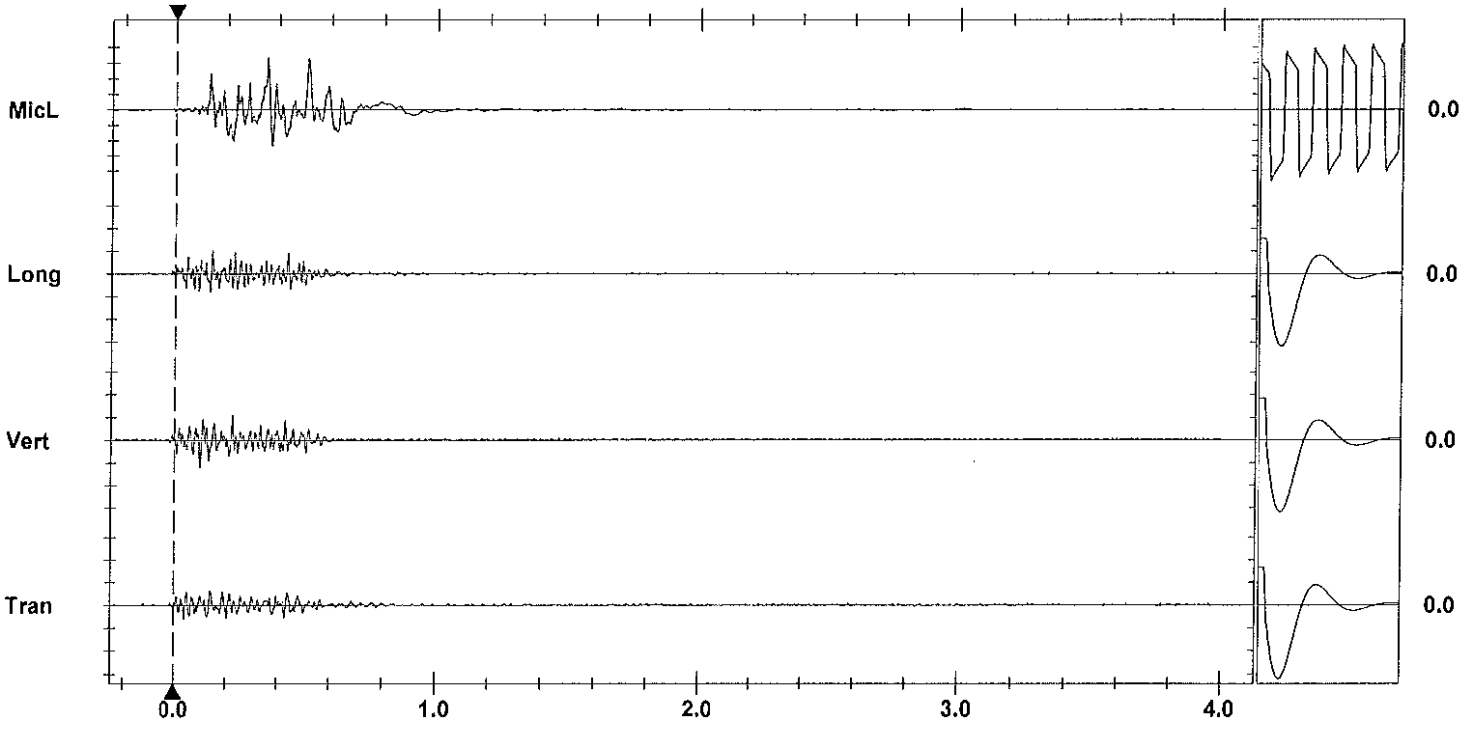
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00334 psi(L) at 0.354 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0600	0.120	0.105	in/s
ZC Freq	64	47	43	Hz
Time (Rel. to Trig)	0.042	0.102	0.146	sec
Peak Acceleration	0.0663	0.0795	0.0928	g
Peak Displacement	0.00029	0.00040	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.133 in/s at 0.102 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——— ———◀

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Instantel

Event Report

Date/Time	Vert at 12:14:06 June 27, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECFO.NI0
Job Number:	1		

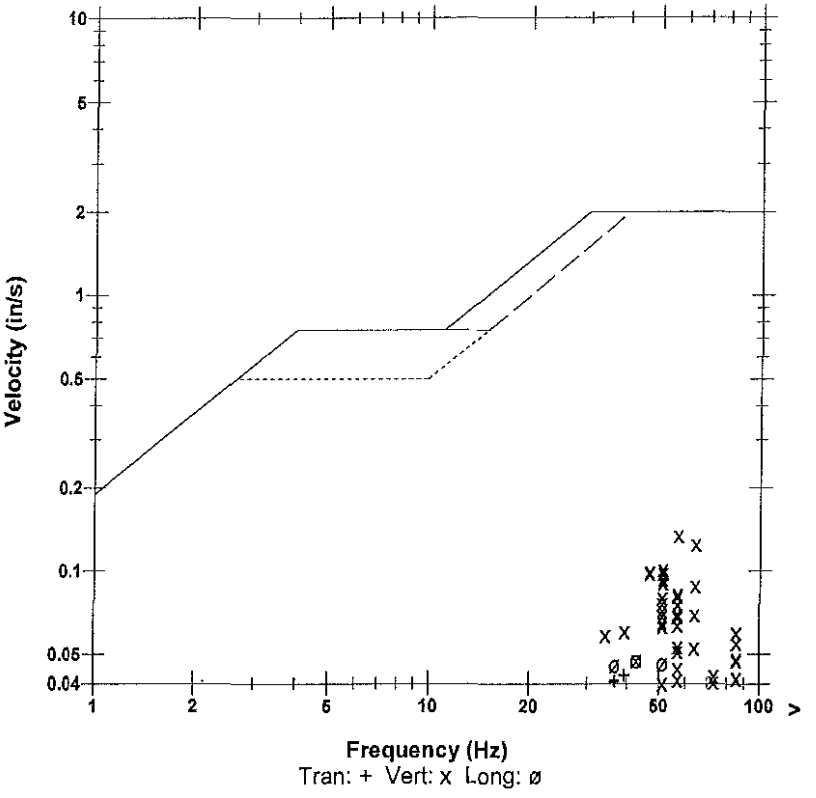
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

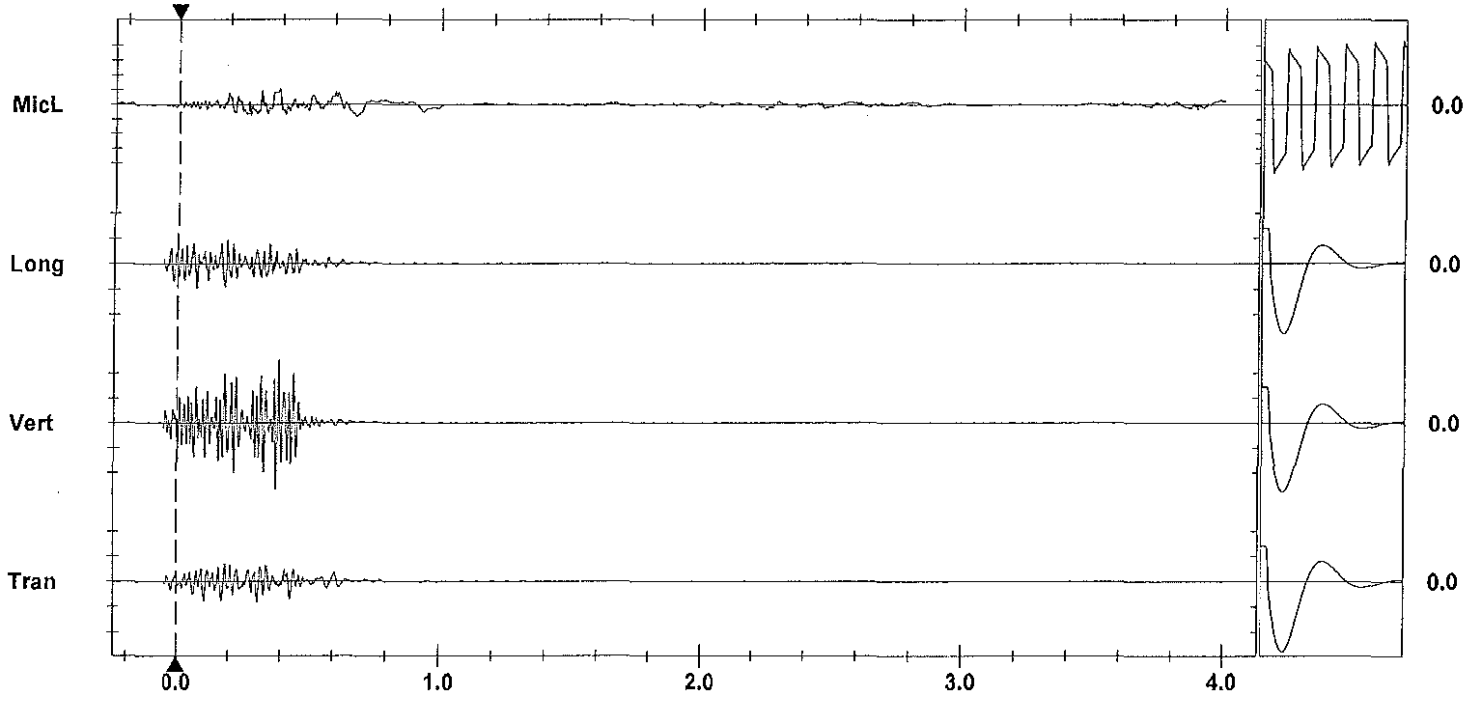
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.387 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 568 mv)

	Tran	Vert	Long	
PPV	0.0419	0.134	0.0475	in/s
ZC Freq	39	57	43	Hz
Time (Rel. to Trig)	0.314	0.385	0.076	sec
Peak Acceleration	0.0348	0.124	0.0447	g
Peak Displacement	0.00017	0.00035	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.135 in/s at 0.385 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 15, 2013 01:8:04 PM
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED June 27/12
ACTUAL BLAST DATE June 27/12 2:18PM
BLAST # MW-0275

HIGHWAY# 97
BLAST LOCATION AT: 128+39 - 128+45 c/L (TOP Cut)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 12 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 12

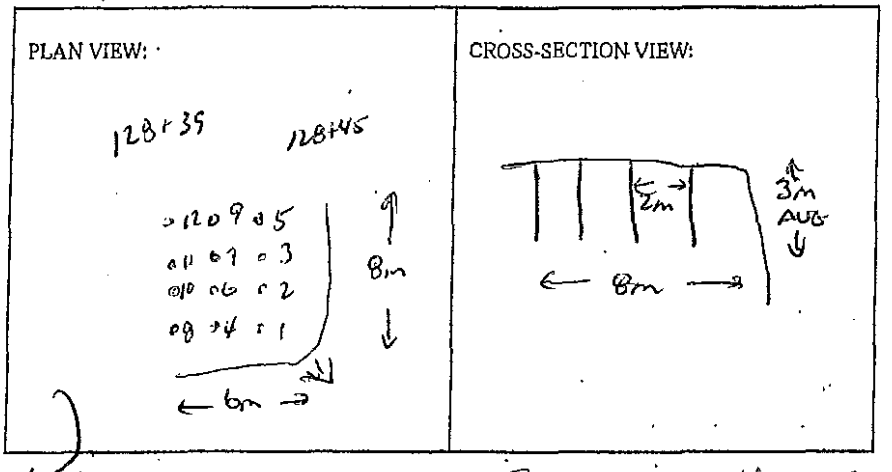
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 35 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13050 OLD MISSION RD - 0.020 ips/39Hz
" @ 13167 Cliffstone Crt - No trigger (< 0.04 ips)
" @ 13093 Cliffstone Crt - 0.12 ips/57Hz

1'-2.5' Drift/Hole + 0.5 Cart. 1½" x 16" Dynamite Primer

Instantel

Event Report

Date/Time	Long at 14:18:03 June 27, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECFU.E30

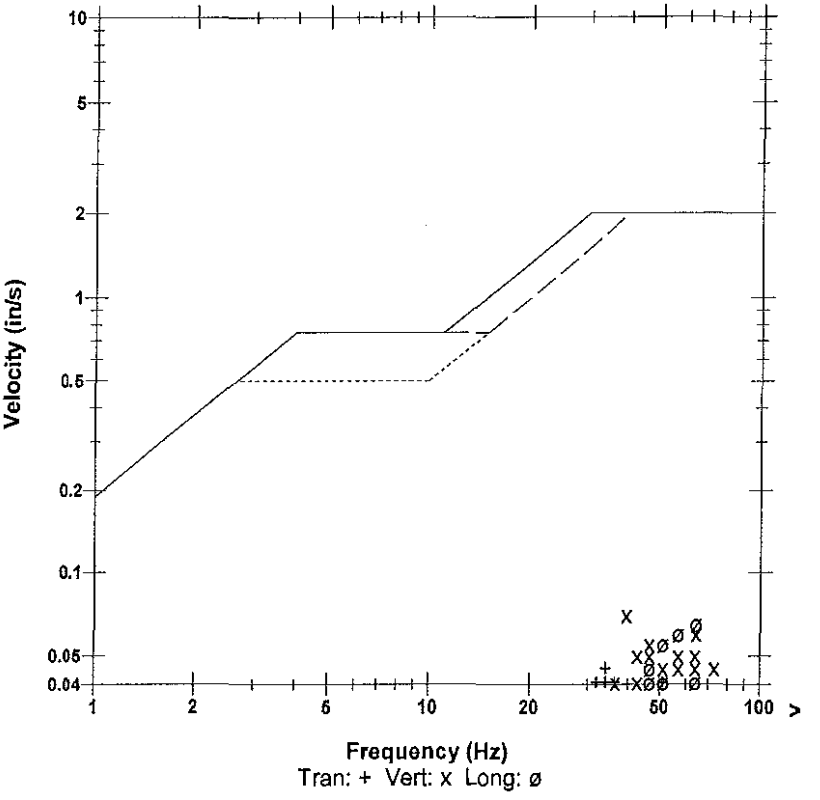
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

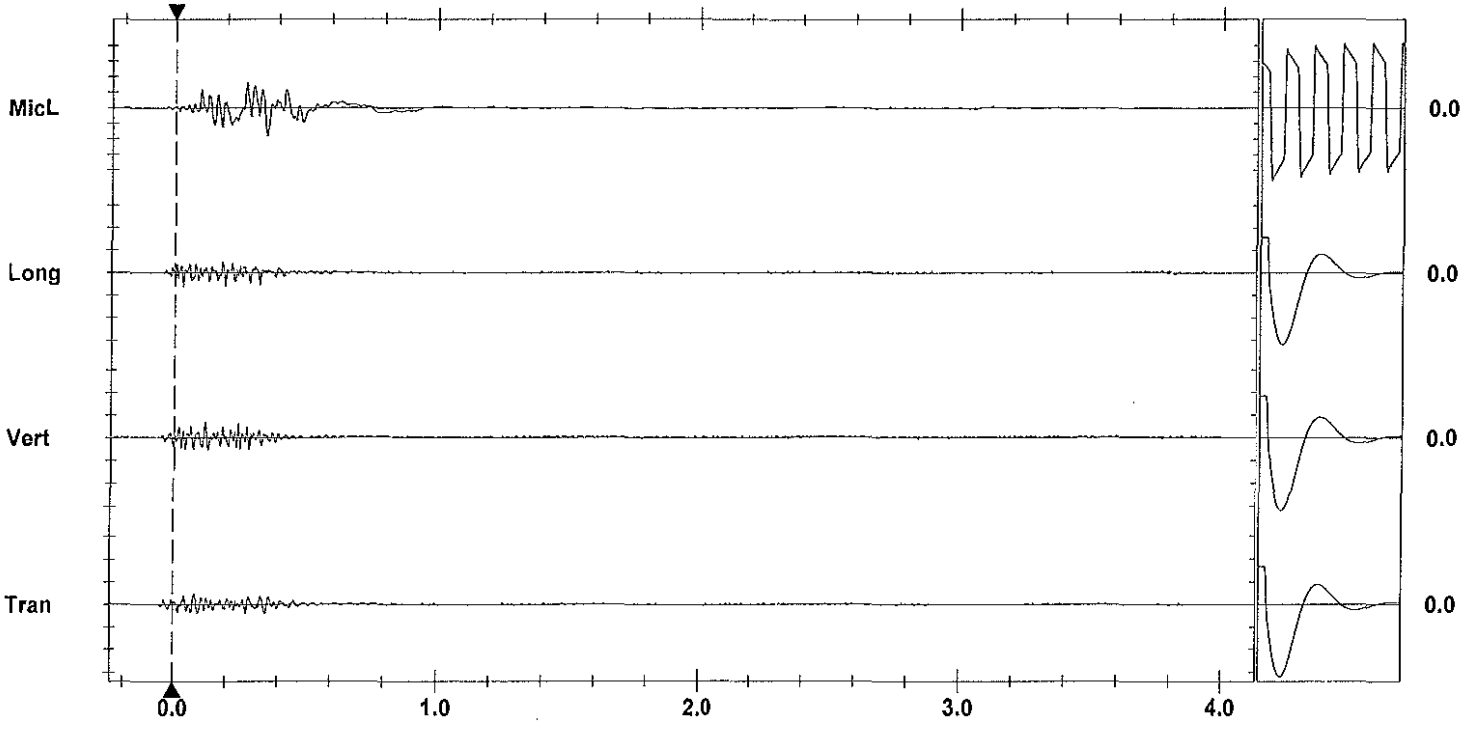
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.353 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 481 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0700	0.0650	in/s
ZC Freq	34	39	64	Hz
Time (Rel. to Trig)	0.082	0.121	0.033	sec
Peak Acceleration	0.0398	0.0663	0.0530	g
Peak Displacement	0.00023	0.00025	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.7	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.0770 in/s at 0.121 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶——————◀

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Instantel

Event Report

Date/Time	Vert at 14:18:16 June 27, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECFU.EG0
Job Number:	1		

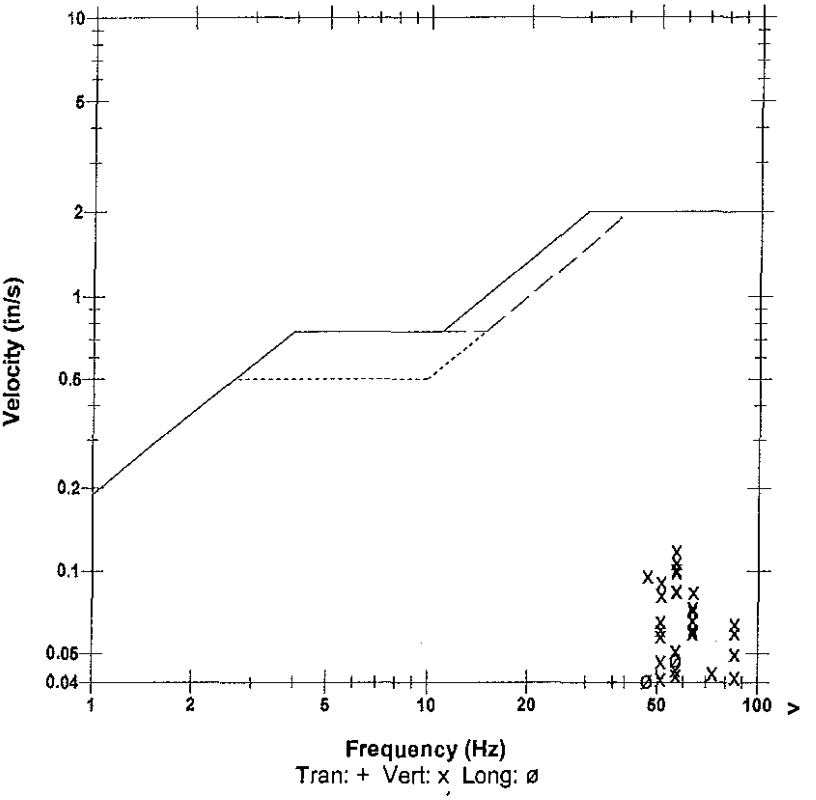
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

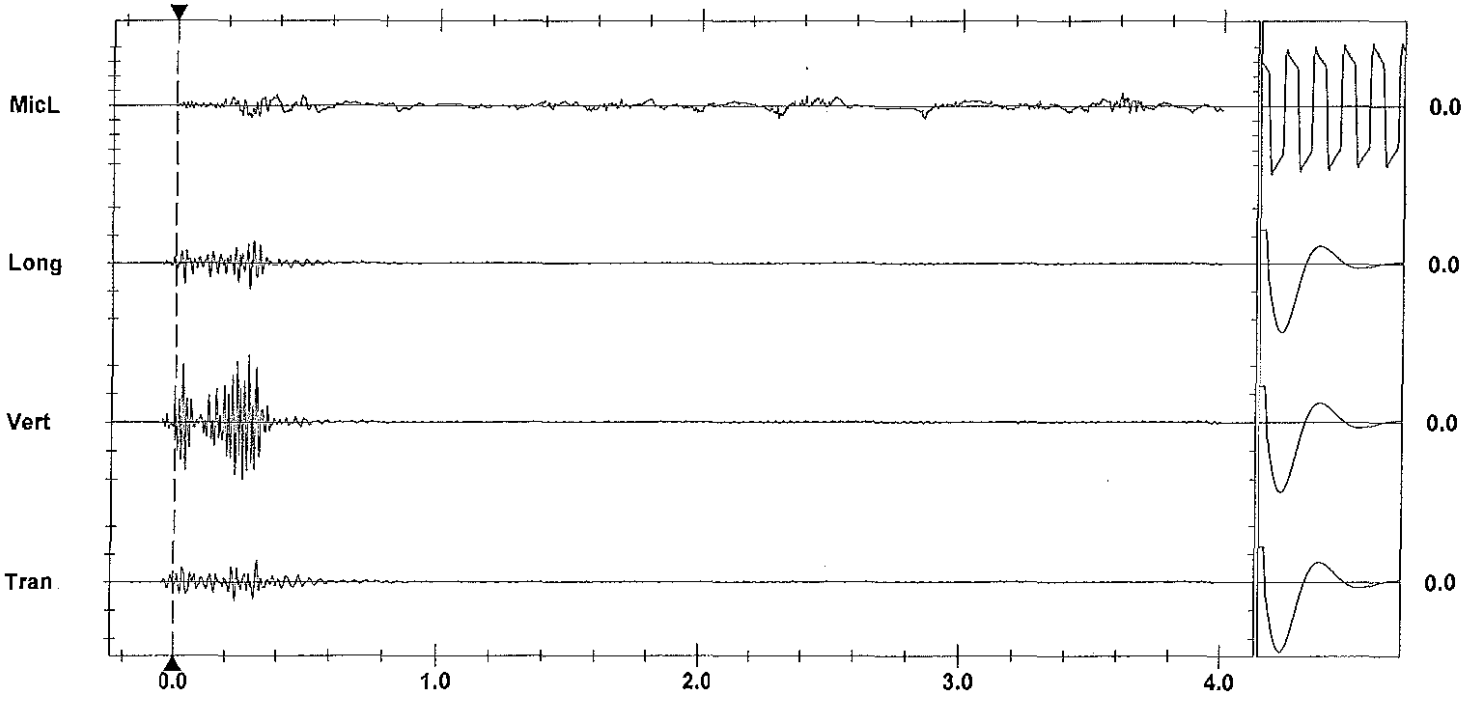
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00091 psi(L) at 2.858 sec
ZC Freq	2.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 558 mv)

	Tran	Vert	Long	
PPV	0.0394	0.119	0.0475	in/s
ZC Freq	37	57	57	Hz
Time (Rel. to Trig)	0.327	0.291	0.291	sec
Peak Acceleration	0.0298	0.0978	0.0497	g
Peak Displacement	0.00016	0.00033	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.128 in/s at 0.291 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 15, 2013 01:04:04 PM
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED June 28/12
ACTUAL BLAST DATE June 28/12 11:58 am
BLAST # MW-0276

HIGHWAY# 97
BLAST LOCATION AT: STN 128+94 - 129+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 7.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 5BL / 3 Buffer / 3 SM8 / 6 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

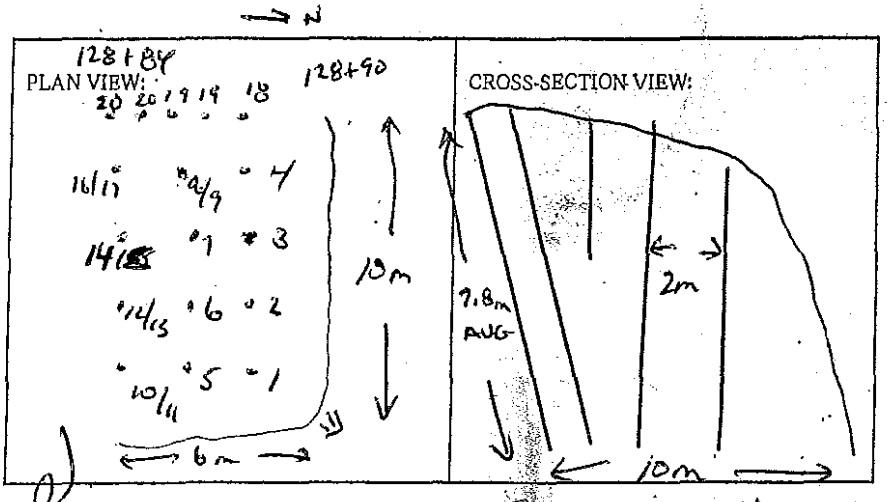
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HT3320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13050 OLD Mission Rd - 0.15 ips / 32Hz
Seismograph 13167 Cliffstone Crt - 0.085 ips / 32Hz
Seismograph 13093 Cliffstone Crt - 0.55 ips / 47Hz

Page 1037
TRA-2013-00119

BOTTOM DECK – 3'-6 AND 6

TOP DECK – 2'-4' AND 6

BUFFER HOLES – 2 DECKS – 3-4 CART 2X16 BLASTEX / DRILL

SCRAP HOLES – 1-2' AND 6

ALL PRIMED W/ 0.5 CART 1½" x 16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:58:58 June 28, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECHI.MA0

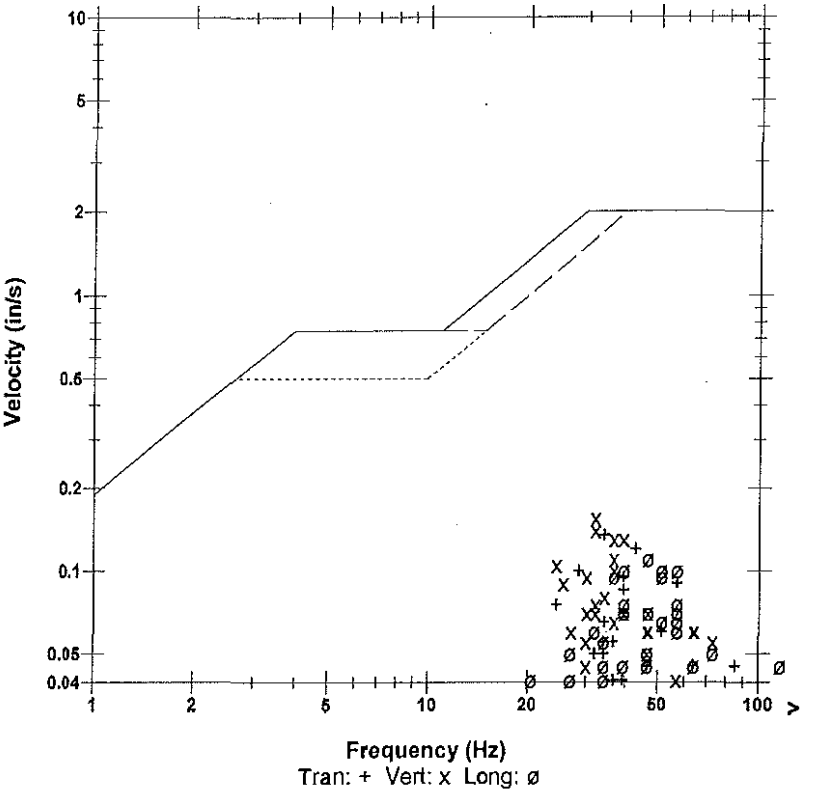
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

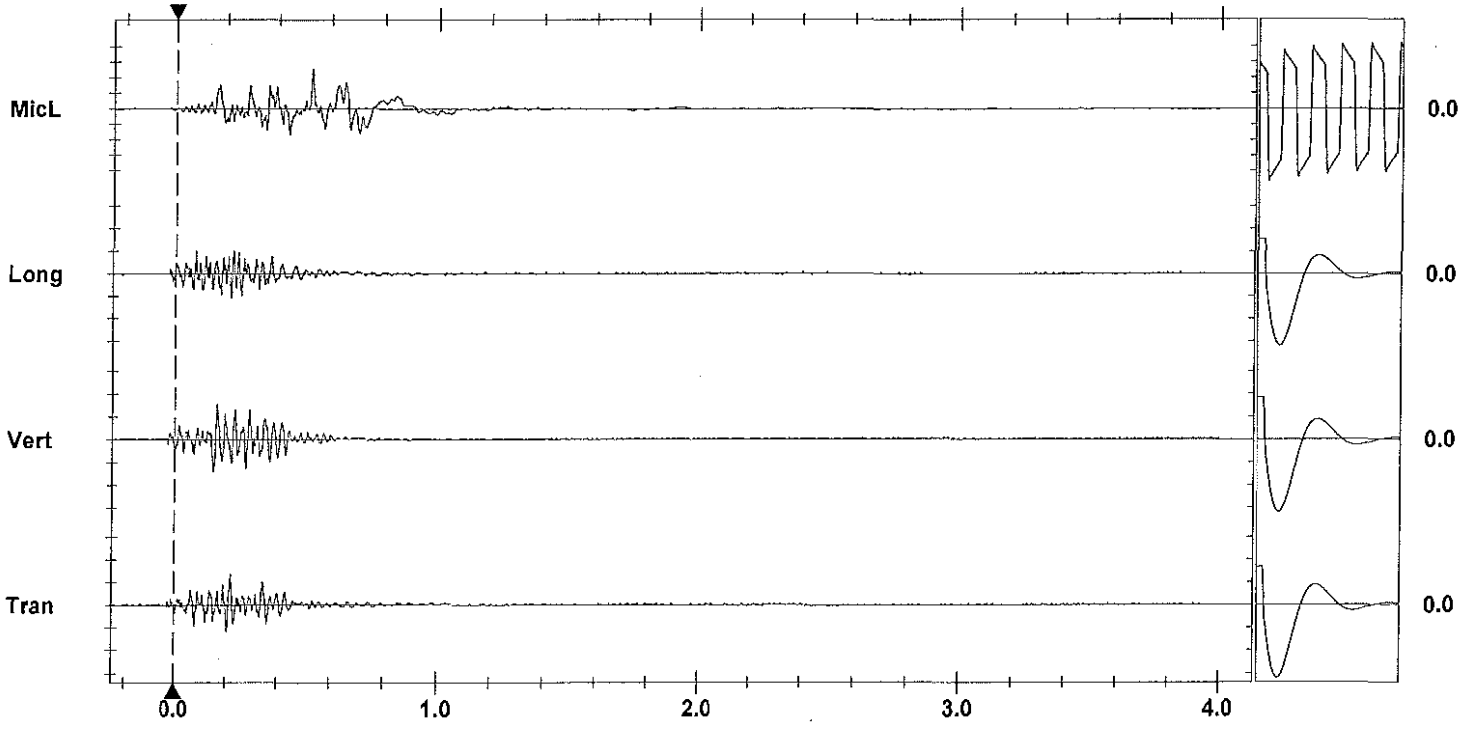
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00247 psi(L) at 0.525 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 581 mv)

	Tran	Vert	Long	
PPV	0.135	0.155	0.110	in/s
ZC Freq	34	32	47	Hz
Time (Rel. to Trig)	0.222	0.167	0.220	sec
Peak Acceleration	0.0928	0.106	0.119	g
Peak Displacement	0.00058	0.00069	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.7	7.4	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.180 in/s at 0.221 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶——————◀

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Instantel

Event Report

Date/Time	Vert at 11:58:45 June 28, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECHI.LX0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

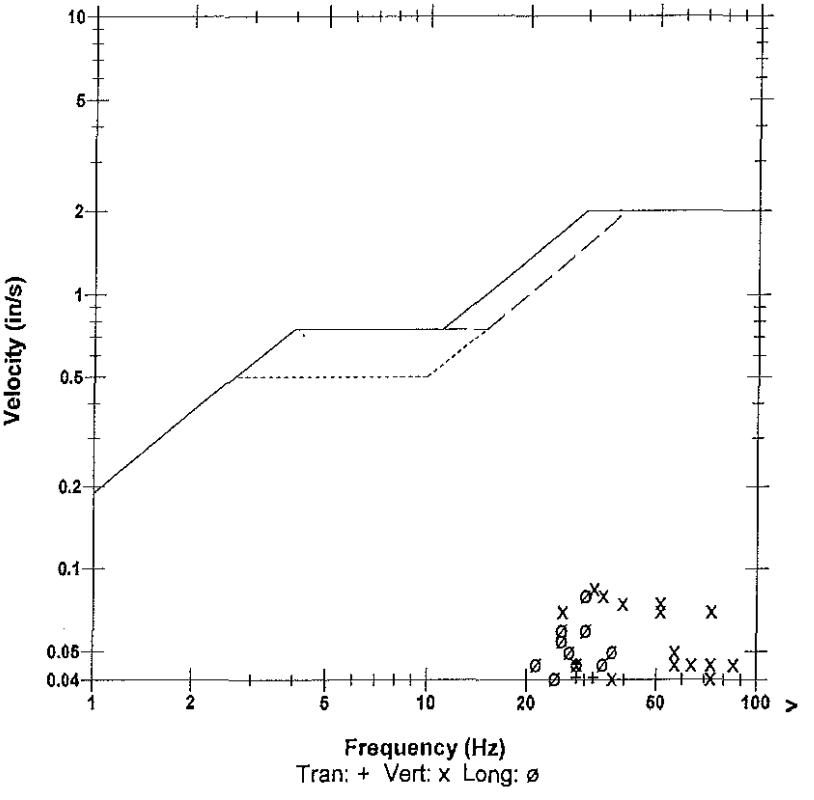
Extended Notes

Post Event Notes

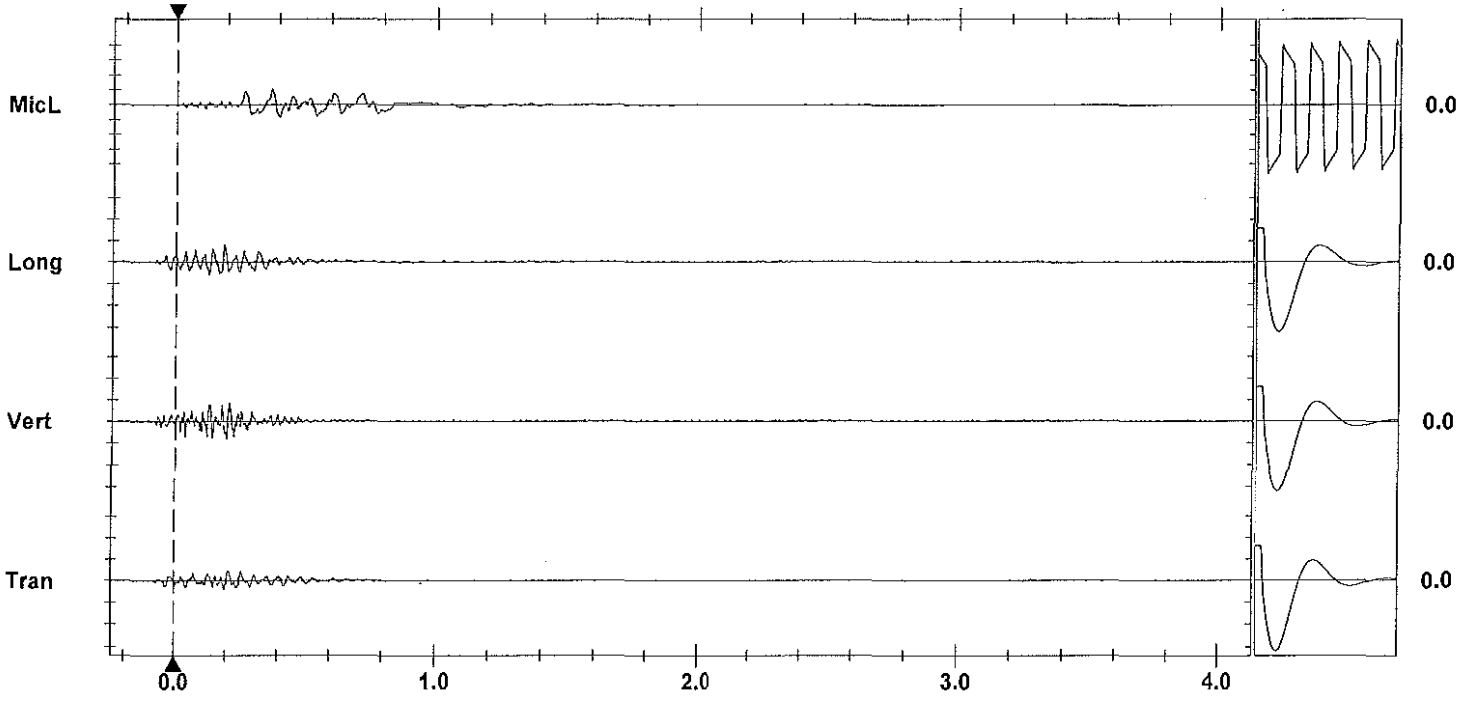
Microphone Linear Weighting
PSPL 0.00102 psi(L) at 0.370 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 490 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0850	0.0800	in/s
ZC Freq	28	32	30	Hz
Time (Rel. to Trig)	0.211	0.213	0.189	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00028	0.00040	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.101 in/s at 0.213 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2013 (V 9.01 - 9.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel®

Event Report

Date/Time	Long at 11:59:11 June 28, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECHI.MN0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

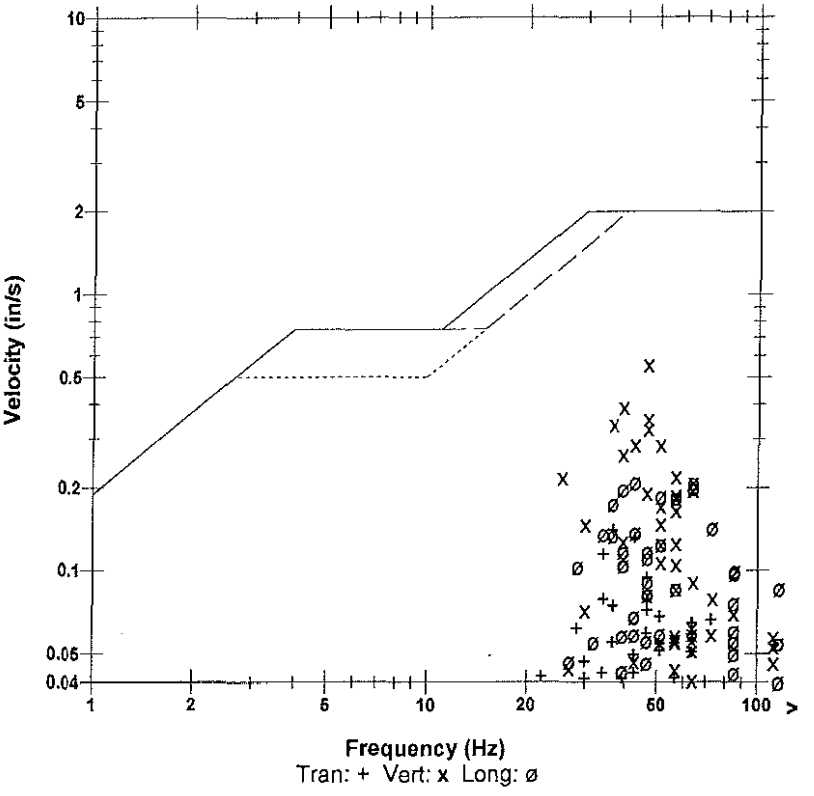
Post Event Notes

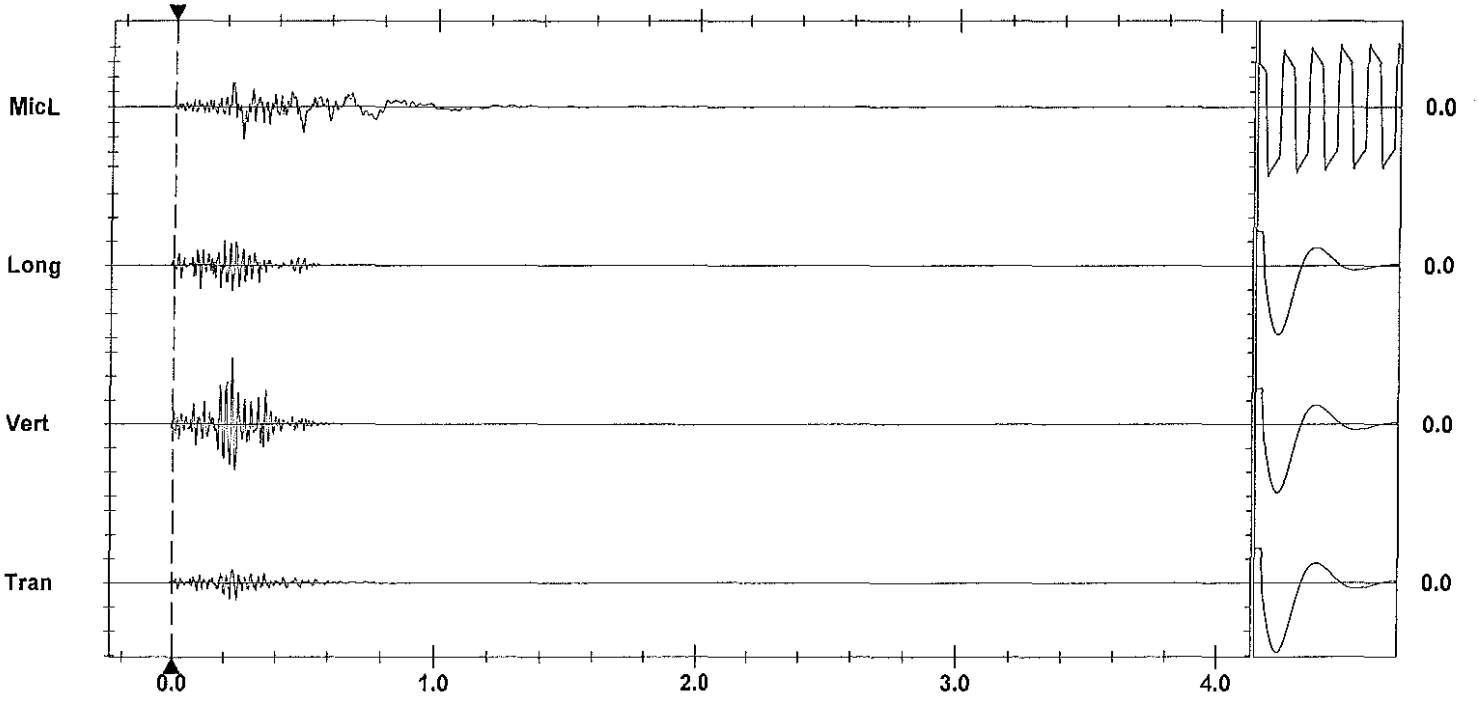
Microphone Linear Weighting
PSPL 0.00214 psi(L) at 0.266 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 560 mv)

	Tran	Vert	Long	
PPV	0.141	0.555	0.209	in/s
ZC Freq	37	47	43	Hz
Time (Rel. to Trig)	0.251	0.232	0.229	sec
Peak Acceleration	0.134	0.469	0.245	g
Peak Displacement	0.00059	0.00183	0.00086	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.567 in/s at 0.232 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 16, 2012 (V 8.04 - 8.04)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 03/12
ACTUAL BLAST DATE July 03/12
BLAST # 385 @ 11:22

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+15 - 128+25 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 152 (m)

TOTAL NUMBER OF HOLES 13 BL/4 Buffer/2 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite & Anfo.
TOTAL NUMBER OF CARTRIDGES 19
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 ms (ms)

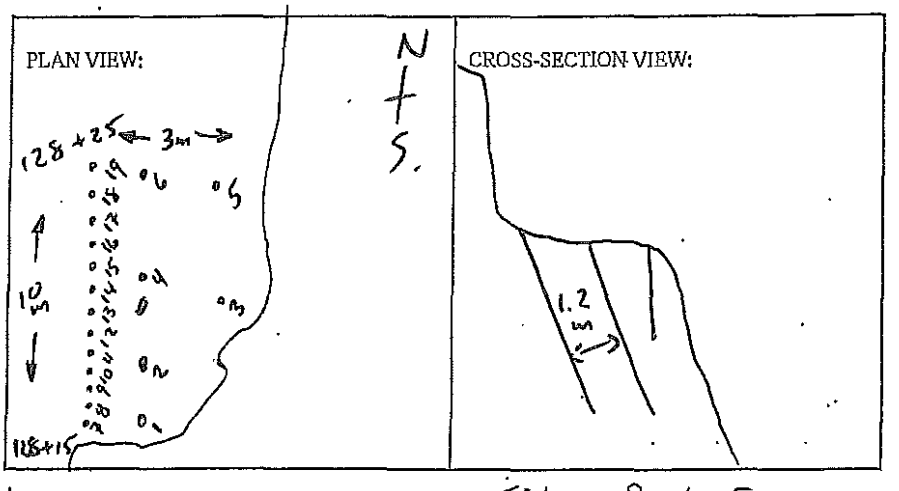
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] System
BLASTING MACHINE: TYPE HB320 CAPACITY 80

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enrs.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

~~HE 4.5~~

17 - 4.5m Electel.

2 - 12m Electel.

3 - Bags Anfo

13 sticks 2"x16" unwrapped

3 sticks 1½"x16" unwrapped

B/L - primed 2"x16" + cord 4' collar

Buffer - 1.5m Anfo + stemming

Instantel

Event Report

Date/Time	Vert at 11:22:30 July 3, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECQQ.9I0

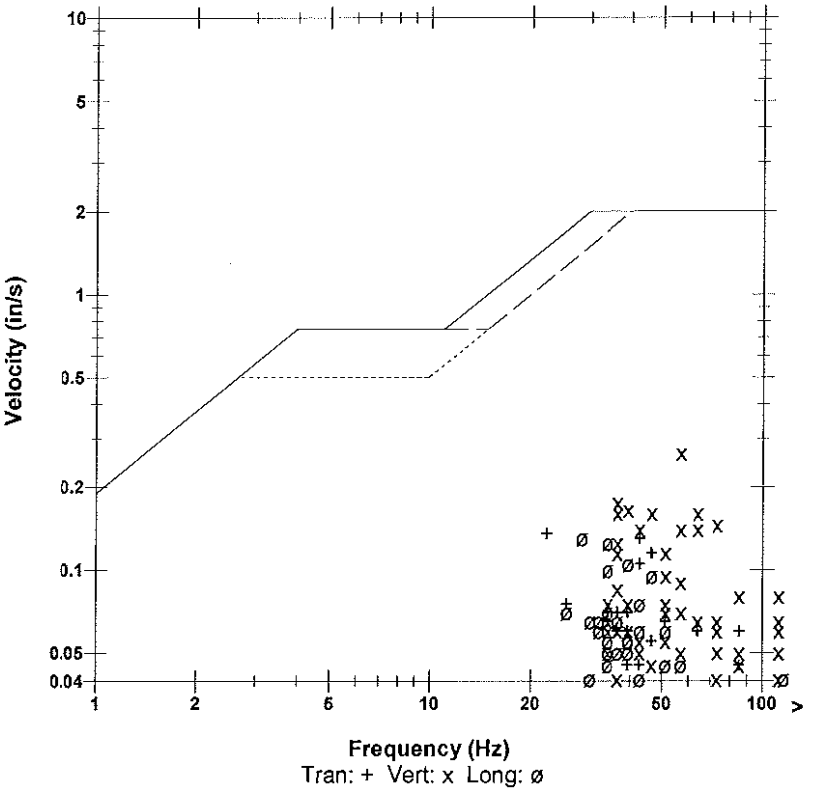
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

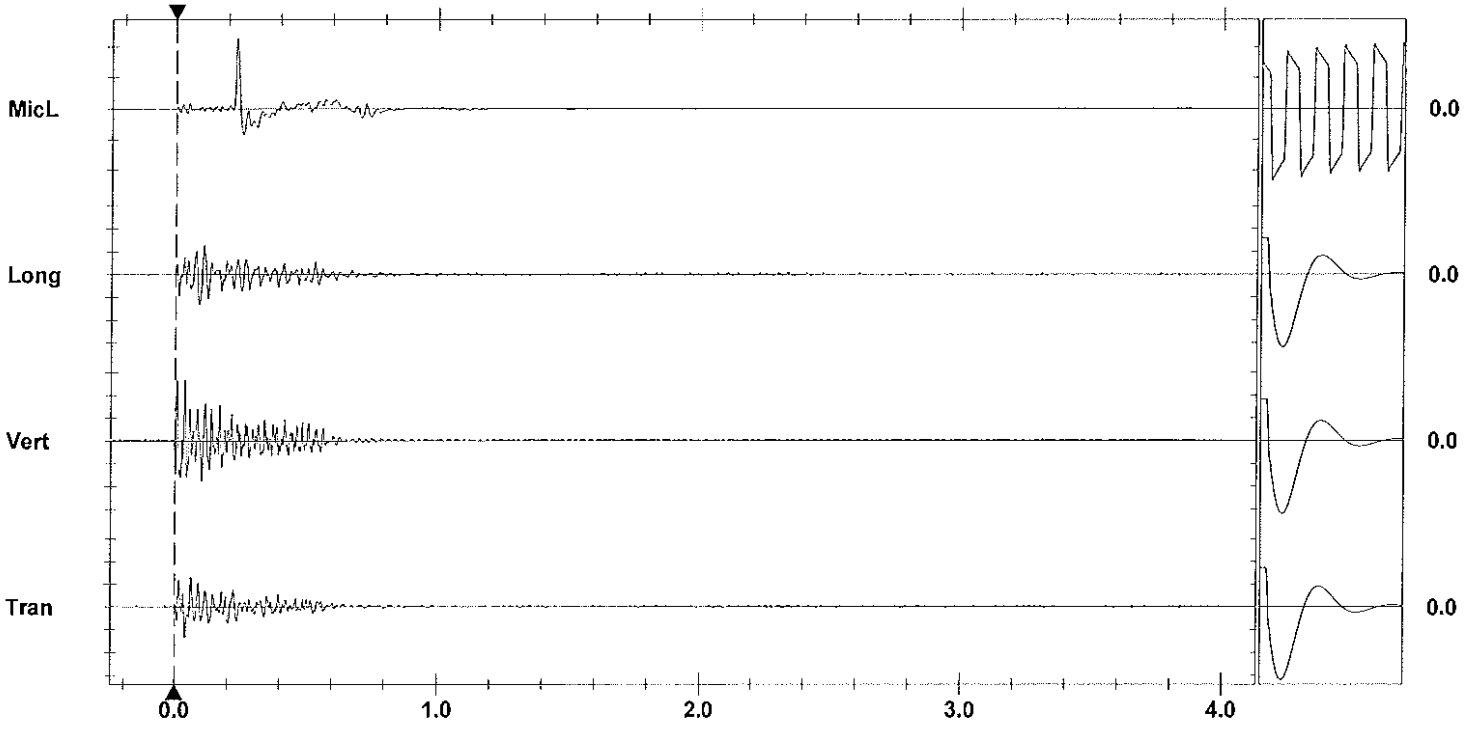
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.135	0.265	0.130	in/s
ZC Freq	22	57	28	Hz
Time (Rel. to Trig)	0.040	0.009	0.091	sec
Peak Acceleration	0.106	0.292	0.0795	g
Peak Displacement	0.00067	0.00080	0.00073	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.5	3.7	3.9	

Microphone Linear Weighting
PSPL 0.0113 psi(L) at 0.233 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 562 mv)

Peak Vector Sum 0.293 in/s at 0.039 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00500 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

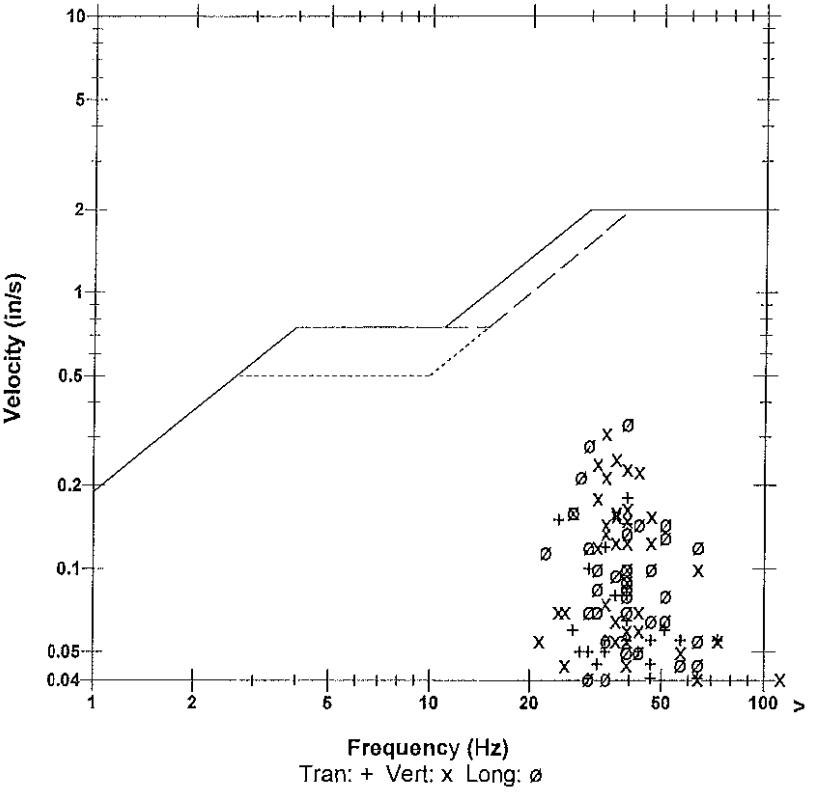
Date/Time	Vert at 11:21:58 July 3, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECQQ.8M0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

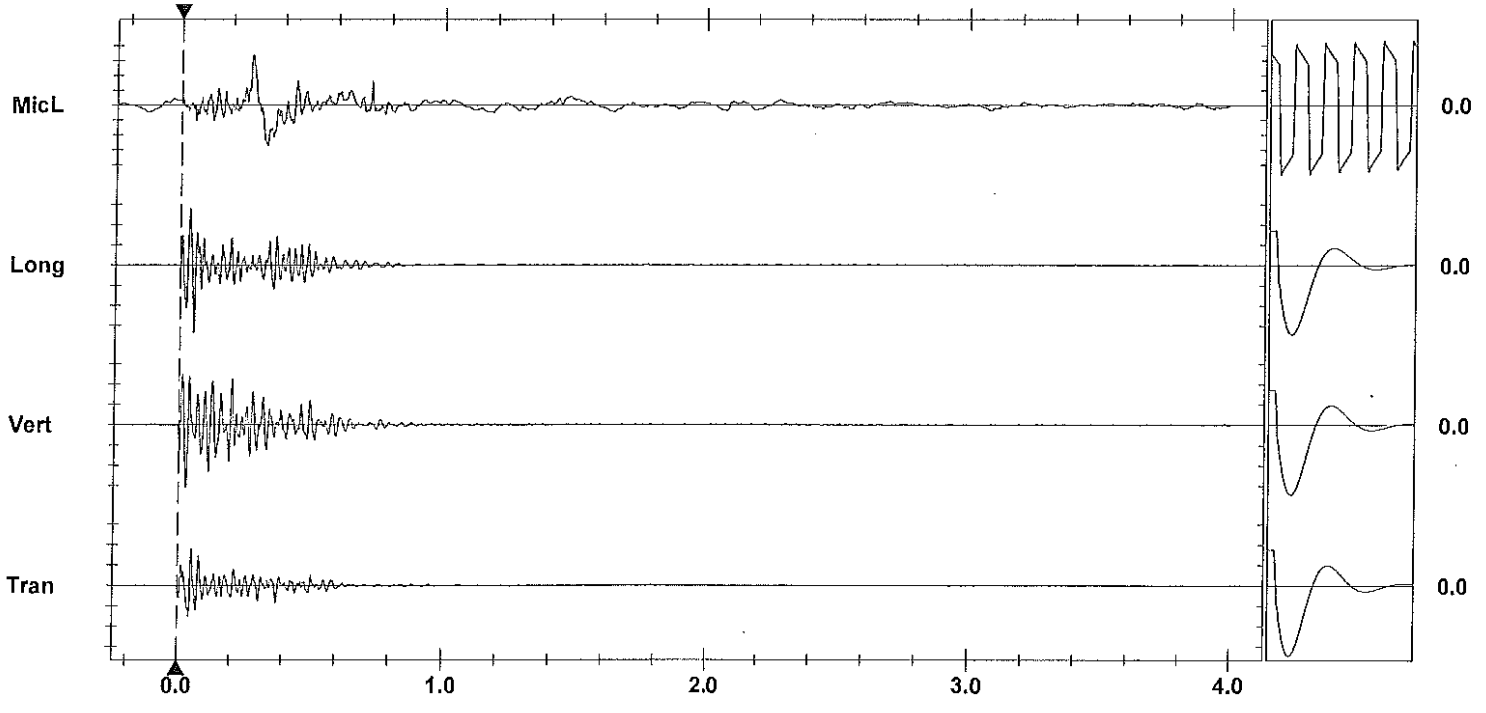
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00341 psi(L) at 0.273 sec
ZC Freq	6.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 581 mv)

	Tran	Vert	Long	
PPV	0.180	0.310	0.335	in/s
ZC Freq	39	34	39	Hz
Time (Rel. to Trig)	0.053	0.029	0.054	sec
Peak Acceleration	0.146	0.225	0.212	g
Peak Displacement	0.00083	0.00148	0.00131	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.381 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:22:40 July 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECQQ.9S0
Job Number:	1		

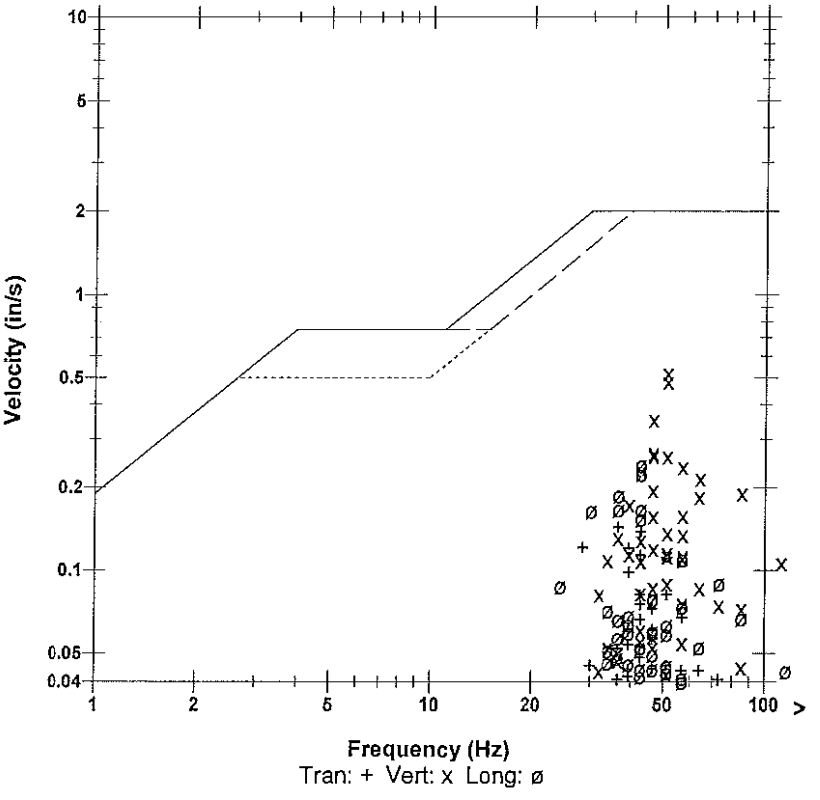
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

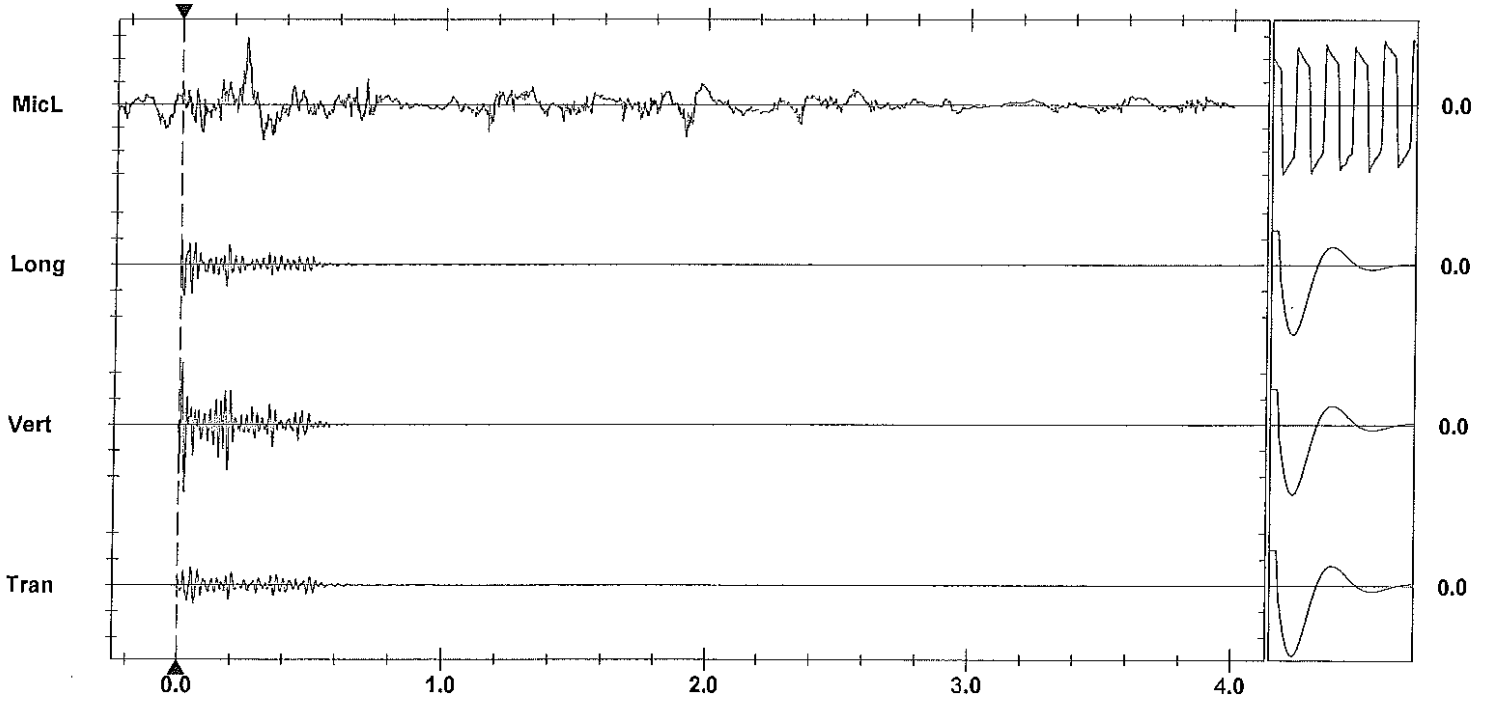


Frequency (Hz)
Tran: + Vert: x Long: ø

Microphone	Linear Weighting			
PSPL	0.00584 psi(L) at 0.249 sec			
ZC Freq	6.3 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 560 mv)			

	Tran	Vert	Long	
PPV	0.143	0.520	0.241	in/s
ZC Freq	37	51	43	Hz
Time (Rel. to Trig)	0.062	0.022	0.014	sec
Peak Acceleration	0.139	0.383	0.303	g
Peak Displacement	0.00058	0.00162	0.00095	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.538 in/s at 0.022 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00200 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 3/12
ACTUAL BLAST DATE July 3/12
BLAST # 386 @13:42

HIGHWAY# 97
BLAST LOCATION AT: STN #128+25 - 128+30 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 B/L / 2 Buffer / 1 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite & ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

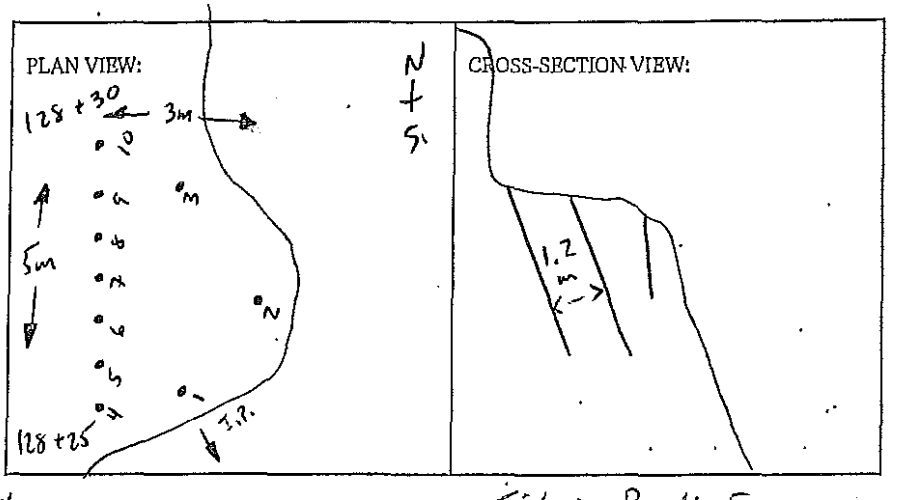
INITIATION DEVICE: (CIRCLE) DET. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] System
BLASTING MACHINE: TYPE MB-320 CAPACITY 80

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enrg.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

8 - 4.5m Elec dets

2 - 12m Elec dets.

7 sticks 2"x16" unimax

1 bag Anfo.

3 sticks 1½x16" unimax

5 sticks 2"x16" blastex

3m - TOE load Anfo in Buffer

Instantel

Event Report

Date/Time	Vert at 13:42:48 July 3, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECQW.RC0

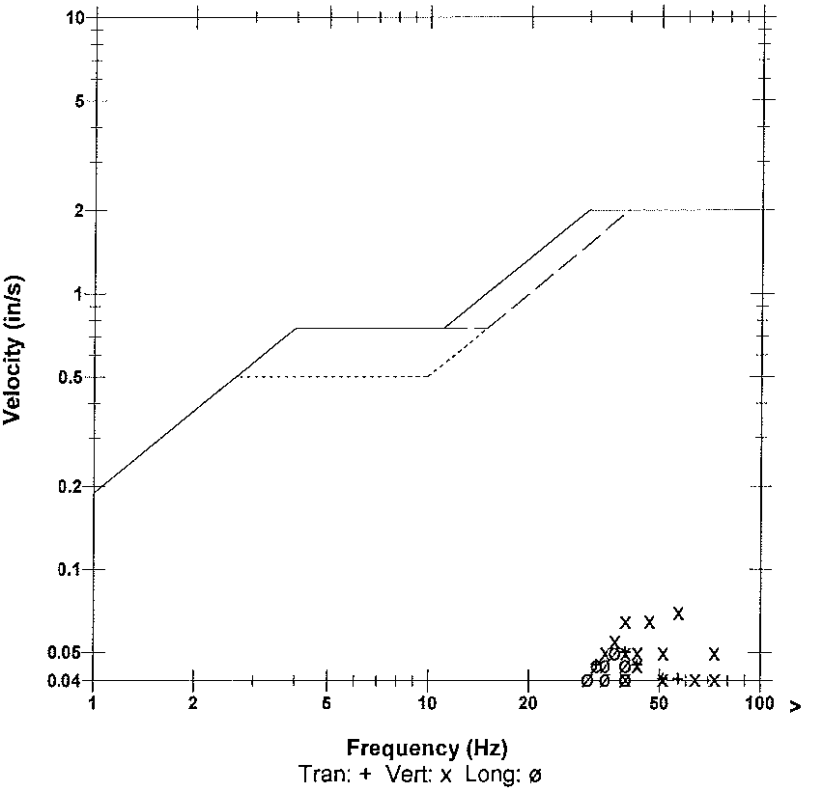
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

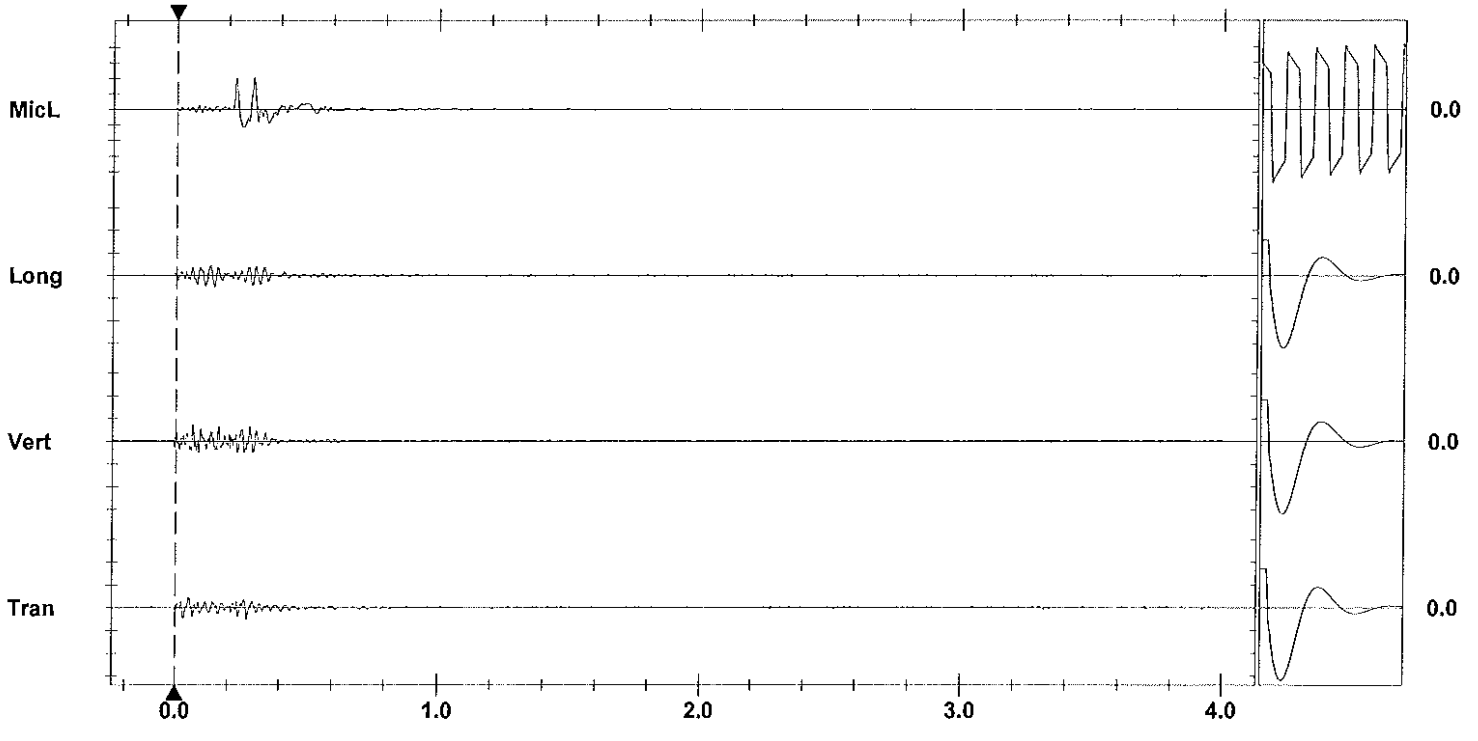
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00203 psi(L) at 0.297 sec			
ZC Freq	21 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 550 mv)			

	Tran	Vert	Long	
PPV	0.0500	0.0700	0.0500	in/s
ZC Freq	39	57	37	Hz
Time (Rel. to Trig)	0.275	0.065	0.146	sec
Peak Acceleration	0.0530	0.0928	0.0398	g
Peak Displacement	0.00022	0.00027	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.0831 in/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

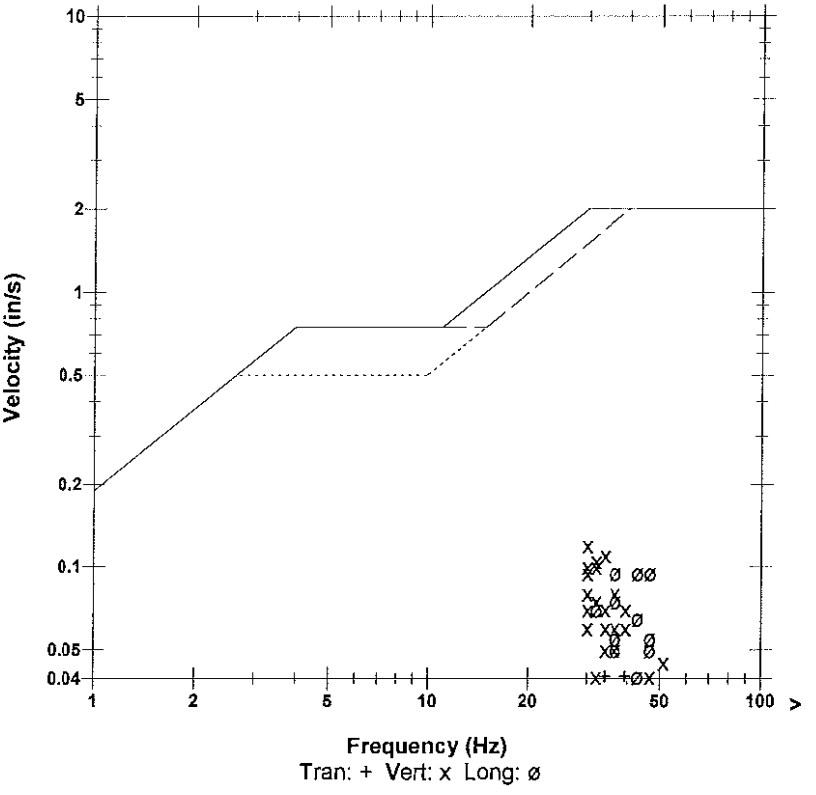
Date/Time	Vert at 13:42:16 July 3, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECQW.QG0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

Extended Notes

Post Event Notes

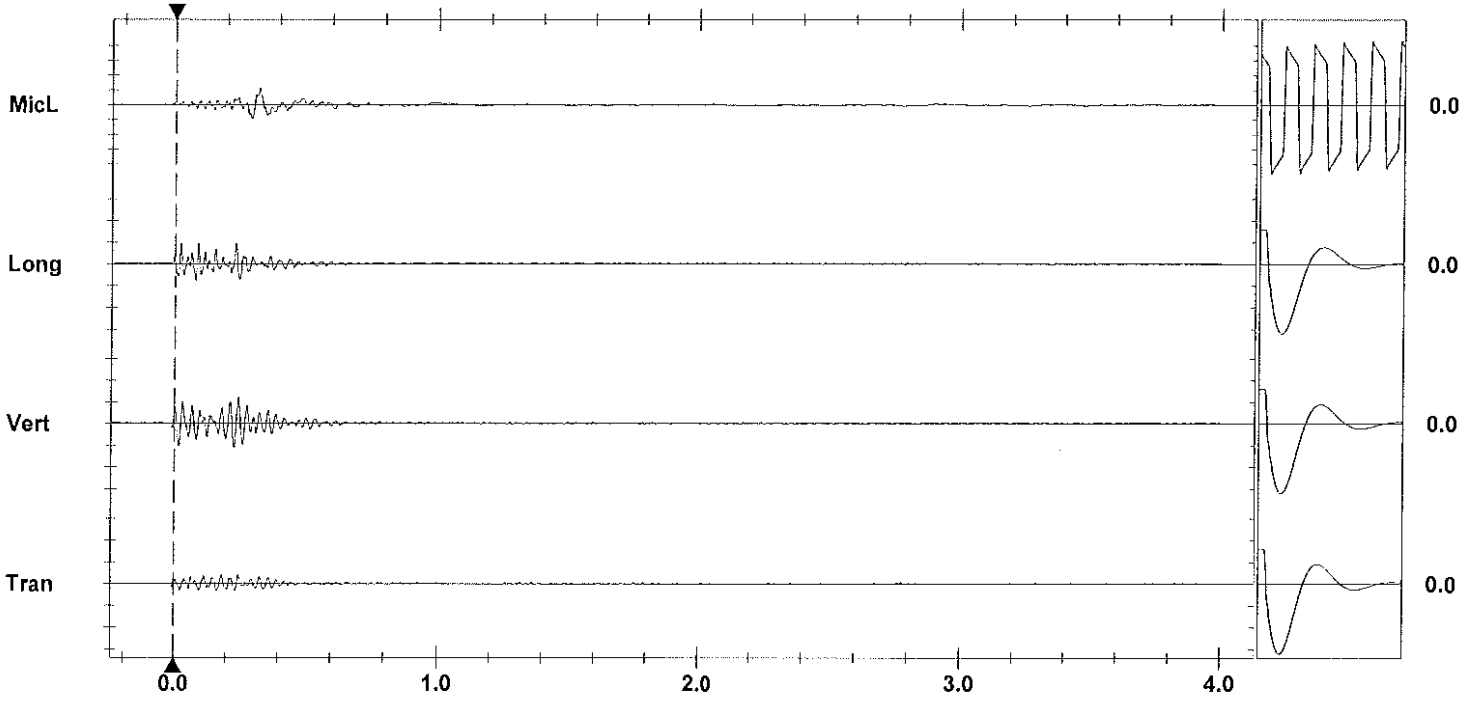
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00112 psi(L) at 0.322 sec			
ZC Freq	16 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 581 mv)			

	Tran	Vert	Long	
PPV	0.0400	0.120	0.0950	in/s
ZC Freq	34	30	43	Hz
Time (Rel. to Trig)	0.185	0.246	0.022	sec
Peak Acceleration	0.0398	0.0795	0.0795	g
Peak Displacement	0.00018	0.00060	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.141 in/s at 0.247 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 13:42:58 July 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECQW.RM0
Job Number:	1		

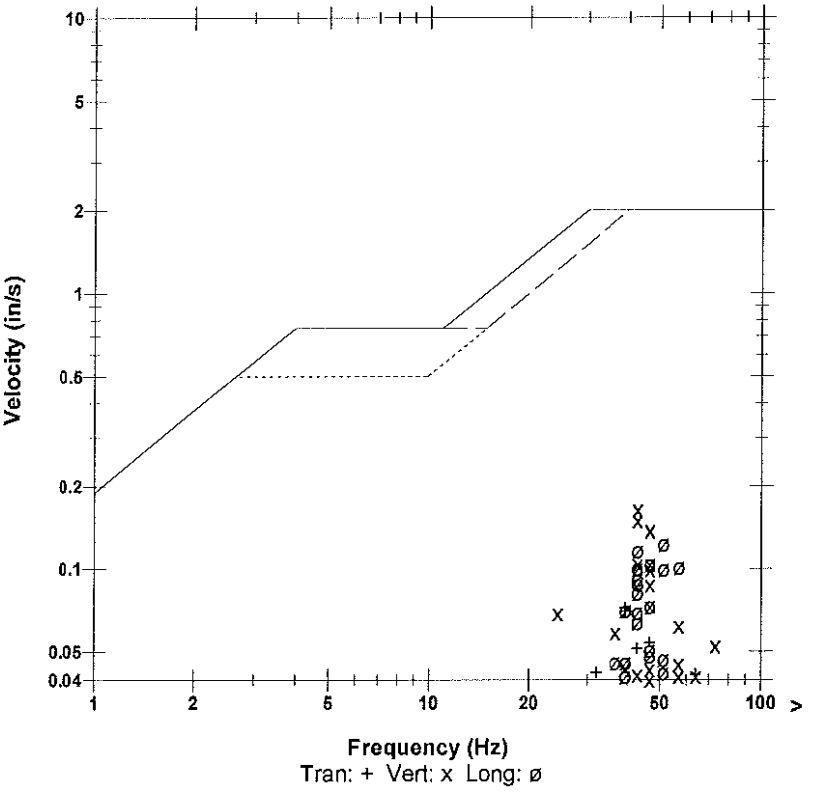
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

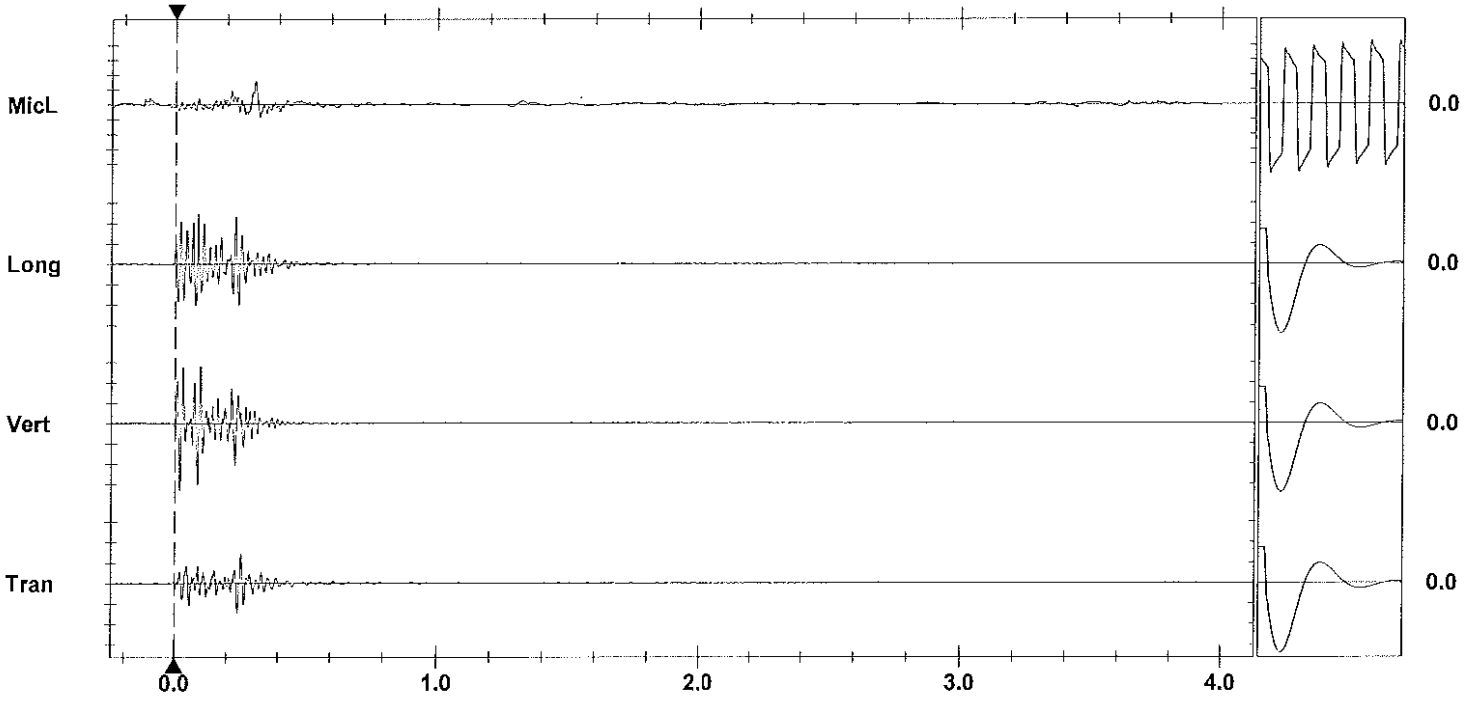
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00156 psi(L) at 0.308 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0719	0.164	0.123	in/s
ZC Freq	39	43	51	Hz
Time (Rel. to Trig)	0.243	0.020	0.089	sec
Peak Acceleration	0.0580	0.124	0.104	g
Peak Displacement	0.00027	0.00053	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.195 in/s at 0.089 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 3/12
ACTUAL BLAST DATE July 3/12
BLAST # 387 @14:42

HIGHWAY # 97
BLAST LOCATION AT: STN #128+30 - 128+35 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 7 B/L / 2 Buffer.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite & Anfo
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

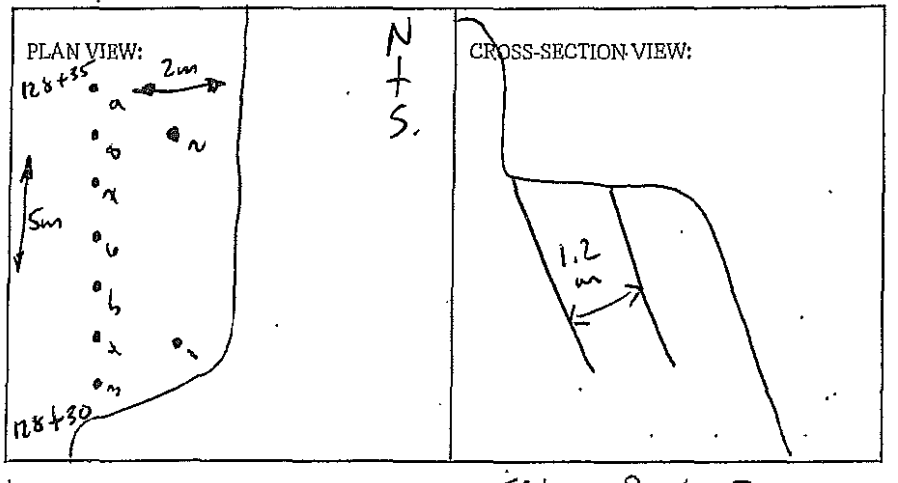
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY): [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enrg.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

7 - 4.5m Elec dets

2 - 12m Elec dets.

3/4 bag Anfo

1/4 bag WR.

7 sticks 2" x 16" unimity

5 sticks 2" x 16" blastex

1 stick 1½" x 16" blastex

3.5m Tue LOAD IN Buffer

Instantel

Event Report

Date/Time	Vert at 14:41:56 July 3, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECQZ.HW0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:Wayne V
General:

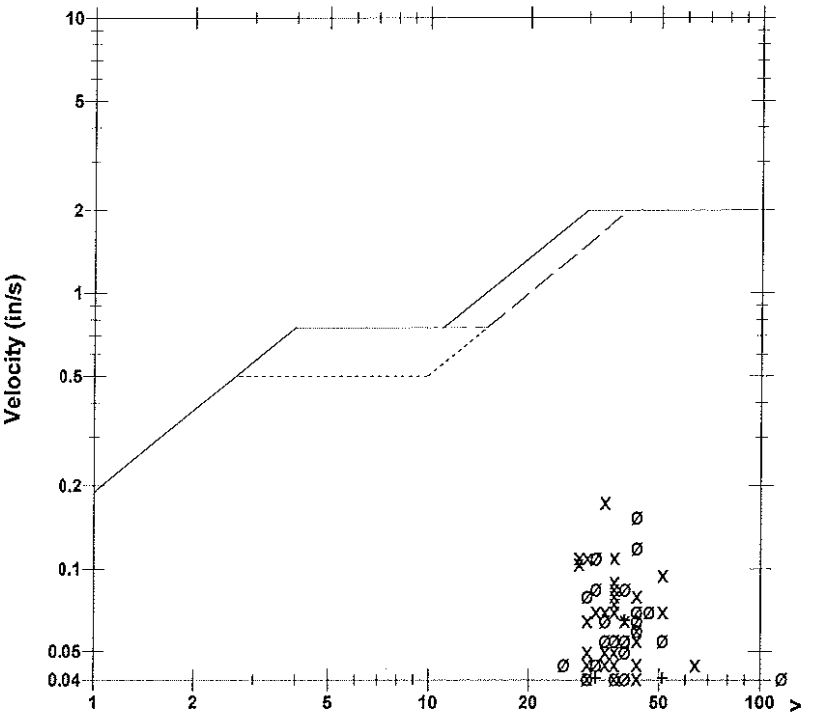
Extended Notes

Post Event Notes

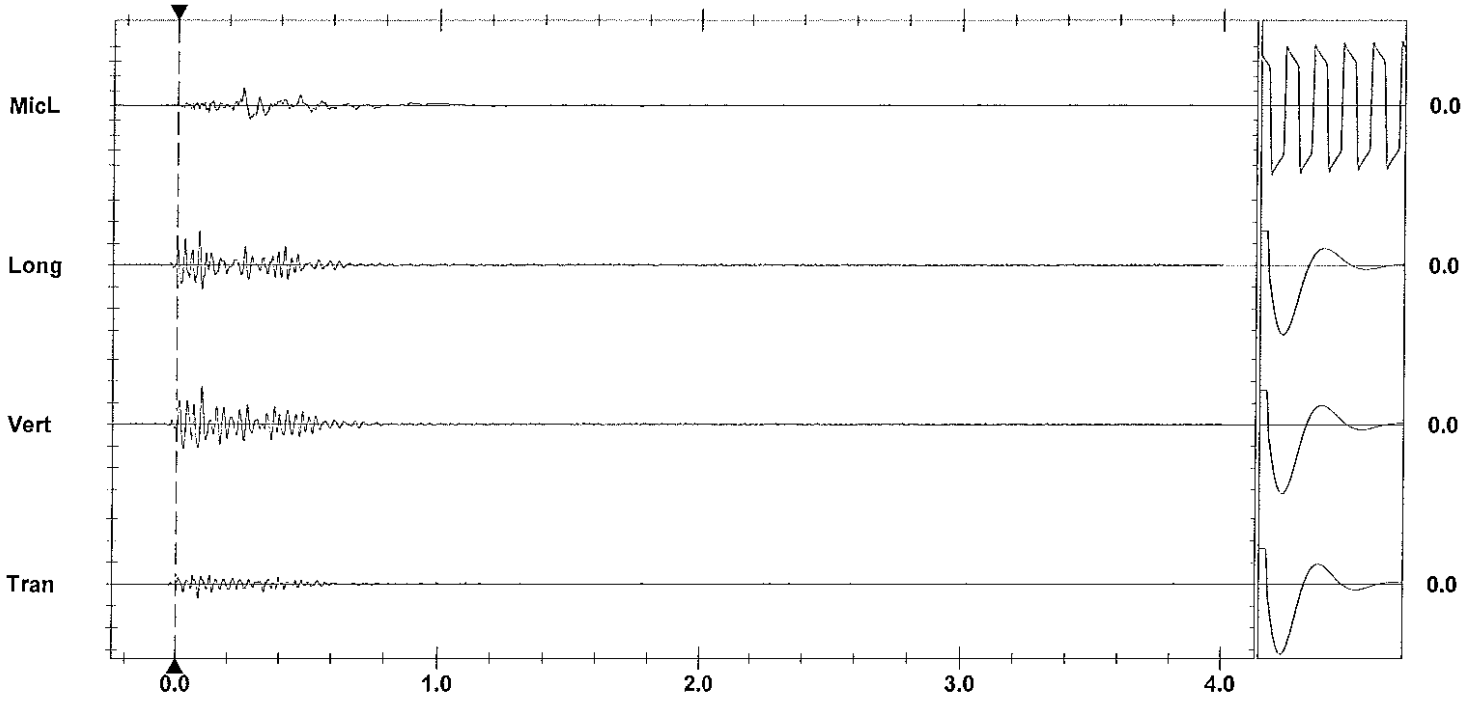
Microphone Linear Weighting
PSPL 0.00120 psi(L) at 0.255 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 552 mv)

	Tran	Vert	Long	
PPV	0.0650	0.175	0.155	in/s
ZC Freq	39	34	43	Hz
Time (Rel. to Trig)	0.088	0.099	0.087	sec
Peak Acceleration	0.0398	0.106	0.119	g
Peak Displacement	0.00023	0.00077	0.00057	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.207 in/s at 0.099 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:42:28 July 3, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECQZ.IS0

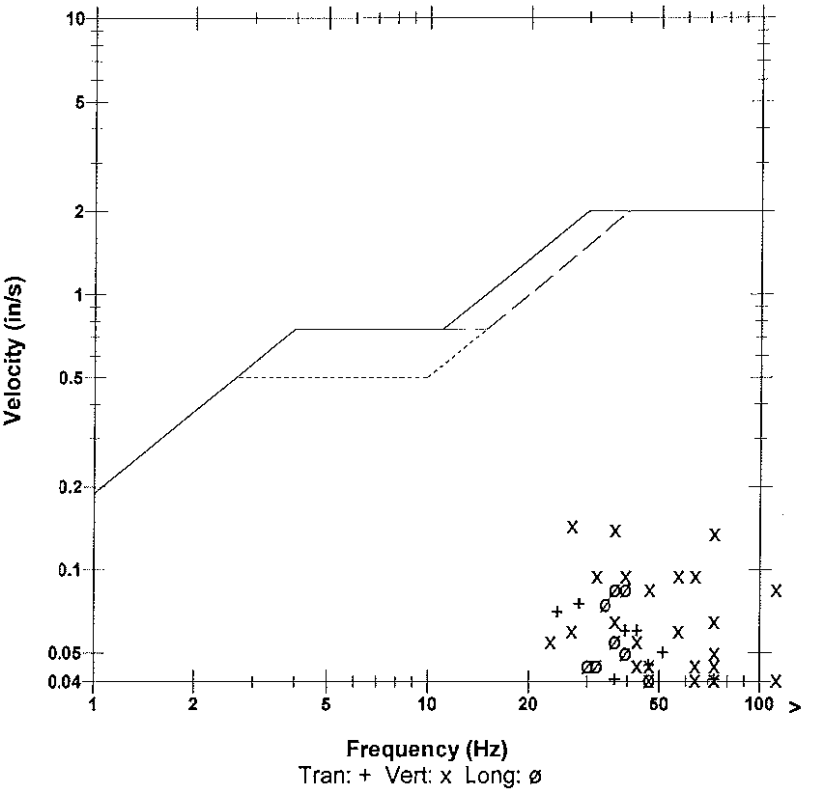
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:

Extended Notes

Post Event Notes

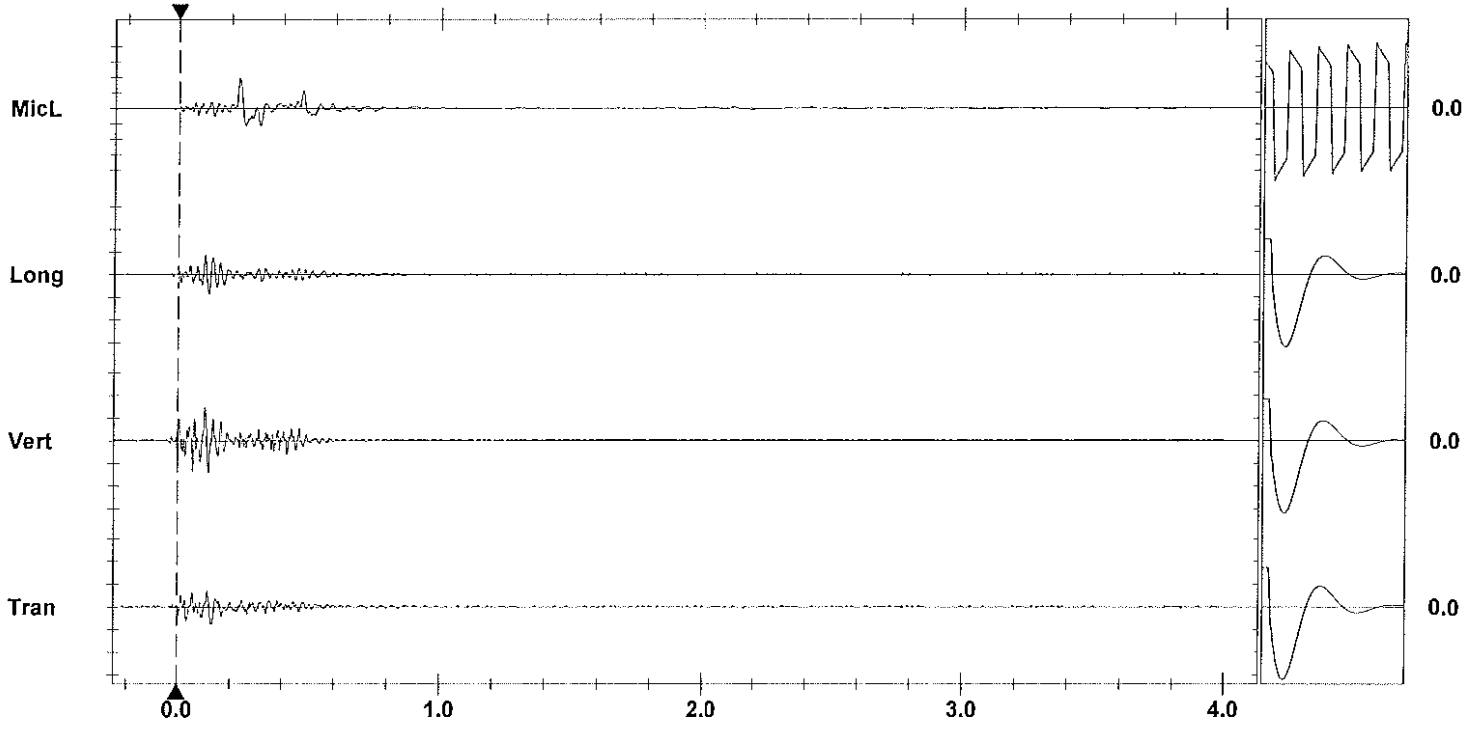
USBM RI8507 And OSMRE



	Tran	**Vert**	**Long**	
PPV	0.0750	0.145	0.0850	in/s
ZC Freq	28	27	39	Hz
Time (Rel. to Trig)	0.129	0.104	0.103	sec
Peak Acceleration	0.0663	0.159	0.0530	g
Peak Displacement	0.00045	0.00069	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.5	Hz
Overswing Ratio	3.5	3.7	4.0	

Microphone Linear Weighting
PSPL 0.00192 psi(L) at 0.230 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 563 mv)

Peak Vector Sum 0.173 in/s at 0.117 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:42:38 July 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECQZ.J20
Job Number:	1		

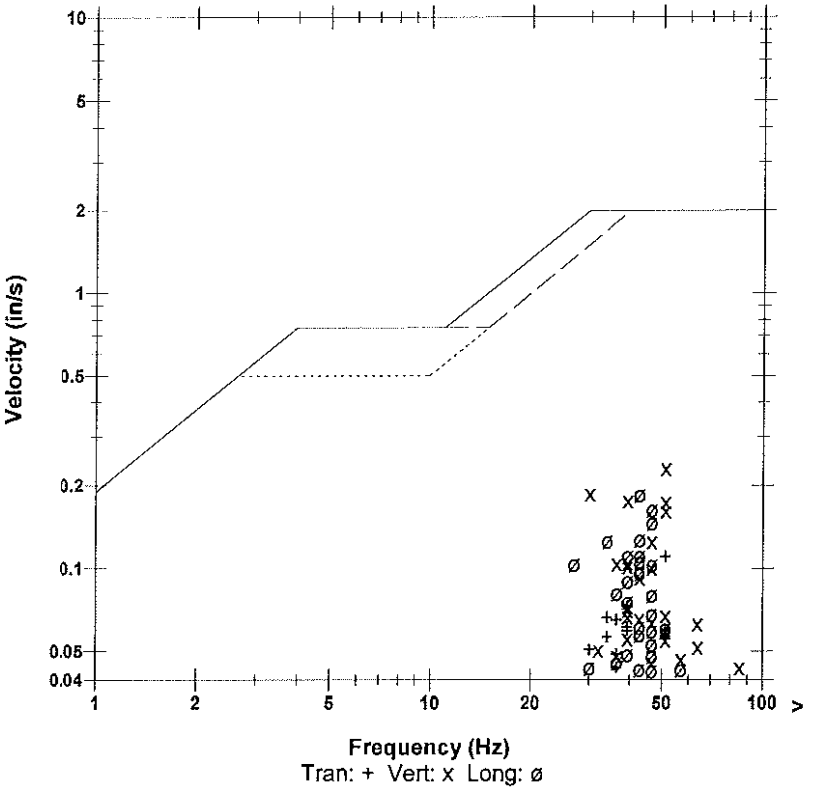
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:W Verwey
General:

Extended Notes

Post Event Notes

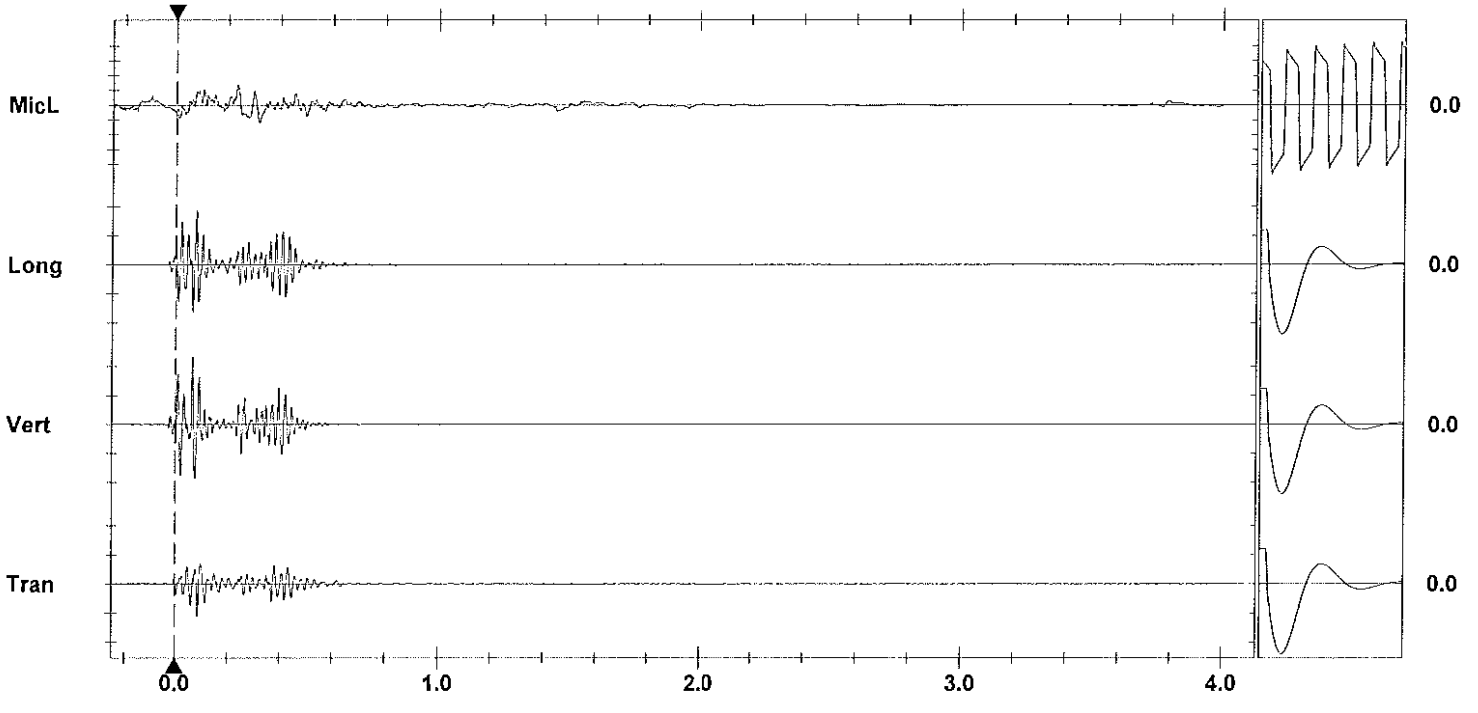
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.111	0.231	0.186	in/s
ZC Freq	51	51	43	Hz
Time (Rel. to Trig)	0.088	0.065	0.080	sec
Peak Acceleration	0.136	0.227	0.207	g
Peak Displacement	0.00033	0.00083	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.233 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 605 mv)

Peak Vector Sum 0.280 in/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: July 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1986-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 4/12
ACTUAL BLAST DATE July 4/12
BLAST # 388 @ 09:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 133+480 ~ 134+30 LS (High spots)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 0 (°) SLOPE LENGTH _____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 1.5 (m)
NUMBER OF ROWS —
MAXIMUM DEPTH 2.0 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 43
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 43
TOTAL NUMBER OF DELAYS 43

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

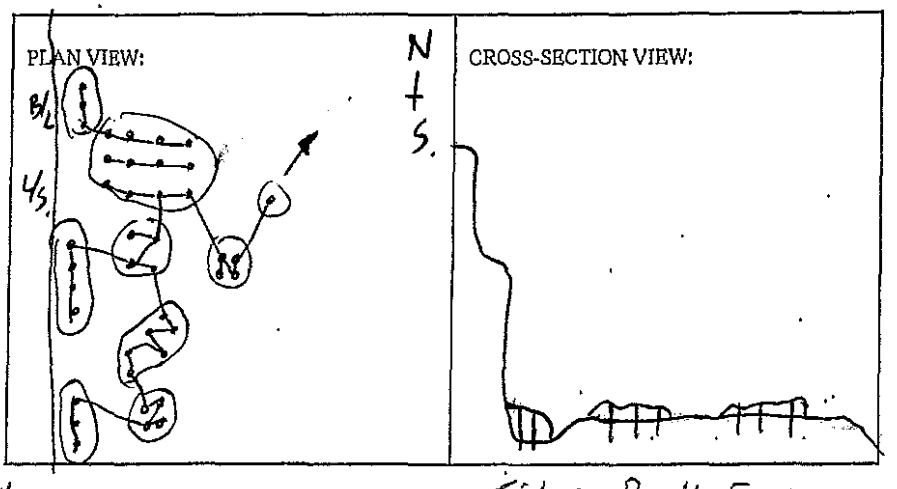
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED Ø (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

43 – 16' Ez dets.

1/2 case 2" x 16" blastex

21 sticks 1 1/2" x 16" unimax

1 bag Anfo

1/2 bag wr.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 4/12
ACTUAL BLAST DATE July 4/12
BLAST # 389 @ 11:30

HIGHWAY # 97
BLAST LOCATION AT: STN # 128 +80 – 128 +85 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 60 (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 91½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

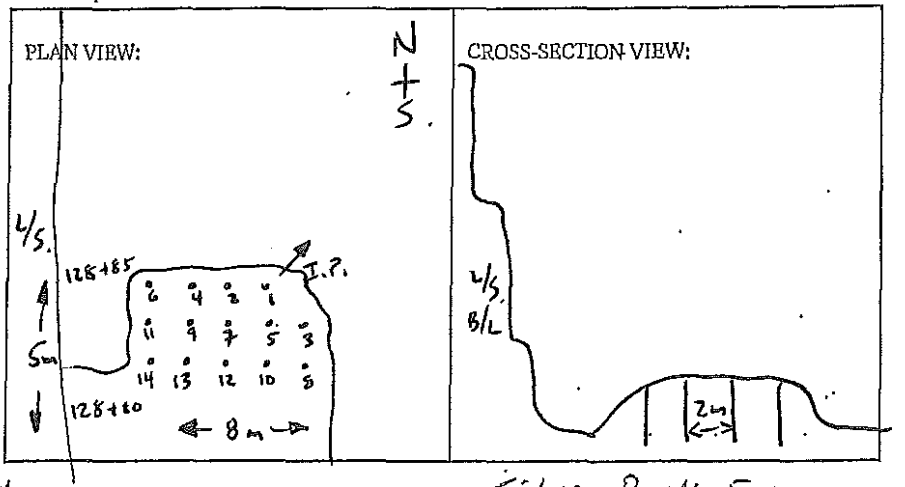
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] Initiation of [redacted] System
BLASTING MACHINE: TYPE MB-320 CAPACITY 80

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

14- 7m Elec det.
3 - Anfo
1 - WR.
7 sticks 1½"x16" unimax

3' Anfo Toe Load

Instantel

Event Report

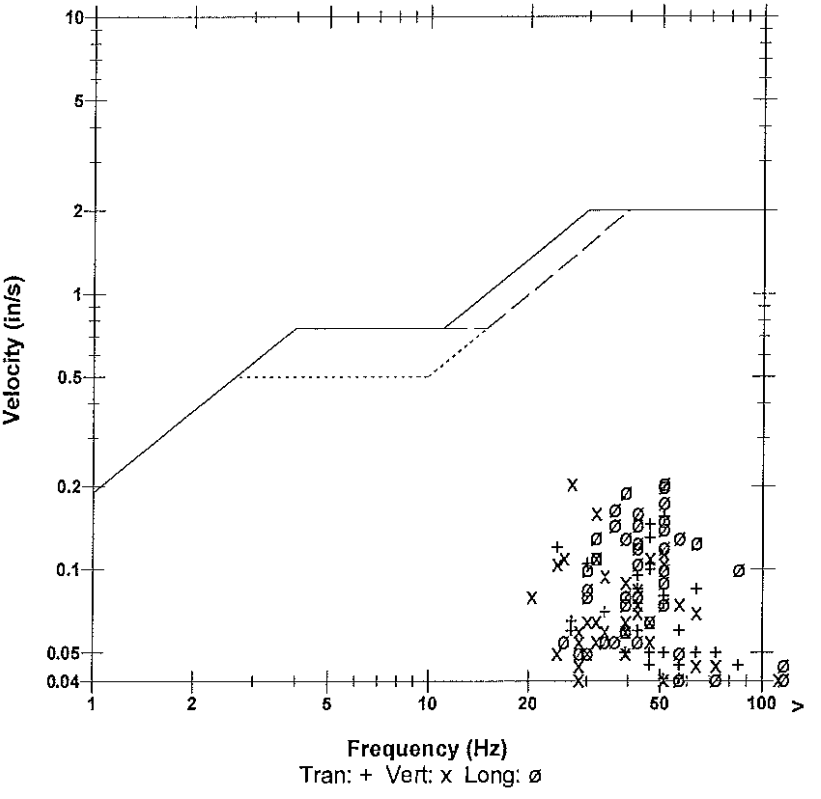
Date/Time	Vert at 11:29:49 July 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECSL.9P0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

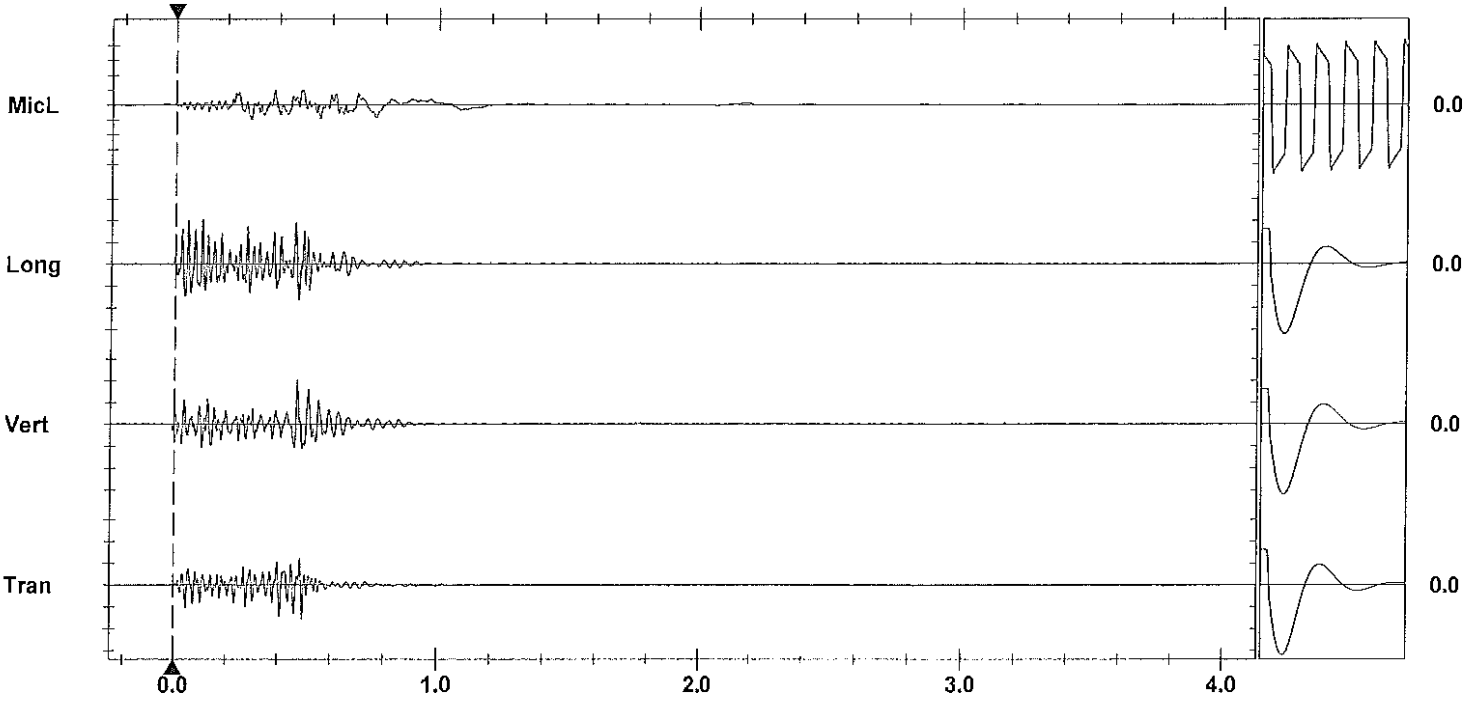
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.290 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 552 mv)

	Tran	Vert	Long	
PPV	0.155	0.205	0.205	in/s
ZC Freq	51	27	51	Hz
Time (Rel. to Trig)	0.496	0.474	0.104	sec
Peak Acceleration	0.119	0.133	0.225	g
Peak Displacement	0.00054	0.00081	0.00075	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.253 in/s at 0.475 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:30:22 July 4, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECSL.AM0

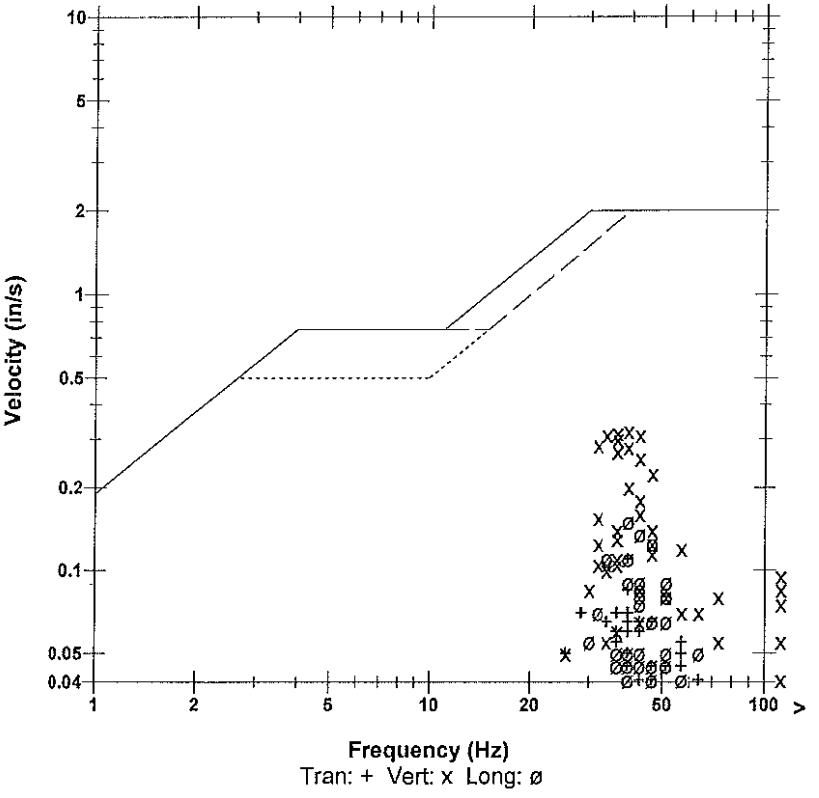
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

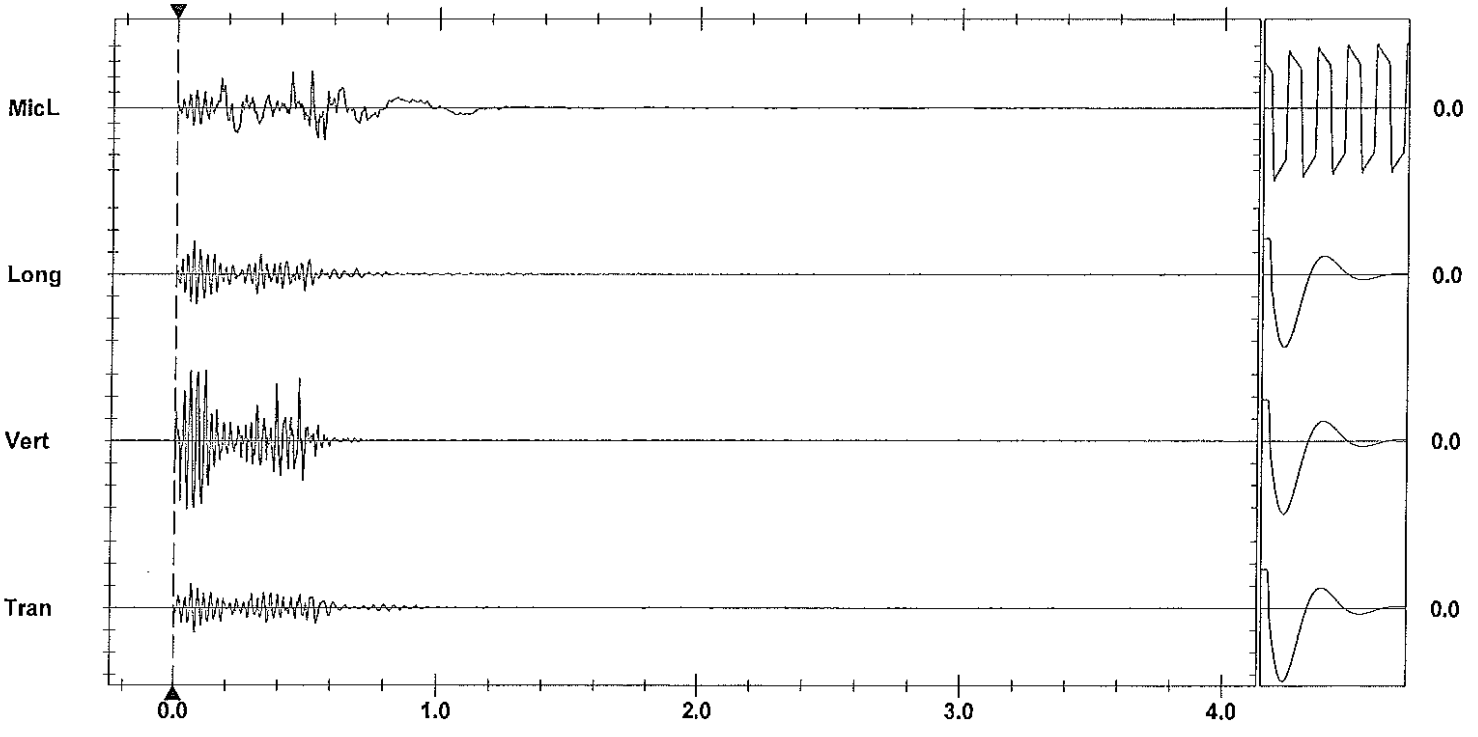
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00236 psi(L) at 0.518 sec
ZC Freq	39 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 551 mv)

	Tran	Vert	Long	
PPV	0.110	0.320	0.150	in/s
ZC Freq	39	39	39	Hz
Time (Rel. to Trig)	0.067	0.116	0.068	sec
Peak Acceleration	0.0795	0.318	0.106	g
Peak Displacement	0.00043	0.00149	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.329 in/s at 0.116 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Long at 11:30:32 July 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECSL.AW0
Job Number:	1		

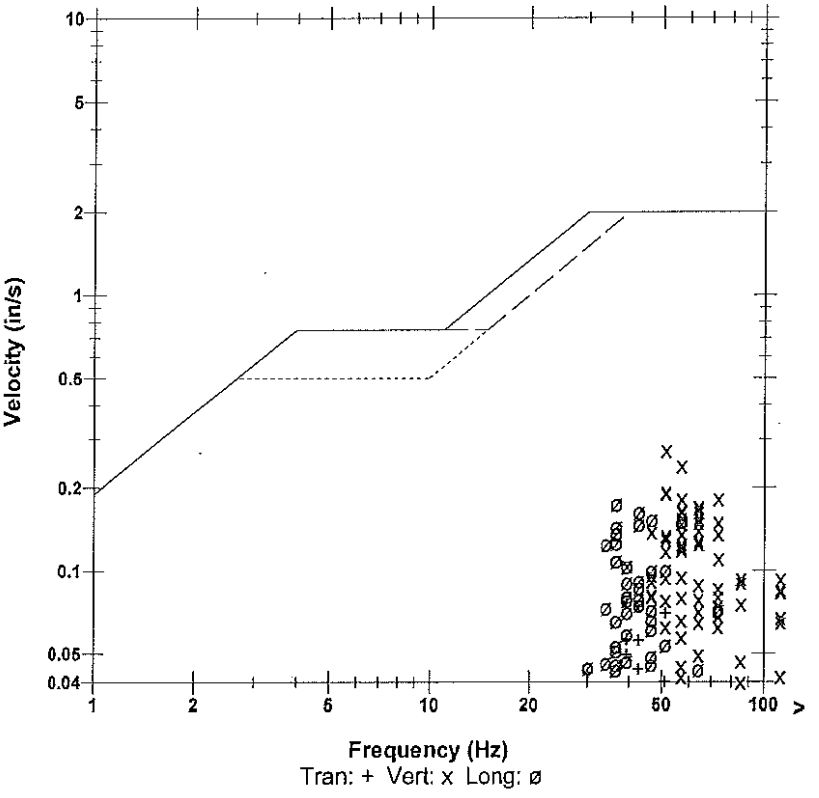
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

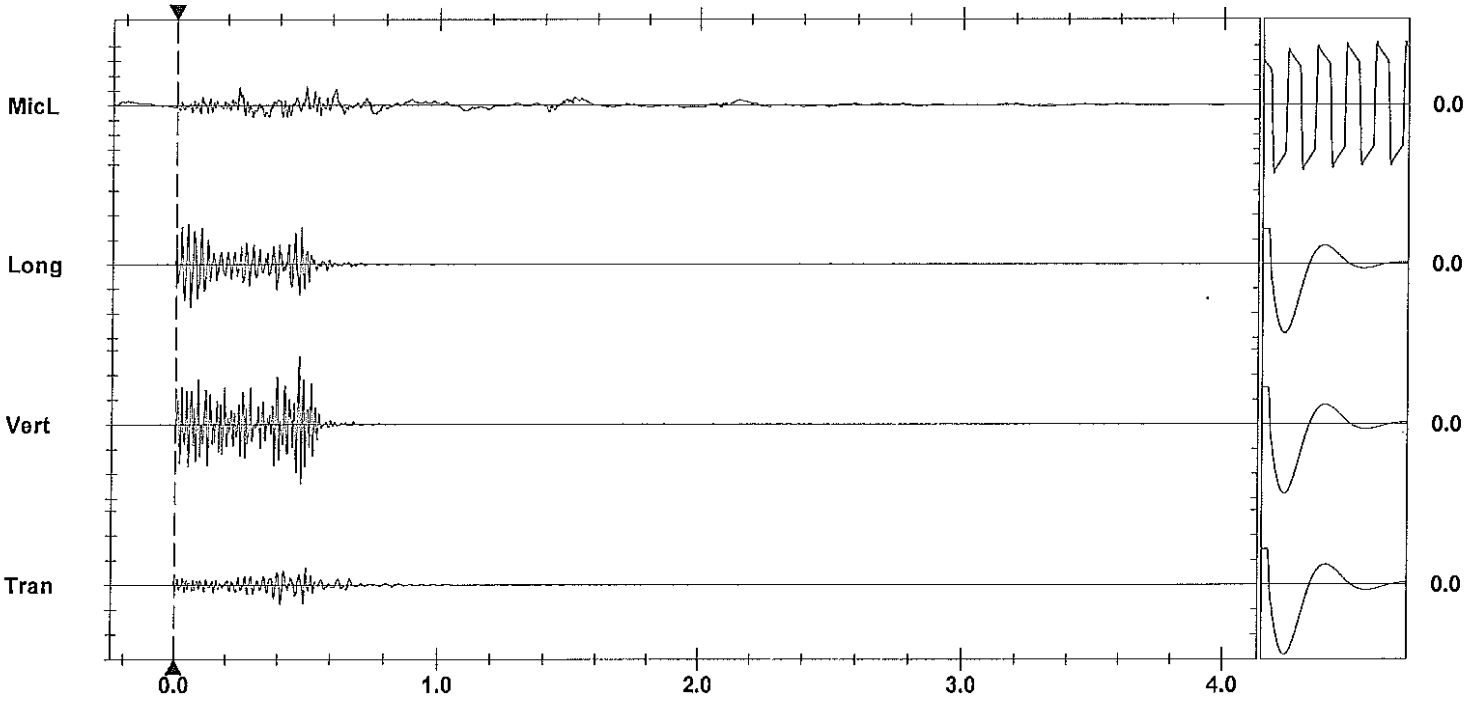
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.500 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 533 mv)

	Tran	Vert	Long	
PPV	0.0762	0.272	0.174	in/s
ZC Freq	39	51	37	Hz
Time (Rel. to Trig)	0.412	0.479	0.056	sec
Peak Acceleration	0.0646	0.297	0.151	g
Peak Displacement	0.00028	0.00092	0.00063	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.278 in/s at 0.478 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 4/12
ACTUAL BLAST DATE July 4/12
BLAST # 390 @14:06

HIGHWAY # 97
BLAST LOCATION AT: STN # 128 + 75 – 128 + 80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 105 (m)

TOTAL NUMBER OF HOLES ~~15~~ 6 B/L / 3 Buffer / 6 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 (ms)

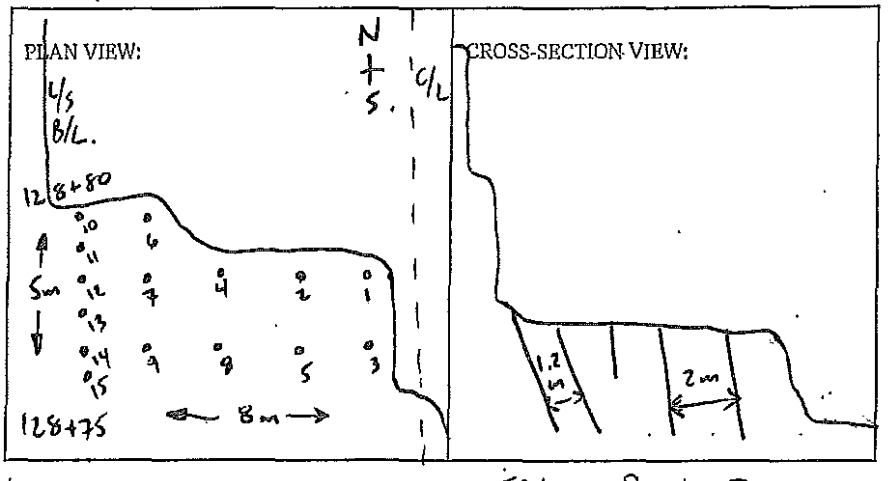
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

6 - 4.5m Elec det.

9 - 7m Elec det

6 sticks 2" x 16" UNICAP

9 sticks 1½ x 16" UNICAP

1 CASE 2" x 16" blastex

1 bag cvR.

2 bags Anfo

2m Toe load in Buffer

3m Toe load in production

Instantel

Event Report

Date/Time	Vert at 14:05:20 July 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECSS.GW0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

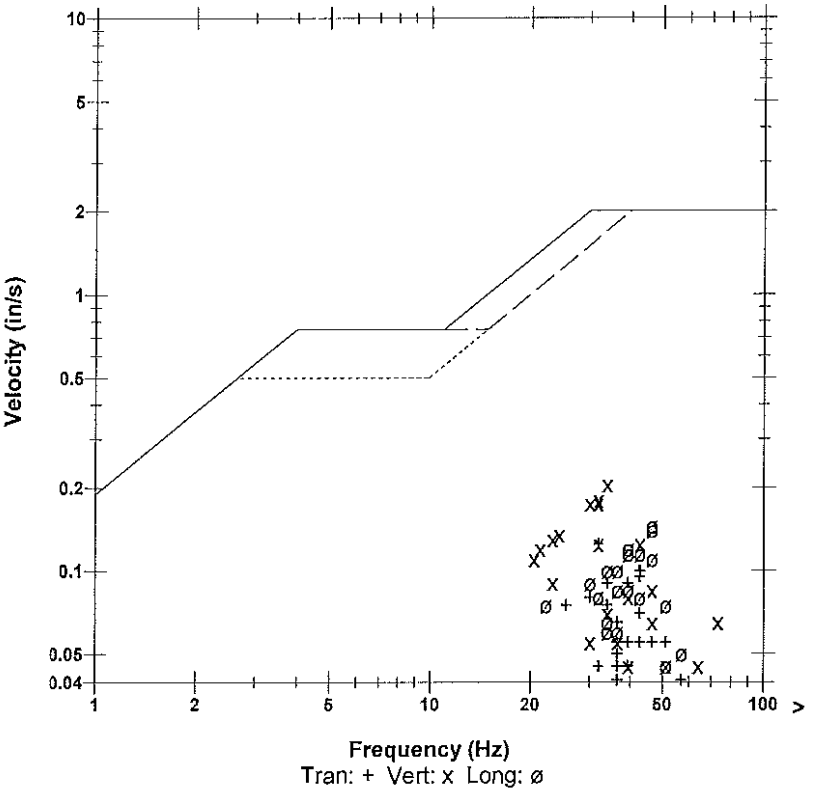
Extended Notes

Post Event Notes

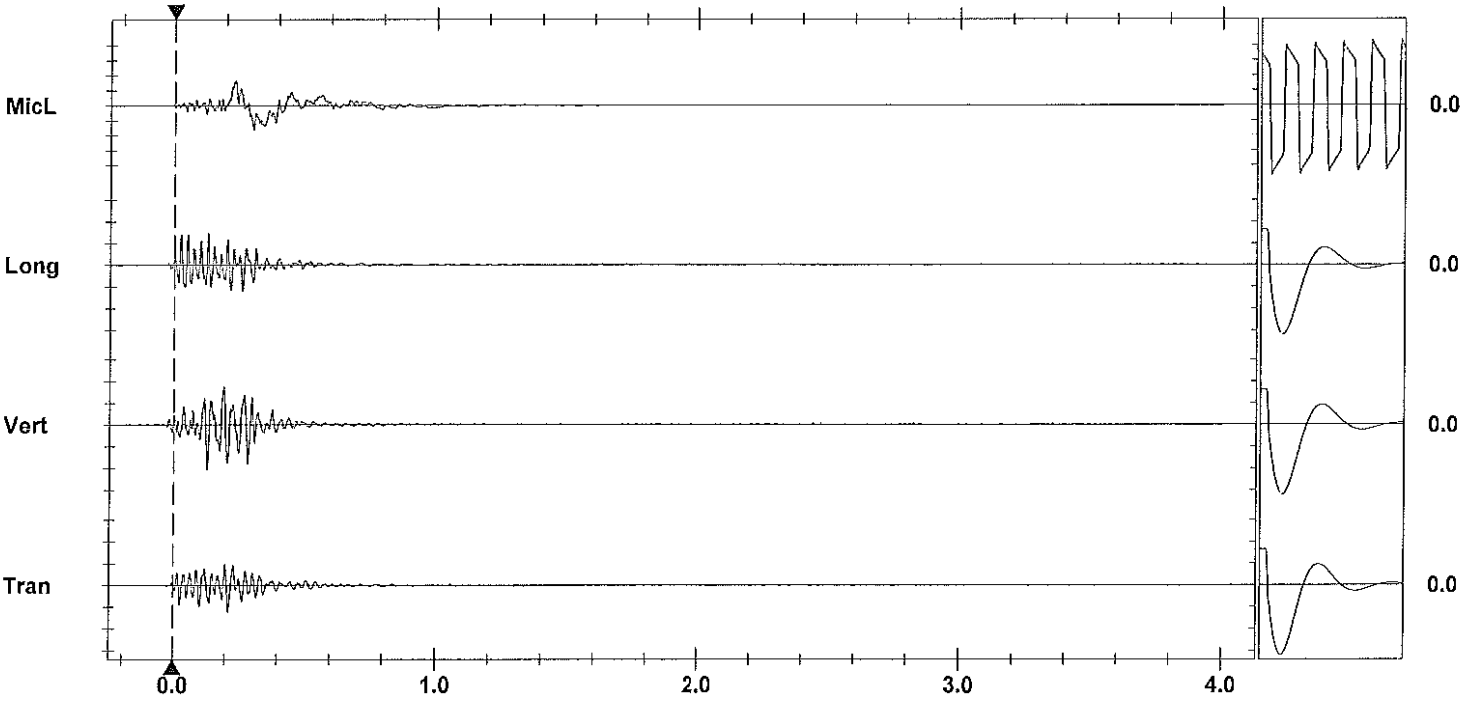
Microphone Linear Weighting
PSPL 0.00163 psi(L) at 0.232 sec
ZC Freq 8.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 478 mv)

	Tran	Vert	Long	
PPV	0.125	0.205	0.145	in/s
ZC Freq	32	34	47	Hz
Time (Rel. to Trig)	0.214	0.127	0.128	sec
Peak Acceleration	0.0928	0.119	0.172	g
Peak Displacement	0.00057	0.00096	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

USBM RI8507 And OSMRE



Peak Vector Sum 0.251 in/s at 0.128 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Long at 14:06:03 July 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECSS.I30
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

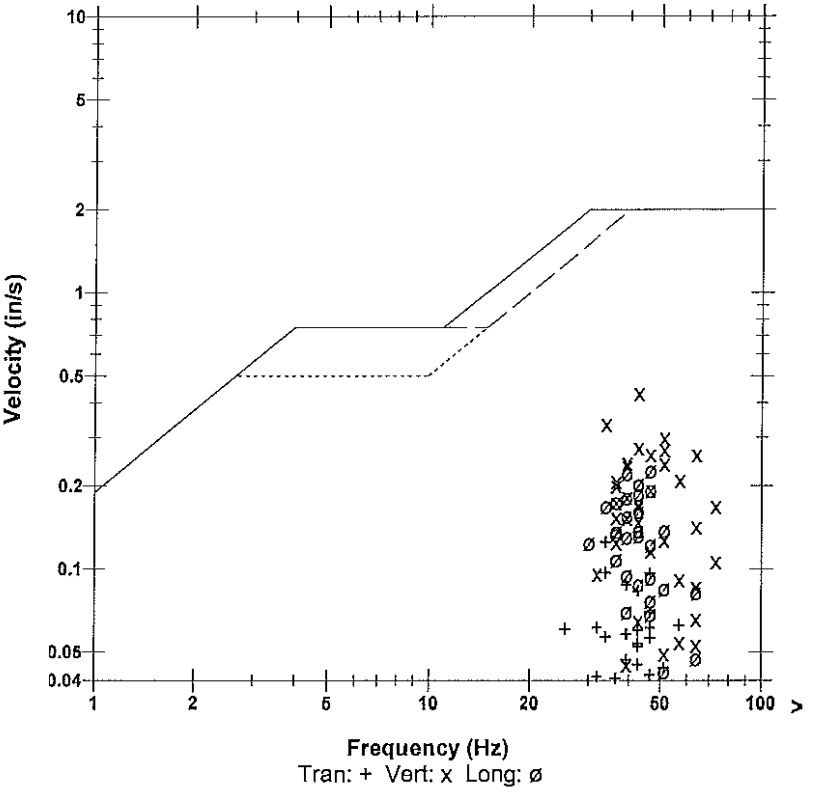
Post Event Notes

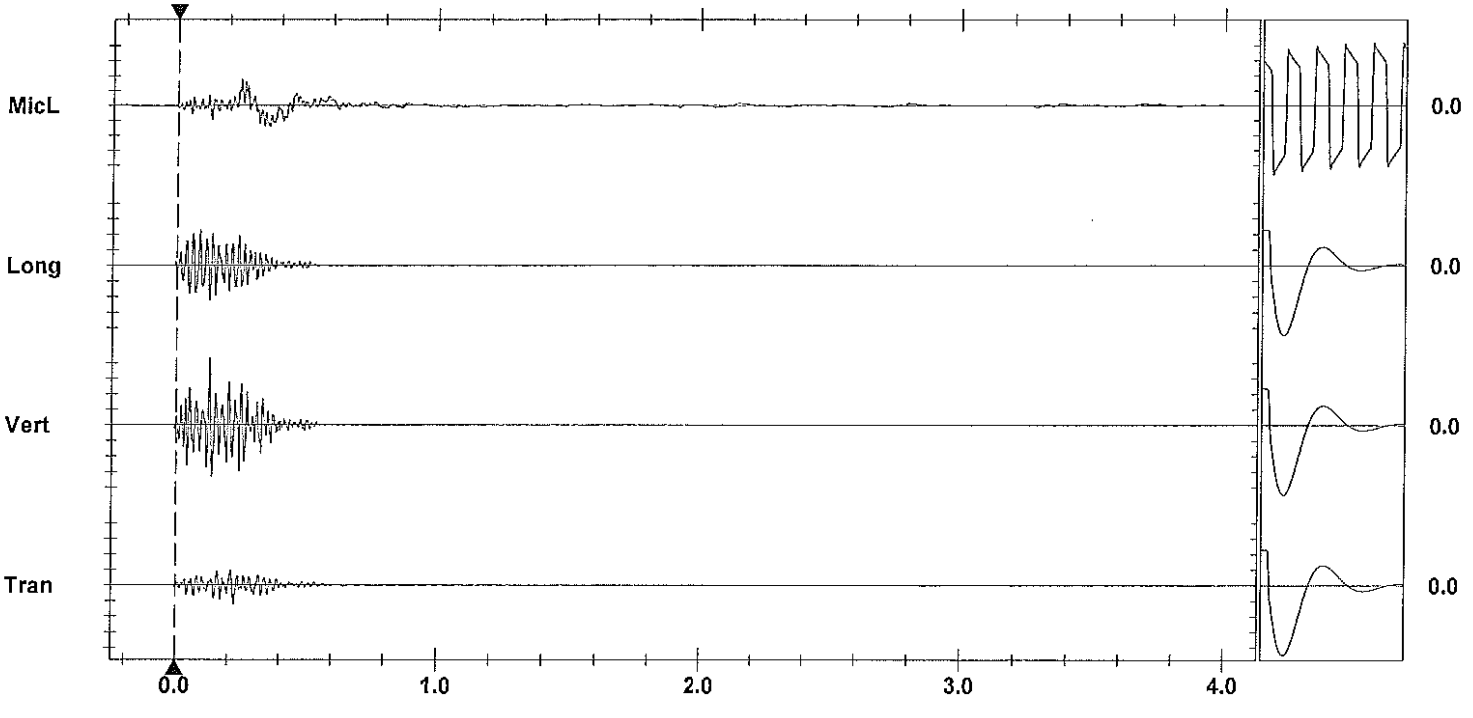
Microphone Linear Weighting
PSPL 0.00174 psi(L) at 0.246 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 525 mv)

	Tran	Vert	Long	
PPV	0.125	0.433	0.227	in/s
ZC Freq	34	43	47	Hz
Time (Rel. to Trig)	0.226	0.127	0.087	sec
Peak Acceleration	0.0878	0.315	0.222	g
Peak Displacement	0.00050	0.00136	0.00082	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.452 in/s at 0.127 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:05:53 July 4, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECSS.HT0

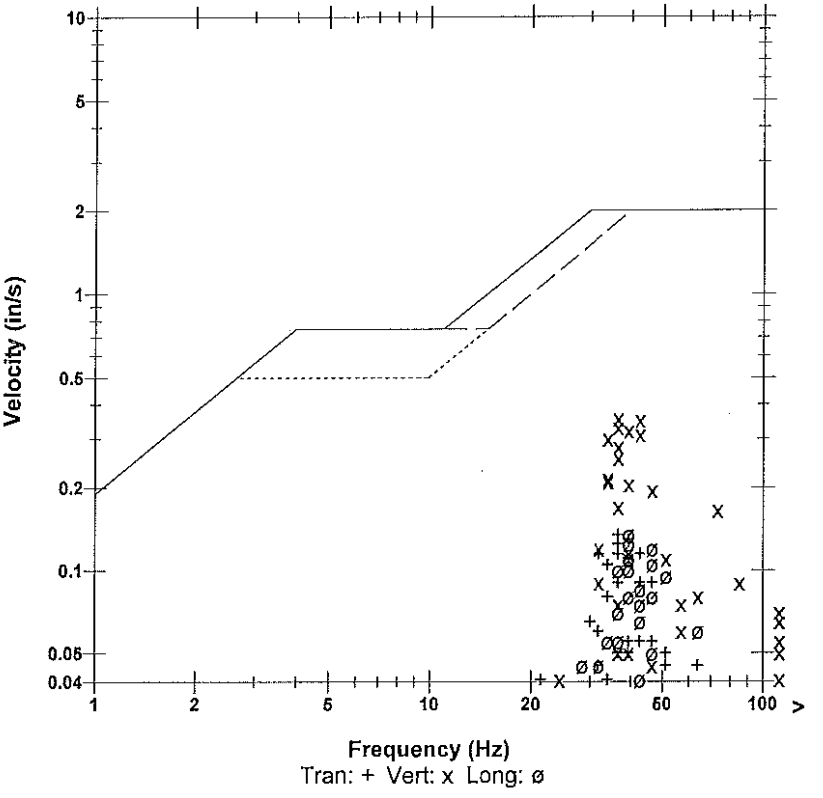
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

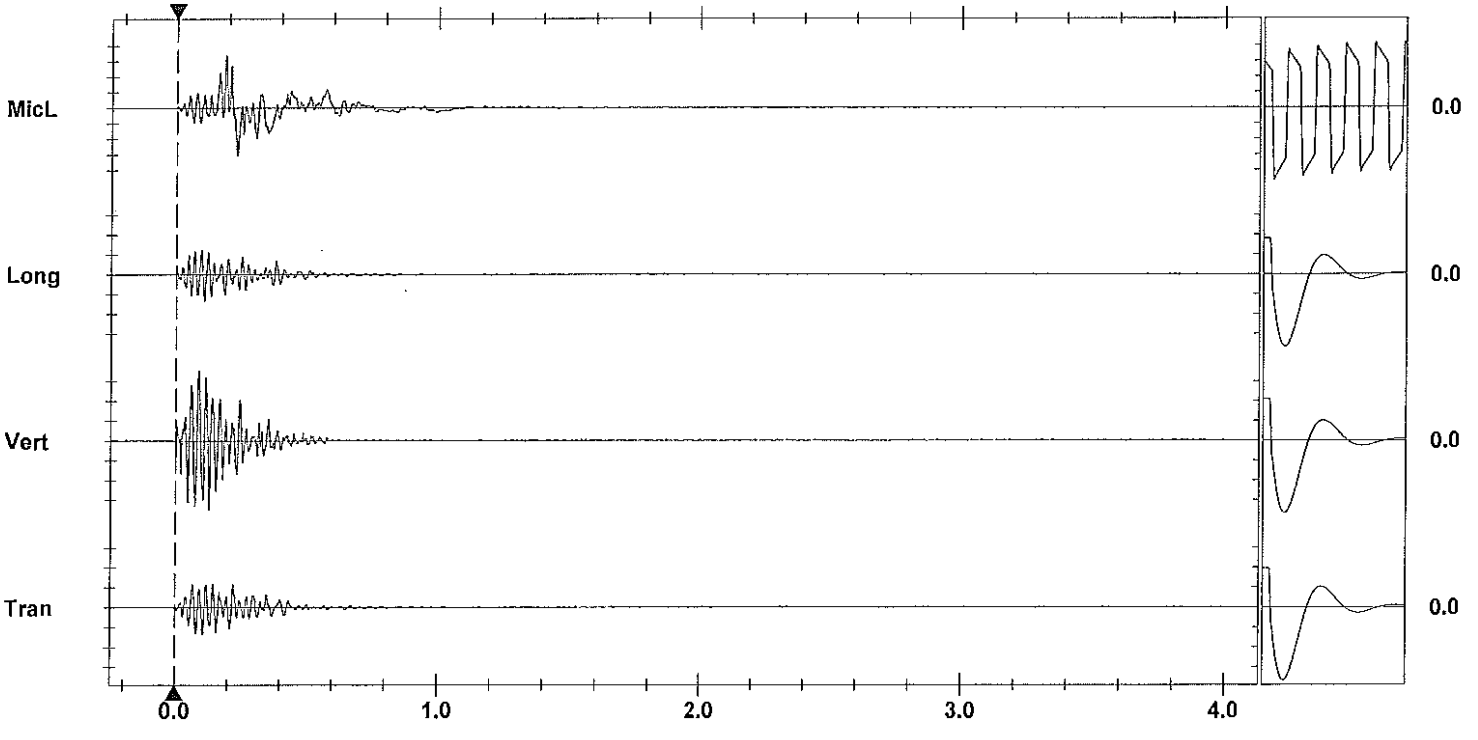
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00337 psi(L) at 0.187 sec			
ZC Freq	32 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 529 mv)			

	Tran	Vert	Long	
PPV	0.135	0.355	0.135	in/s
ZC Freq	37	37	39	Hz
Time (Rel. to Trig)	0.104	0.085	0.105	sec
Peak Acceleration	0.106	0.278	0.119	g
Peak Displacement	0.00053	0.00153	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.362 in/s at 0.128 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12
BLAST # 391 @ 10:24 AM

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+50 - 128+55 c/L (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

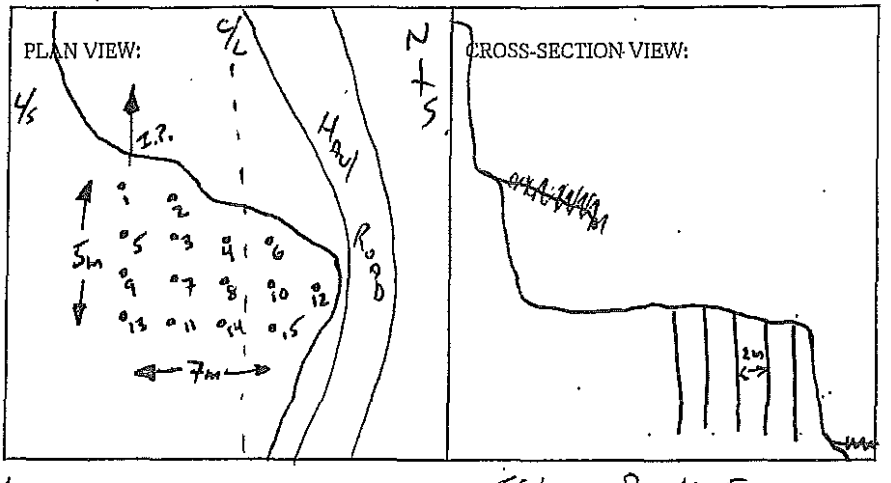
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 105 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

15 - 7m Elec. dets.

1½ bag Anfo.

8 sticks 1½" x 16" Unimax

2' - 3' Toe load Anfo in prod.

Instantel

Event Report

Date/Time	Long at 10:24:48 July 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECUC.XC0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

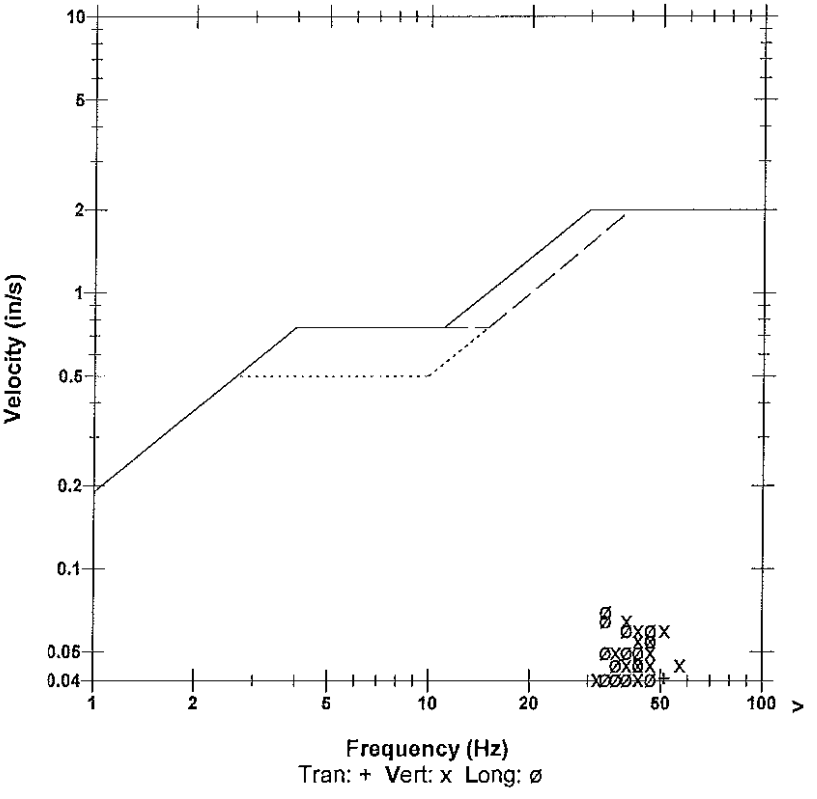
Extended Notes

Post Event Notes

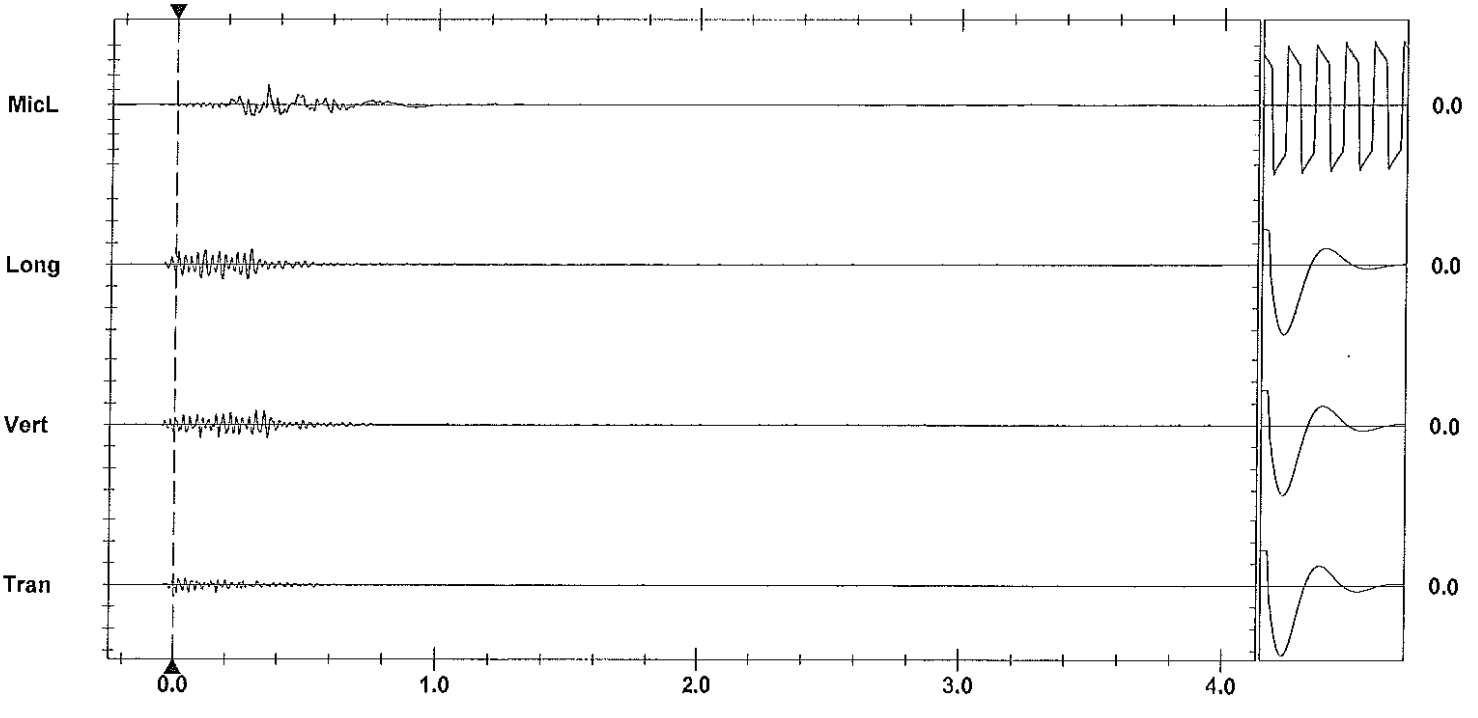
Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.353 sec
ZC Freq 22 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 507 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0650	0.0700	in/s
ZC Freq	51	39	34	Hz
Time (Rel. to Trig)	0.011	0.316	0.292	sec
Peak Acceleration	0.0398	0.0530	0.0530	g
Peak Displacement	0.00012	0.00025	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0728 in/s at 0.011 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 10:25:32 July 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECUC.YK0
Job Number:	1		

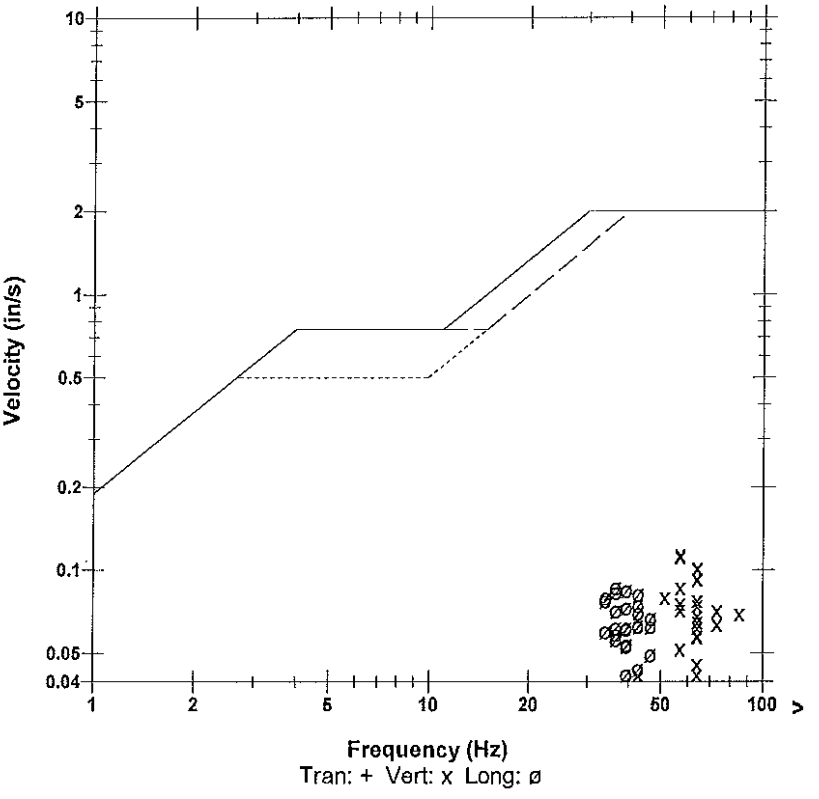
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

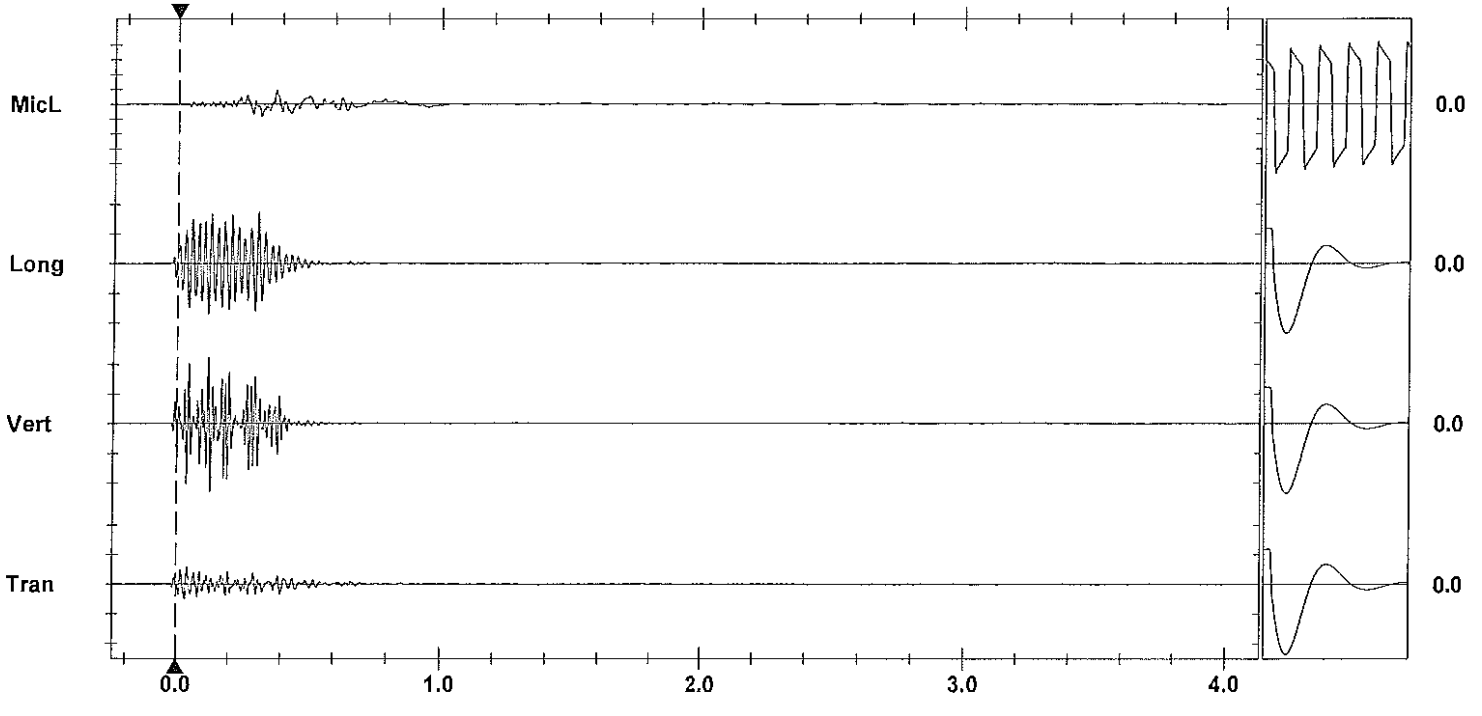
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00091 psi(L) at 0.375 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 545 mv)

	Tran	Vert	Long	
PPV	0.0287	0.114	0.0862	in/s
ZC Freq	51	57	37	Hz
Time (Rel. to Trig)	0.042	0.128	0.311	sec
Peak Acceleration	0.0265	0.118	0.0613	g
Peak Displacement	0.00010	0.00031	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.141 in/s at 0.128 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 10:25:23 July 5, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECUC.YB0

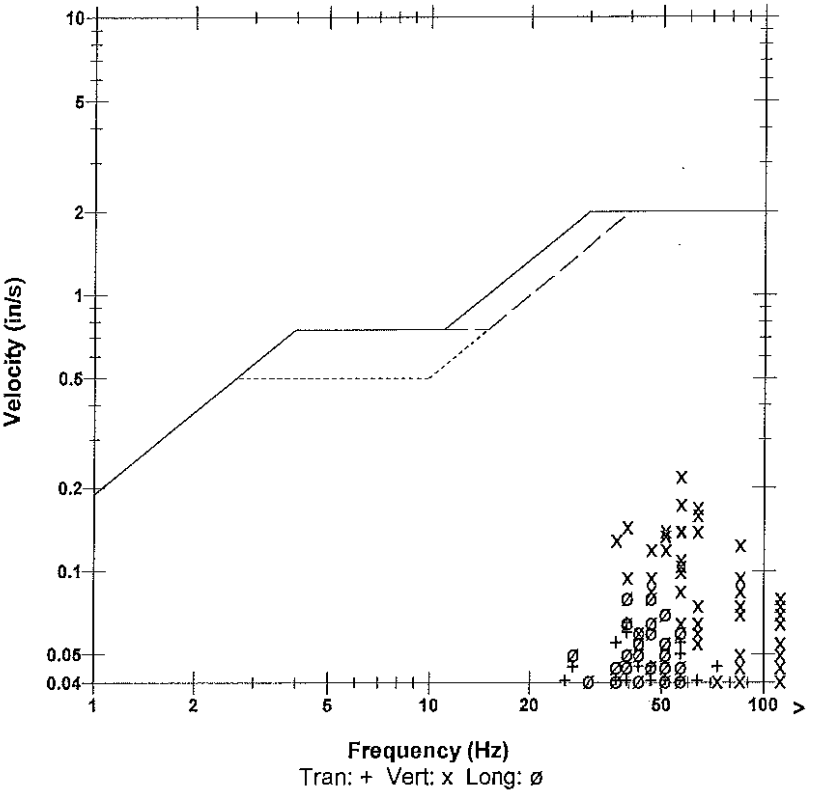
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

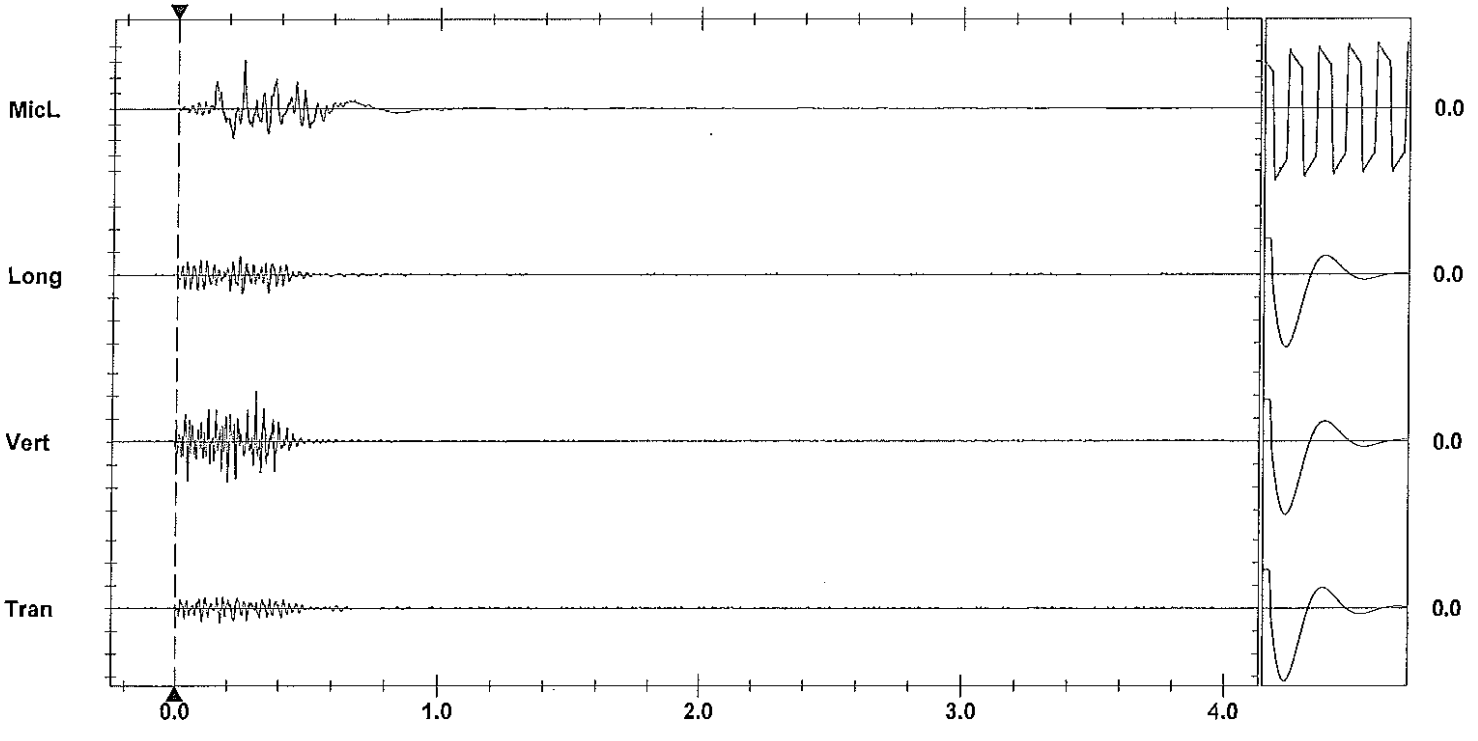
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0650	0.220	0.0800	in/s
ZC Freq	39	57	47	Hz
Time (Rel. to Trig)	0.174	0.308	0.242	sec
Peak Acceleration	0.0663	0.212	0.0795	g
Peak Displacement	0.00027	0.00055	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Microphone Linear Weighting
PSPL 0.00312 psi(L) at 0.257 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 631 mv)

Peak Vector Sum 0.220 in/s at 0.308 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12 12:39 PM
BLAST # 392

HIGHWAY# 97
BLAST LOCATION AT: STN #128+50 - 128+40 C/L (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

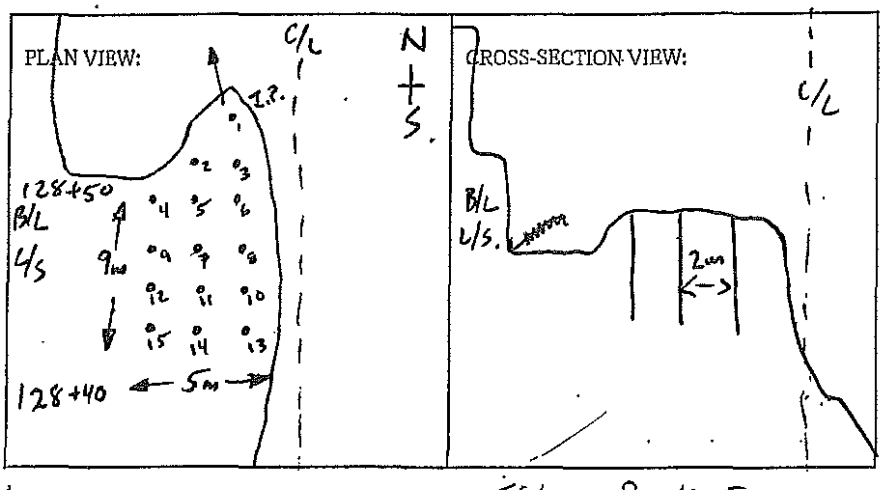
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB-320 CAPACITY 80

VOLUME OF ROCK BLASTED 135 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

15 - 7m Electets.

2 - Anfo.

8 - sticks 1½" x 16" unimax

2'-3' Toe loads of Anfo.

Instantel

Event Report

Date/Time	Vert at 12:40:13 July 5, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECUJ.710

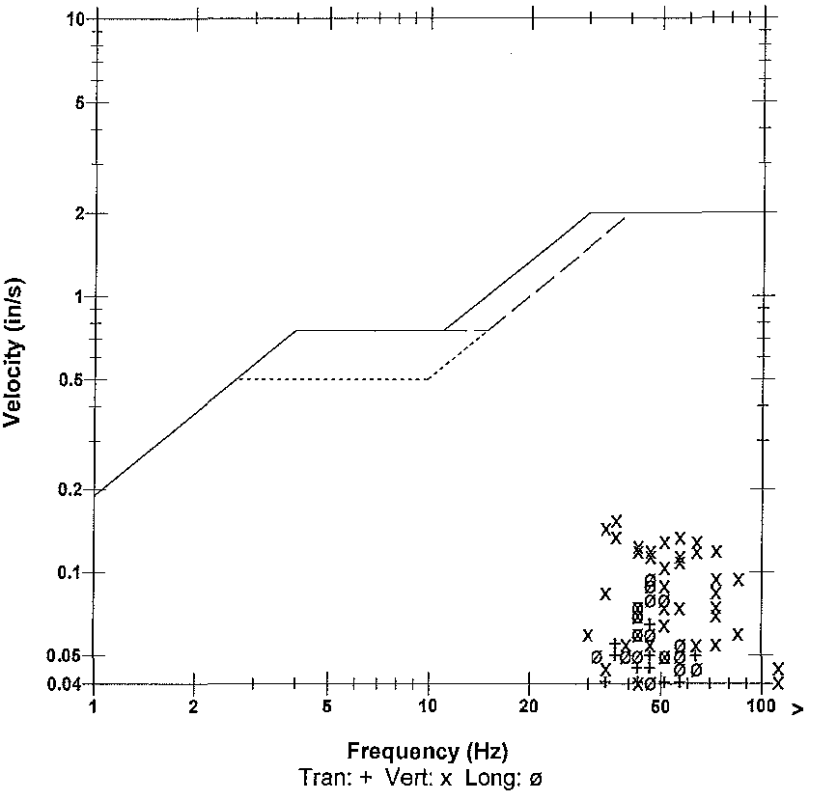
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

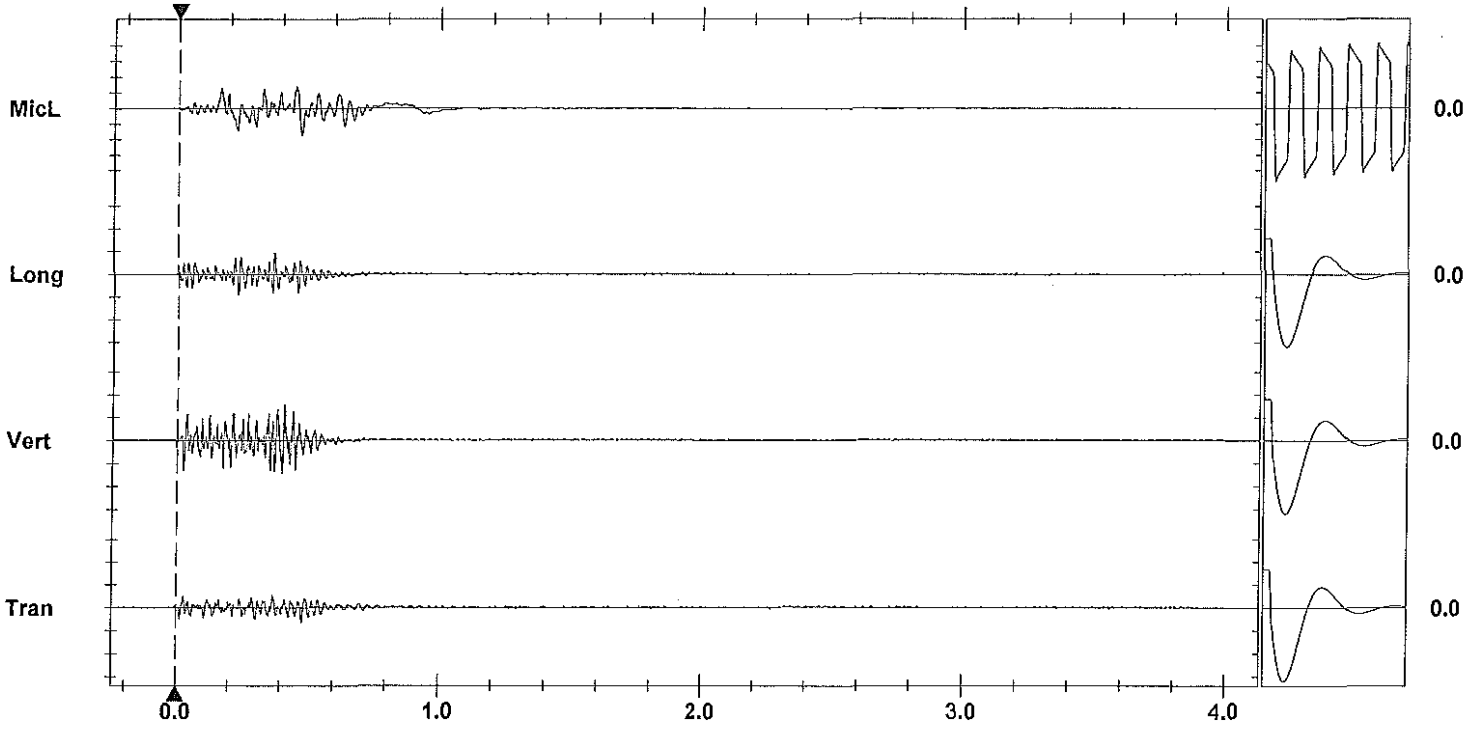
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0650	0.155	0.0950	in/s
ZC Freq	47	37	47	Hz
Time (Rel. to Trig)	0.484	0.412	0.372	sec
Peak Acceleration	0.0530	0.172	0.0795	g
Peak Displacement	0.00021	0.00056	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.474 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 539 mv)

Peak Vector Sum 0.160 in/s at 0.413 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

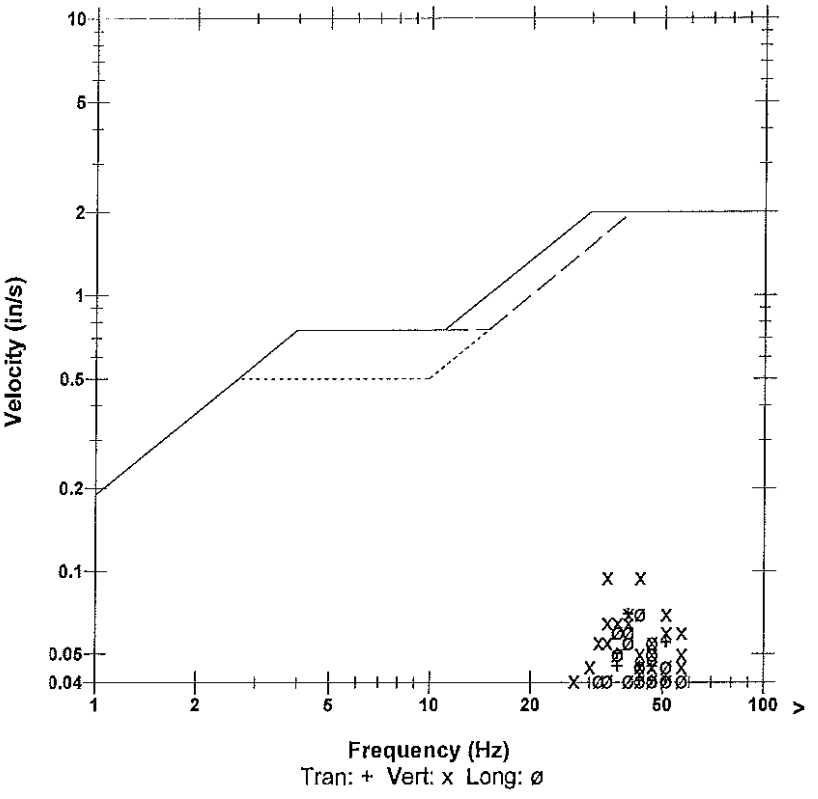
Date/Time	Long at 12:39:39 July 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECUJ.630

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

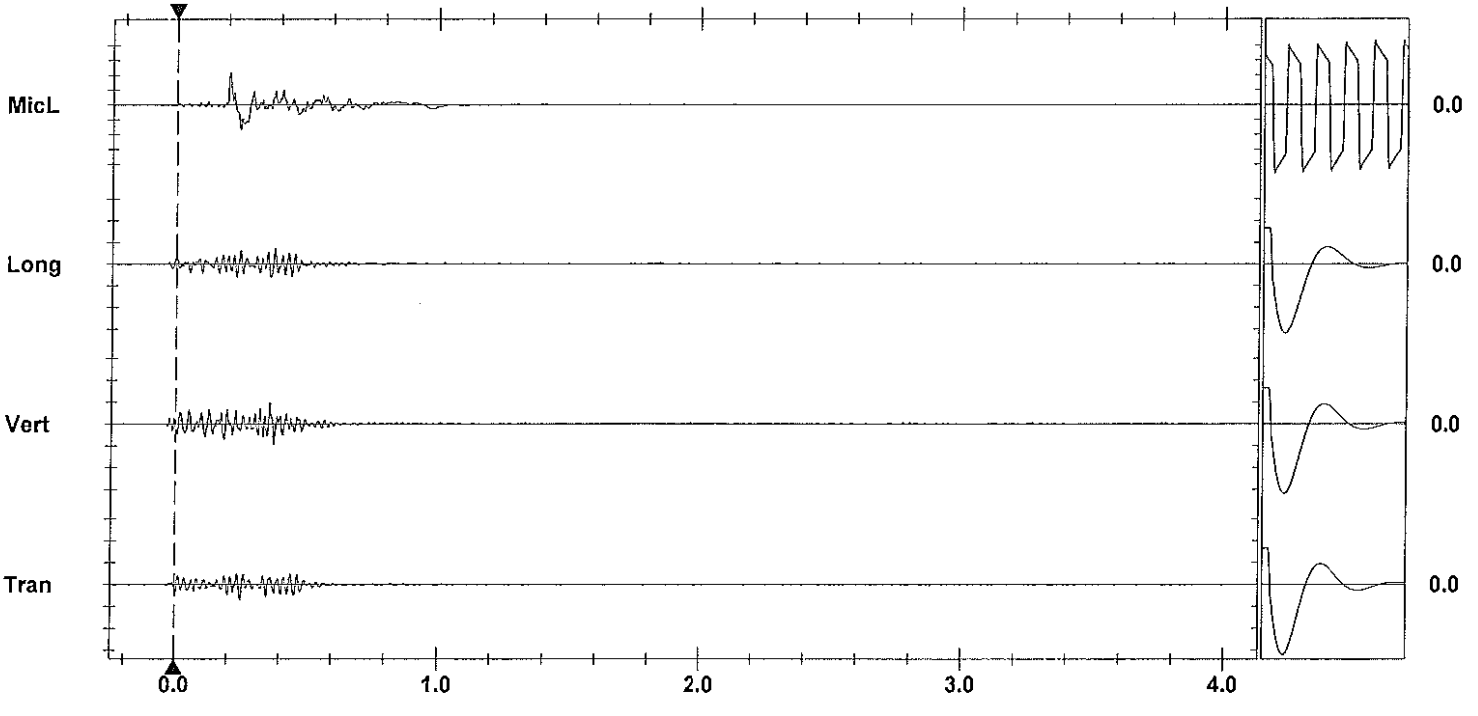
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00214 psi(L) at 0.203 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 493 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0950	0.0700	in/s
ZC Freq	39	34	43	Hz
Time (Rel. to Trig)	0.253	0.364	0.380	sec
Peak Acceleration	0.0530	0.0663	0.0530	g
Peak Displacement	0.00029	0.00036	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.118 in/s at 0.380 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 12:40:23 July 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECUJ.7B0
Job Number:	1		

Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james.m
General:

Extended Notes

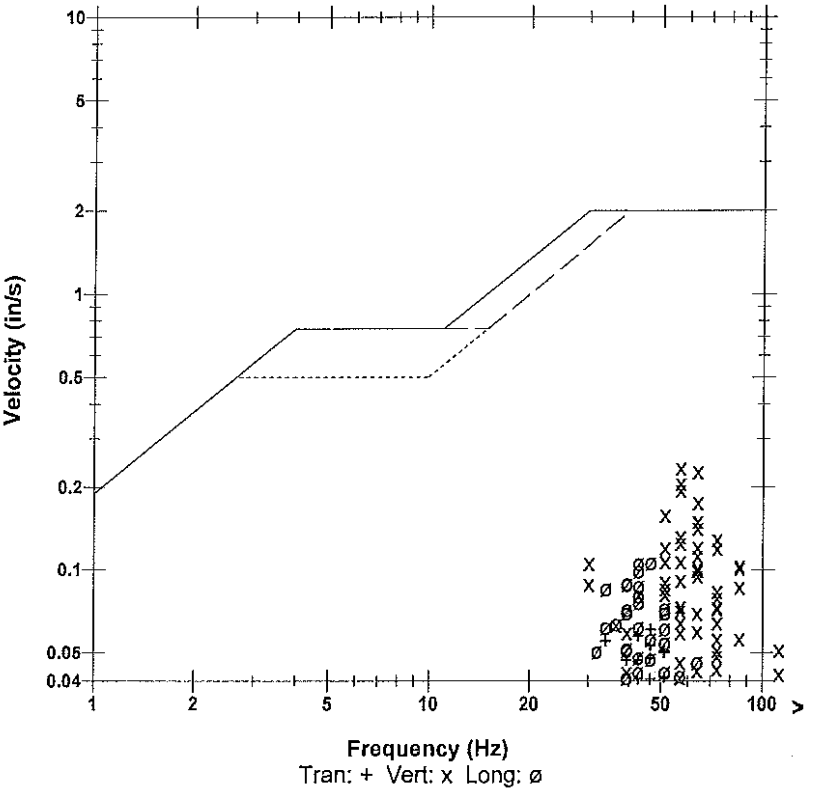
Post Event Notes

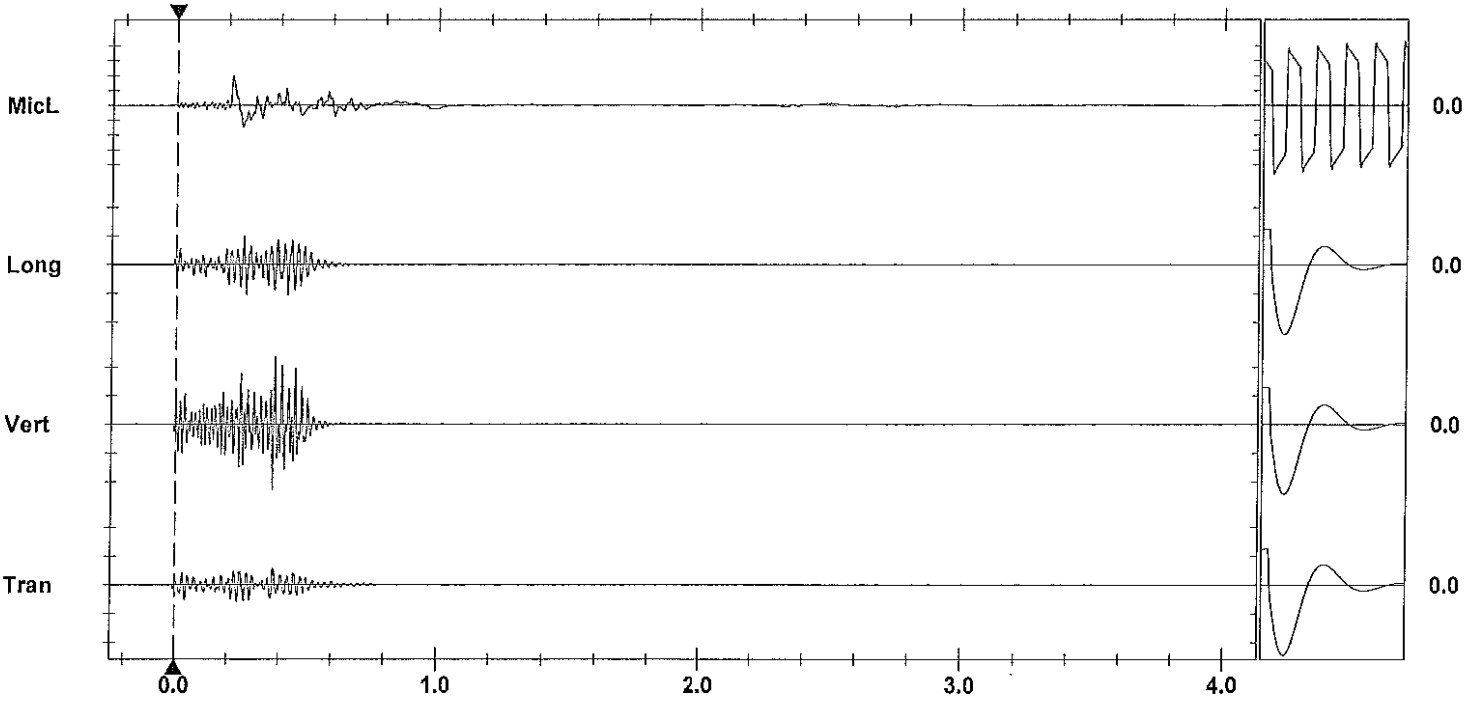
Microphone Linear Weighting
PSPL 0.00199 psi(L) at 0.216 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 473 mv)

	Tran	Vert	Long	
PPV	0.0606	0.236	0.106	in/s
ZC Freq	47	57	47	Hz
Time (Rel. to Trig)	0.242	0.383	0.430	sec
Peak Acceleration	0.0679	0.237	0.0895	g
Peak Displacement	0.00023	0.00064	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.247 in/s at 0.383 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 5/12
ACTUAL BLAST DATE July 5/12. 3:25PM
BLAST # 393

HIGHWAY# 97
BLAST LOCATION AT: STN # 128+50 - 128+45 C/L (2nd Beach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES /
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

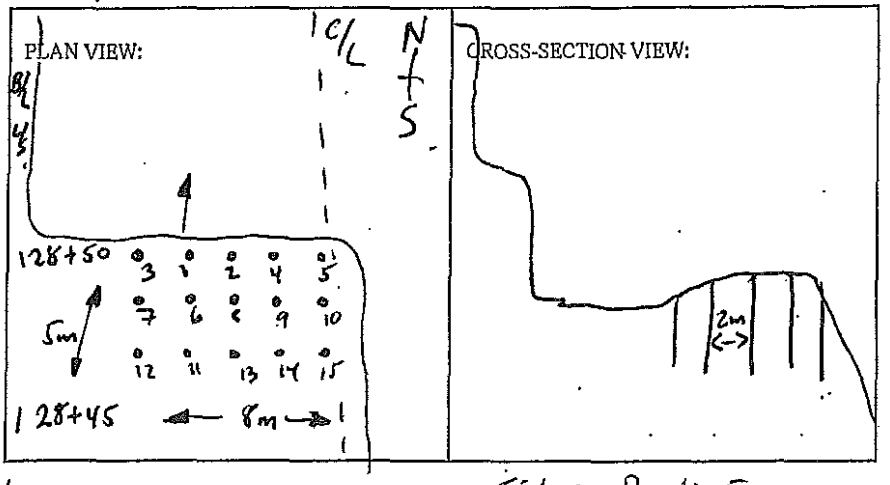
INITIATION DEVICE: (CIRCLE) (E.E. CAPS) SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Enos.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

15 - 7m Elec dets

2 bags Anfo.

8 sticks 1½" x 16" unimix

2' - 3' Toe load Anfo

Instantel

Event Report

Date/Time	Vert at 15:26:11 July 5, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECUQ.VN0

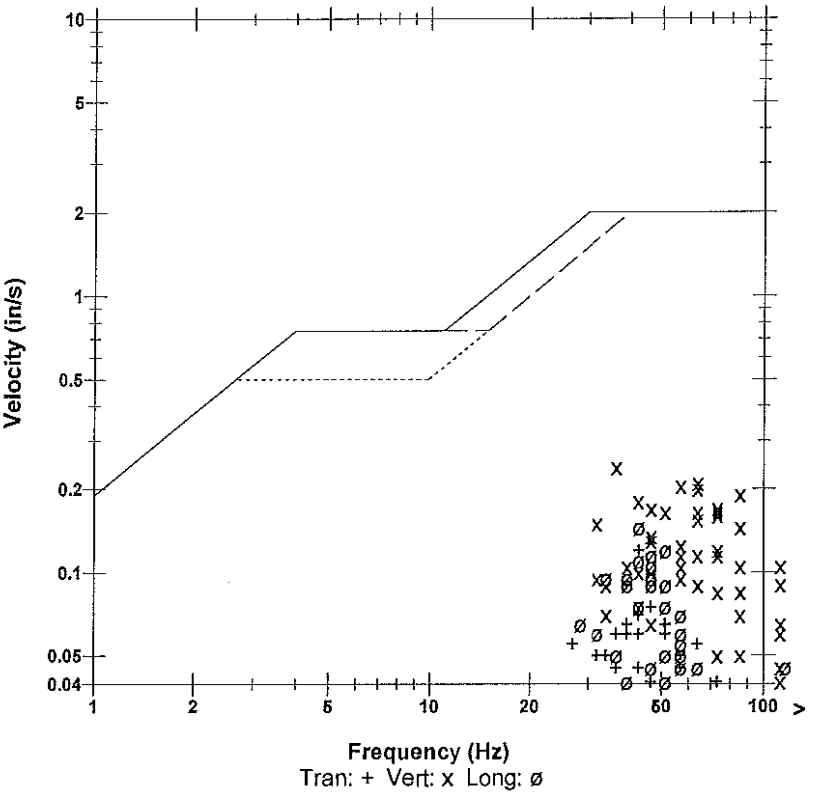
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

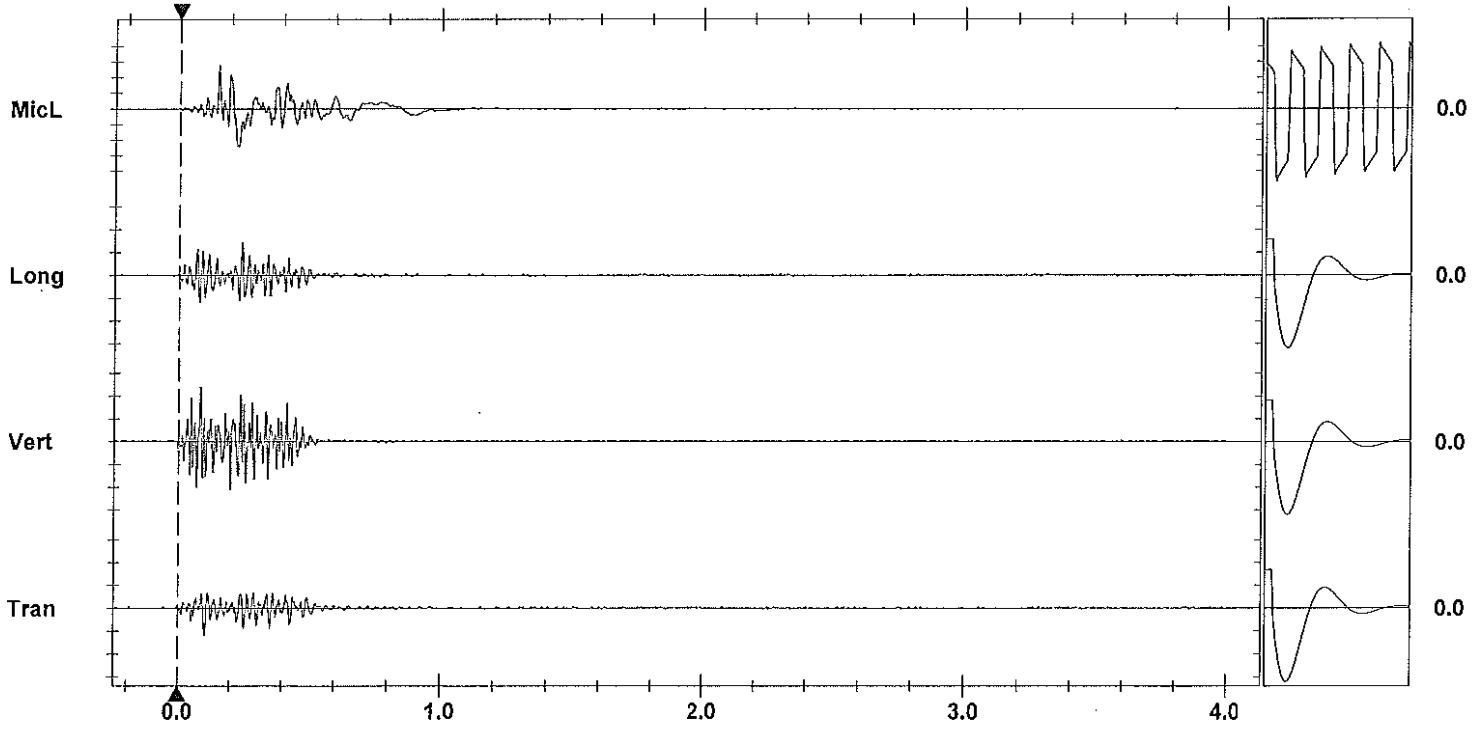
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.120	0.240	0.145	in/s
ZC Freq	43	37	43	Hz
Time (Rel. to Trig)	0.101	0.083	0.244	sec
Peak Acceleration	0.0795	0.292	0.119	g
Peak Displacement	0.00045	0.00078	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Microphone Linear Weighting
PSPL 0.00279 psi(L) at 0.148 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 556 mv)

Peak Vector Sum 0.240 in/s at 0.242 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

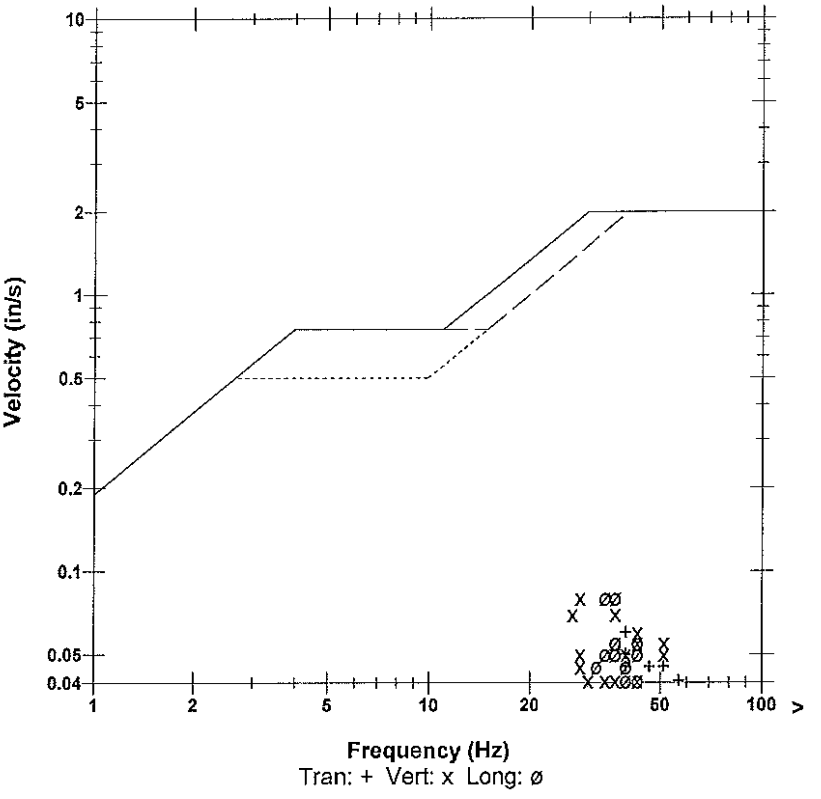
Date/Time	Long at 15:25:36 July 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECUQ.UO0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

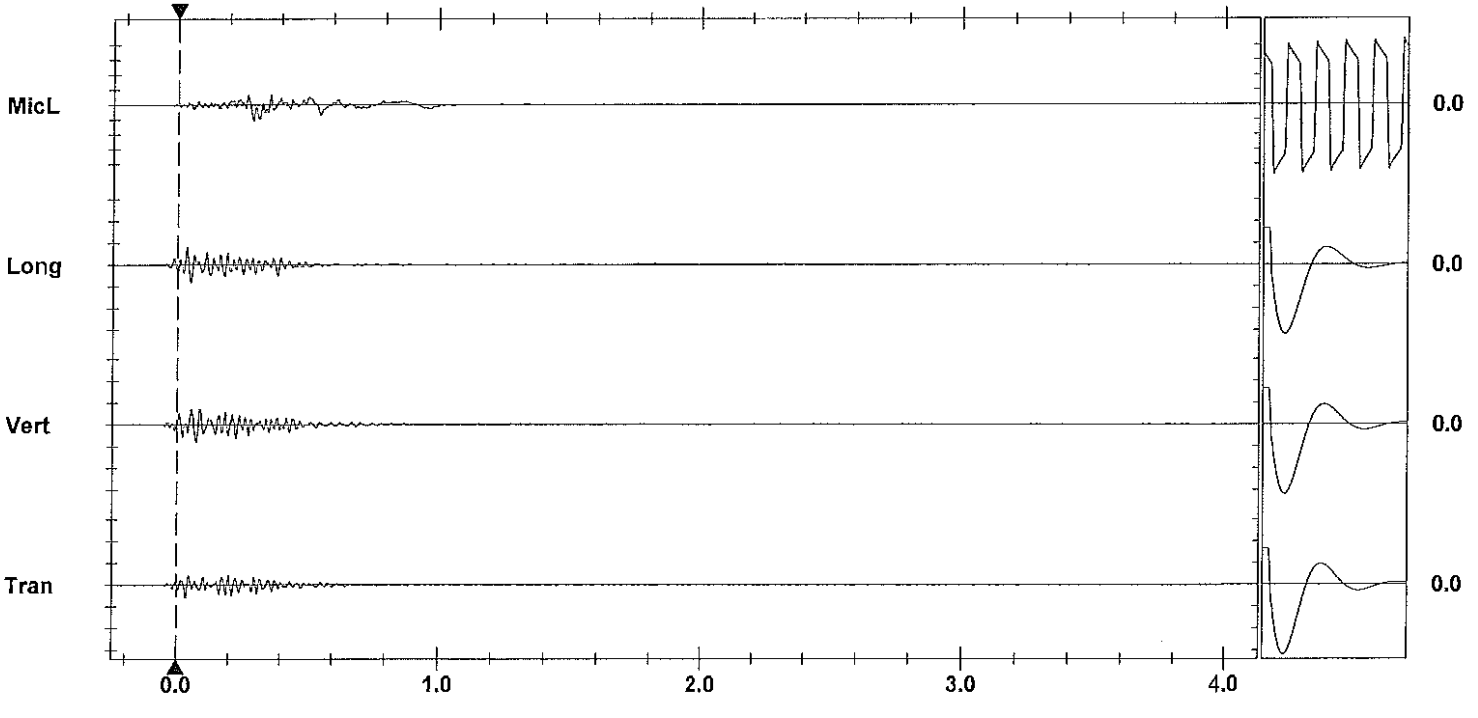
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0600	0.0800	0.0800	in/s
ZC Freq	39	28	37	Hz
Time (Rel. to Trig)	0.035	0.072	0.036	sec
Peak Acceleration	0.0398	0.0530	0.0530	g
Peak Displacement	0.00022	0.00043	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.1	

Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.291 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 560 mv)

Peak Vector Sum 0.100 in/s at 0.036 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 15:26:21 July 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECUQ.VX0
Job Number:	1		

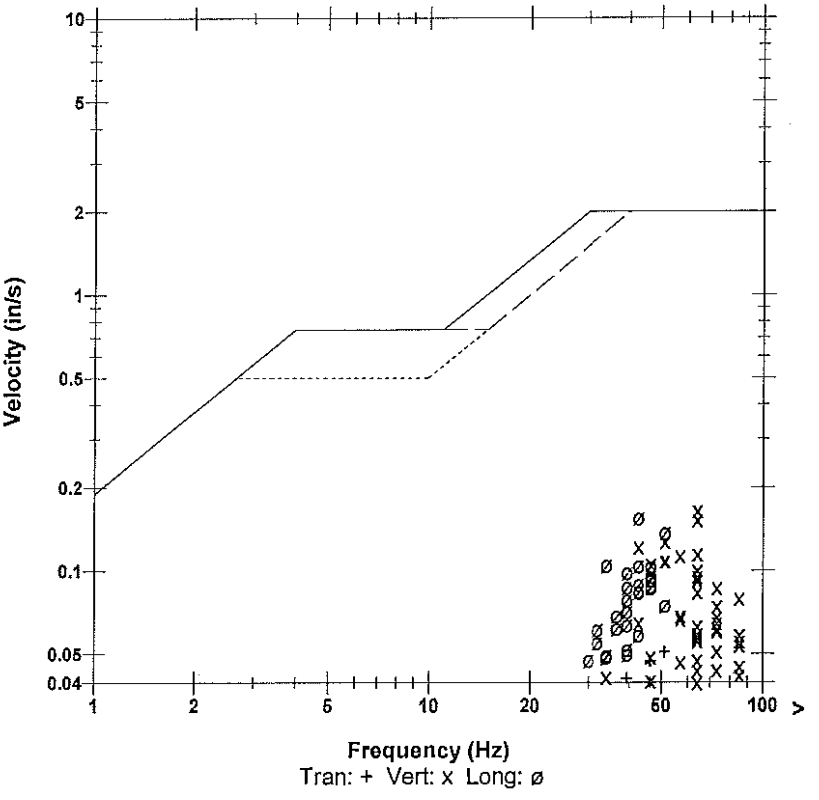
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

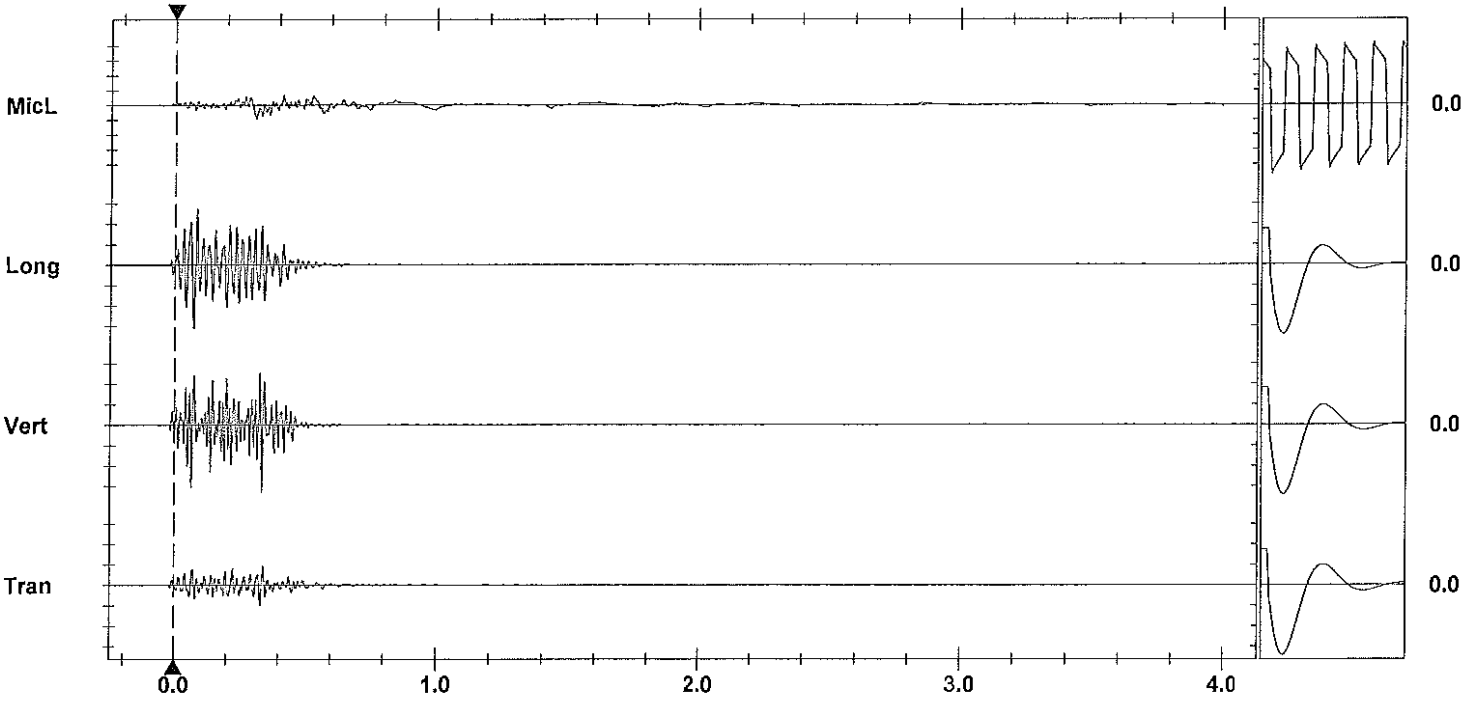
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00091 psi(L) at 0.311 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 552 mv)

	Tran	Vert	Long	
PPV	0.0506	0.165	0.156	in/s
ZC Freq	51	64	43	Hz
Time (Rel. to Trig)	0.334	0.338	0.070	sec
Peak Acceleration	0.0414	0.152	0.103	g
Peak Displacement	0.00016	0.00040	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.192 in/s at 0.071 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12
BLAST # 394 9:22AM

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+45 - 128+35 C/L (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ____ (°) SLOPE LENGTH ____ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A, Ø
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 18
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

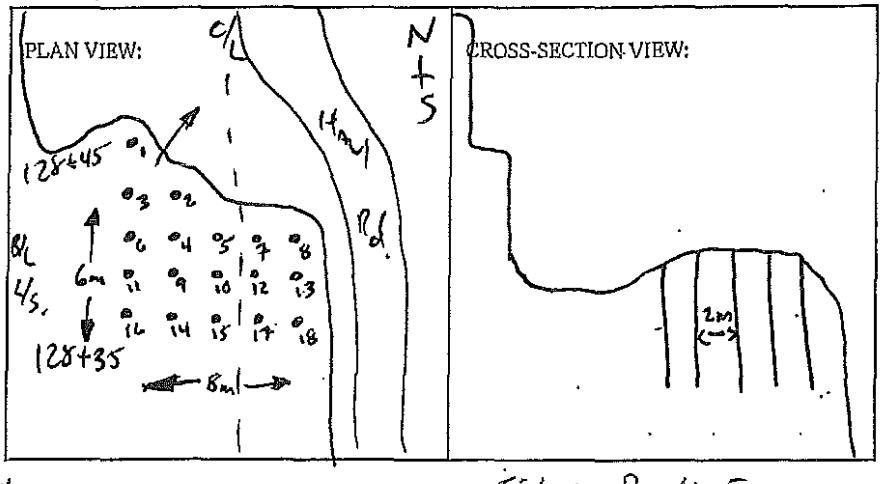
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 144 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fiebea COMPANY Fiebea Rock Enos.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

This shot did not trigger seismograph @ 13167 C/L ft from det trigger level set @ 0.04 ips

18 - 7m Elec dets.

9 - sticks 1½" x 16" on inside

2½ - Anfo.

2'-3' Toe Load Anfo

Instantel

Event Report

Date/Time	Vert at 09:22:09 July 6, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECW4.OX0

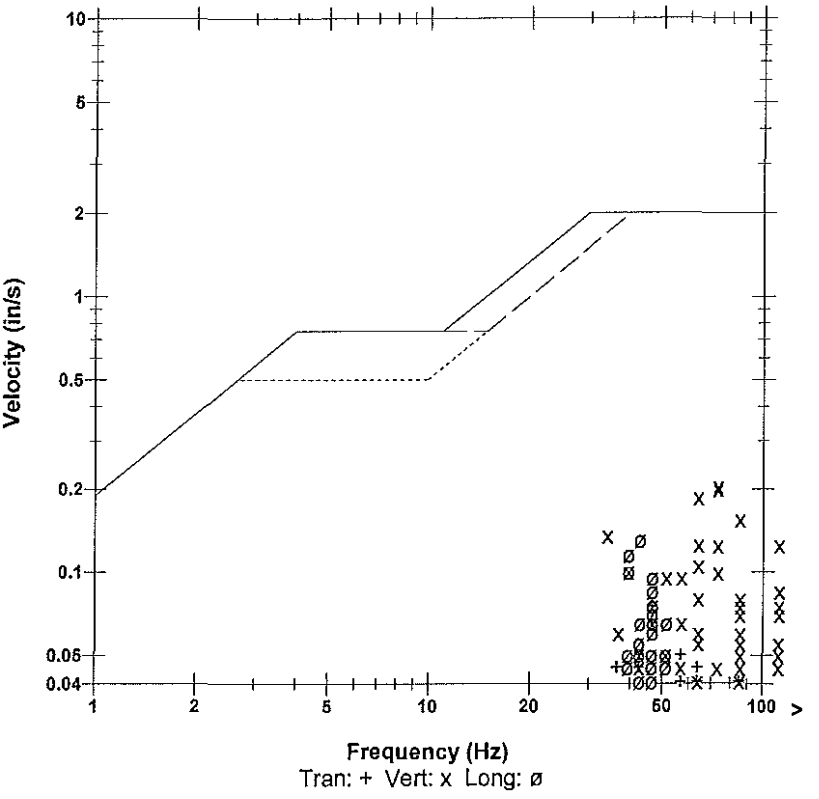
Notes
Location:13050 entance Old Mission Rd on concrete slab north behind house

General:james m

Extended Notes

Post Event Notes

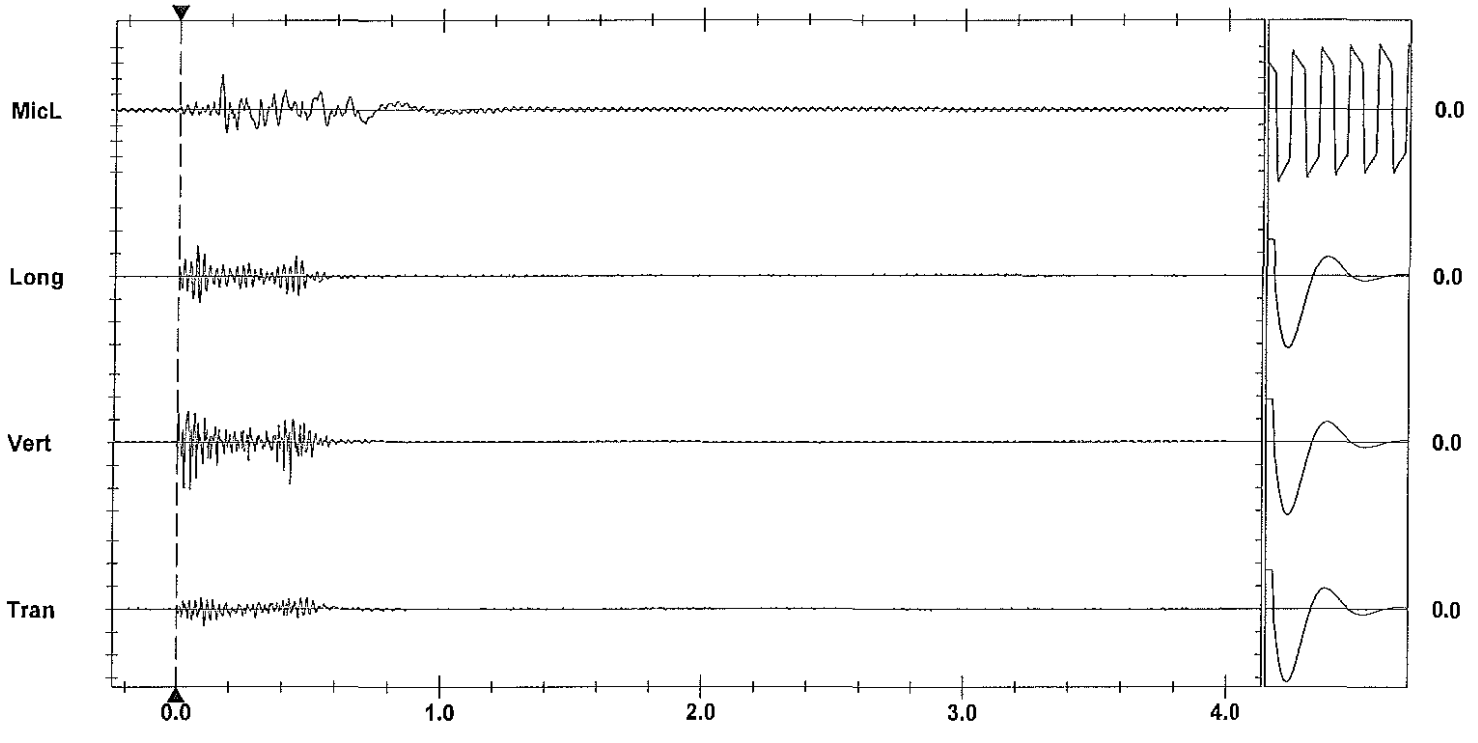
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0750	0.205	0.130	in/s
ZC Freq	47	73	43	Hz
Time (Rel. to Trig)	0.104	0.049	0.068	sec
Peak Acceleration	0.0530	0.252	0.0928	g
Peak Displacement	0.00024	0.00067	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Microphone	Linear Weighting
PSPL	0.00225 psi(L) at 0.163 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 629 mv)

Peak Vector Sum 0.215 in/s at 0.025 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 09:22:19 July 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECW4.P70
Job Number:	1		

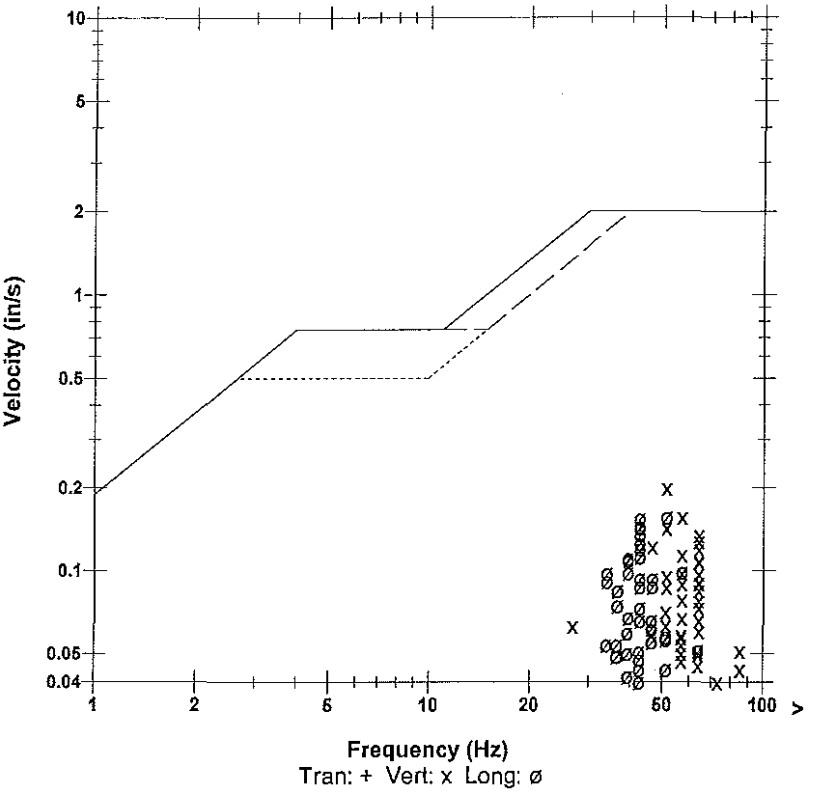
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

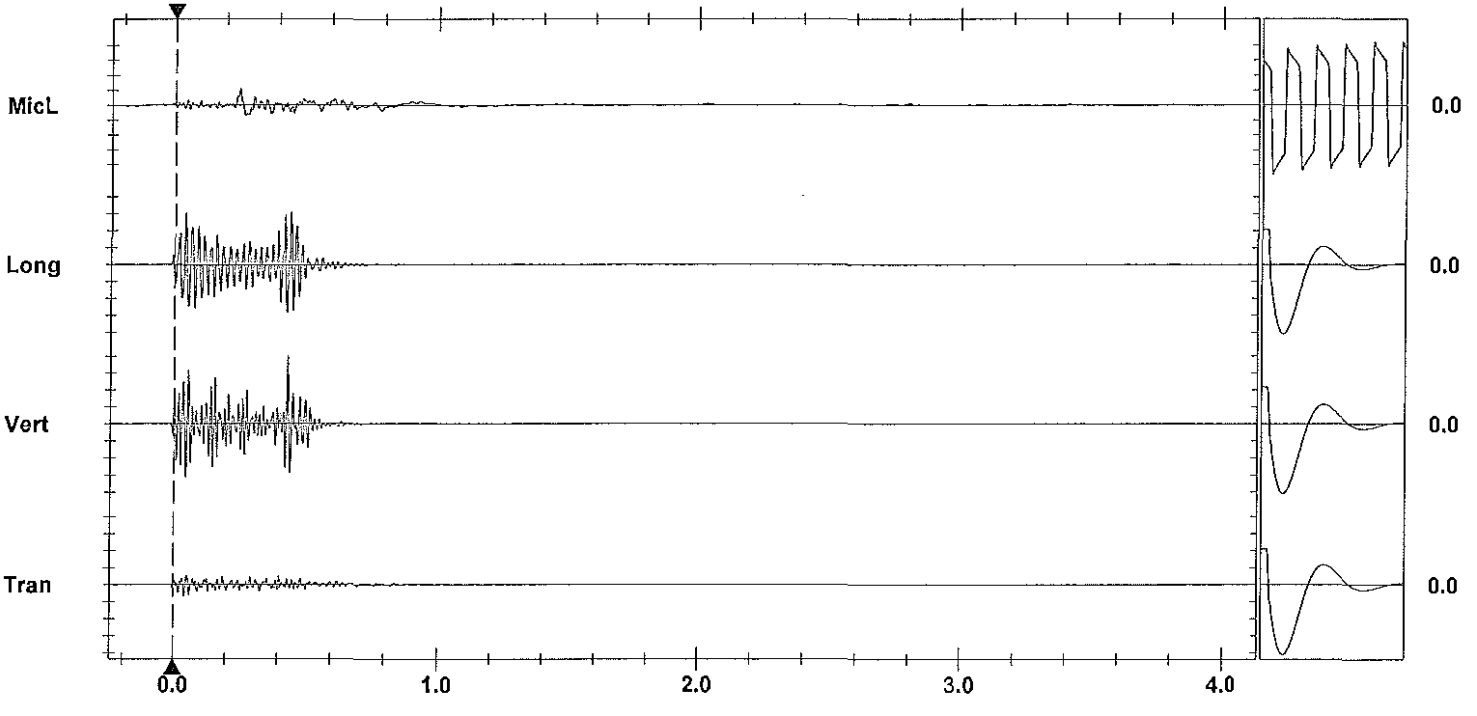
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.247 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 545 mv)

	Tran	Vert	Long	
PPV	0.0337	0.199	0.156	in/s
ZC Freq	57	51	51	Hz
Time (Rel. to Trig)	0.041	0.438	0.043	sec
Peak Acceleration	0.0331	0.167	0.144	g
Peak Displacement	0.00009	0.00057	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.215 in/s at 0.437 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mowhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12 12:14 PM
BLAST # 395

HIGHWAY# 97
BLAST LOCATION AT: STN # 128+50 – 128+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES —
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

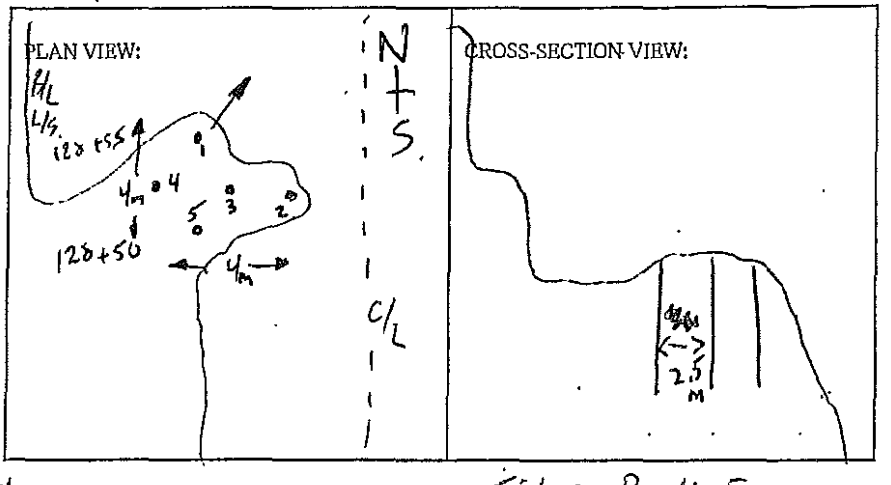
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB-324 CAPACITY 90

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

5 – 7m Elec dets

1½ Anfo

#3 sticks 1½ × 16" UNIMAX

1.5m–2m Toe Load Anfo

Instantel

Event Report

Date/Time	Vert at 12:13:56 July 6, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECWC.N80

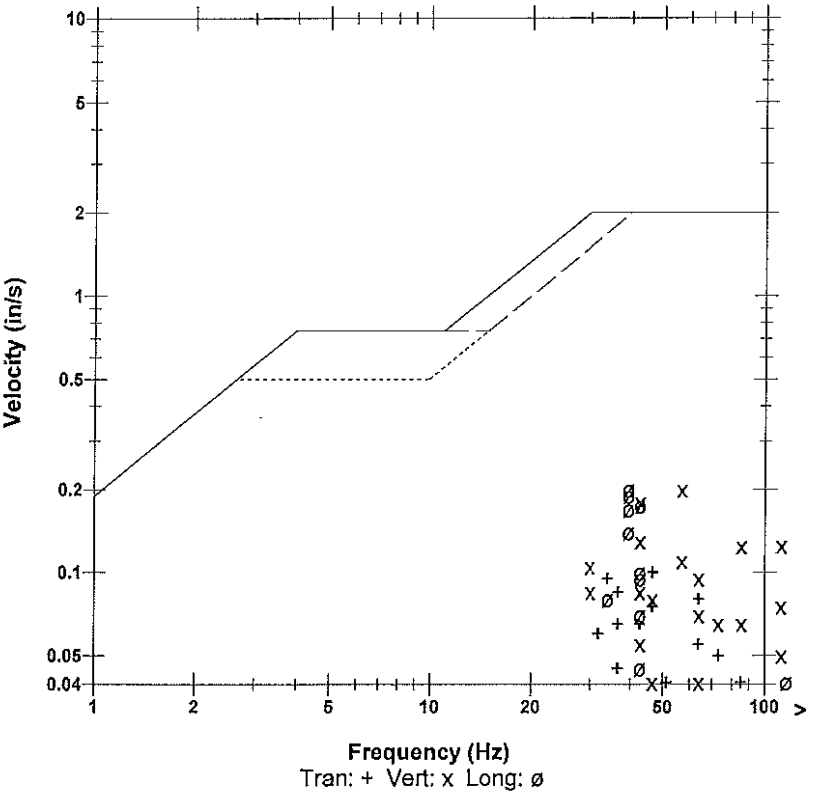
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

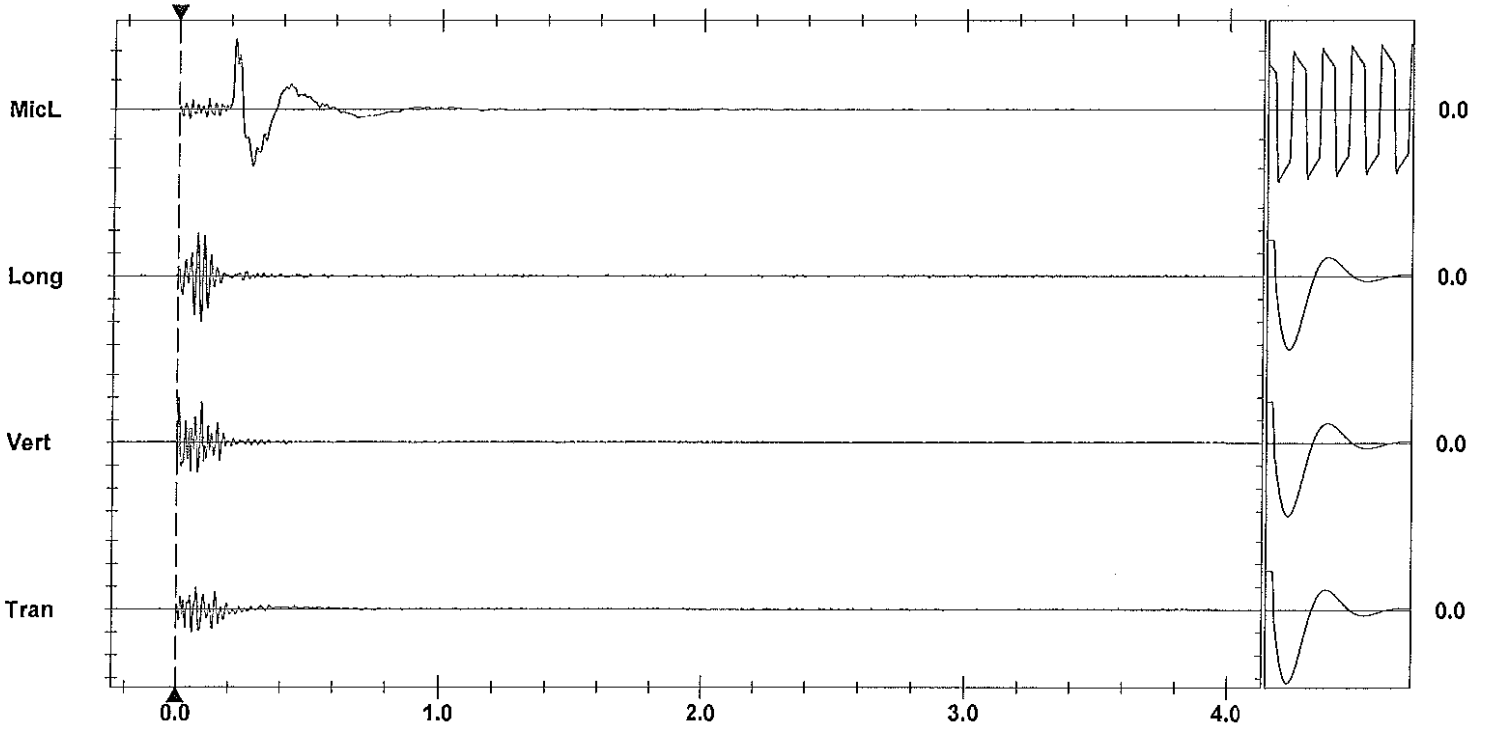
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00479 psi(L) at 0.219 sec			
ZC Freq	9.7 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 506 mv)			

	Tran	Vert	Long	
PPV	0.1000	0.200	0.200	in/s
ZC Freq	47	57	39	Hz
Time (Rel. to Trig)	0.060	0.009	0.087	sec
Peak Acceleration	0.0795	0.239	0.146	g
Peak Displacement	0.00048	0.00063	0.00080	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.222 in/s at 0.087 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

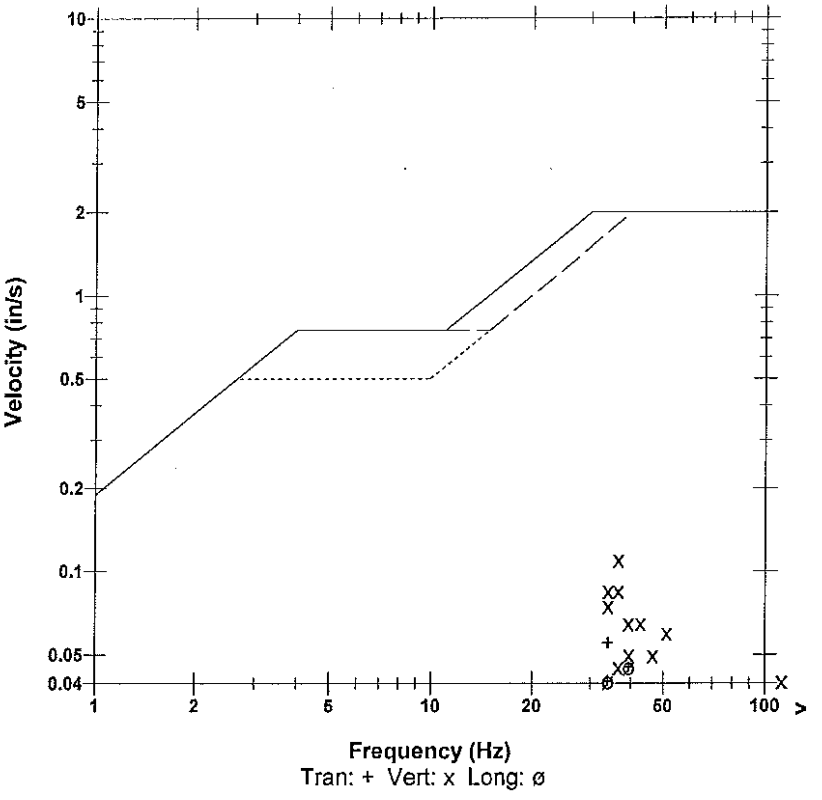
Date/Time	Vert at 12:13:21 July 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECWC.M90

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

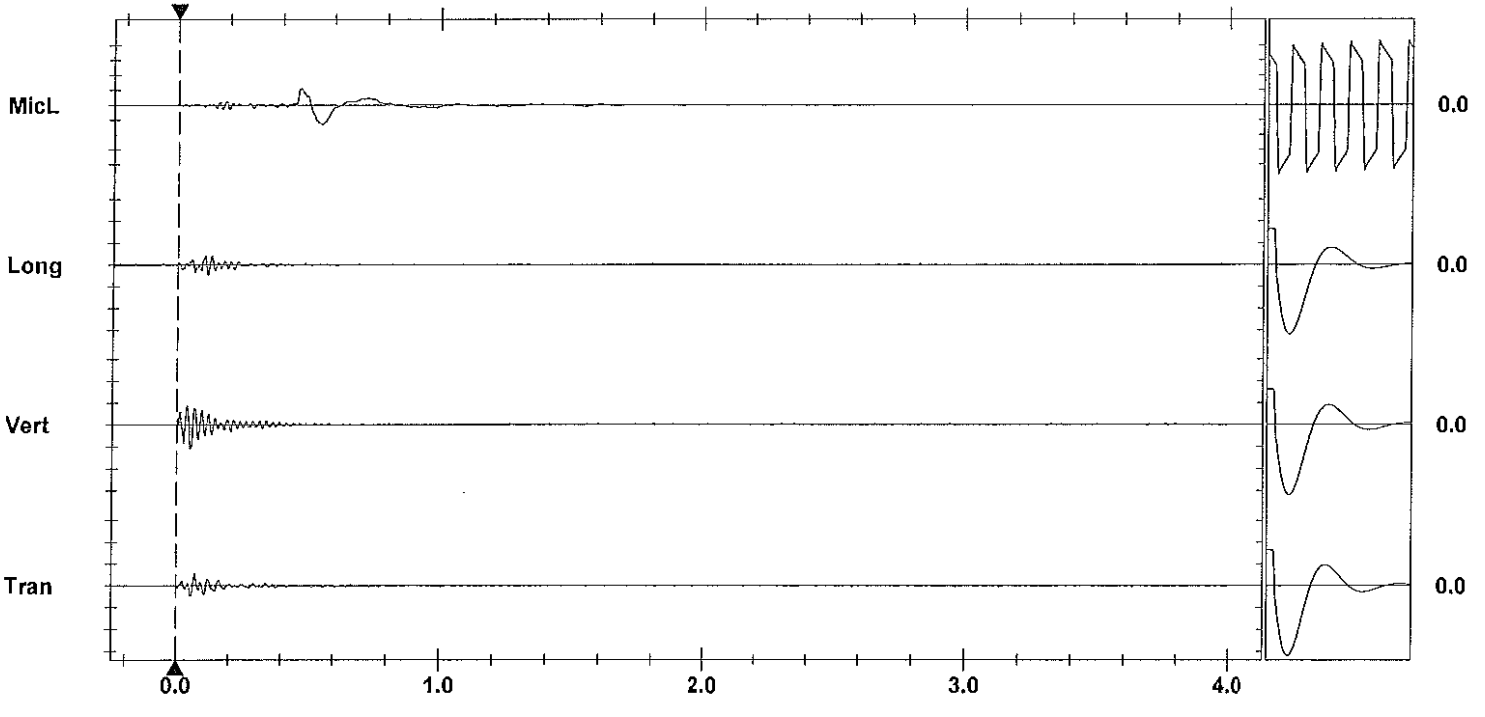
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.550 sec
ZC Freq	4.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 499 mv)

	Tran	Vert	Long	
PPV	0.0550	0.110	0.0450	in/s
ZC Freq	34	37	39	Hz
Time (Rel. to Trig)	0.071	0.051	0.114	sec
Peak Acceleration	0.0398	0.0928	0.0398	g
Peak Displacement	0.00022	0.00052	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.116 in/s at 0.056 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

Date/Time	Tran at 12:14:06 July 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECWC.NI0
Job Number:	1		

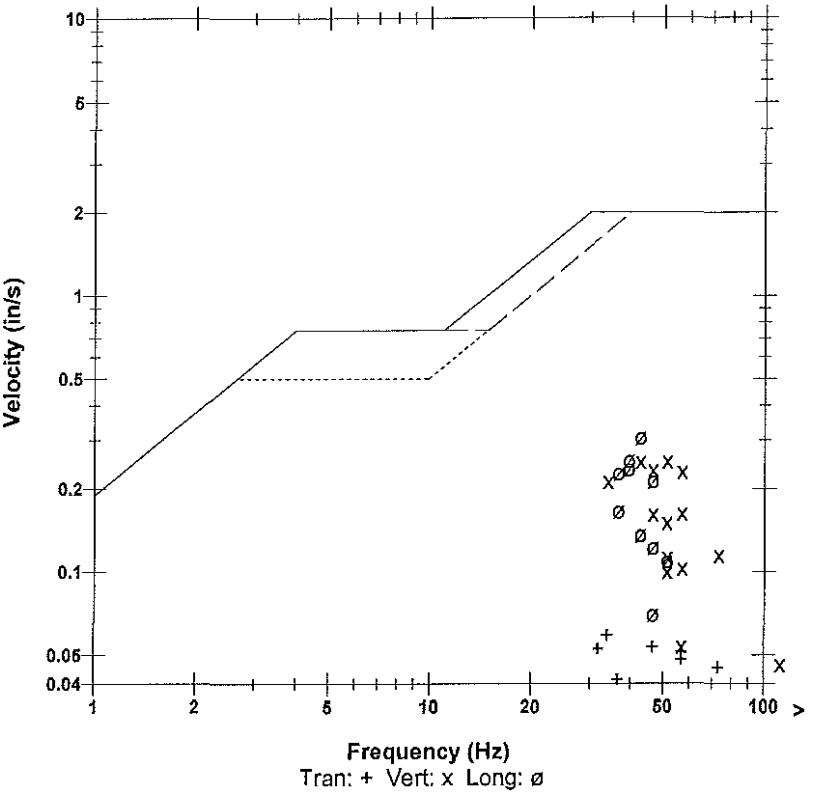
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

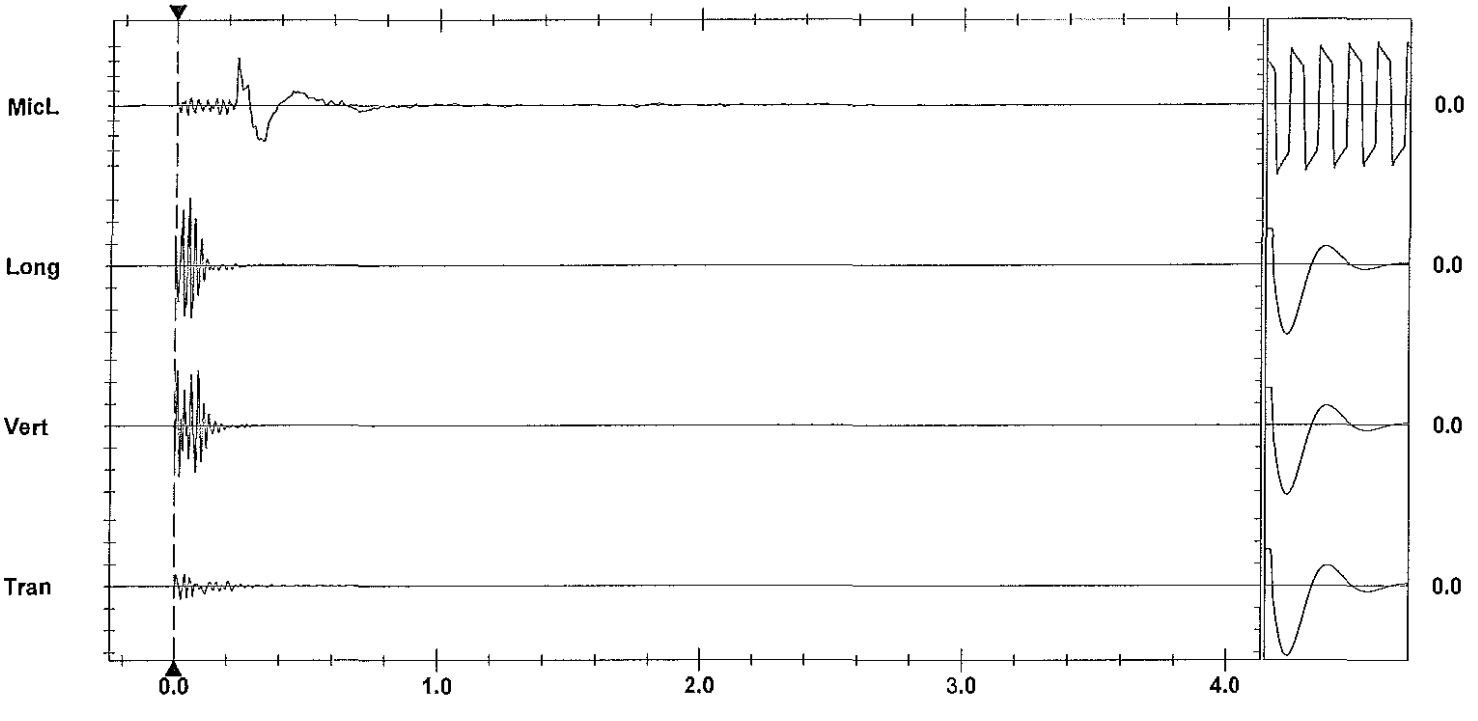
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00319 psi(L) at 0.235 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 510 mv)

	Tran	Vert	Long	
PPV	0.0587	0.252	0.306	in/s
ZC Freq	34	51	43	Hz
Time (Rel. to Trig)	0.024	0.010	0.051	sec
Peak Acceleration	0.0597	0.245	0.194	g
Peak Displacement	0.00027	0.00085	0.00103	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.326 in/s at 0.052 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12 1:35PM
BLAST # 396

HIGHWAY # 97
BLAST LOCATION AT: STN #128+30 - 128+40 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 128 (m)

TOTAL NUMBER OF HOLES 8-B/L/5 Buffer/3 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 120 (kg)
DELAY TYPE AND LENGTH 25 (ms)

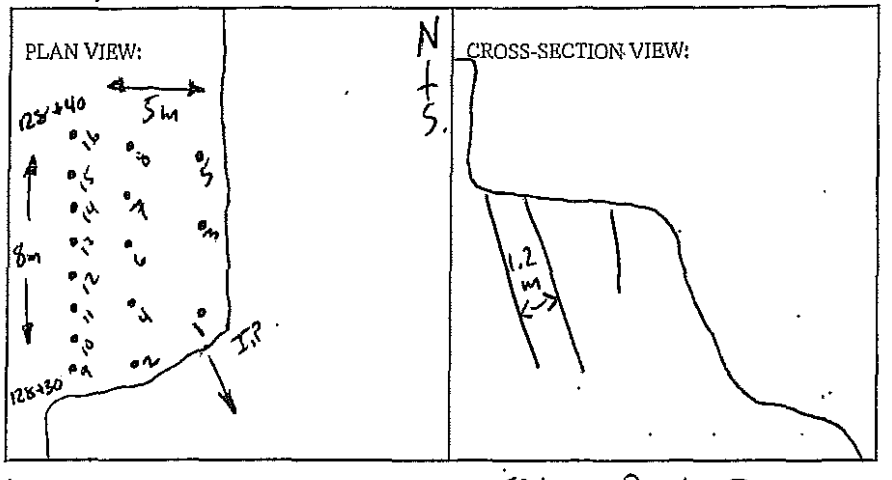
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) [redacted] initiation of [redacted] system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 320 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

11 – 4.5m Elec.
5 – 12m Elec.
8 sticks 2" x16' unimax
8 sticks 2" x16" blastex
4 – sticks 1½" x16 Unimax
1 – WR
3 – bags Anfo

3m Toe load Anfo in Buffer
prod. 1' Toe load Anfo

Instantel

Event Report

Date/Time	Vert at 13:35:30 July 6, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECWG.F60

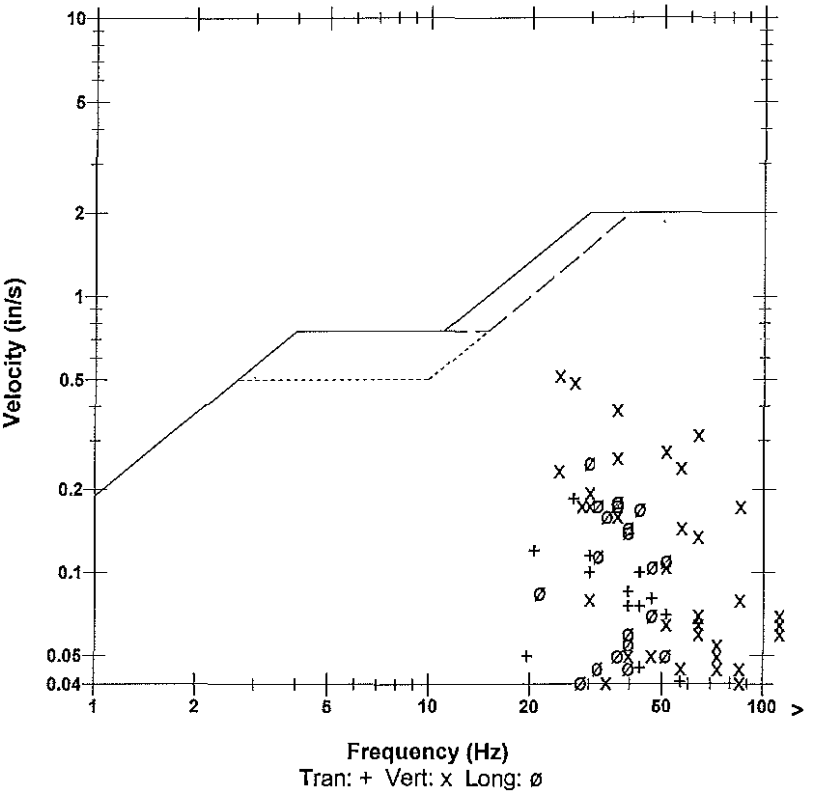
Notes
Location:13050 entance Old Mission Rd on concrete slab north behind house

General:james m

Extended Notes

Post Event Notes

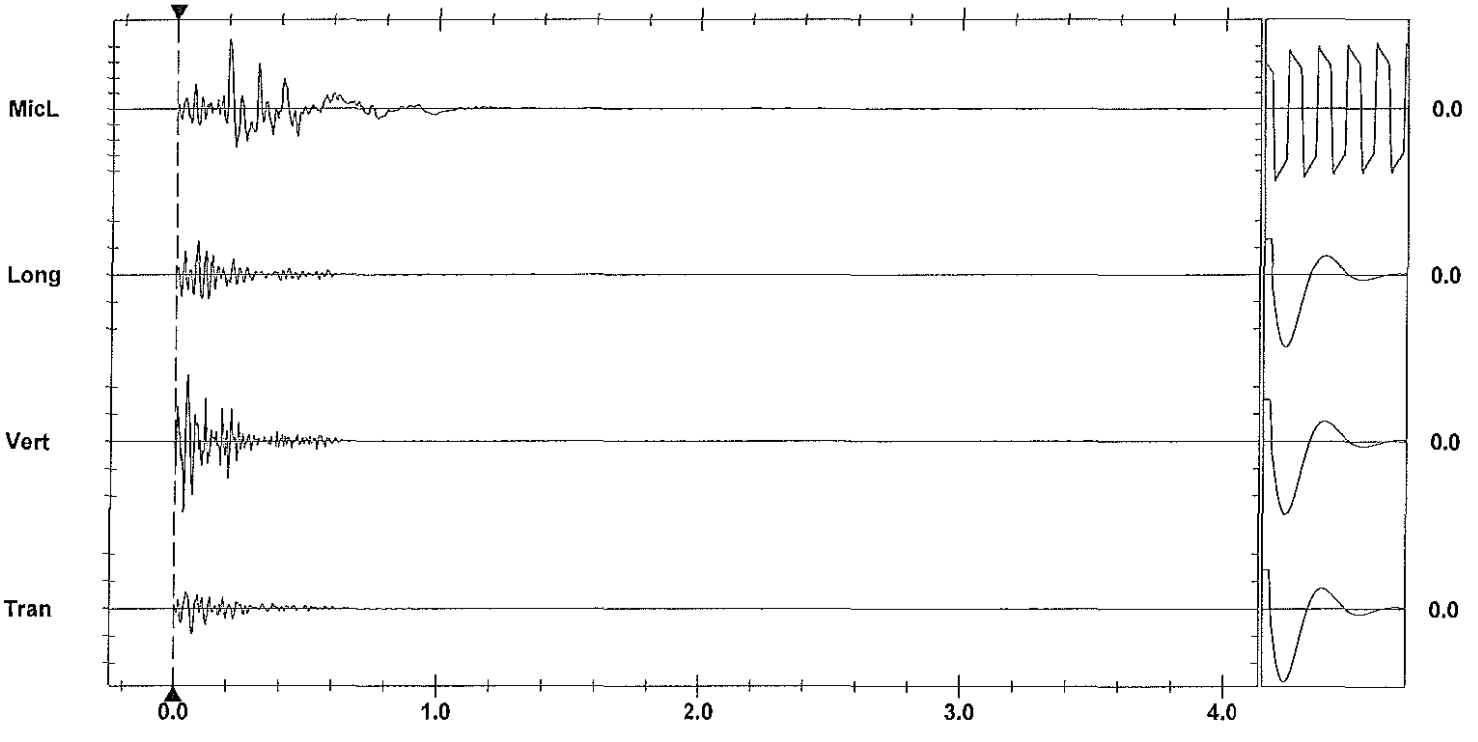
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.185	0.520	0.250	in/s
ZC Freq	27	24	30	Hz
Time (Rel. to Trig)	0.069	0.033	0.079	sec
Peak Acceleration	0.0928	0.305	0.133	g
Peak Displacement	0.00102	0.00264	0.00126	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Microphone Linear Weighting
PSPL 0.00446 psi(L) at 0.202 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 524 mv)

Peak Vector Sum 0.540 in/s at 0.033 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:34:55 July 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ECWG.E70

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

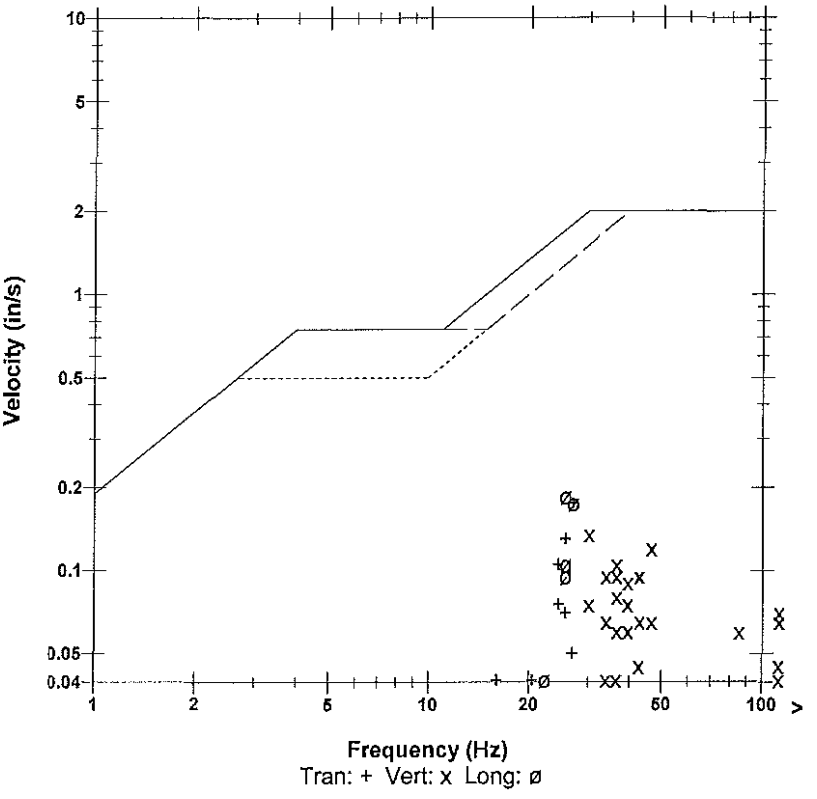
Extended Notes

Post Event Notes

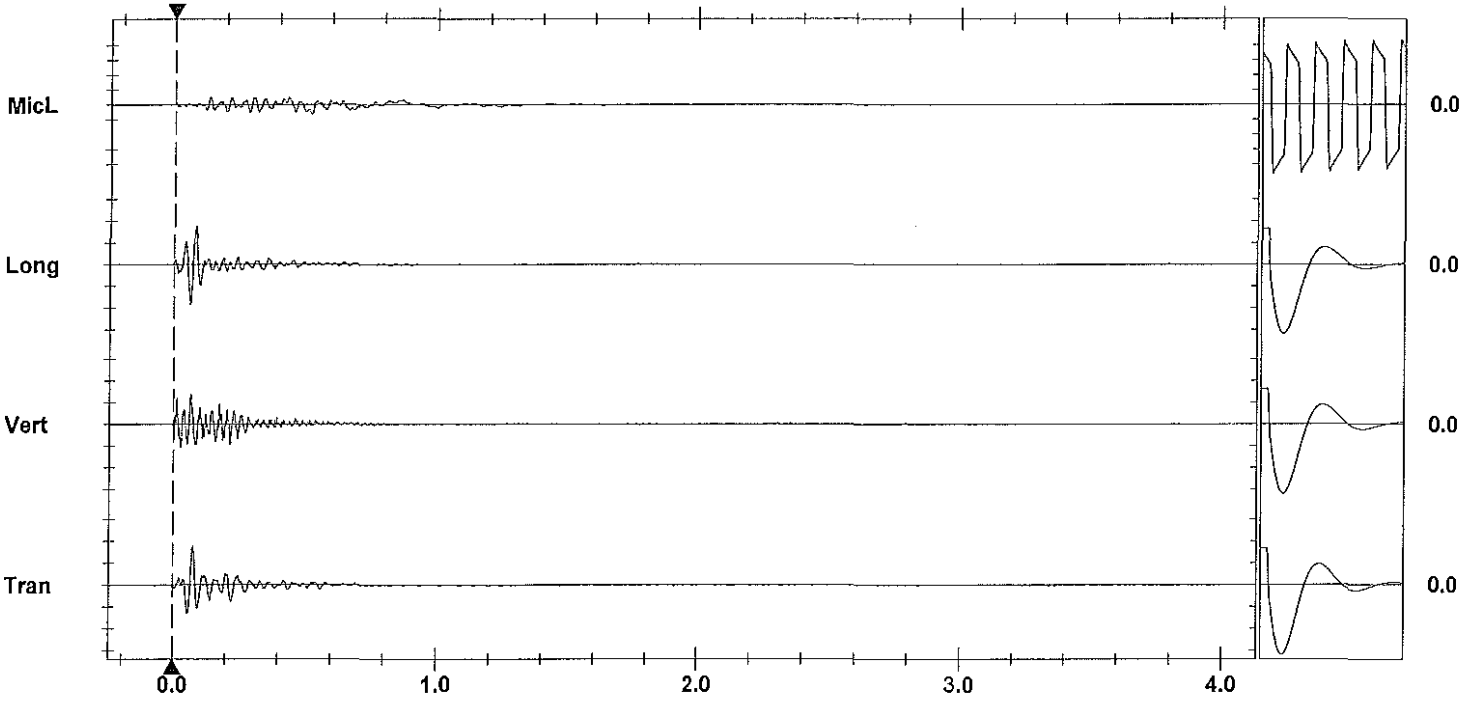
Microphone Linear Weighting
PSPL 0.00065 psi(L) at 0.521 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 453 mv)

	Tran	Vert	Long	
PPV	0.175	0.135	0.185	in/s
ZC Freq	27	30	26	Hz
Time (Rel. to Trig)	0.076	0.065	0.063	sec
Peak Acceleration	0.0795	0.133	0.0795	g
Peak Displacement	0.00102	0.00063	0.00108	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.4	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

USBM RI8507 And OSMRE



Peak Vector Sum 0.234 in/s at 0.080 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

Date/Time	Vert at 13:35:40 July 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECWG.FG0
Job Number:	1		

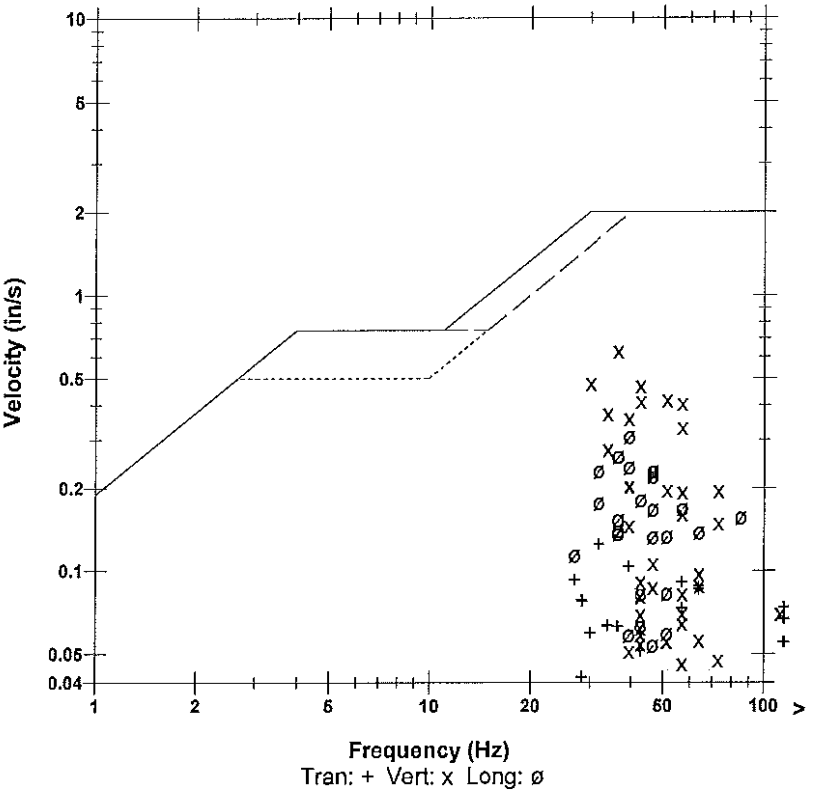
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

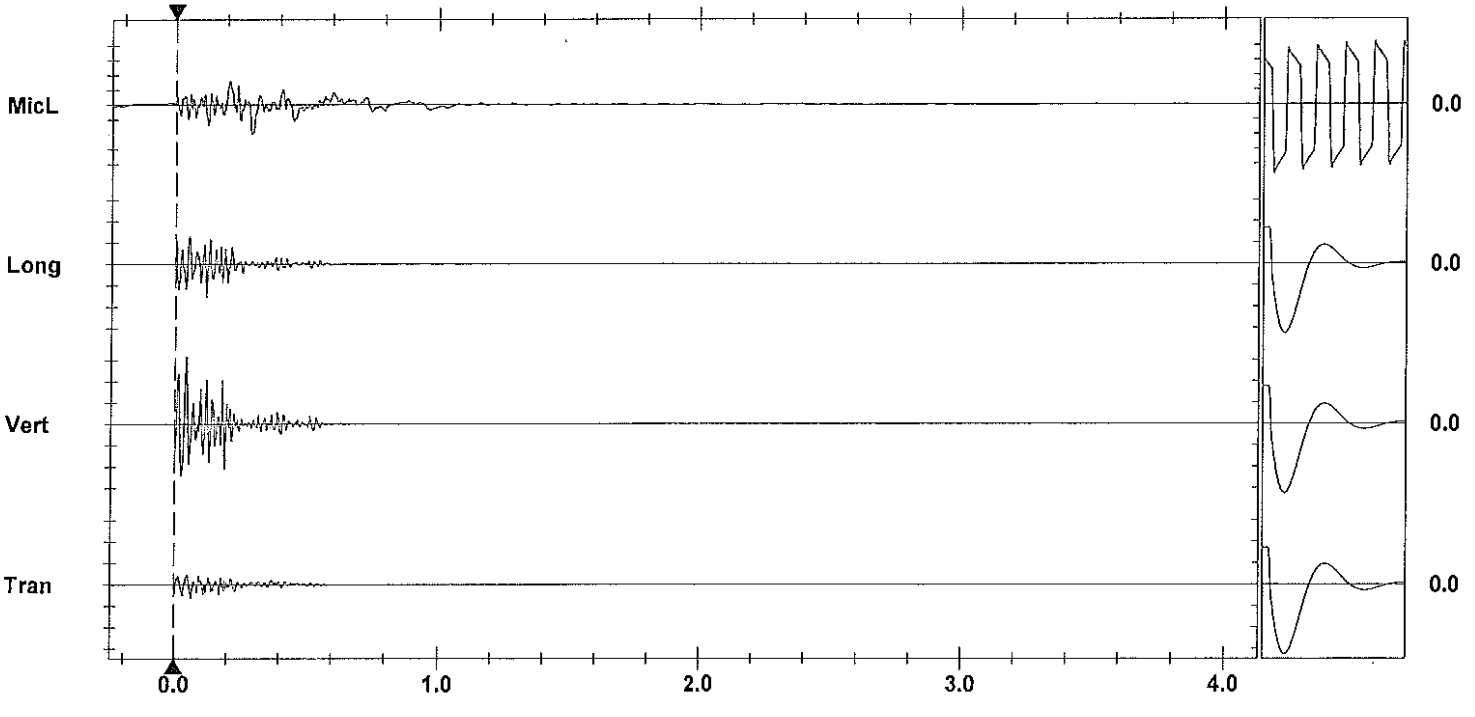
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00199 psi(L) at 0.289 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 487 mv)

	Tran	Vert	Long	
PPV	0.125	0.629	0.309	in/s
ZC Freq	32	37	39	Hz
Time (Rel. to Trig)	0.063	0.042	0.116	sec
Peak Acceleration	0.123	0.406	0.317	g
Peak Displacement	0.00050	0.00261	0.00123	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.650 in/s at 0.042 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED July 6/12
ACTUAL BLAST DATE July 6/12 3:40PM
BLAST # 397

HIGHWAY # 97
BLAST LOCATION AT: STN # 128+40 - 128+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 112 (m)

TOTAL NUMBER OF HOLES 7 BL / 4 Buffer / 3 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 110 (kg)
DELAY TYPE AND LENGTH 25 (ms)

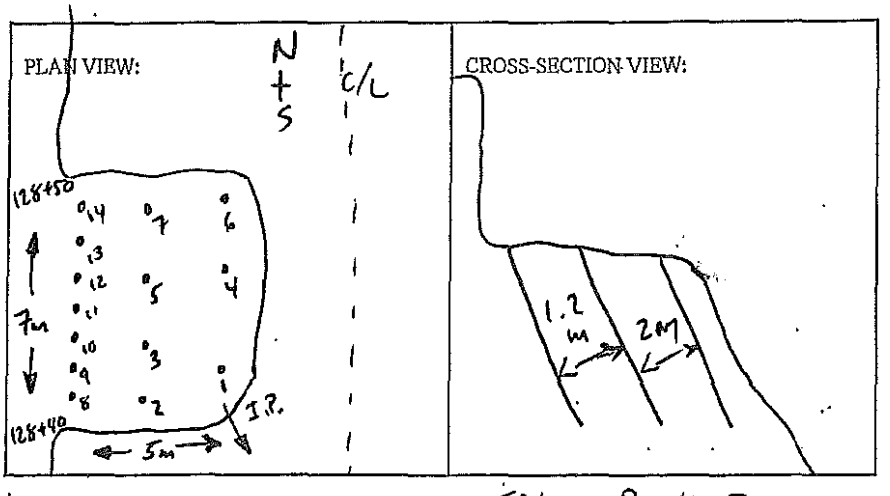
INITIATION DEVICE: (CIRCLE) (C.R. CAPS) SAFETY FUSE OTHER (SPECIFY) [redacted] initiation system
BLASTING MACHINE: TYPE HB 320 CAPACITY 90

VOLUME OF ROCK BLASTED 280. (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

7 - 4.5m Bleedel

7 - 12m dets.

7 sticks 2"x16" unimax

4 sticks 1 1/2 x16 unimax

1 - WR.

3 Anfo.

3m Toe load Anfo in Buffer

1' Toe load Anfo in prod STAB

Instantel

Event Report

Date/Time	Vert at 15:40:11 July 6, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ECWM.6Z0

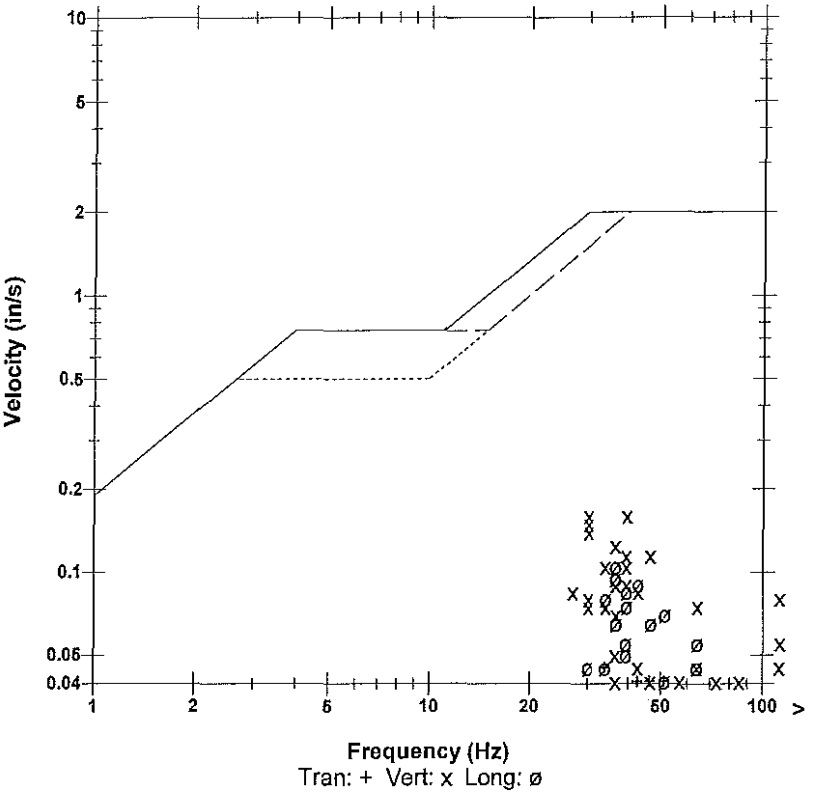
Notes
Location:13050 Old Mission Rd on concrete slab north entance behind house

General:james m

Extended Notes

Post Event Notes

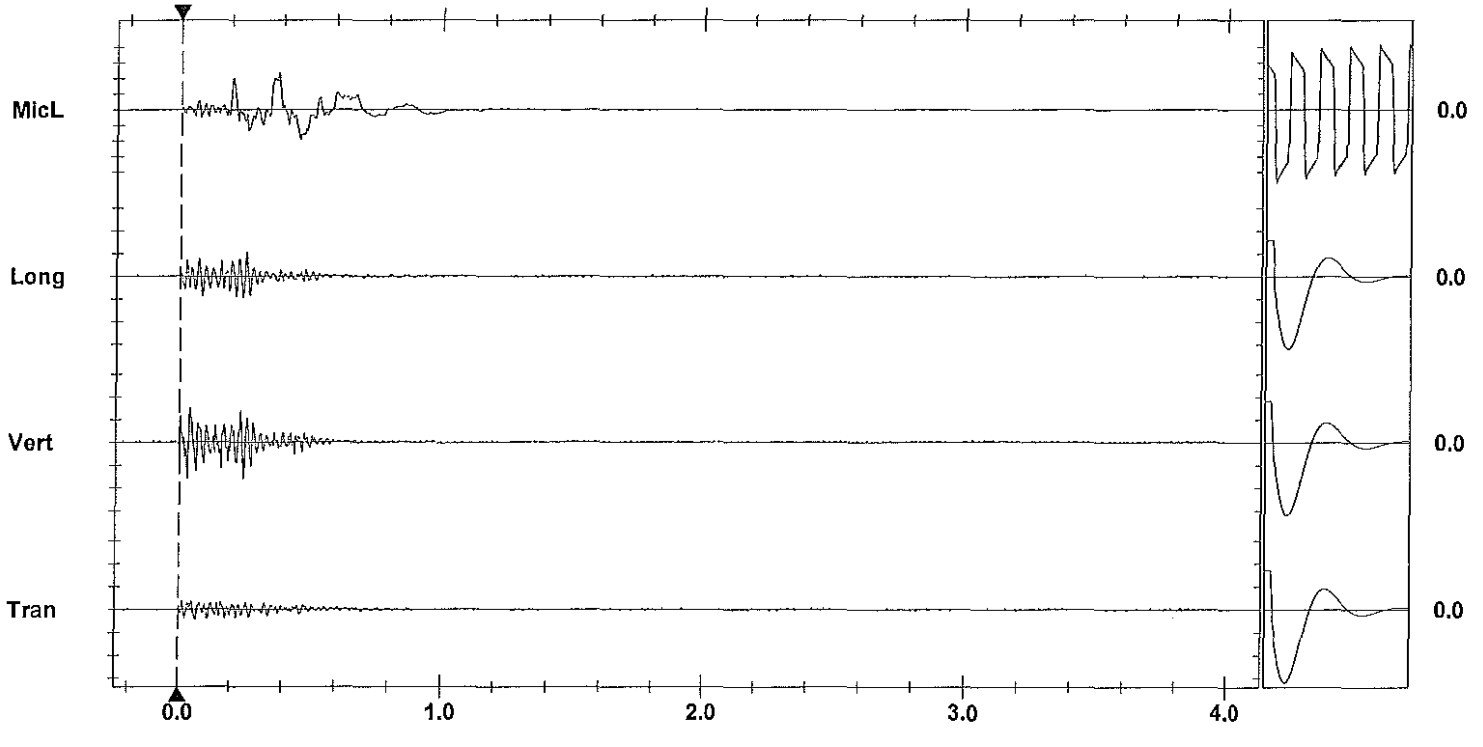
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0450	0.160	0.105	in/s
ZC Freq	34	30	37	Hz
Time (Rel. to Trig)	0.062	0.029	0.260	sec
Peak Acceleration	0.0398	0.172	0.0663	g
Peak Displacement	0.00021	0.00072	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Microphone Linear Weighting
PSPL 0.00232 psi(L) at 0.378 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 508 mv)

Peak Vector Sum 0.175 in/s at 0.250 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Event Report

Date/Time	Vert at 15:40:21 July 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ECWM.790
Job Number:	1		

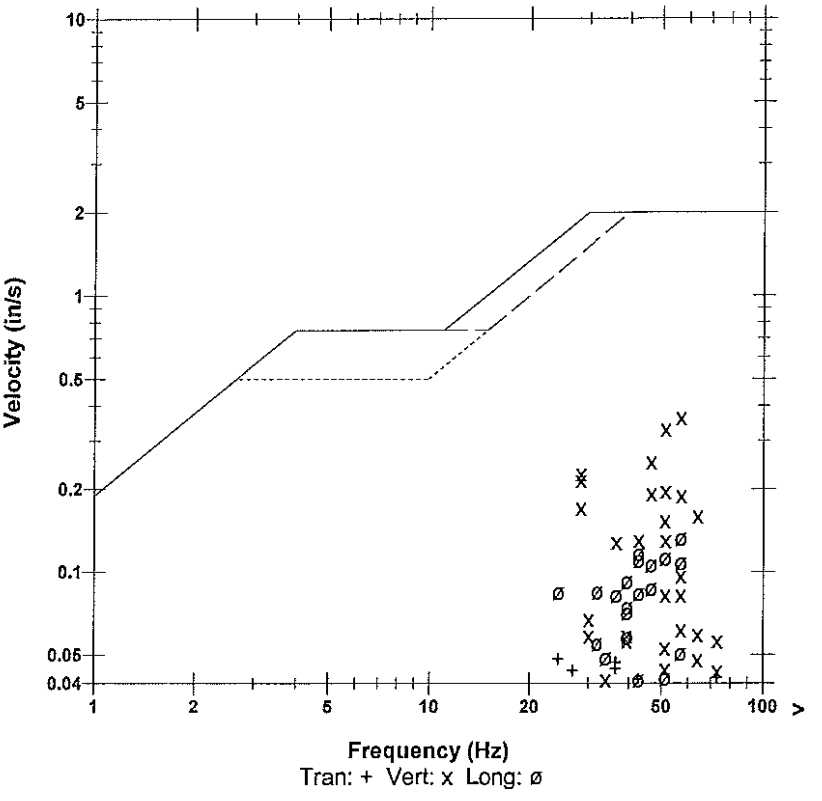
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

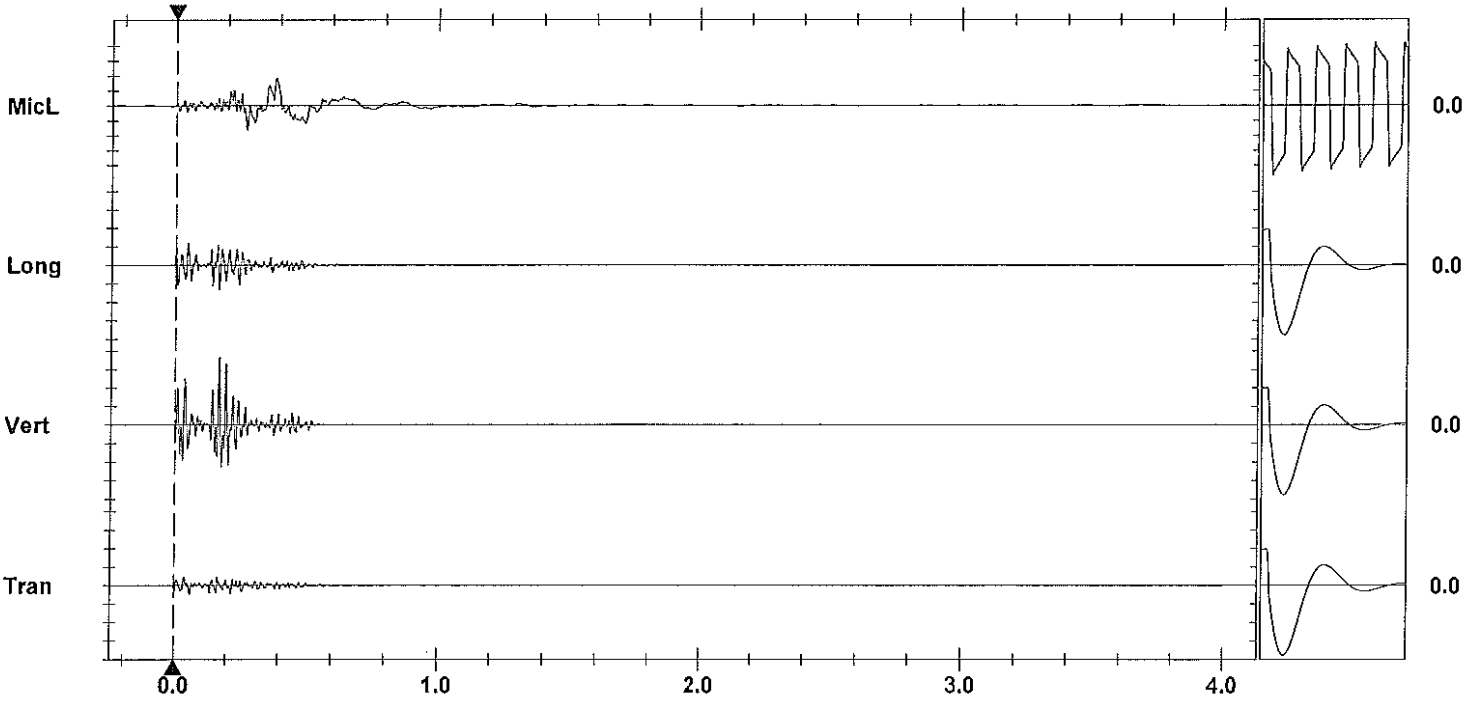
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00185 psi(L) at 0.384 sec
ZC Freq	8.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 514 mv)

	Tran	Vert	Long	
PPV	0.0481	0.364	0.132	in/s
ZC Freq	24	57	57	Hz
Time (Rel. to Trig)	0.219	0.171	0.167	sec
Peak Acceleration	0.0530	0.321	0.154	g
Peak Displacement	0.00018	0.00104	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.376 in/s at 0.171 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21377-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 9/12
ACTUAL BLAST DATE July 9/12 2:19 PM
BLAST # HWY-0277

HIGHWAY# 97
BLAST LOCATION AT: 128+38 - 128+44 c/l to (Bulgamak)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* Shot metted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 69 (m)

TOTAL NUMBER OF HOLES 21 Peod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 3 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

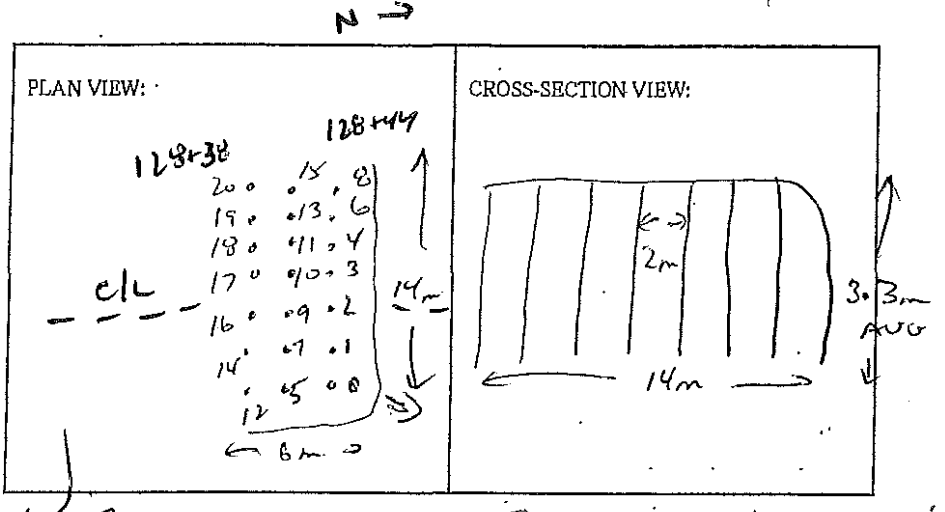
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 278 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.52ips/ 32Hz
" @ 13167 Cliffstone ct - 0.14ips/ 39Hz
" @ 13093 Cliffstone ct - 0.34ips/ 57Hz

3'-6' and Hole + 0.5 each 1½"x18" Dynamite Primer

Instantel

Event Report

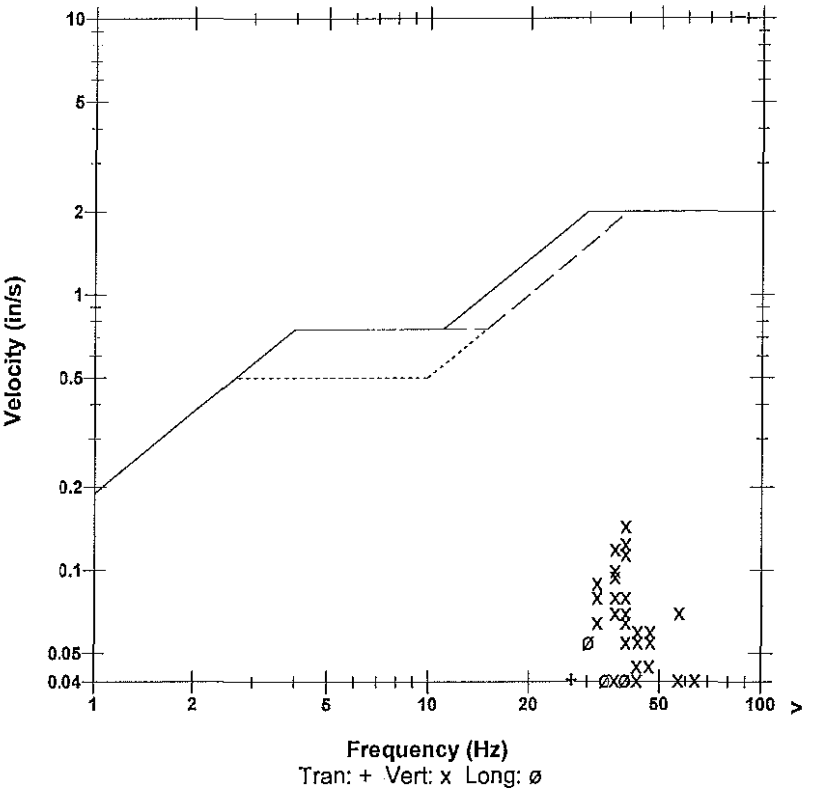
Date/Time	Vert at 14:19:26 July 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED22.GE0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

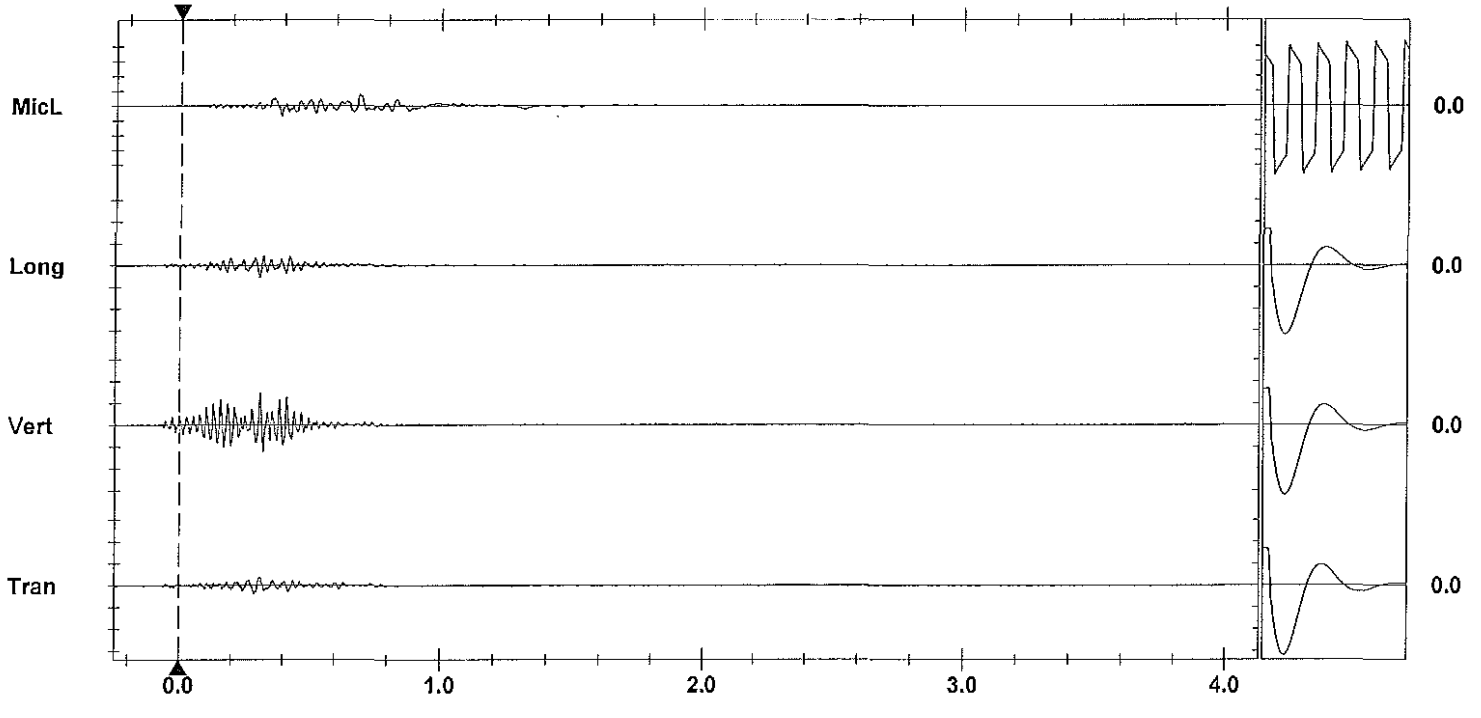
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0400	0.145	0.0550	in/s
ZC Freq	27	39	30	Hz
Time (Rel. to Trig)	0.290	0.312	0.309	sec
Peak Acceleration	0.0265	0.0928	0.0398	g
Peak Displacement	0.00024	0.00054	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Microphone Linear Weighting
PSPL 0.00076 psi(L) at 0.688 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 528 mv)

Peak Vector Sum 0.154 in/s at 0.312 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:20:14 July 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED22.HQ0
Job Number:	1		

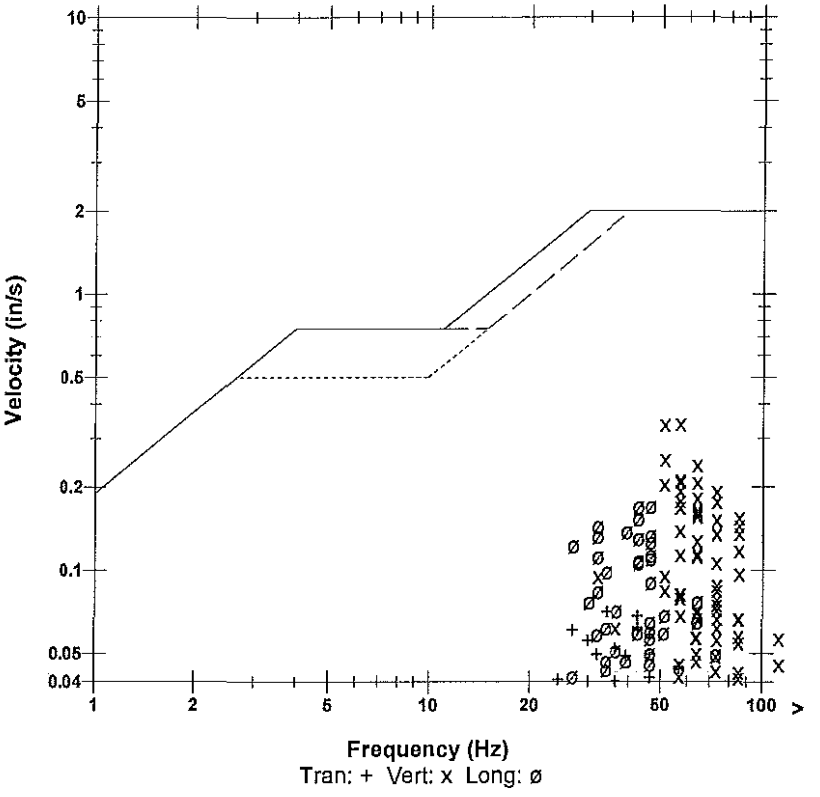
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

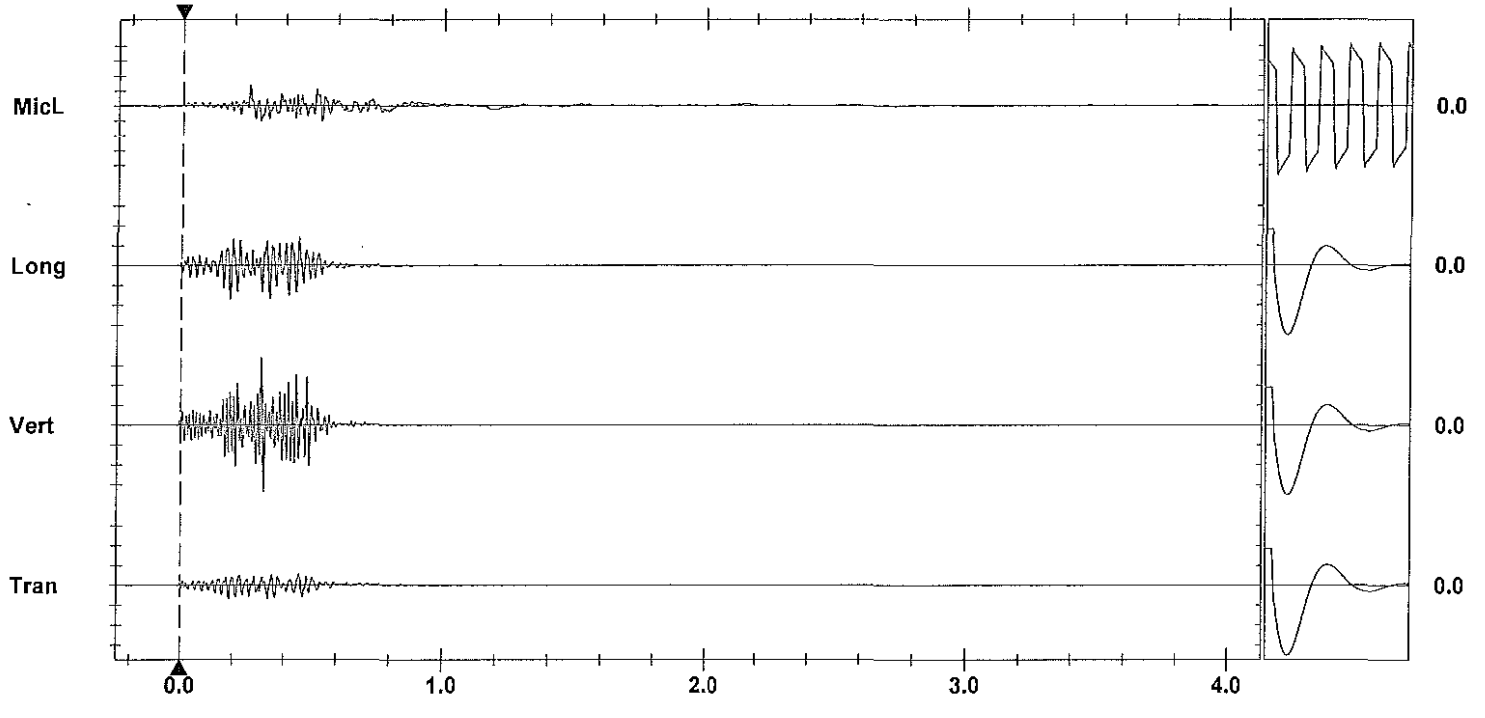
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00138 psi(L) at 0.260 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 468 mv)

	Tran	Vert	Long	
PPV	0.0706	0.339	0.170	in/s
ZC Freq	34	57	47	Hz
Time (Rel. to Trig)	0.340	0.313	0.189	sec
Peak Acceleration	0.0580	0.355	0.136	g
Peak Displacement	0.00029	0.00099	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.4	3.5	3.7	

Peak Vector Sum 0.365 in/s at 0.313 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:20:04 July 9, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED22.HG0

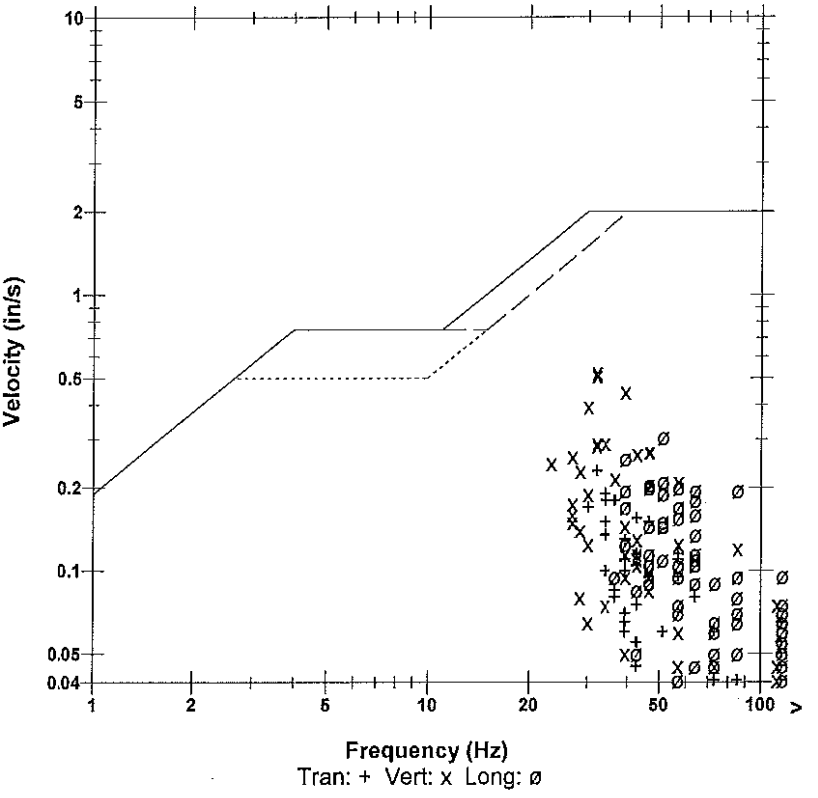
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

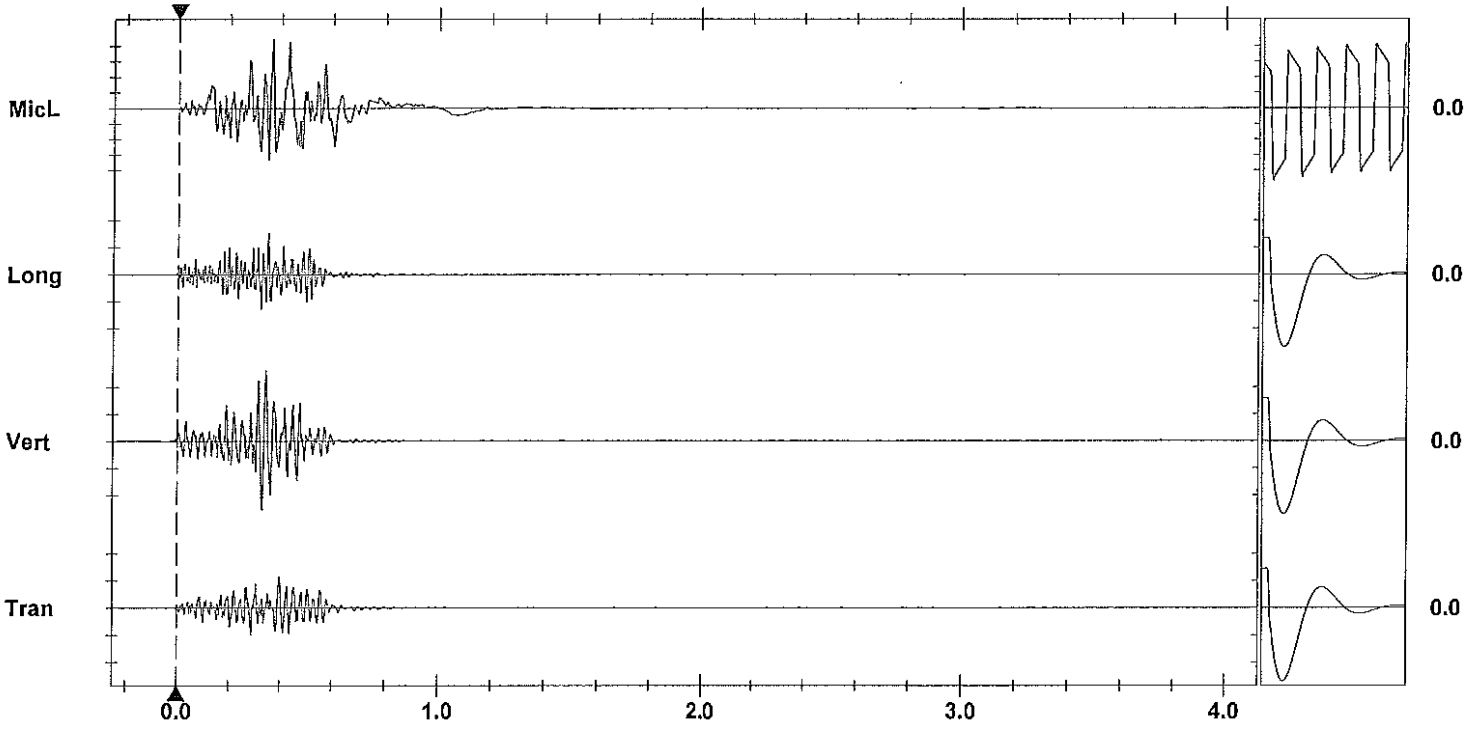
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00446 psi(L) at 0.364 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 493 mv)

	Tran	Vert	Long	
PPV	0.230	0.525	0.305	in/s
ZC Freq	32	32	51	Hz
Time (Rel. to Trig)	0.398	0.343	0.351	sec
Peak Acceleration	0.212	0.345	0.305	g
Peak Displacement	0.00103	0.00250	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.556 in/s at 0.343 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 16, 2012 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Jul 9/12
ACTUAL BLAST DATE Jul 9/12 4:28 PM
BLAST # MW-0278

HIGHWAY# 97
BLAST LOCATION AT: STN 128+32 - 128+38 c/l (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 20 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 105 (kg)
DELAY TYPE AND LENGTH 25 (ms)

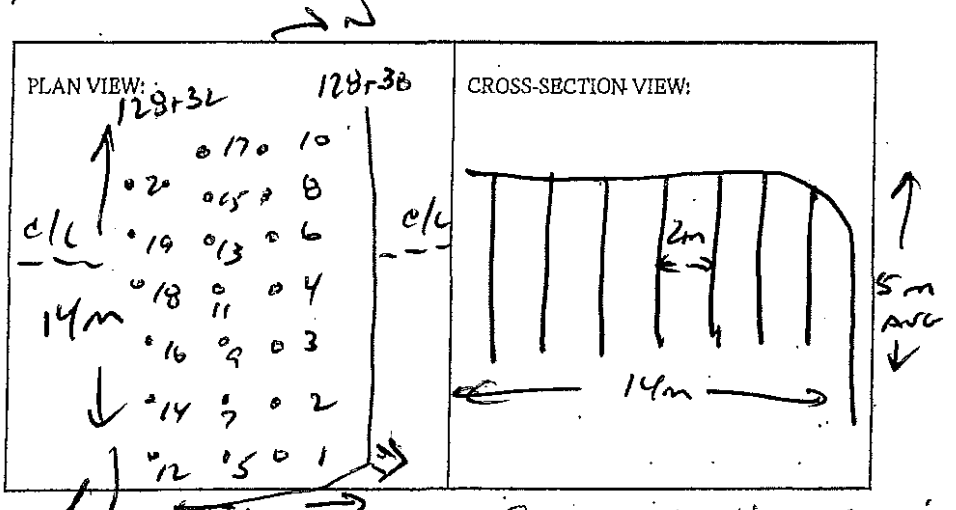
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.35 ips / 34 Hz
" @ 13167 Cliffstone Crt - 0.12 ips / 5 Hz
" @ 13093 Cliffstone Crt - 0.21 ips / 5 Hz

5'-7' AMBO HAUCG + 0.5 ANLT 1/L

Instantel

Event Report

Date/Time	Vert at 16:28:51 July 9, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED28.G30

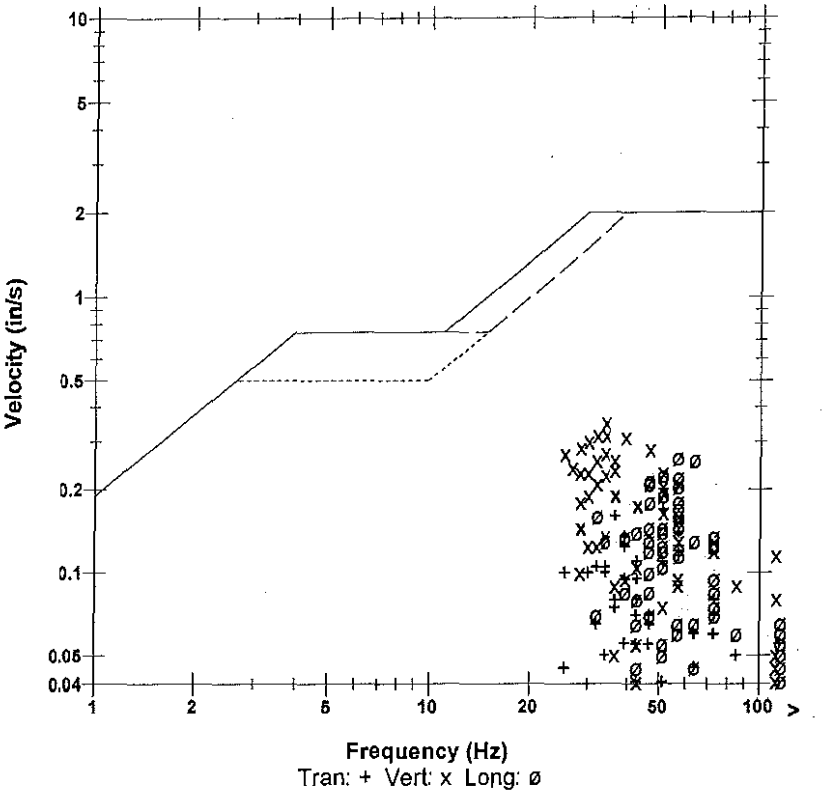
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

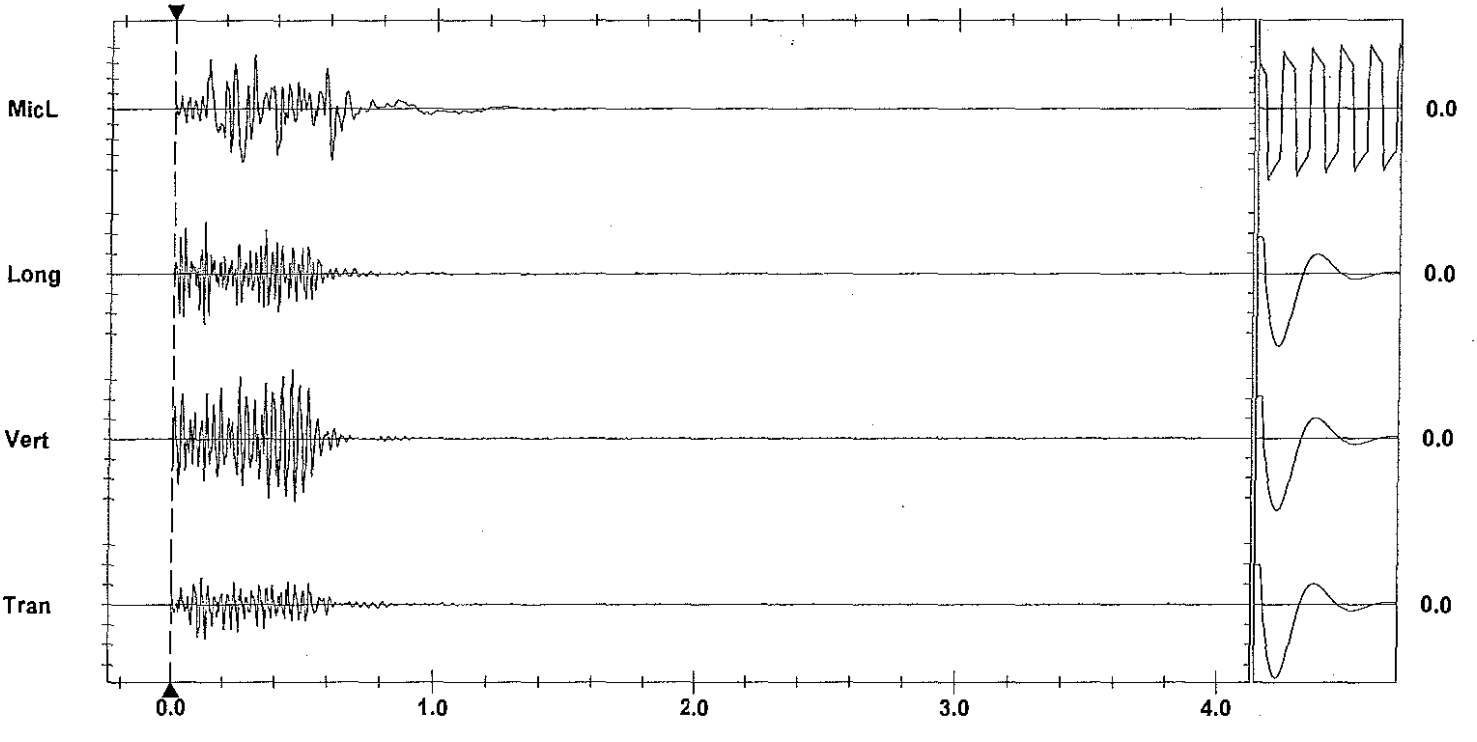
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00352 psi(L) at 0.263 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 523 mv)

	Tran	Vert	Long	
PPV	0.170	0.350	0.260	in/s
ZC Freq	51	34	57	Hz
Time (Rel. to Trig)	0.131	0.460	0.124	sec
Peak Acceleration	0.172	0.212	0.292	g
Peak Displacement	0.00072	0.00149	0.00071	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.376 in/s at 0.460 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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Instantel

Event Report

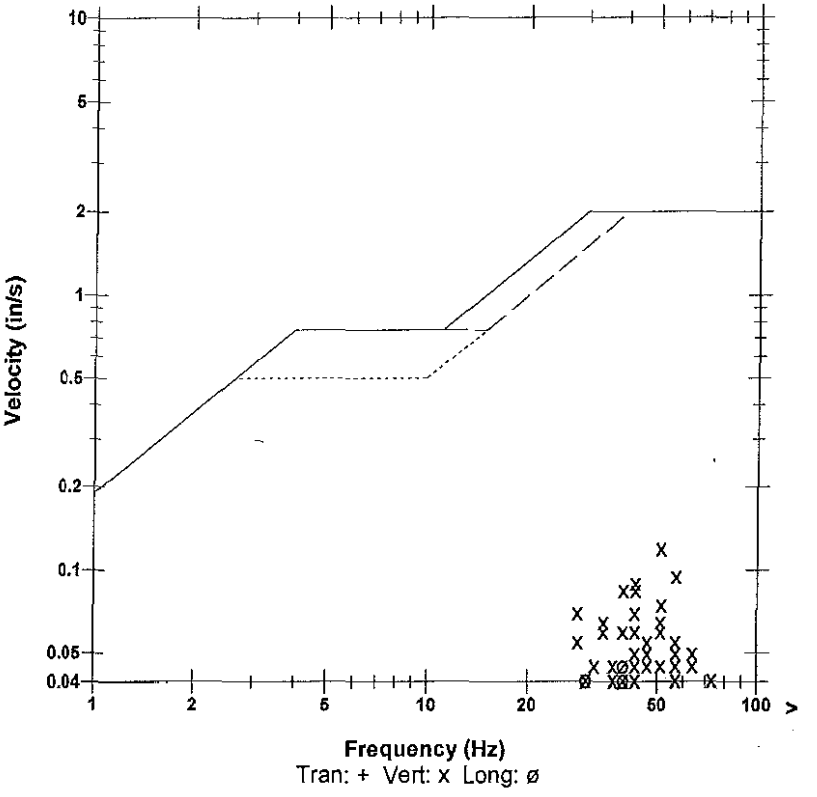
Date/Time	Vert at 16:28:13 July 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED28.F10

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

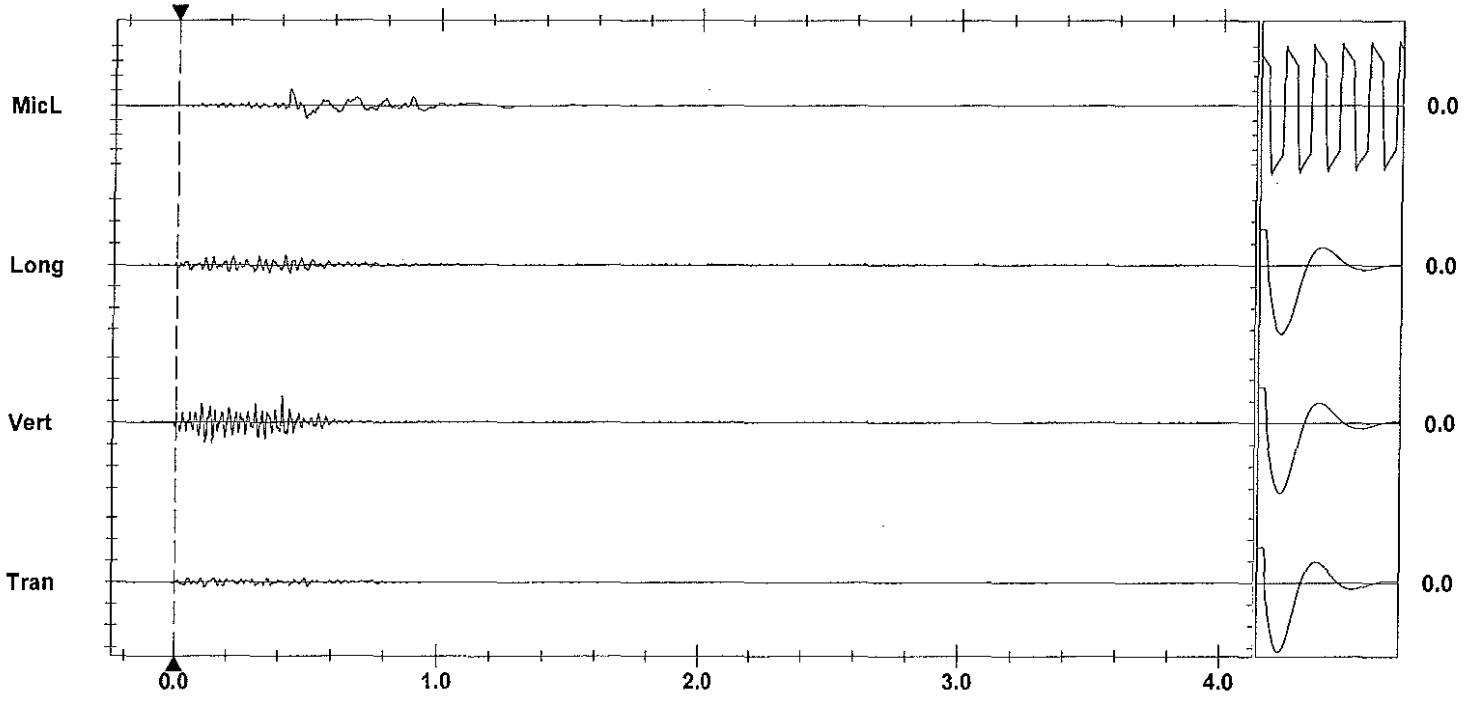
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at 0.434 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 516 mv)

	Tran	Vert	Long	
PPV	0.0250	0.120	0.0450	in/s
ZC Freq	37	51	39	Hz
Time (Rel. to Trig)	0.119	0.411	0.419	sec
Peak Acceleration	0.0265	0.0928	0.0265	g
Peak Displacement	0.00011	0.00036	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Peak Vector Sum 0.120 in/s at 0.411 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

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Event Report

Date/Time	Vert at 16:29:01 July 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED28.GD0
Job Number:	1		

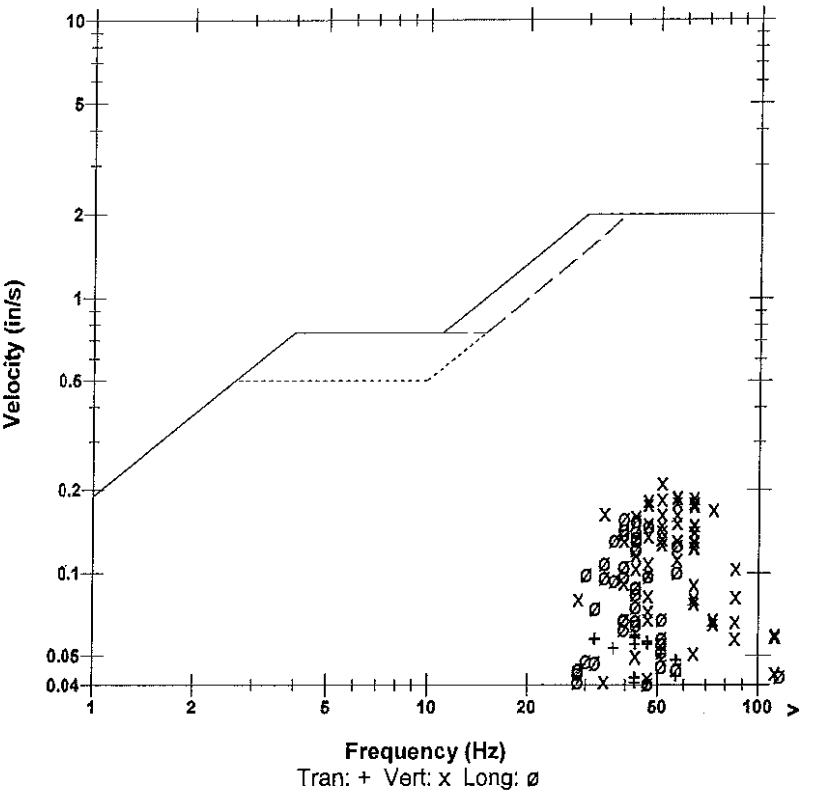
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

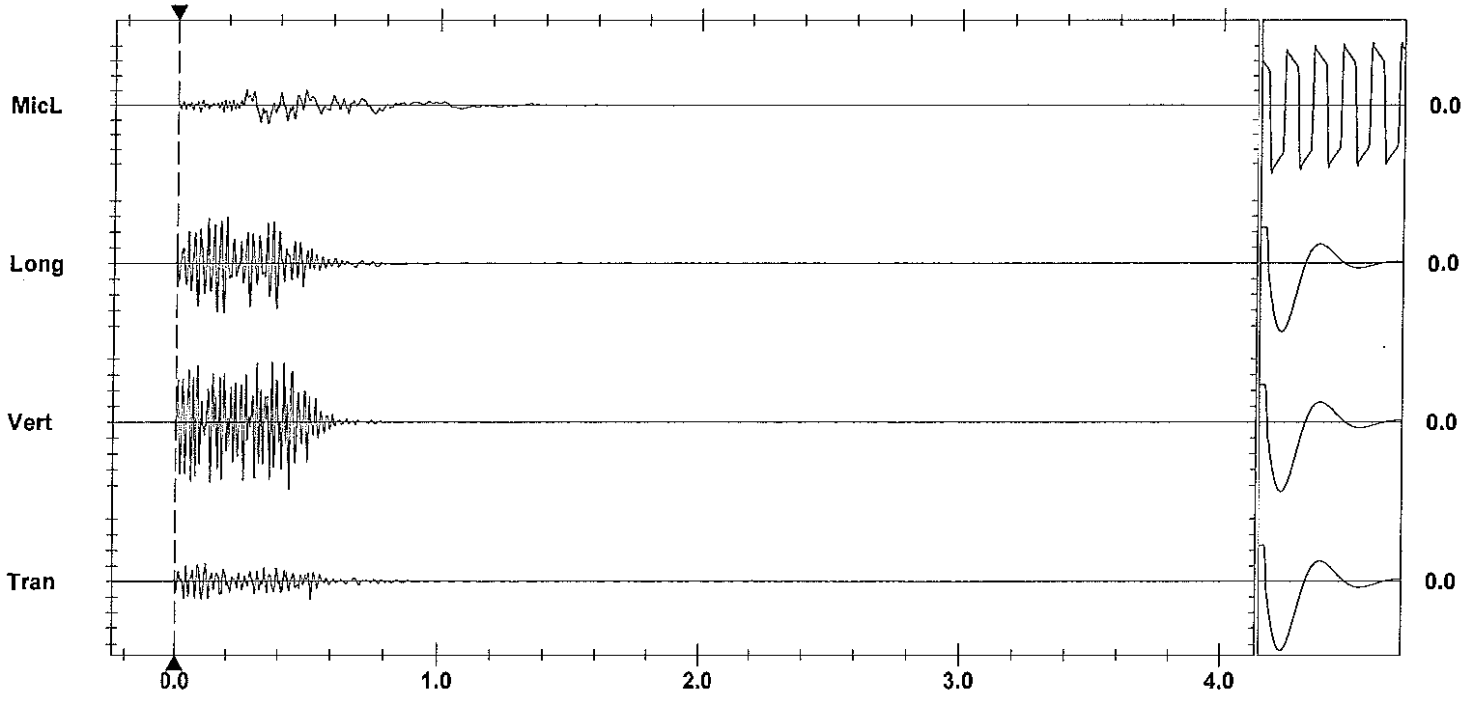
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.350 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 527 mv)

	Tran	Vert	Long	
PPV	0.0594	0.212	0.157	in/s
ZC Freq	43	51	39	Hz
Time (Rel. to Trig)	0.526	0.440	0.184	sec
Peak Acceleration	0.0497	0.229	0.126	g
Peak Displacement	0.00026	0.00066	0.00061	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.4	3.5	3.7	

Peak Vector Sum 0.225 in/s at 0.375 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Jun/12
ACTUAL BLAST DATE Jun/12 10:18 AM
BLAST # MW-0279

HIGHWAY# 97
BLAST LOCATION AT: 127+85 - 128+01 C/L (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot matted.

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 36 (m)

TOTAL NUMBER OF HOLES 18 Peod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) ~~BURDEN~~ 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

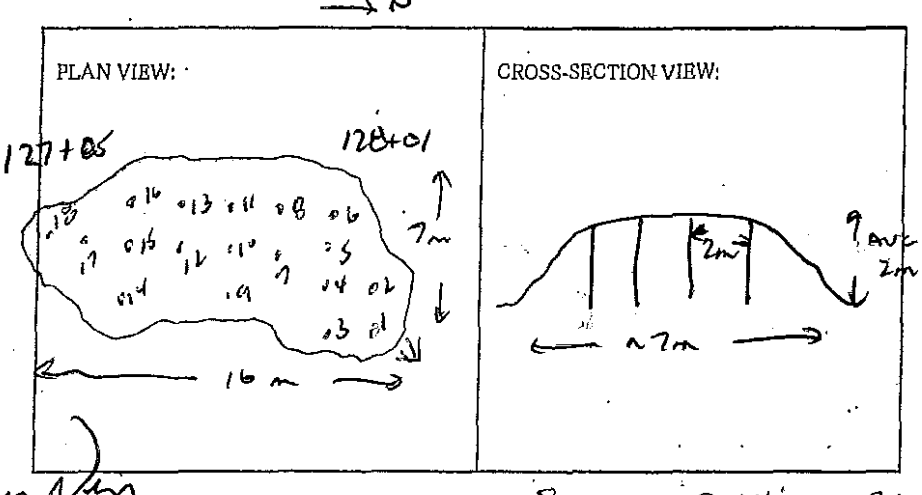
EXPLOSIVE SIZE 60 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs 13050 Old Mission Rd - 0.090 ips / 39 Hz
" @ 13167 Cliffstone Crt. No trigger (< 0.04 ips)
" @ 13093 Cliffstone Crt - 0.10 ips / 51 Hz

1'-2.5' Anchor/Hole + 0.5 cover 1½" x 16" Pyramidal Primer

Instantel

Event Report

Date/Time	Vert at 10:18:04 July 11, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED5G.M40

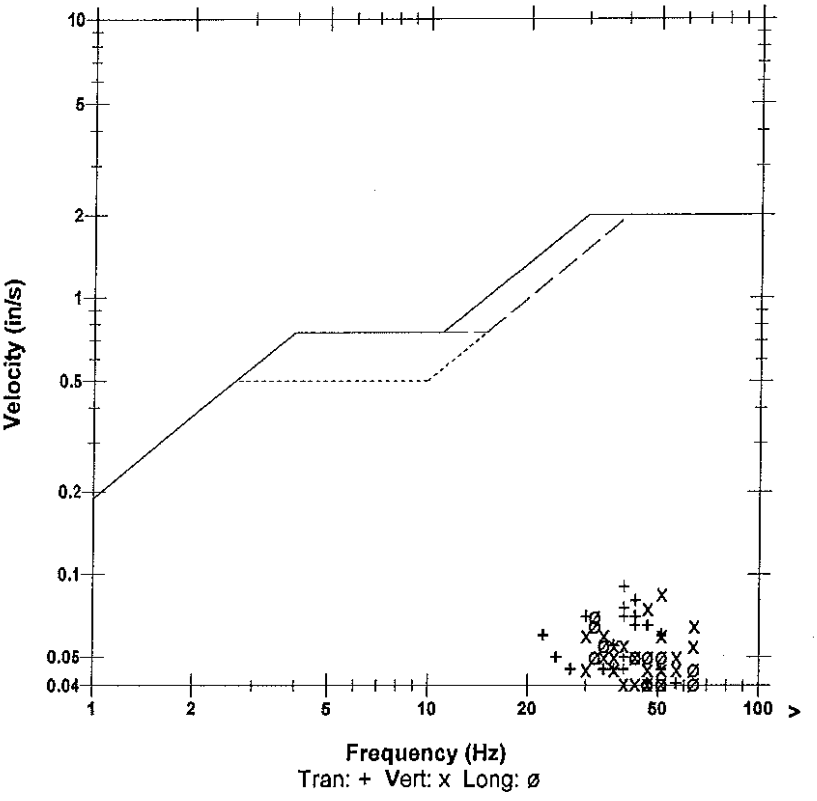
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

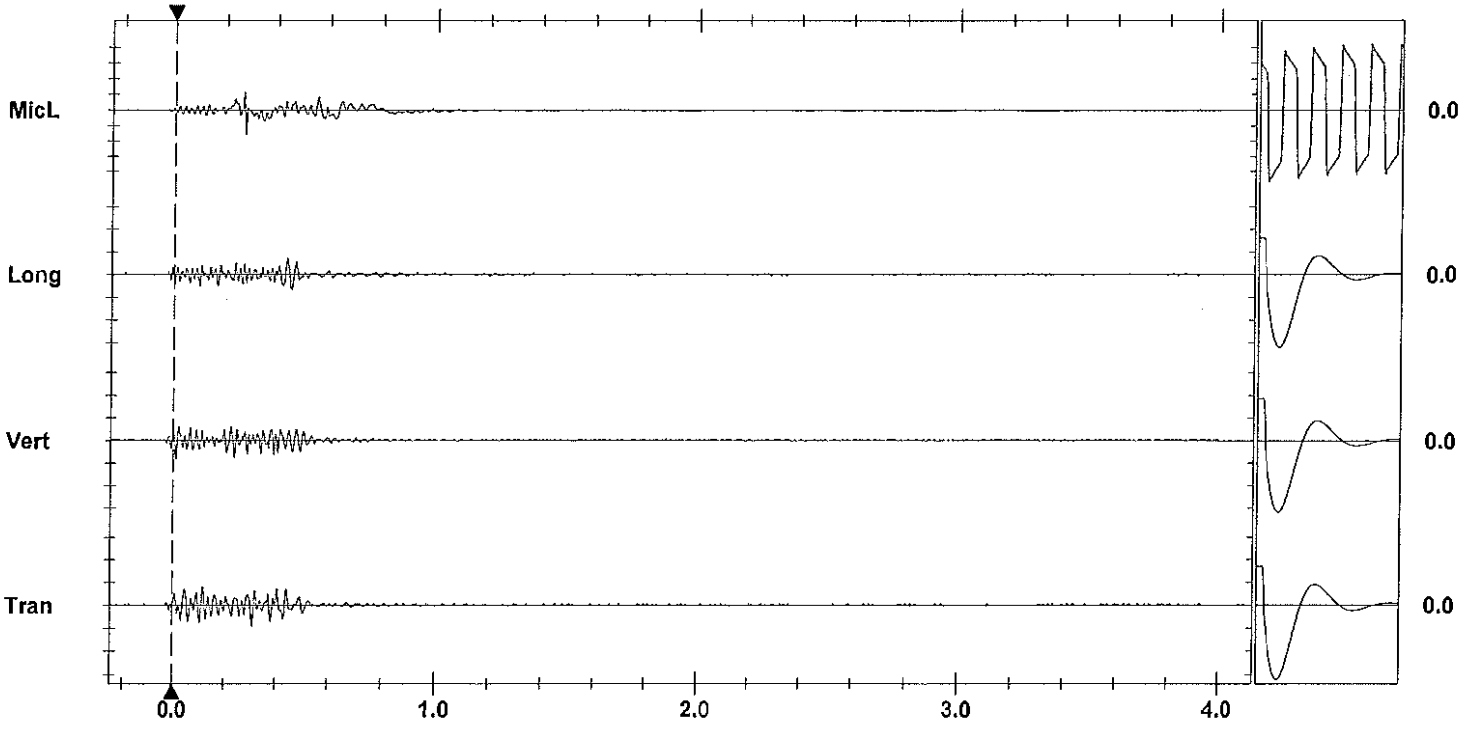
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0900	0.0850	0.0700	in/s
ZC Freq	39	51	32	Hz
Time (Rel. to Trig)	0.310	0.011	0.438	sec
Peak Acceleration	0.0663	0.0795	0.0530	g
Peak Displacement	0.00037	0.00029	0.00035	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Microphone	Linear Weighting
PSPL	0.00156 psi(L) at 0.274 sec
ZC Freq	51 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 539 mv)

Peak Vector Sum 0.101 in/s at 0.011 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc

Instantel

Event Report

Date/Time	Vert at 10:18:15 July 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED5G.MF0
Job Number:	1		

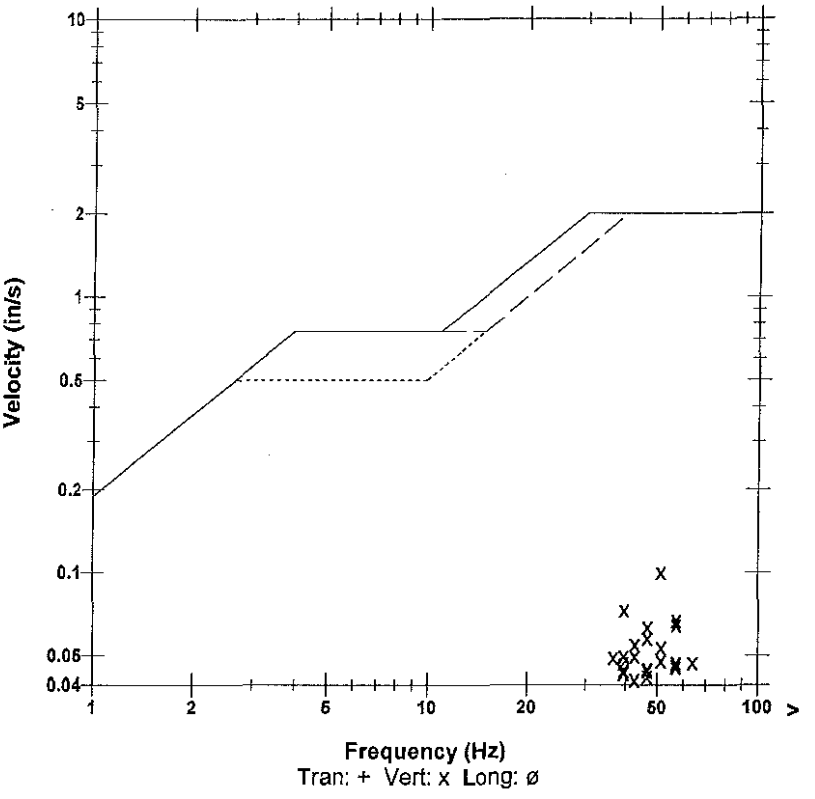
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

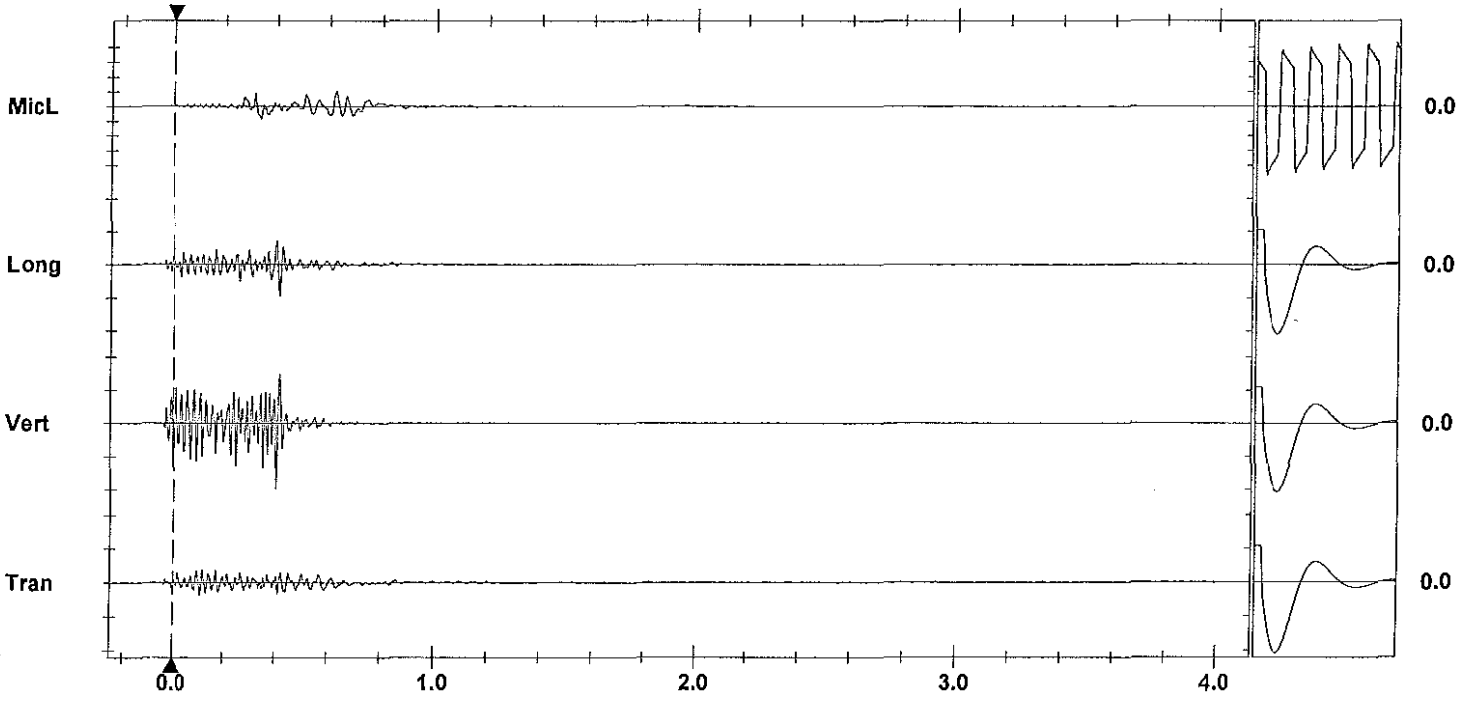
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.625 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 519 mv)

	Tran	Vert	Long	
PPV	0.0194	0.101	0.0475	in/s
ZC Freq	47	51	39	Hz
Time (Rel. to Trig)	0.110	0.406	0.413	sec
Peak Acceleration	0.0199	0.0779	0.0282	g
Peak Displacement	0.00009	0.00031	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.101 in/s at 0.406 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Varney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 11/12
ACTUAL BLAST DATE Jul 11/12 11:53am
BLAST # MW-0280

HIGHWAY# 97
BLAST LOCATION AT: 128+29 - 128+35 (Bench 2)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 13 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1/2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 13

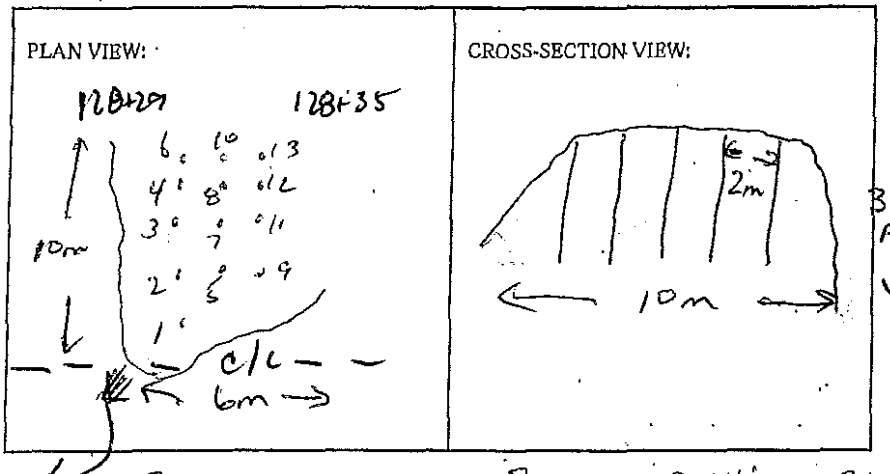
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOGATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Varney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.13 ips/47Hz
" @ 13167 Cliffstone Cut - 0.055 ips/43Hz
" @ 13093 Cliffstone Cut - 0.24 ips/57Hz

3'-6 ANFO/HOLE + 0.5 CART 1½" x 16" DYNAMITE PRIMER.

Instantel

Event Report

Date/Time	Long at 11:53:03 July 11, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED5L.0F0

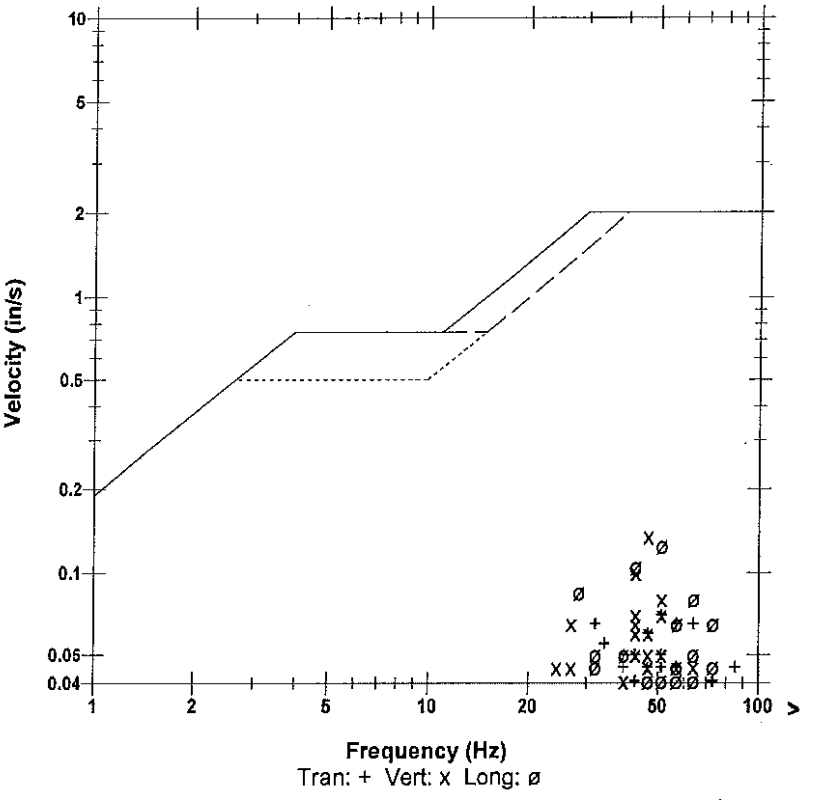
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

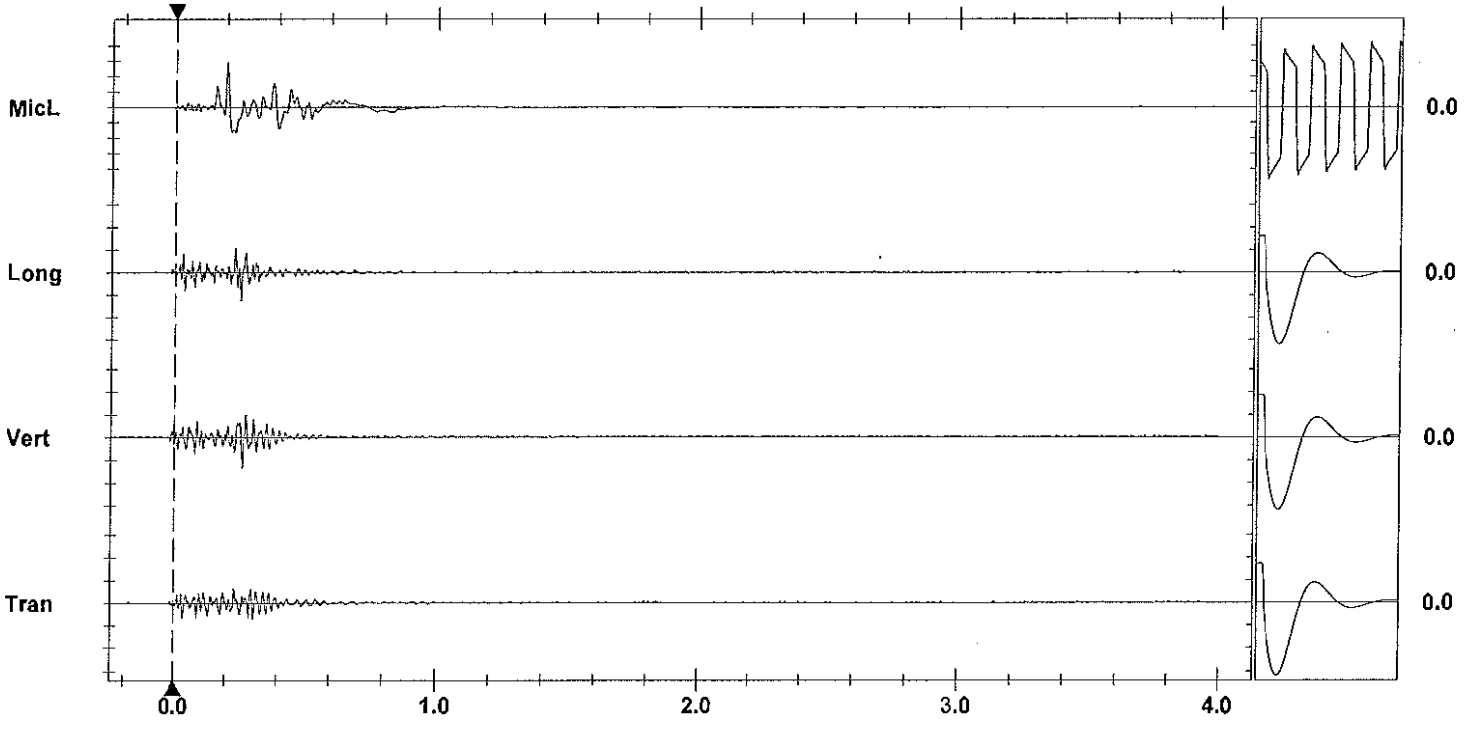
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00290 psi(L) at 0.199 sec
ZC Freq	32 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	0.0700	0.135	0.125	in/s
ZC Freq	51	47	51	Hz
Time (Rel. to Trig)	0.310	0.265	0.255	sec
Peak Acceleration	0.0795	0.0928	0.0928	g
Peak Displacement	0.00024	0.00048	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.148 in/s at 0.255 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶———◀

Sensorcheck

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Event Report

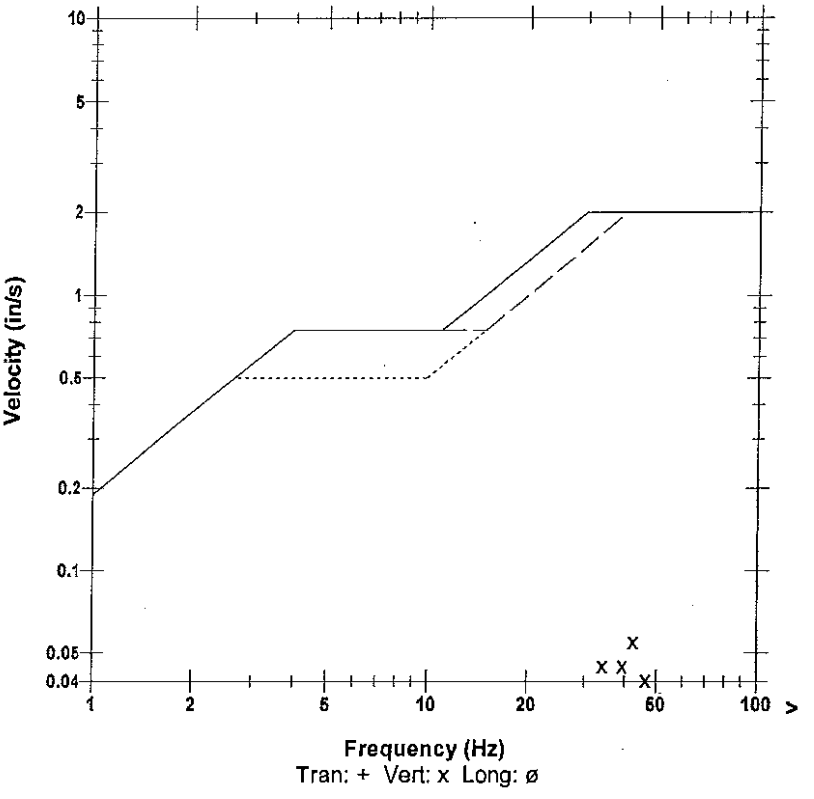
Date/Time	Vert at 11:52:23 July 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED5K.ZB0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

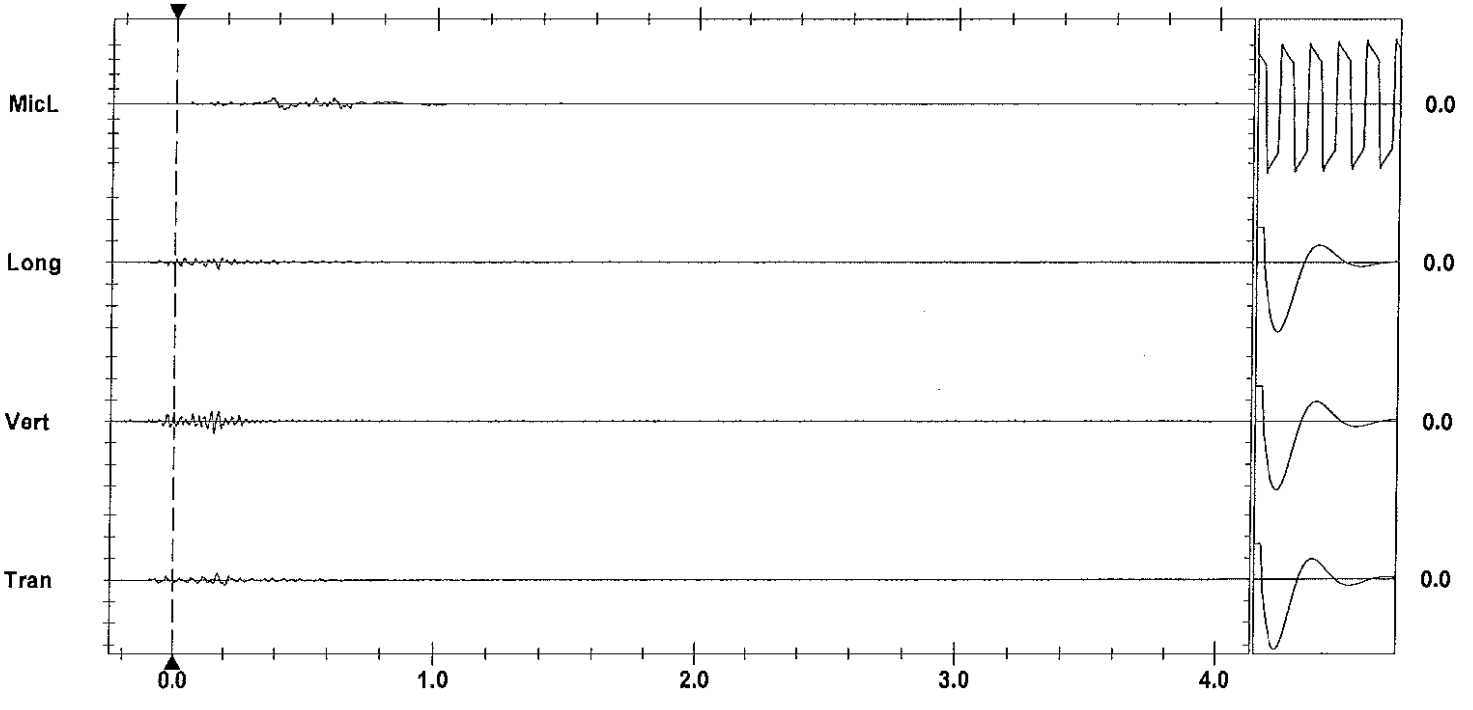
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00040 psi(L) at 0.378 sec			
ZC Freq	9.0 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 490 mv)			

	Tran	Vert	Long	
PPV	0.0300	0.0550	0.0300	in/s
ZC Freq	28	43	37	Hz
Time (Rel. to Trig)	0.177	0.158	0.171	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00019	0.00021	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.0572 in/s at 0.158 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: August 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:53:13 July 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED5L.0P0
Job Number:	1		

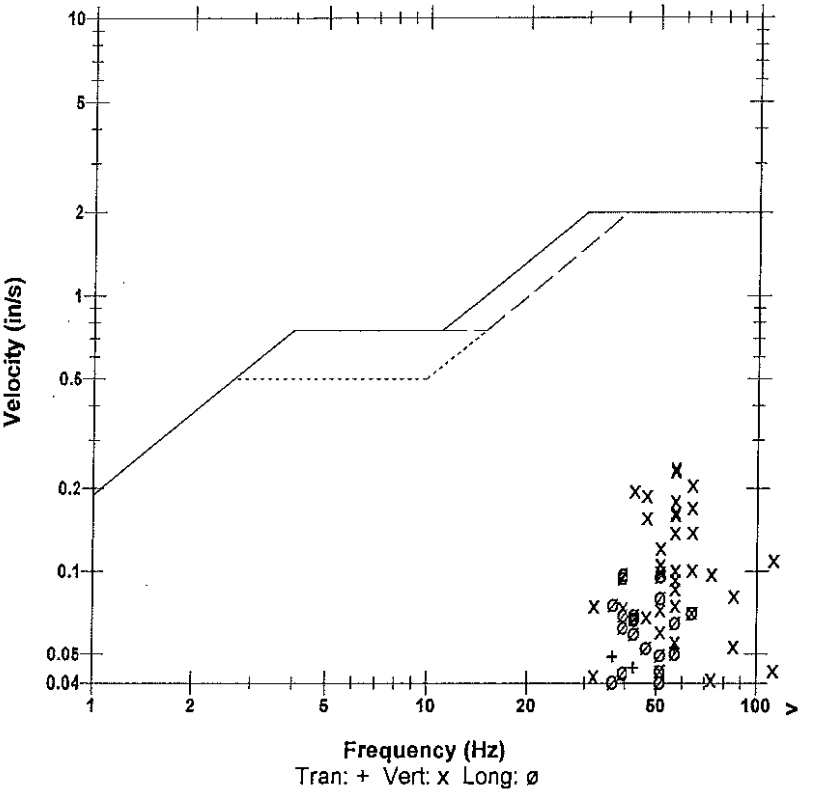
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

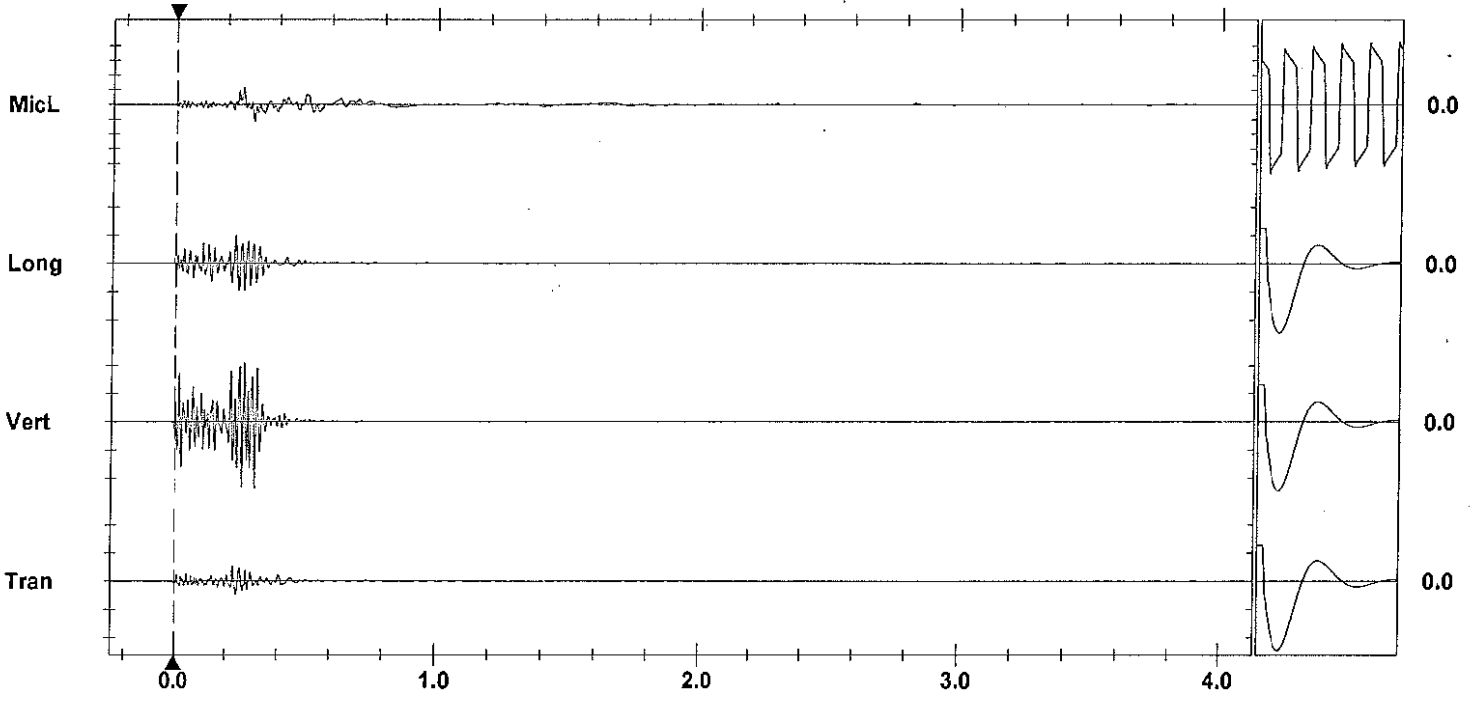
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00116 psi(L) at 0.301 sec
ZC Freq	8.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 450 mv)

	Tran	Vert	Long	
PPV	0.0525	0.238	0.0981	in/s
ZC Freq	57	57	39	Hz
Time (Rel. to Trig)	0.231	0.312	0.232	sec
Peak Acceleration	0.0481	0.224	0.0812	g
Peak Displacement	0.00019	0.00075	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.244 in/s at 0.312 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 15, 2012 0/ 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 14:16:56 July 11, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED5R.O80

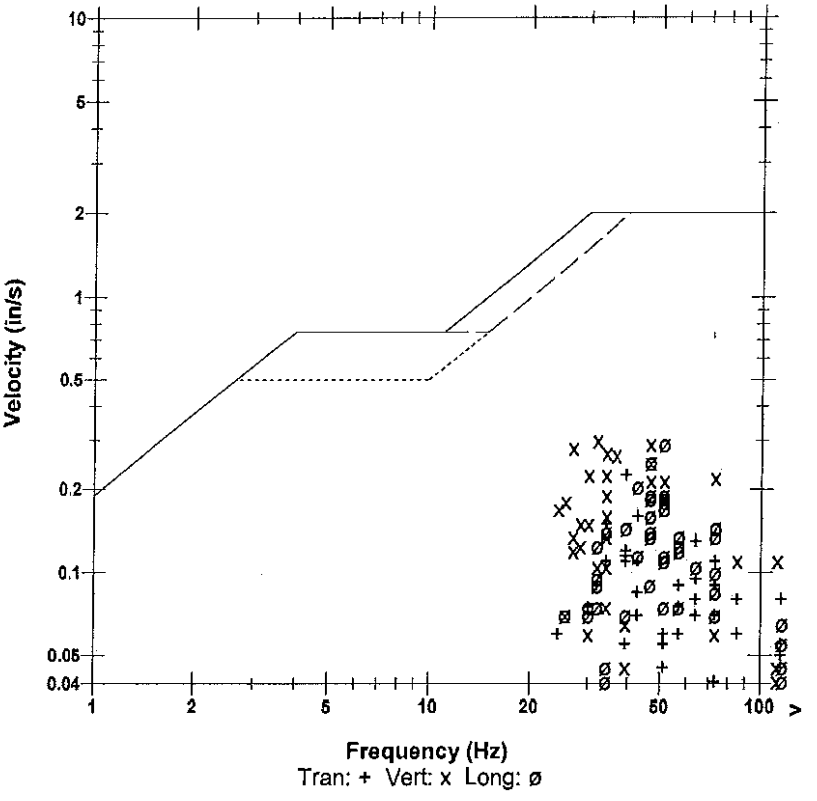
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

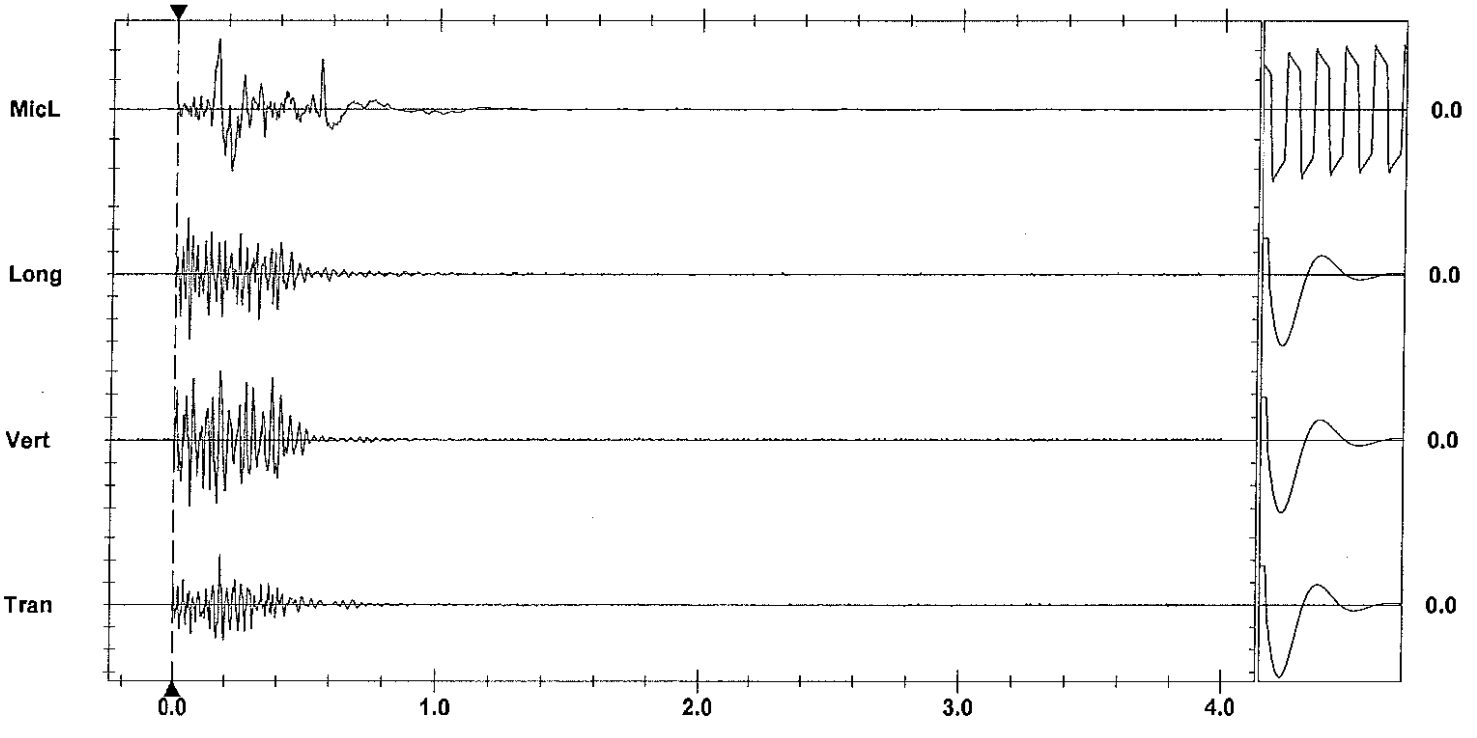
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00471 psi(L) at 0.163 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 495 mv)

	Tran	Vert	Long	
PPV	0.225	0.300	0.290	in/s
ZC Freq	39	32	51	Hz
Time (Rel. to Trig)	0.184	0.179	0.056	sec
Peak Acceleration	0.199	0.239	0.252	g
Peak Displacement	0.00072	0.00152	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.357 in/s at 0.182 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc

Instantel

Event Report

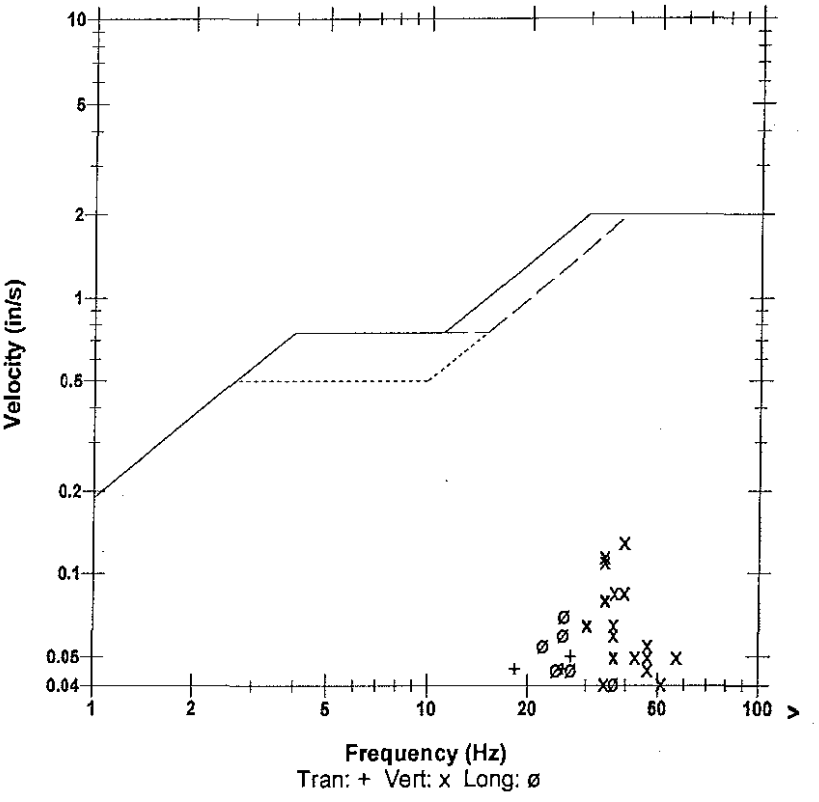
Date/Time	Vert at 14:16:16 July 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED5R.N40

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

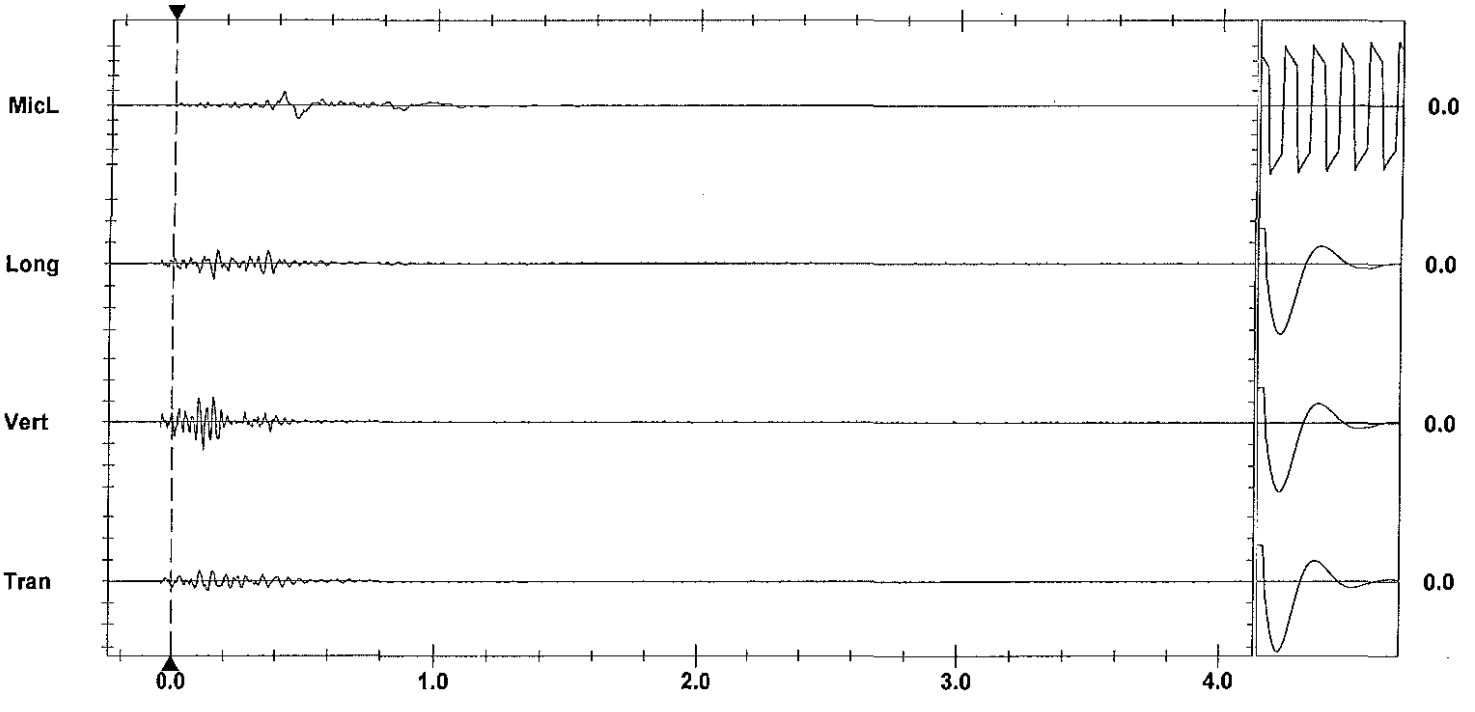
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00091 psi(L) at 0.474 sec
ZC Freq	7.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 501 mv)

	Tran	Vert	Long	
PPV	0.0500	0.130	0.0700	in/s
ZC Freq	27	39	26	Hz
Time (Rel. to Trig)	0.110	0.122	0.157	sec
Peak Acceleration	0.0398	0.106	0.0398	g
Peak Displacement	0.00037	0.00056	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Peak Vector Sum 0.133 in/s at 0.122 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01)
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Event Report

Date/Time	Vert at 14:17:06 July 11, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED5R.OI0
Job Number:	1		

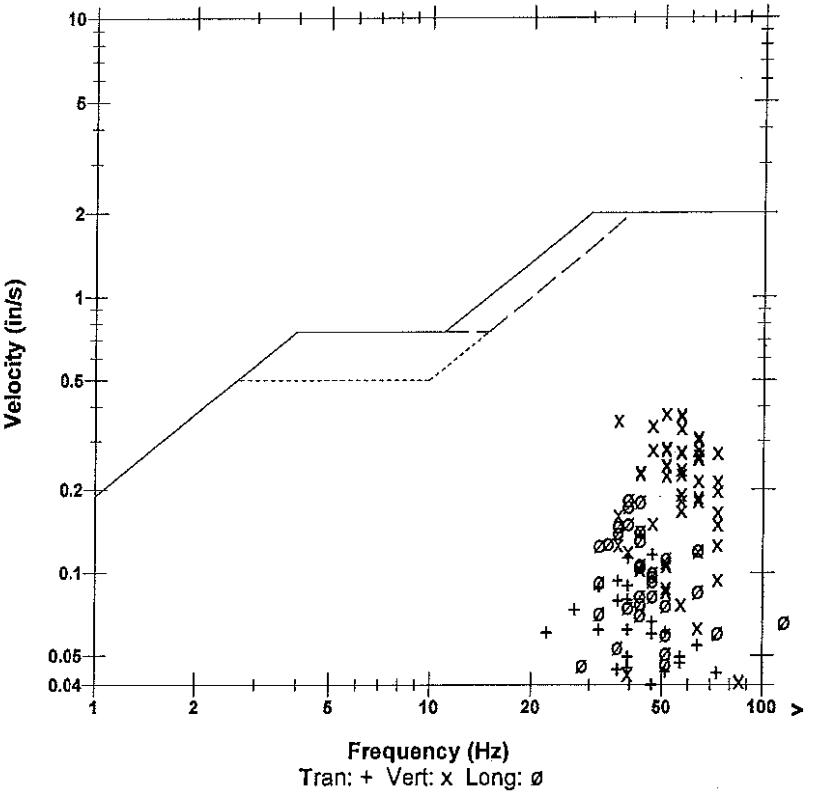
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

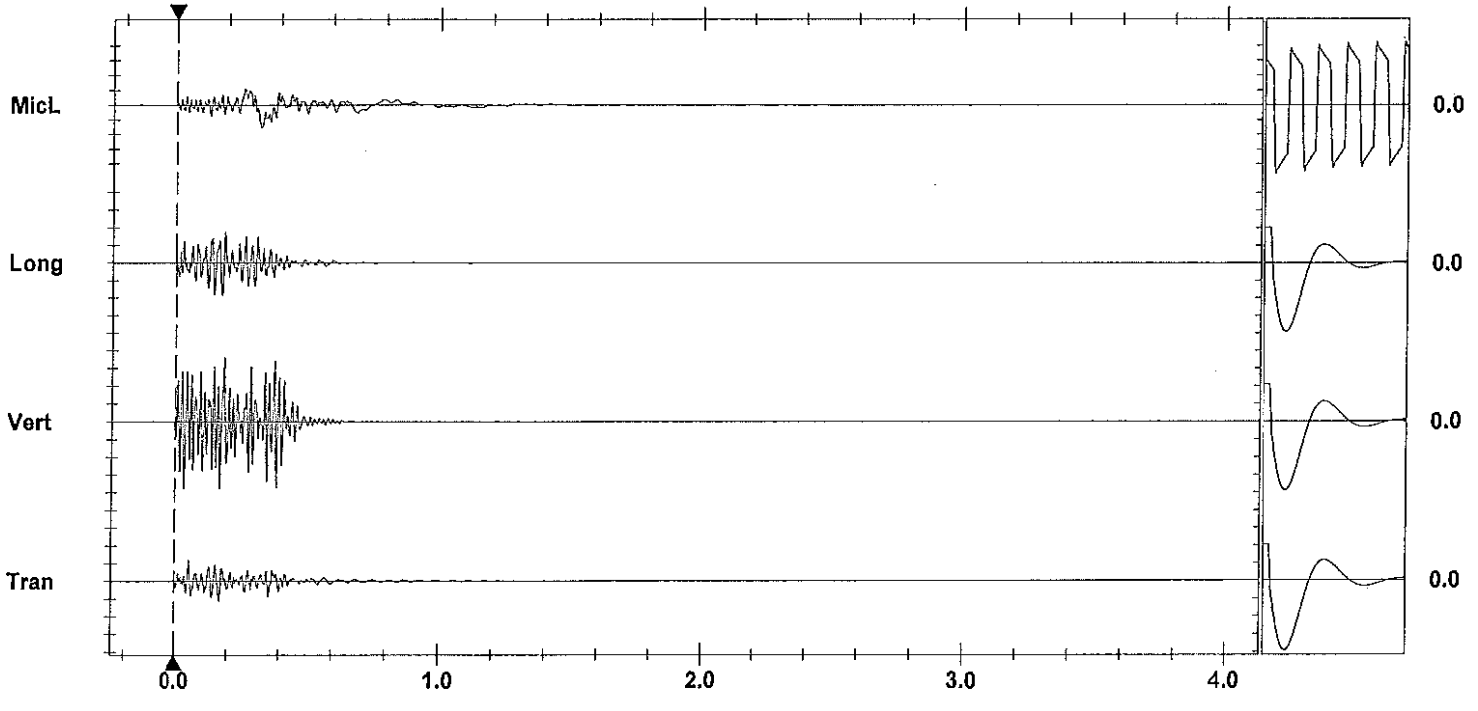
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00156 psi(L) at 0.324 sec
ZC Freq	6.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 503 mv)

	Tran	Vert	Long	
PPV	0.116	0.378	0.184	in/s
ZC Freq	47	51	39	Hz
Time (Rel. to Trig)	0.057	0.035	0.176	sec
Peak Acceleration	0.118	0.384	0.214	g
Peak Displacement	0.00044	0.00140	0.00079	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.7	

Peak Vector Sum 0.423 in/s at 0.174 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 16, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 12/12
ACTUAL BLAST DATE Jul 12/12 2:17PM
BLAST # MW-0282

HIGHWAY# 97
BLAST LOCATION AT: 128+65 - 128+71 (toe/bg mark)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 5K (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 112 (m)

TOTAL NUMBER OF HOLES 14 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 195
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

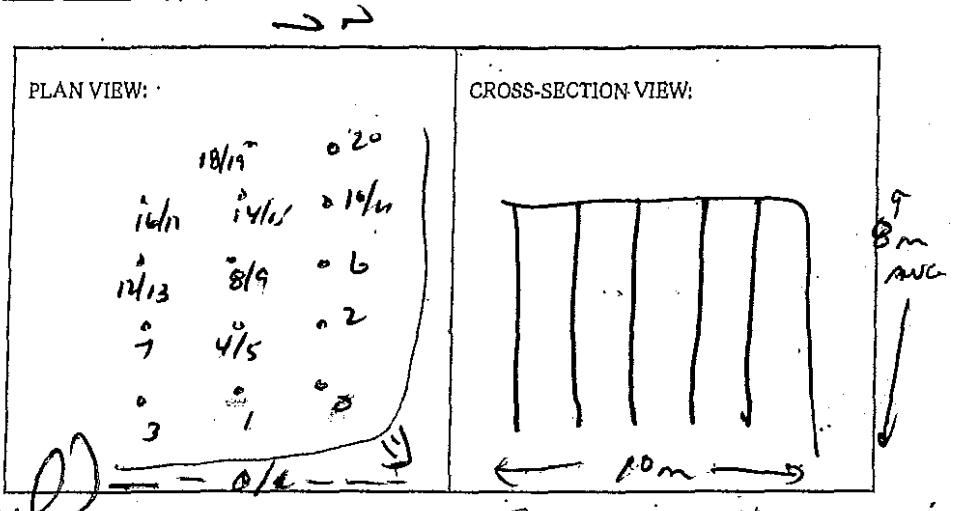
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.49 ips/37 Hz
" @ 13167 Cliffstone Crt - 0.19 ips/43 Hz
" @ 13093 Cliffstone Crt - 0.42 ips/64 Hz

Bottom Decks – 5'-7' ANFO

Top Decks – 2'-4' ANFO

All primed w/ 0.5 each 1½" 6/6 Dynamite

Instantel

Event Report

Date/Time	Vert at 14:18:04 July 12, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED7M.E40

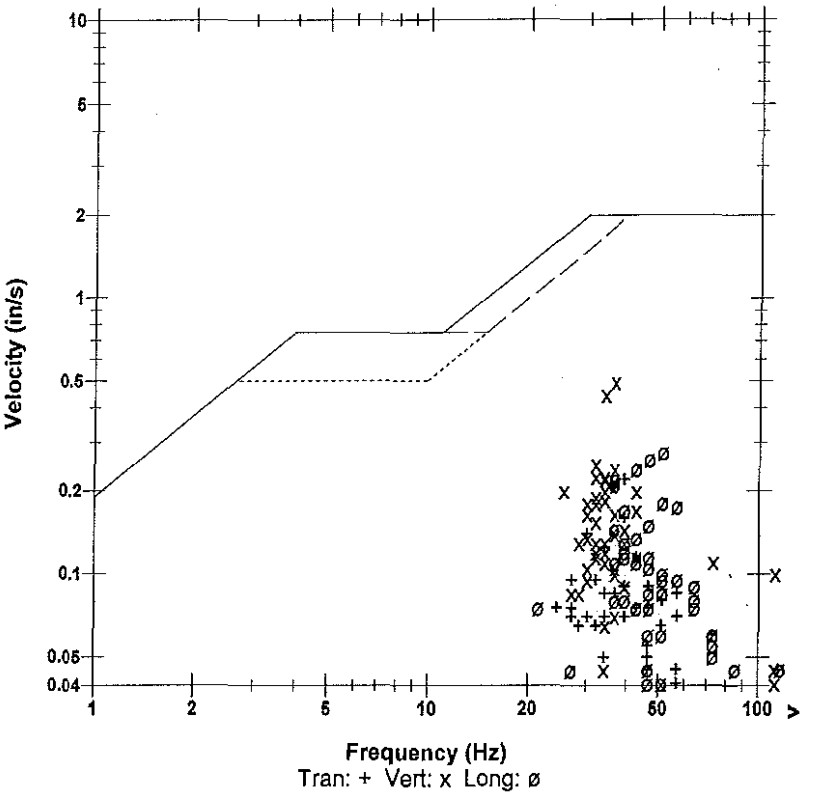
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

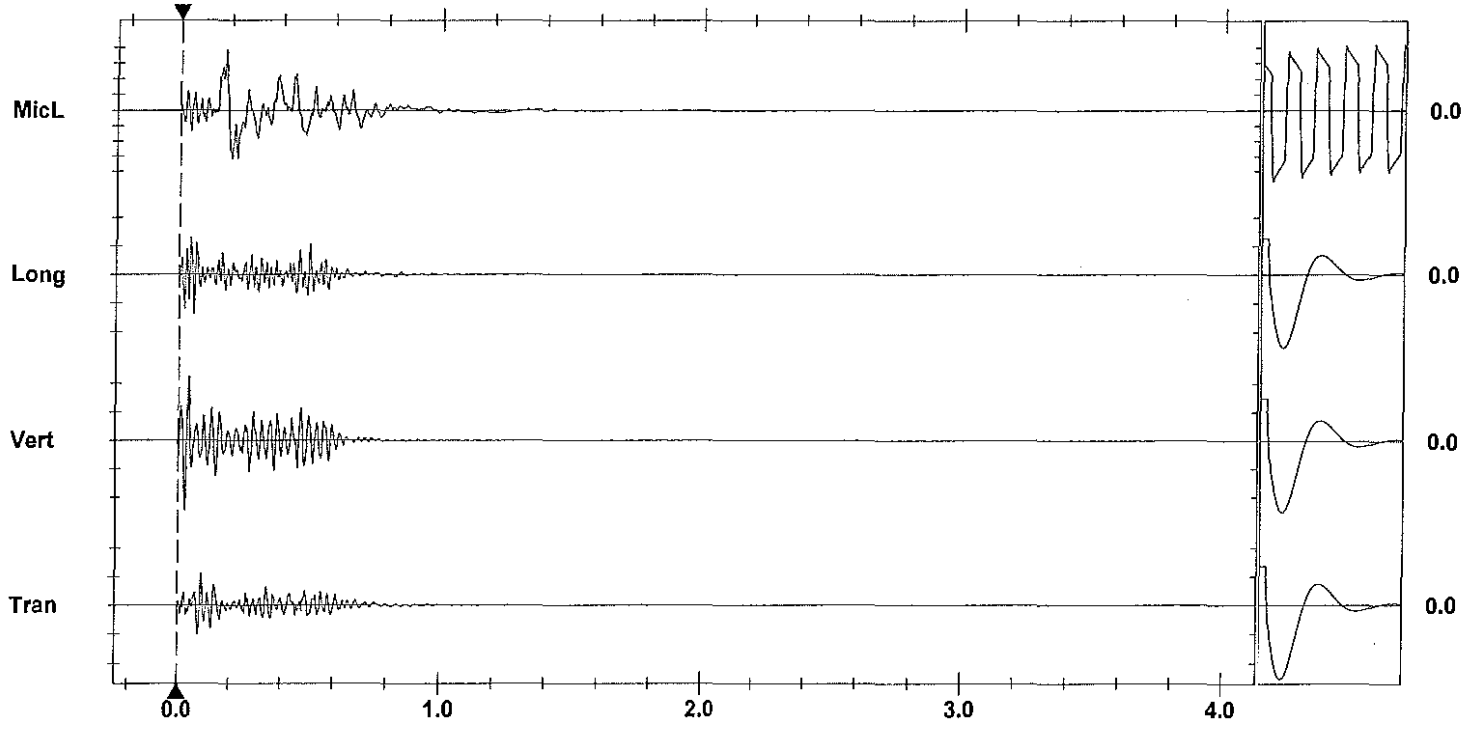
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00381 psi(L) at 0.176 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 452 mv)

	Tran	Vert	Long	
PPV	0.220	0.495	0.275	in/s
ZC Freq	39	37	51	Hz
Time (Rel. to Trig)	0.097	0.027	0.060	sec
Peak Acceleration	0.146	0.305	0.278	g
Peak Displacement	0.00089	0.00211	0.00094	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.506 in/s at 0.027 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2012 07:8:04 - 8.01
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Event Report

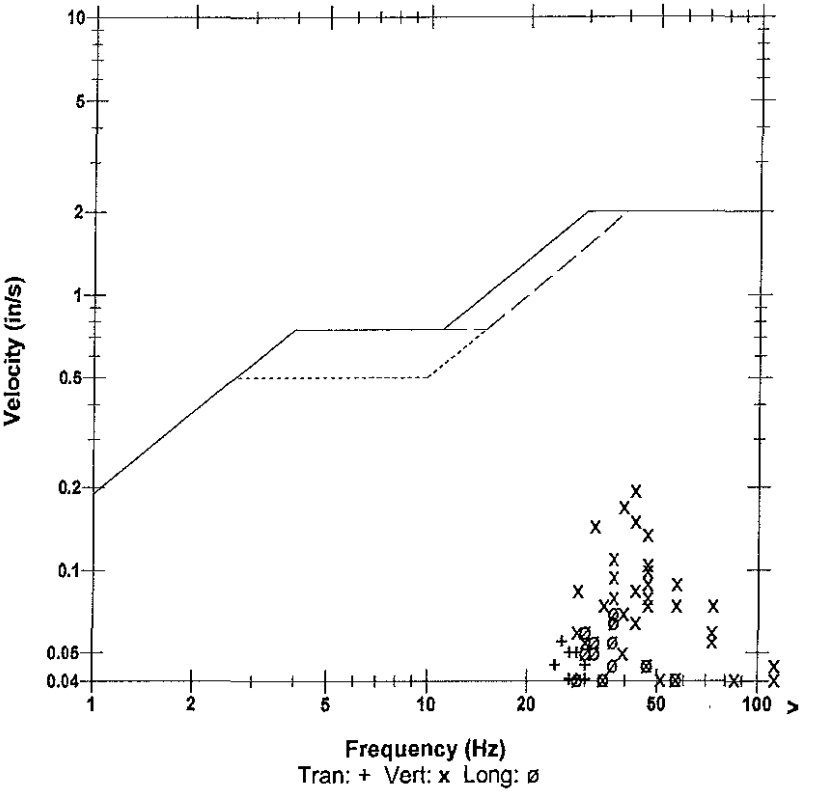
Date/Time	Vert at 14:17:23 July 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED7M.CZ0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

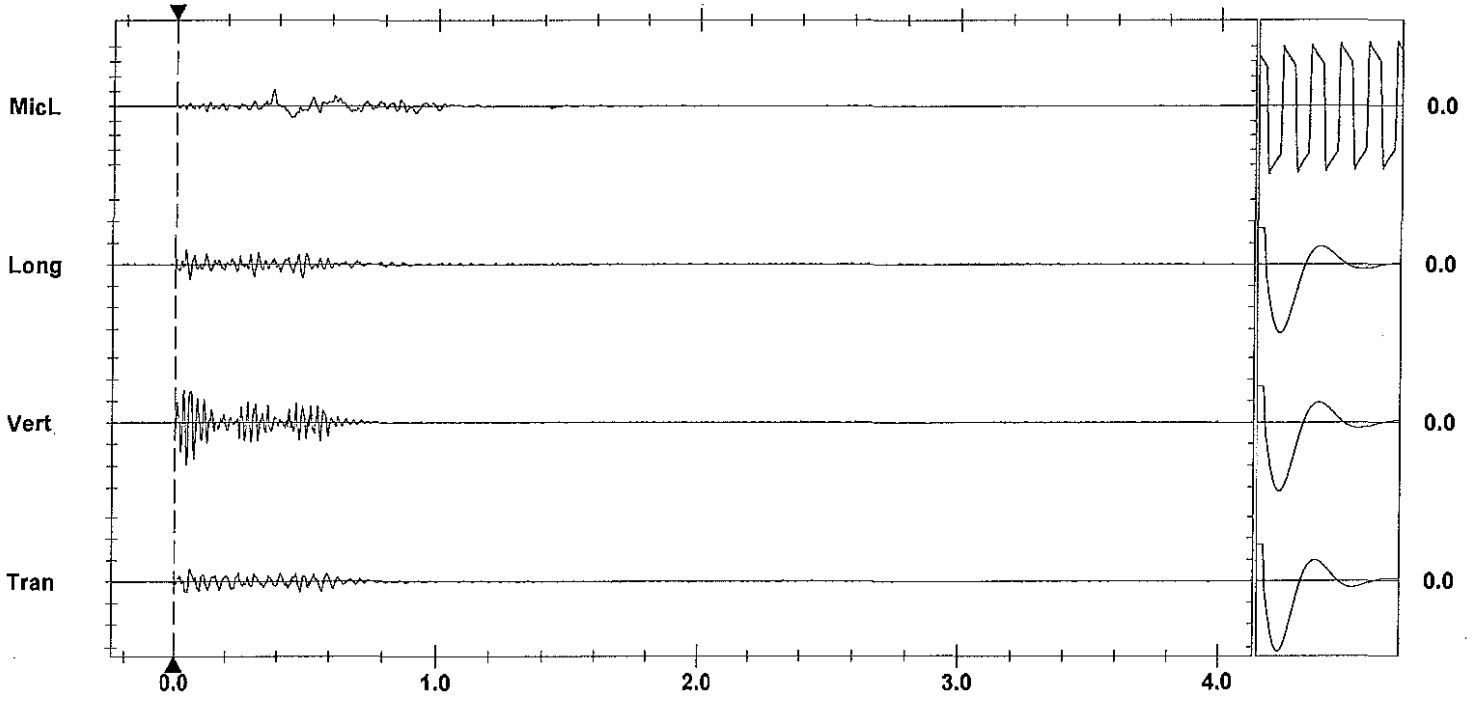
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at 0.379 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 490 mv)

	Tran	Vert	Long	
PPV	0.0550	0.195	0.0700	in/s
ZC Freq	26	43	37	Hz
Time (Rel. to Trig)	0.062	0.048	0.059	sec
Peak Acceleration	0.0530	0.146	0.0398	g
Peak Displacement	0.00035	0.00090	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.4	7.2	Hz
Overswing Ratio	3.3	3.5	3.9	

Peak Vector Sum 0.204 in/s at 0.048 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: August 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:18:14 July 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED7M.EE0
Job Number:	1		

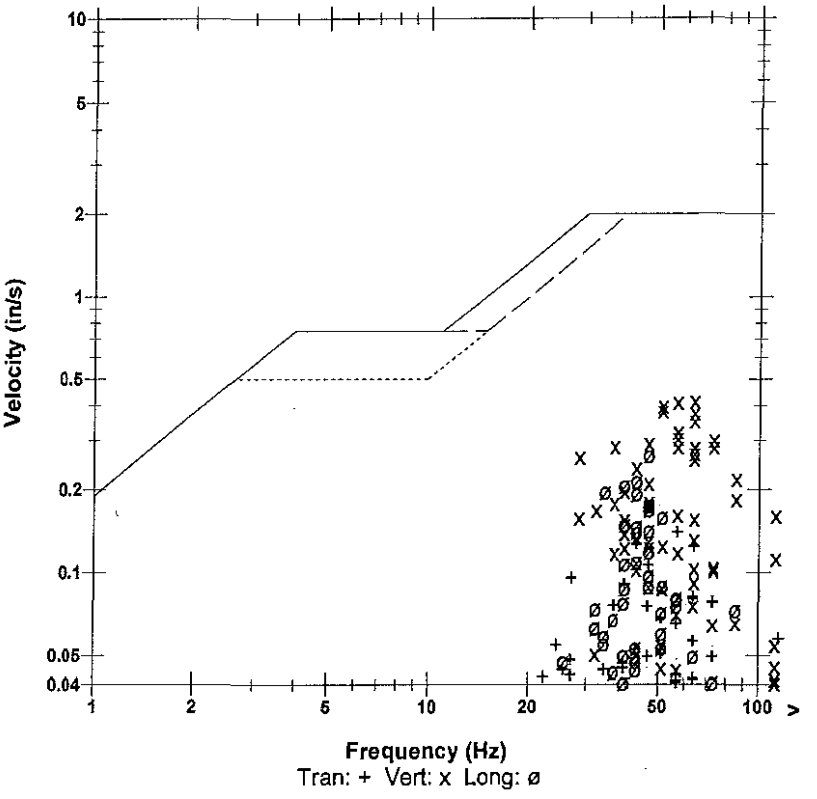
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

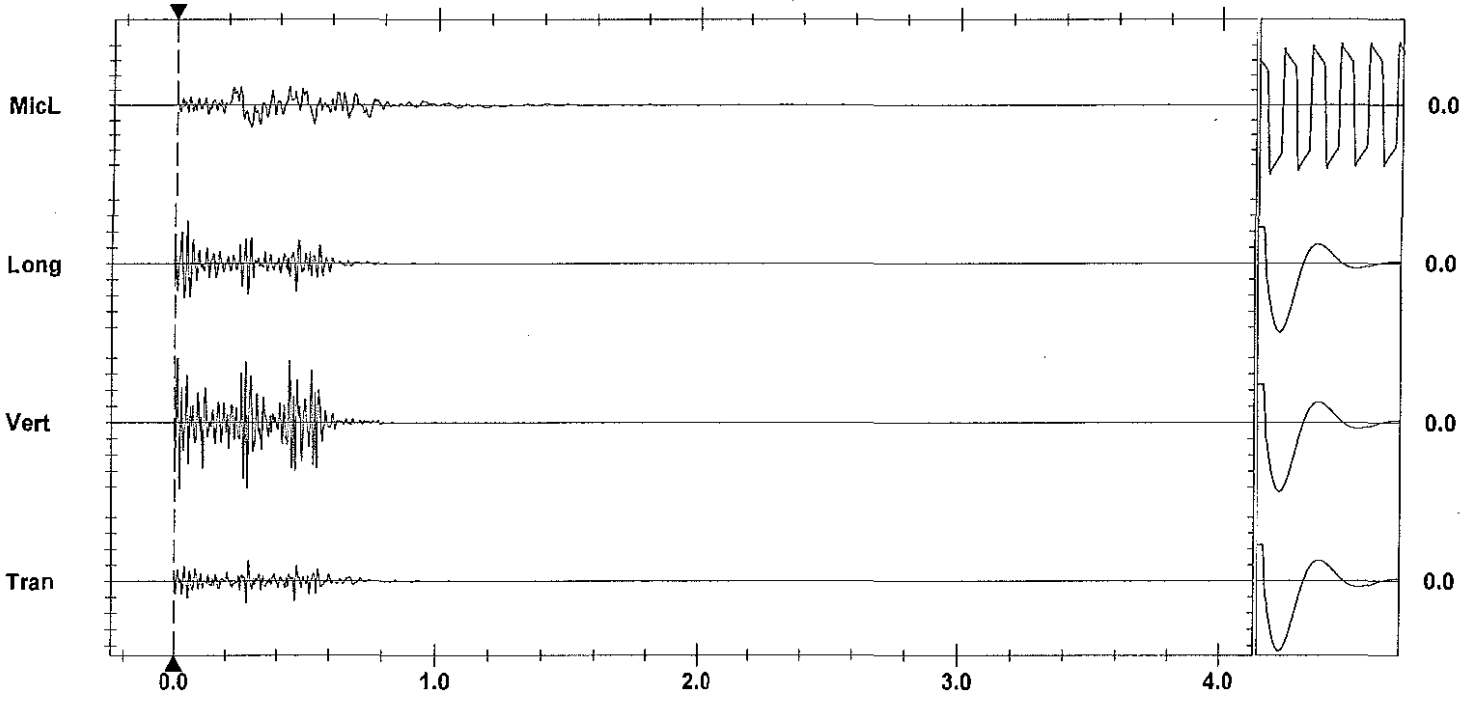
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.288 sec
ZC Freq	6.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 503 mv)

	Tran	Vert	Long	
PPV	0.140	0.416	0.265	in/s
ZC Freq	57	64	47	Hz
Time (Rel. to Trig)	0.281	0.020	0.049	sec
Peak Acceleration	0.124	0.499	0.230	g
Peak Displacement	0.00040	0.00120	0.00087	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.4	3.5	3.7	

Peak Vector Sum 0.459 in/s at 0.283 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED July 12/12
ACTUAL BLAST DATE July 12/12 4:00 PM
BLAST # MW-0283

HIGHWAY# 97
BLAST LOCATION AT: 128+59 - 128+61 (Cross bay road)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* Slot muffled

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 8 Perd.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

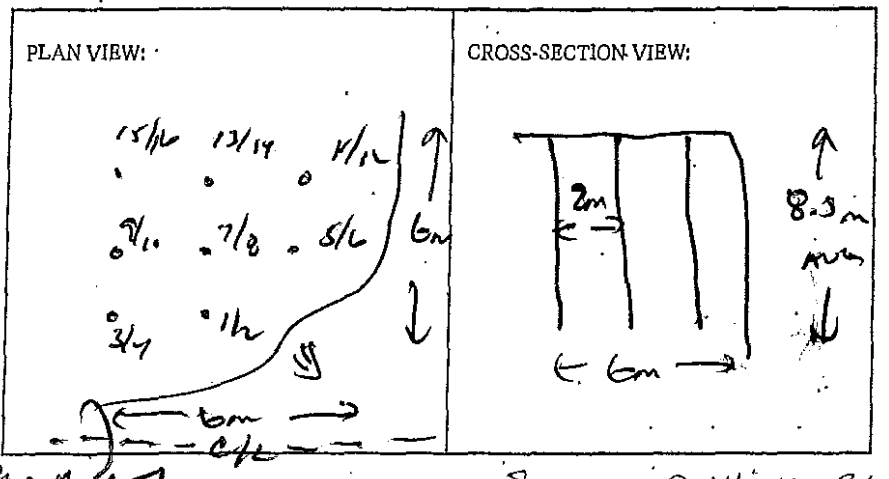
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.33 ips/32Hz
" @ 13167 Cliffstone Ct - 0.12 ips/27Hz
" @ 13093 Cliffstone Ct. - 0.46 ips/64Hz

Bottom Decks – 6'-1" ±

Top Decks – 3'-5' ANFO

All Primed w/ 0.5 gram 1½"x16" Dynamite

Instantel

Event Report

Date/Time	Long at 16:00:16 July 12, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED7R.4G0

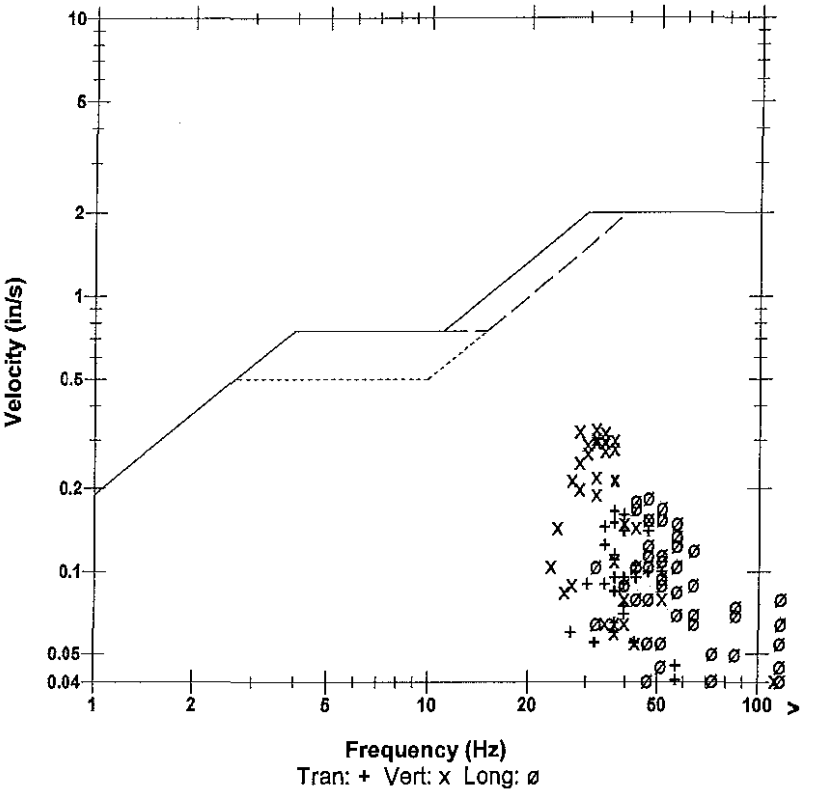
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

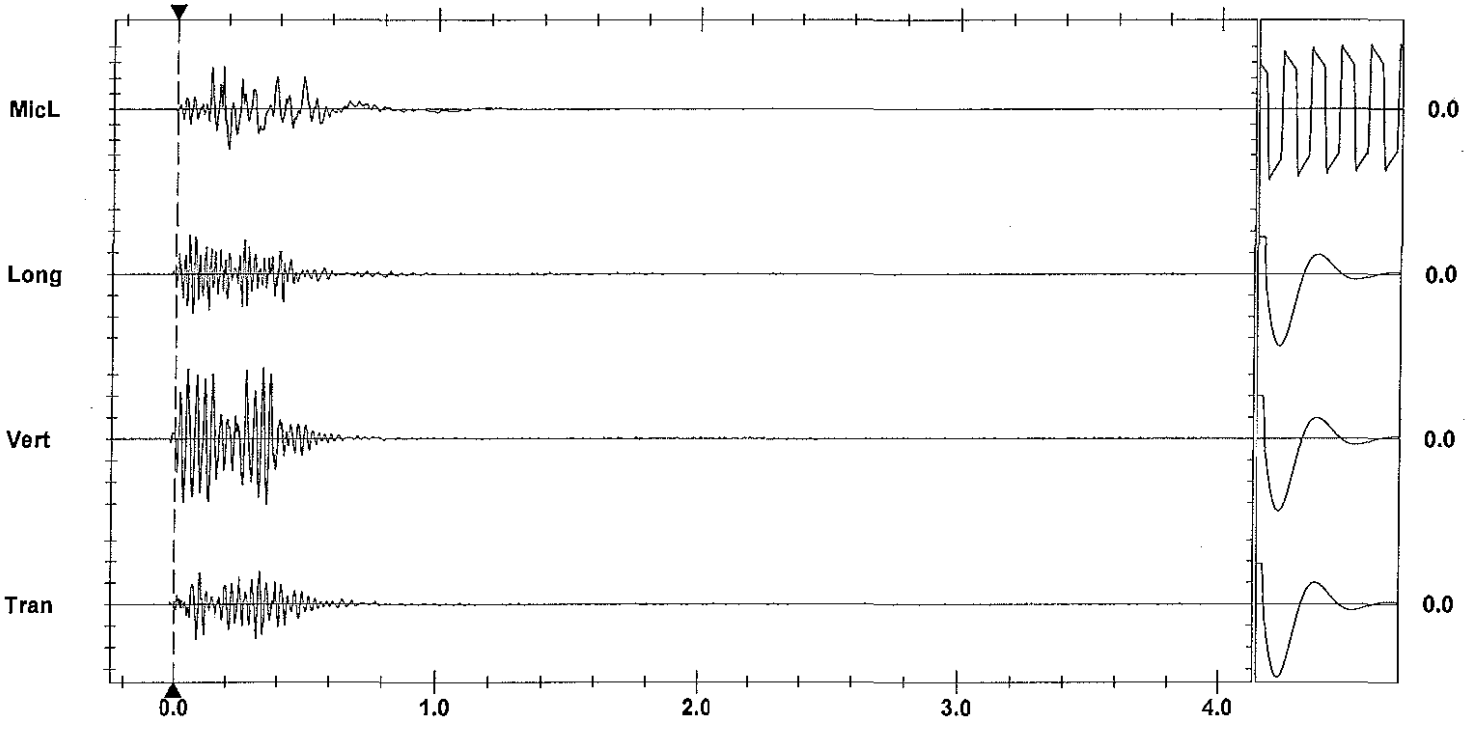
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00272 psi(L) at 0.180 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 507 mv)

	Tran	Vert	Long	
PPV	0.165	0.330	0.185	in/s
ZC Freq	37	32	47	Hz
Time (Rel. to Trig)	0.089	0.343	0.066	sec
Peak Acceleration	0.133	0.225	0.239	g
Peak Displacement	0.00067	0.00159	0.00070	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.5	3.5	3.8	

Peak Vector Sum 0.355 in/s at 0.343 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

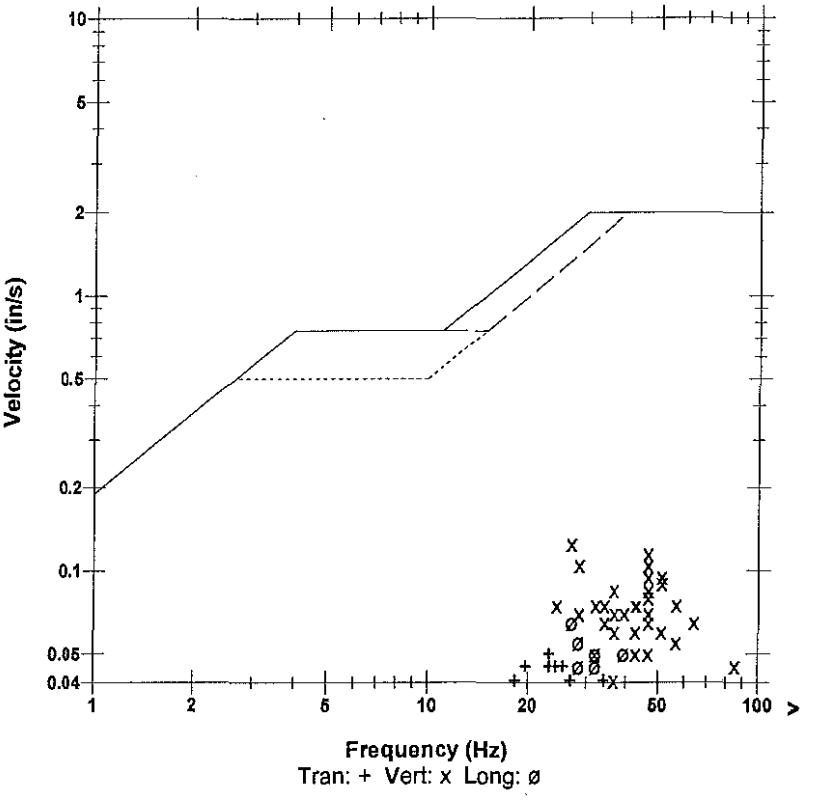
Date/Time	Vert at 15:59:36 July 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED7R.3C0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

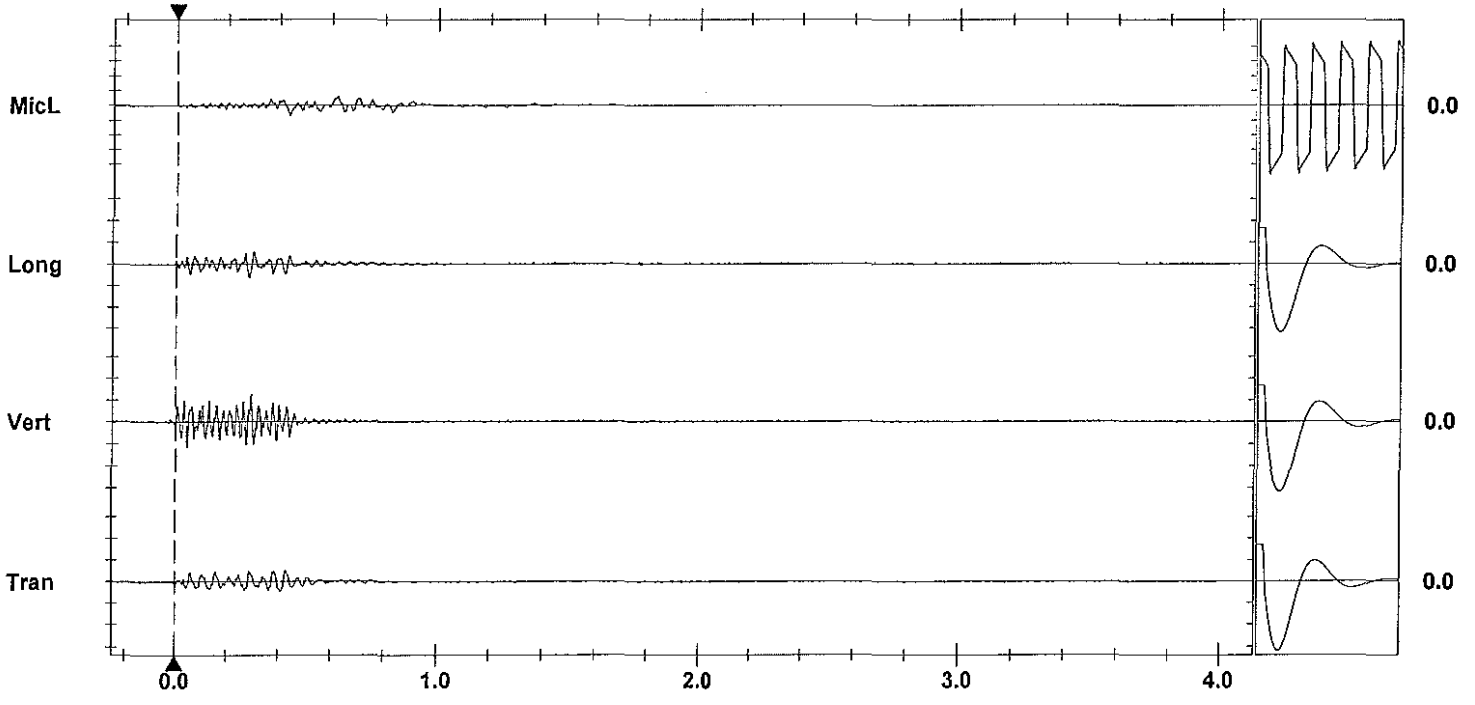
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00065 psi(L) at 0.437 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 488 mv)

	Tran	Vert	Long	
PPV	0.0500	0.125	0.0650	in/s
ZC Freq	23	27	27	Hz
Time (Rel. to Trig)	0.431	0.296	0.285	sec
Peak Acceleration	0.0398	0.119	0.0398	g
Peak Displacement	0.00042	0.00056	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.2	Hz
Overswing Ratio	3.3	3.5	4.0	

Peak Vector Sum 0.132 in/s at 0.296 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 16:00:27 July 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED7R.4R0
Job Number:	1		

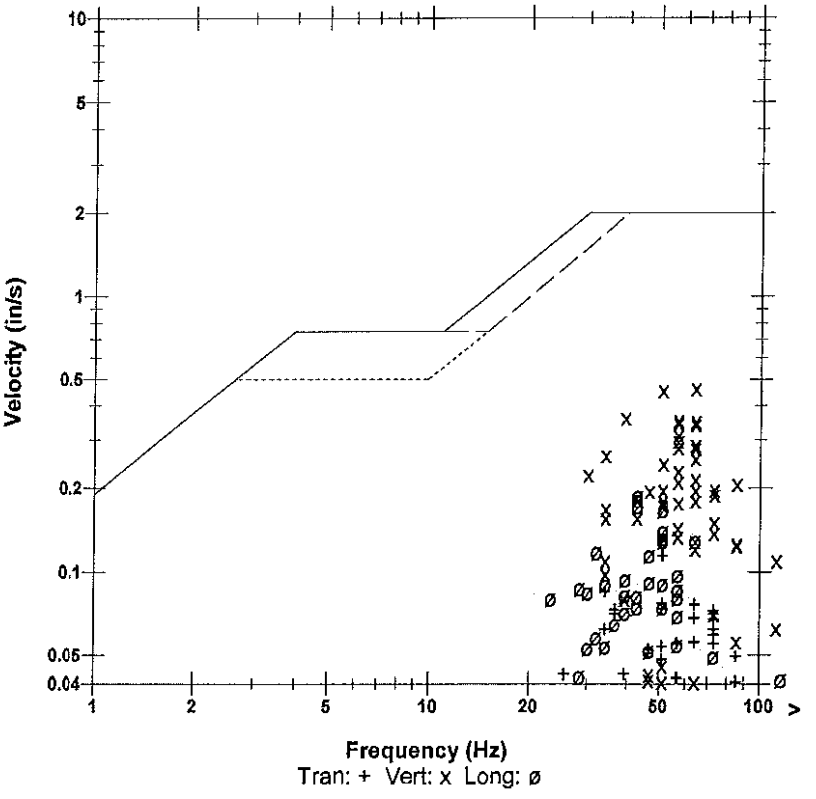
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

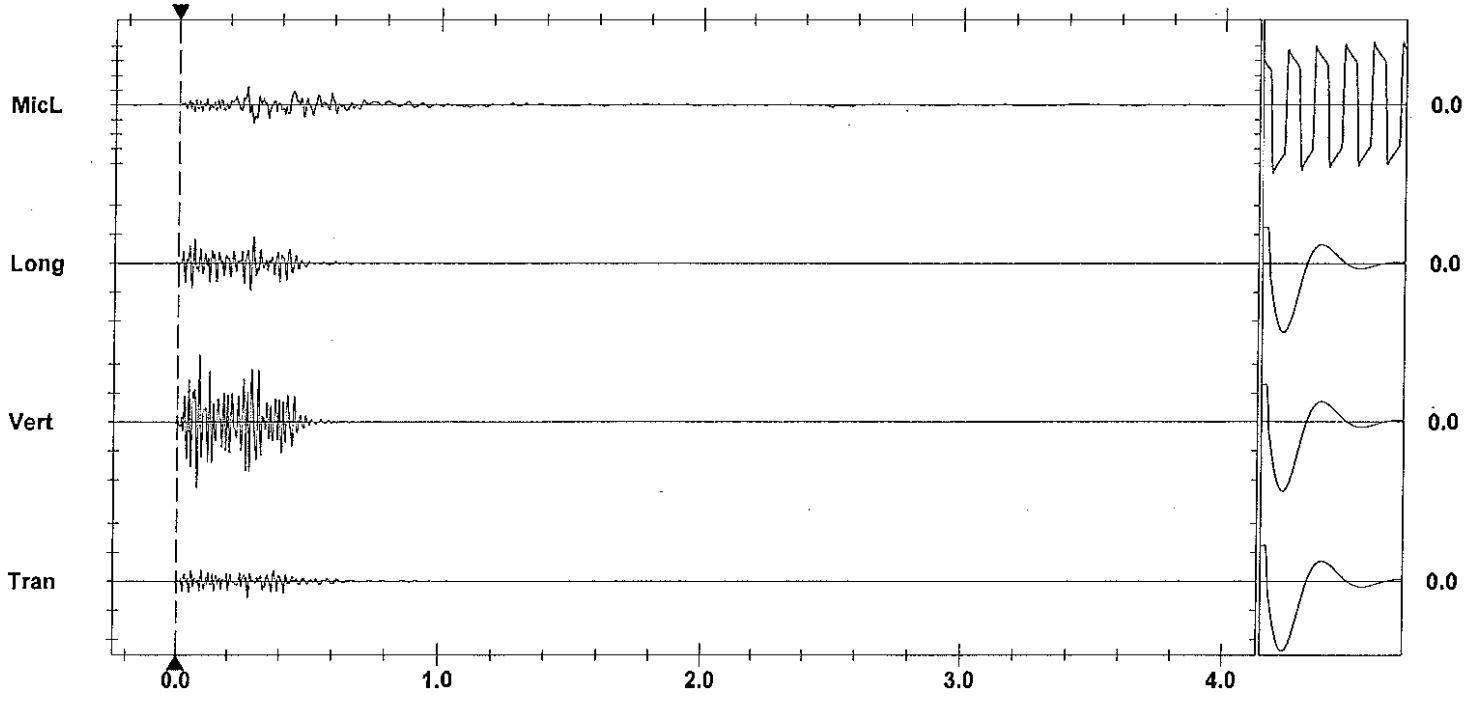
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.289 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 484 mv)

	Tran	Vert	Long	
PPV	0.114	0.463	0.187	in/s
ZC Freq	51	64	43	Hz
Time (Rel. to Trig)	0.278	0.087	0.282	sec
Peak Acceleration	0.0978	0.477	0.146	g
Peak Displacement	0.00032	0.00142	0.00064	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.5	3.7	

Peak Vector Sum 0.472 in/s at 0.087 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 15, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED JUL 13/12
ACTUAL BLAST DATE JUL 13/12 12:35 PM
BLAST # MW-0284

HIGHWAY# 97
BLAST LOCATION AT: Stn 12864 - Stn 12871 LS (TOS Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 9 BL/4 Buffer/3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

1 cart. 2416 Dynamite + 200 gr. det cord to 4' collar in B/L holes.

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

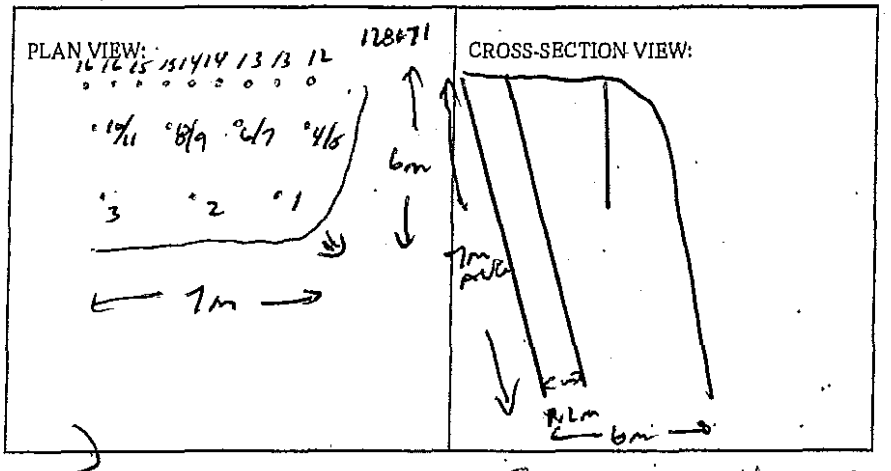
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 220 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

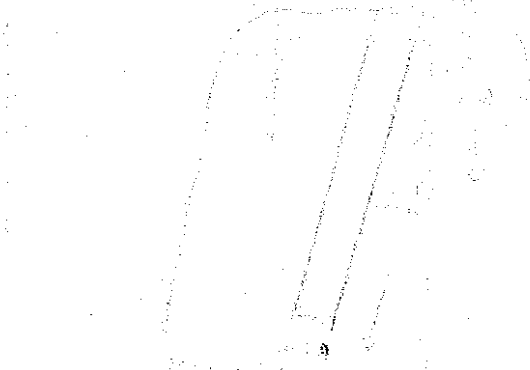
Seismograph @ 13050 OLD Mission Rd - 0.17 ips/ 39 Hz
" @ 13167 Cliffstone Crt - 0.090 ips/ 39 Hz
" @ 13093 Cliffstone Crt - 0.29 ips/ 57 Hz

BH holes - 1 coat 2x16 Dynamite + 200 g/m² cloth
cord to 4' collar

All primed w/ 0.5 coat 2" x 16" Dynamite

Bottom Holes - Bottom Row - 3 coats 2x16 Blastex
- Top Row 2-3 coats 2x16 Blastex

Stab Holes - 1'-3' apart



Instantel

Event Report

Date/Time	Long at 12:36:03 July 13, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746ED9C.C30

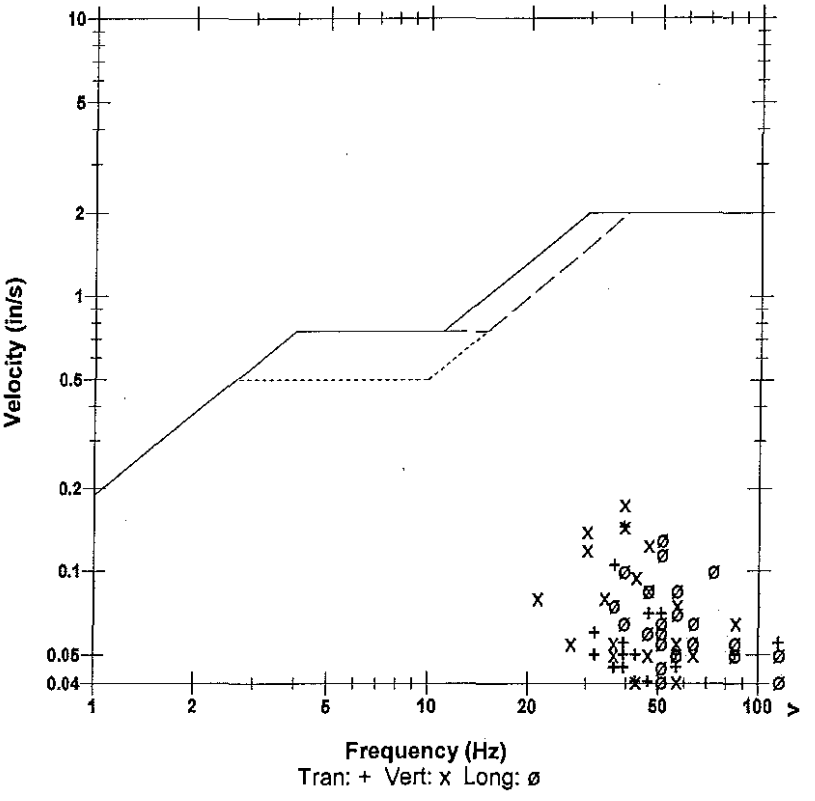
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

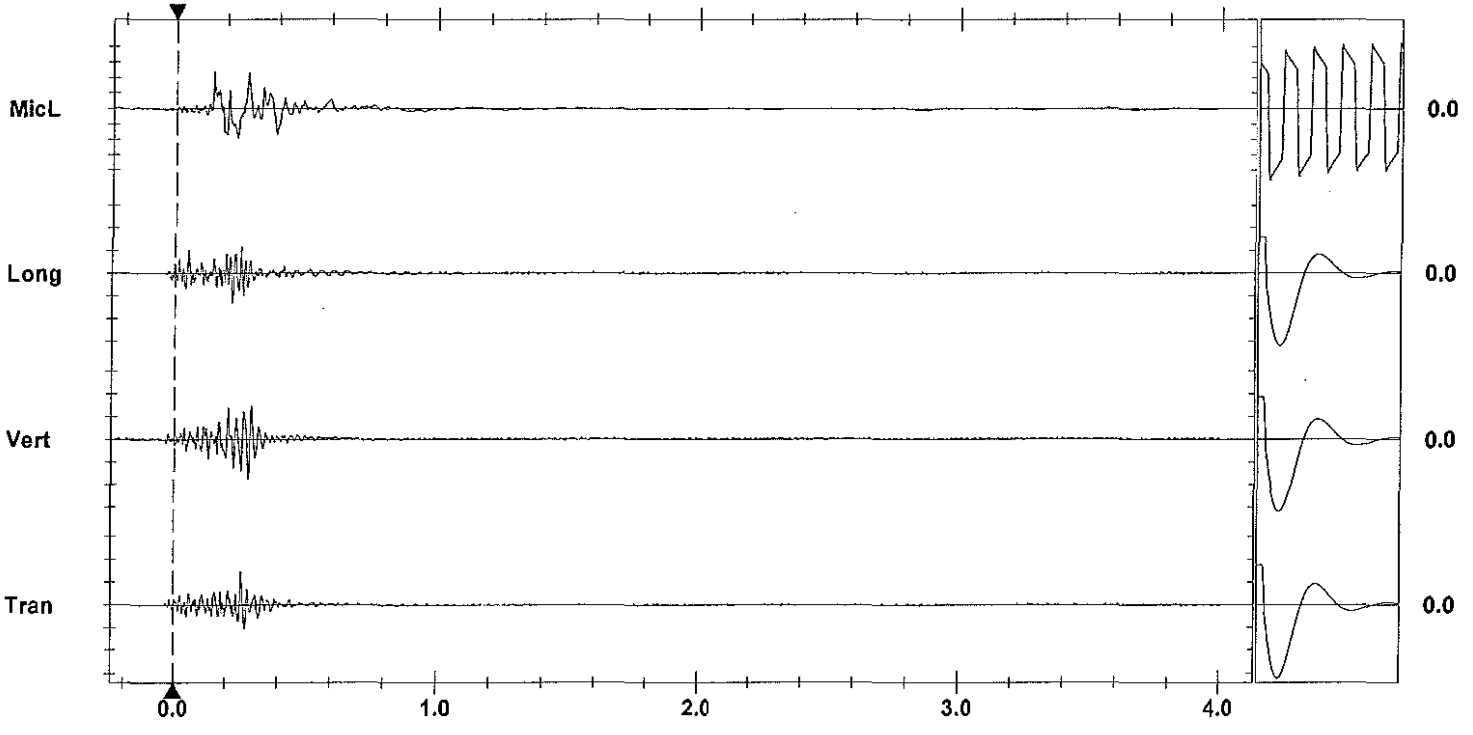
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00236 psi(L) at 0.147 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 539 mv)

	Tran	Vert	Long	
PPV	0.145	0.175	0.130	in/s
ZC Freq	39	39	51	Hz
Time (Rel. to Trig)	0.263	0.288	0.223	sec
Peak Acceleration	0.0928	0.133	0.146	g
Peak Displacement	0.00053	0.00070	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.189 in/s at 0.289 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 6, 2012 07:8:01 - 8.01
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Instantel®

Event Report

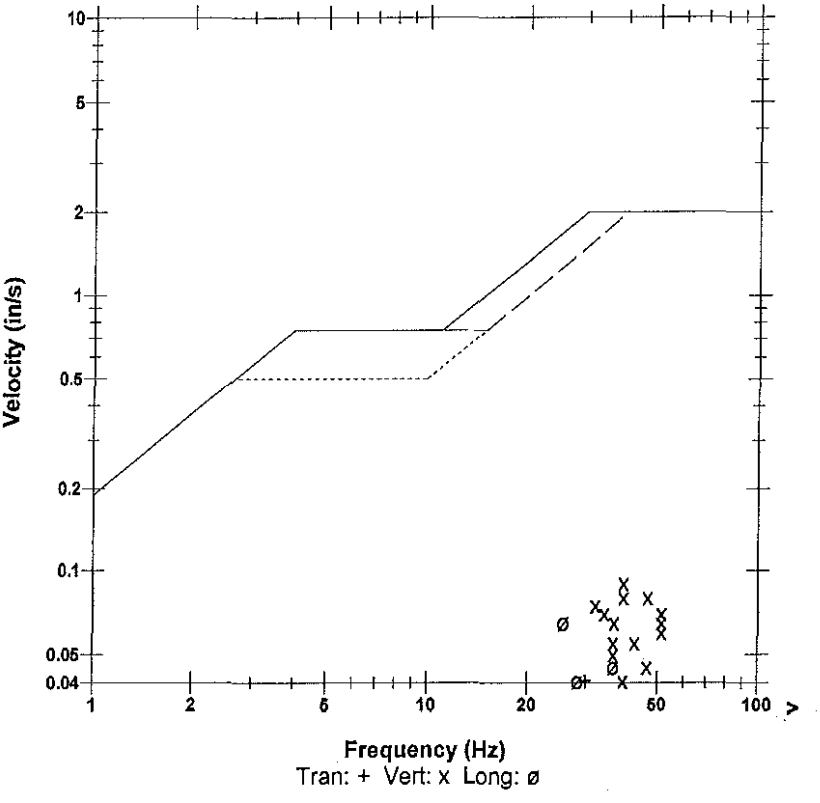
Date/Time	Vert at 12:35:22 July 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866ED9C.AY0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

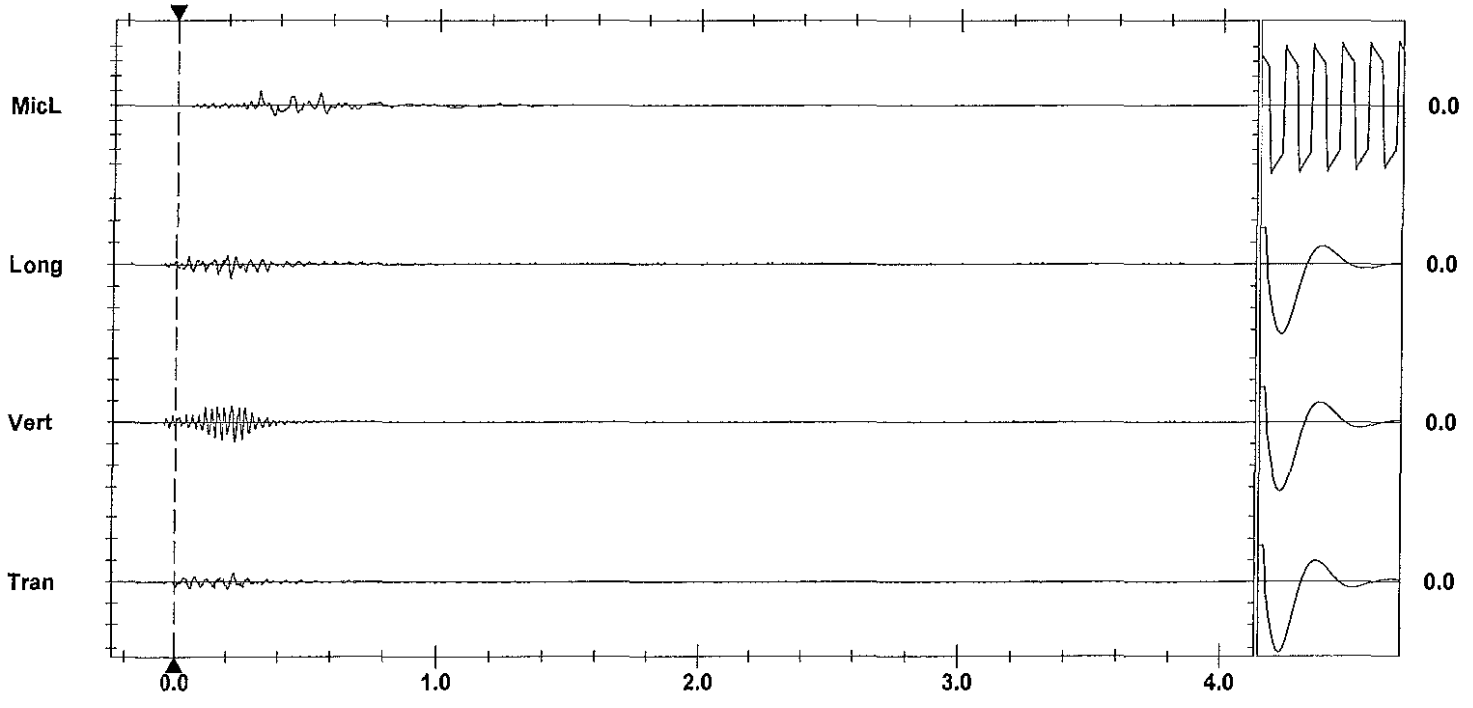
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.320 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 474 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0900	0.0650	in/s
ZC Freq	30	39	26	Hz
Time (Rel. to Trig)	0.229	0.229	0.212	sec
Peak Acceleration	0.0398	0.0928	0.0398	g
Peak Displacement	0.00021	0.00039	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Peak Vector Sum 0.105 in/s at 0.229 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: August 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Long at 12:36:13 July 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960ED9C.CD0
Job Number:	1		

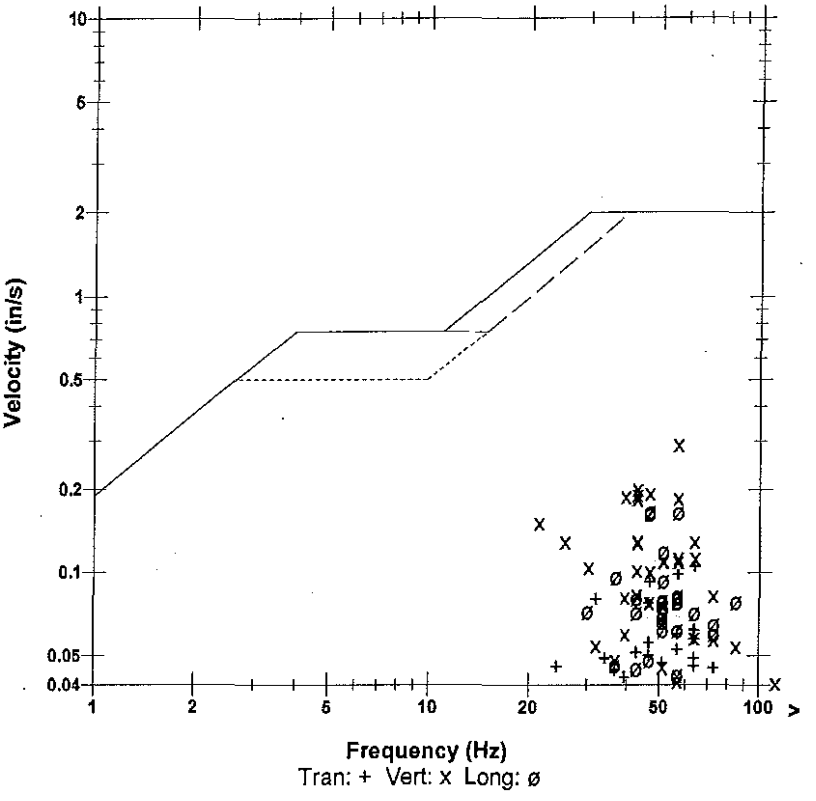
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:james m
General:

Extended Notes

Post Event Notes

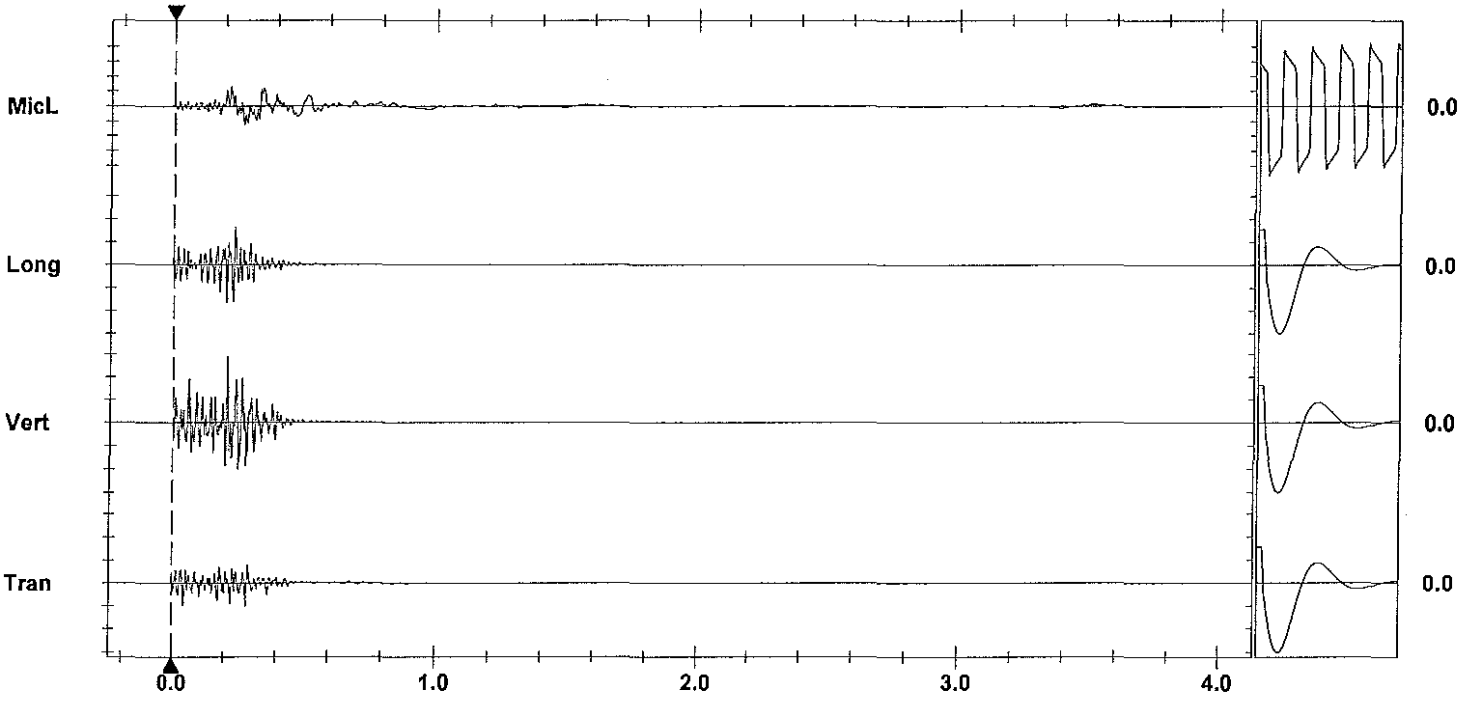
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.219 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 483 mv)

	Tran	Vert	Long	
PPV	0.105	0.291	0.166	in/s
ZC Freq	64	57	47	Hz
Time (Rel. to Trig)	0.286	0.209	0.239	sec
Peak Acceleration	0.106	0.290	0.207	g
Peak Displacement	0.00027	0.00073	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.4	3.5	3.7	

Peak Vector Sum 0.297 in/s at 0.209 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 15, 2012 07:08:01 - 8.01
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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED July 16/12
ACTUAL BLAST DATE July 16/12 2:39 PM
BLAST # MW-0285

HIGHWAY# 97
BLAST LOCATION AT: 128+58 - 128+64 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* BC Hydro notified

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 60/L / 38 buffers 8 stab / 4 Trim
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 135 (kg)
DELAY TYPE AND LENGTH 025 (ms)

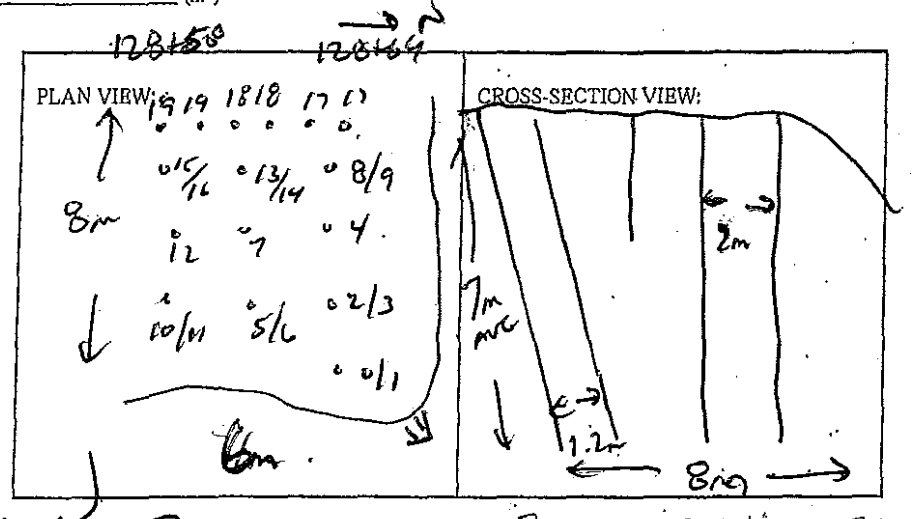
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE ~~HB320~~ CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.131PV/39Hz
" @ 13167 Cliffstone Crt - 0.095IPS/64Hz
" @ 13093 Cliffstone Crt - 0.36IPS/47Hz

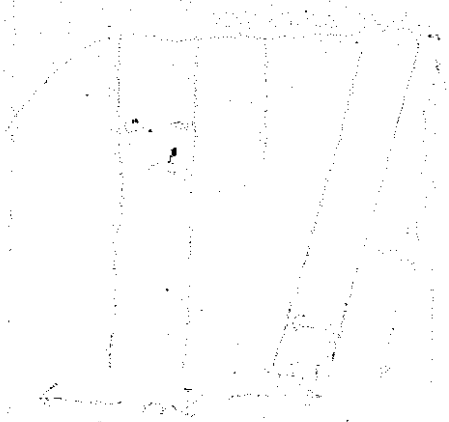
Pond holes - Bottom Deck 5'-6' and 0.5 cart
2"x16" Dynamite Prim

- Top Deck - 3'-4' and 0.5 cart 2"x16" Dynamite Prim

Stab holes - 15' Depth - 3'-4' and 0.5 cart 2"x16" Dynamite Prim

Buffer holes: Bottom Rock - 4 cart 2"x16" Blasters
Top Rock - 2-3 cart 2"x16" Blasters
Both Decks Primed w/ 0.5 cart 2"x16" Dynamite

B/L holes - 1 cart 2"x16" Dynamite + 200 grain det cord to 4' collar.



Instantel

Event Report

Date/Time	Vert at 14:39:23 July 16, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDF2.1N0

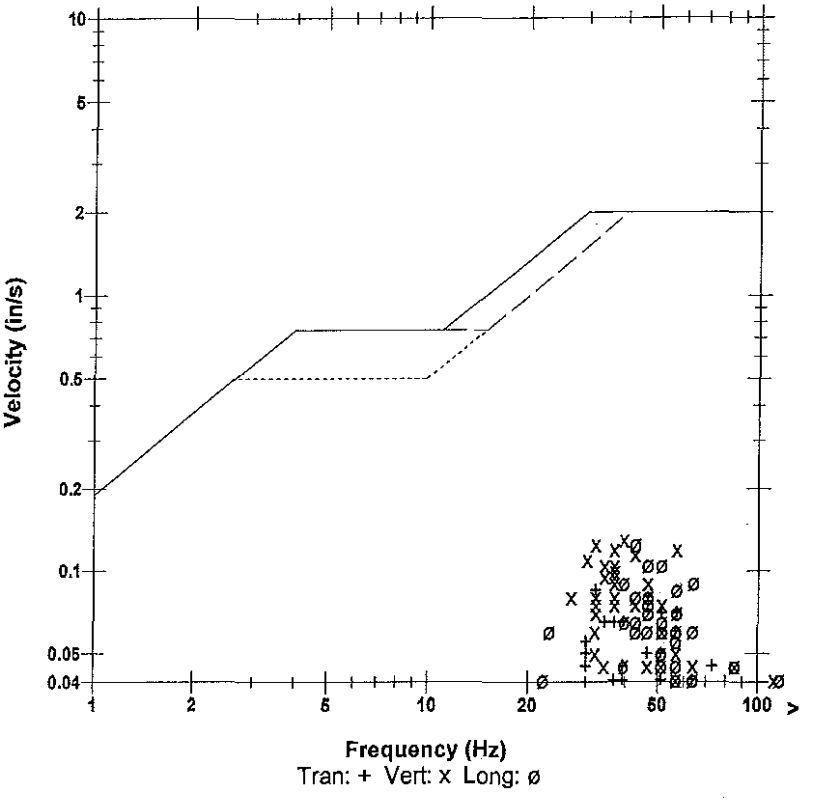
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

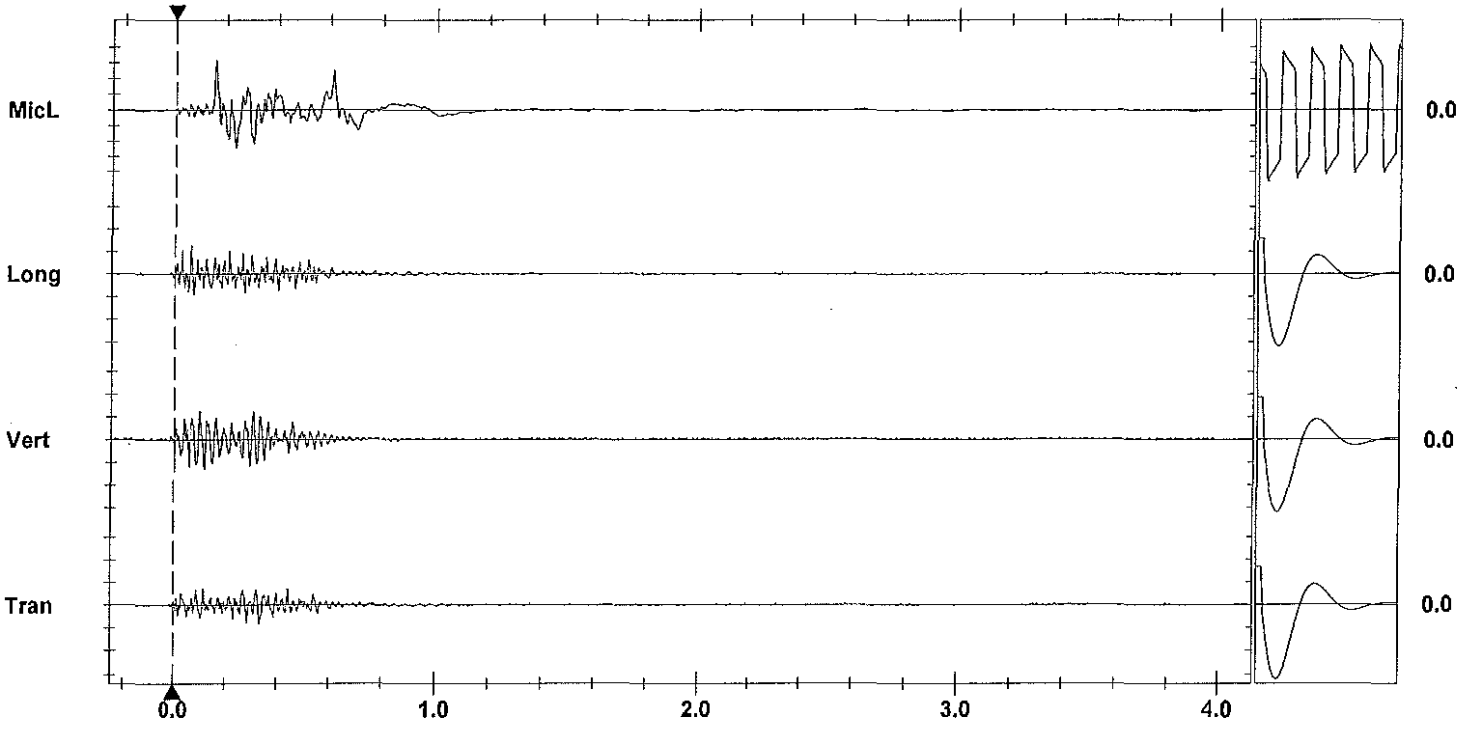
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00319 psi(L) at 0.155 sec			
ZC Freq	18 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 473 mv)			

	Tran	Vert	Long	
PPV	0.0850	0.130	0.125	in/s
ZC Freq	32	39	43	Hz
Time (Rel. to Trig)	0.337	0.118	0.065	sec
Peak Acceleration	0.0795	0.133	0.119	g
Peak Displacement	0.00039	0.00061	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.148 in/s at 0.118 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 07:8:01 - 8.01
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Instantel

Event Report

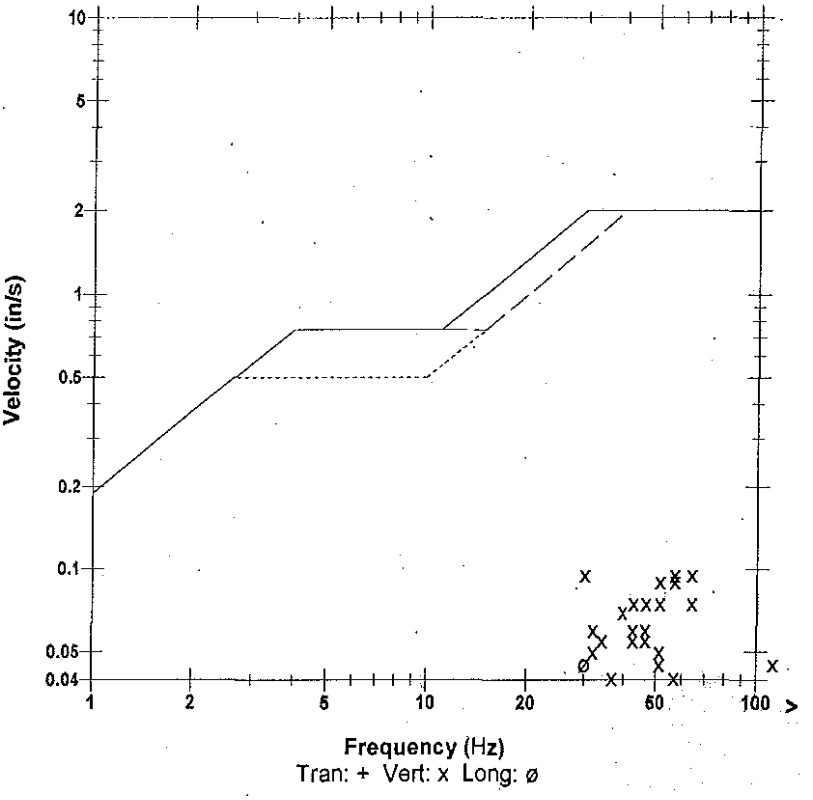
Date/Time	Vert at 14:38:39 July 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDF2.0F0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

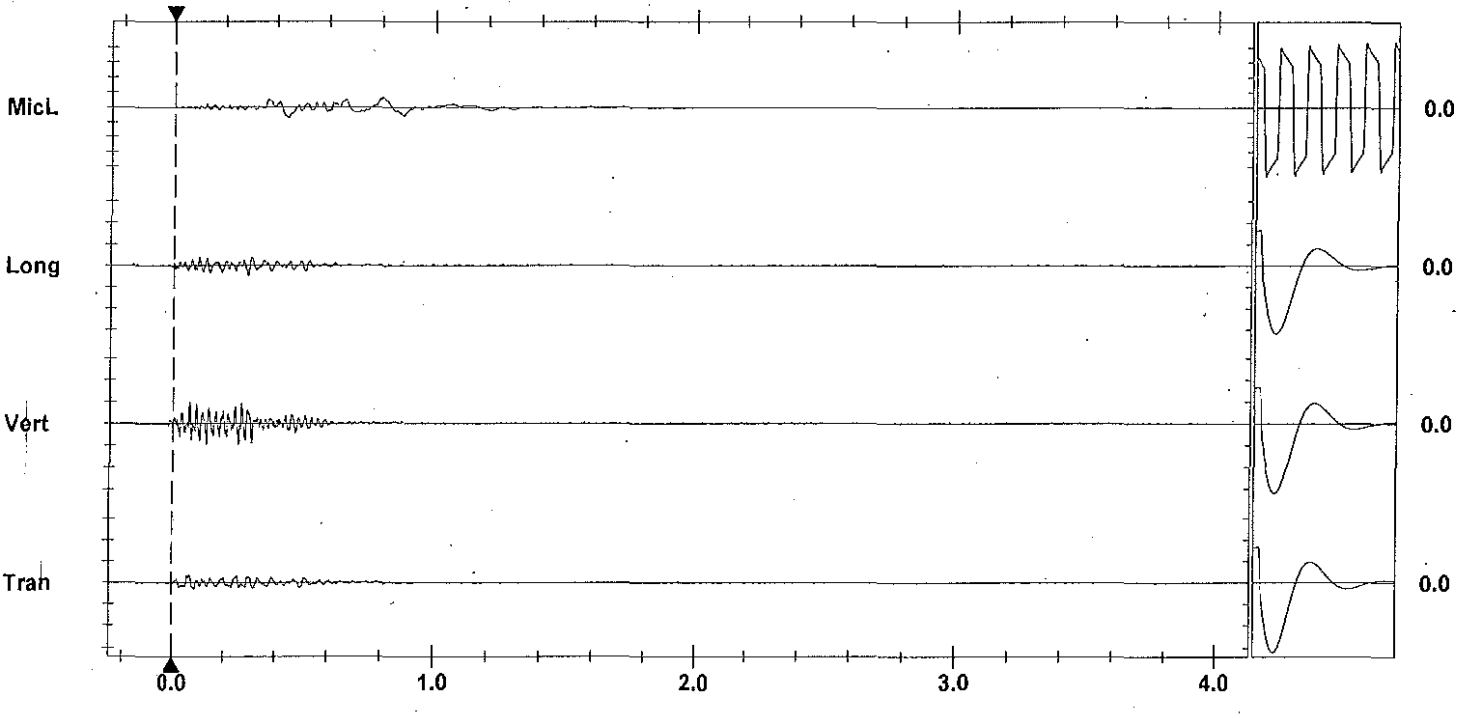
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00069 psi(L) at 0.438 sec
ZC Freq	9.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 486 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0950	0.0450	in/s
ZC Freq	26	64	30	Hz
Time (Rel. to Trig)	0.060	0.064	0.290	sec
Peak Acceleration	0.0398	0.106	0.0398	g
Peak Displacement	0.00024	0.00032	0.00023	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.1	

Peak Vector Sum 0.102 in/s at 0.132 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:39:34 July 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDF2.1Y0
Job Number:	1		

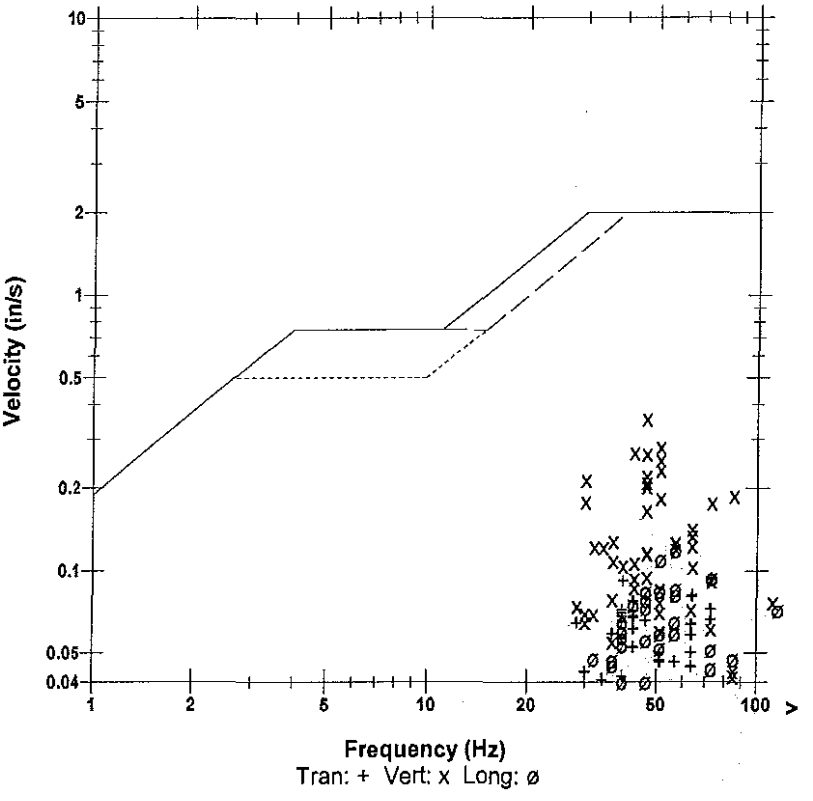
Notes
location:13093 Cliffstone Crt on rear patio slab se cr

User Name:James m
General:

Extended Notes

Post Event Notes

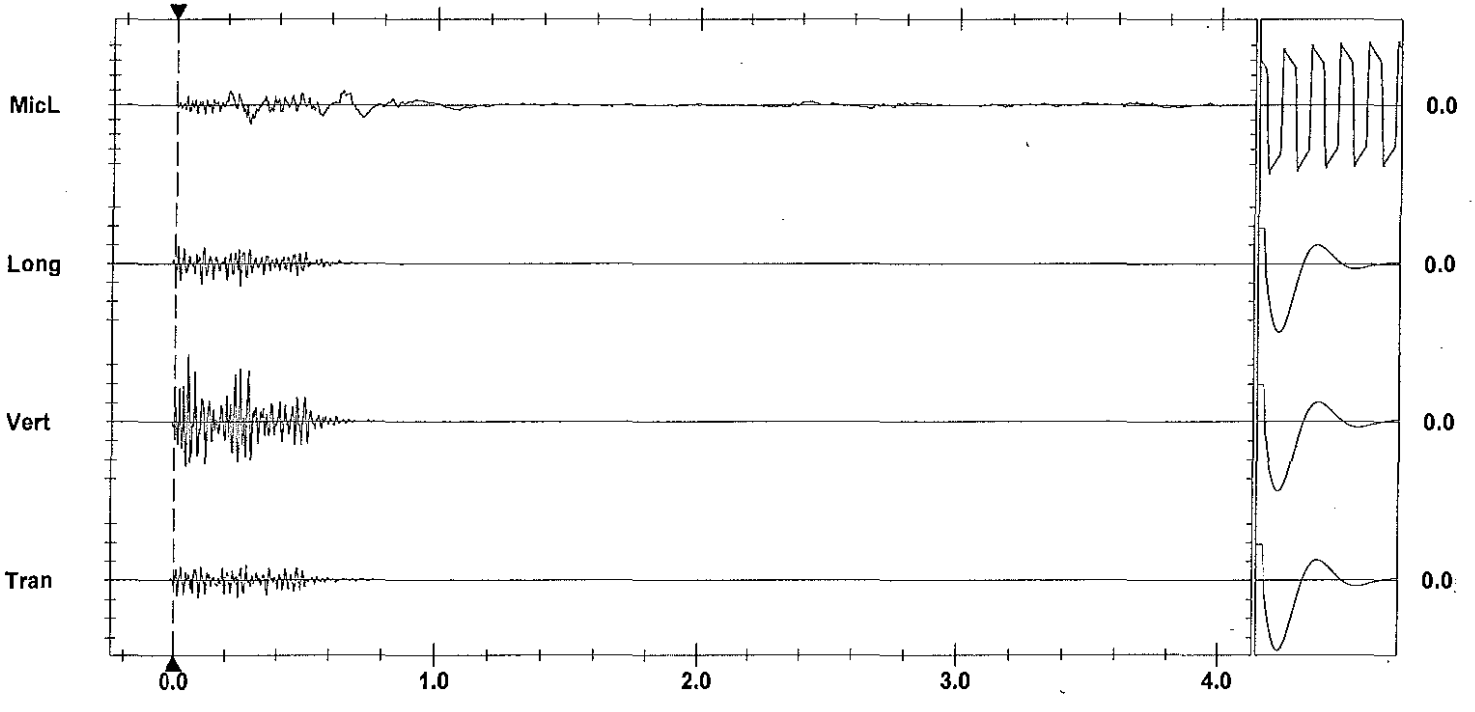
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.285 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 533 mv)

	Tran	Vert	Long	
PPV	0.0937	0.356	0.119	in/s
ZC Freq	73	47	57	Hz
Time (Rel. to Trig)	0.249	0.052	0.253	sec
Peak Acceleration	0.143	0.270	0.123	g
Peak Displacement	0.00029	0.00113	0.00032	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.4	3.6	3.7	

Peak Vector Sum 0.356 in/s at 0.052 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JULY/12
ACTUAL BLAST DATE JULY/12 11:15AM
BLAST # MW-0286

HIGHWAY# 97
BLAST LOCATION AT: STN 128+49 - 128+59 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.9 (m)
TOTAL DEPTH 96 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES ~~25~~ 11
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 170 (kg)
DELAY TYPE AND LENGTH 25 (ms)

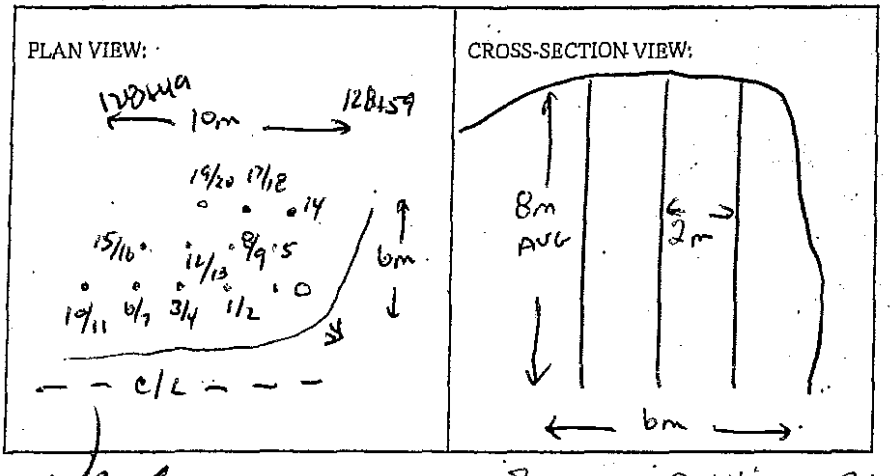
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 460 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.37 ips/37 Hz
" @ 13167 Cliffstone Crt - 0.100 ips/43 Hz
" @ 13073 Cliffstone Crt - 0.68 ips/37 Hz

BOTTOM DECKS – 6'-7' ANFO

TOP DECKS – 3'-6' ANFO

ALL DECKS PRIMED W/ 0.5 CART. 1½" x 16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:15:54 July 17, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDGN.AI0

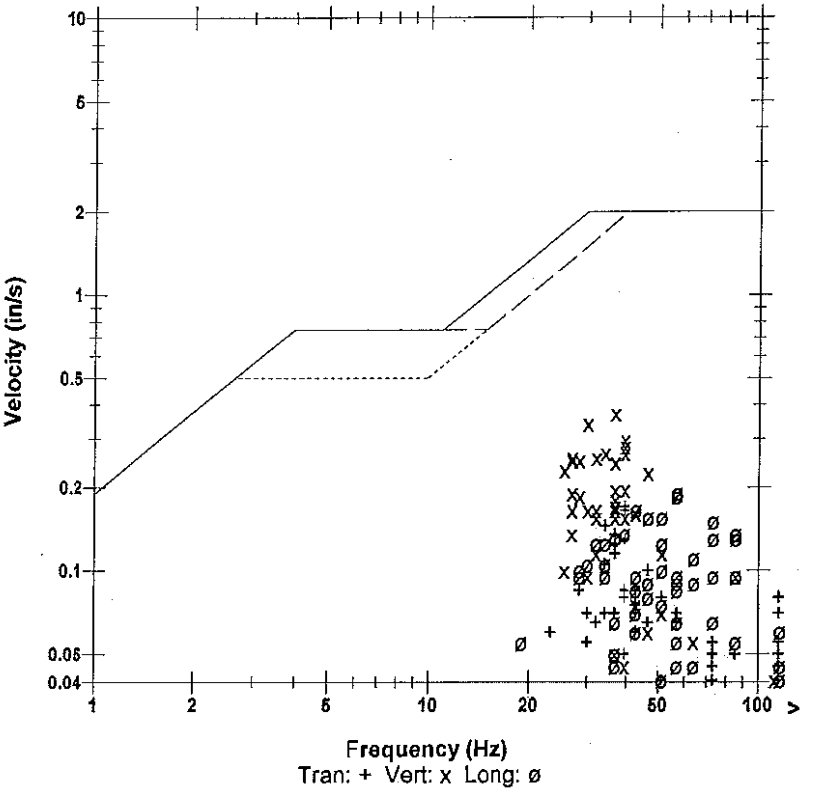
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

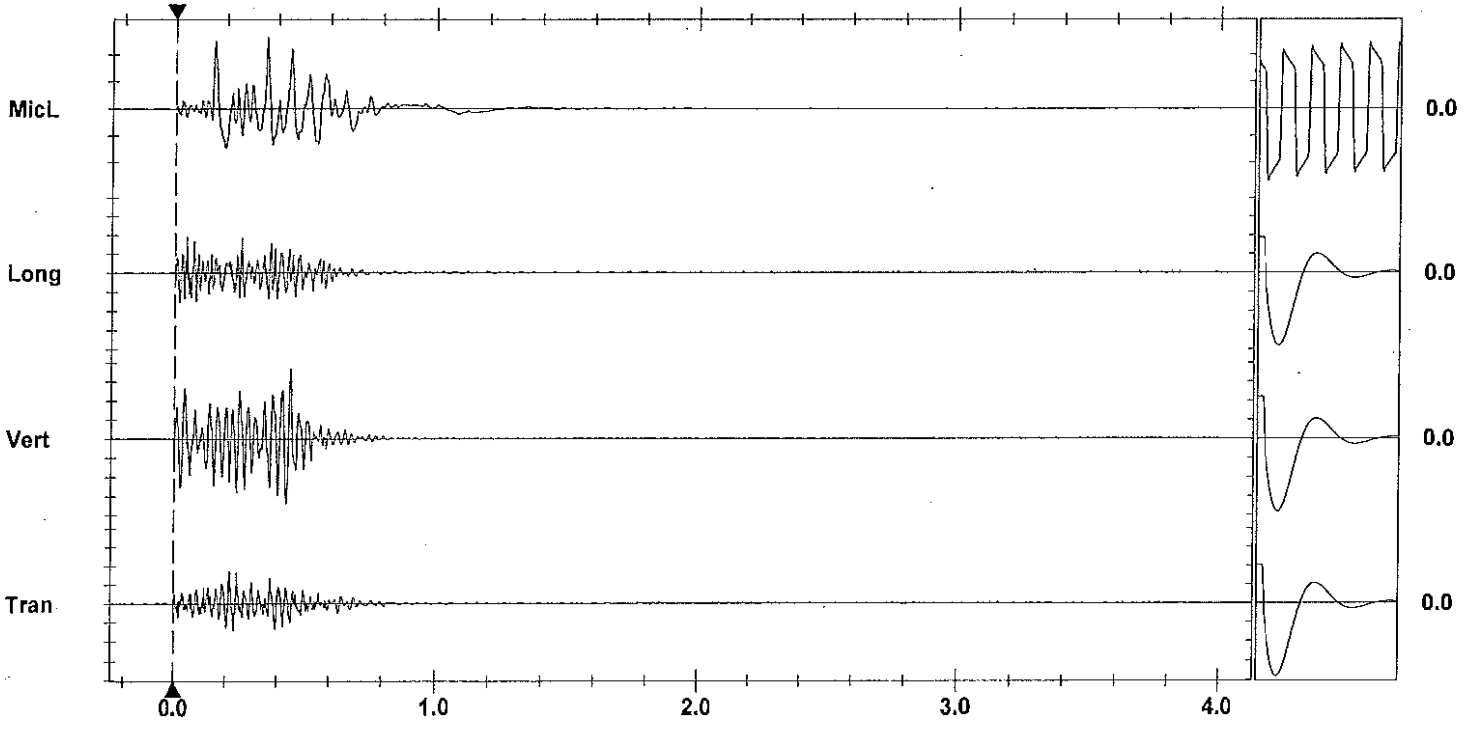
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00522 psi(L) at 0.355 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	0.170	0.370	0.190	in/s
ZC Freq	39	37	57	Hz
Time (Rel. to Trig)	0.218	0.450	0.045	sec
Peak Acceleration	0.159	0.212	0.225	g
Peak Displacement	0.00061	0.00176	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.379 in/s at 0.450 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div

Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

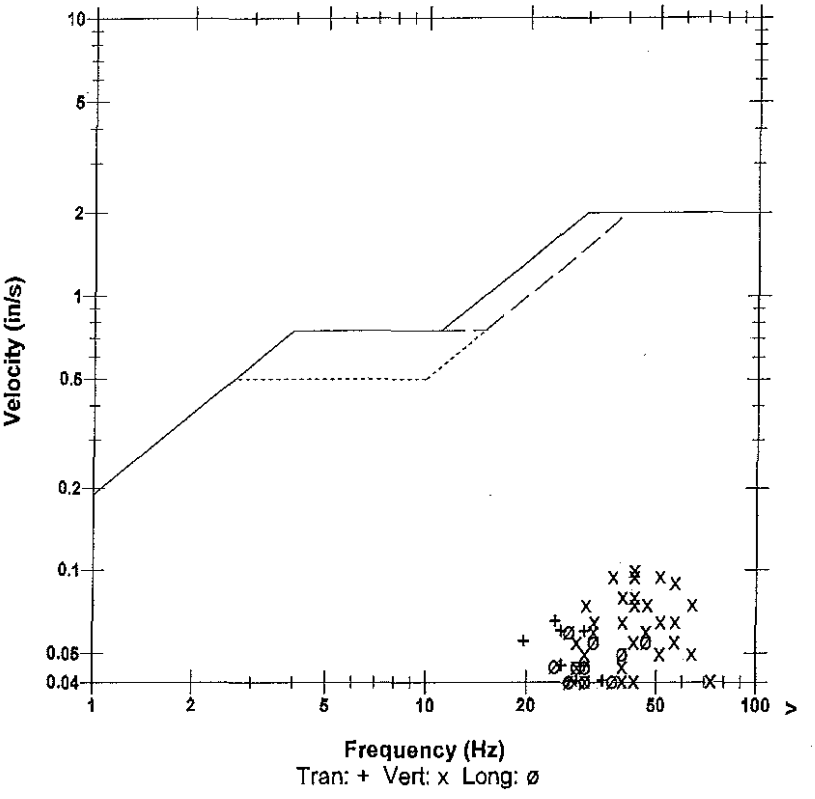
Date/Time	Vert at 11:15:55 July 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDGN.AJ0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

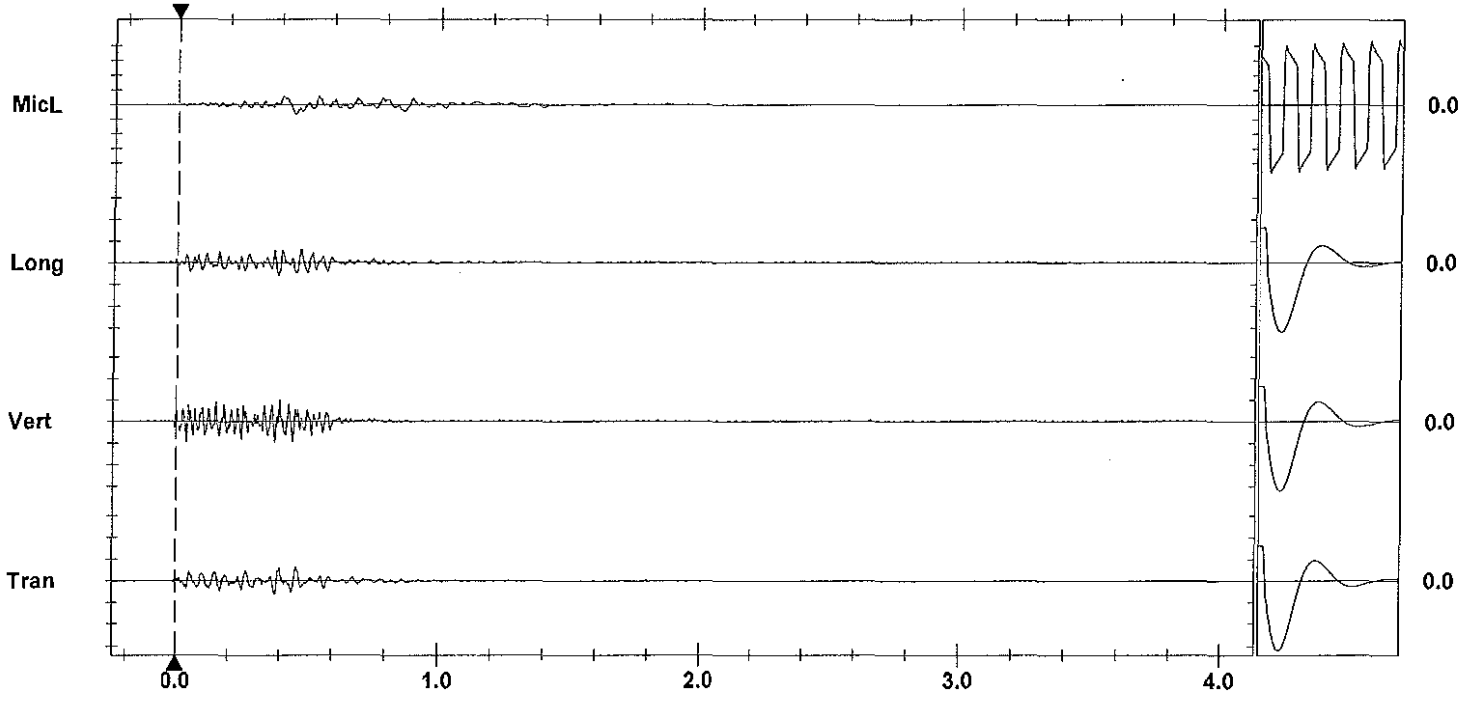
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00065 psi(L) at 0.447 sec			
ZC Freq	8.8 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 442 mv)			

	Tran	Vert	Long	
PPV	0.0650	0.1000	0.0600	in/s
ZC Freq	24	43	27	Hz
Time (Rel. to Trig)	0.464	0.401	0.392	sec
Peak Acceleration	0.0530	0.0795	0.0530	g
Peak Displacement	0.00040	0.00036	0.00035	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.113 in/s at 0.401 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 29, 2012 07:8:01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:15:52 July 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDGN.AG0
Job Number:	1		

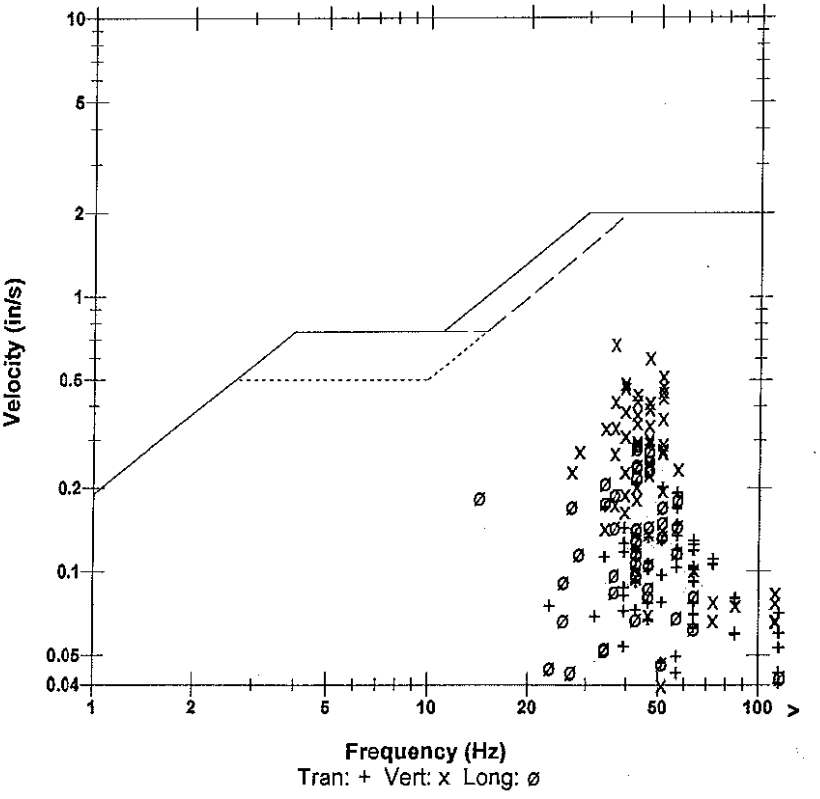
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

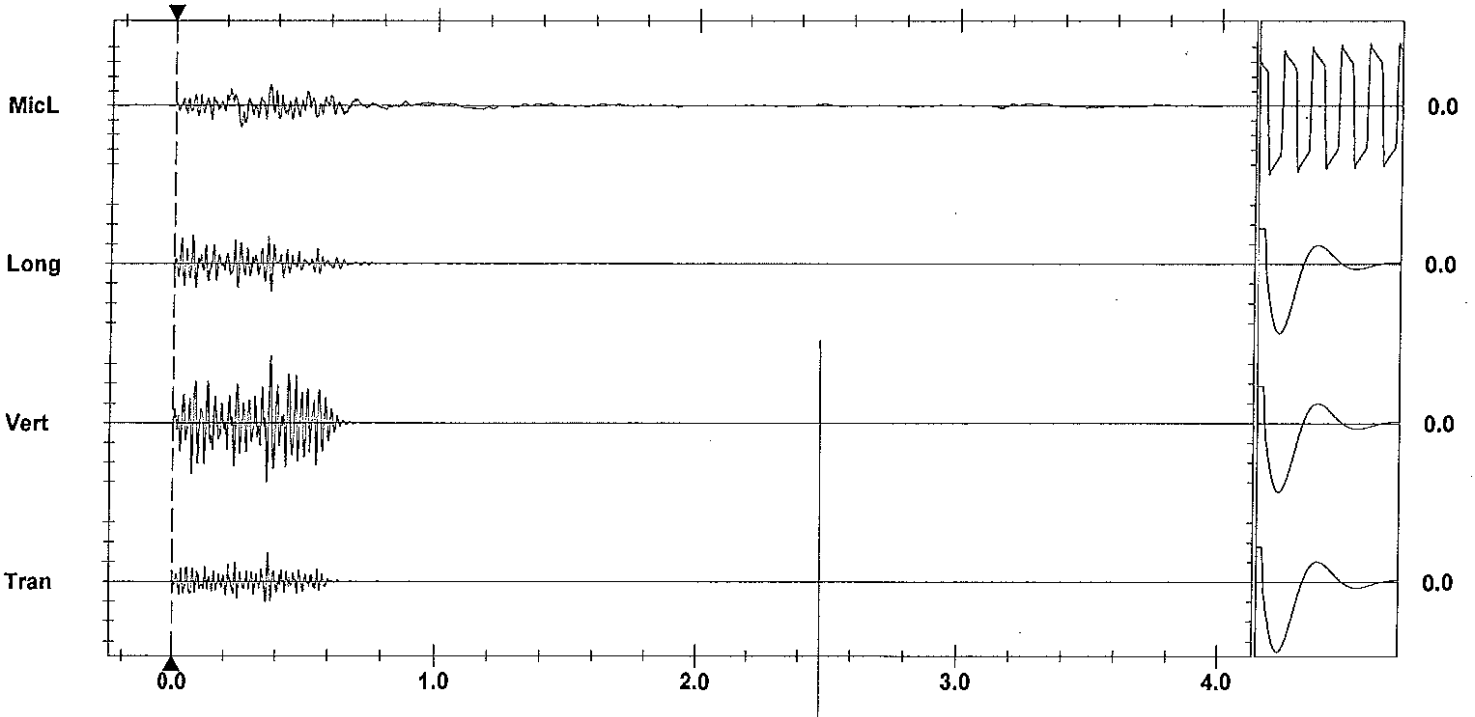
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.256 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 489 mv)

	Tran	Vert	Long	
PPV	0.287	0.679	0.288	in/s
ZC Freq	47	37	43	Hz
Time (Rel. to Trig)	0.374	0.379	0.074	sec
Peak Acceleration	0.244	0.444	0.199	g
Peak Displacement	0.00094	0.00283	0.00102	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.727 in/s at 0.379 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED Jul 18/12
ACTUAL BLAST DATE Jul 18/12 9:58 AM
BLAST # MW-0287

HIGHWAY# 97
BLAST LOCATION AT: STN 128+41 - 128+49 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 85 (m)

TOTAL NUMBER OF HOLES 10 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 20

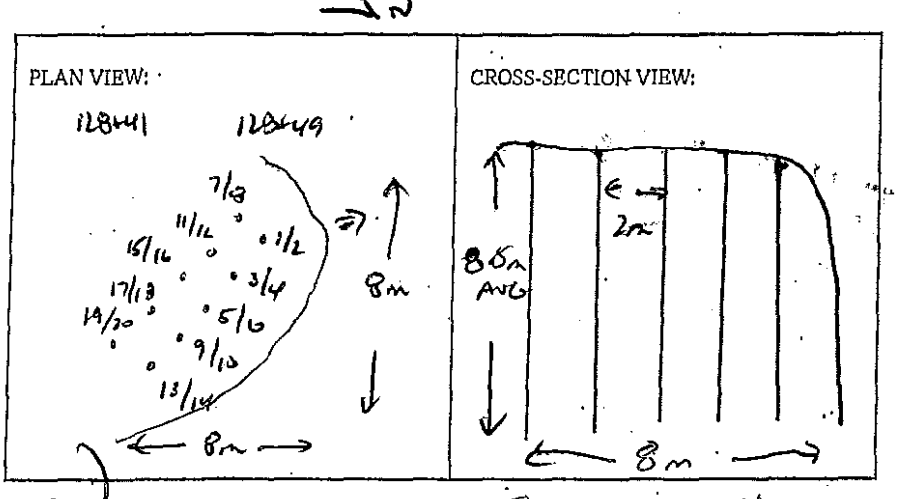
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

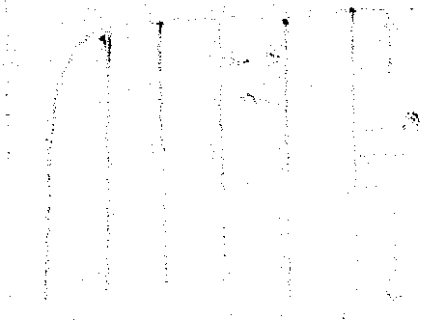
(Use Additional Sheets If Necessary)

Seismograph @ 13050 OCO Mission Rd - 0.24 ips) 37Hz
" @ 13167 Cliffstone Crt - 0.090 ips) 34Hz
" @ 13073 Cliffstone Crt - 0.56 ips) 47Hz

BOTTOM DECKS - 6'-7' ANFO

TOP DECKS - 4'-6' ANFO

ALL PRIMES w/ 0.5 CHRT 1½" x 16" DYNAMITE



Instantel

Event Report

Date/Time	Vert at 09:58:32 July 18, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDIE.DK0

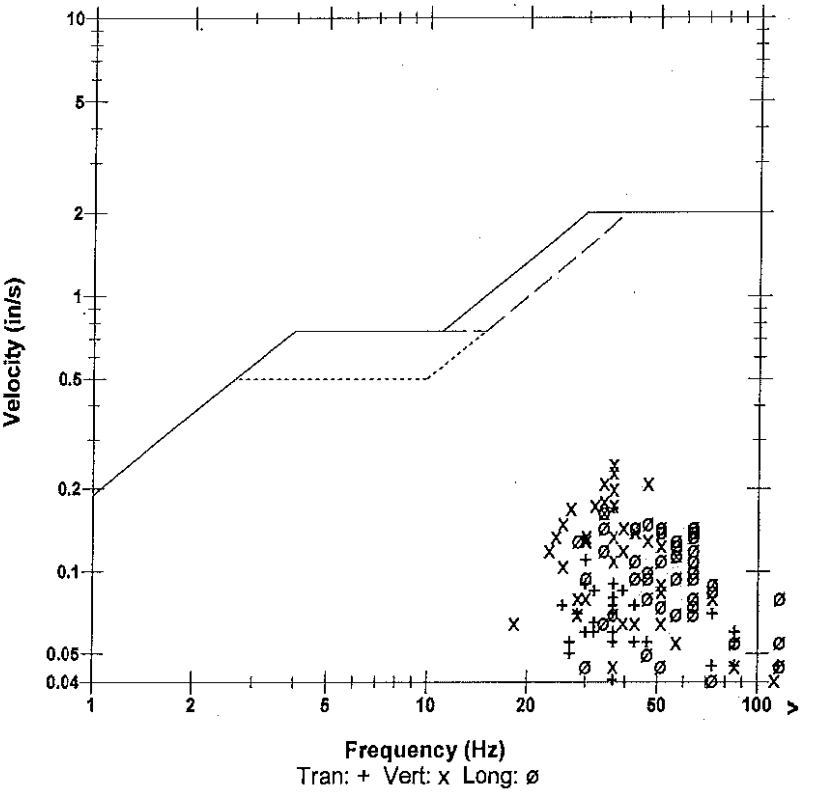
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

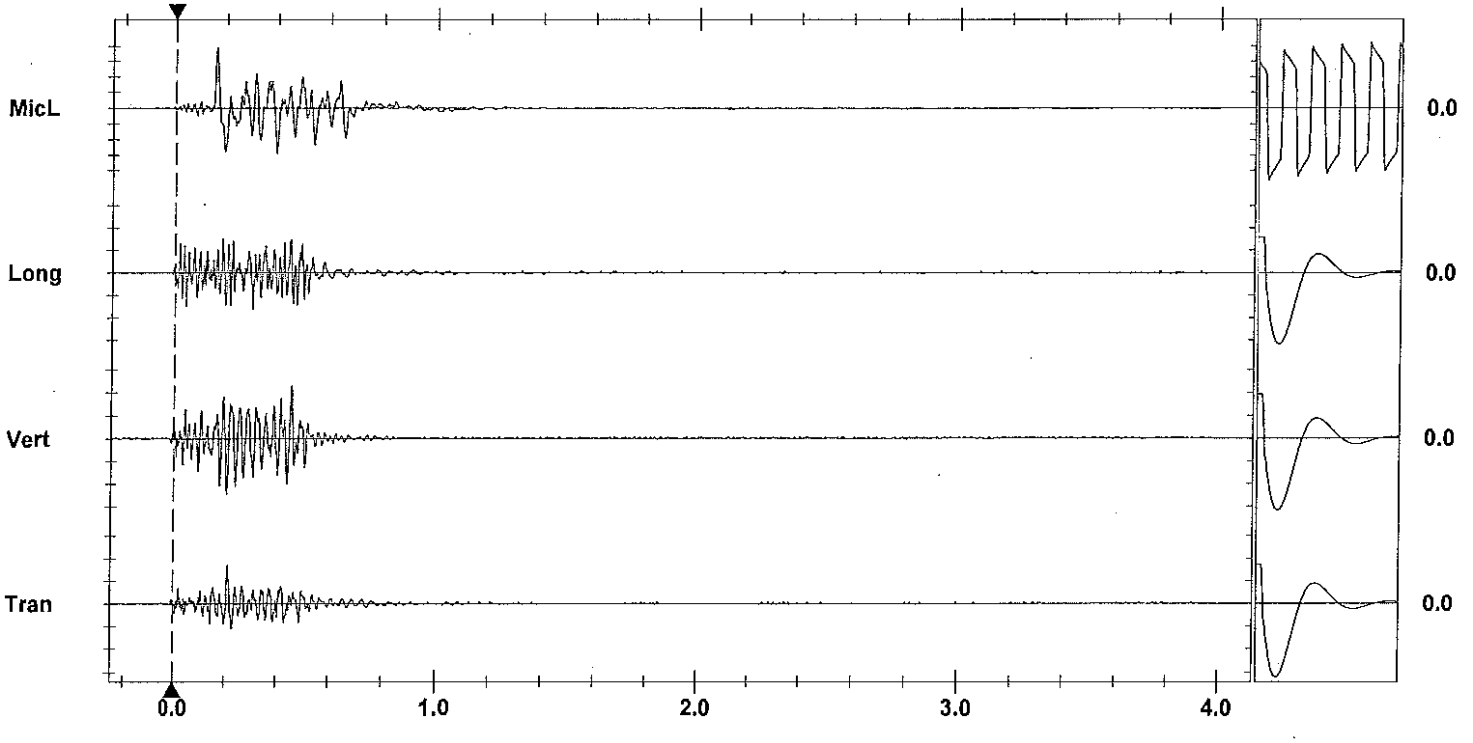
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00392 psi(L) at 0.160 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 538 mv)

	Tran	Vert	Long	
PPV	0.170	0.245	0.165	in/s
ZC Freq	37	37	34	Hz
Time (Rel. to Trig)	0.213	0.208	0.305	sec
Peak Acceleration	0.119	0.172	0.225	g
Peak Displacement	0.00069	0.00105	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.272 in/s at 0.207 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶——————◀

Printed: July 29, 2012 (V 8.01 - 8.01)

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Instantel

Event Report

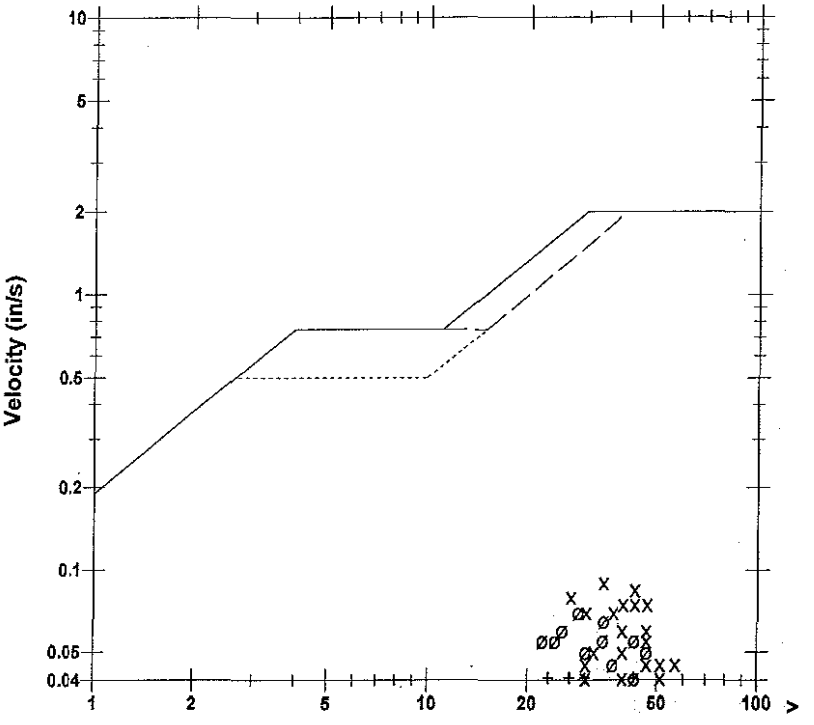
Date/Time	Vert at 09:58:32 July 18, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDIE.DK0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

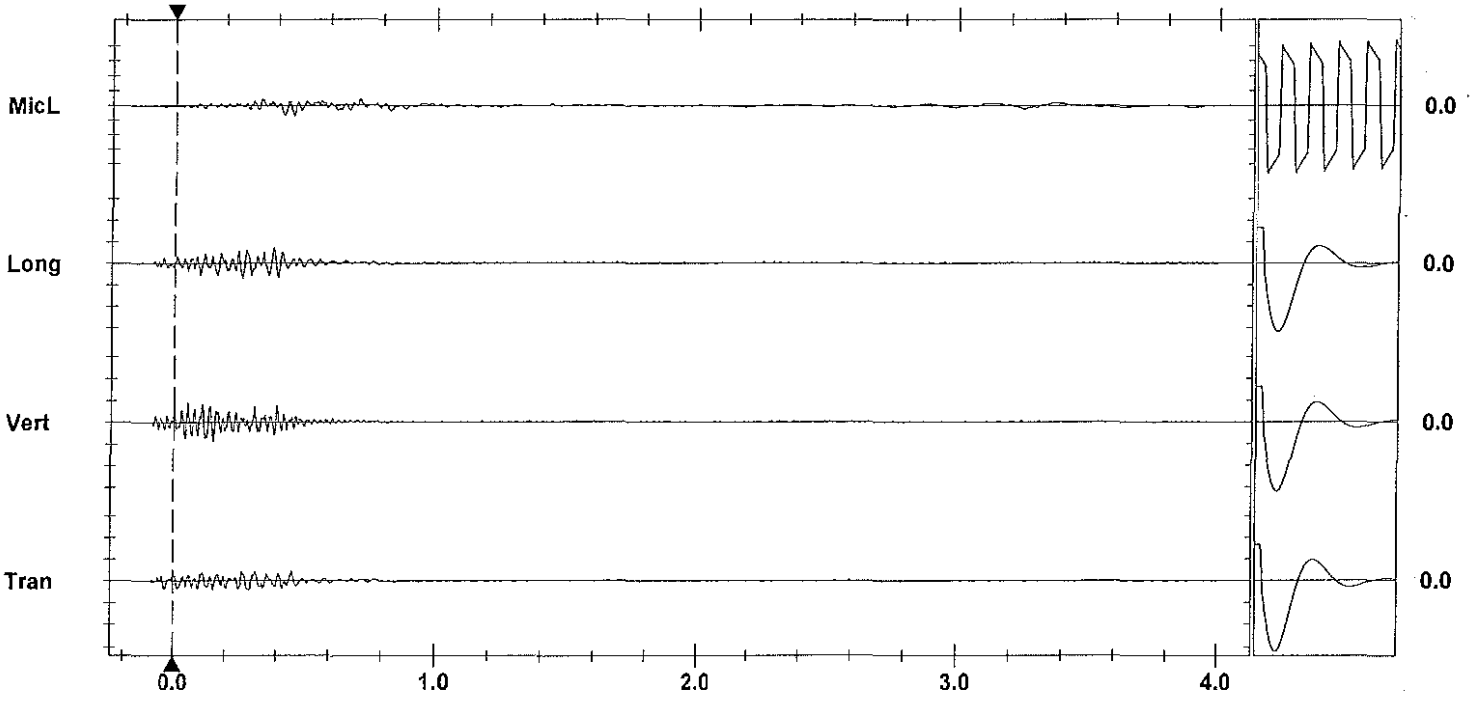


Tran: + Vert: x Long: ø

Microphone Linear Weighting
PSPL 0.00069 psi(L) at 0.457 sec
ZC Freq 27 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 544 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0900	0.0700	in/s
ZC Freq	43	34	28	Hz
Time (Rel. to Trig)	0.158	0.054	0.264	sec
Peak Acceleration	0.0398	0.0795	0.0398	g
Peak Displacement	0.00033	0.00043	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.0966 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 09:58:31 July 18, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDIE.DJ0
Job Number:	1		

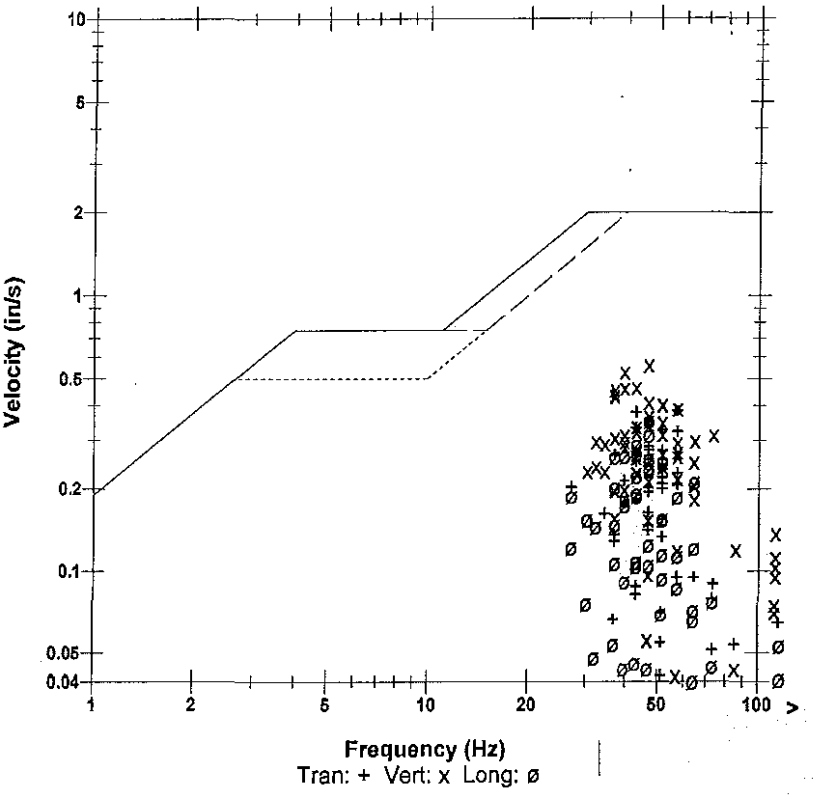
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

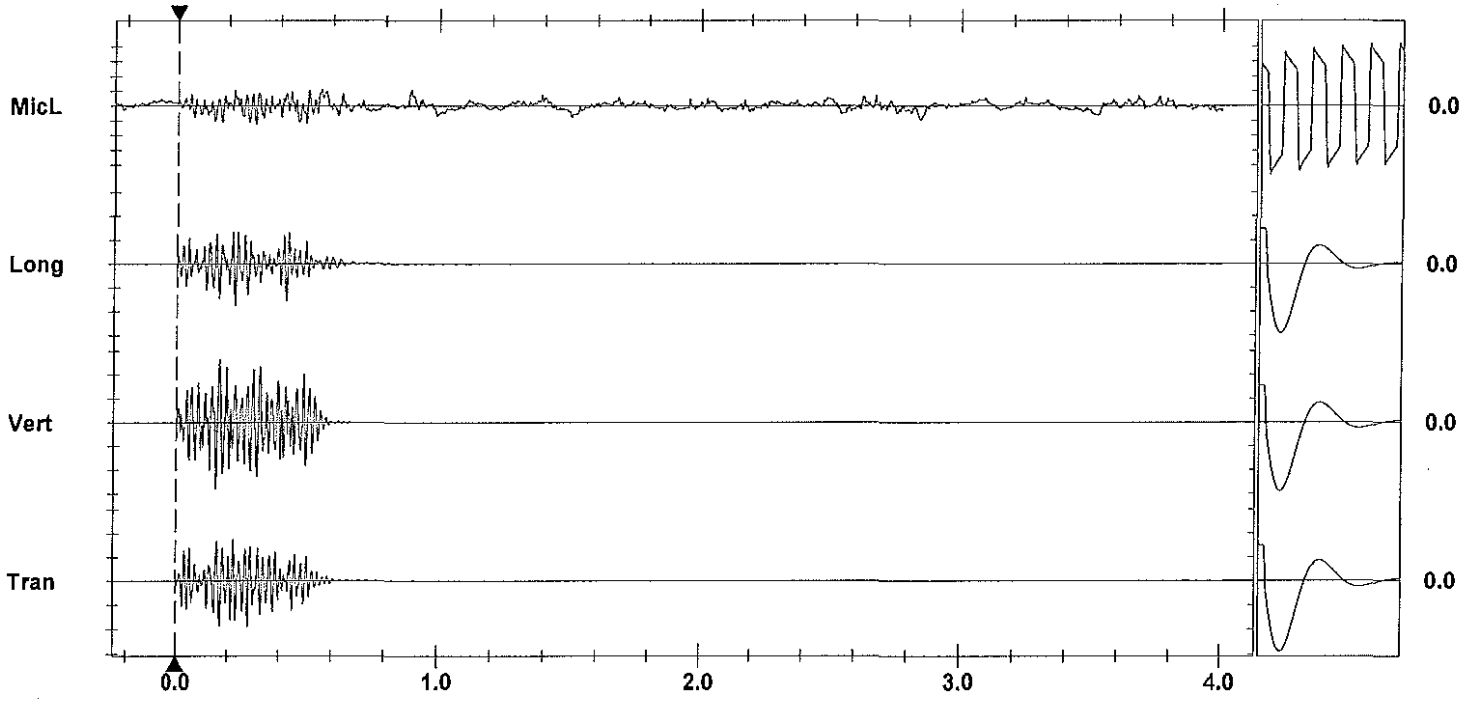
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.304 sec
ZC Freq	39 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 538 mv)

	Tran	Vert	Long	
PPV	0.382	0.560	0.353	in/s
ZC Freq	57	47	47	Hz
Time (Rel. to Trig)	0.281	0.157	0.228	sec
Peak Acceleration	0.323	0.459	0.283	g
Peak Displacement	0.00132	0.00223	0.00122	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.621 in/s at 0.157 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 18/12
ACTUAL BLAST DATE Jul 18/12 12:19 PM
BLAST # MW-0288

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+53 - 128+58 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Alberco Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH 117 (m)

TOTAL NUMBER OF HOLES 7 BL / 2 Buffer / 2 Stab / 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

- BL Holes loaded w/ 1 cart 2"x16" Dynamite + 200 grain det. cord for collar

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 130 (kg)
DELAY TYPE AND LENGTH 25 (ms)

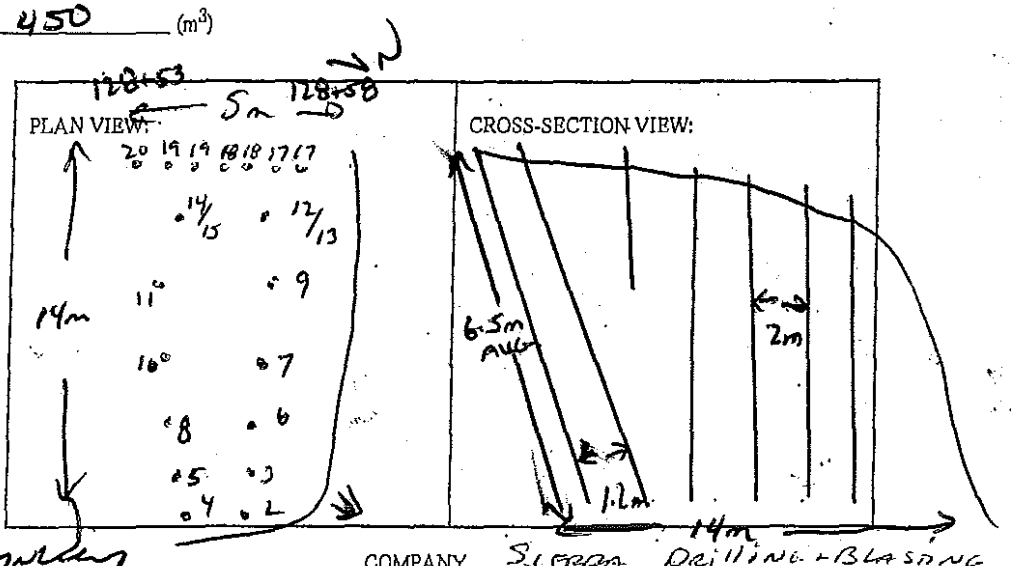
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HMS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 450 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

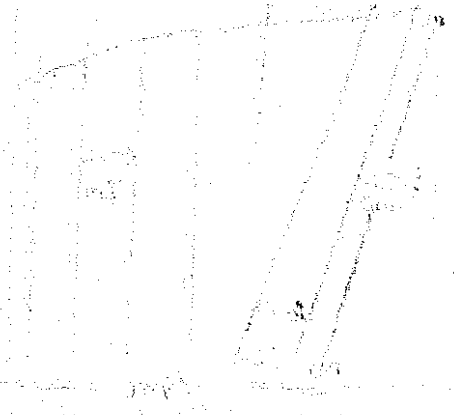
Seismograph @ 13050 Old Mission Rd - 0.22 ips/57 HL
" @ 13167 Cliffstone Crt - 0.100 ips/39 HL
" @ 13073 Cliffstone Crt - 0.58 ips/47 HL

PROD. HOLES -

BUFFER HOLES - BOTTOM DECKS - 4 CASES 2"x16" BLASTEX
TOP DECKS - 2-3 CASES 2"x16" BLASTEX
ALL PRIMED W/ 0.5 CASE 1½"x16" DYNAMITE

STAB HOLES - 2'-4' ANFO + 0.5 CASE 1½"x16" DYNAMITE PRIMER

B/L HOLES - 1 CASE 2"x16" DYNAMITE + 200 grain det. to 4' collar.



Instantel

Event Report

Date/Time	Vert at 12:19:53 July 18, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDIK.X50

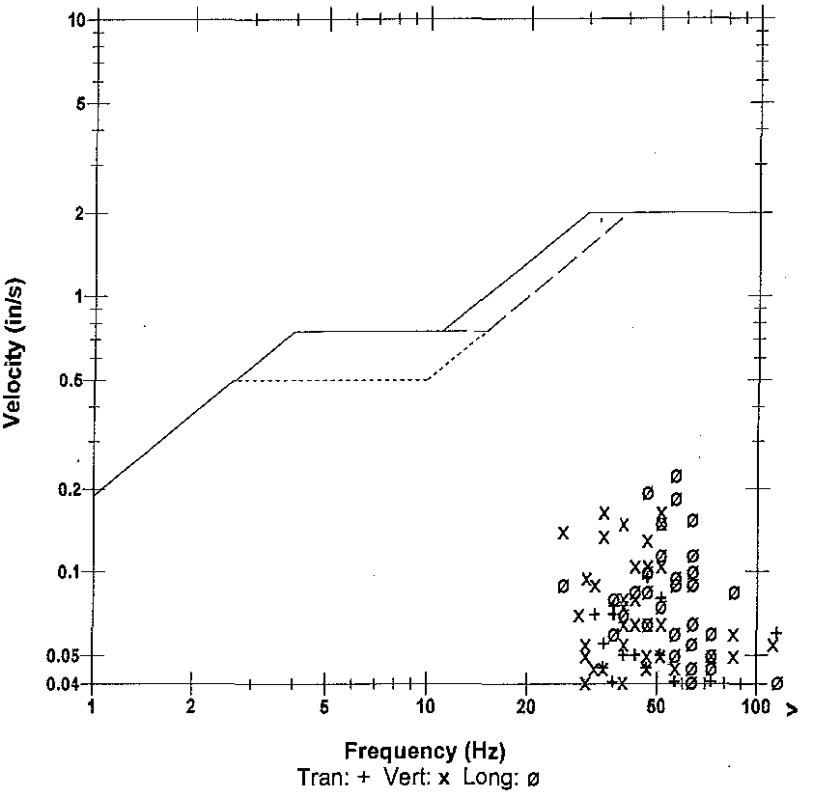
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

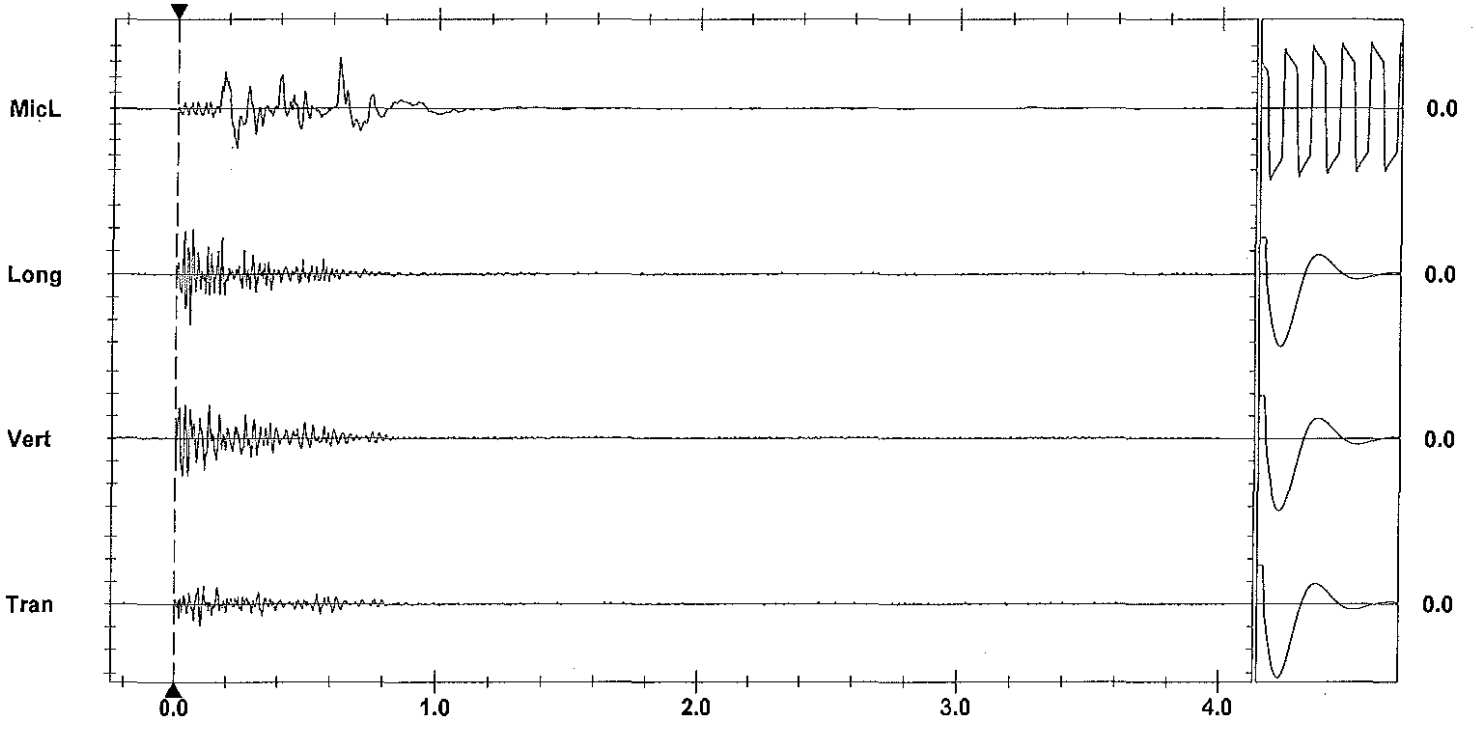
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00323 psi(L) at 0.625 sec
ZC Freq	9.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 464 mv)

	Tran	Vert	Long	
PPV	0.0950	0.165	0.225	in/s
ZC Freq	47	34	57	Hz
Time (Rel. to Trig)	0.102	0.026	0.056	sec
Peak Acceleration	0.106	0.186	0.278	g
Peak Displacement	0.00032	0.00079	0.00061	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.4	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.255 in/s at 0.056 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:19:52 July 18, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDIK.X40
Job Number:	1		

Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

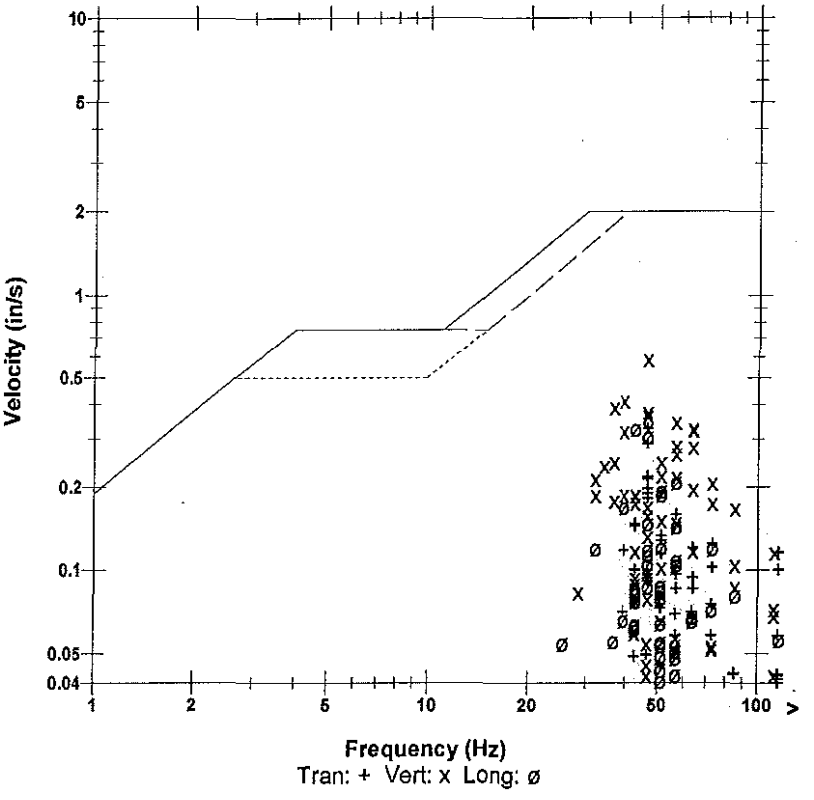
Post Event Notes

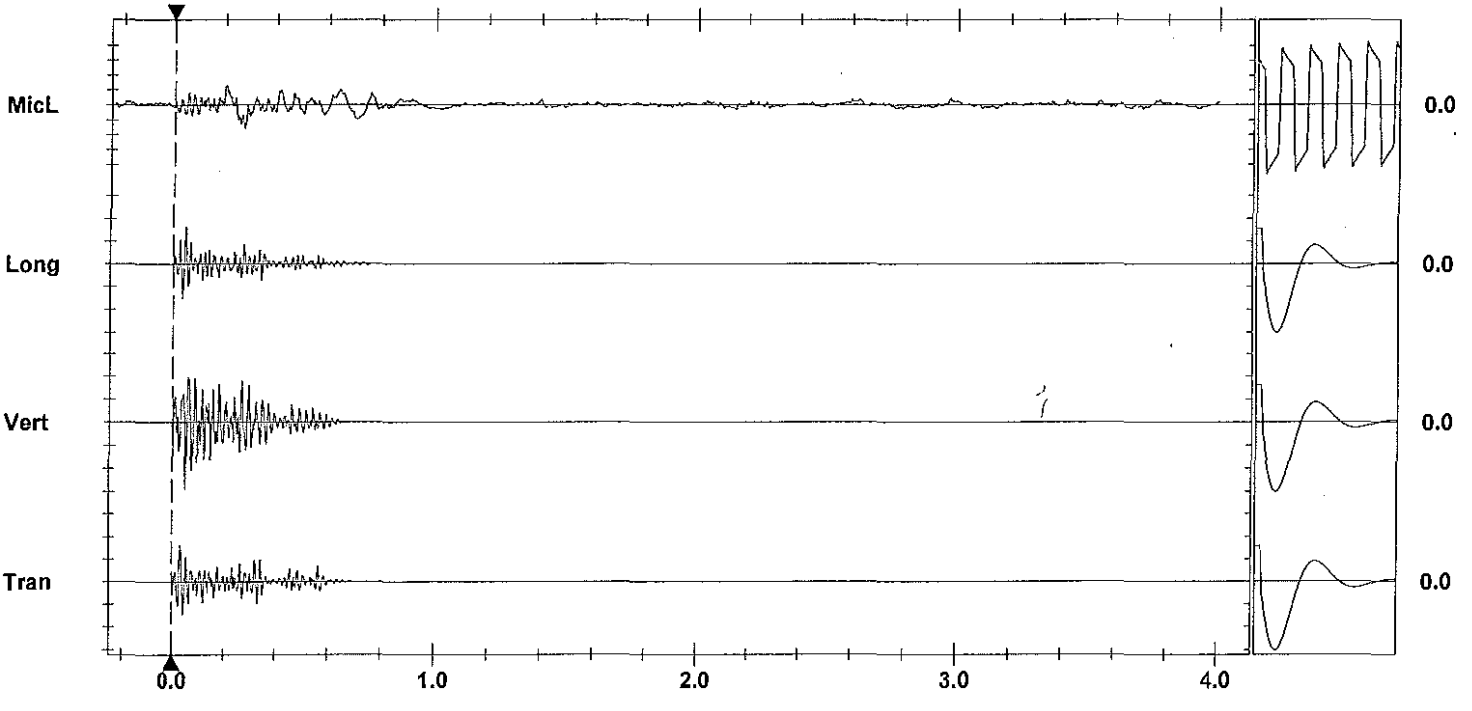
Microphone Linear Weighting
PSPL 0.00156 psi(L) at 0.271 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 492 mv)

	Tran	Vert	Long	
PPV	0.327	0.585	0.326	in/s
ZC Freq	47	47	43	Hz
Time (Rel. to Trig)	0.033	0.051	0.048	sec
Peak Acceleration	0.338	0.404	0.230	g
Peak Displacement	0.00123	0.00185	0.00106	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.4	3.6	3.7	

Peak Vector Sum 0.623 in/s at 0.051 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel®

Event Report

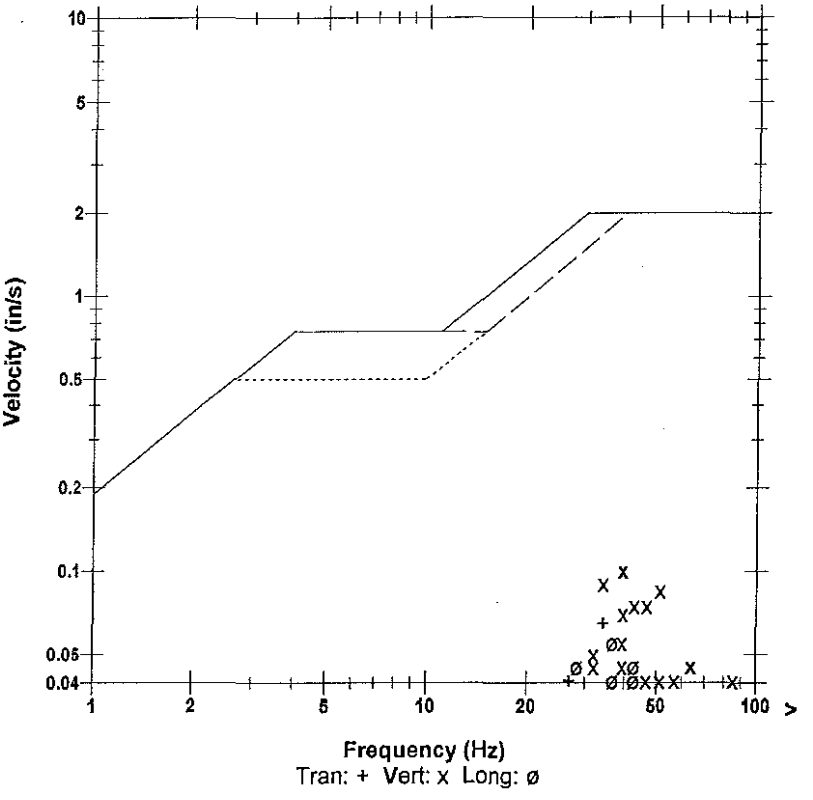
Date/Time	Vert at 12:19:53 July 18, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDIK.X50

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

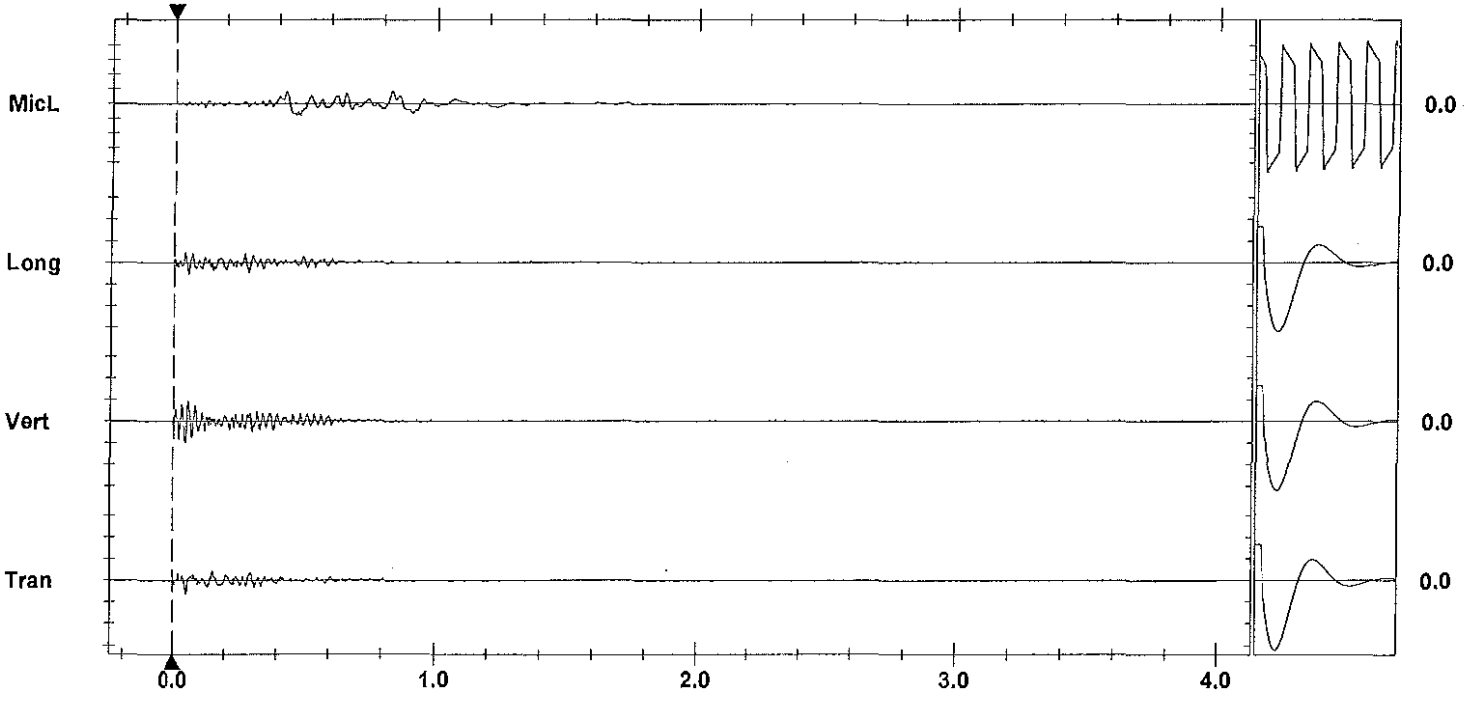
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00083 psi(L) at 0.827 sec			
ZC Freq	9.1 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 451 mv)			

	Tran	Vert	Long	
PPV	0.0650	0.1000	0.0550	in/s
ZC Freq	34	39	37	Hz
Time (Rel. to Trig)	0.054	0.046	0.057	sec
Peak Acceleration	0.0530	0.0928	0.0398	g
Peak Displacement	0.00029	0.00046	0.00022	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Peak Vector Sum 0.117 in/s at 0.056 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 19/12
ACTUAL BLAST DATE Jul 19/12 2:35PM
BLAST # MW-0289

HIGHWAY# 97
BLAST LOCATION AT: STA 128+44 - 128+53 LS (To Submarks)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot notched

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 163 (m)

TOTAL NUMBER OF HOLES 98/2 Buffer / 2 SMB / 6 Rock
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

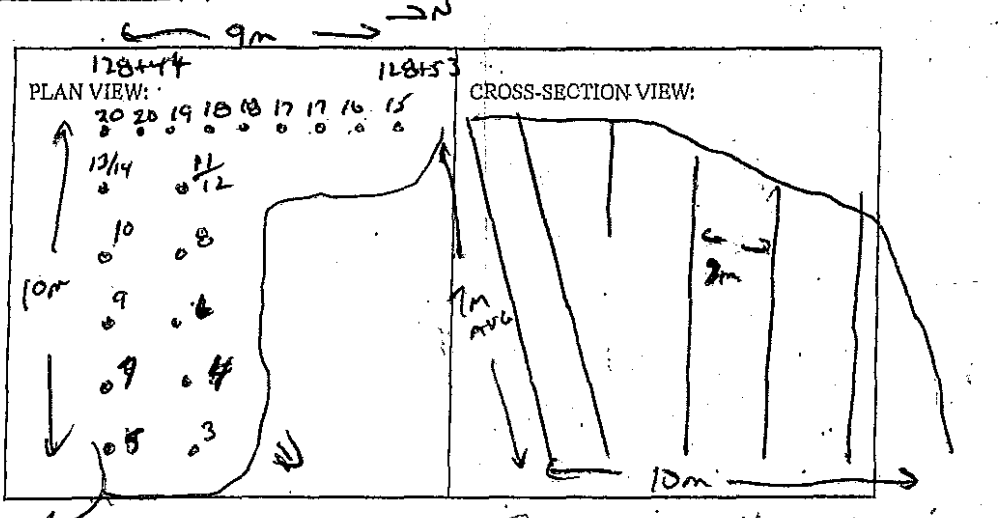
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.16 ips / 34 Hz
" @ 13167 cliffstone Crt. 0.065 ips / 64 Hz
" @ 13073 cliffstone Crt. 0.50 ips / 47 Hz

PROD. Holes. 5'-6' ANFO/Hole

SAVER Holes - 2'-3' ANFO/Hole

BOTTOM Holes - Bottom Decks - 4 CASES 2"x16" DYNAMITE

TOP DECKS - 2 CASES 2"x16" DYNAMITE

ALL PRIMED W/ 0.5 CASE 1½" 6/16" DYNAMITE

B/C HOLES - 1 CASE 2"x16" DYNAMITE + 200 gr. det. cord to 4' collars

Instantel

Event Report

Date/Time	Vert at 14:35:00 July 19, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDKL.UC0

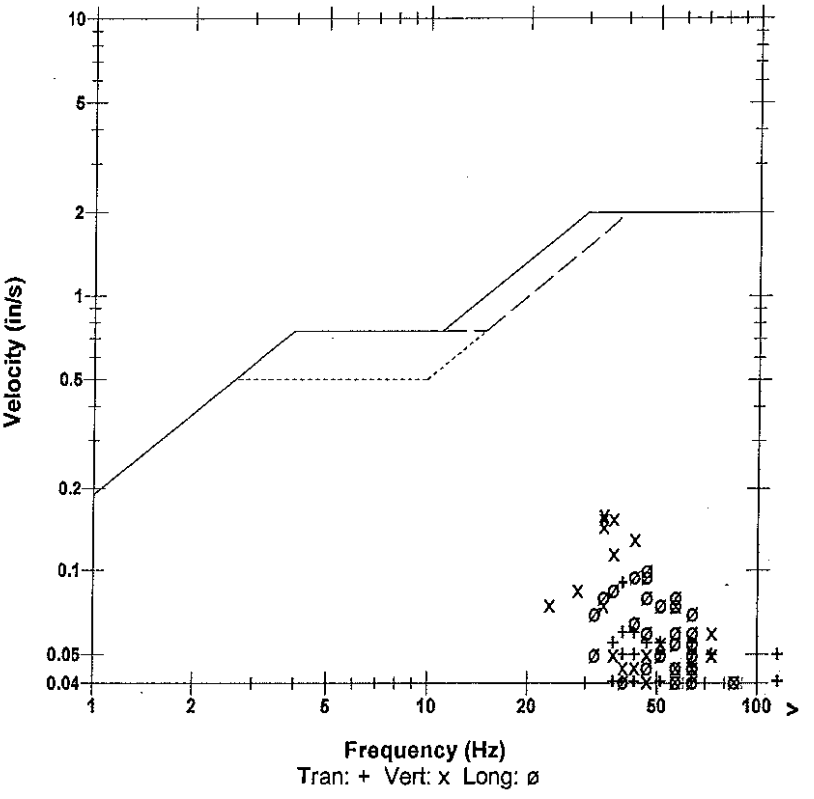
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

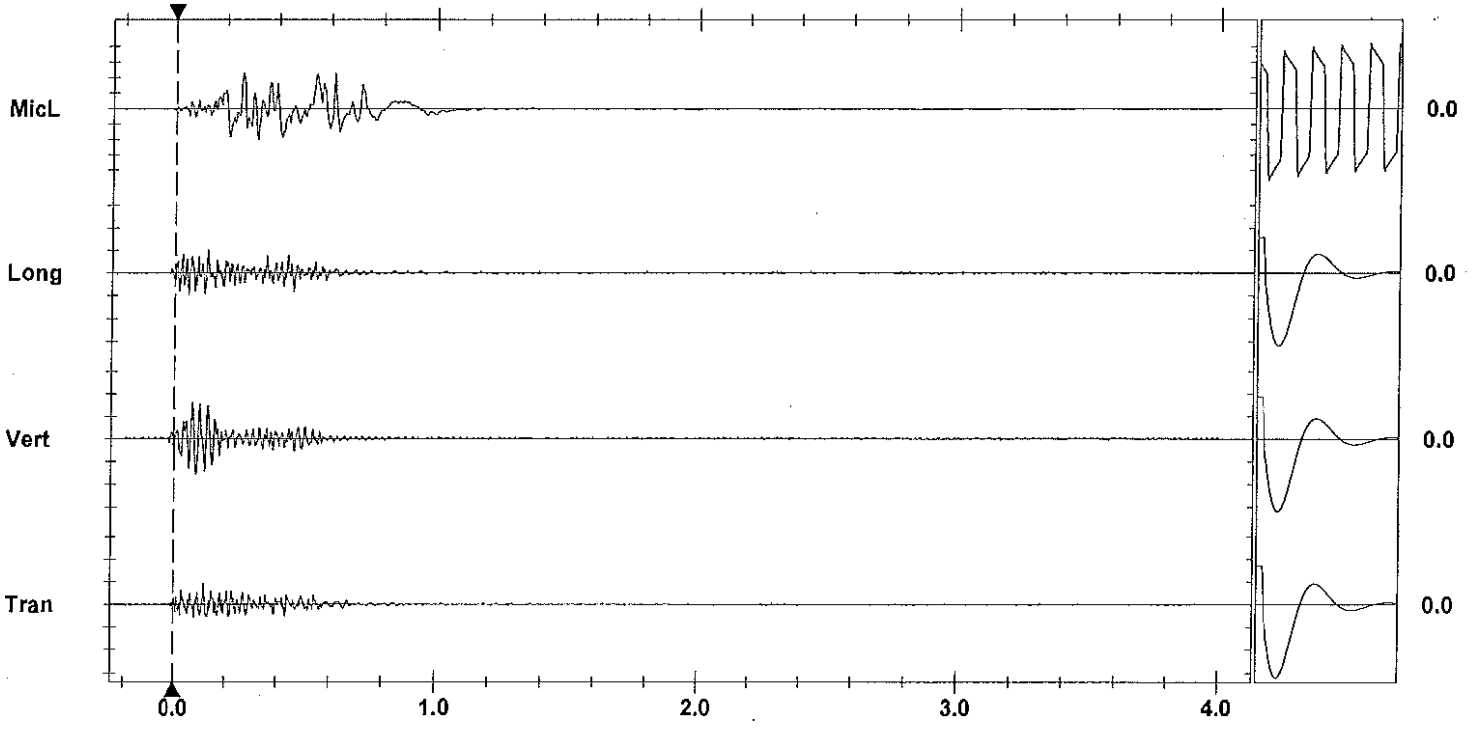
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00228 psi(L) at 0.261 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 458 mv)

	Tran	Vert	Long	
PPV	0.0900	0.160	0.1000	in/s
ZC Freq	39	34	47	Hz
Time (Rel. to Trig)	0.122	0.073	0.130	sec
Peak Acceleration	0.106	0.119	0.119	g
Peak Displacement	0.00028	0.00081	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.179 in/s at 0.122 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:34:59 July 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDKL.UB0
Job Number:	1		

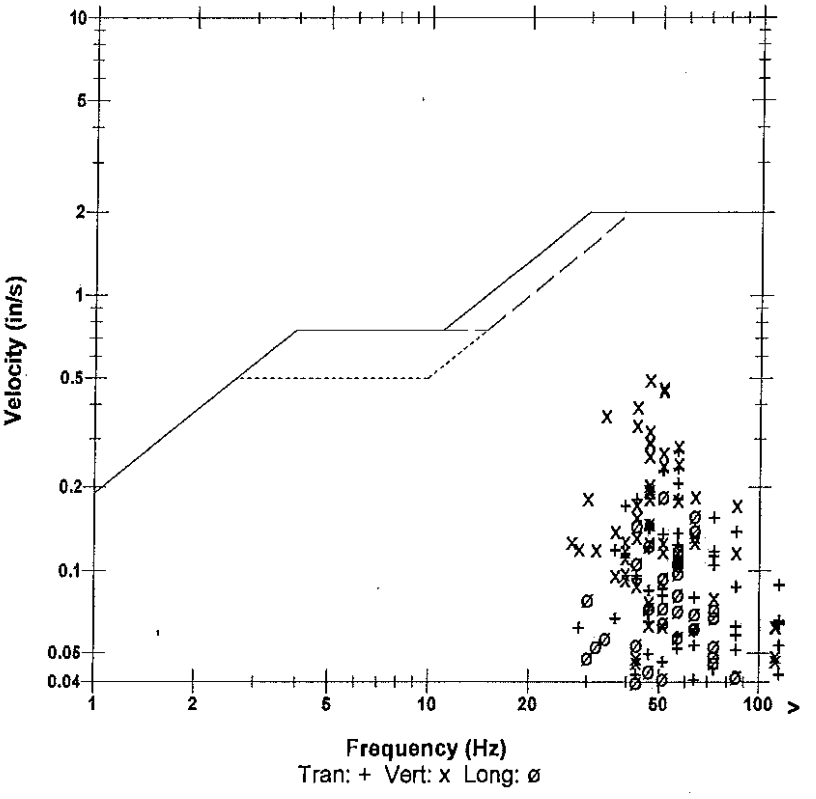
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

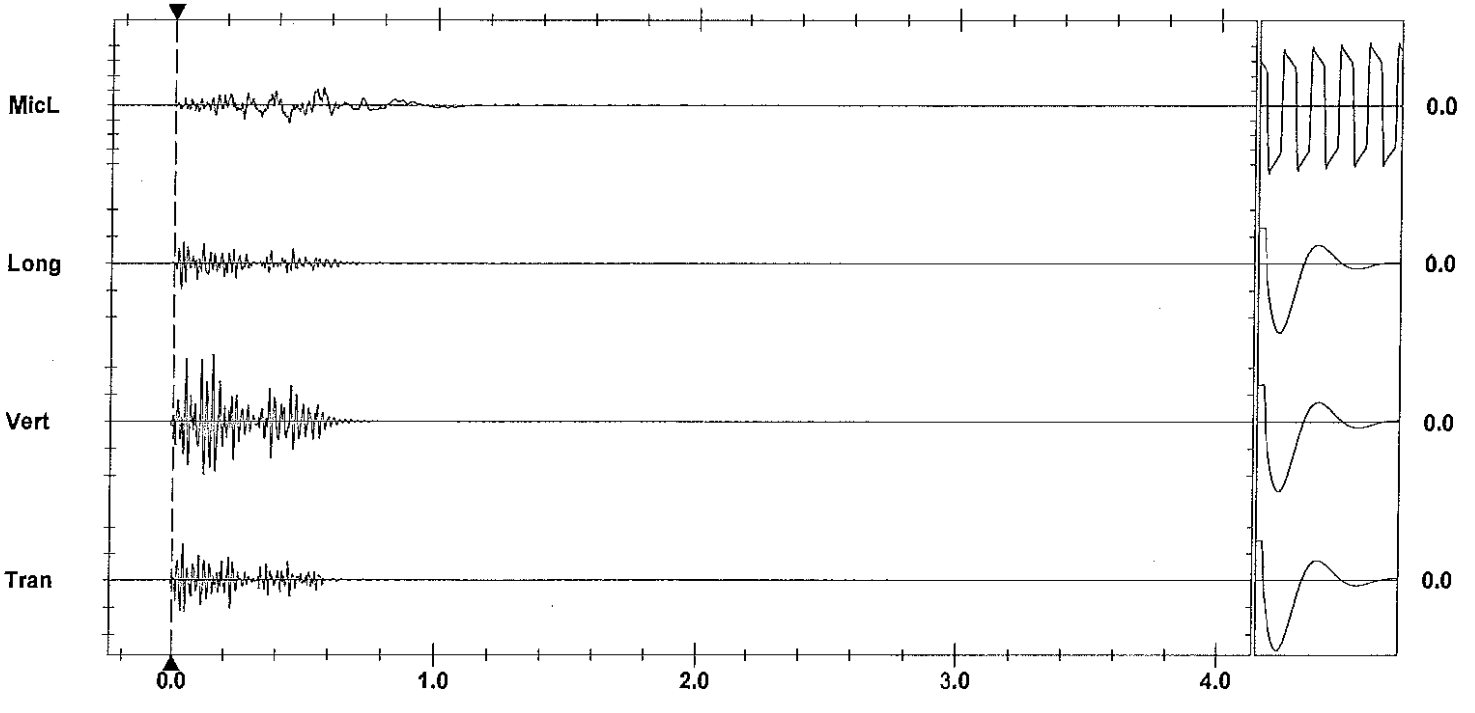
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.437 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 530 mv)

	Tran	Vert	Long	
PPV	0.270	0.496	0.185	in/s
ZC Freq	57	47	51	Hz
Time (Rel. to Trig)	0.041	0.155	0.026	sec
Peak Acceleration	0.249	0.436	0.181	g
Peak Displacement	0.00077	0.00164	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.517 in/s at 0.049 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

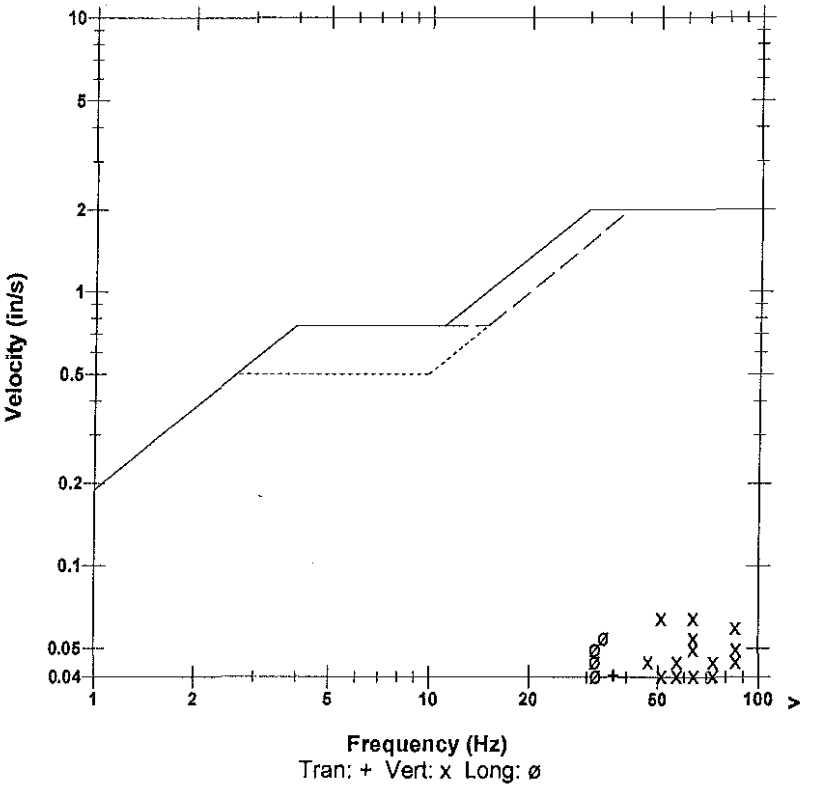
Date/Time	Vert at 14:34:59 July 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDKL.UB0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

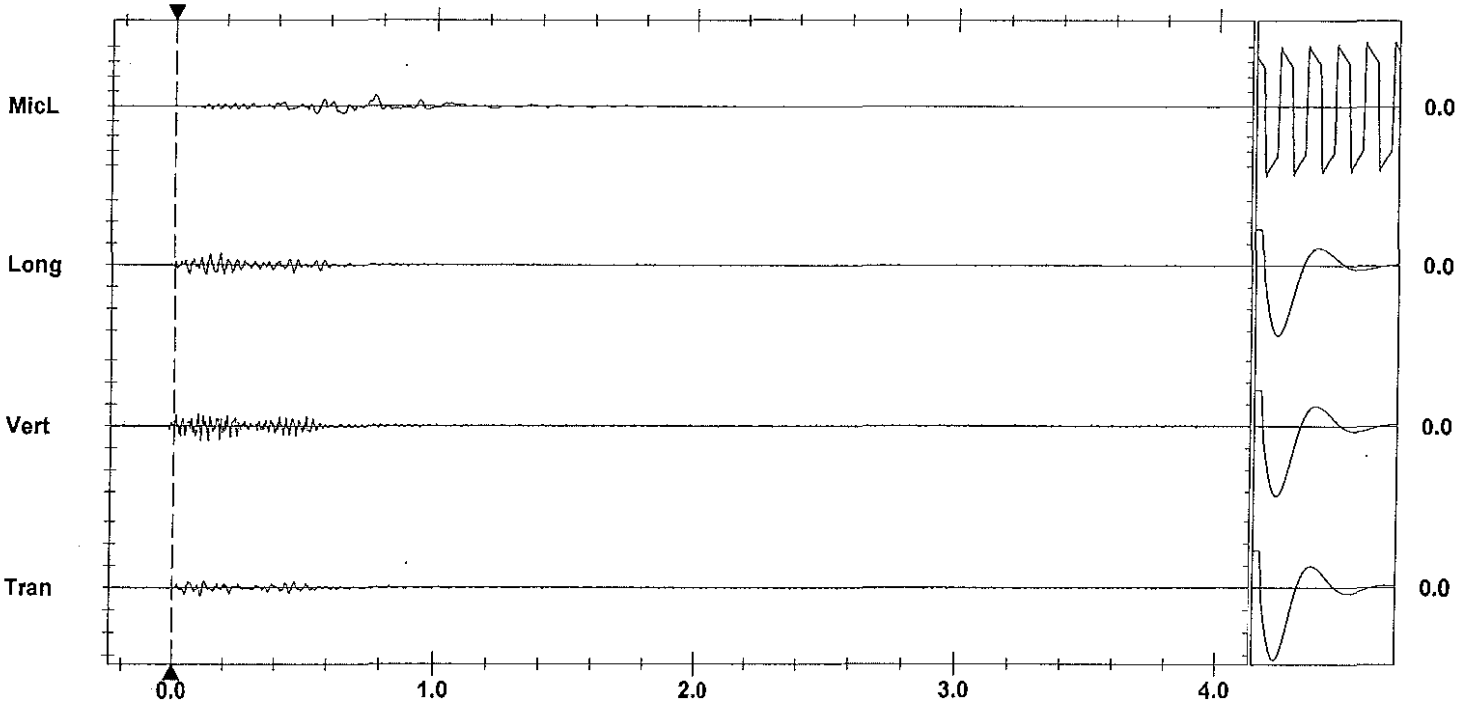
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00073 psi(L) at 0.769 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 484 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0650	0.0550	in/s
ZC Freq	37	64	34	Hz
Time (Rel. to Trig)	0.112	0.107	0.177	sec
Peak Acceleration	0.0265	0.0928	0.0530	g
Peak Displacement	0.00017	0.00019	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.4	7.2	Hz
Overswing Ratio	3.4	3.5	4.0	

Peak Vector Sum 0.0828 in/s at 0.178 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED July 20/12
ACTUAL BLAST DATE July 20/12 10:35AM
BLAST # MW-0290

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+24 - 128+32 e/c (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 3.4 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 14/1200.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 14

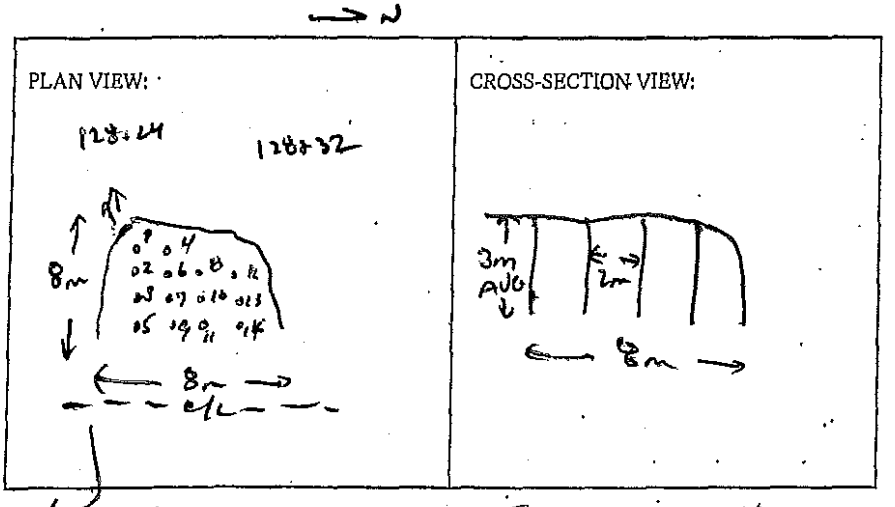
EXPLOSIVE SIZE 46 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.R. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 old Mission Rd - 0.12 ips/64 Hz
" @ 13167 Cl: Ffstone ct - No Trigger (<0.04 ips)
" @ 13073 Cl: Ffstone ct - 0.33 ips/51 Hz

1.5' – 2.5' ANFO/[illegible] + 0.5 emer 1½" x 16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Vert at 10:35:02 July 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDM5.EE0

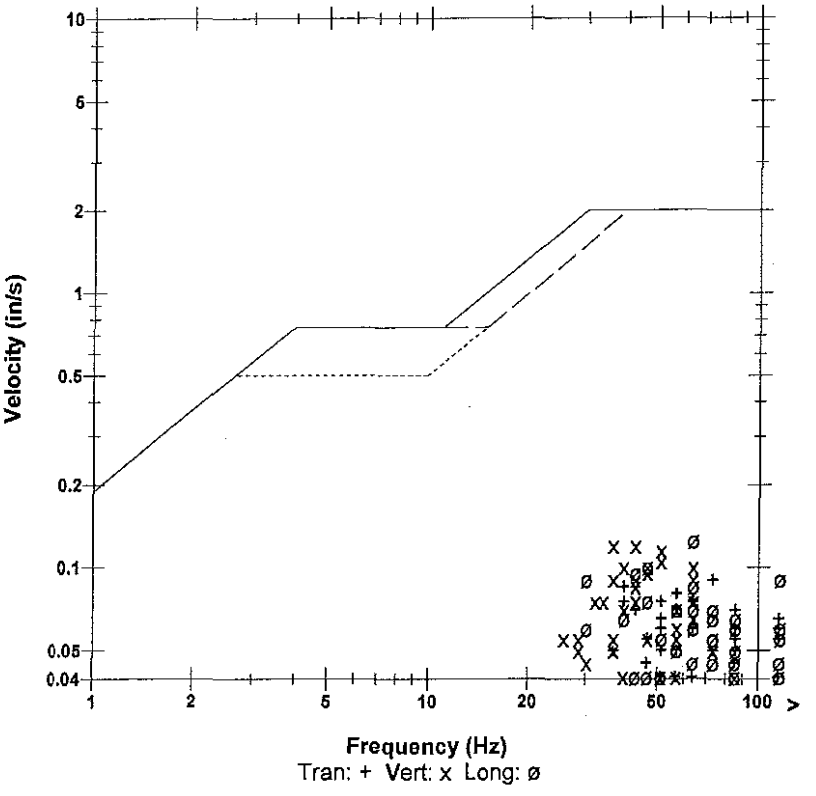
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

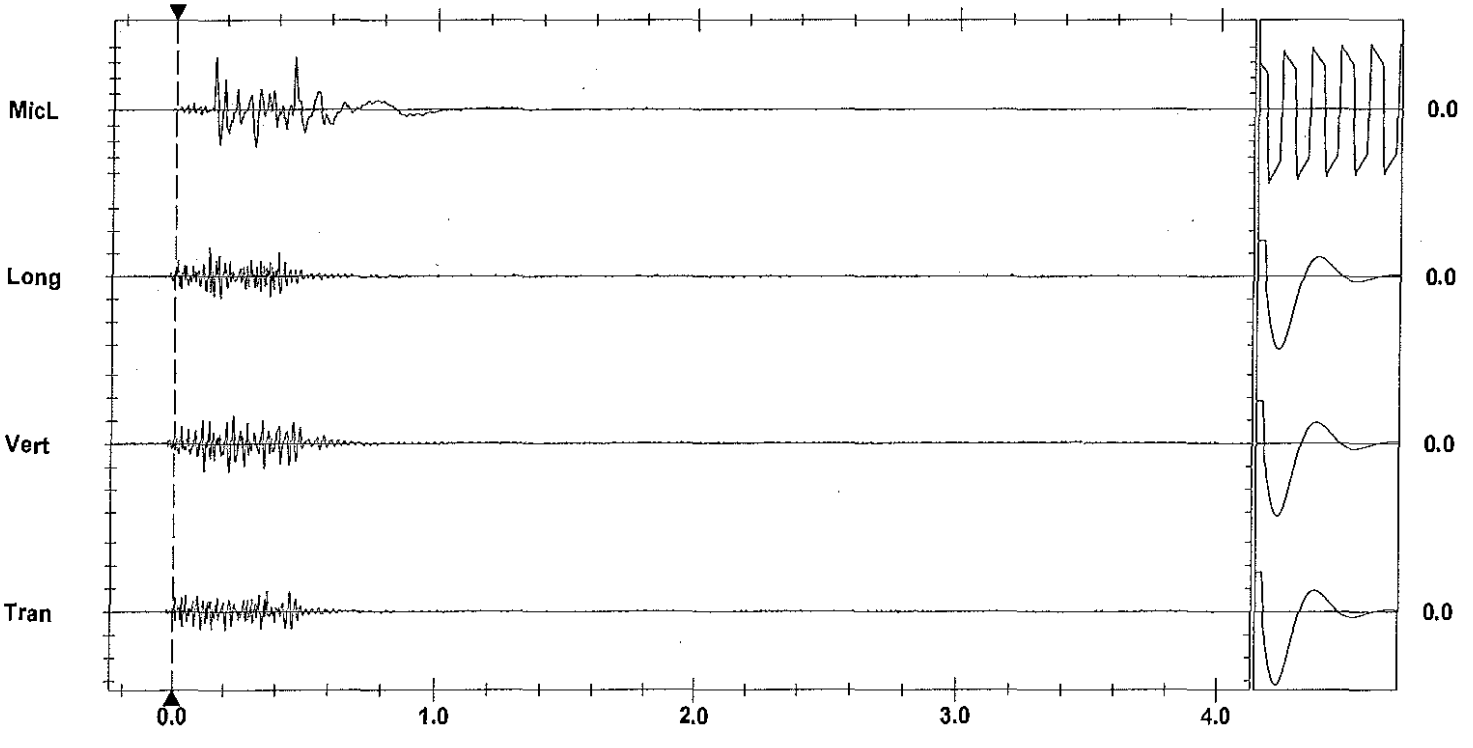
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00334 psi(L) at 0.153 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 517 mv)

	Tran	Vert	Long	
PPV	0.0900	0.120	0.125	in/s
ZC Freq	73	37	64	Hz
Time (Rel. to Trig)	0.367	0.217	0.132	sec
Peak Acceleration	0.106	0.106	0.146	g
Peak Displacement	0.00033	0.00051	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.134 in/s at 0.231 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Event Report

Date/Time	Vert at 10:35:01 July 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDM5.EDO
Job Number:	1		

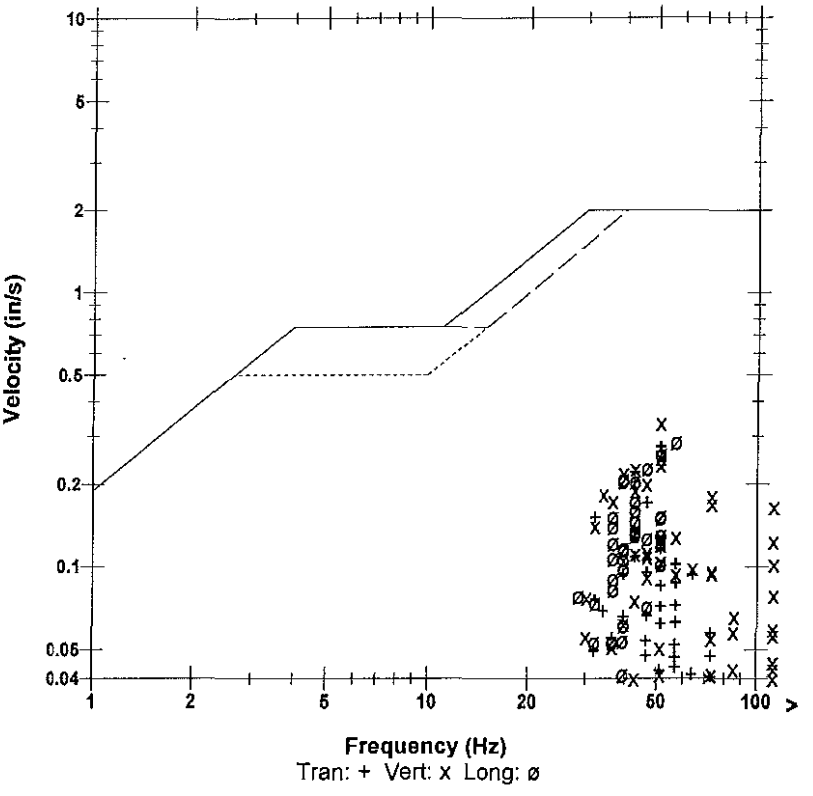
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

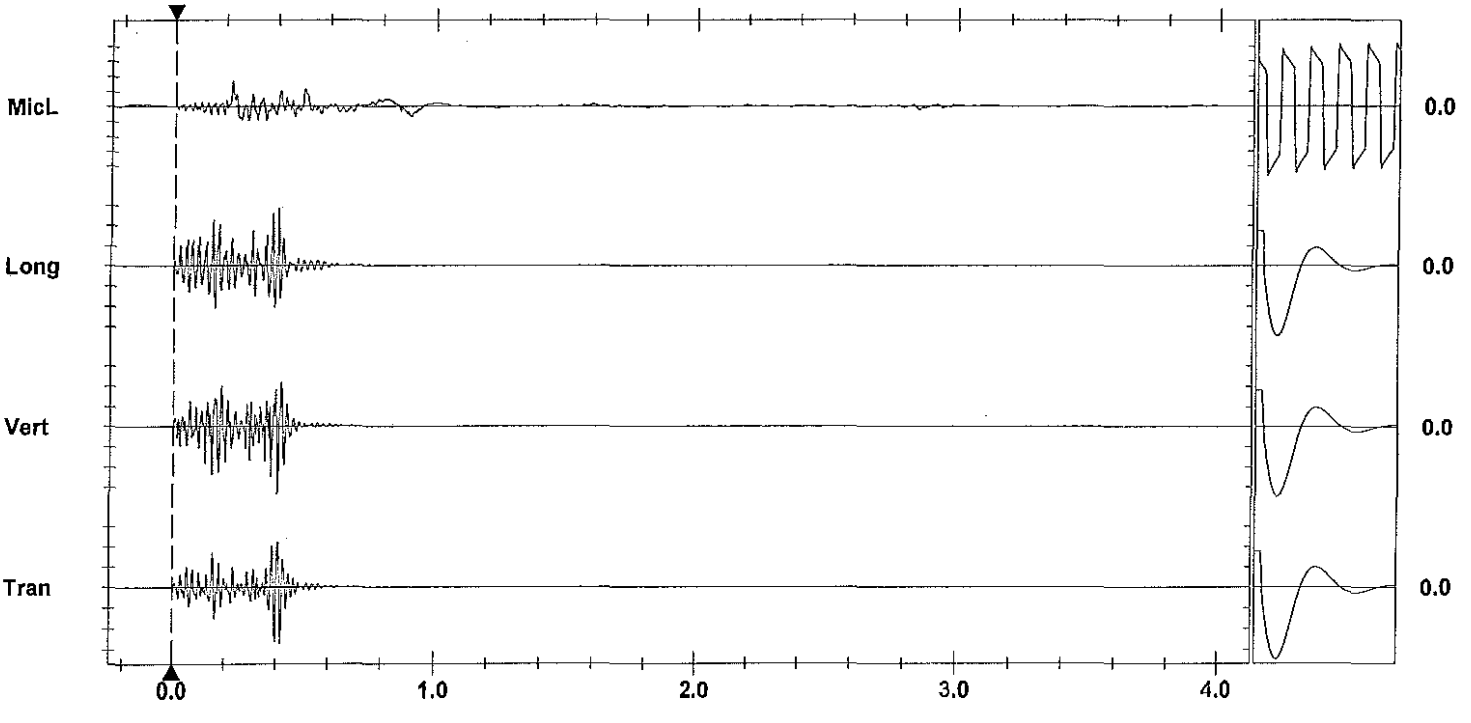
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.274	0.334	0.285	in/s
ZC Freq	51	51	57	Hz
Time (Rel. to Trig)	0.420	0.404	0.402	sec
Peak Acceleration	0.278	0.374	0.222	g
Peak Displacement	0.00091	0.00090	0.00082	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Microphone Linear Weighting
PSPL 0.00167 psi(L) at 0.222 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 518 mv)

Peak Vector Sum 0.436 in/s at 0.404 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Jul 20/12
ACTUAL BLAST DATE Jul 20/12 12:01 PM
BLAST # MW-0298

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+23 - 128+35 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 116 (m)

TOTAL NUMBER OF HOLES 21 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10.5
TOTAL NUMBER OF DELAYS 21

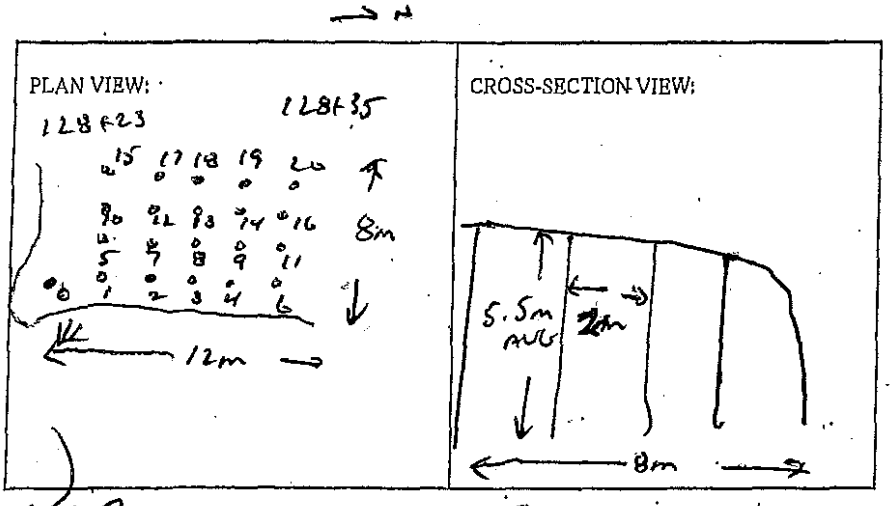
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 145 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Ho Mission Rd - 0.23 ips / 32 Hz
" @ 13167 Cliffstone Crt - 0.065 ips / 57 Hz
" @ 13073 Cliffstone Crt - 0.49 ips / 43 Hz

5'-7' ANGLE/WALL @ 0.5 CREW 1½"x15" DIAMETER PRIMER

Instantel®

Event Report

Date/Time	Vert at 12:01:08 July 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDM9.DW0
Job Number:	1		

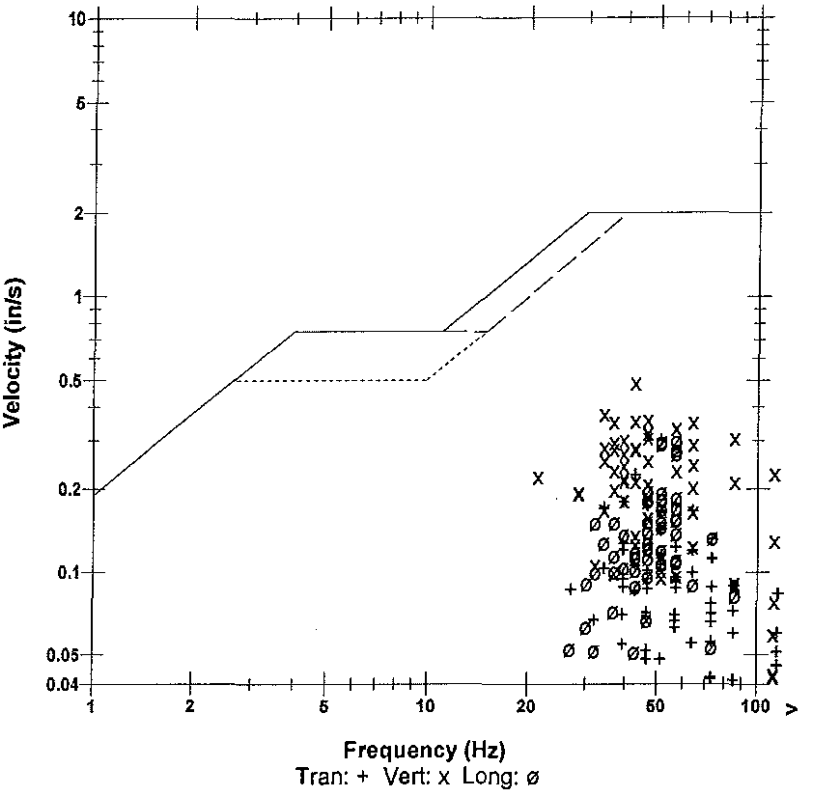
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

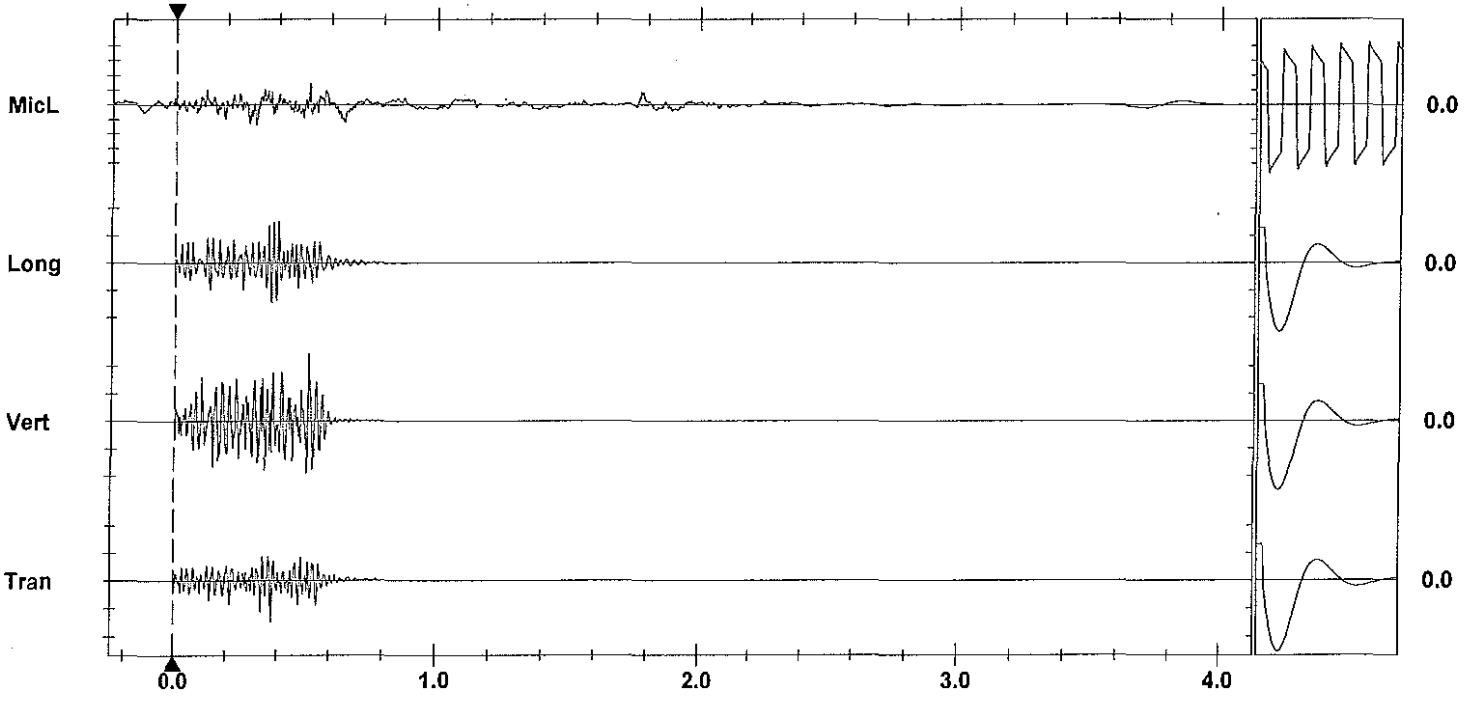
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.517 sec
ZC Freq	43 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 547 mv)

	Tran	Vert	Long	
PPV	0.302	0.489	0.300	in/s
ZC Freq	51	43	57	Hz
Time (Rel. to Trig)	0.380	0.518	0.401	sec
Peak Acceleration	0.338	0.567	0.263	g
Peak Displacement	0.00089	0.00154	0.00083	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.493 in/s at 0.381 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: July 29, 2012 0(8 01 - 8 01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

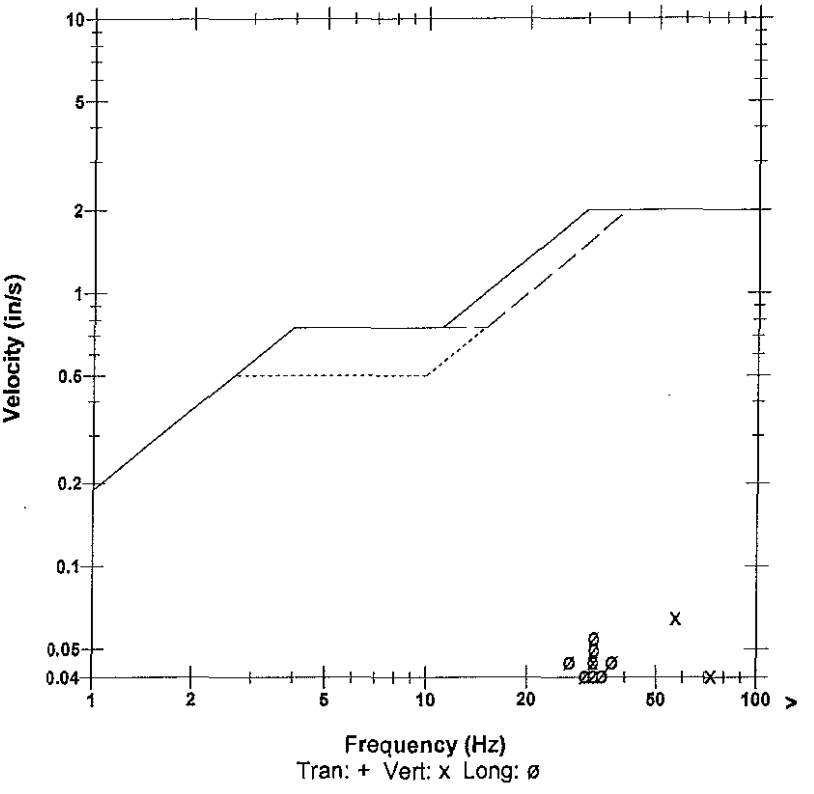
Date/Time	Vert at 12:01:07 July 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDM9.DV0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

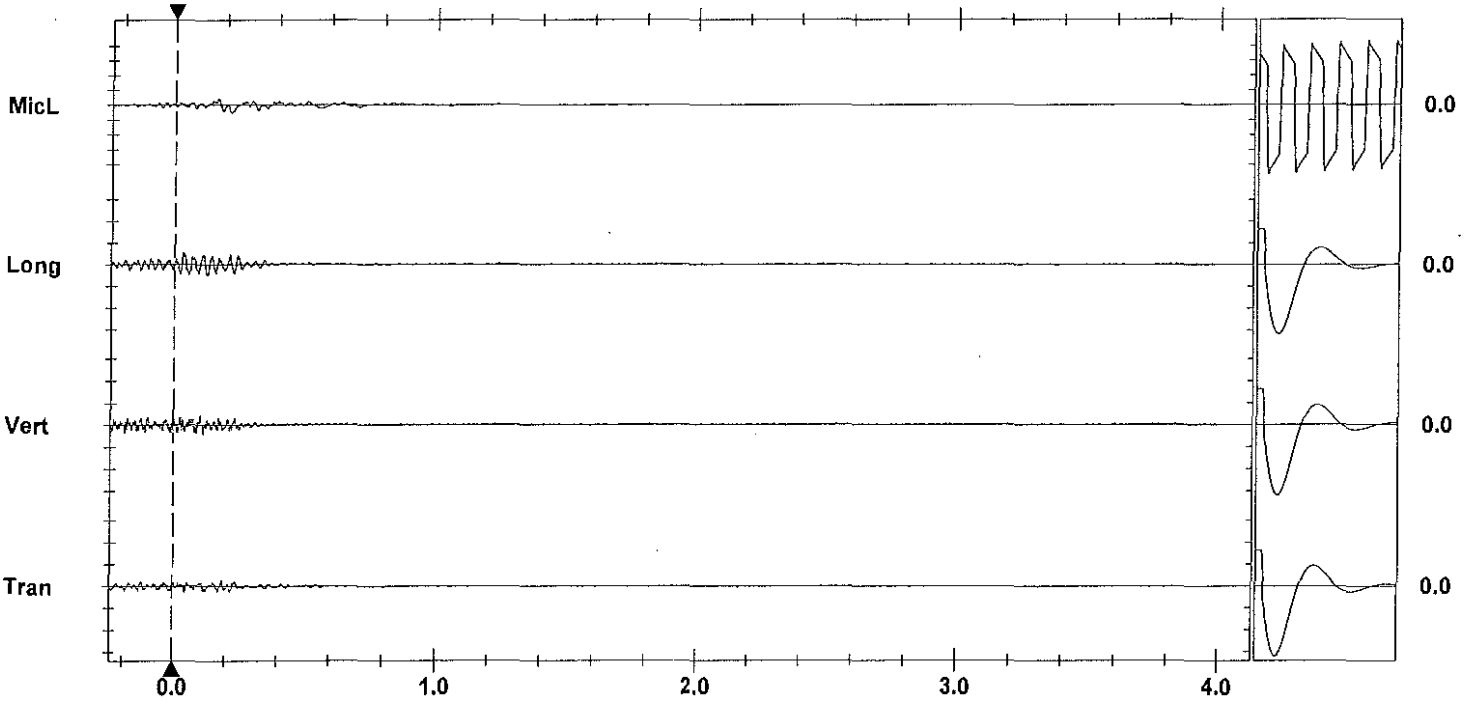
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00051 psi(L) at 0.215 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 501 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0650	0.0550	in/s
ZC Freq	64	57	32	Hz
Time (Rel. to Trig)	0.049	0.001	0.035	sec
Peak Acceleration	0.0398	0.0663	0.0530	g
Peak Displacement	0.00014	0.00015	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.0658 in/s at 0.001 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

Date/Time	Vert at 12:01:09 July 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDM9.DX0

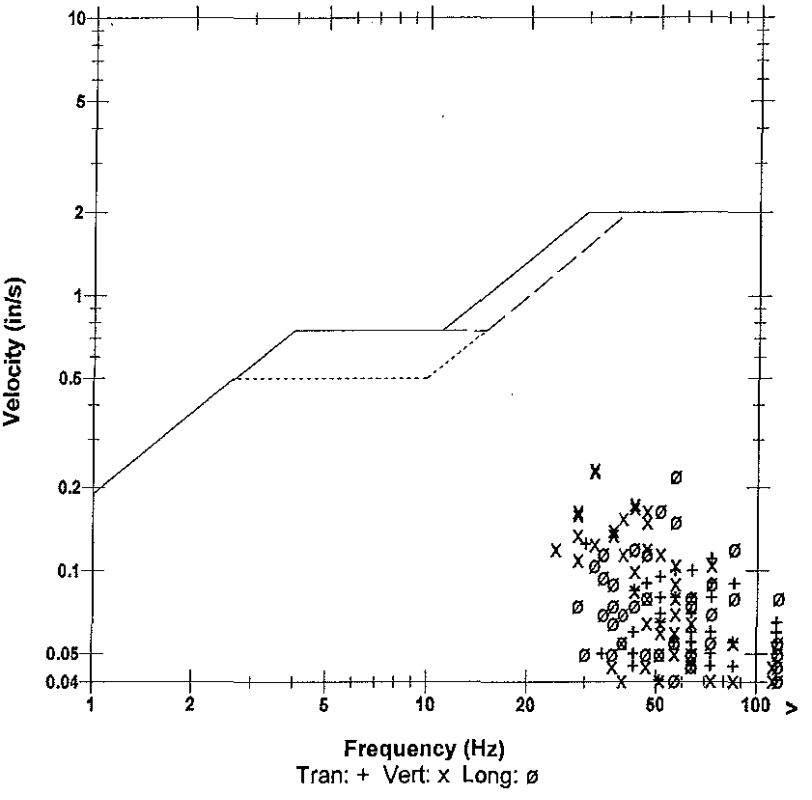
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

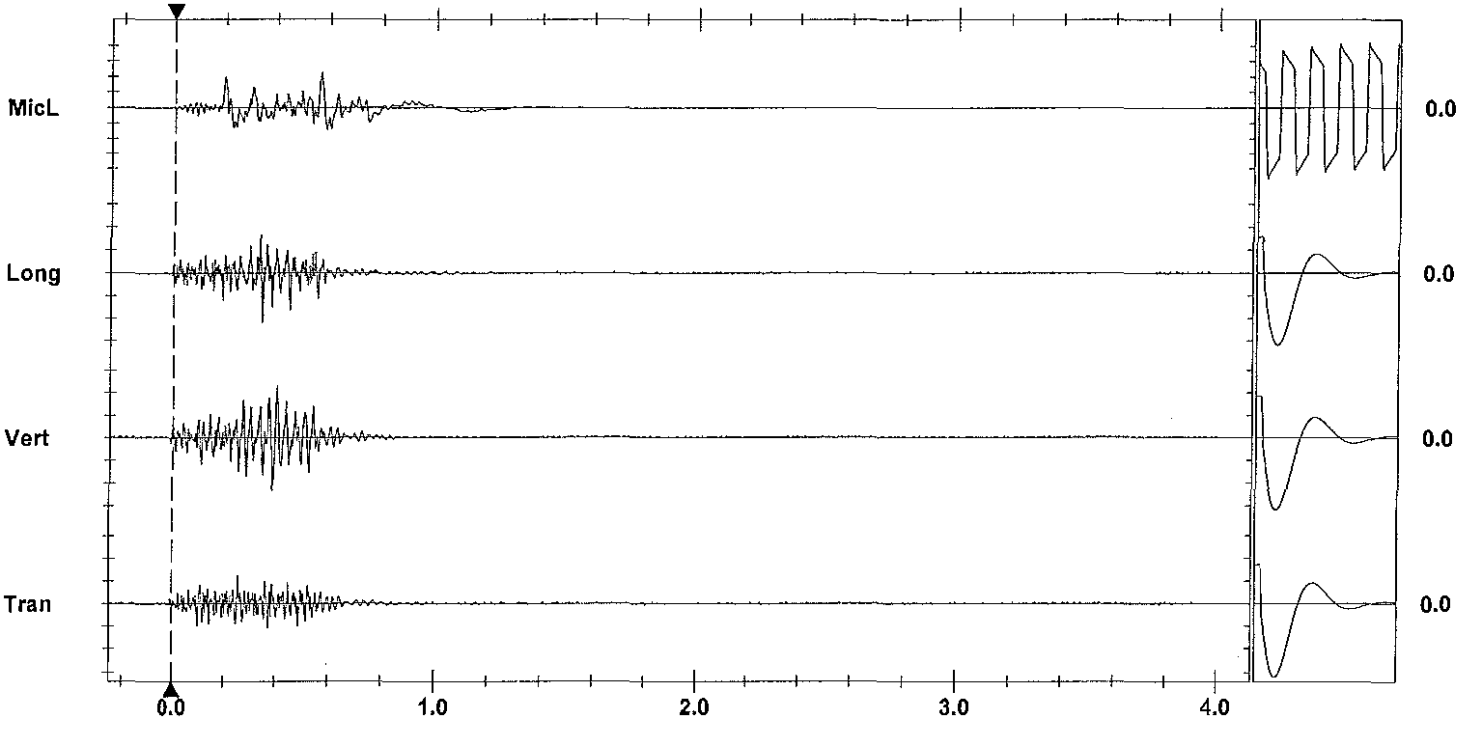
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00225 psi(L) at 0.565 sec			
ZC Freq	20 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 548 mv)			

	Tran	Vert	Long	
PPV	0.125	0.235	0.220	in/s
ZC Freq	30	32	57	Hz
Time (Rel. to Trig)	0.259	0.390	0.346	sec
Peak Acceleration	0.159	0.159	0.225	g
Peak Displacement	0.00040	0.00102	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.249 in/s at 0.390 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 20/12
ACTUAL BLAST DATE Jul 20/12 2:50PM
BLAST # MW-0292

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+39 - 128+45 c/l (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 56 (m)

TOTAL NUMBER OF HOLES 7 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

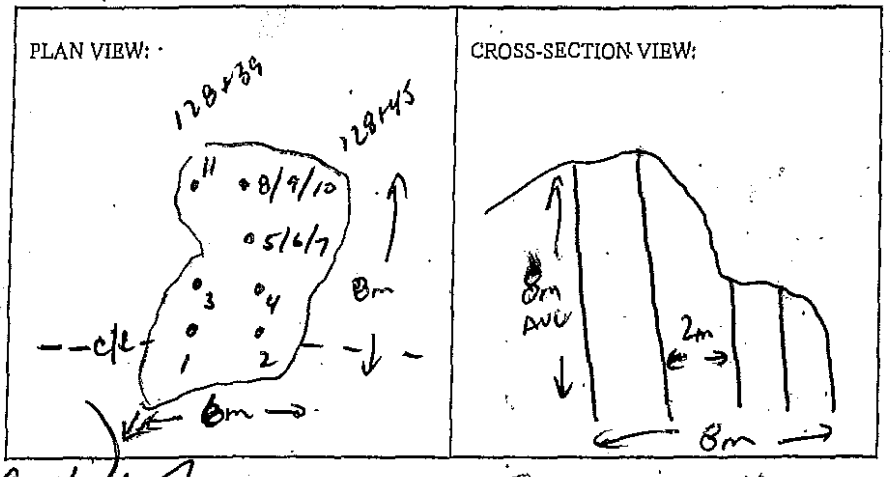
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.131PS/24Hz
" @ 13167 Cliffstone Crt - 0.040 IPS/57Hz
" @ 13073 Cliffstone Crt - 0.381PS/5Hz

Bottom Decks - 5' ANFO
Mid Decks - 5' ANFO
Top Decks - 2'-3' ANFO

} All primed w/ 0.5 gram 1½"x16" Dynamite

Instantel

Event Report

Date/Time	Vert at 14:50:36 July 20, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDMH.8C0

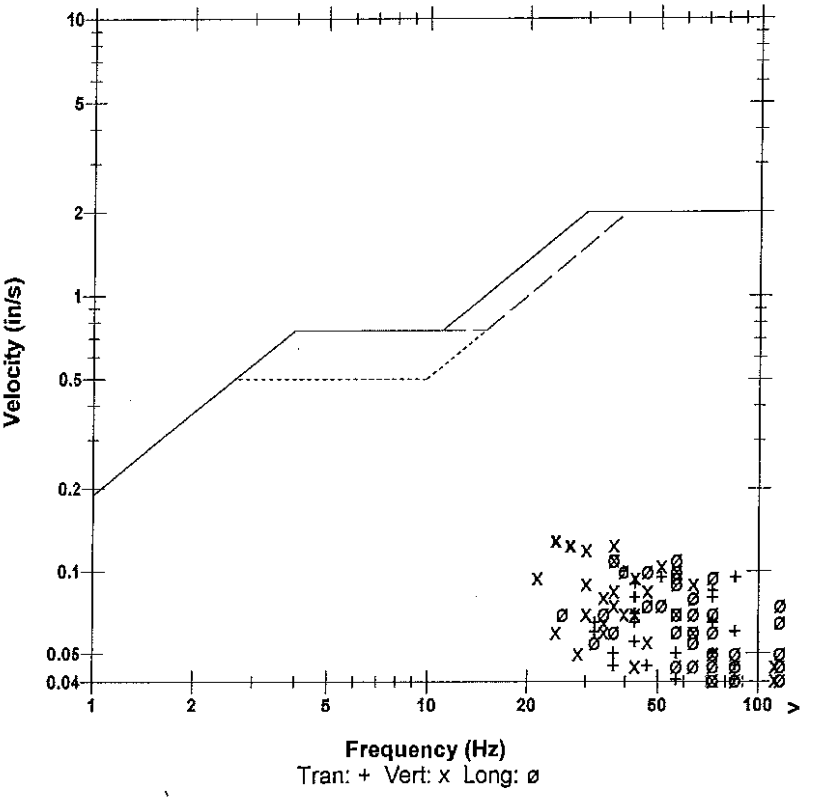
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

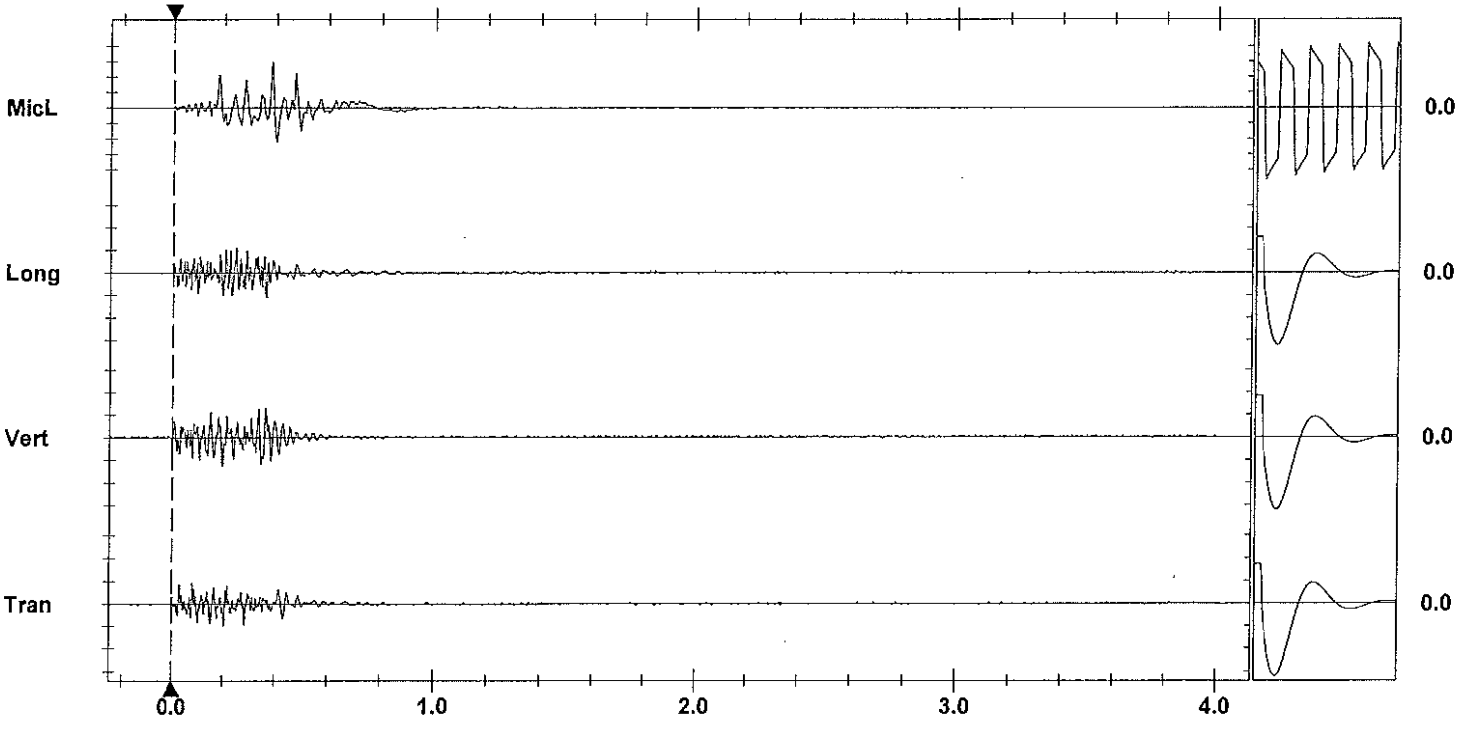
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00294 psi(L) at 0.383 sec			
ZC Freq	28 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 545 mv)			

	Tran	Vert	Long	
PPV	0.1000	0.130	0.110	in/s
ZC Freq	39	24	37	Hz
Time (Rel. to Trig)	0.205	0.365	0.247	sec
Peak Acceleration	0.119	0.119	0.159	g
Peak Displacement	0.00033	0.00067	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.5	3.6	3.9	

Peak Vector Sum 0.171 in/s at 0.365 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc

Instantel

Event Report

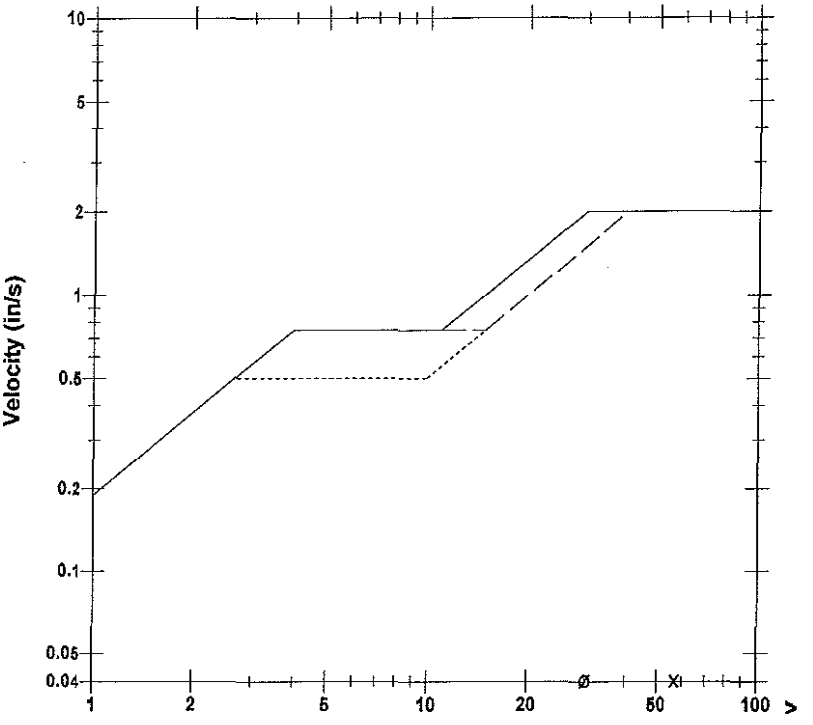
Date/Time	Vert at 14:50:34 July 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDMH.8A0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

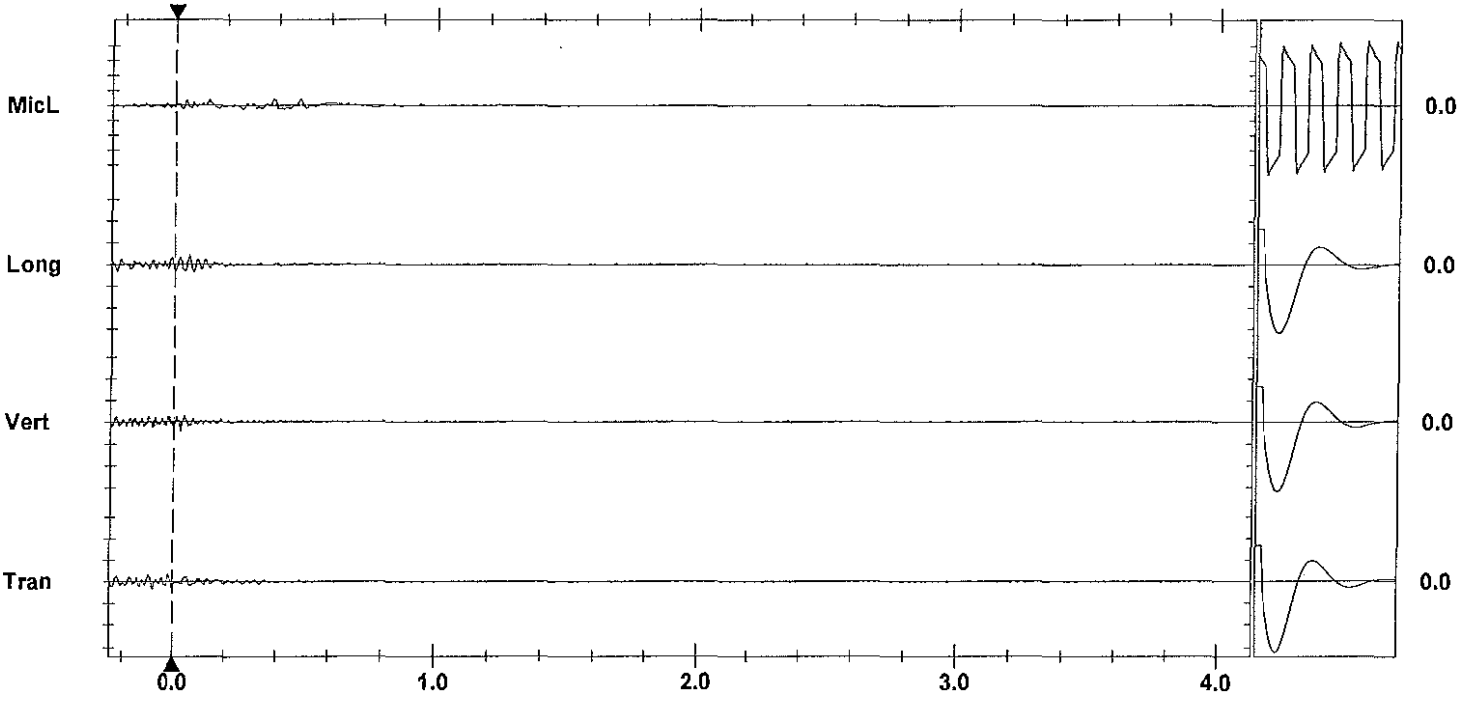
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0350	0.0400	0.0400	in/s
ZC Freq	47	57	30	Hz
Time (Rel. to Trig)	-0.082	0.000	0.057	sec
Peak Acceleration	0.0265	0.0398	0.0398	g
Peak Displacement	0.00016	0.00011	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.4	3.5	4.1	

Microphone Linear Weighting
PSPL 0.00040 psi(L) at 0.382 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 516 mv)

Peak Vector Sum 0.0559 in/s at 0.000 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:50:35 July 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDMH.8B0
Job Number:	1		

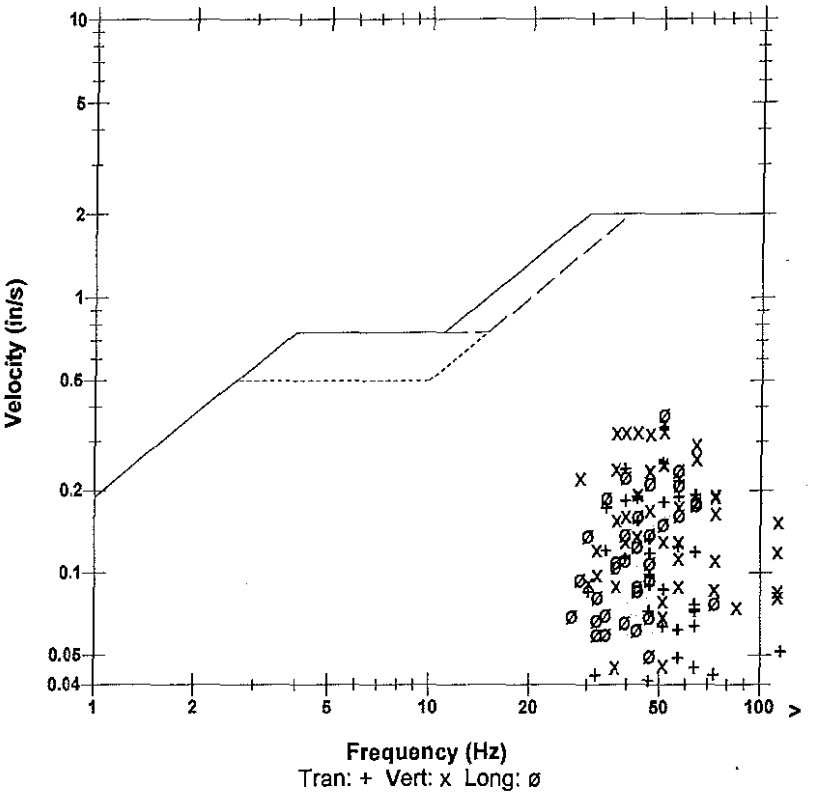
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

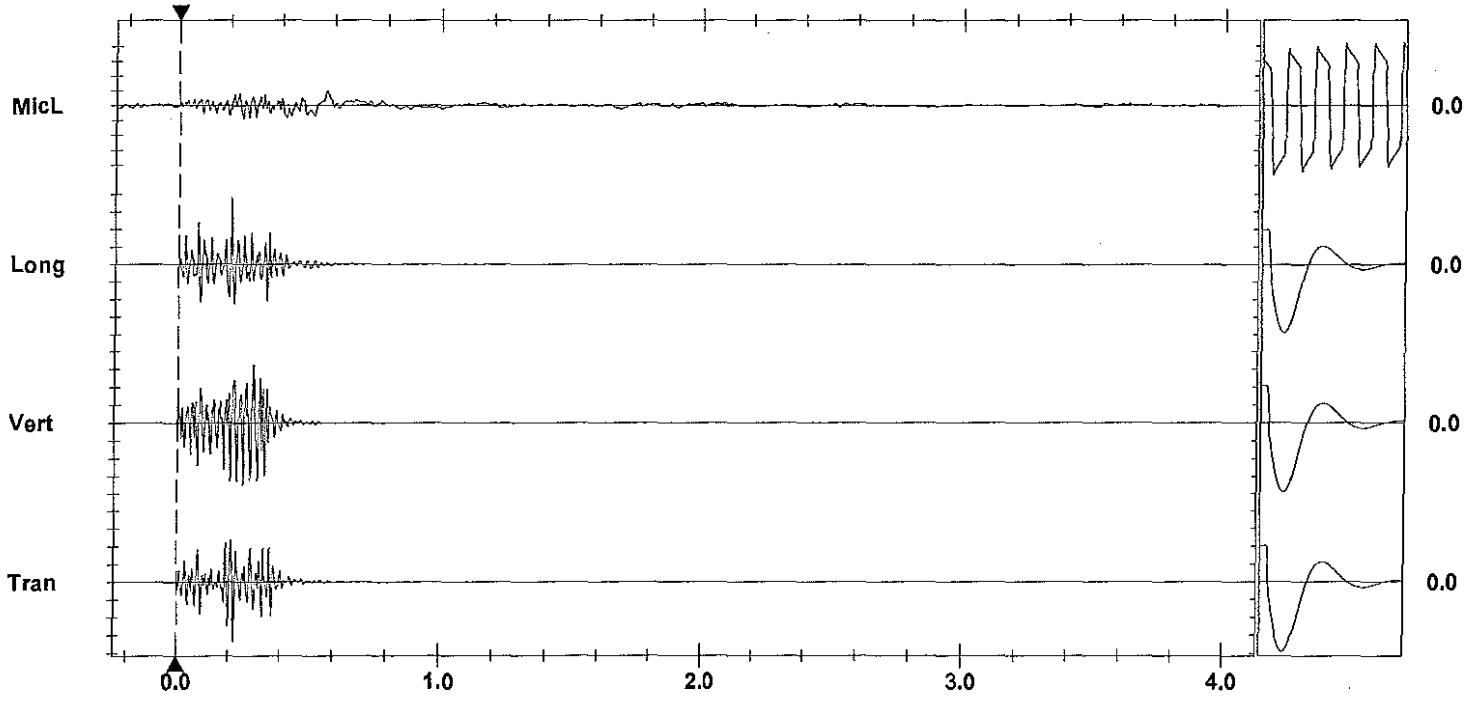
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00094 psi(L) at 0.566 sec
ZC Freq	9.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 517 mv)

	Tran	Vert	Long	
PPV	0.336	0.351	0.376	in/s
ZC Freq	51	51	51	Hz
Time (Rel. to Trig)	0.223	0.257	0.206	sec
Peak Acceleration	0.313	0.527	0.275	g
Peak Displacement	0.00103	0.00128	0.00105	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.501 in/s at 0.206 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 24/12
ACTUAL BLAST DATE Jul 24/12 11:08am
BLAST # MM 0293

HIGHWAY# 97
BLAST LOCATION AT: STN 128+38 - 128+114 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 9m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 93 (m)

TOTAL NUMBER OF HOLES 7B/L / 2 B of FGL / 3 STAB / 3 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 CART. 2"x16" DYNAMITE + 200 g/m det cord to 4' collar in B/L holes

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

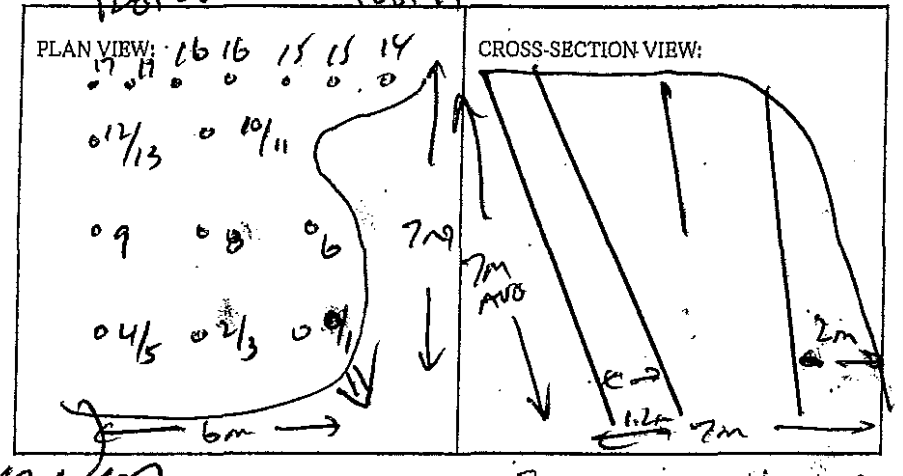
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE ~~HS 320~~ CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 275 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.151 PS/ 34 Hz
" @ 13167 Cliffstone Crt - 0.065 PS/ 73 Hz
" @ 13073 Cliffstone Crt - 0.50 PS/ 43 Hz

B/L Holes - 1 CART 2x16" DYNAMITE + 200g. det. cord to 4' collar

Buffer Holes - BOTTOM DECK - 5 CART 2x16 BLASTEX
- TOP DECK - 3 CART 2x16 BLASTEX

SHAFT HOLES - 2'-3' ANFO / HOLE

PILOT HOLES - BOTTOM DECK - 6' ANFO
TOP DECK - 2'-3' ANFO

ALL PRIMED W/ 0.5 CART 1½x16" DYNAMITE

Instantel

Event Report

Date/Time	Long at 11:08:39 July 24, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDTL.MF0

Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

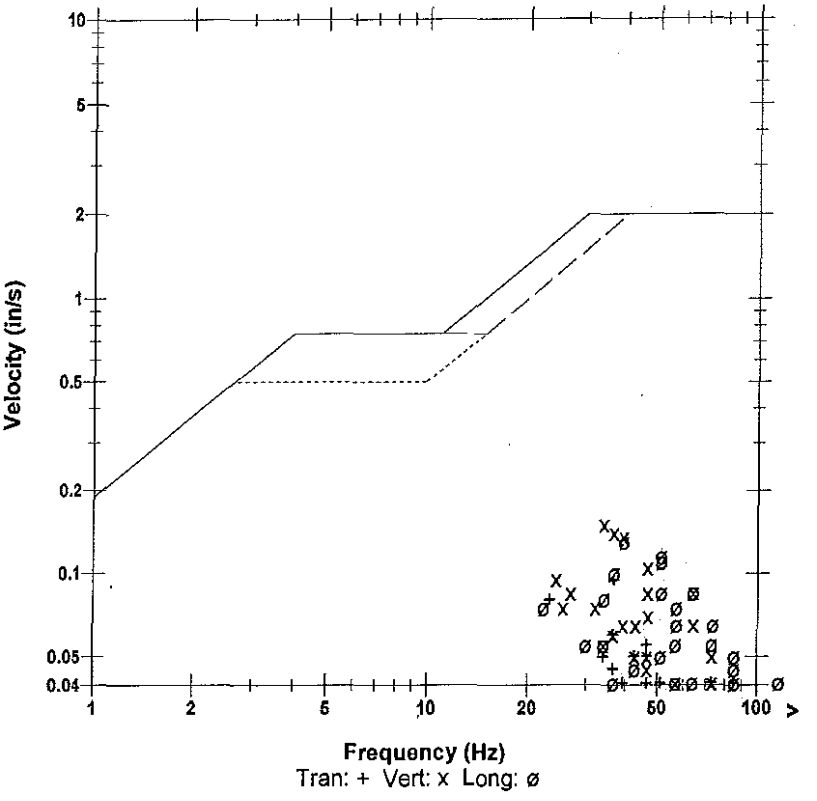
Post Event Notes

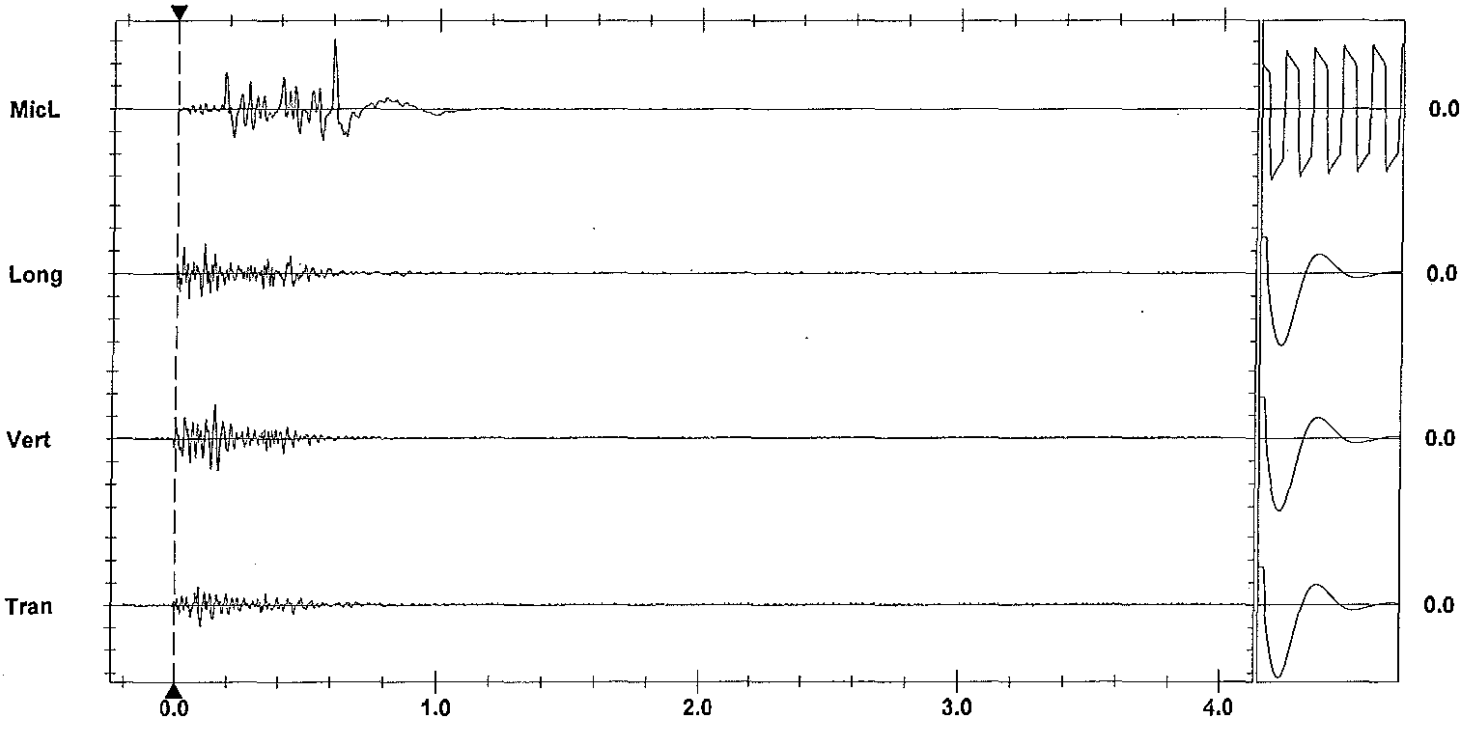
Microphone Linear Weighting
PSPL 0.00616 psi(L) at 0.602 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 531 mv)

	Tran	Vert	Long	
PPV	0.0950	0.150	0.130	in/s
ZC Freq	37	34	39	Hz
Time (Rel. to Trig)	0.104	0.154	0.109	sec
Peak Acceleration	0.0795	0.119	0.106	g
Peak Displacement	0.00041	0.00067	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.160 in/s at 0.154 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc

Instantel

Event Report

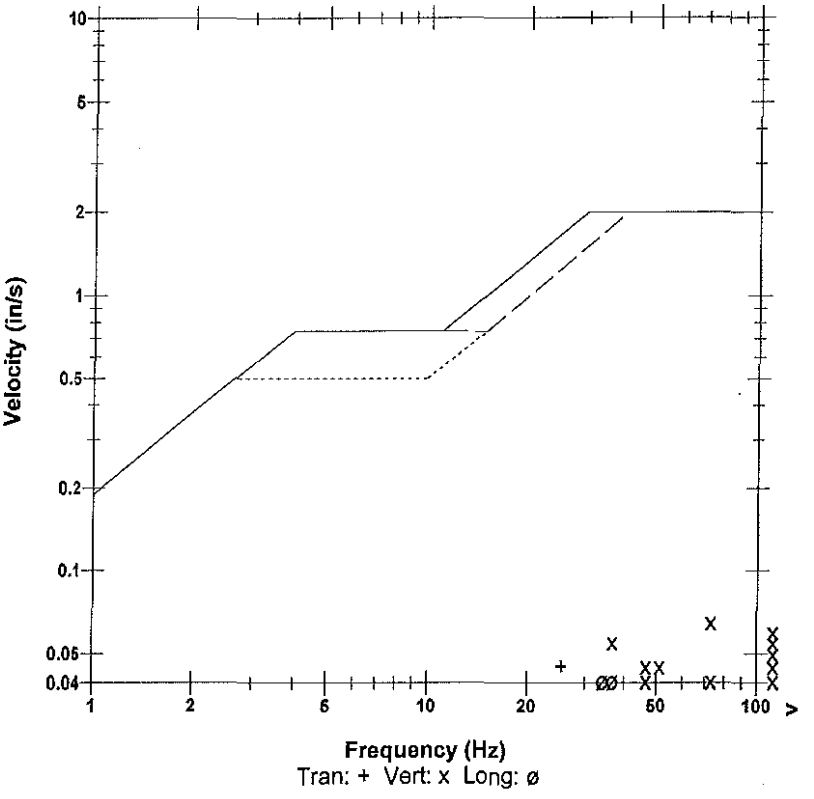
Date/Time	Vert at 11:08:33 July 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDTL.M90

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:James m
General:

Extended Notes

Post Event Notes

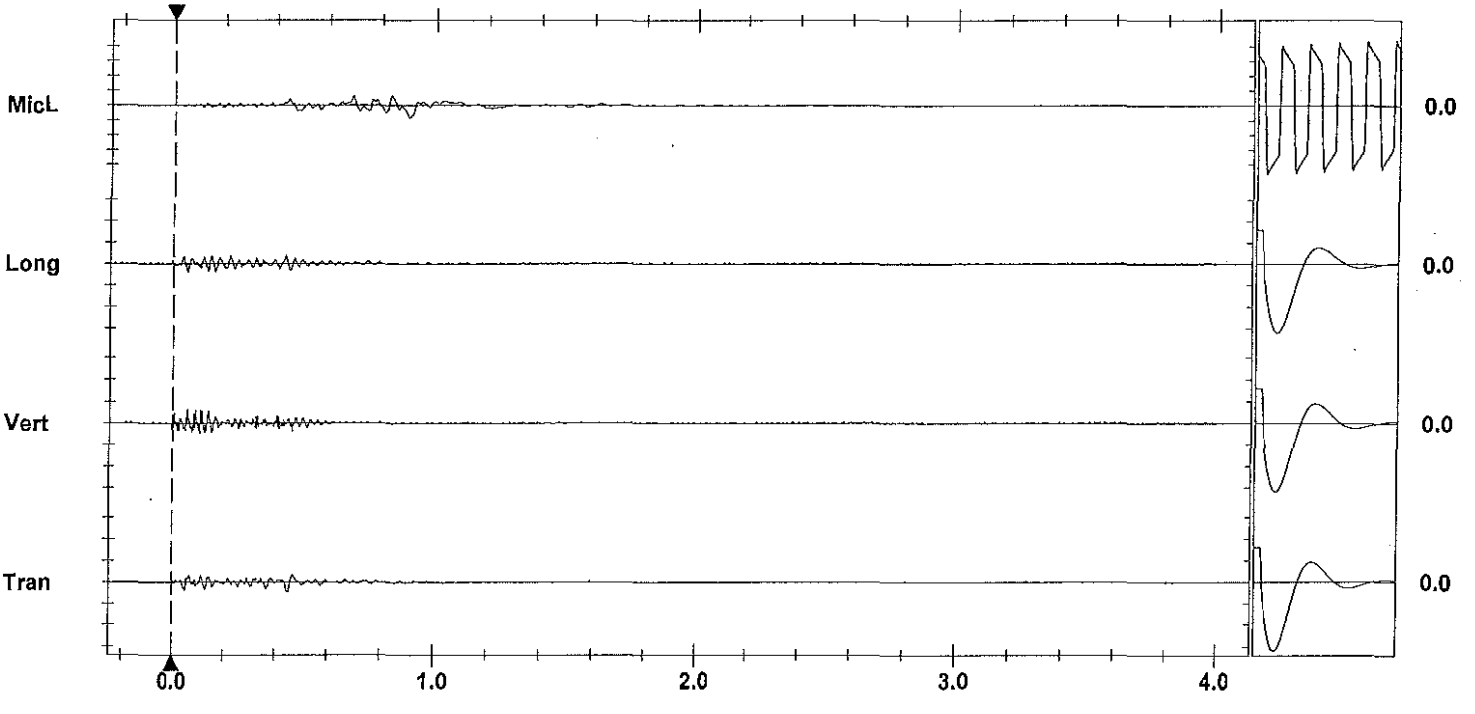
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00080 psi(L) at 0.896 sec
ZC Freq	7.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 509 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0650	0.0400	in/s
ZC Freq	26	73	34	Hz
Time (Rel. to Trig)	0.447	0.058	0.056	sec
Peak Acceleration	0.0265	0.119	0.0265	g
Peak Displacement	0.00030	0.00021	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0778 in/s at 0.058 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: July 29, 2012 07:8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:08:38 July 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDTL.ME0
Job Number:	1		

Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

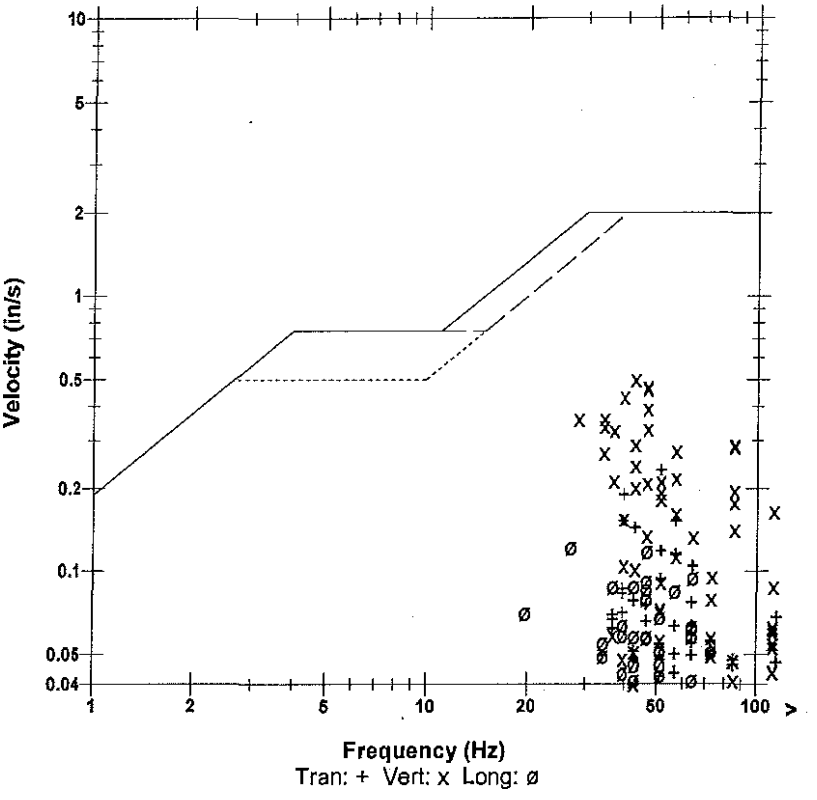
Post Event Notes

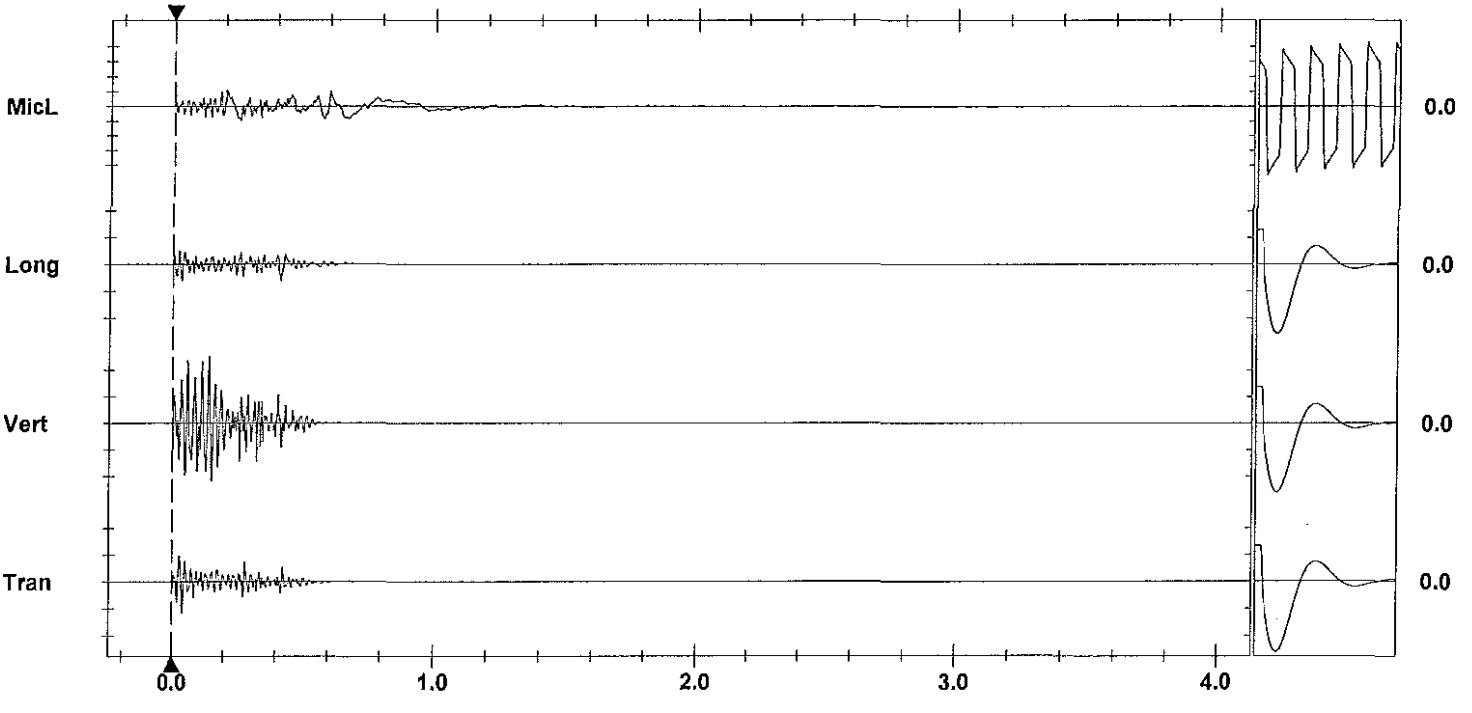
Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.201 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 519 mv)

	Tran	Vert	Long	
PPV	0.233	0.500	0.122	in/s
ZC Freq	51	43	27	Hz
Time (Rel. to Trig)	0.041	0.143	0.418	sec
Peak Acceleration	0.174	0.487	0.111	g
Peak Displacement	0.00073	0.00176	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.502 in/s at 0.143 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834/89

DATE PREPARED Jul 24/12
ACTUAL BLAST DATE Jul 24/12 3:11 PM
BLAST # MW-0394

HIGHWAY# 97
BLAST LOCATION AT: STN 128+30 - 128+38 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Augen Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9 B/L
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 126 (m)

TOTAL NUMBER OF HOLES 9 B/L / 4 Buffer) 3 stabs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

least 2x16" Dynamite + 200g det cord to 4' collar in B/L holes

BLAST DETAILS:

EXPLOSIVE TYPE 16" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

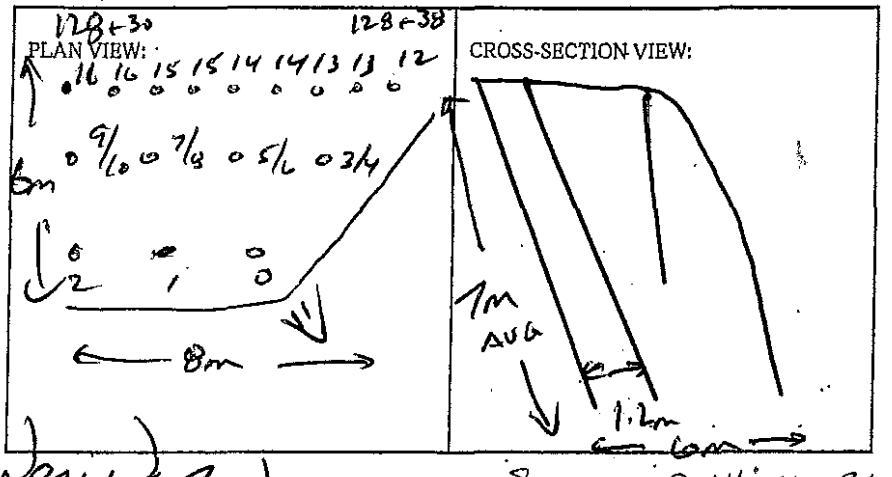
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.15 ips/39Hz
" @ 13167 Cliffstone Crt - 0.065 ips/85Hz
" @ 13073 Cliffstone Crt - 0.36 ips/57Hz

B/L Holes - 1 each 2x16 DYNAMITE
& 200 gr det cord to 4' below

Buffer Holes - Bottom Decks - 4-5 each
2x16 BLASTEX

- Top Decks 2-4 each 2x16 BLASTEX

Stem Holes - 2'-3' AWAY

All primed w/ 0.5 each 1/2" x 16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 15:11:15 July 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDTW.UR0
Job Number:	1		

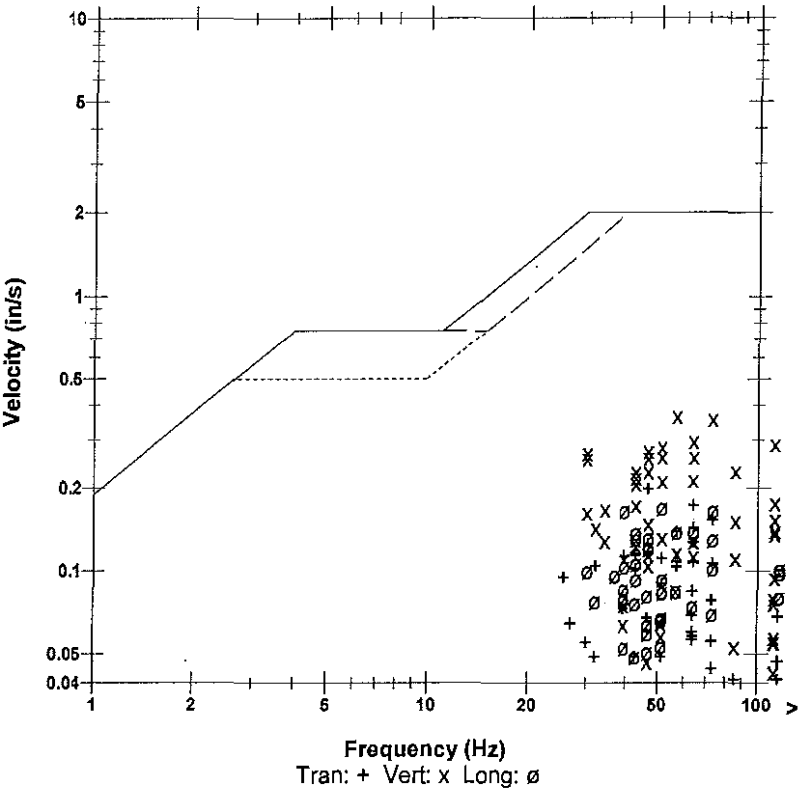
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

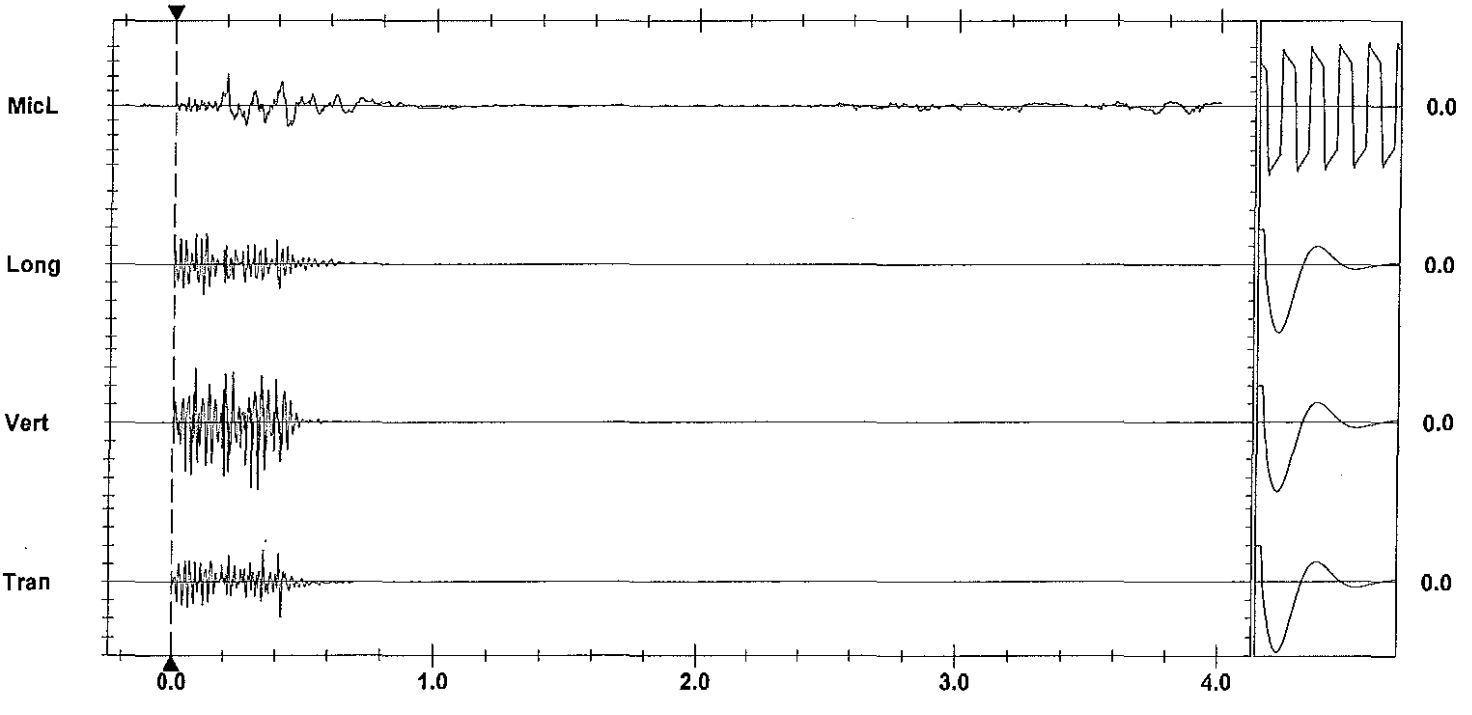
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00214 psi(L) at 0.201 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 545 mv)

	Tran	Vert	Long	
PPV	0.199	0.365	0.169	in/s
ZC Freq	47	57	51	Hz
Time (Rel. to Trig)	0.422	0.333	0.116	sec
Peak Acceleration	0.186	0.560	0.209	g
Peak Displacement	0.00060	0.00104	0.00064	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.371 in/s at 0.333 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel®

Event Report

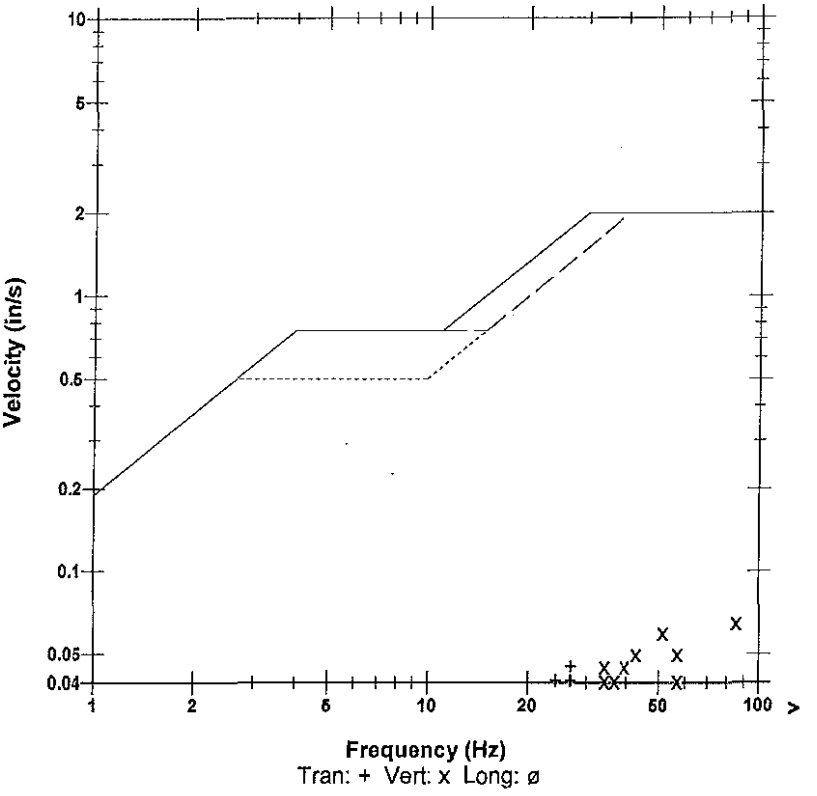
Date/Time	Vert at 15:11:10 July 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDTW.UM0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

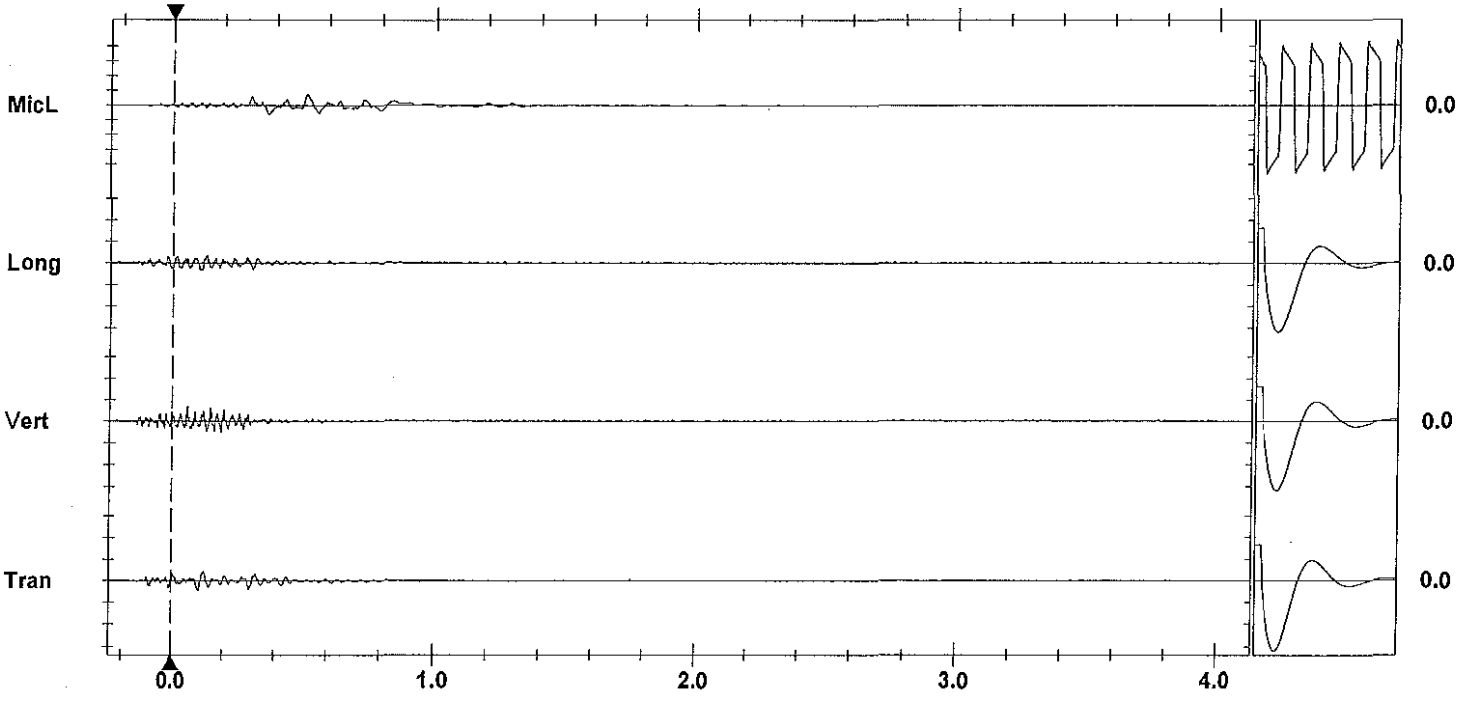
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00073 psi(L) at 0.514 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 528 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0650	0.0350	in/s
ZC Freq	27	85	28	Hz
Time (Rel. to Trig)	0.106	0.060	0.106	sec
Peak Acceleration	0.0265	0.0928	0.0265	g
Peak Displacement	0.00029	0.00020	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.0675 in/s at 0.061 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 15:11:16 July 24, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDTW.USO

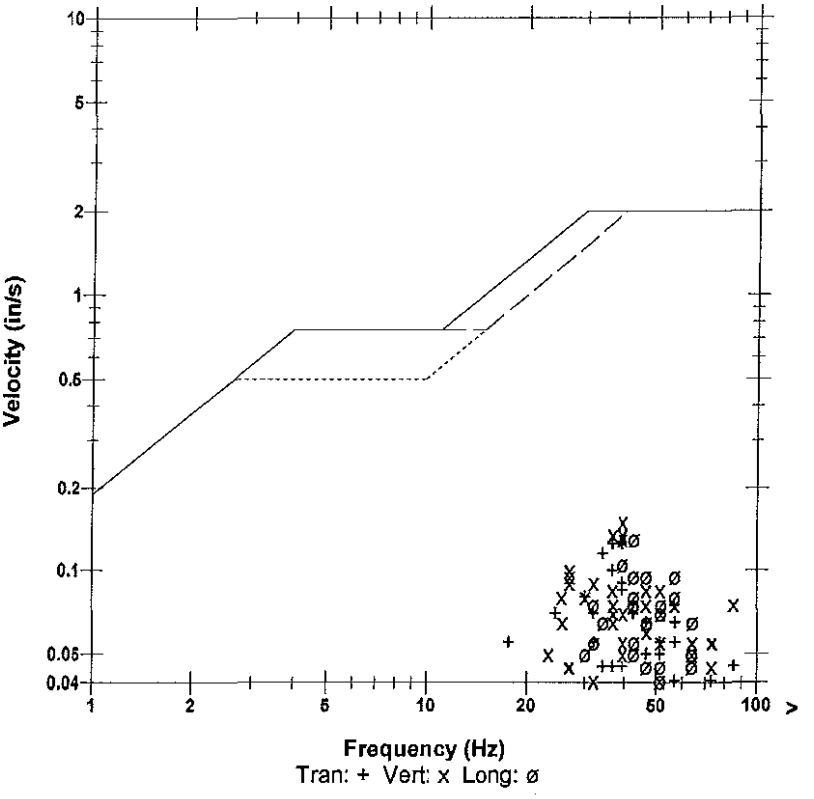
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

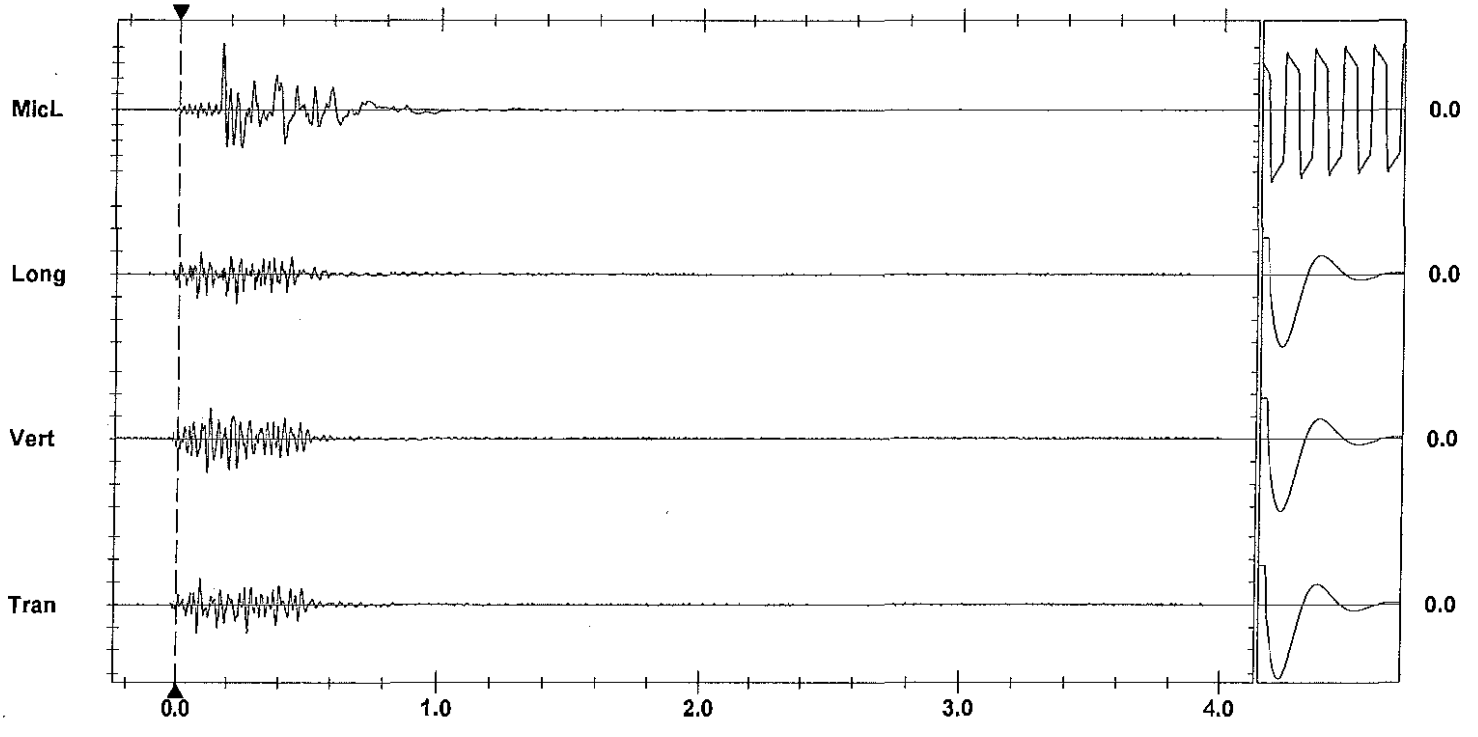
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00424 psi(L) at 0.170 sec			
ZC Freq	26 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 531 mv)			

	Tran	Vert	Long	
PPV	0.125	0.150	0.130	in/s
ZC Freq	39	39	43	Hz
Time (Rel. to Trig)	0.083	0.117	0.224	sec
Peak Acceleration	0.106	0.119	0.106	g
Peak Displacement	0.00049	0.00071	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 0.157 in/s at 0.203 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jul 25/12
ACTUAL BLAST DATE Jul 25/12 10:20AM
BLAST # MW-0295

HIGHWAY# 97
BLAST LOCATION AT: STN 128+22 ~ 128+30 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 7 D/L / 3 Buffer / 3 stems
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 (ms)

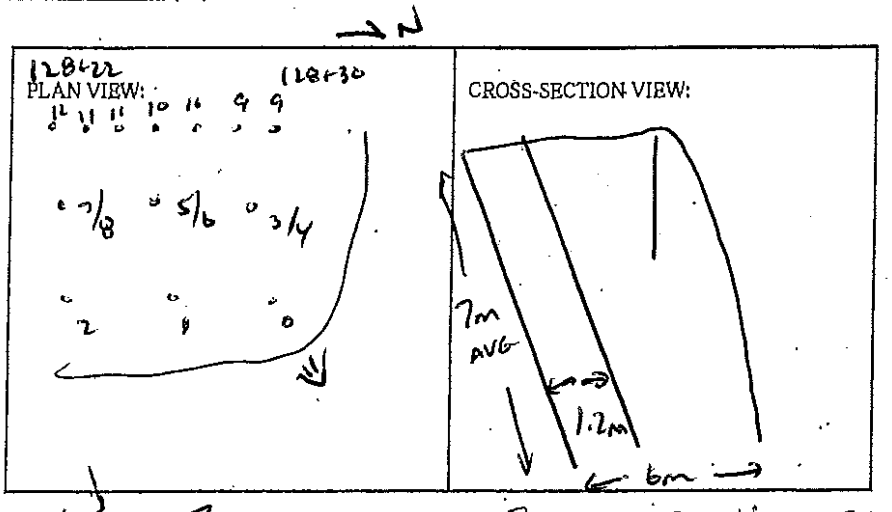
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 325 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13050 Old Mission Rd - 0.14 ips / 39Hz
" @ 13167 C1: Firestone Crt - 0.060 ips / 37Hz
" @ 13073 C1: Offstore Crt. 0.51 ips / 47Hz

STAB HOLES - 1'-1.5' ANFO + 0.5 CART 1½"x16" DYNAMITE Primer

BUFFER HOLES - BOTTOM DECK - 3-4 CART 2"x16" BLASTEX

↗ - TOP DECK - 2-3 CART 2"x16" BLASTEX
↗

Primed w/ 0.5 CART 1½"x16" DYNAMITE

BIL HOLES - 1 CART 2"x16" DYNAMITE + 200 gr det cord to 4' collar.

Instantel

Event Report

Date/Time	Vert at 10:20:55 July 25, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDVE.2V0

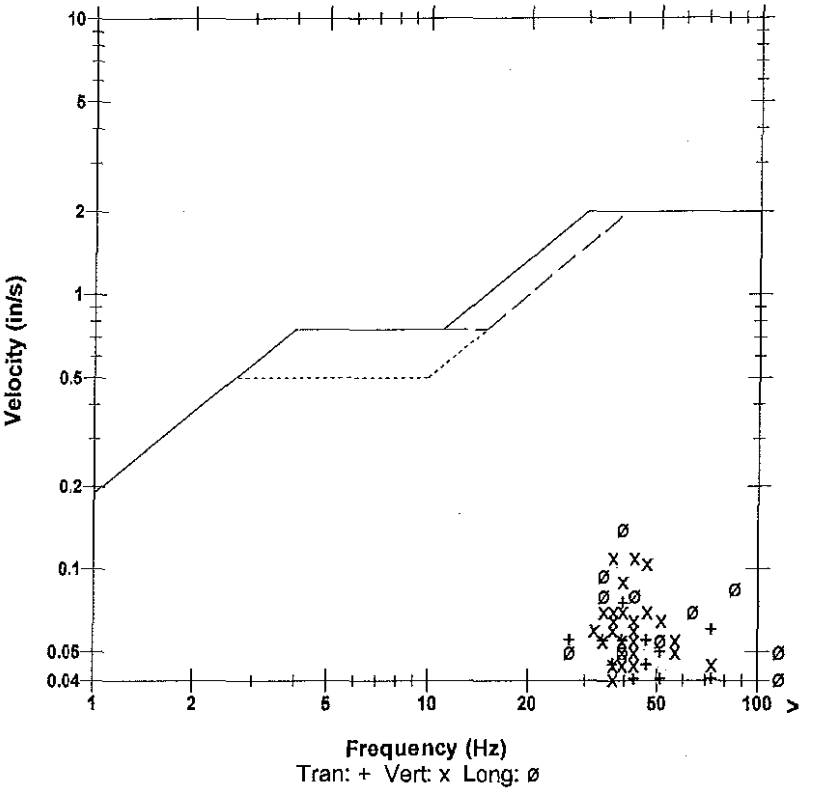
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

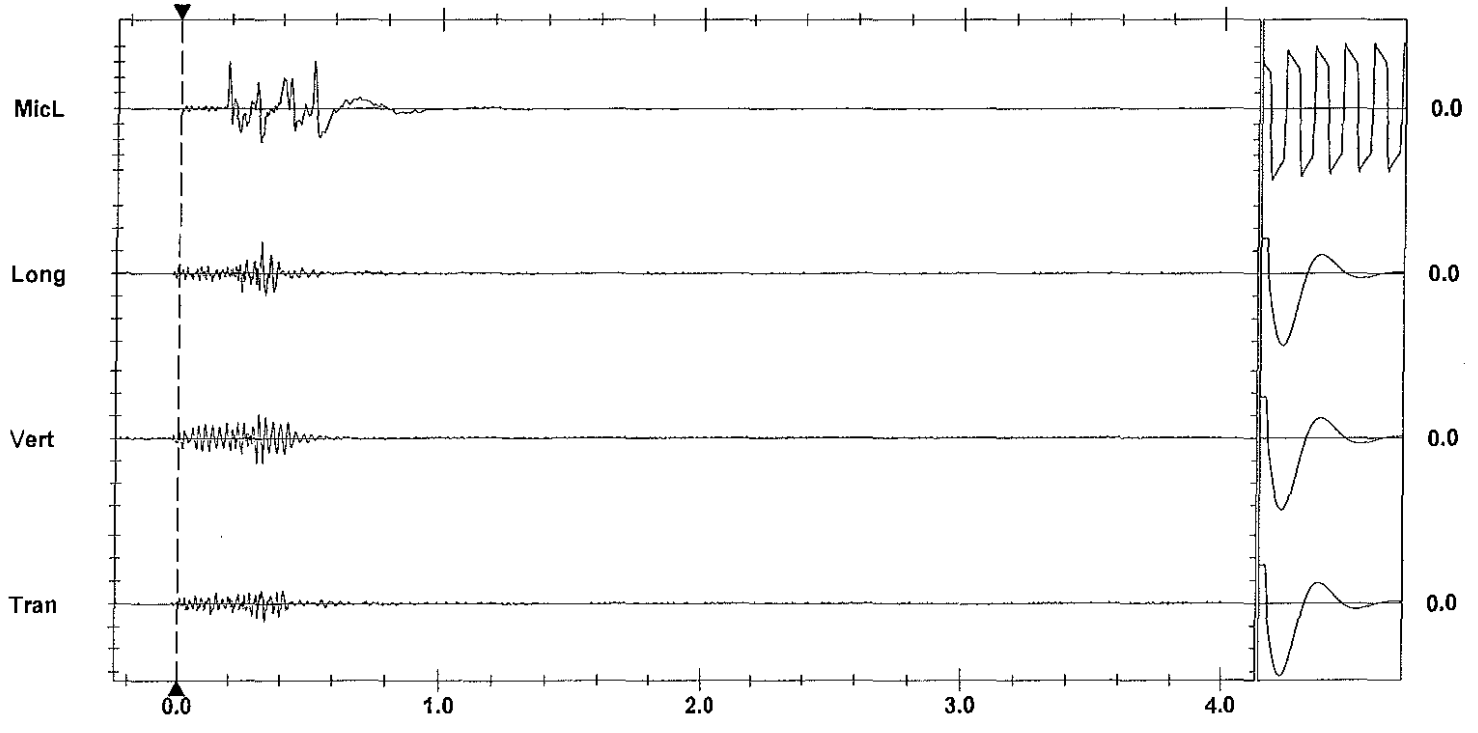
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00305 psi(L) at 0.520 sec			
ZC Freq	22 Hz			
Channel Test	Passed (Freq = 19.7 Hz Amp = 564 mv)			

	Tran	Vert	Long	
PPV	0.0750	0.110	0.140	in/s
ZC Freq	39	43	39	Hz
Time (Rel. to Trig)	0.342	0.307	0.323	sec
Peak Acceleration	0.0663	0.119	0.106	g
Peak Displacement	0.00032	0.00038	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.146 in/s at 0.323 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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Instantel

Event Report

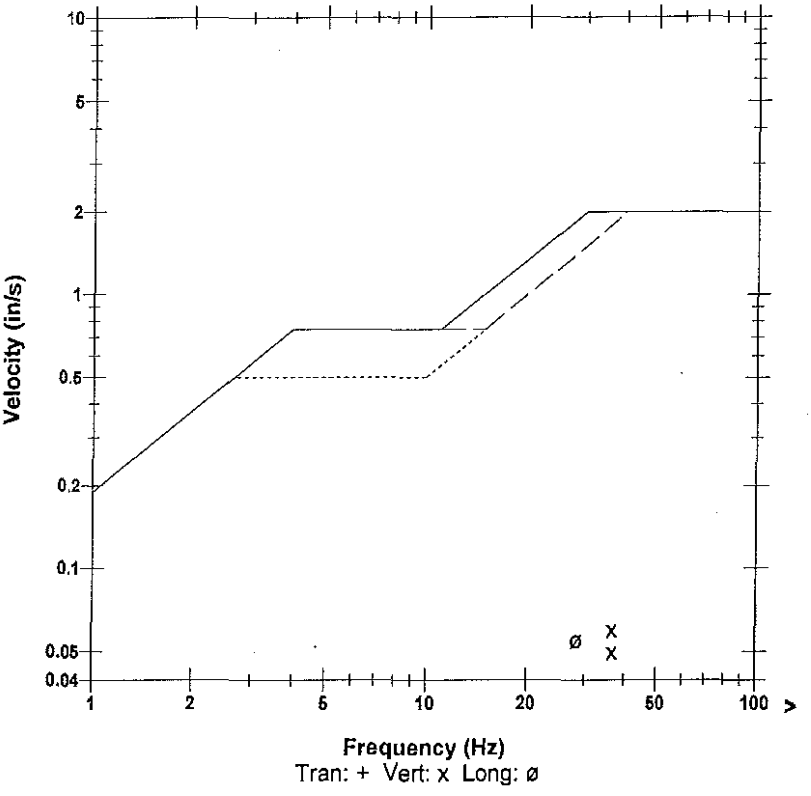
Date/Time	Vert at 10:20:49 July 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDVE.2P0

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

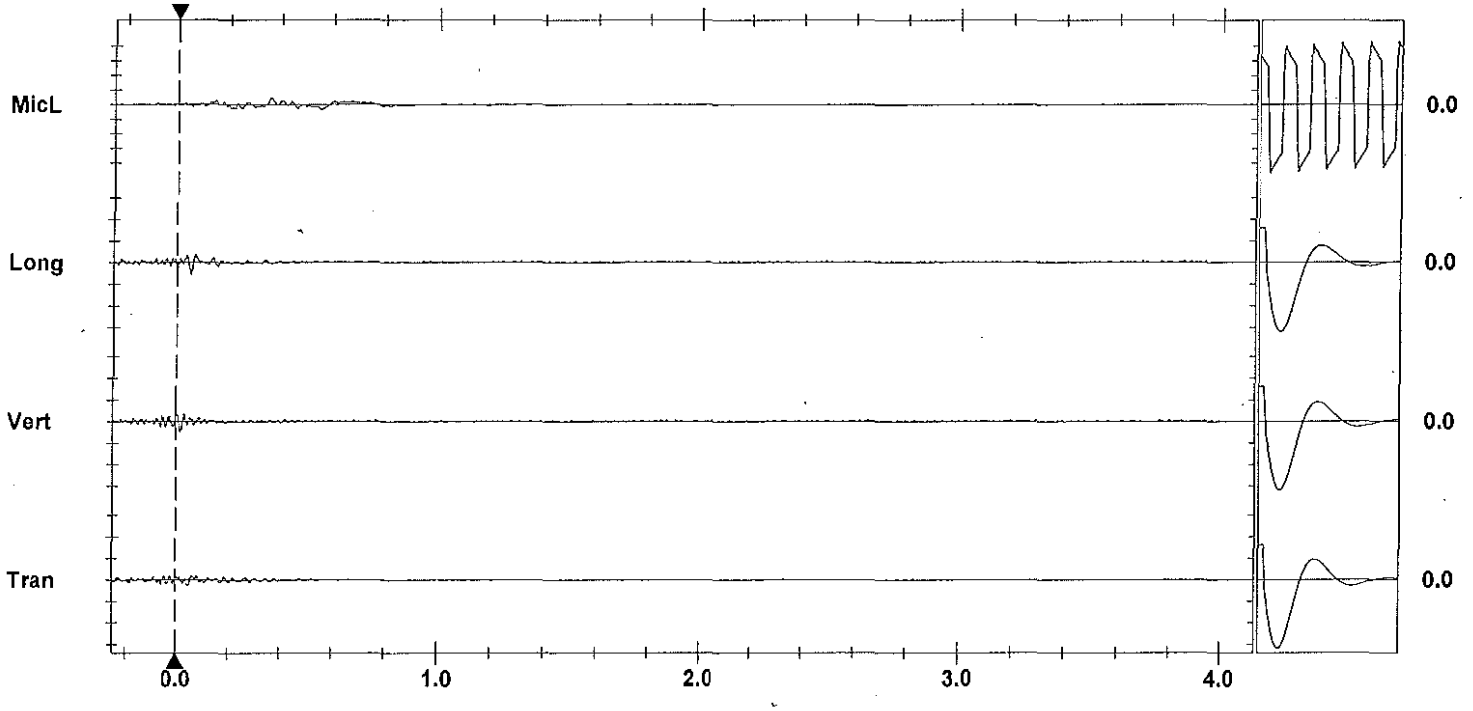
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00044 psi(L) at 0.357 sec			
ZC Freq	16 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 558 mv)			

	Tran	Vert	Long	
PPV	0.0250	0.0600	0.0550	in/s
ZC Freq	37	37	28	Hz
Time (Rel. to Trig)	0.047	0.002	0.056	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00013	0.00022	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.0667 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 10:20:54 July 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDVE.2U0
Job Number:	1		

Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

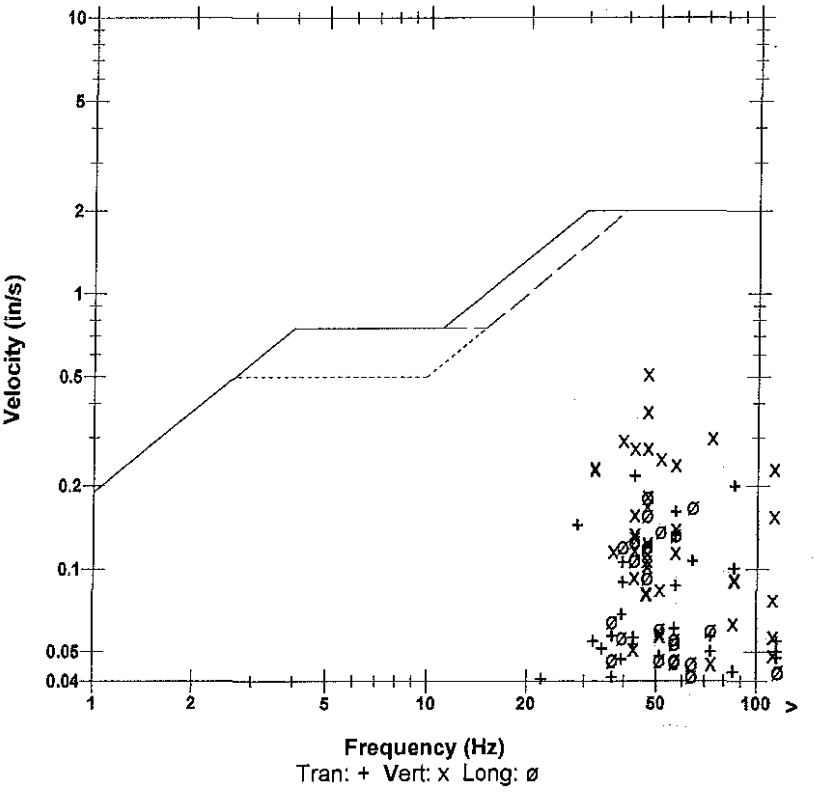
Post Event Notes

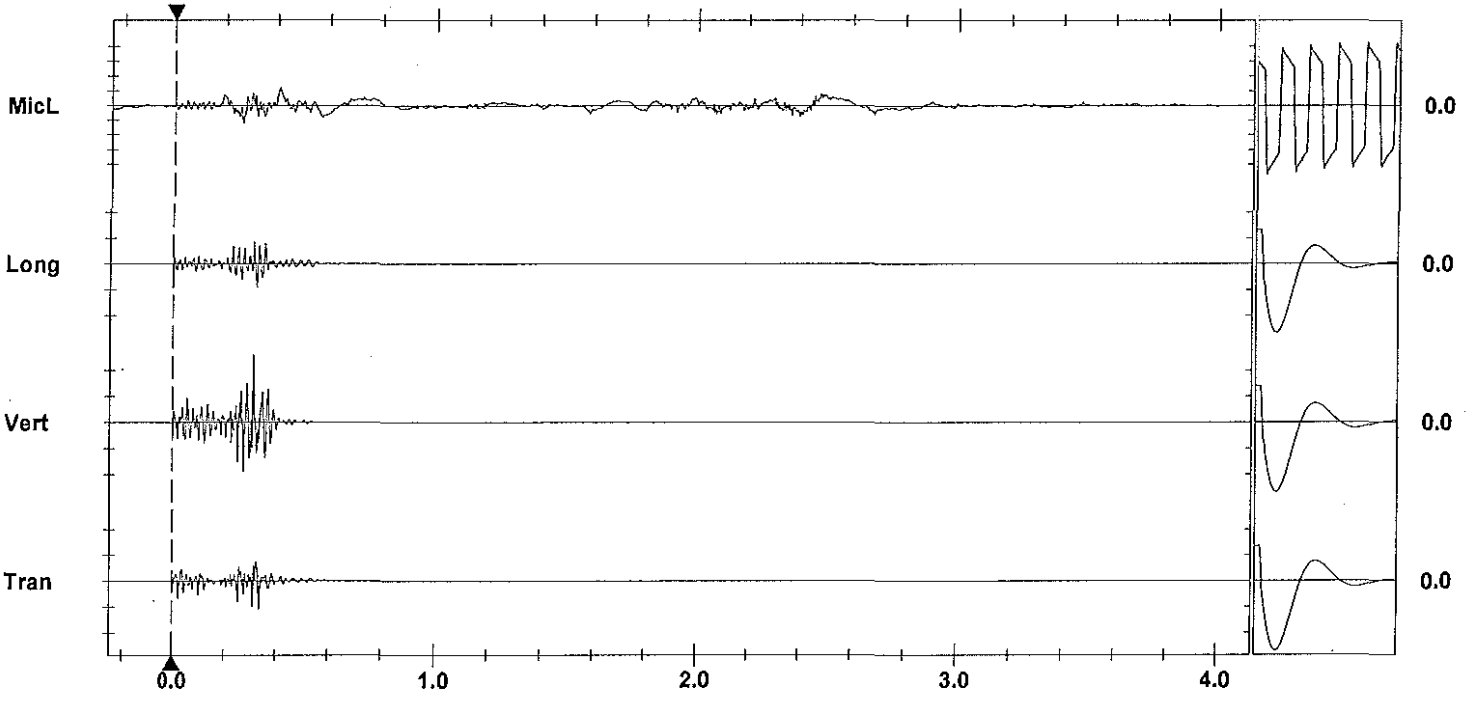
Microphone Linear Weighting
PSPL 0.00120 psi(L) at 0.265 sec
ZC Freq 8.8 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 545 mv)

	Tran	Vert	Long	
PPV	0.217	0.515	0.182	in/s
ZC Freq	43	47	47	Hz
Time (Rel. to Trig)	0.339	0.315	0.326	sec
Peak Acceleration	0.240	0.678	0.219	g
Peak Displacement	0.00077	0.00110	0.00057	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.550 in/s at 0.315 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED Jul 25/12
ACTUAL BLAST DATE Jul 25/12 1:24 PM
BLAST # MW-0296

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+10 - 128+22 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 12 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 17
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 142 (m)

TOTAL NUMBER OF HOLES 17 BH / 5 Buffer / 3 Scab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

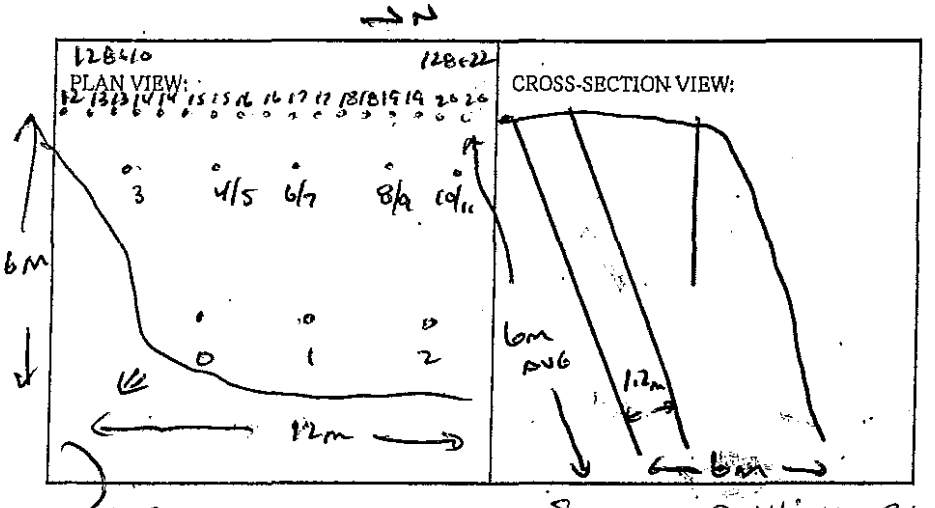
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.17 ips / 43 Hz
" @ 13167 Cliffstone ent - 0.055 ips / 28 Hz
" @ 13073 Cliffstone Crt - 0.31 ips / 57 Hz

B/L Holes – 1 CART 2X16 DYNAMITE + 200 g/m det cord to 4' collar

Buffer Holes – Bottom Deck 4-5 CART 2X16 BLASTEX

– TOP DECK 3-4 CART 2X16 BLASTEX

Stab Holes – 2'-3' AWFO

All primed w/ 0.5 CART 1½" x 16" DYNAMITE

Instantel®

Event Report

Date/Time	Vert at 13:24:43 July 25, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDVM.L70
Job Number:	1		

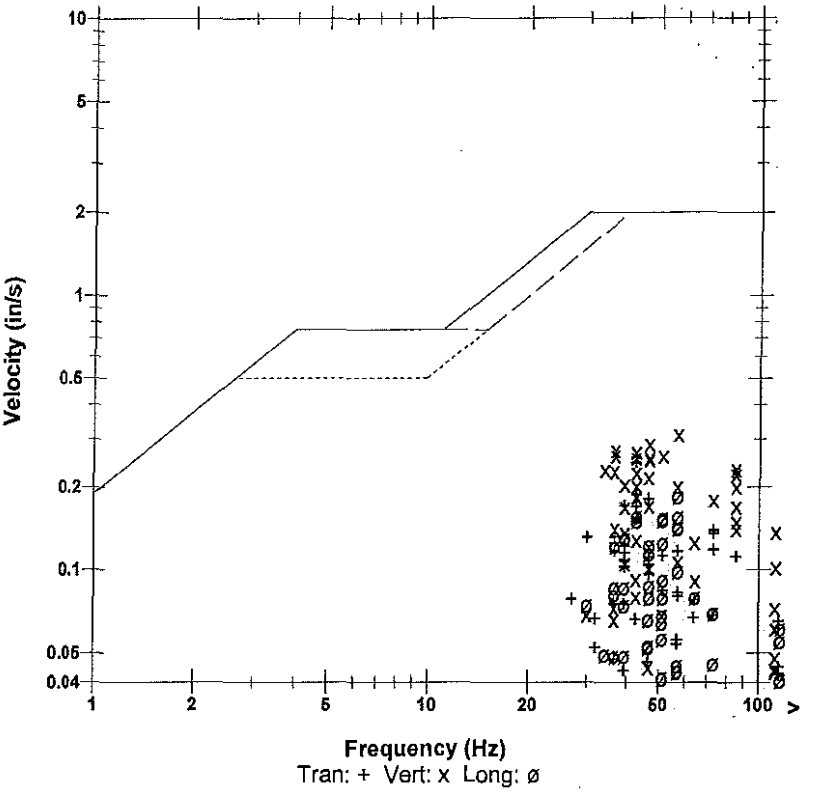
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

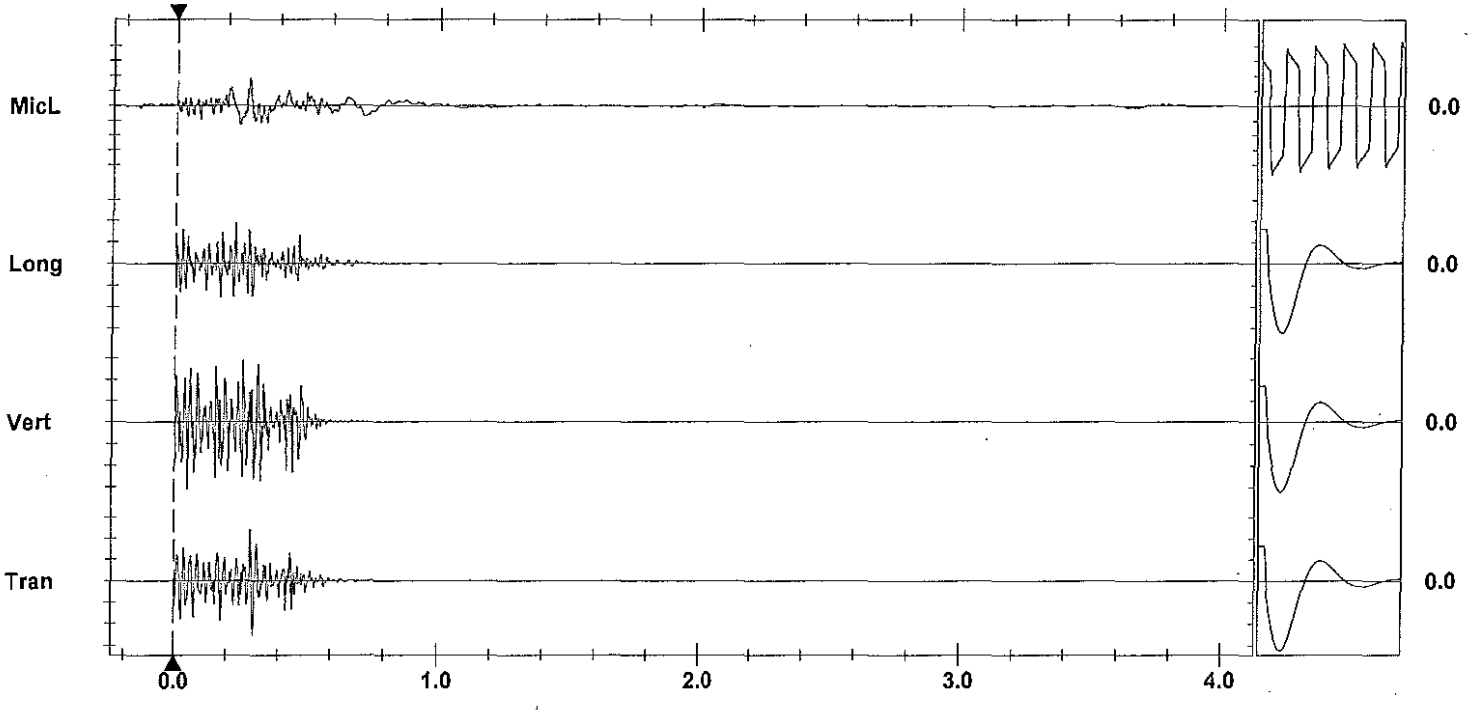
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.281 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 533 mv)

	Tran	Vert	Long	
PPV	0.257	0.312	0.184	in/s
ZC Freq	43	57	57	Hz
Time (Rel. to Trig)	0.308	0.052	0.232	sec
Peak Acceleration	0.220	0.471	0.237	g
Peak Displacement	0.00089	0.00109	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.365 in/s at 0.308 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

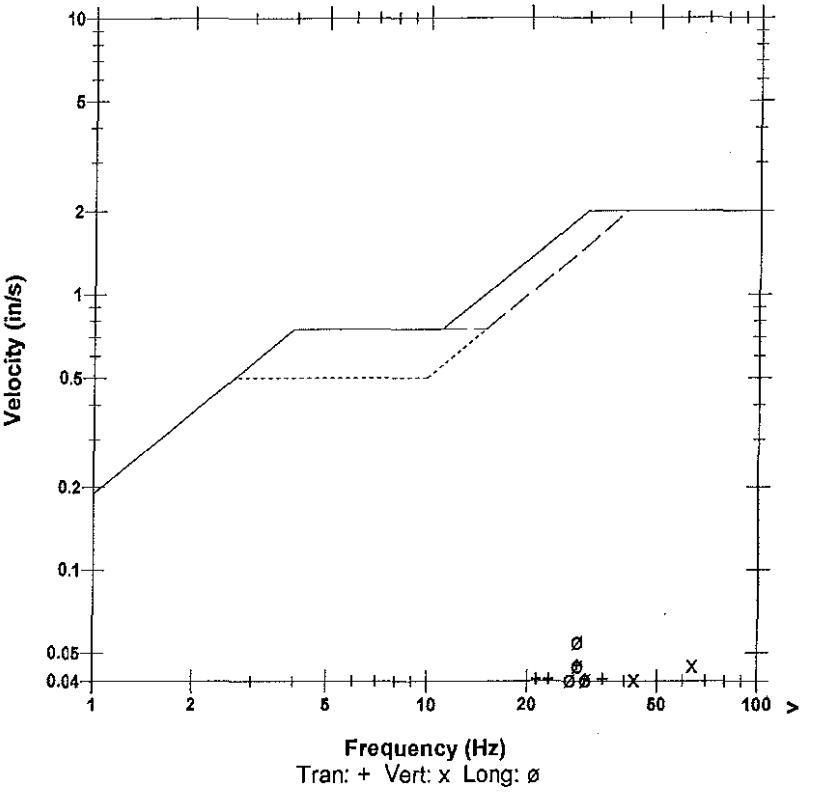
Date/Time	Tran at 13:24:38 July 25, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866EDVM.L20

Notes
location:13167 Cliffstone Crt on
rear patio slab se corner
User Name:james m
General:

Extended Notes

Post Event Notes

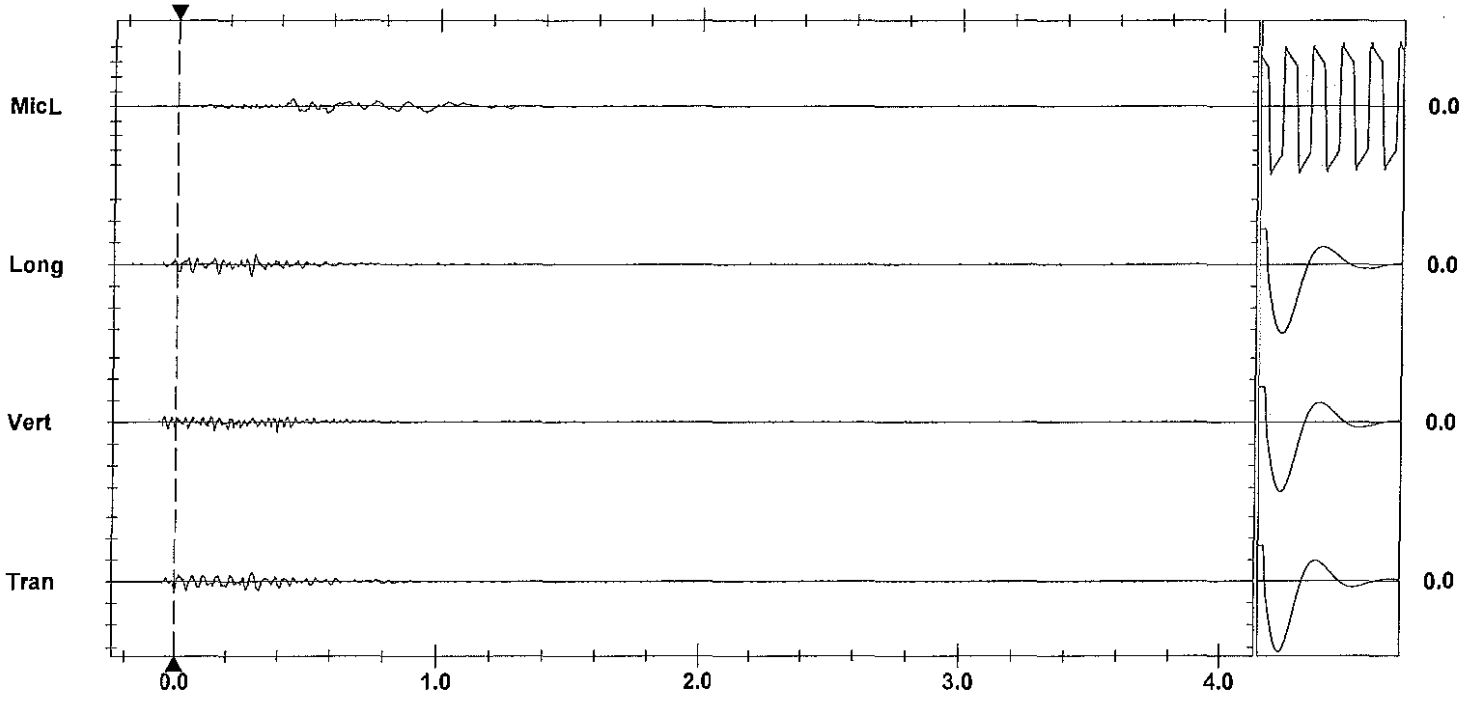
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00047 psi(L) at 0.439 sec			
ZC Freq	13 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 495 mv)			

	Tran	Vert	Long	
PPV	0.0450	0.0450	0.0550	in/s
ZC Freq	28	64	28	Hz
Time (Rel. to Trig)	0.047	0.396	0.291	sec
Peak Acceleration	0.0398	0.0398	0.0398	g
Peak Displacement	0.00032	0.00013	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.4	3.6	4.1	

Peak Vector Sum 0.0596 in/s at 0.047 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Long at 13:24:44 July 25, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDVM.L80

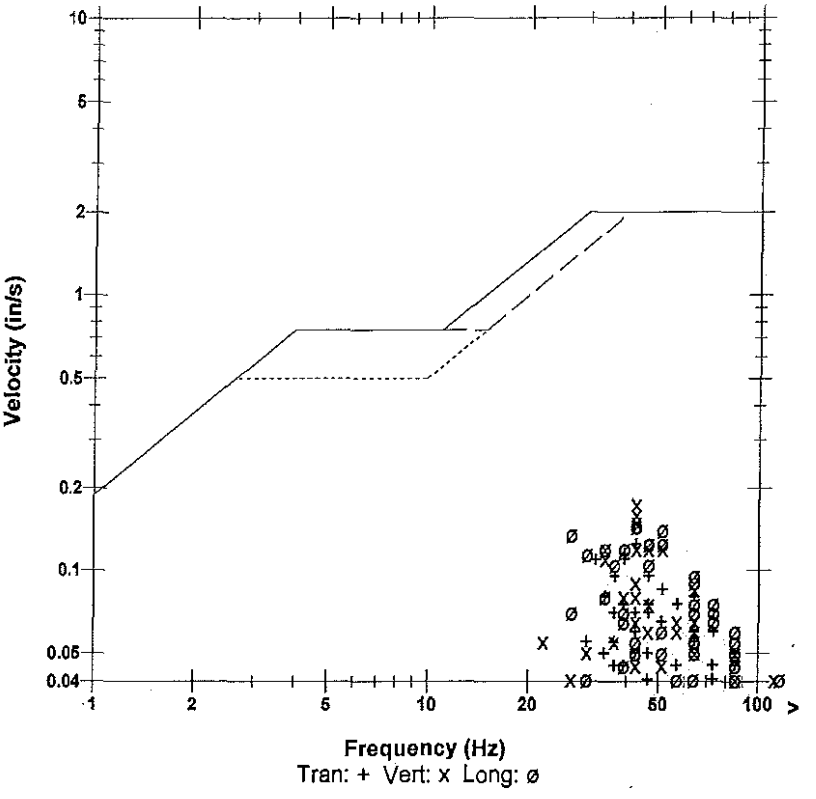
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

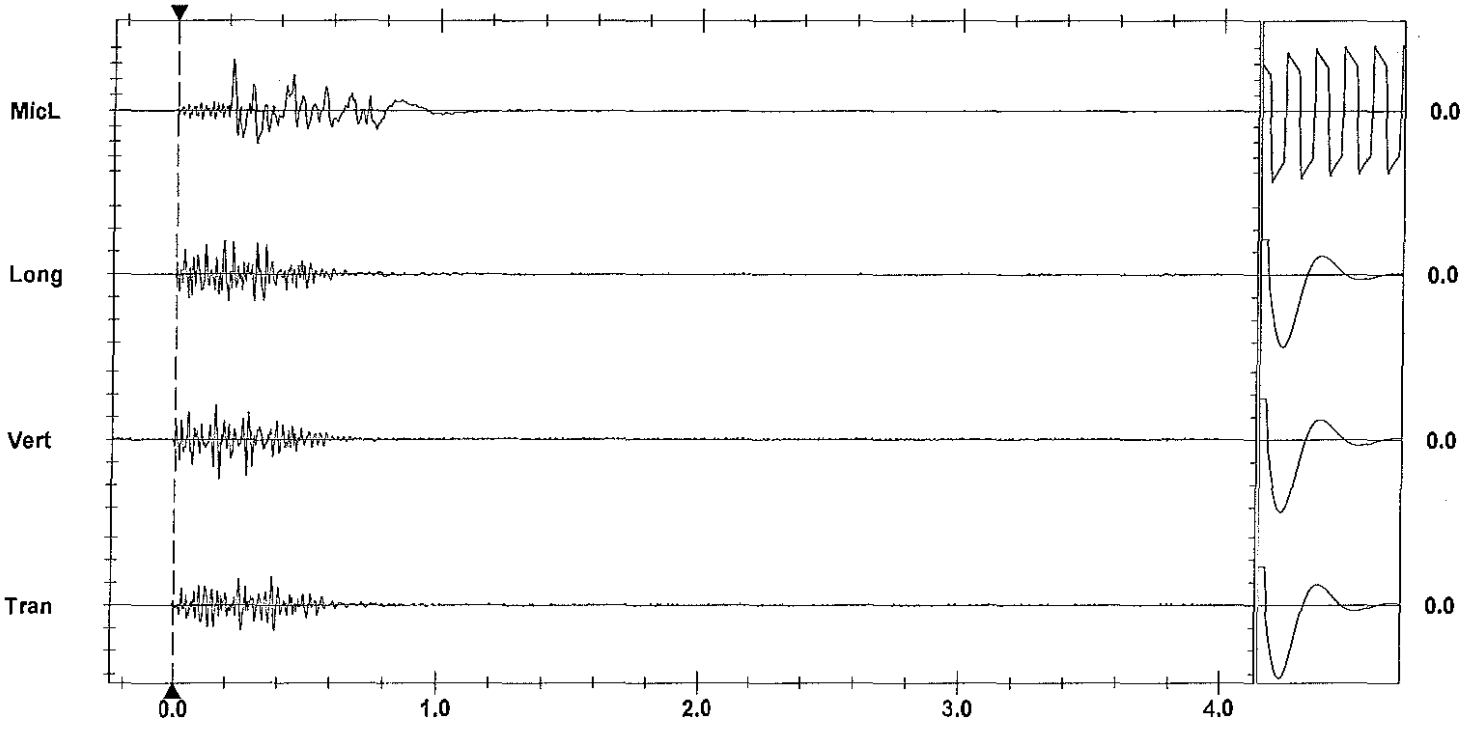
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00323 psi(L) at 0.215 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 485 mv)

	Tran	Vert	Long	
PPV	0.125	0.175	0.145	in/s
ZC Freq	43	43	43	Hz
Time (Rel. to Trig)	0.378	0.171	0.187	sec
Peak Acceleration	0.106	0.133	0.146	g
Peak Displacement	0.00052	0.00058	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.4	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.185 in/s at 0.171 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jul 26/12
ACTUAL BLAST DATE Jul 26/12 10:23 AM
BLAST # MW-0297

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+02 cl (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.4 (m)
TOTAL DEPTH 13 (m)

TOTAL NUMBER OF HOLES 6 Prod. + 2 C.S.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 410 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

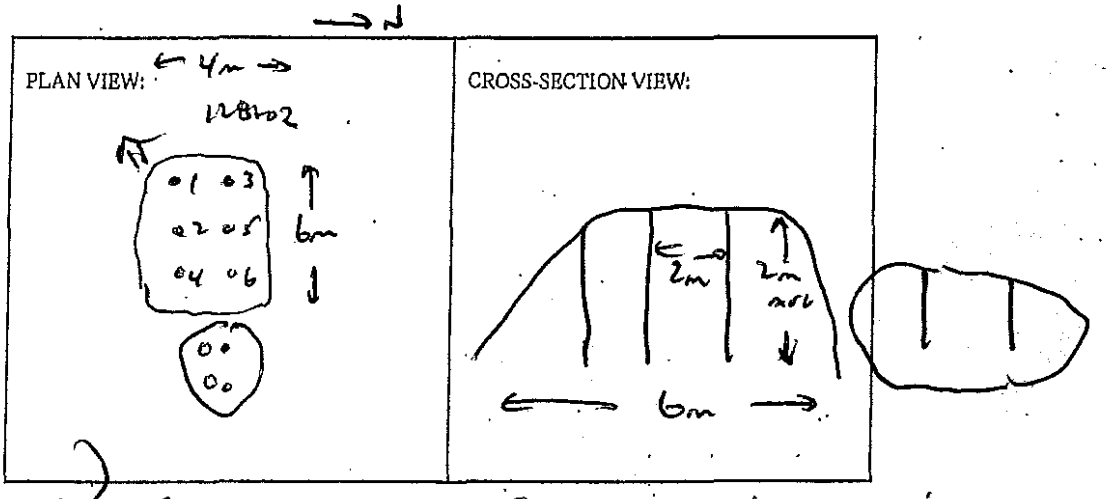
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 45 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 old Mission Rd – 0.080 ips/57 HL
" @ 13167 Cliffstone Crt. No Reading (< 0.04 ips)
" @ 13073 Cliffstone Crt - 0.064 ips/47 HL

POOR CASES – 1'–3' ANFO + 0.5 CART 1½"x16" DYNAMITE PRIMER

OVERSIZE – 0.25 CART 1½"x16" PRIMER

DRAFT

Instantel

Event Report

Date/Time	Vert at 10:23:24 July 26, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDX8.V00

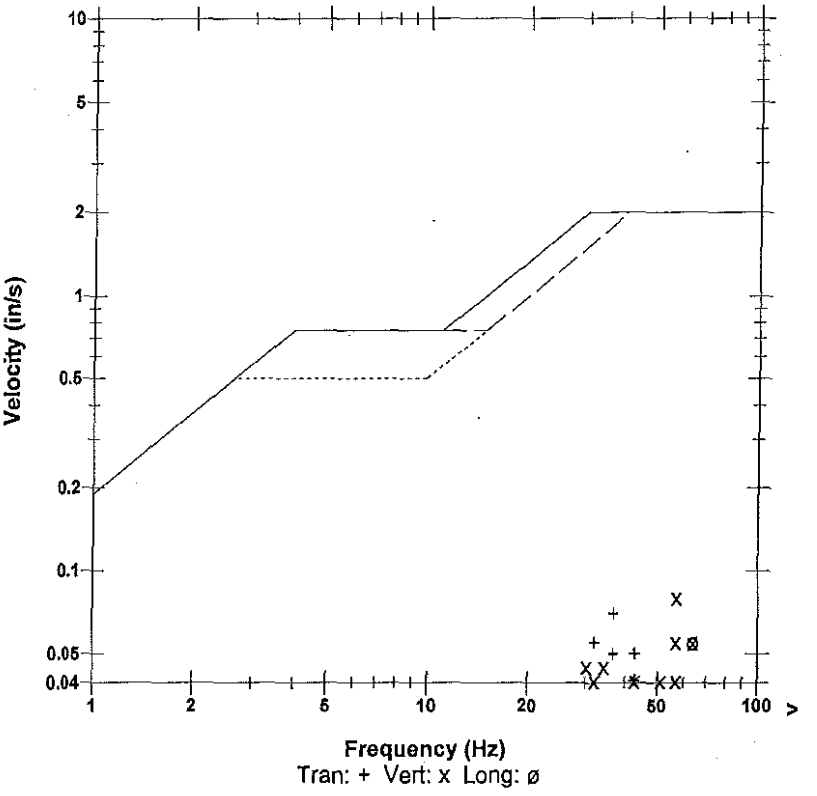
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

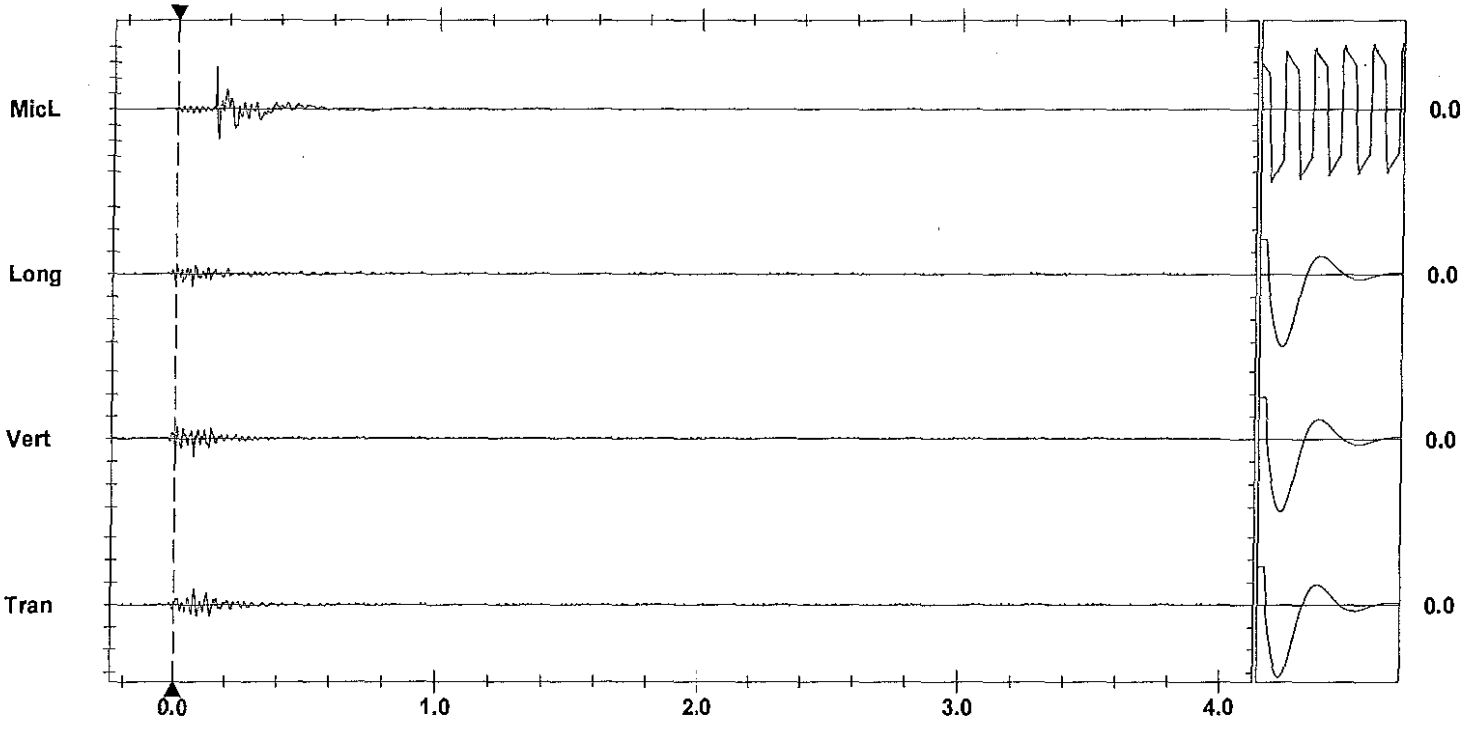
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00265 psi(L) at 0.152 sec
ZC Freq	64 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 549 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0800	0.0550	in/s
ZC Freq	37	57	64	Hz
Time (Rel. to Trig)	0.082	0.074	0.065	sec
Peak Acceleration	0.0530	0.0663	0.0530	g
Peak Displacement	0.00028	0.00022	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.7	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0879 in/s at 0.074 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Tran at 10:23:23 July 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDX8.UZ0
Job Number:	1		

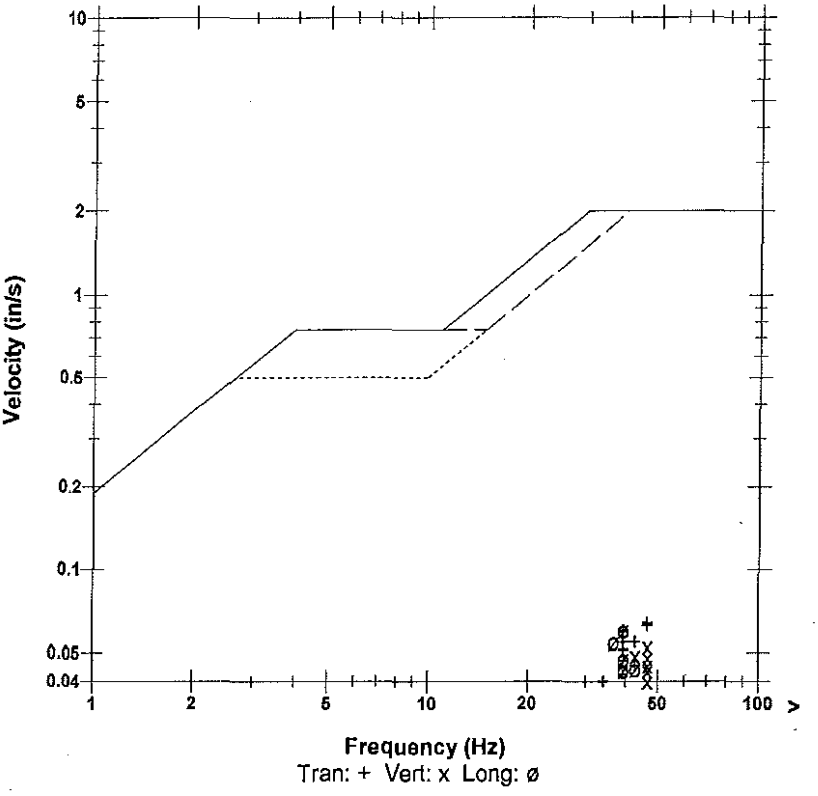
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

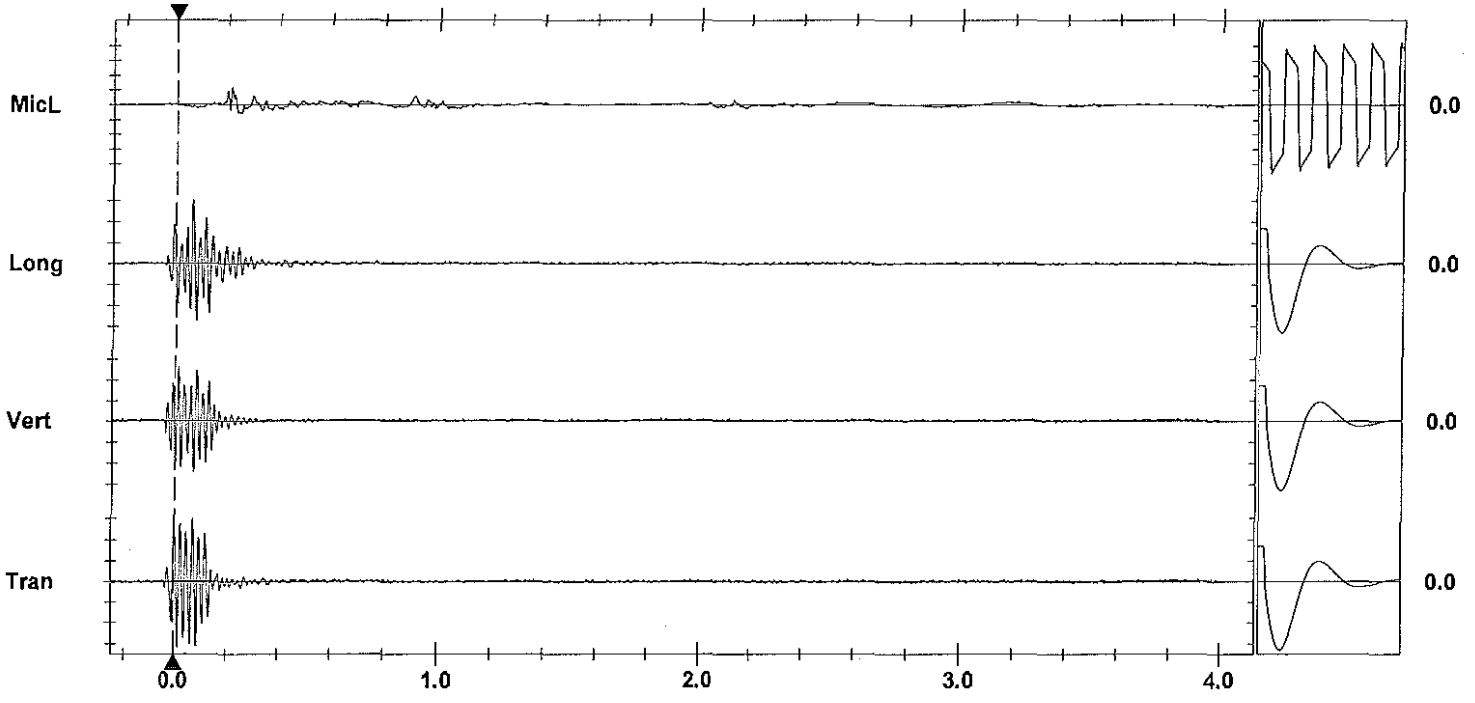
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00116 psi(L) at 0.213 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 514 mv)

	Tran	Vert	Long	
PPV	0.0637	0.0525	0.0600	in/s
ZC Freq	47	47	39	Hz
Time (Rel. to Trig)	0.016	0.015	0.066	sec
Peak Acceleration	0.0547	0.0431	0.0497	g
Peak Displacement	0.00025	0.00019	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.0909 in/s at 0.065 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED June 26/12
ACTUAL BLAST DATE June 26/12 10:58 AM
BLAST # MW-0298

HIGHWAY # 97
BLAST LOCATION AT: STN 128+40 - 128+46 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 18 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

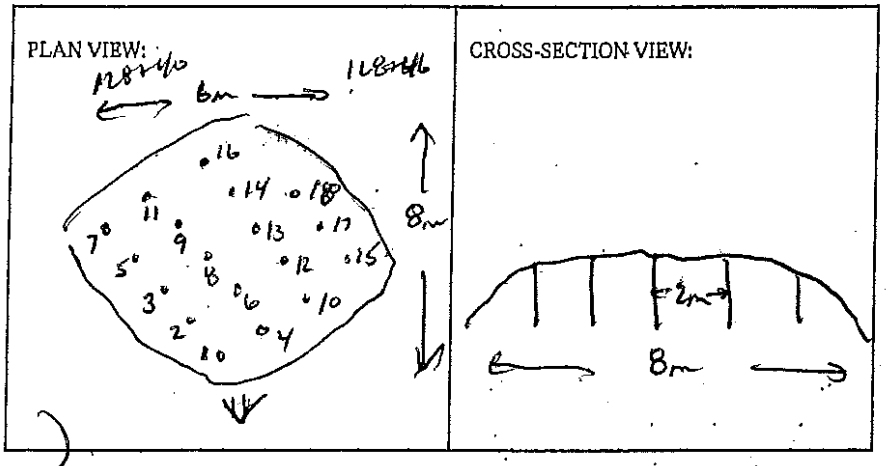
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13050 Old Mission Rd - 0.840 ips / 57Hz
" @ 13167 Cliffstone Crt - NO TRIGGER (< 0.04 ips)
" @ 13073 Cliffstone Crt - 0.081 ips / 57Hz

2'-3' ANFO PER HOLE + 0.5 CART 1½"x16" DYNAMITE
Primer

Instantel

Event Report

Date/Time	Vert at 10:58:34 July 26, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EDXA.HM0

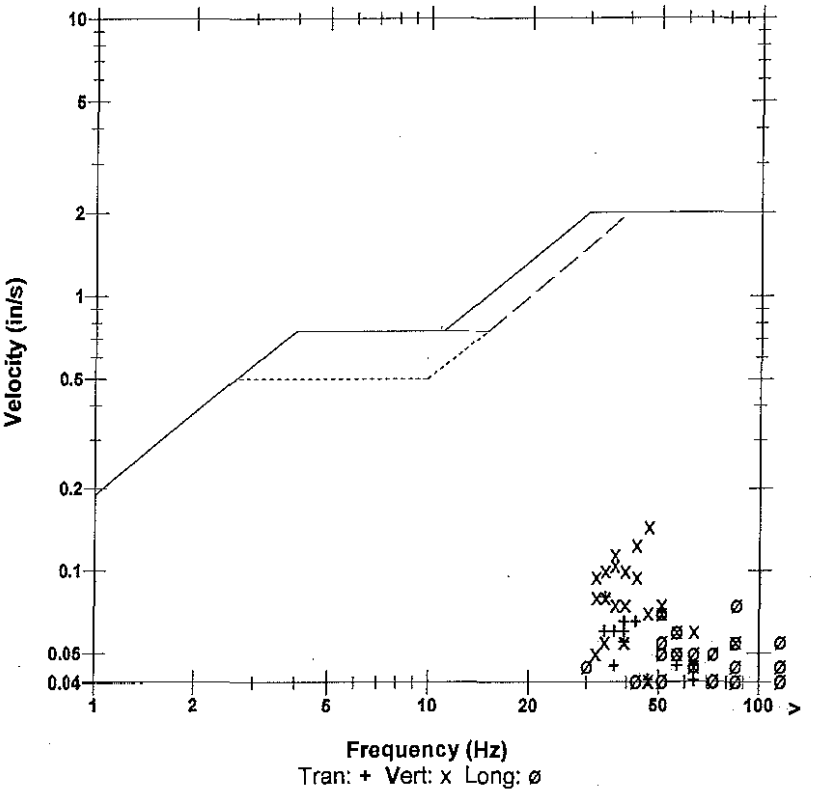
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

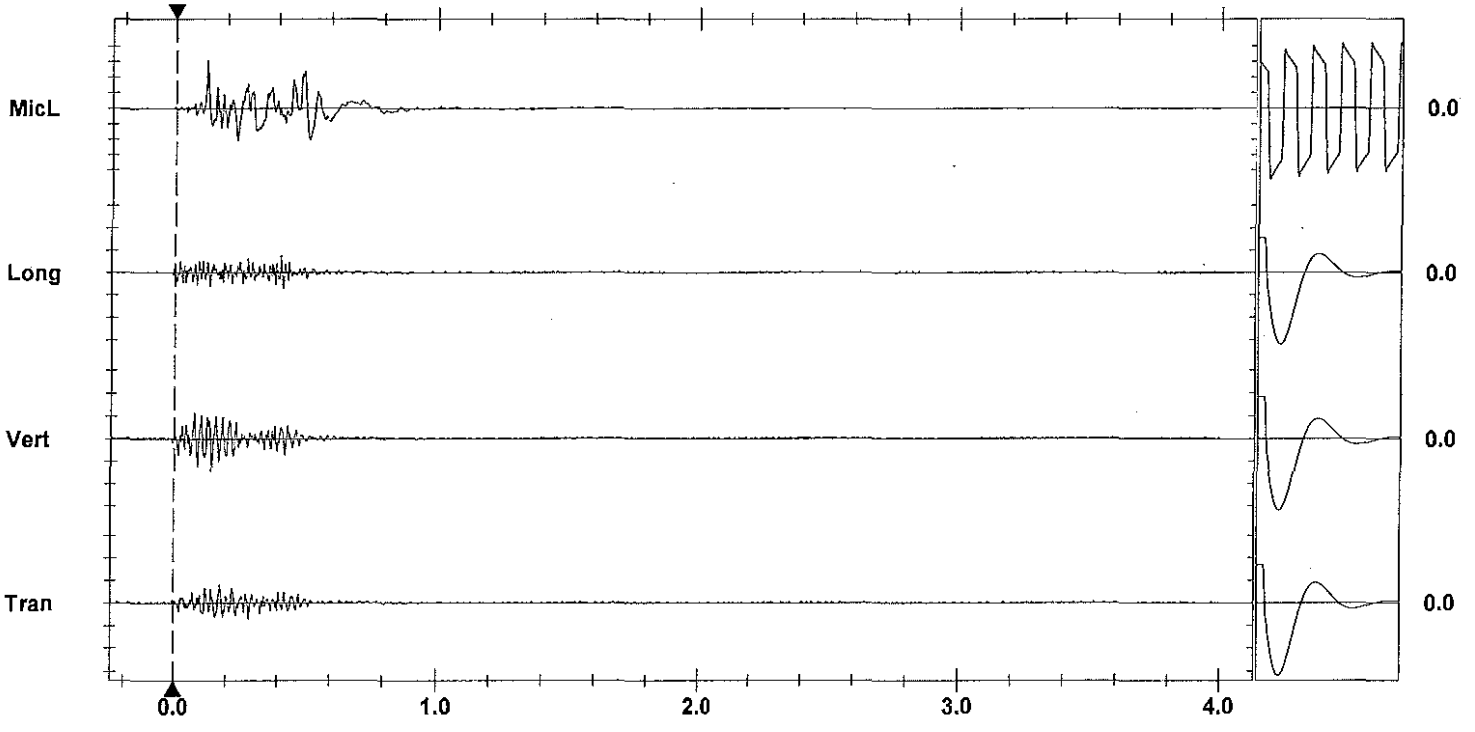
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00305 psi(L) at 0.122 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 498 mv)

	Tran	Vert	Long	
PPV	0.0800	0.145	0.0750	in/s
ZC Freq	34	47	85	Hz
Time (Rel. to Trig)	0.181	0.146	0.411	sec
Peak Acceleration	0.0928	0.106	0.106	g
Peak Displacement	0.00033	0.00047	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.154 in/s at 0.146 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: July 29, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Long at 10:58:33 July 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EDXA.HL0
Job Number:	1		

Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

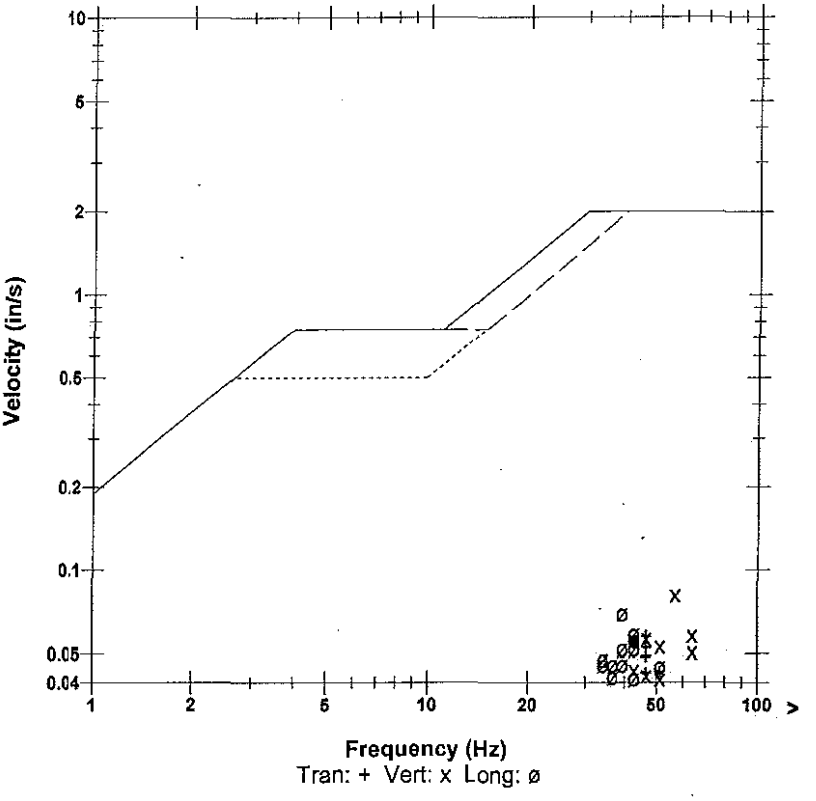
Post Event Notes

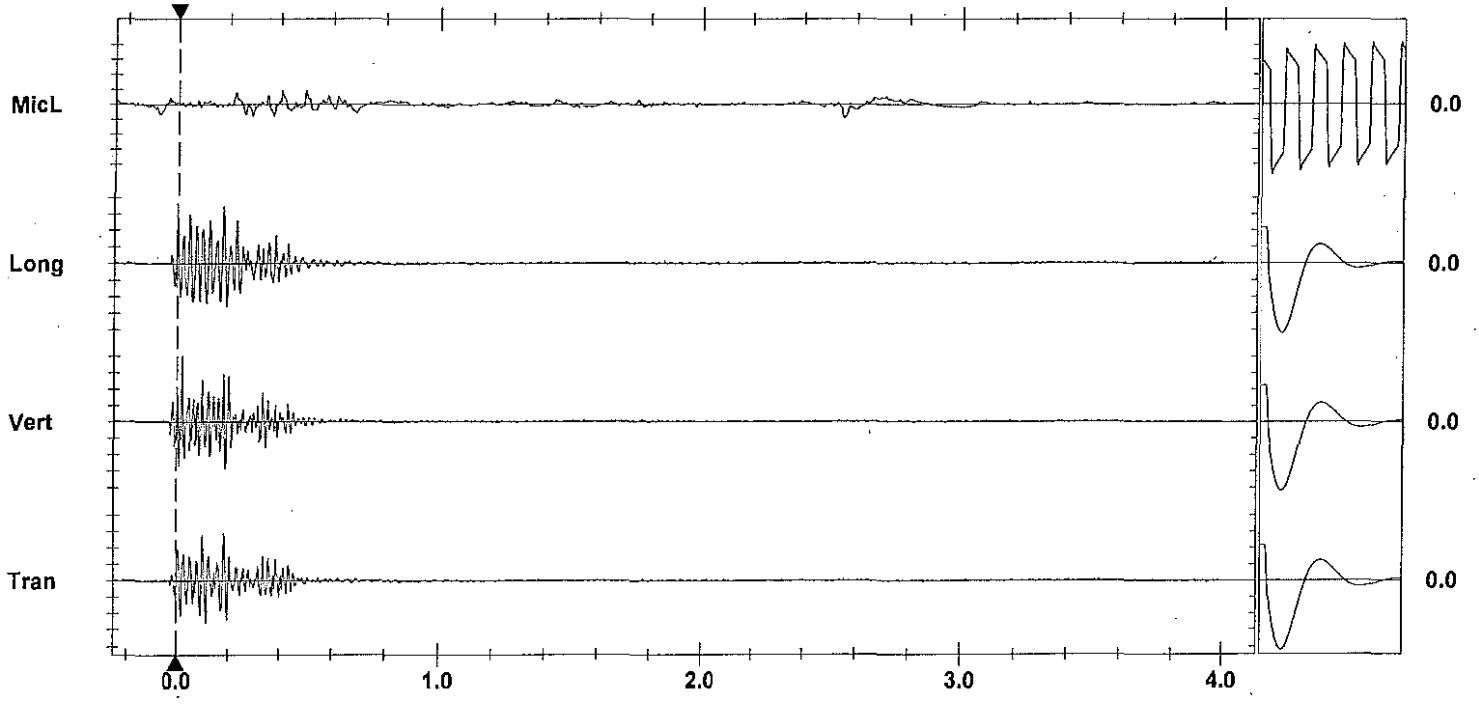
Microphone Linear Weighting
PSPL 0.00091 psi(L) at 0.402 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 488 mv)

	Tran	Vert	Long	
PPV	0.0575	0.0812	0.0694	in/s
ZC Freq	47	57	39	Hz
Time (Rel. to Trig)	0.186	0.021	0.181	sec
Peak Acceleration	0.0481	0.0945	0.0547	g
Peak Displacement	0.00019	0.00021	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.0897 in/s at 0.181 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Printed: July 29, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED AUG-2/12
ACTUAL BLAST DATE AUG-2/12 12:16 PM
BLAST # MW-0299

HIGHWAY# 97
BLAST LOCATION AT: STN 128+40 AND STN 128+20 (HIGH SPOT)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALKALI GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 28.6 (m)

TOTAL NUMBER OF HOLES 13 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

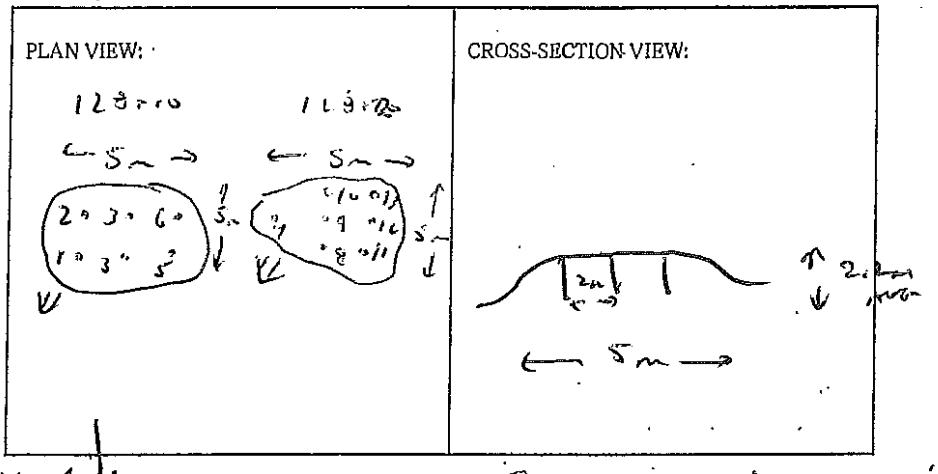
EXPLOSIVE SIZE 25 mm by 203 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED NIL (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Client Fastline Cut - 0.105 ips/37Hz
@ 13050 Communication Rd - 0.09 ips/47Hz

1'-2" ANFO / Hole primed w/ 1 cart 1/2 Dynamite

Instantel

Event Report

Date/Time	Vert at 12:16:18 August 2, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960EEAC.R60
Job Number:	1		

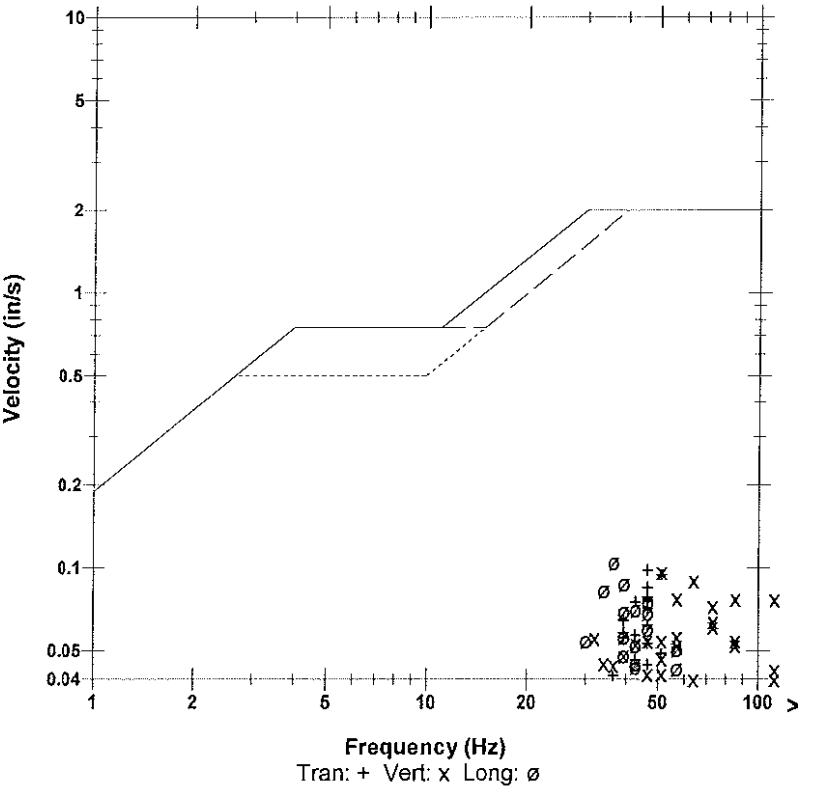
Notes
location:13073 Cliffstone Crt on rear patio slab ne cr

User Name:james m
General:

Extended Notes

Post Event Notes

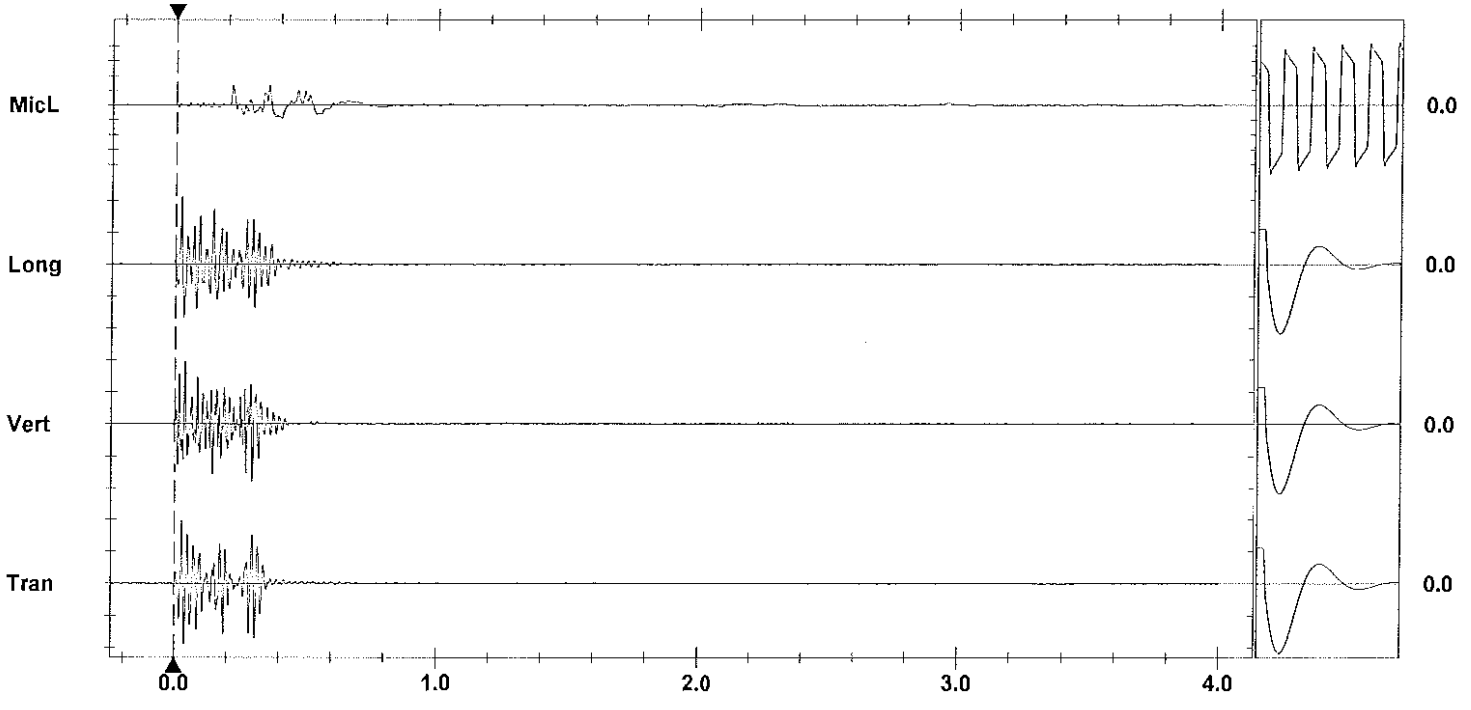
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00138 psi(L) at 0.355 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	0.0981	0.0969	0.105	in/s
ZC Freq	47	51	37	Hz
Time (Rel. to Trig)	0.029	0.039	0.023	sec
Peak Acceleration	0.0878	0.109	0.0978	g
Peak Displacement	0.00031	0.00027	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.143 in/s at 0.039 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

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Instantel

Event Report

Date/Time	Vert at 12:16:19 August 2, 2012	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746EEAC.R70

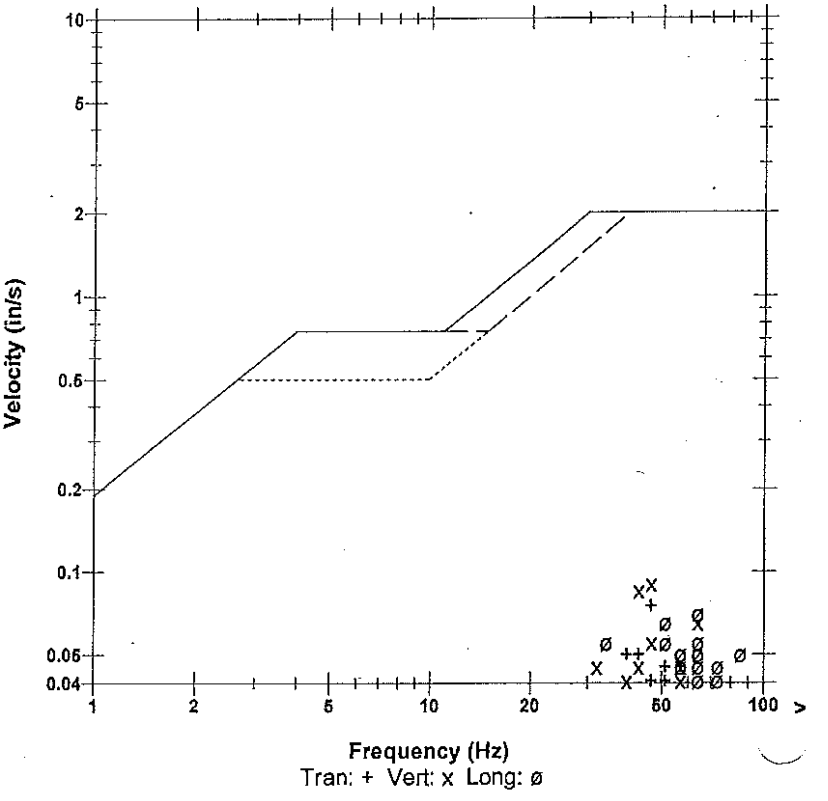
Notes
Location:13050 Old Mission Rd on foundation wall at nw entrance

General:Wayne V

Extended Notes

Post Event Notes

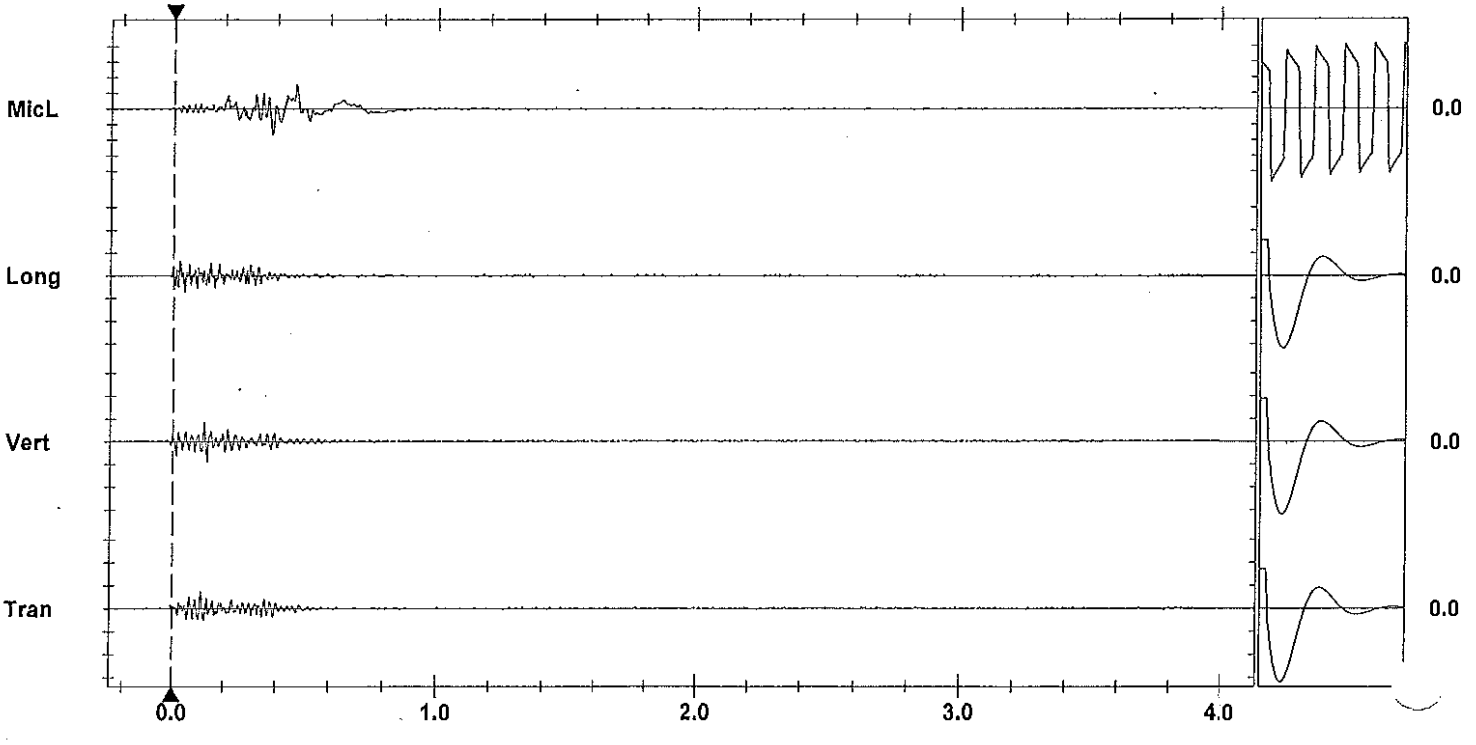
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.381 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 542 mv)

	Tran	Vert	Long	
PPV	0.0750	0.0900	0.0700	in/s
ZC Freq	47	47	64	Hz
Time (Rel. to Trig)	0.110	0.134	0.041	sec
Peak Acceleration	0.0663	0.0663	0.0663	g
Peak Displacement	0.00024	0.00027	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.5	Hz
Overswing Ratio	3.6	3.6	3.9	

Peak Vector Sum 0.0986 in/s at 0.122 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED Sept. 10/12
ACTUAL BLAST DATE Sept. 10/12
BLAST # 434 @ 13:00

HIGHWAY# 97
BLAST LOCATION AT: STN # 129+40 - 129+20 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 1 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.2 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 20
HOLE DIAMETER 76 (mm)
HOLE SPACING 1 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

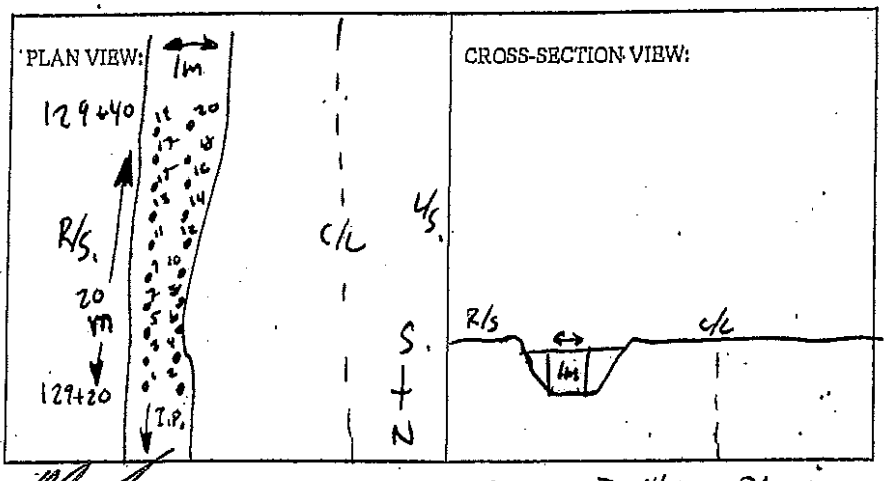
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Instantel

Event Report

Date/Time	Vert at 09:44:59 September 4, 1995	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M8665KJ9.QZ0

Notes
location:on concrete slab in front of doorway on old mission

User Name:james m
General: stn 129

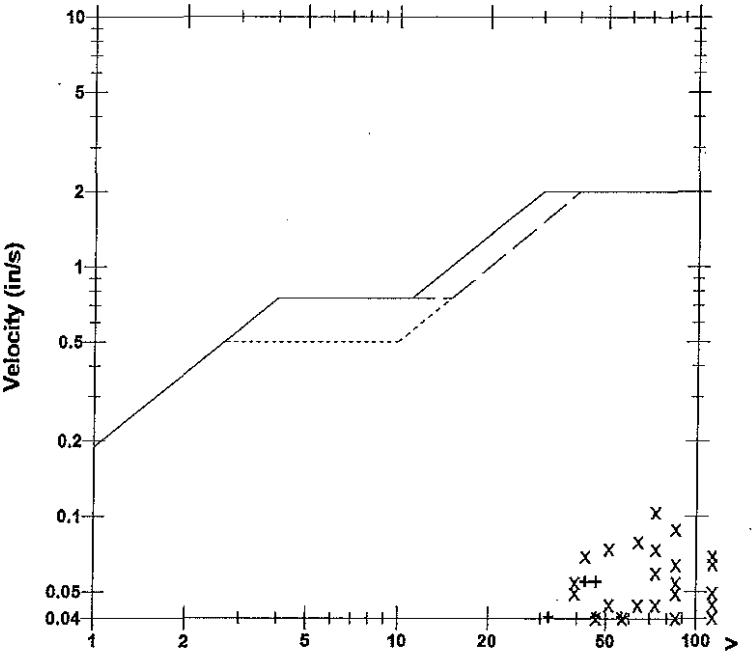
Extended Notes

Post Event Notes
Unit located at 13050 Old Mission Road. Date and time settings incorrect due to unit previously shutting down due to low battery - 1995 default date

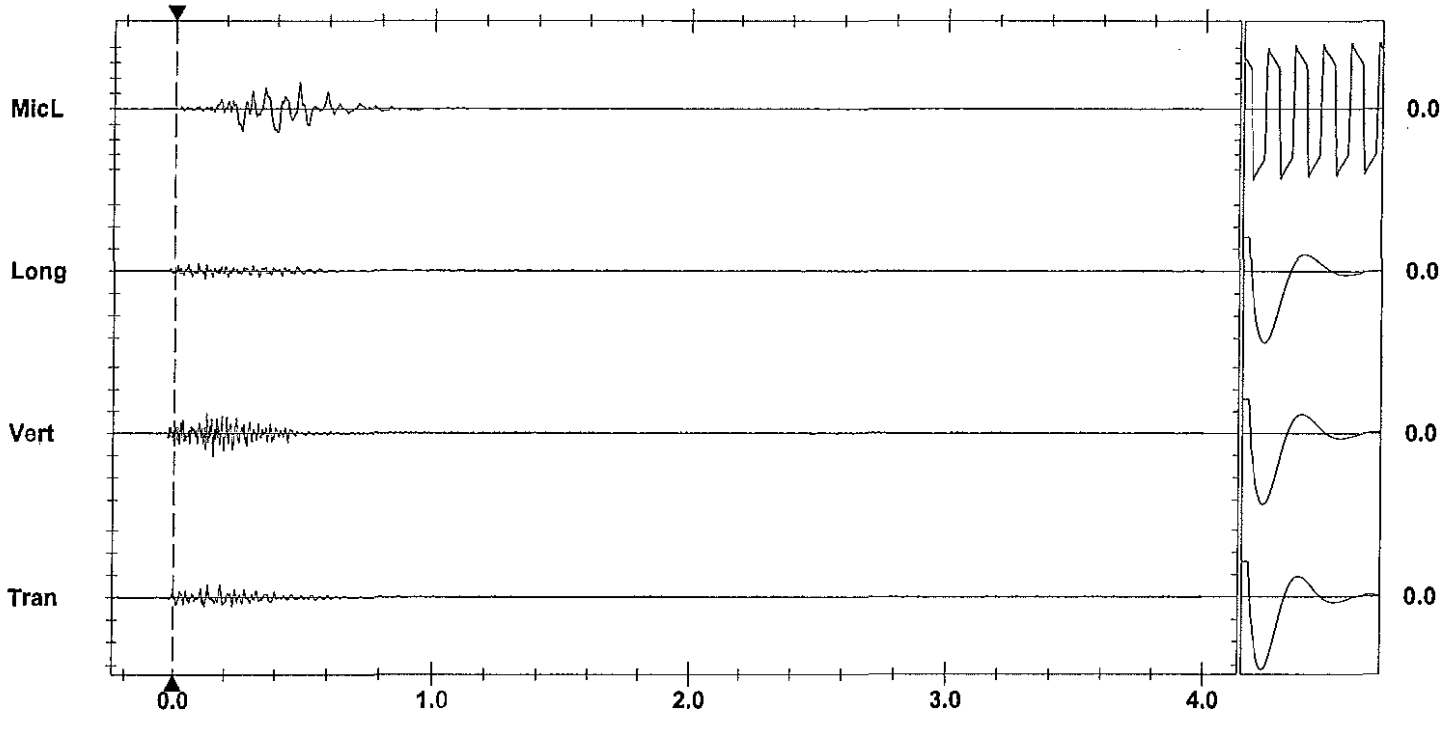
Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.484 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.0550	0.105	0.0350	in/s
ZC Freq	47	73	57	Hz
Time (Rel. to Trig)	0.136	0.153	0.092	sec
Peak Acceleration	0.0530	0.133	0.0530	g
Peak Displacement	0.00021	0.00027	0.00010	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.5	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.106 in/s at 0.153 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Sept. 14/12
ACTUAL BLAST DATE Sept. 14/12
BLAST # 440

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY # 97
BLAST LOCATION AT: STN # 129+00 (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ✓ (°) SLOPE LENGTH ✓ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ✓
AVERAGE DEPTH 1.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.5 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 25
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 25

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

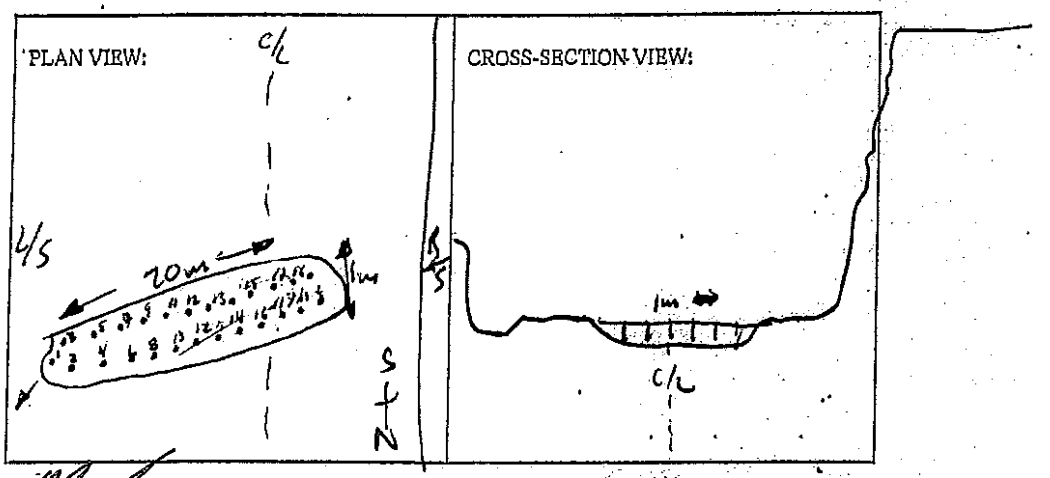
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 20 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

APPENDIX A

Instantel Blastmate III Seismograph Calibration Certificates (Pre-job & post-job)

Calibration Certificate

Instantel

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA11746
Calibration Date: January 7, 2011
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____
Martin Hogue

Instantel

Instantel

Calibration Certificate

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG10809
Calibration Date: January 7, 2011
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology, or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

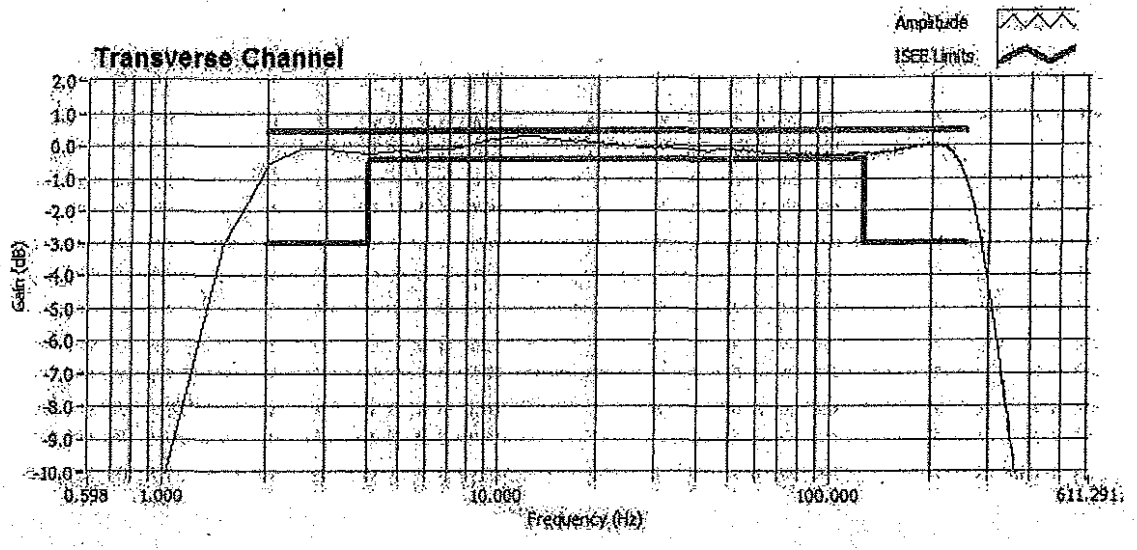
The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

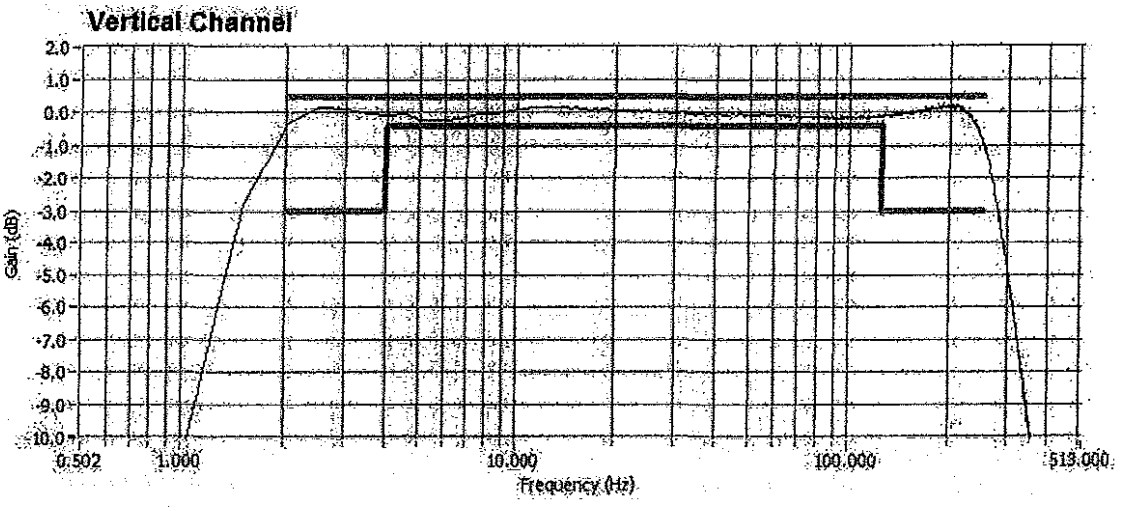
Please note that the sensor check function is provided to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

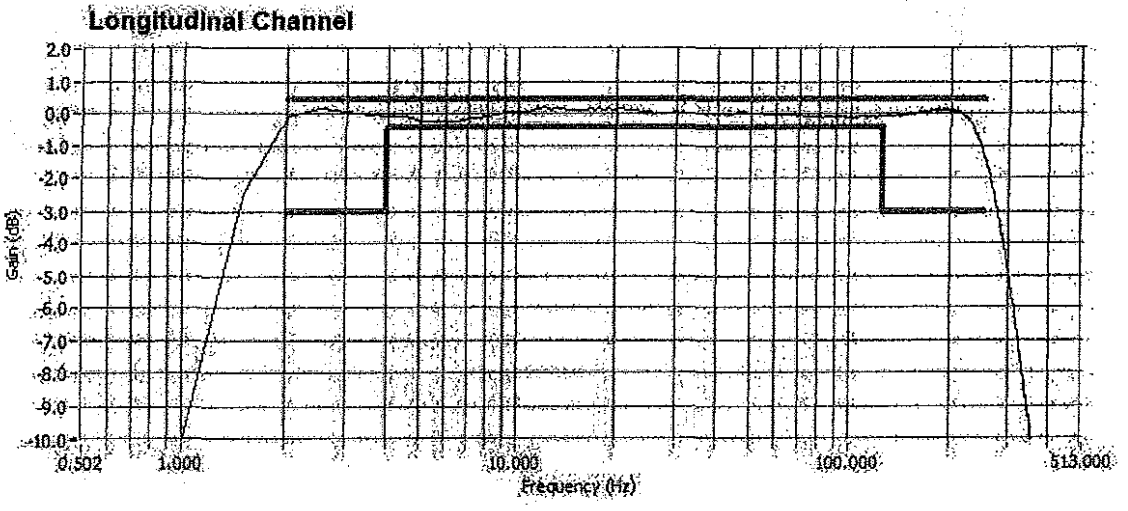
Calibrated By: _____
Martin Hogue

Instantel

Amplitude Frequency Response of BG10809







Calibration Certificate

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH9075
Calibration Date: January 7, 2011
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

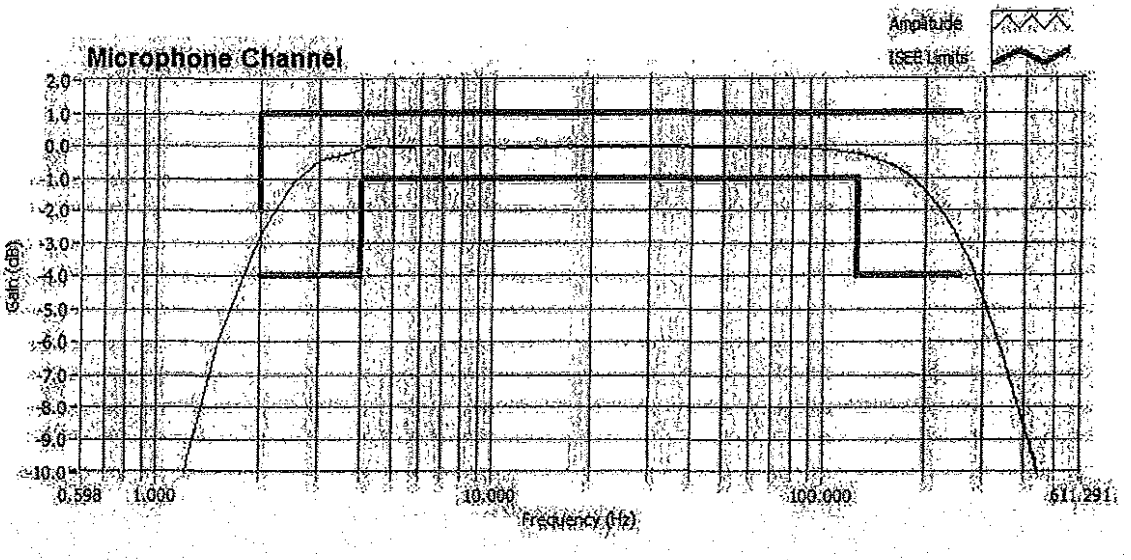
The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

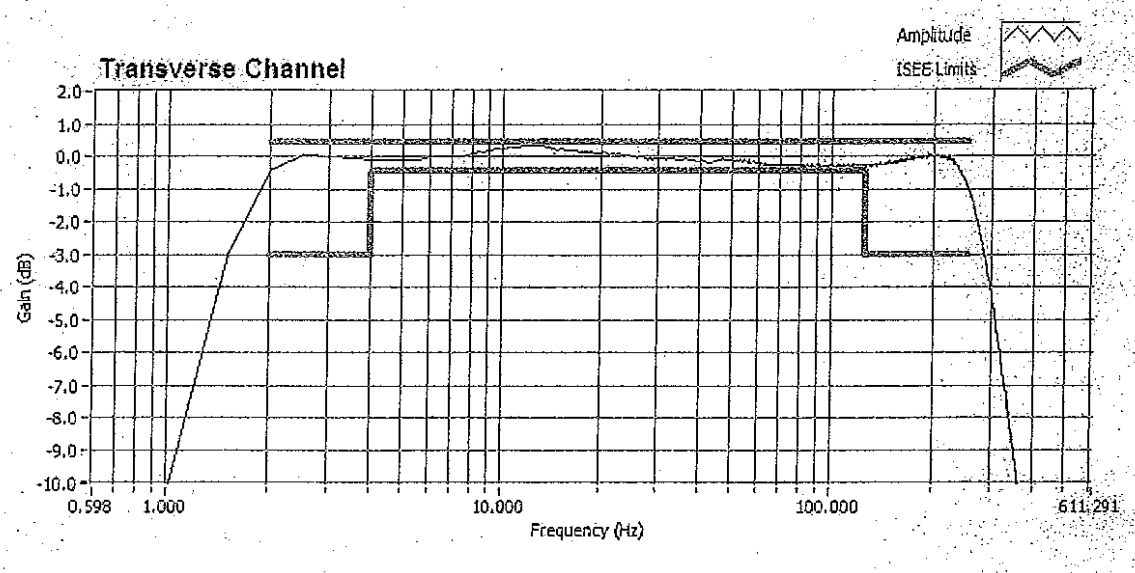
Calibrated By: _____
Martin Hogue

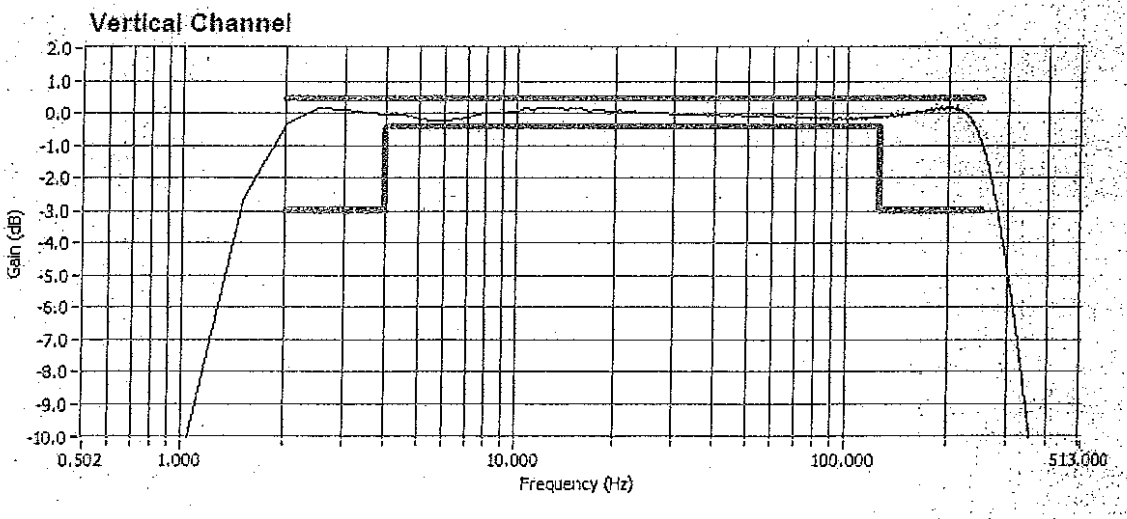
Instantel

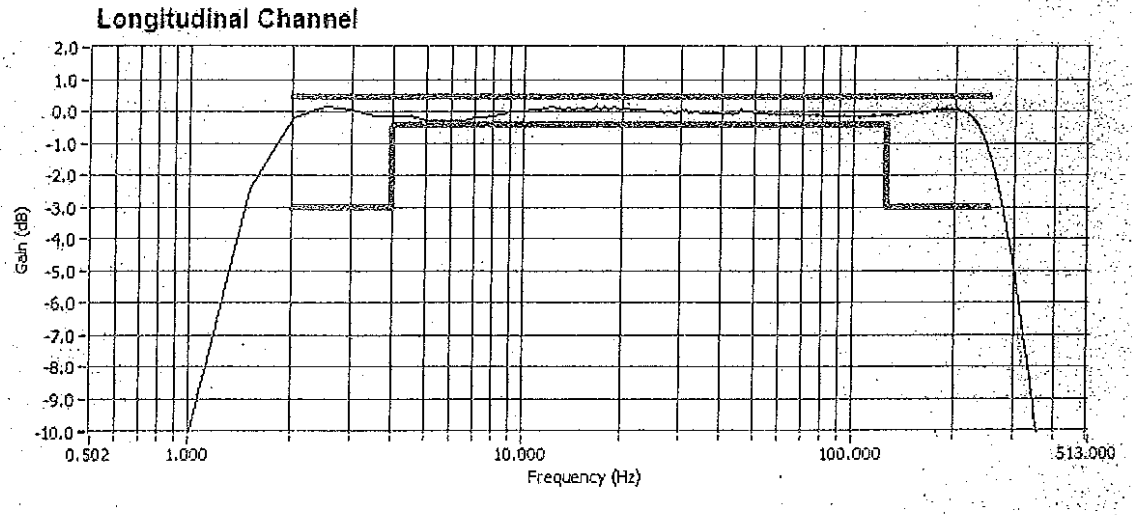
Amplitude Frequency Response of BH9075



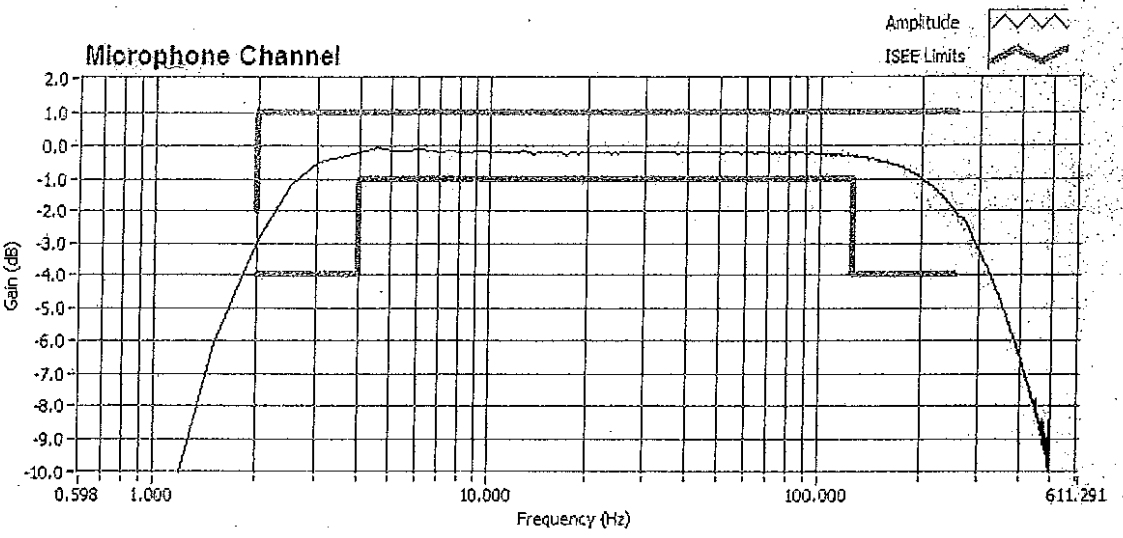
Amplitude Frequency Response of BG10809 (As Found)







Amplitude Frequency Response of BH9075 (As Found)



Calibration Certificate

Instantel

Part Number:	714A0801
Description:	BLASTMATE III
Serial Number:	BA11866
Calibration Date:	January 26, 2011
Calibration Equipment:	718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____

Martin Hogue

Instantel

Instantel

Calibration Certificate

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG10960
Calibration Date: January 26, 2011
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

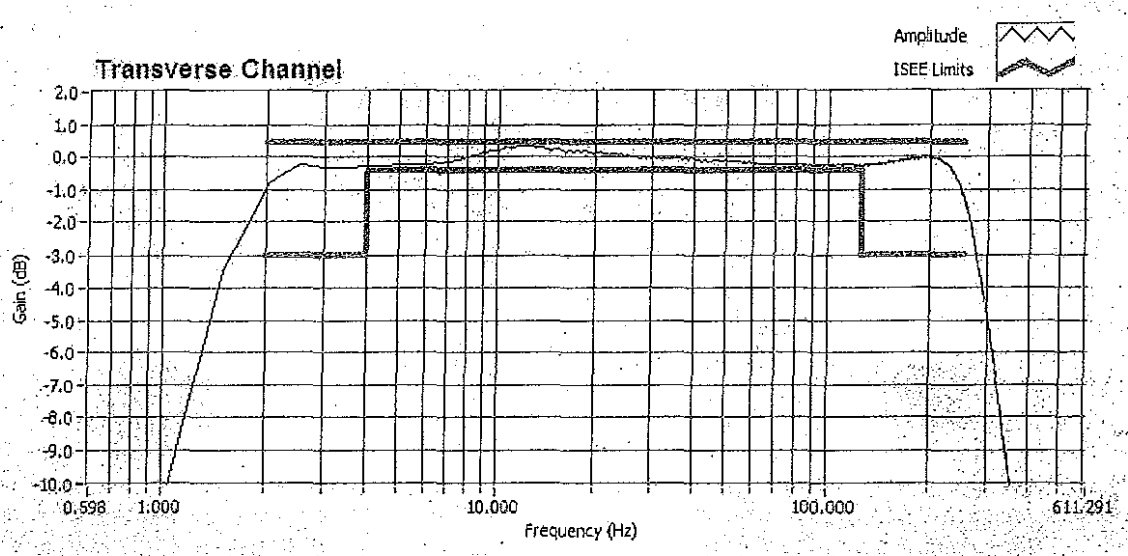
The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

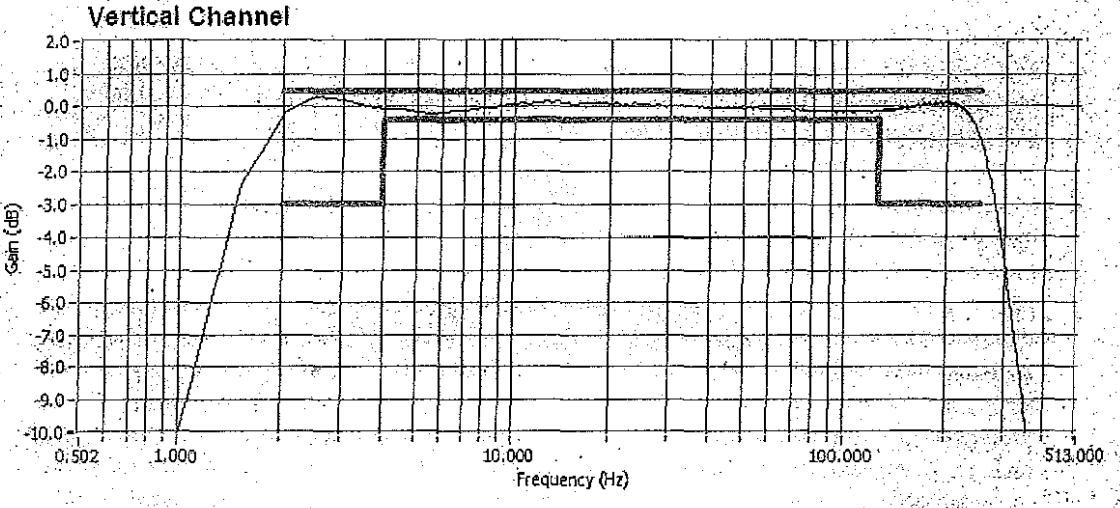
Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

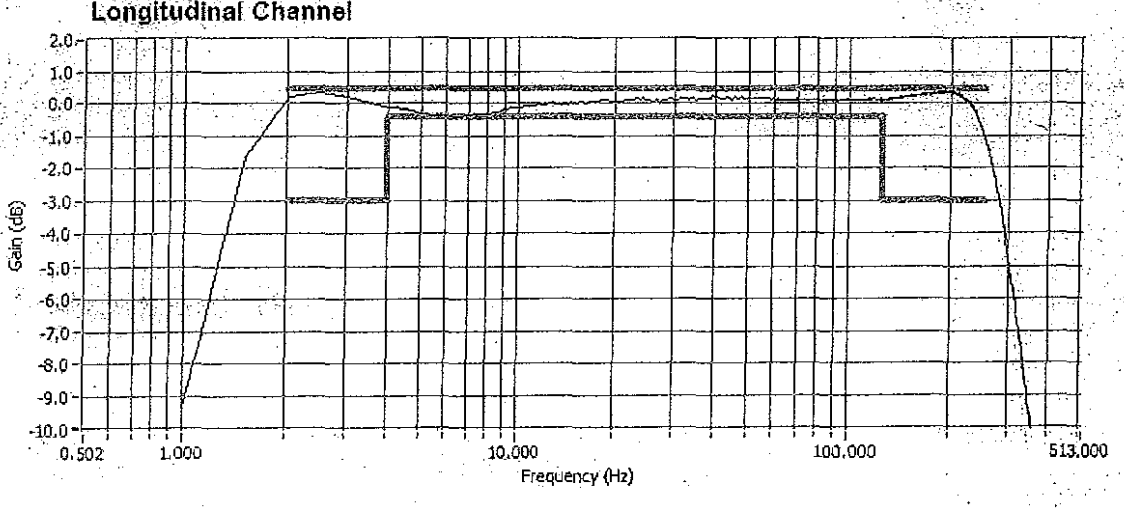
Calibrated By: _____
Martin Hogue

Instantel

Amplitude Frequency Response of BG10960







Calibration Certificate

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH9161
Calibration Date: January 26, 2011
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

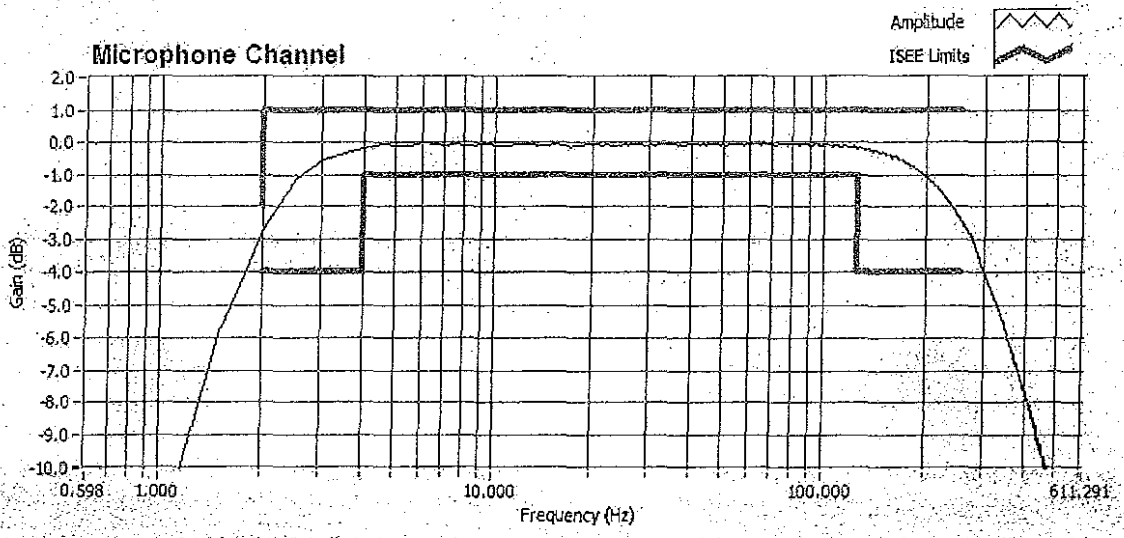
The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service or calibration facility for annual calibration.

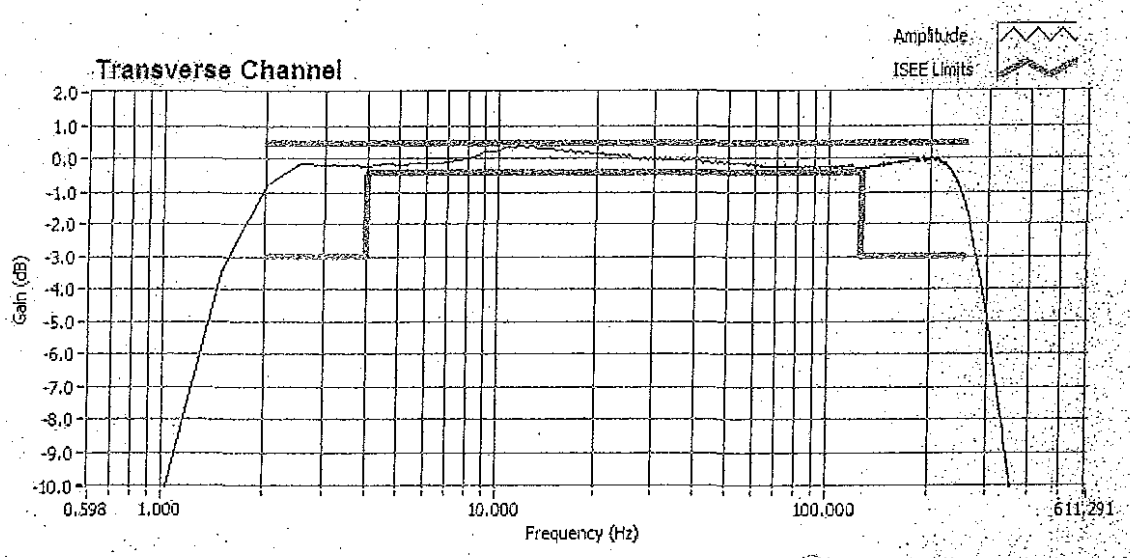
Calibrated By: _____
Martin Hogue

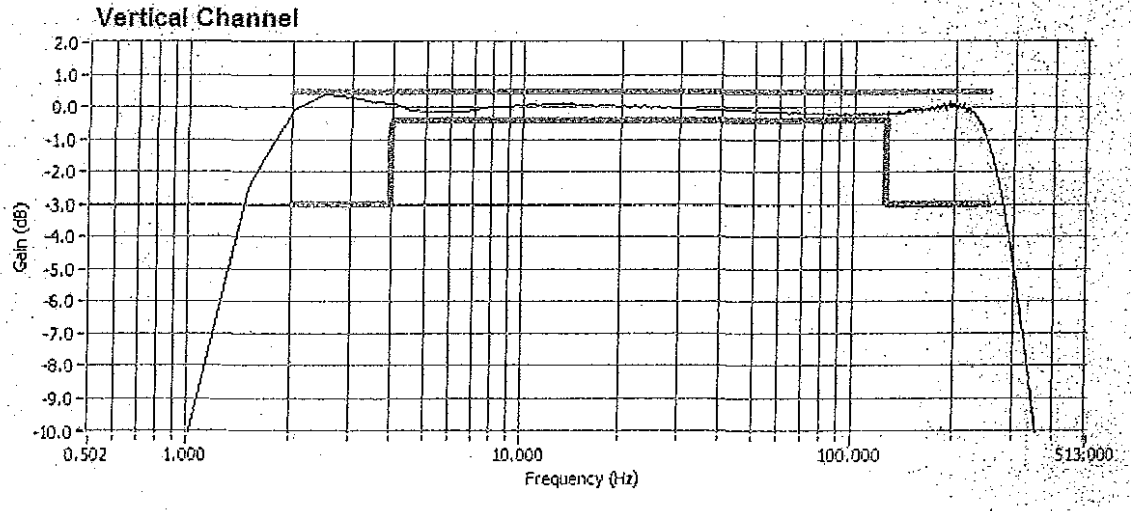
Instantel

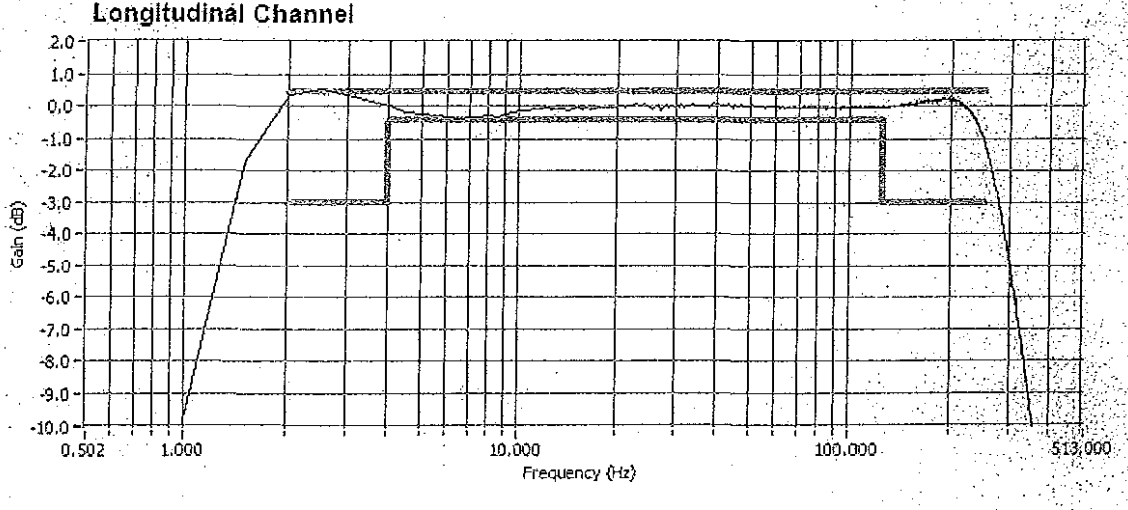
Amplitude Frequency Response of BH9161



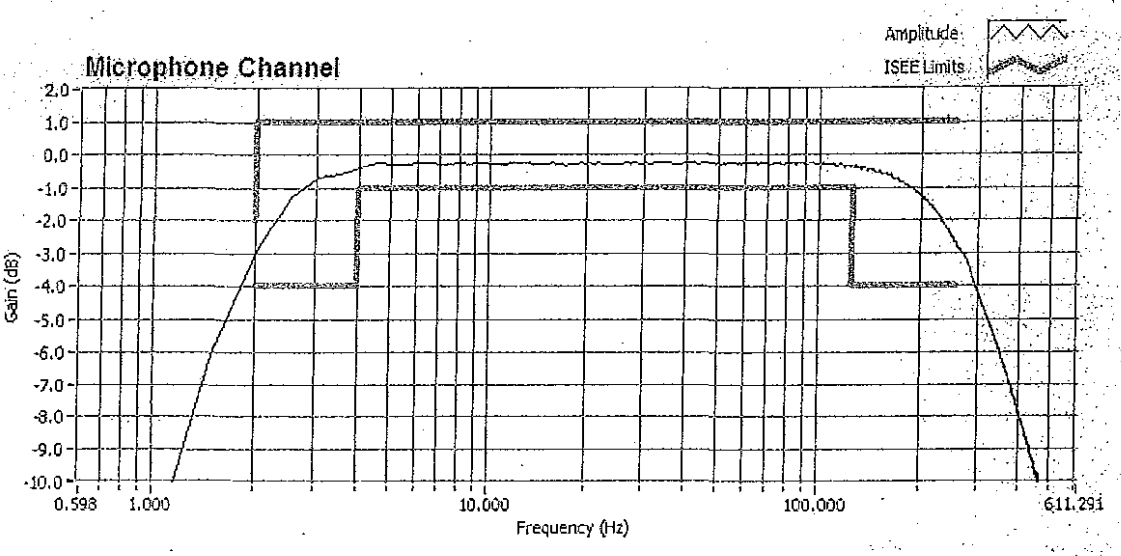
Amplitude Frequency Response of BG10960 (As Found)







Amplitude Frequency Response of BH9161 (As Found)



Calibration Certificate

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA13960
Calibration Date: December 22, 2010
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____
Mark Benoit

Instantel

Instantel

Calibration Certificate

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG12858
Calibration Date: December 22, 2010
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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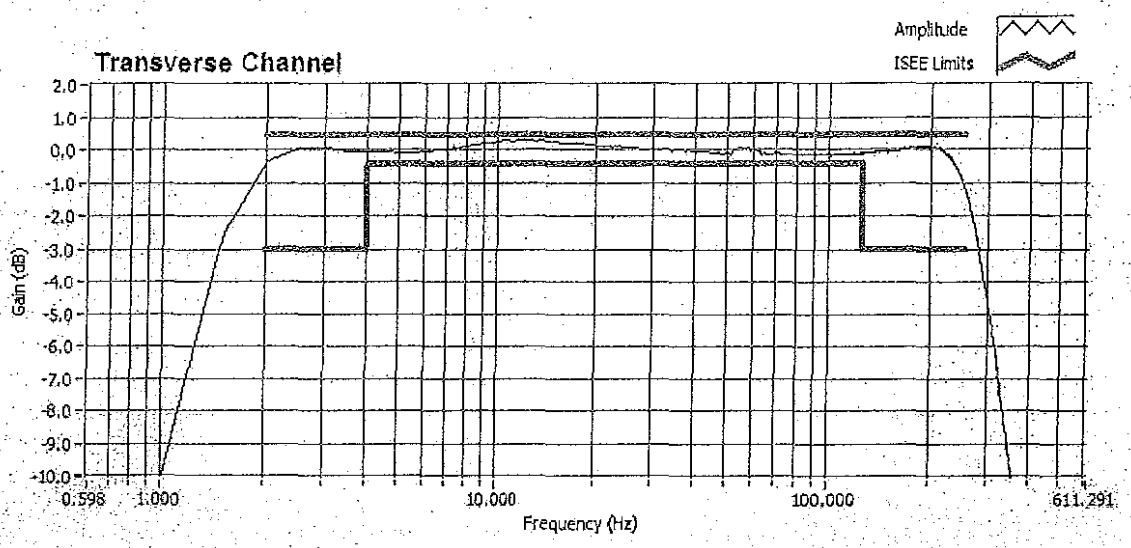
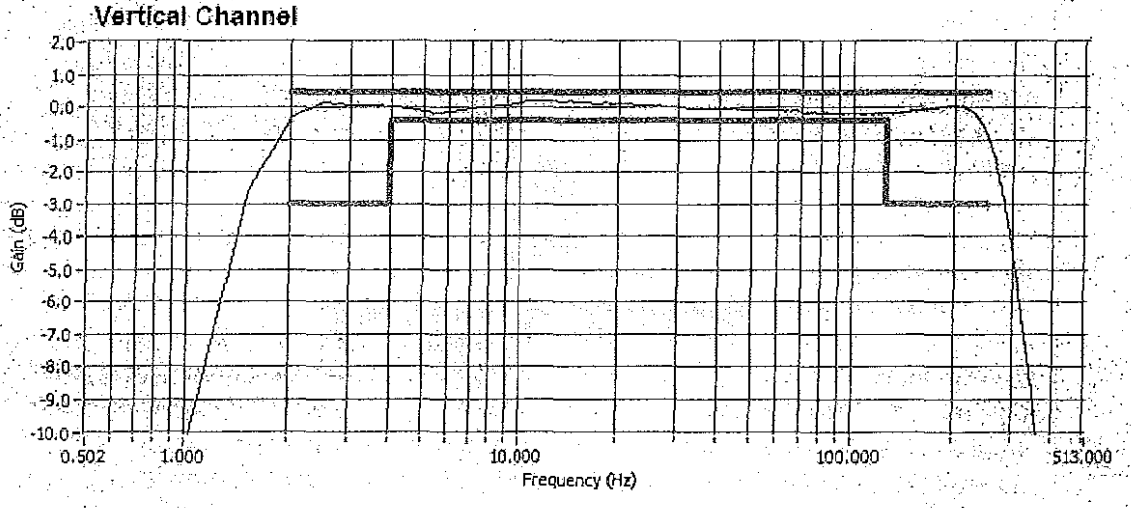
Calibrated By: _____
Mark Benoit

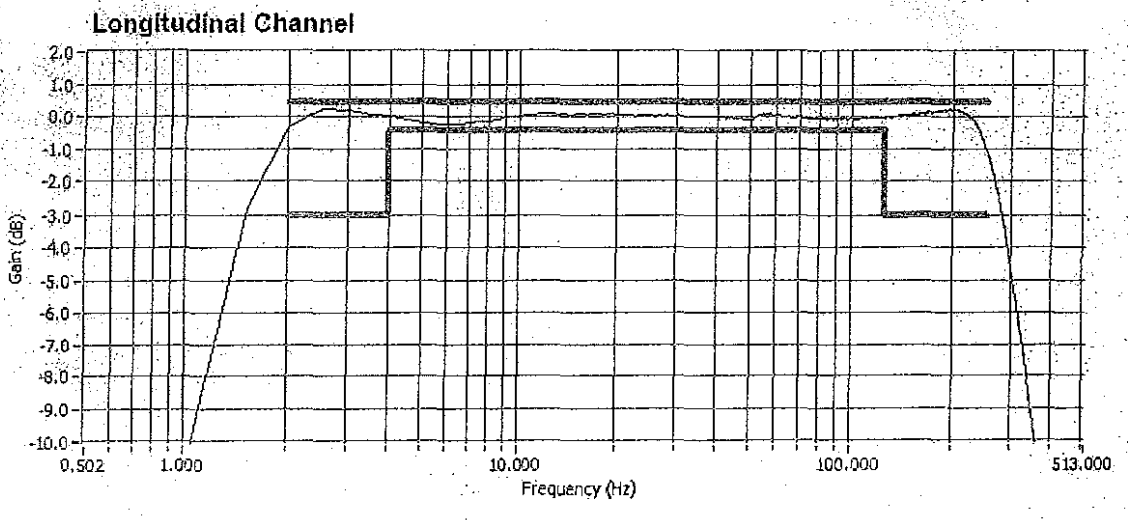
Instantel

Instantel

Amplitude Frequency Response of BG12858







Calibration Certificate

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH10283
Calibration Date: December 22, 2010
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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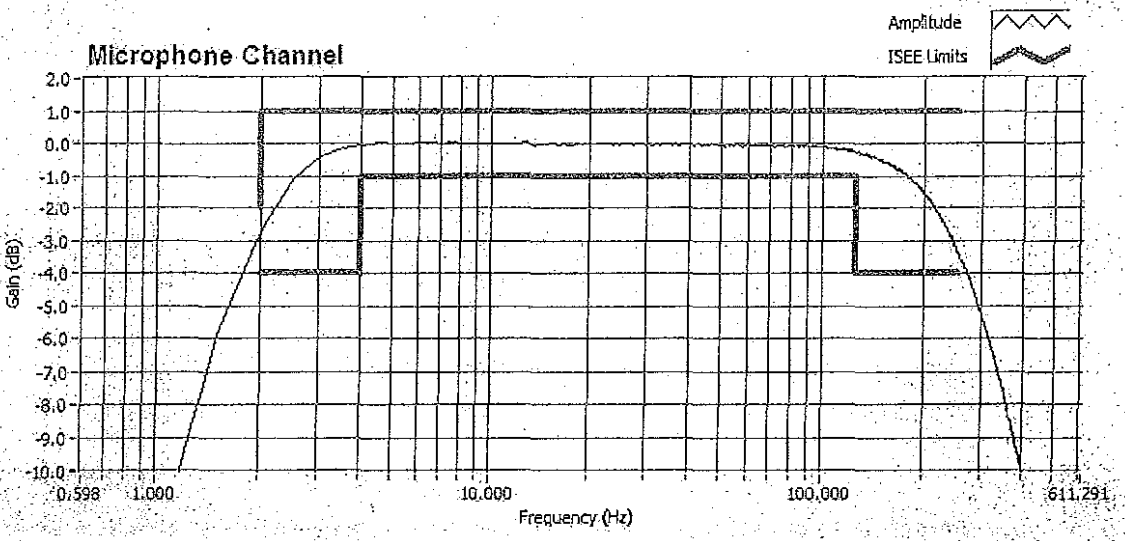
Calibrated By: _____
Mark Benoit

Instantel

7408901 Rev 01

Amplitude Frequency Response of BH10283



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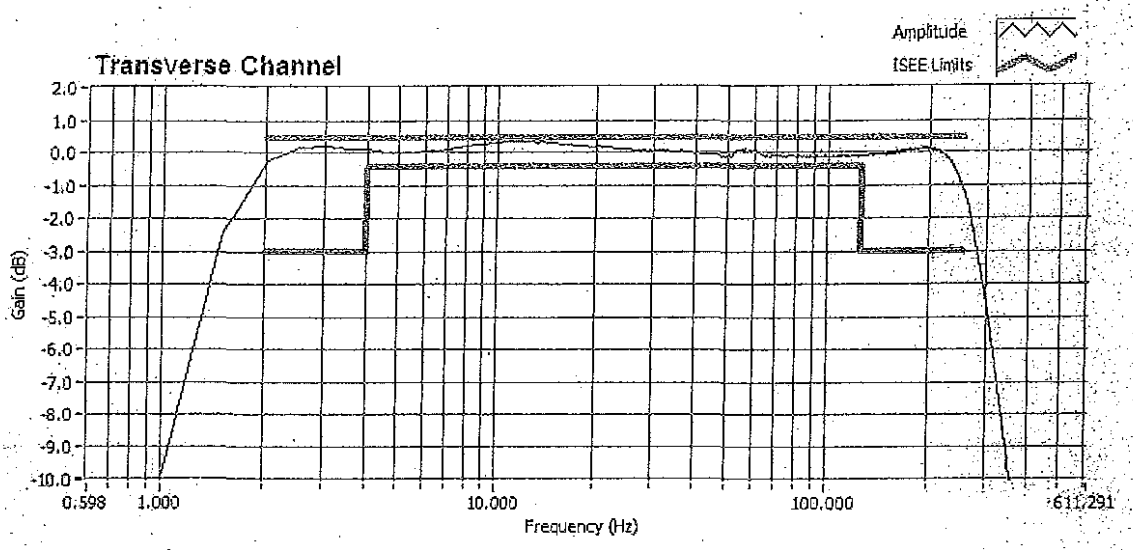
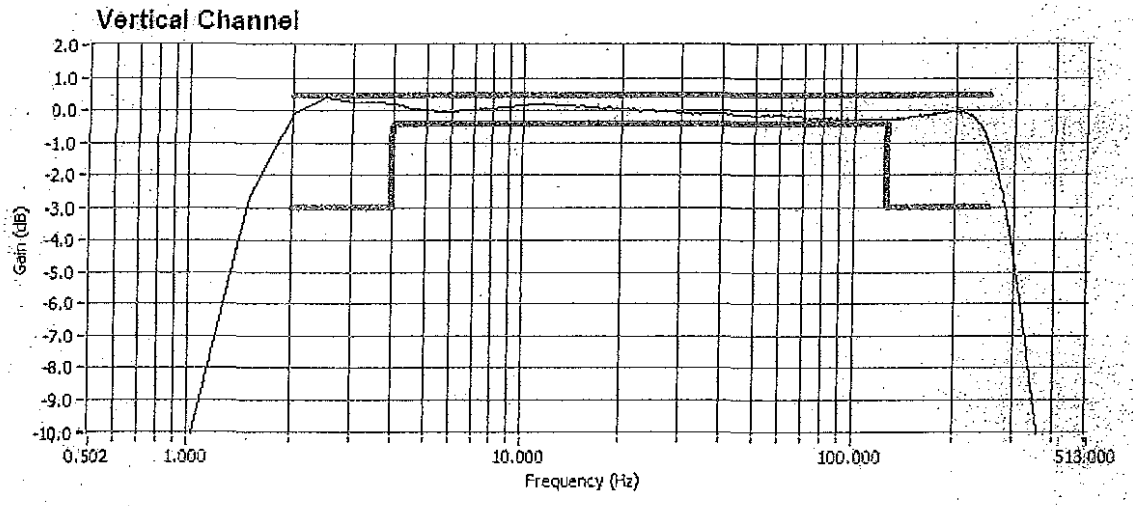
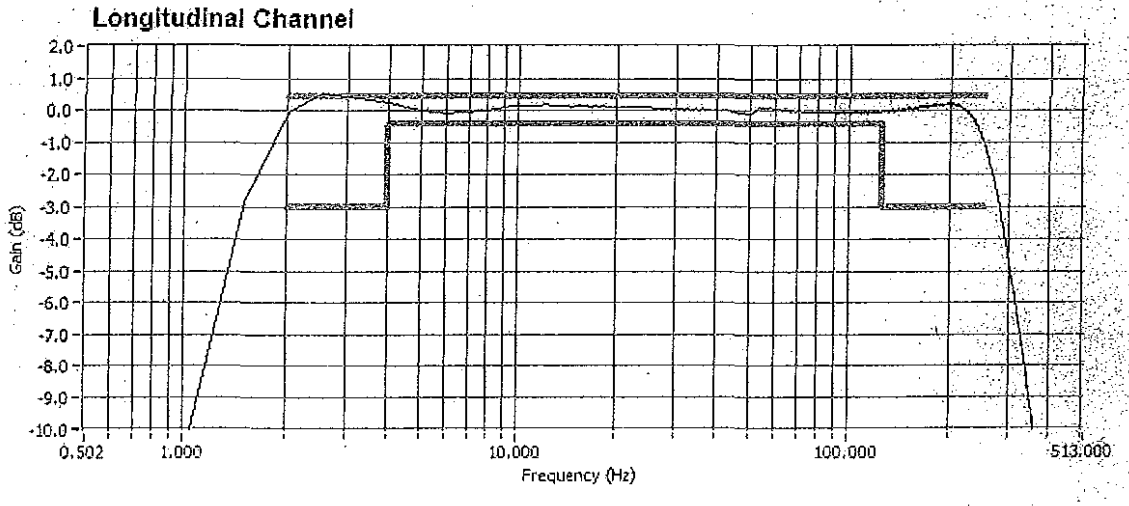
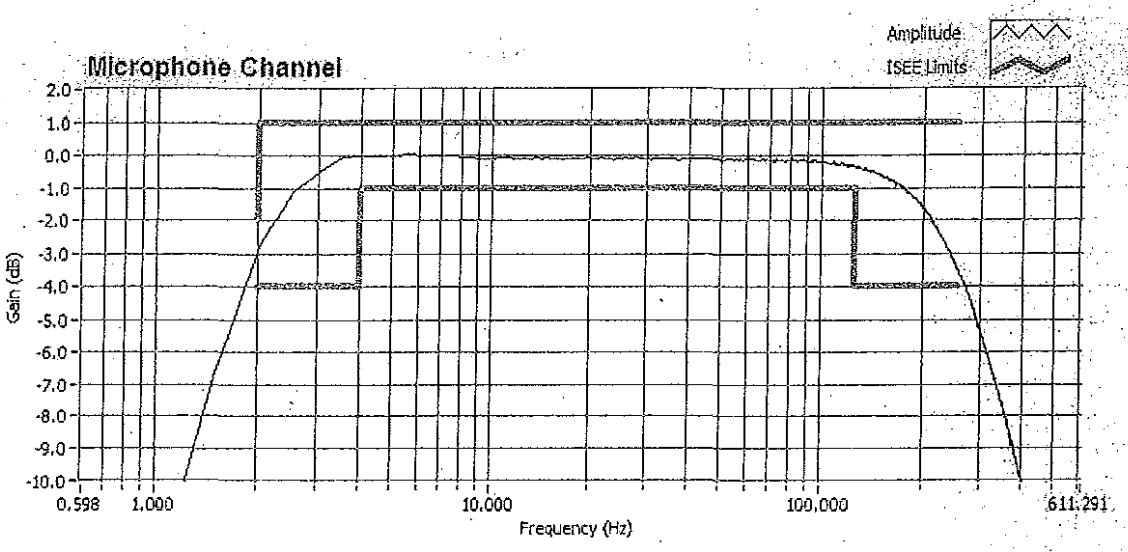






Amplitude Frequency Response of BH10283 (As Found)



Calibration Certificate

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA11746
Calibration Date: September 11, 2012
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: Mark Benoit

Instantel

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Calibration Certificate

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG10809
Calibration Date: September 11, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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Calibrated By: Mark Benoit

Instantel

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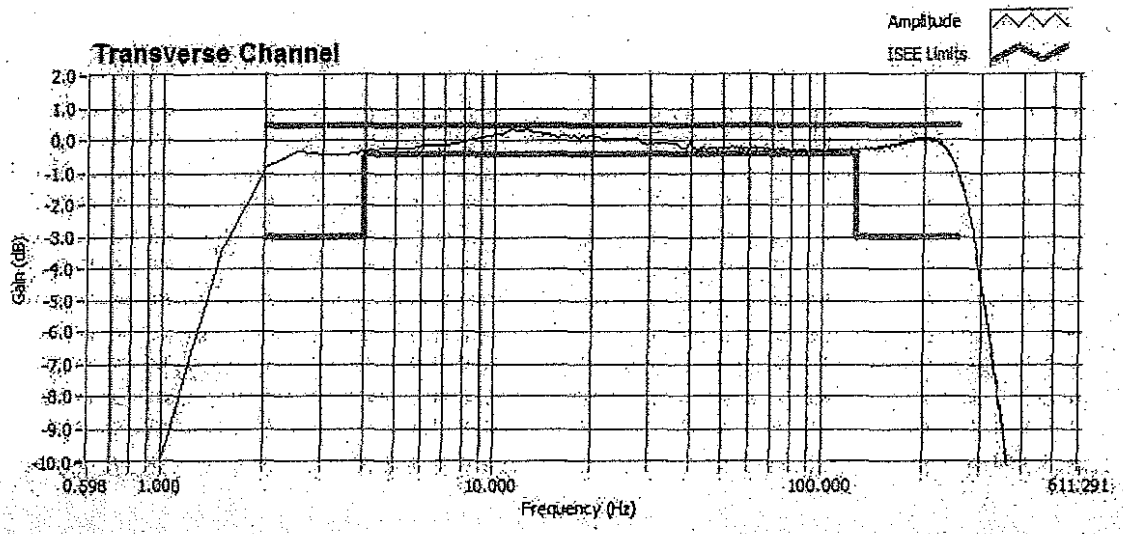
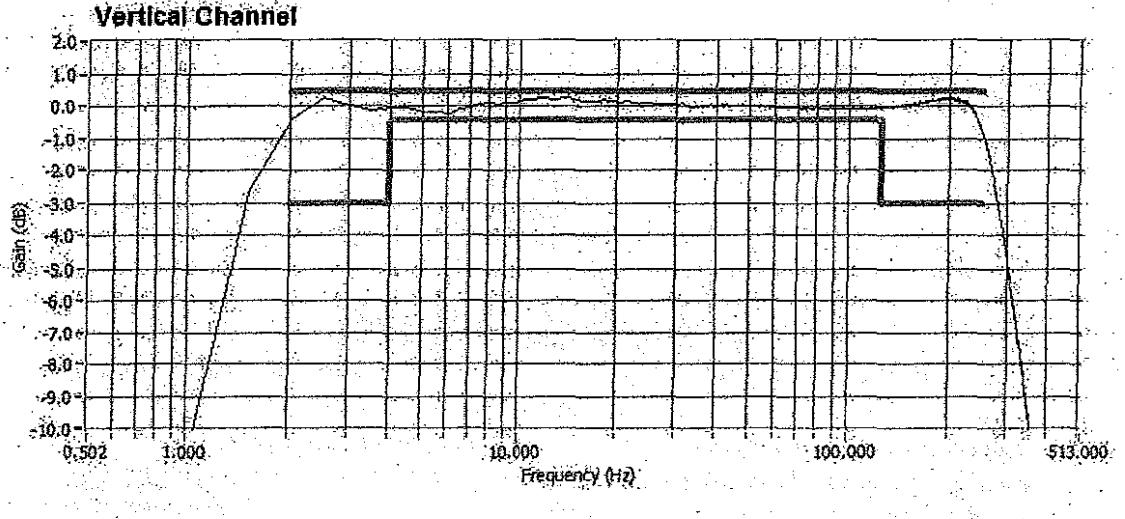
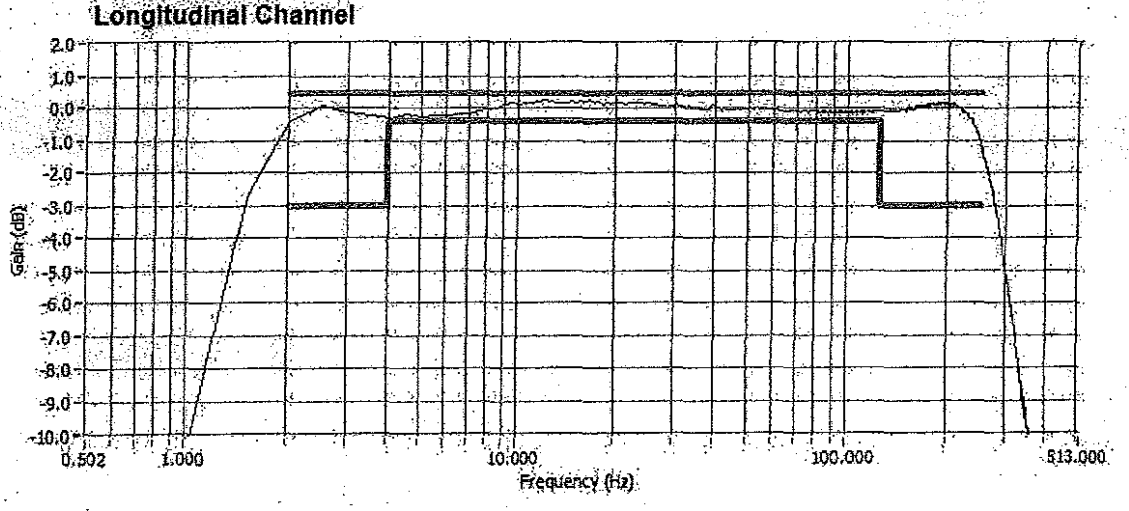
Amplitude Frequency Response of BG10809







Calibration Certificate

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH9075
Calibration Date: September 11, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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Calibrated By: Mark Benoit

Instantel

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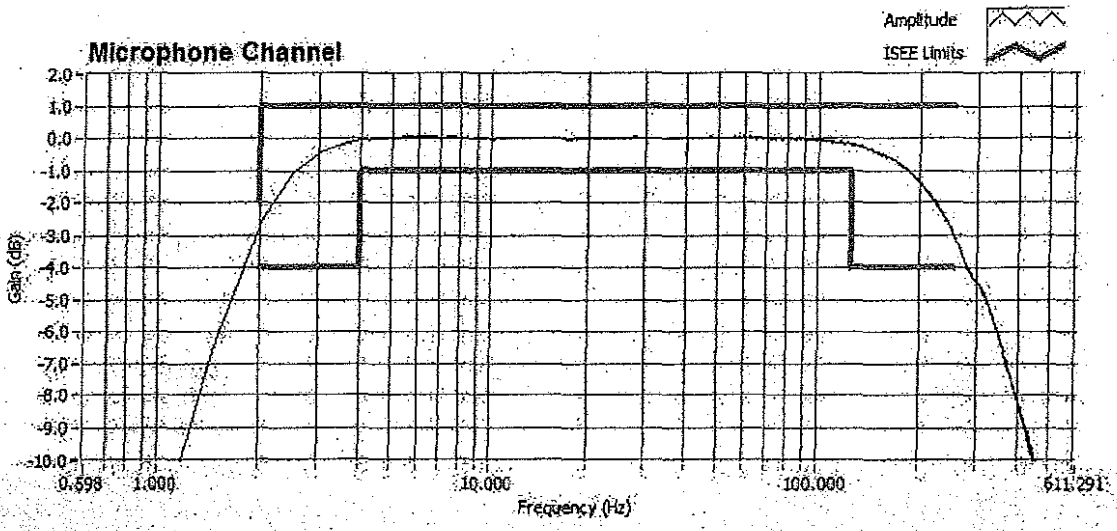
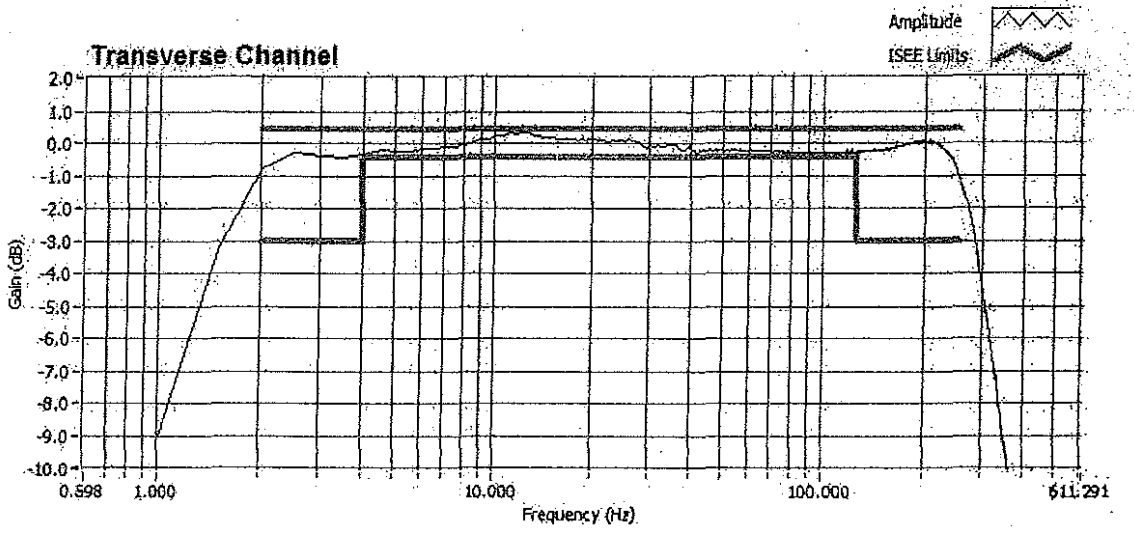
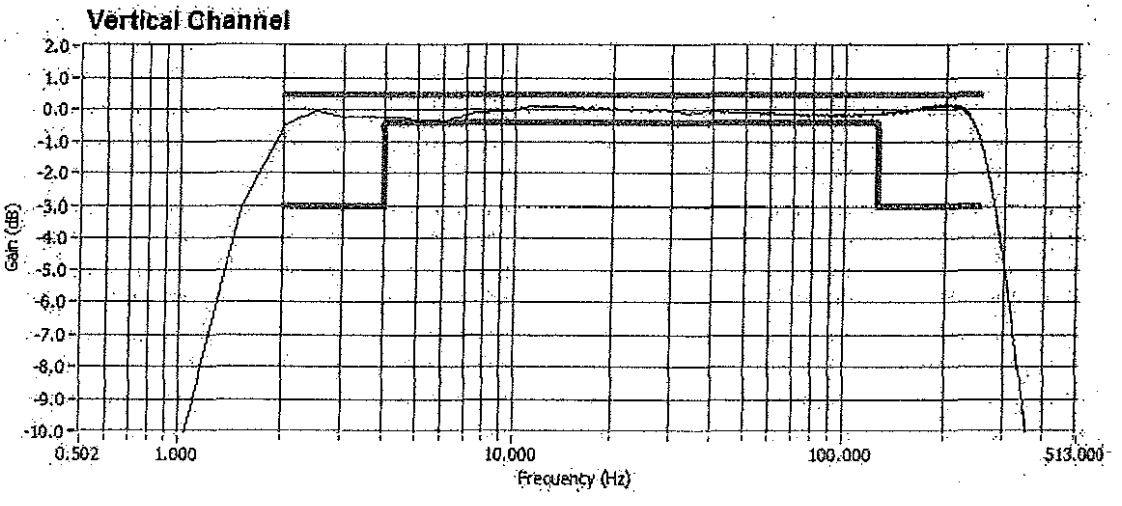
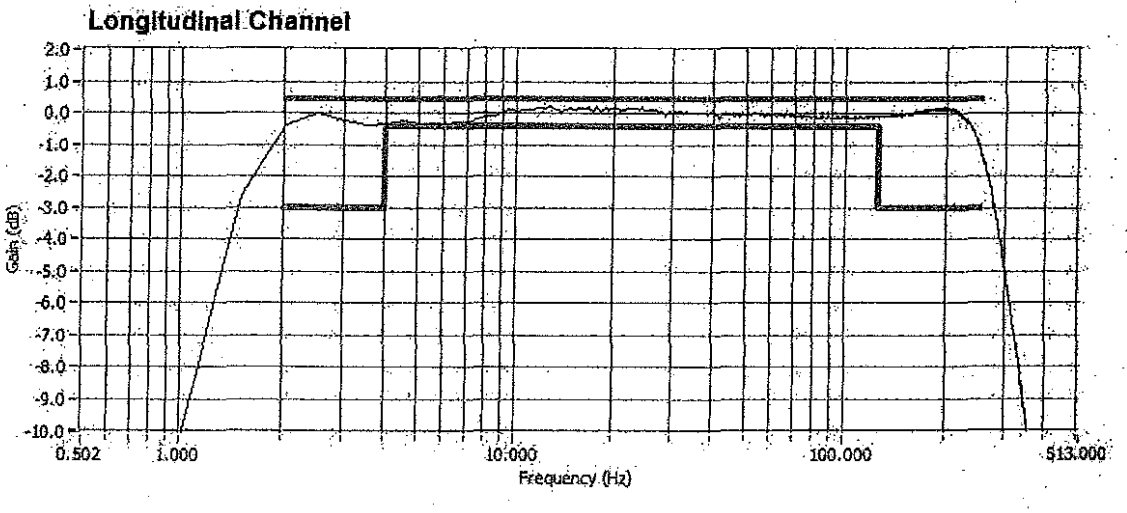
Amplitude Frequency Response of BH9075



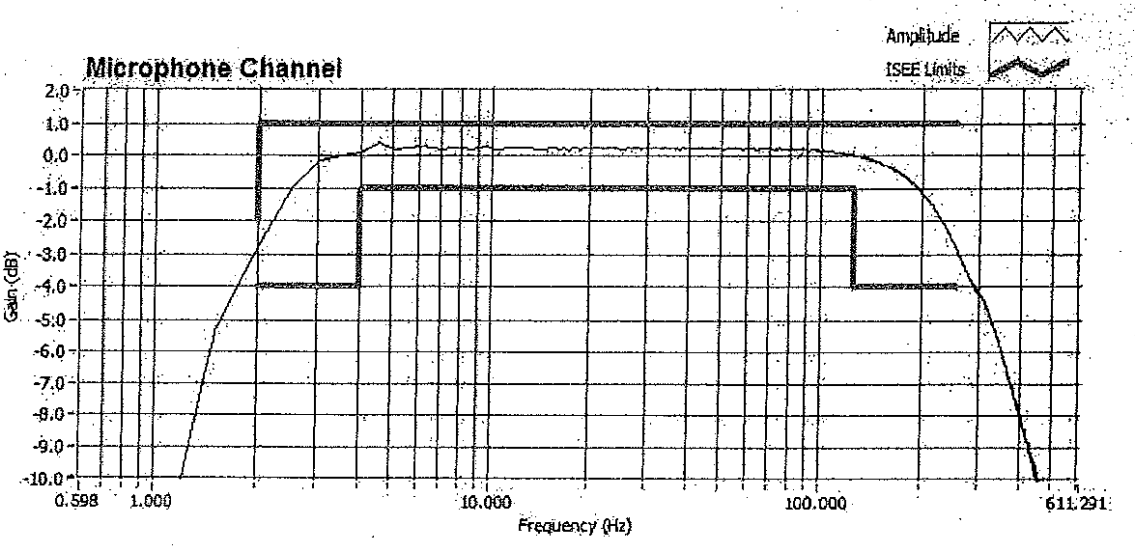
Amplitude Frequency Response of BG10809 (As Found)







Amplitude Frequency Response of BH9075 (As Found)



Calibration Certificate

Instantel

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA11866
Calibration Date: September 28, 2012
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: Y. Frenkel

Yuri Frenkel

Instantel

Instantel

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Calibration Certificate

Instantel

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG10960
Calibration Date: September 28, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications

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Calibrated By: Y. Frenkel
Yuri Frenkel

Instantel

Instantel

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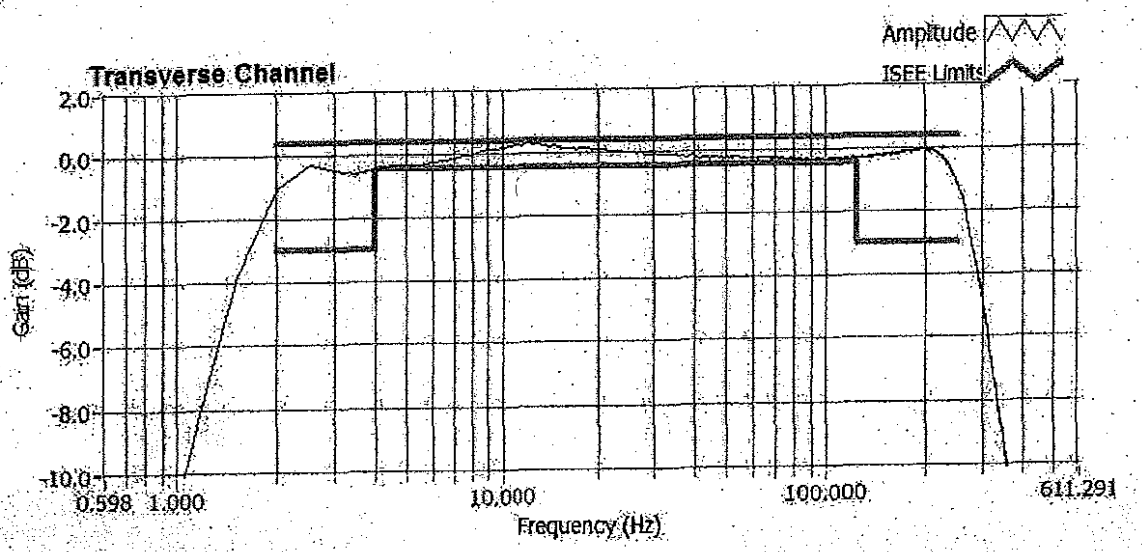
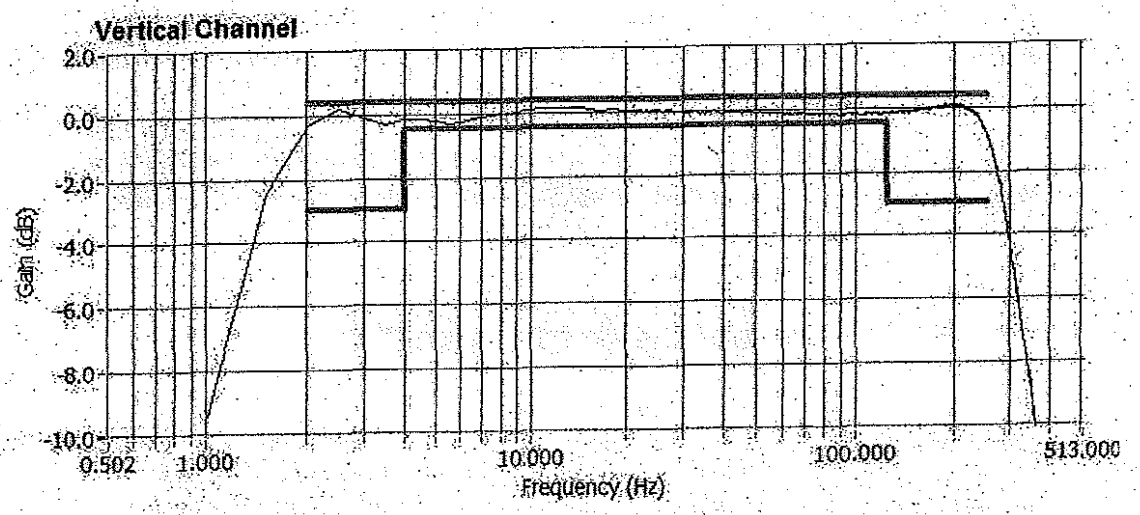
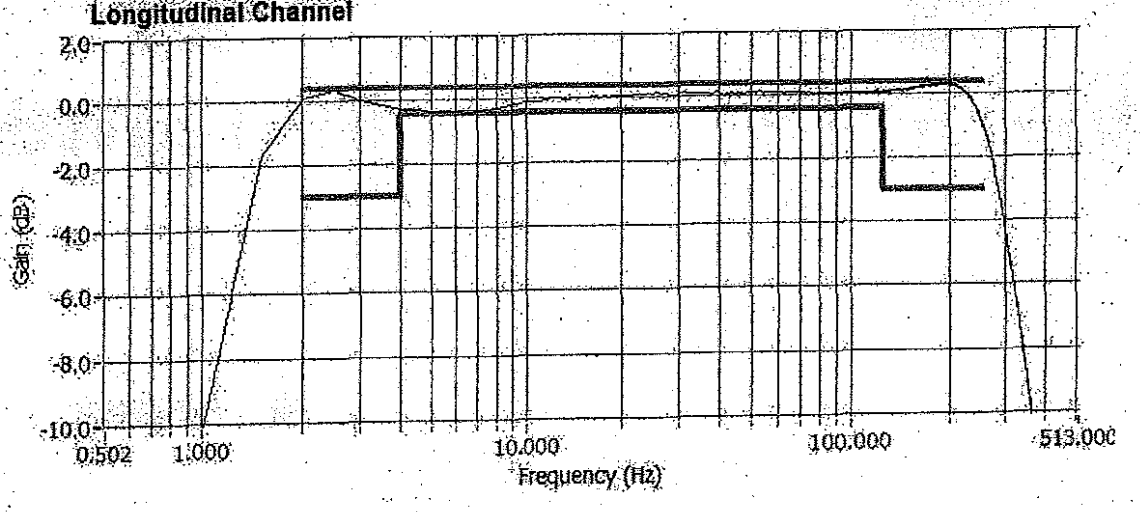
Amplitude Frequency Response of BG10960







Calibration Certificate

Instantel

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH9161
Calibration Date: September 28, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications

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Calibrated By: Y. Frenkel

Yuri Frenkel

Instantel

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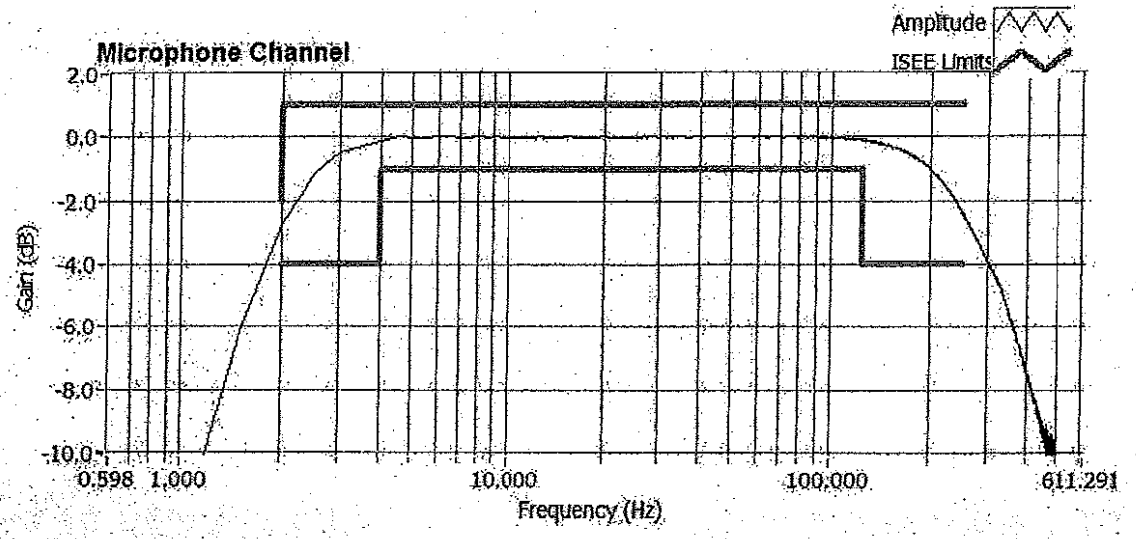
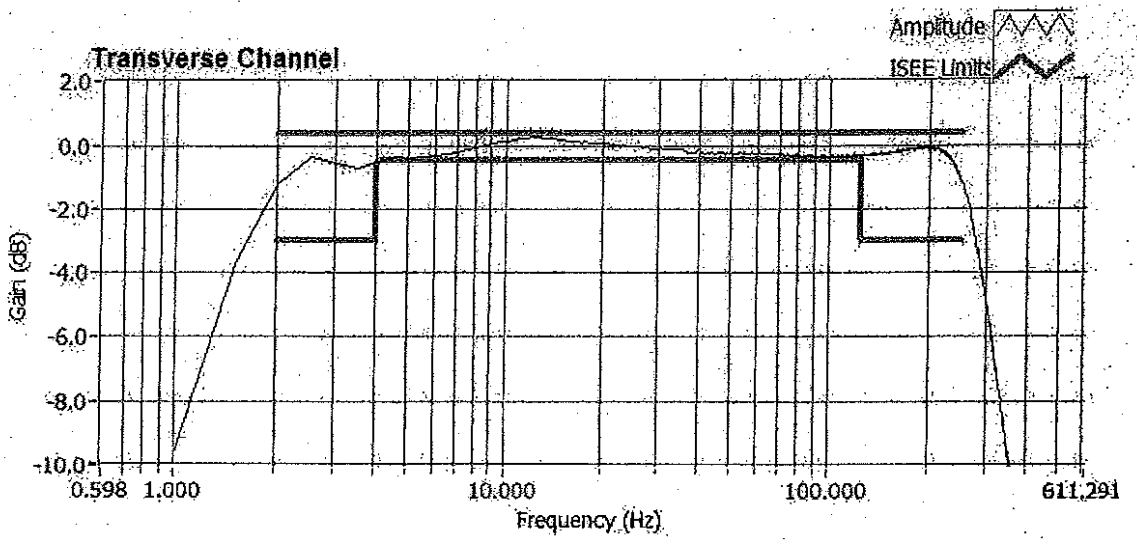
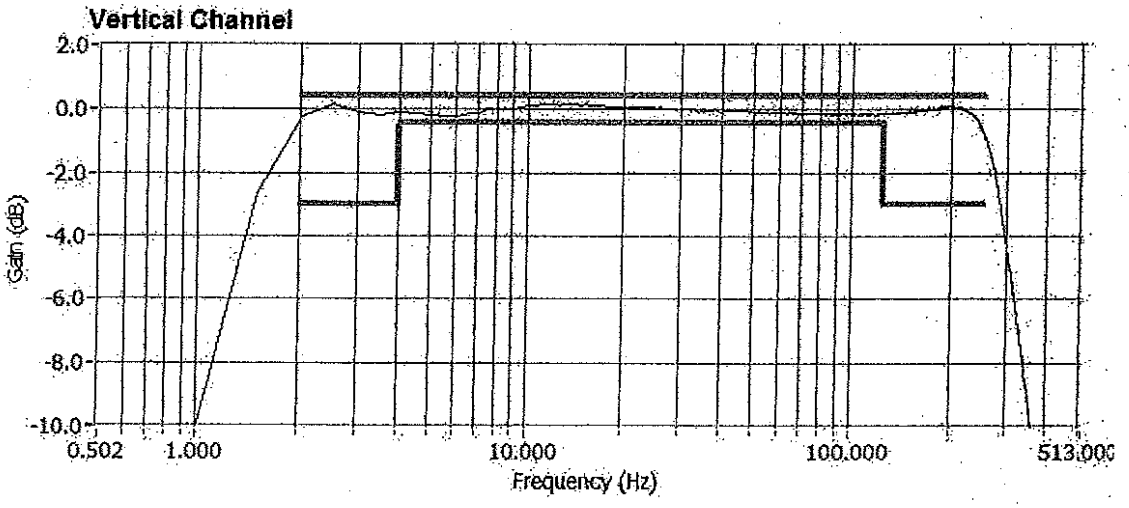
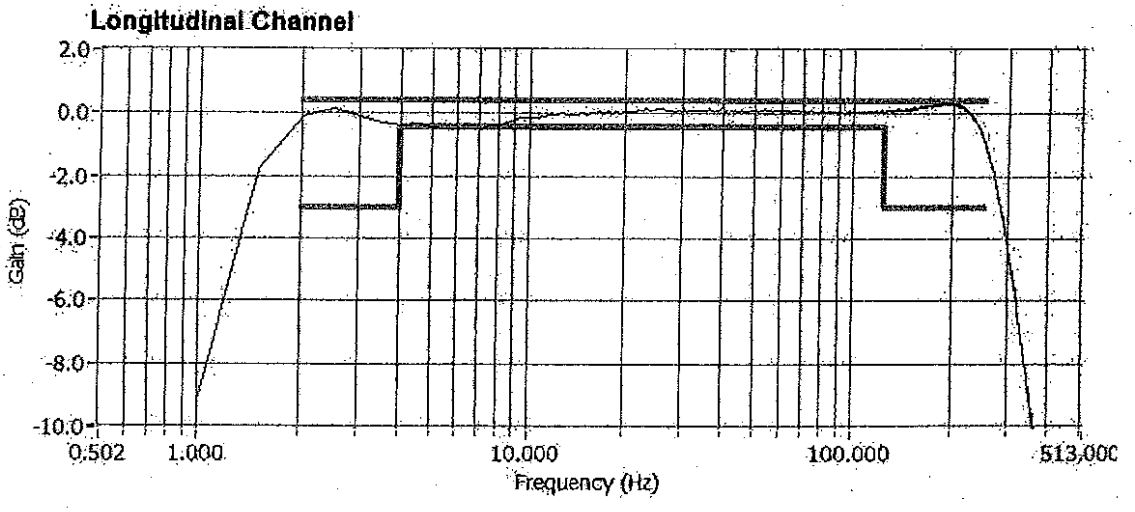
Amplitude Frequency Response of BH9161



Amplitude Frequency Response of BG10960 (As Found)







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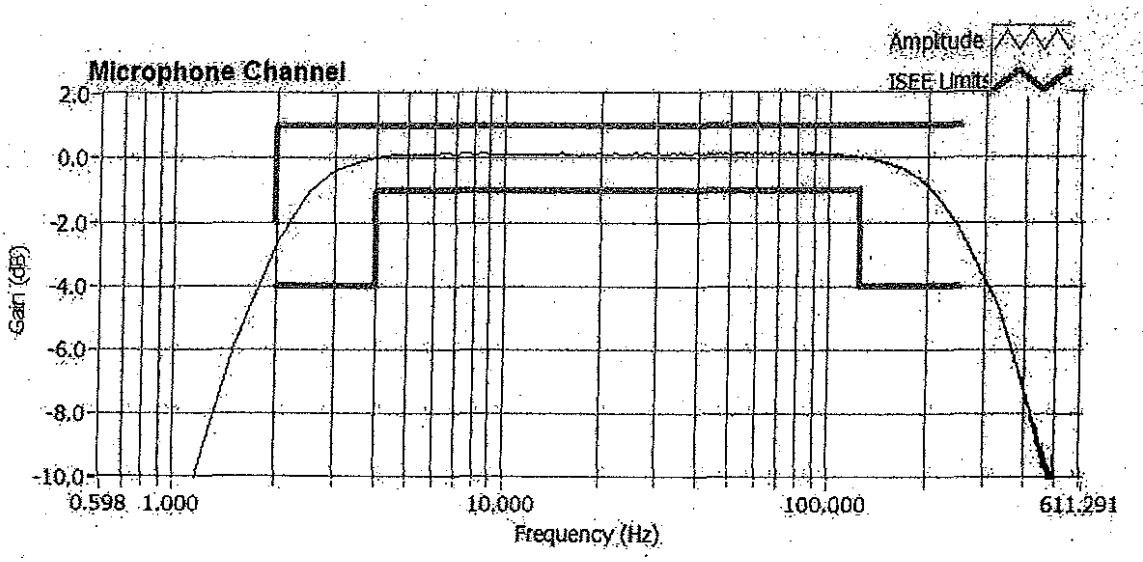

Calibration Certificate

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA13960
Calibration Date: October 11, 2012
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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Calibrated By: Mark Benoit

Instantel

Calibration Certificate

Part Number: 714A9701
Description: TRIAXIAL GEOPHONE (ISEE)
Serial Number: BG12858
Calibration Date: October 11, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system designed to assure that the product listed above meets or exceeds Instantel specifications.

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Calibrated By: _____
Mark Benoit

Instantel

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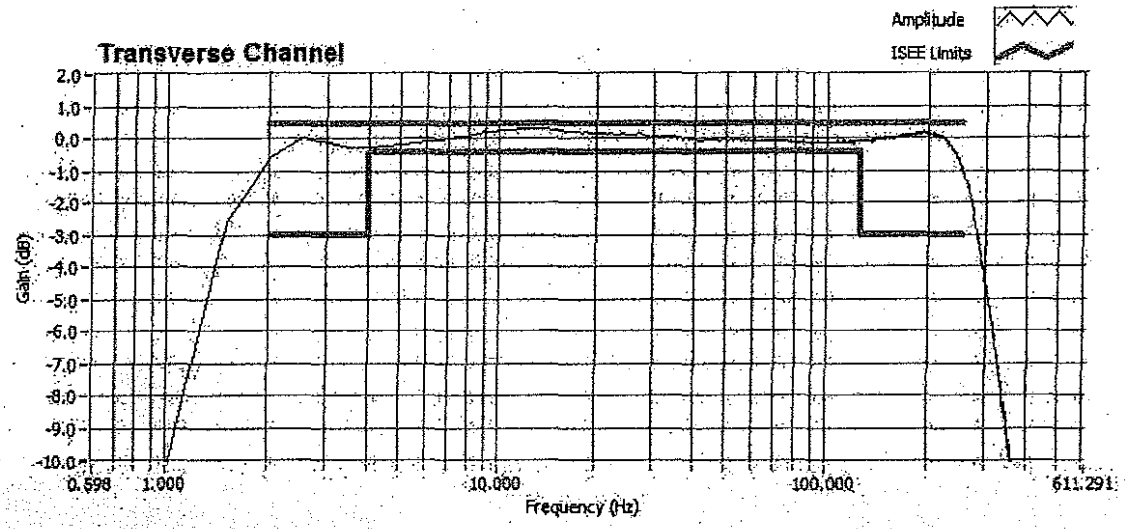
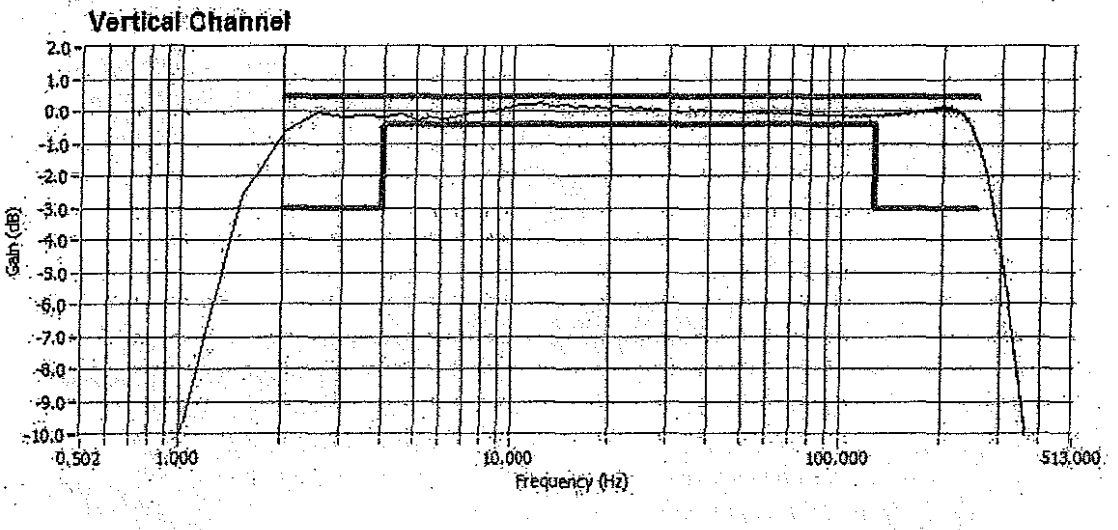
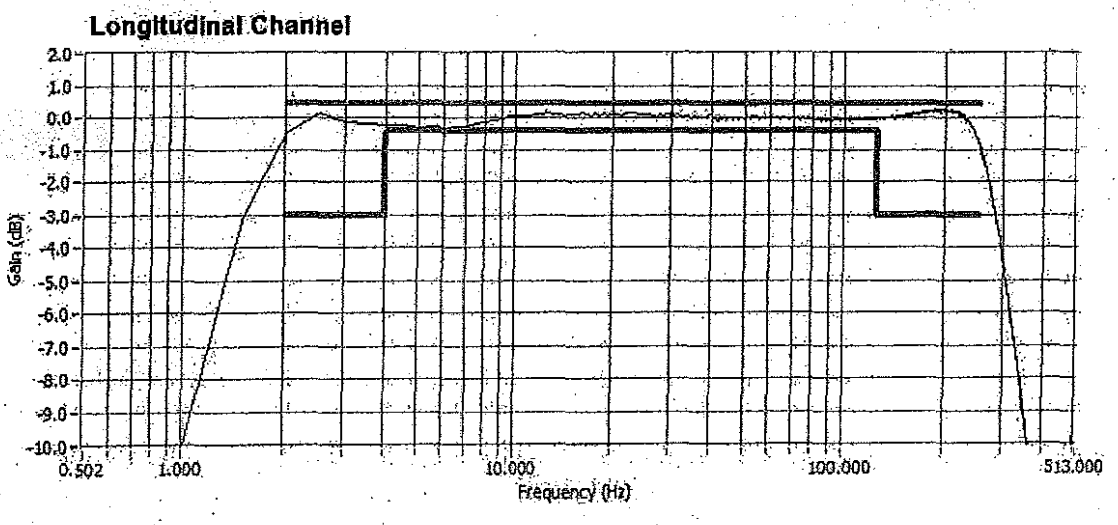
Amplitude Frequency Response of BG12858







Calibration Certificate

Part Number: 714A9801
Description: LINEAR MICROPHONE 2-250HZ
Serial Number: BH10283
Calibration Date: October 11, 2012
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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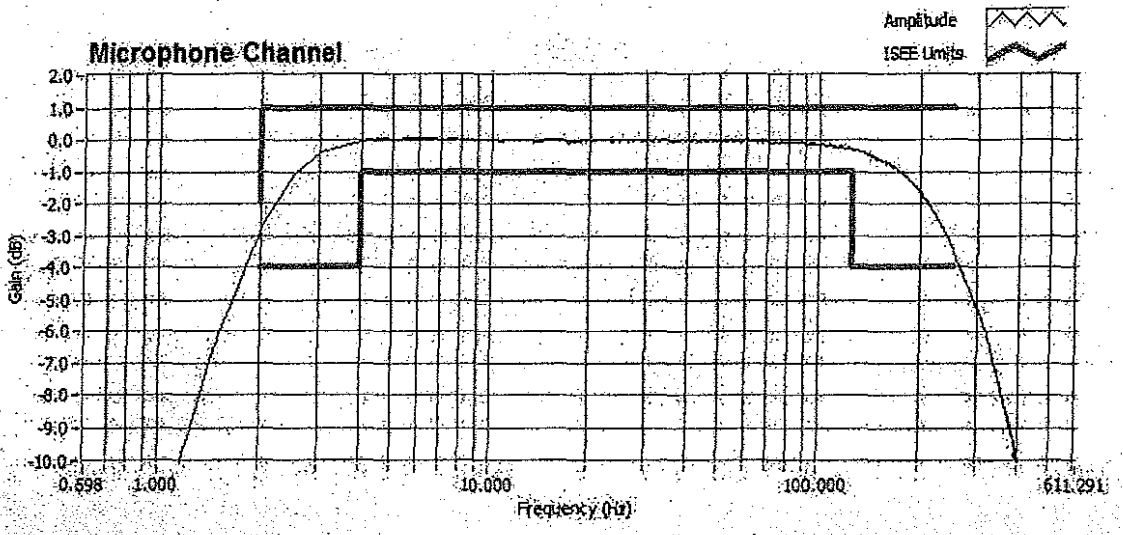
Calibrated By: _____
Mark Benoit

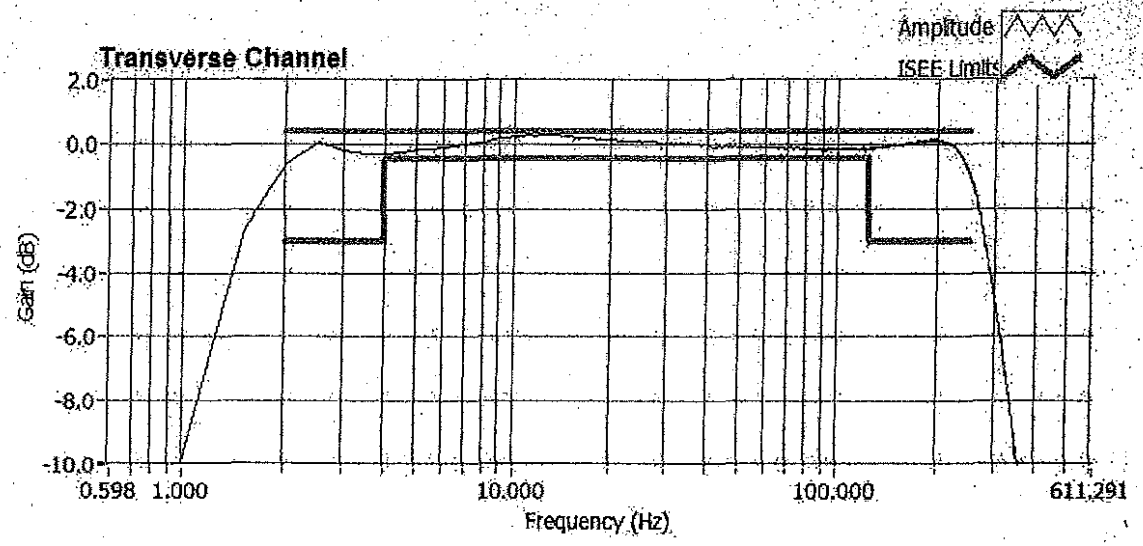
Instantel

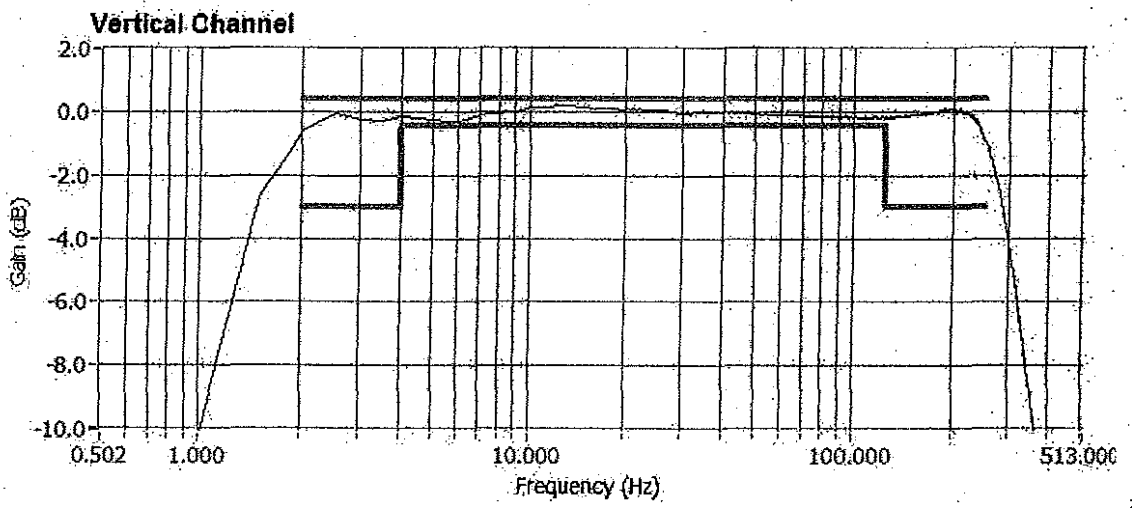
TRA-2013-00119

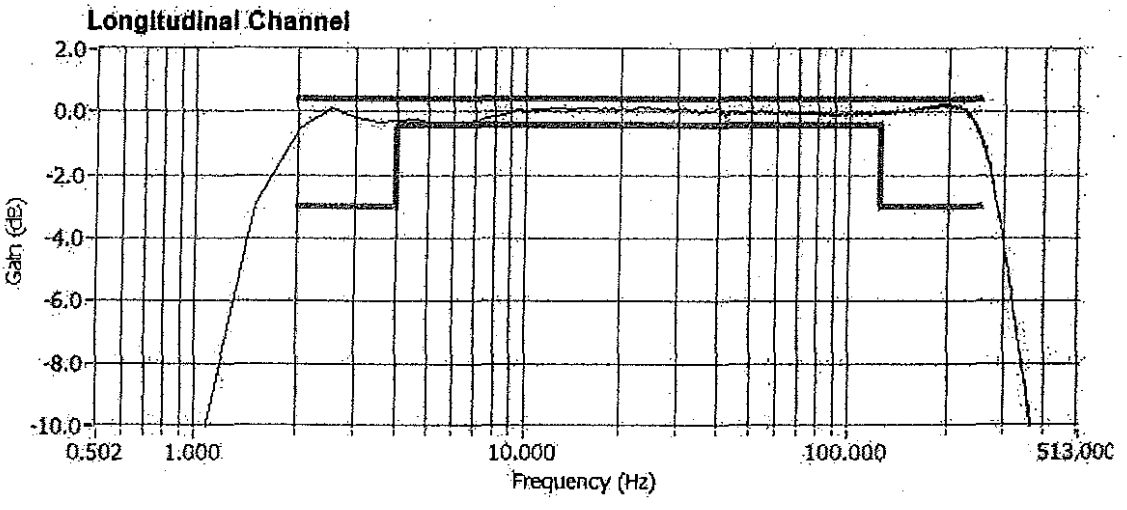
Amplitude Frequency Response of BH10283



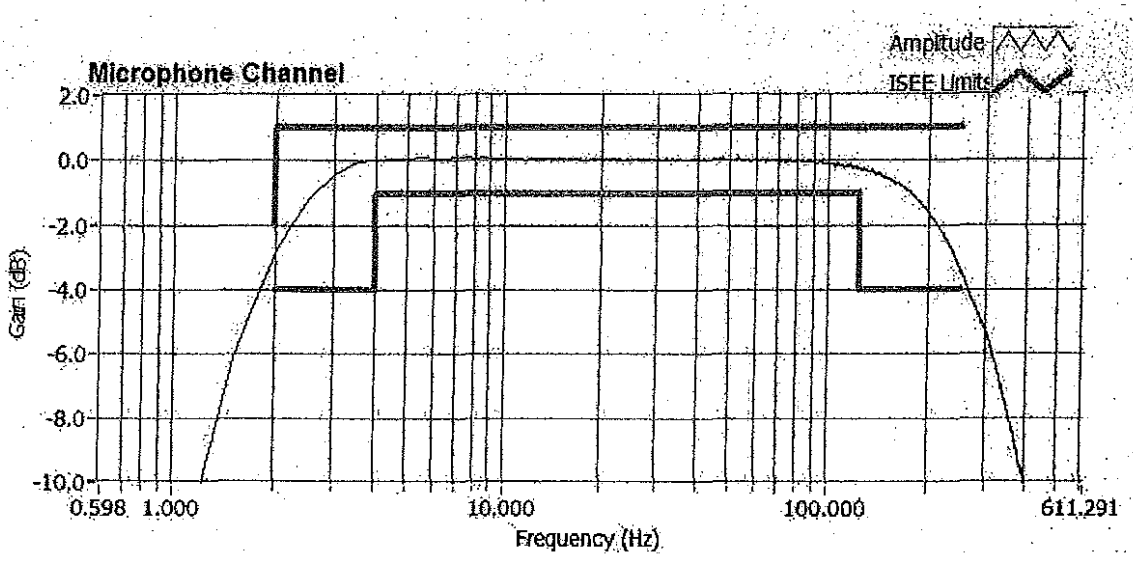
Amplitude Frequency Response of BG12858 (As Found)







Amplitude Frequency Response of BH10283 (As Found)



AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Oct. 11/11
ACTUAL BLAST DATE Oct. 7/11
BLAST # 50

HIGHWAY # 97
BLAST LOCATION AT: 133+18 — 133+60 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 42. (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 500 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 7.7 (m)
TOTAL DEPTH 440 (m)

TOTAL NUMBER OF HOLES 22 B/L /60 prod./8 Buffer
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
*every 2nd B/L Hole loaded with explosives

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS _____

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

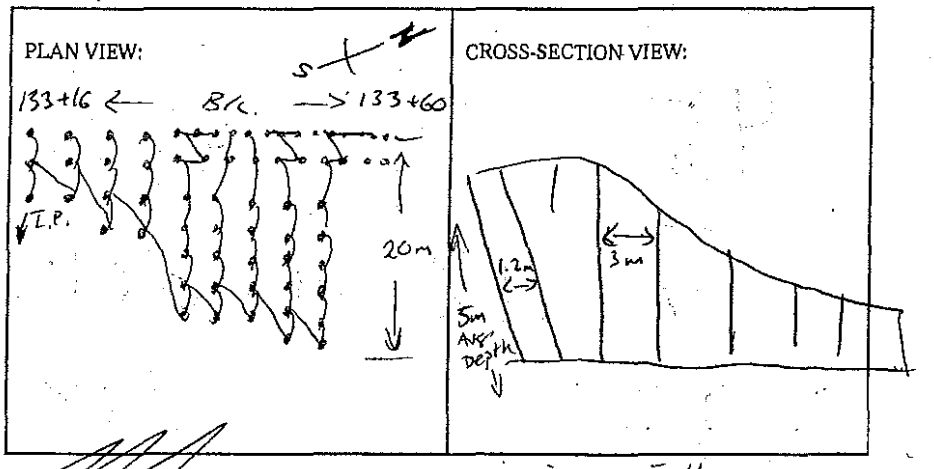
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1650 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

OCT

7

2 - Amex

5 - WR

8 sticks 2"

1 - 1 1/2 cross

~~2~~ - cross 3" x 16"

45 - 7m dets.

7 - 12 ms dets.

13 - 42 ms dets.

Instantel

Event Report

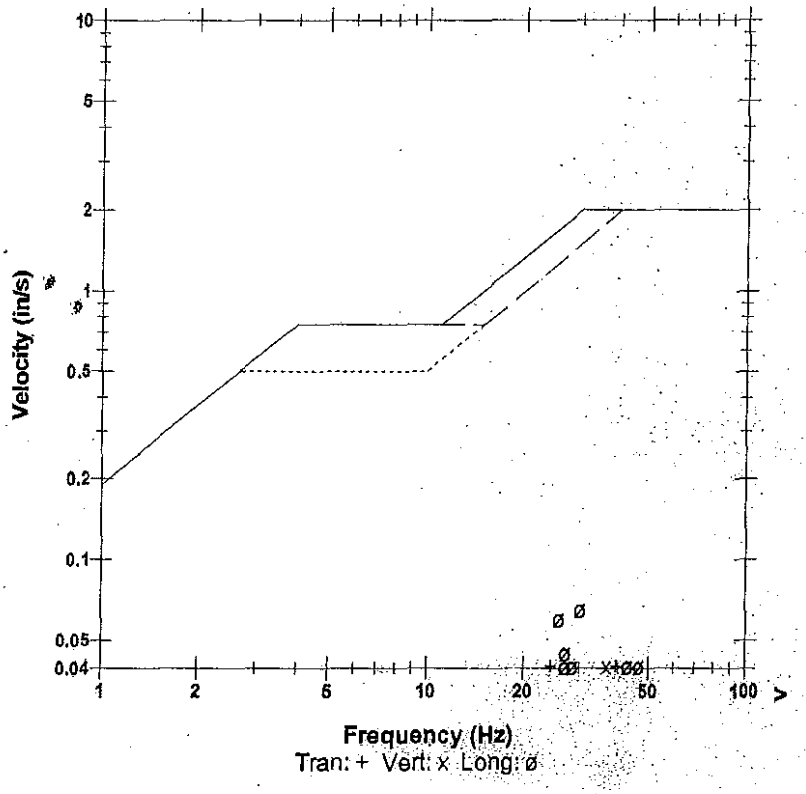
Date/Time	Long at 12:53:37 October 7, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
	Mic: 0.00029 psi(L)	**Calibration**	January 26, 2011 by Instantel Inc.
Range	Geo :10.00 in/s	**File Name**	M866DYUU.HD0
Record Time	4.0 sec at 1024 sps		

Notes
location:13191 old osa road on driveway
Windley
User Name: James m
General:

Extended Notes

Post Event Notes

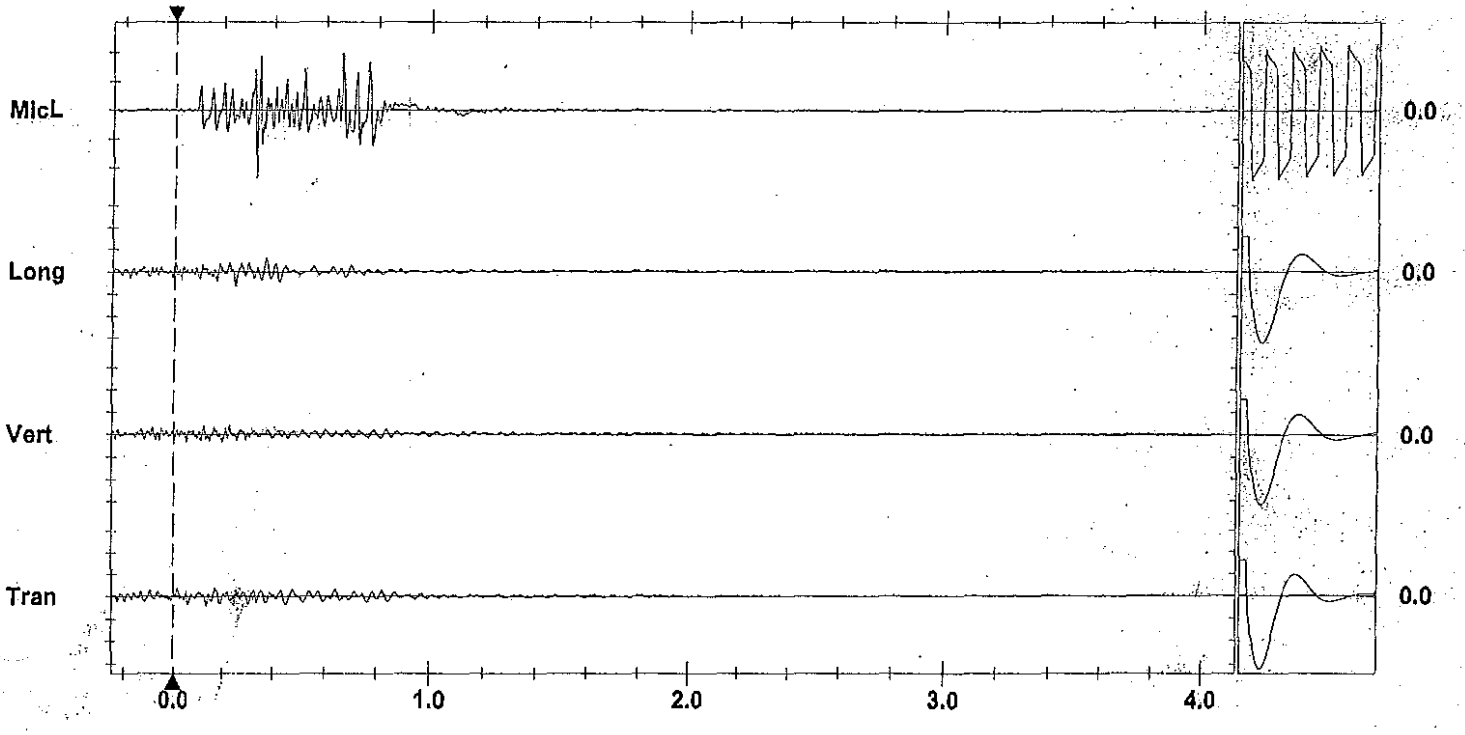
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00479 psi(L) at 0.328 sec
ZC Freq 51 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0400	0.0650	in/s
ZC Freq	39	37	30	Hz
Time (Rel. to Trig)	0.138	0.126	0.247	sec
Peak Acceleration	0.0398	0.0398	0.0398	g
Peak Displacement	0.00026	0.00018	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.4	7.2	Hz
Overswing Ratio	3.5	3.7	4.2	

Peak Vector Sum 0.0665 in/s at 0.247 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Oct 12/11
ACTUAL BLAST DATE Oct 11/11
BLAST # 54

HIGHWAY# 97
BLAST LOCATION AT: 133+45 - 133+90 LS (TV Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 45 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 55
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 7.7 (m)
TOTAL DEPTH 750 (m)

TOTAL NUMBER OF HOLES 55 B/L & 94 Prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 160
TOTAL NUMBER OF DELAYS 130

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT [redacted] 1800 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

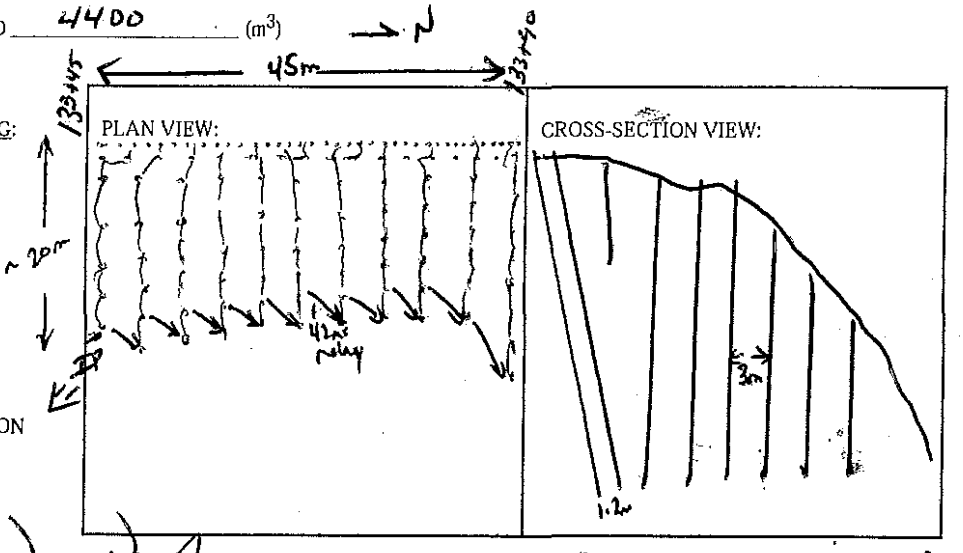
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 4400 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

B/L Holes - 1 Cart 2"x16' Dynamite + 200gr det. cord to 4' collar

Buffer Holes - 1 cart 2"x16' Dynamite + 8-10 cart 2"x16' Blastex

Stabs Holes - 0.5 cart 2"x16' Dynamite + 1.5' ANFO

Prod Holes - 0.5 cart 2"x16' Dynamite + 5'-13' ANFO / Hole

Instantel

Event Report

Date/Time Long at 17:08:19 October 12, 2011
Trigger Source Geo: 0.0700 in/s
Mic: 0.00029 psi(L)
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960DZ4F.LV0

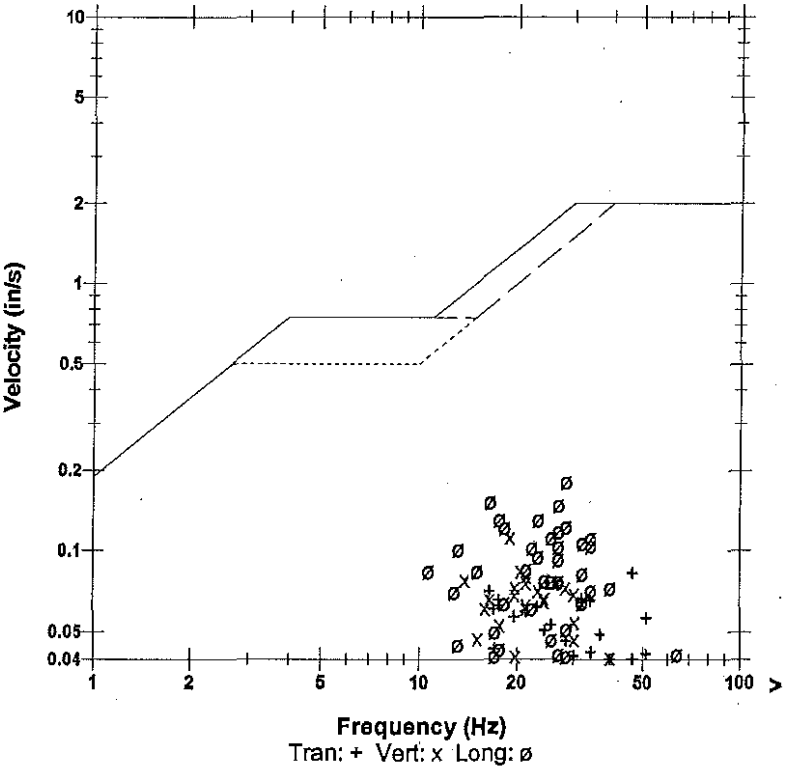
Notes
location:NW corner garage 13191 Old Mission Rd

User Name:W Verwey
General:Blast for stn 133+43 to 133+90

Extended Notes

Post Event Notes

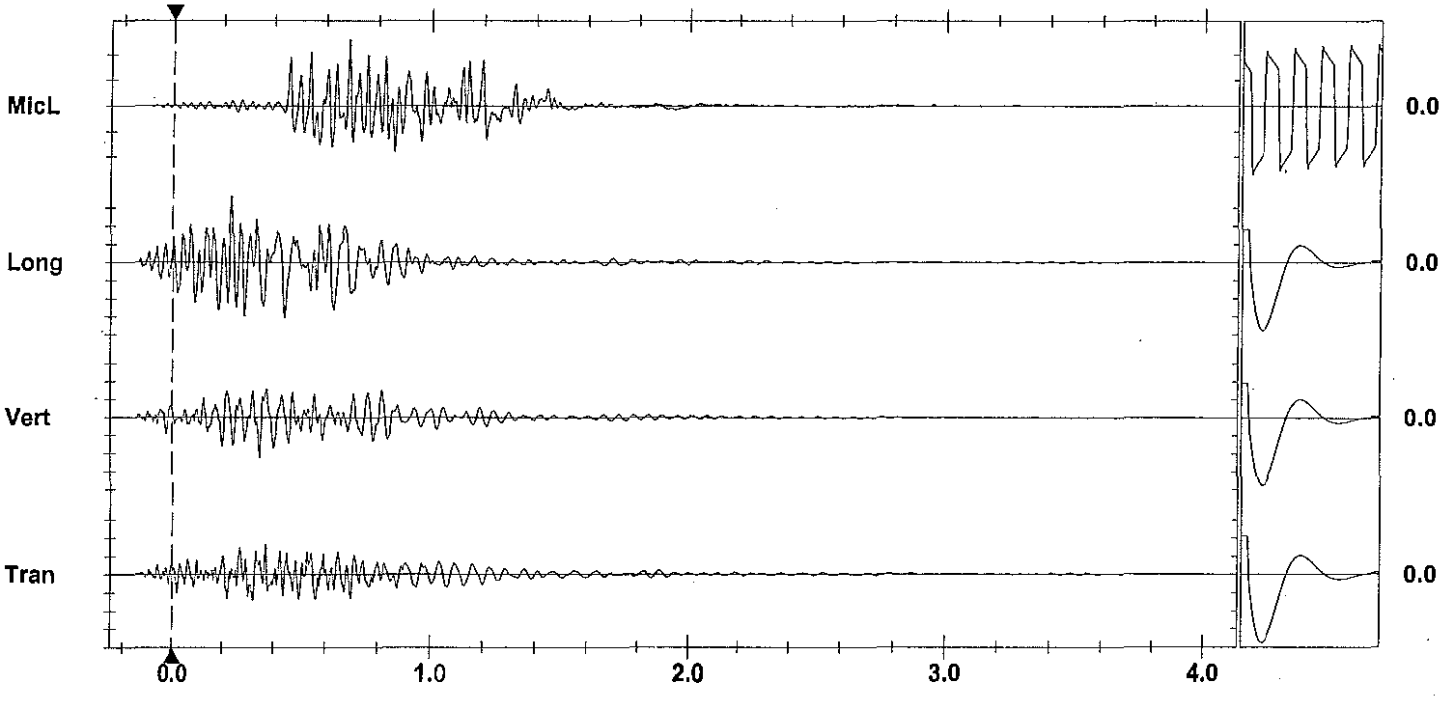
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00518 psi(L) at 0.687 sec
ZC Freq 34 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 640 mv)

	Tran	Vert	Long	
PPV	0.0825	0.112	0.181	in/s
ZC Freq	47	19	28	Hz
Time (Rel. to Trig)	0.370	0.348	0.233	sec
Peak Acceleration	0.0746	0.0663	0.0961	g
Peak Displacement	0.00065	0.00079	0.00123	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.181 in/s at 0.233 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div Sensorcheck
Trigger = ▶———◀

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Jeffrey
BLASTER'S CERTIFICATE NUMBER 5034389

DATE PREPARED OCT 14/11
ACTUAL BLAST DATE OCT 14/11 5:17 PM
BLAST # 57

HIGHWAY# 97
BLAST LOCATION AT: STN 133+90 - 134+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 45
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 10
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 960 (m)

TOTAL NUMBER OF HOLES 456 + 112 Presp.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* every 2nd 4th hole loaded w/ 200 grain det. cord

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 160
TOTAL NUMBER OF DELAYS 135

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2500 (kg)
DELAY TYPE AND LENGTH 25 • 42 (ms)

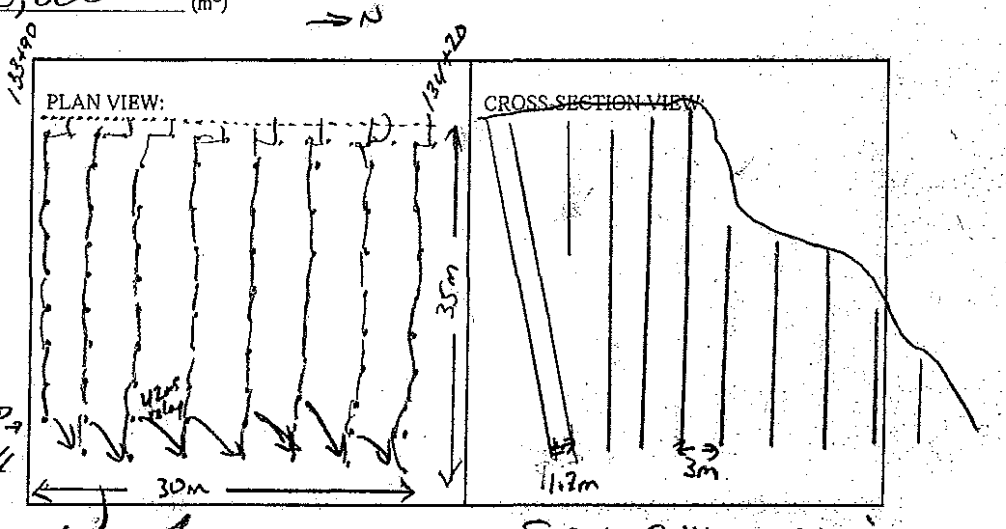
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 5,000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Jeffrey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph Located @ 13191 Old Mission Rd. — 0.16 ips / 22 Hz

PROD HOLES - 0.5 CART 2"X16" DYNAMITE + 6'-16' ANFO/HOLE

BUFFER HOLES - 0.5 CART 2"X16" DYNAMITE + 6-9 CART 2"X16" B/AIRTEX

STEAD HOLES - 0.5 CART 2"X16" DYNAMITE + 1'-2' ANFO/HOLE

B/L HOLES - 1 CART 2"X16" DYNAMITE + 200gr det cord to 4' collar

Instantel

Event Report

Date/Time Vert at 17:11:21 October 14, 2011
Trigger Source Geo: 0.0500 in/s
Mic: 0.00029 psi(L)
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11746 V 10.10-8.17 BlastMate III
Battery Level 6.1 Volts
Calibration January 7, 2011 by Instantel
File Name M746DZ85.2X0

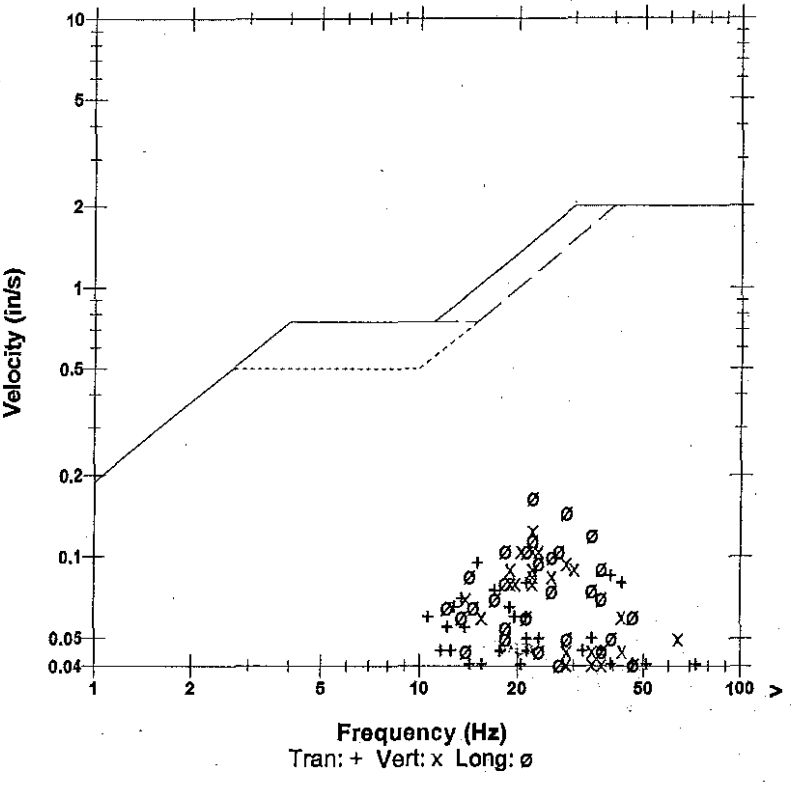
Notes
Location:on garage apron 13191 Old Mission Rd

User Name:james m
General: Blast at stn 134

Extended Notes

Post Event Notes

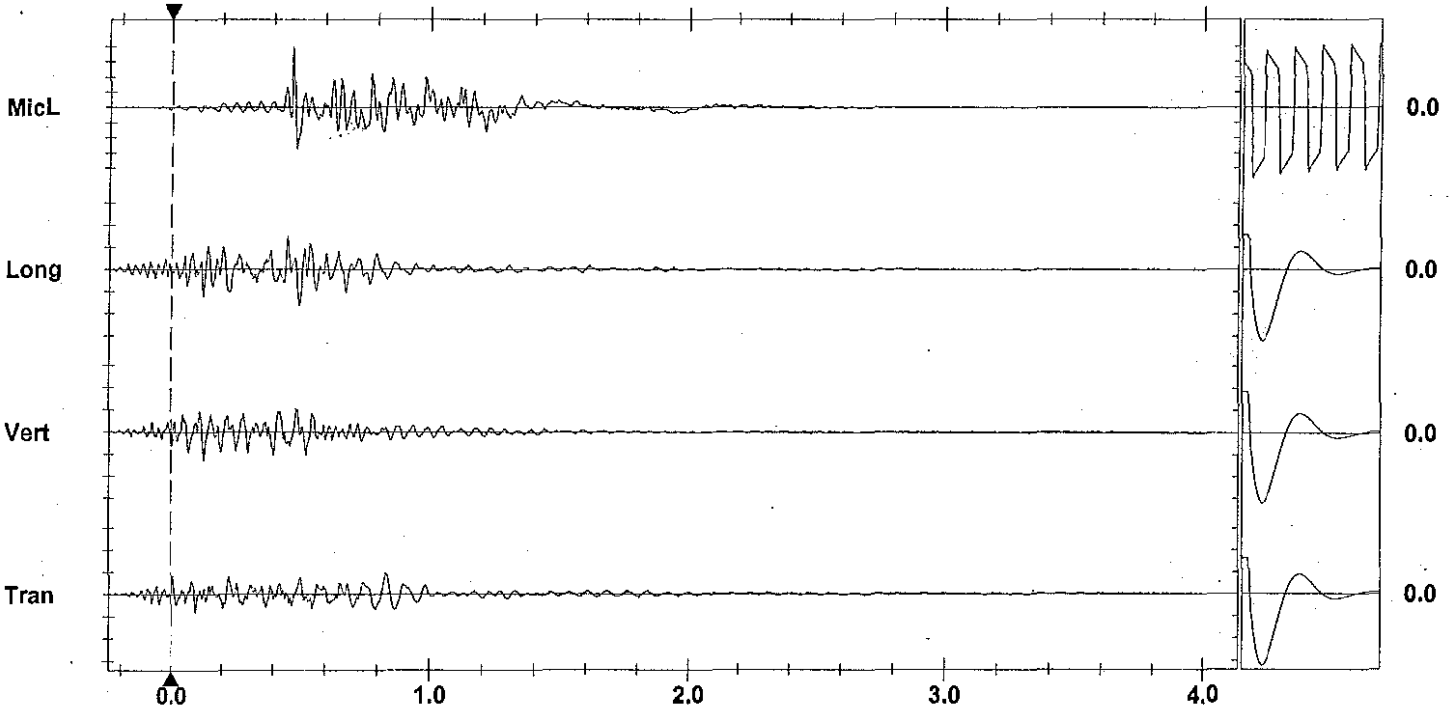
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00392 psi(L) at 0.472 sec
ZC Freq 37 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.0950	0.125	0.165	in/s
ZC Freq	15	22	22	Hz
Time (Rel. to Trig)	0.833	0.129	0.499	sec
Peak Acceleration	0.0663	0.0795	0.0795	g
Peak Displacement	0.00093	0.00085	0.00117	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.6	7.5	Hz
Overswing Ratio	3.6	3.7	4.0	

Peak Vector Sum 0.177 in/s at 0.501 sec



Time Scale:0.20 sec/div **Amplitude Scale**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: October 16, 2011 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sicco Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Oct 19/11
ACTUAL BLAST DATE Oct 19/11
BLAST # 62

HIGHWAY# 97
BLAST LOCATION AT: 134+20 - 134+51 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 31 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 320 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 43
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 870 (m)

TOTAL NUMBER OF HOLES 436 11/73 Prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* every 2nd bll hole loaded w/200grain det. cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 110
TOTAL NUMBER OF DELAYS 95

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1850 (kg)
DELAY TYPE AND LENGTH 25 & 42 (ms)

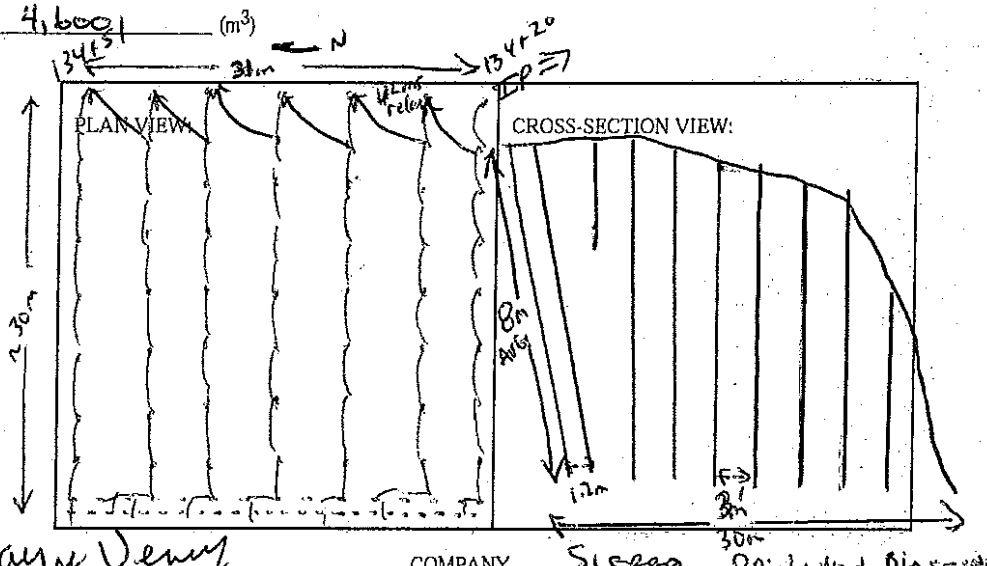
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 41,600 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sicco Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

69 ANFO

4 WaterBlock

1 1½x16 Unimax

1 2" x16 Powerfire

¼ Roll 2009n

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Oct. 29/11
ACTUAL BLAST DATE Oct. 28/11
BLAST # 76

HIGHWAY# 97
BLAST LOCATION AT: STN# 134+55 - 134+90 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 35 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 22
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 1000 (m)

TOTAL NUMBER OF HOLES 22 B/L / 76 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/ 200 grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 98
TOTAL NUMBER OF DELAYS 76

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1950 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

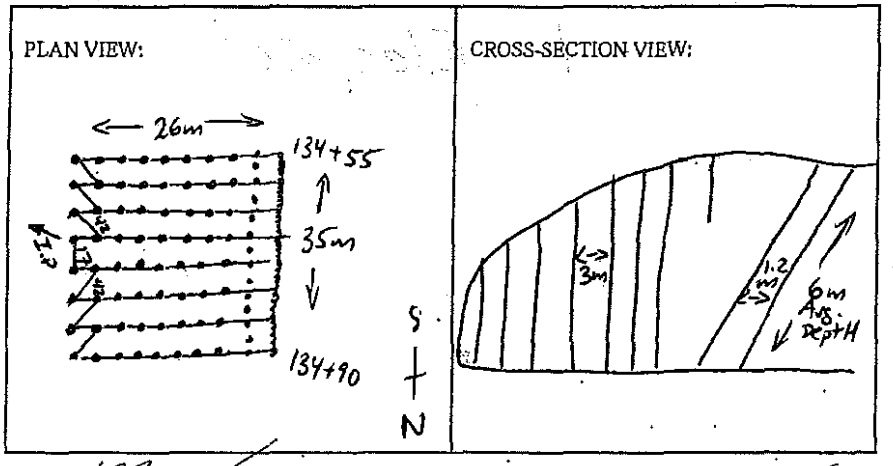
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 Caps

VOLUME OF ROCK BLASTED 5000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

28 - Bags WR

45 - Bags Anfo

2 - CASE 2"x16"

1 3/4 CASE 1 1/2 x 16"

2 CASE 3 1/2" x 16"

45 - 40' dets.

23 - 30' dets.

8 - 24' dets.

22 - 12' ms dets.

6 - 42ms connectadets.

1 - Elec det

Instantel

Event Report

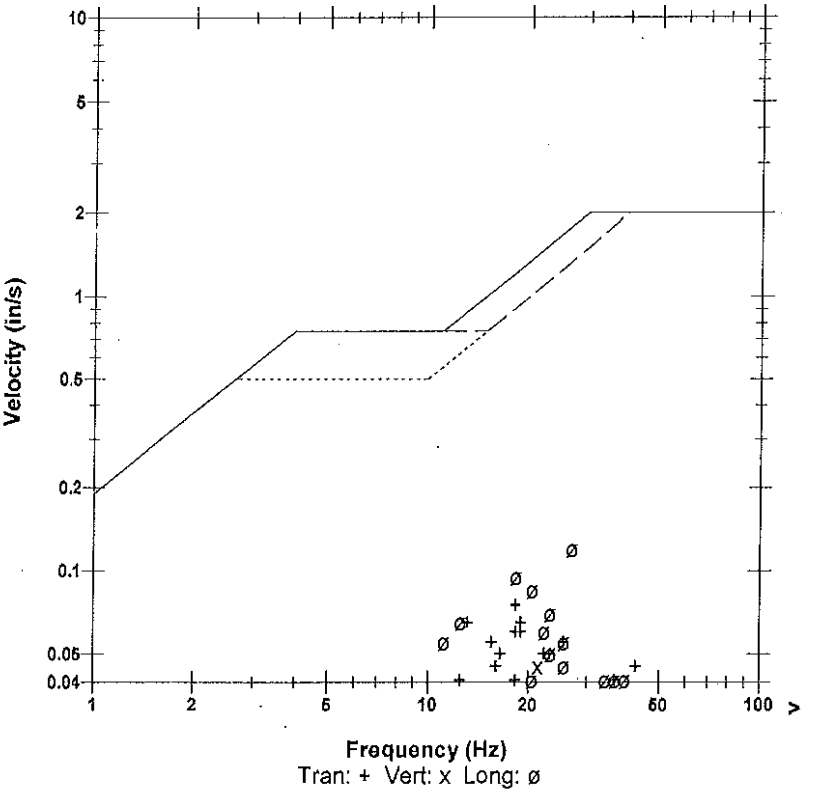
Date/Time	Long at 16:27:10 October 28, 2011	**Serial Number**	BA11746 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0700 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 7, 2011 by Instantel
Record Time	4.0 sec at 1024 sps	**File Name**	M746DZY0.DA0

Notes
Location: 13191 old misson rd
corner foundation
User Name:james m
General: Blast at stn 134

Extended Notes

Post Event Notes

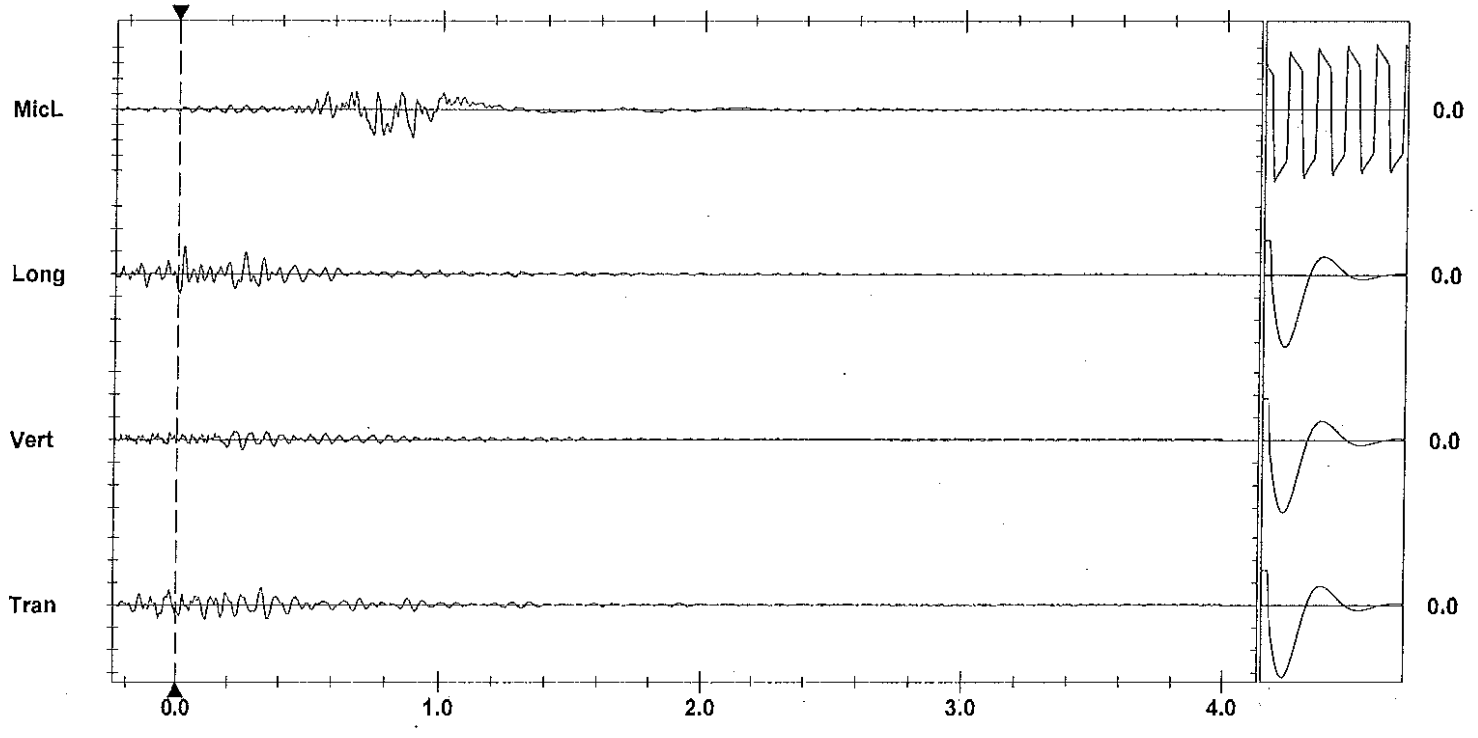
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00185 psi(L) at 0.889 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 690 mv)

	Tran	Vert	Long	
PPV	0.0750	0.0450	0.120	in/s
ZC Freq	18	21	27	Hz
Time (Rel. to Trig)	0.330	0.254	0.023	sec
Peak Acceleration	0.0398	0.0398	0.0663	g
Peak Displacement	0.00069	0.00045	0.00077	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.6	7.6	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 0.129 in/s at 0.024 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 3/11
ACTUAL BLAST DATE Nov 3/11
BLAST # 83

HIGHWAY# 97
BLAST LOCATION AT: STN 125+80 - 126+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY NA (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 26 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 25
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 6.8 (m)
TOTAL DEPTH 580 (m)

TOTAL NUMBER OF HOLES 25 b/l + 35 Prod
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

4 every 2nd B/l hole loaded w/ 1/2 grain det. cord,

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 50

EXPLOSIVE SIZE 58 mm by 400 mm
TOTAL WEIGHT 825 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

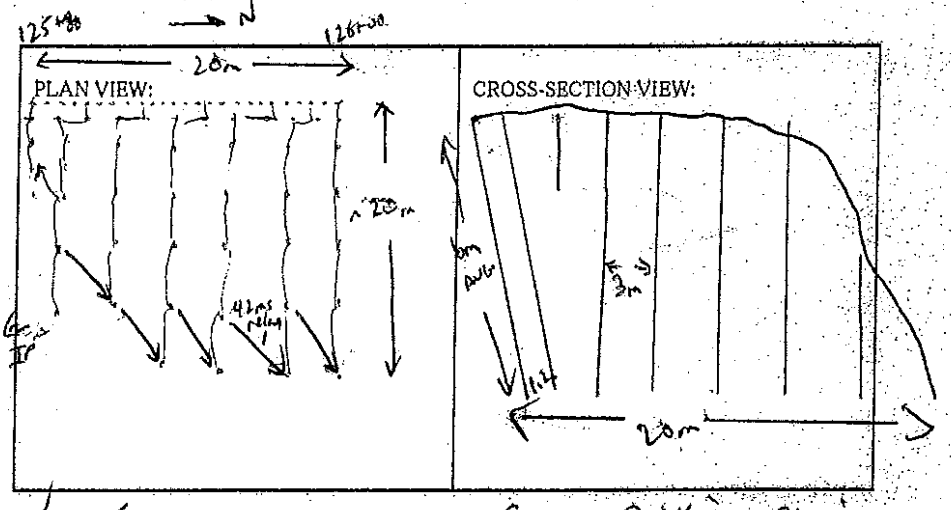
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERC Initiation of Nonel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

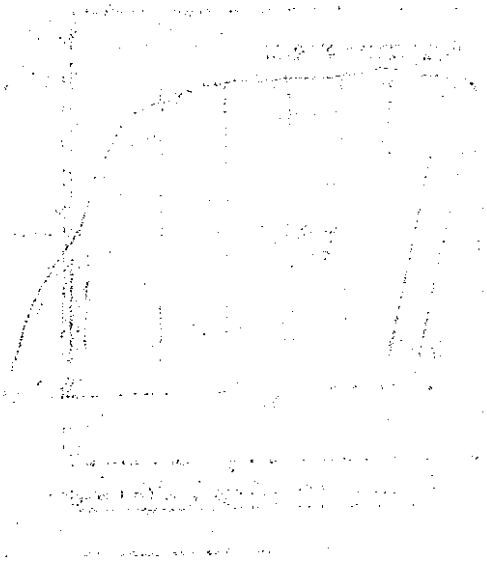
RC ✓

HRSD - IV - [illegible]

B/C Holes - 1 CART 2"x16" DYNAMITE + 200 gm. detcord to 4' collar

STAB Holes - 1'-2' NMO + 0.5 EXCT. 2"x16" DYNAMITE

BUFFER Holes - 1 CART 2"x16" DYNAMITE + 8-12 CARTRIDGES 2"x16" BLASTEX.



Instantel

Event Report

Date/Time	Tran at 15:46:30 November 3, 2011
Trigger Source	Geo: 0.0400 in/s
	Mic: 0.00029 psi(L)
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.3 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E092.HI0

Notes

location:on sidewalk Court	south end Cliffstoneoffice adjacent to
User Name:W Verwey	
General:Blast at Stn	126+00

Extended Notes

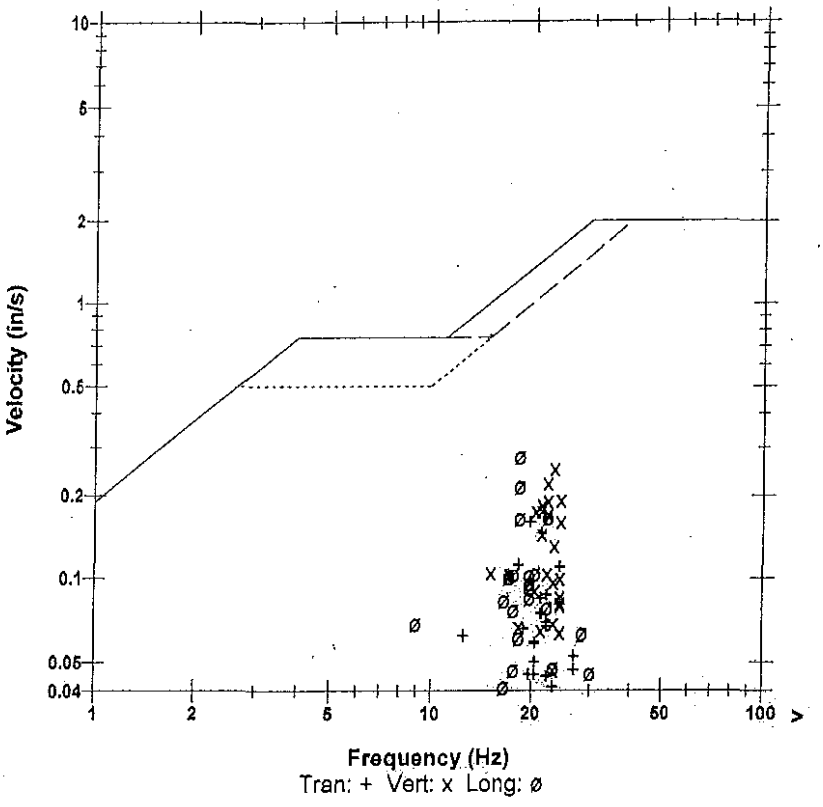
Post Event Notes

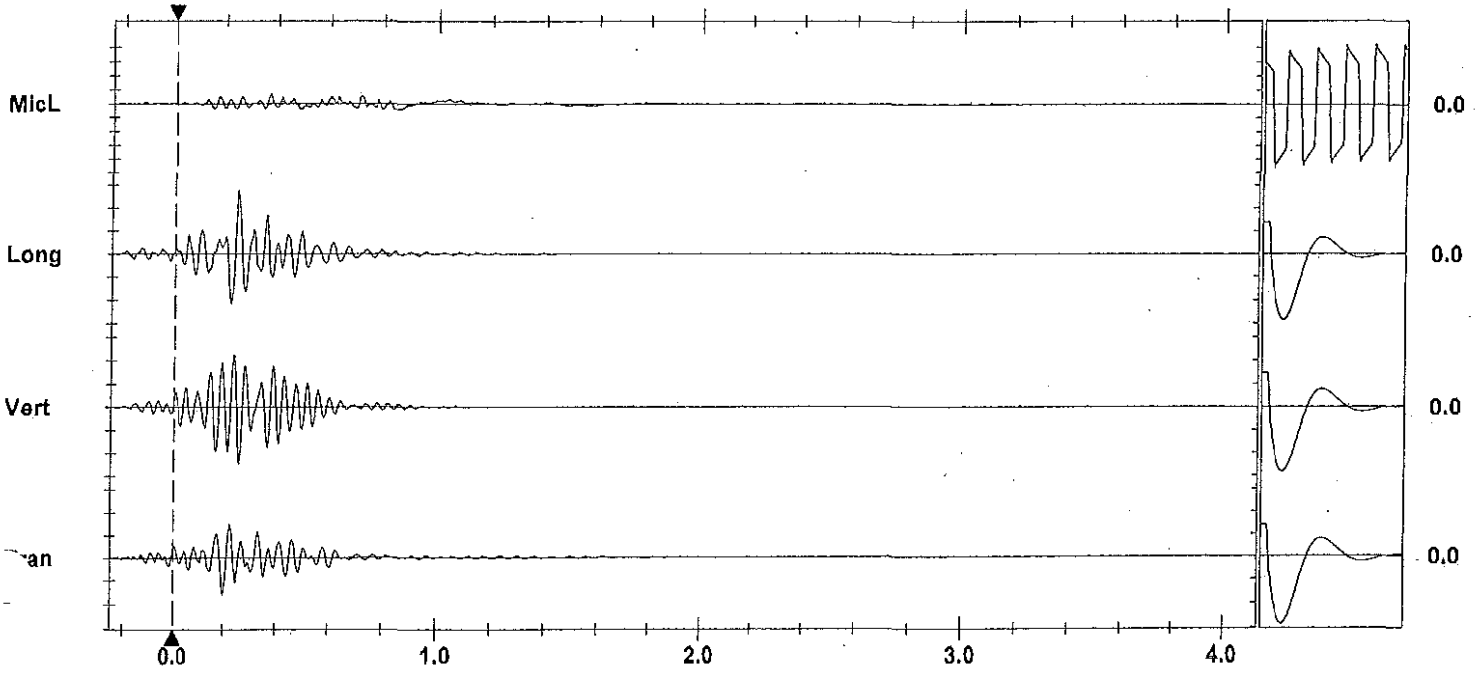
Microphone	Linear Weighting
PSPL	0.00069 psi(L) at 0.369 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.160	0.250	0.276	in/s
ZC Freq	20	23	18	Hz
Time (Rel. to Trig)	0.200	0.257	0.249	sec
Peak Acceleration	0.0580	0.101	0.0895	g
Peak Displacement	0.00122	0.00174	0.00217	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.315 in/s at 0.253 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 4/11
ACTUAL BLAST DATE Nov 4/11
BLAST # 85

HIGHWAY # 97
BLAST LOCATION AT: SOW 126+00 - 126+20 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Alaskan Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS: * every 2nd bill hole loaded w/ 200 grain det. cord.

NUMBER OF BACKLINE HOLES 26
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 265 (m)

TOTAL NUMBER OF HOLES 26b/l + 30 P250
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Pyramex Hanfo
TOTAL NUMBER OF CARTRIDGES 56
TOTAL NUMBER OF DELAYS 45

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

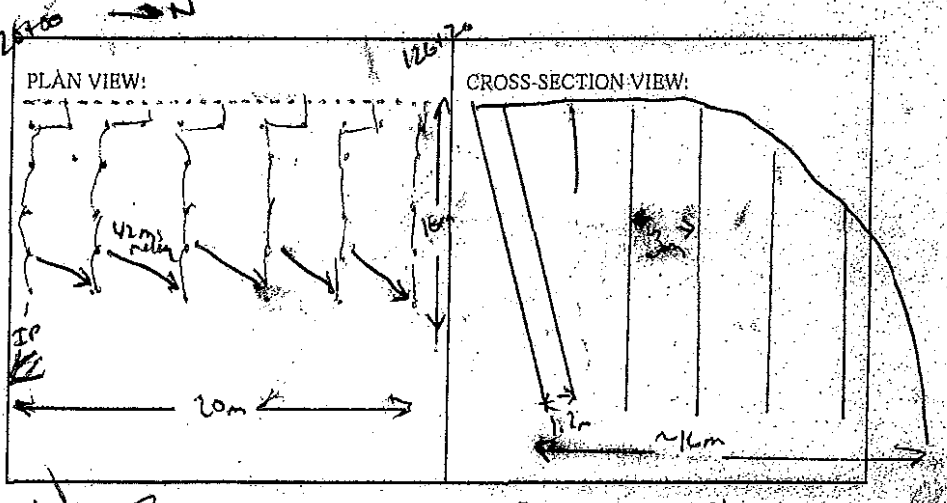
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EDC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 1300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

14 72' rows (Bamline)

7 24 ft each

20 30 ft each

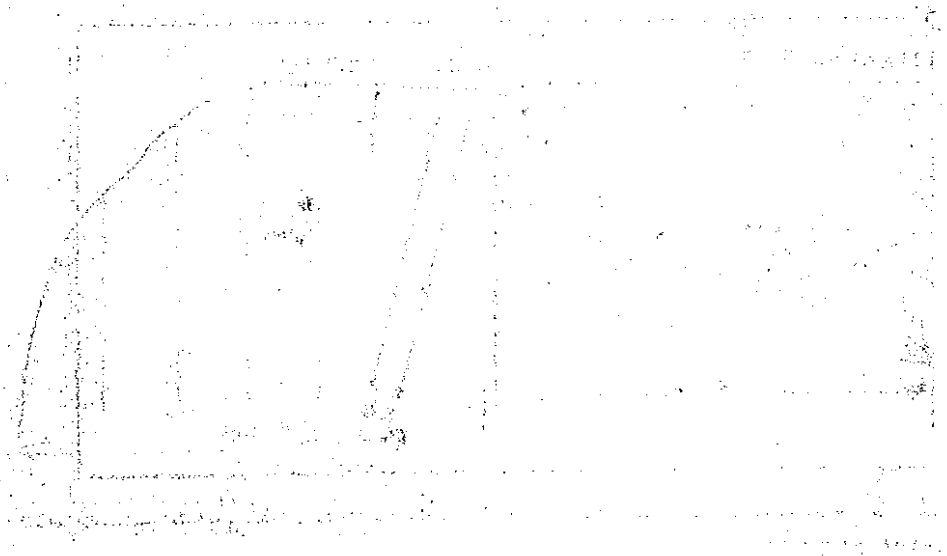
5 42ms each

8 ANFO

1 cup 2x16

1 cup 1½x16 } unions

200gr each



AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 7/11
ACTUAL BLAST DATE Nov. 05/11
BLAST # 87

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+20 - 126+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 156 (m)

TOTAL NUMBER OF HOLES ~~10~~ 16 B/L. /16 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/ 2 no grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 175 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

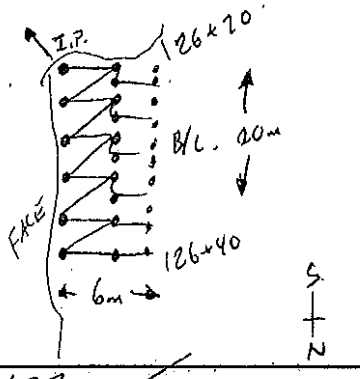
VOLUME OF ROCK BLASTED 720 (m^3)

BLAST SKETCH:

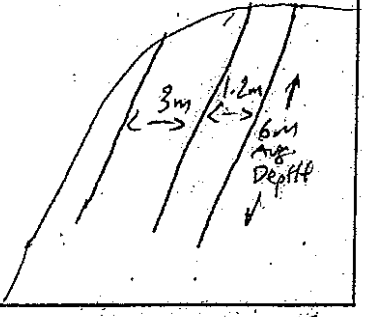
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

1/2 bag WR

5 bag Anfo

1 - 2" x 16"

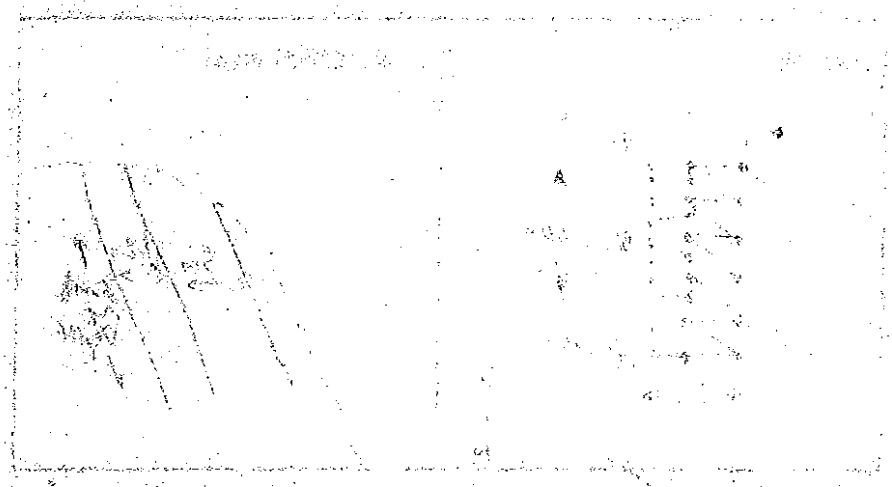
1 - ~~1~~ 1 1/2" x 16"

16 - 40' dets.

10 - 12' ms dets.

10 - 42 ms

1 - Bleedels



Instantel®

Event Report

Date/Time Vert at 09:32:04 November 5, 2011
Trigger Source Geo: 0.0700 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11746 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration January 7, 2011 by Instantel
File Name M746E0CA.HG0

Notes
Location: 13073 cliffside dr
on se corner of hous corner foundation
User Name:James m
General:

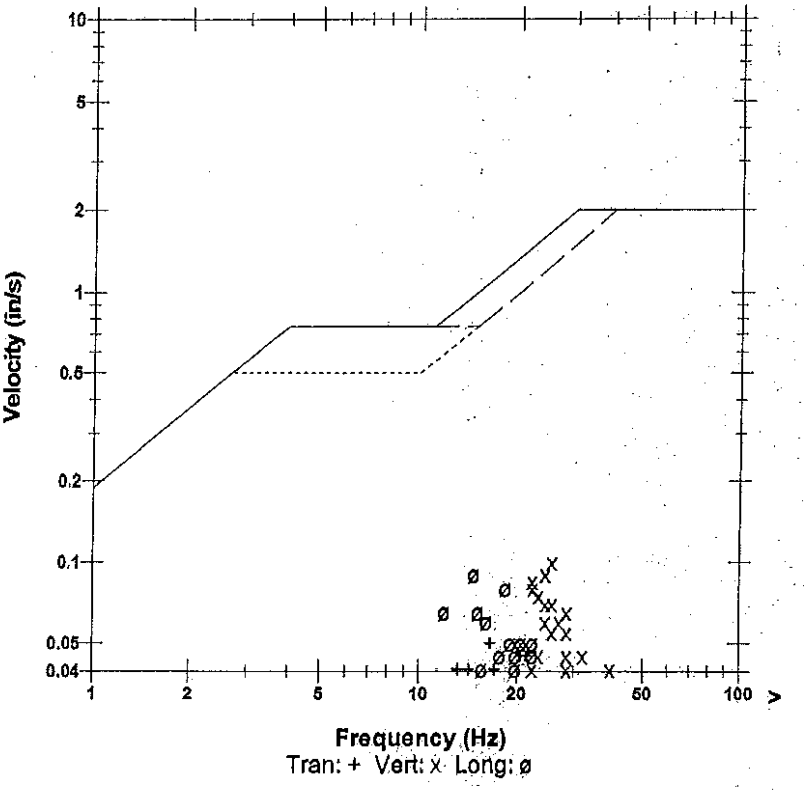
Extended Notes

Post Event Notes

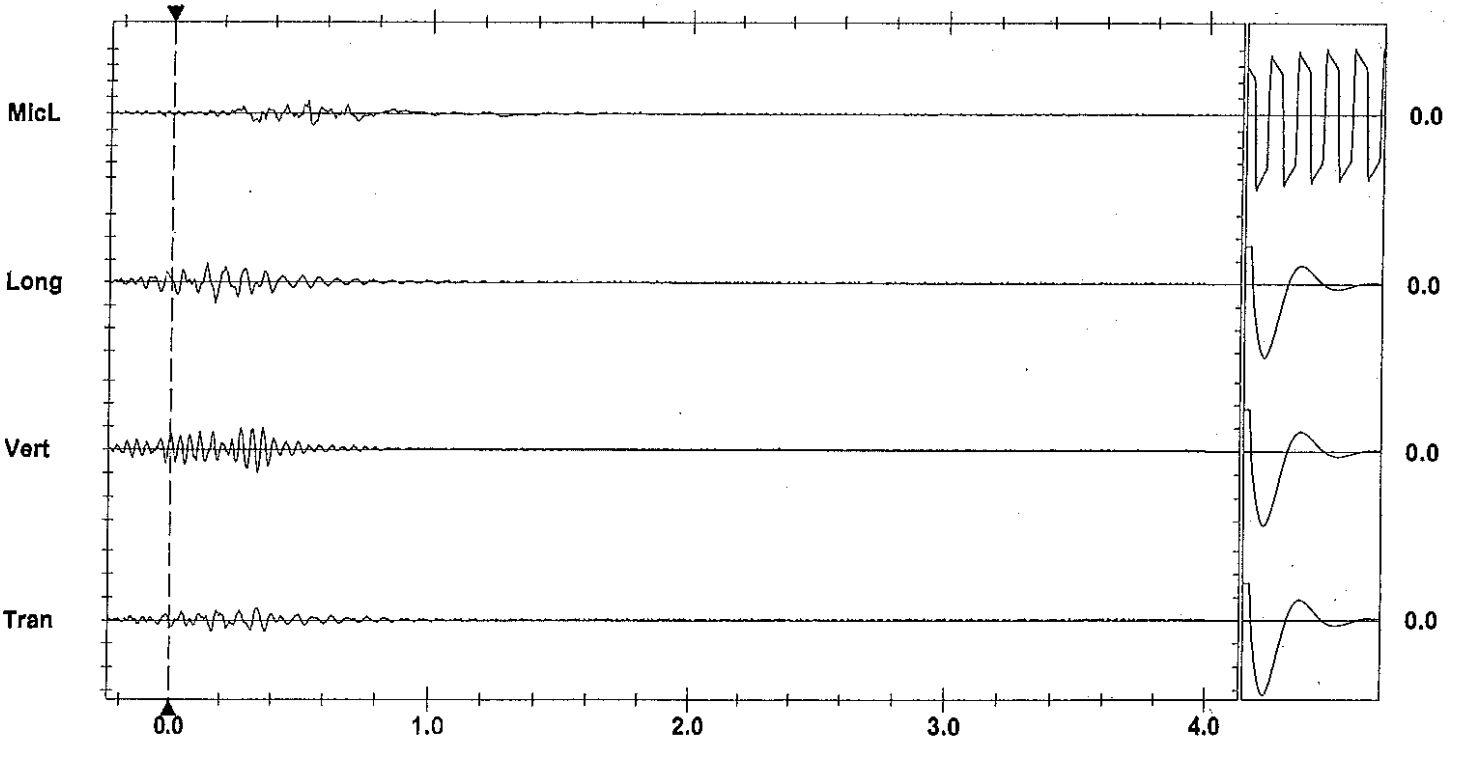
Microphone Linear Weighting
PSPL 0.00076 psi(L) at 0.526 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 660 mv)

	Tran	Vert	Long	
PPV	0.0500	0.1000	0.0900	in/s
ZC Freq	17	26	15	Hz
Time (Rel. to Trig)	0.340	0.345	0.174	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00052	0.00063	0.00074	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.7	3.8	4.0	

USBM RI8507 And OSMRE



Peak Vector Sum 0.114 in/s at 0.345 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 8/11
ACTUAL BLAST DATE Nov. 7/11
BLAST # 89

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+48 - 126+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 22 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 + (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 240 (m)

TOTAL NUMBER OF HOLES 14 B/L / 31 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L hole loaded w/ 200 grain det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 45
TOTAL NUMBER OF DELAYS 31

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

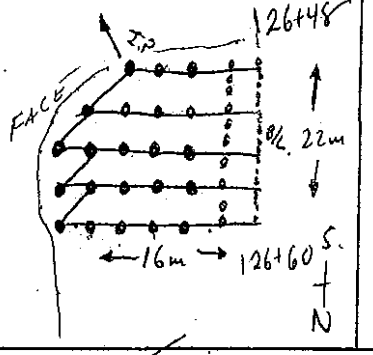
VOLUME OF ROCK BLASTED 2100 (m^3)

BLAST SKETCH:

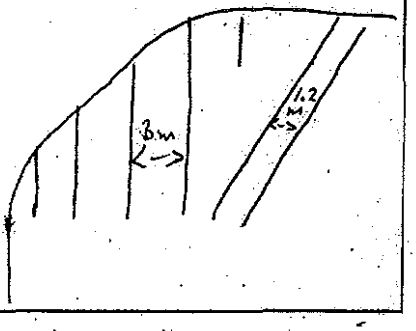
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

8 BASS Anfo

1 1/2 CASE 1 1/2 x 16"

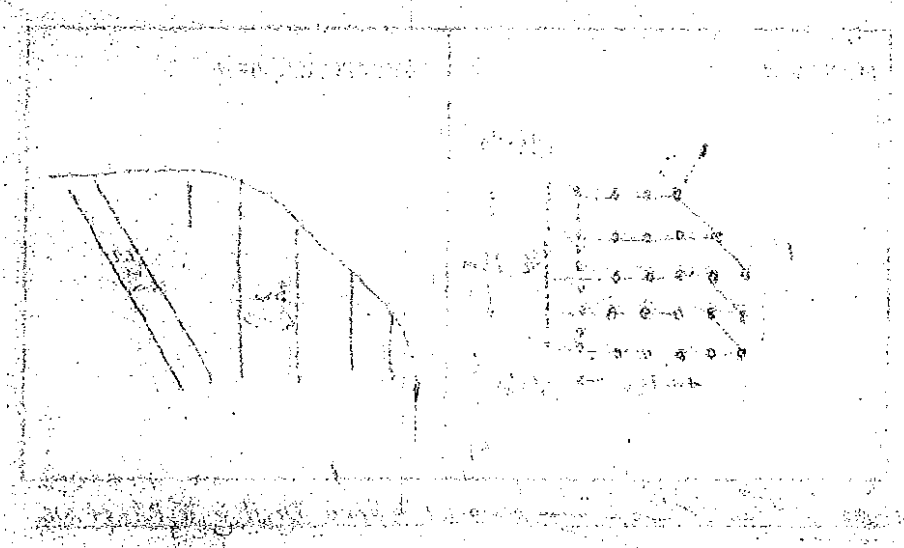
10 - 40' dets.

10 - 24' dets.

14 - 12' ms dets

5 - 42 ms.

1 - Exoe det.



Instantel®

Event Report

Date/Time	Vert at 12:31:00 November 7, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E0G8.3O0

Notes
location:13973 Cliffstone Crt on driveway
User Name: james m
General:

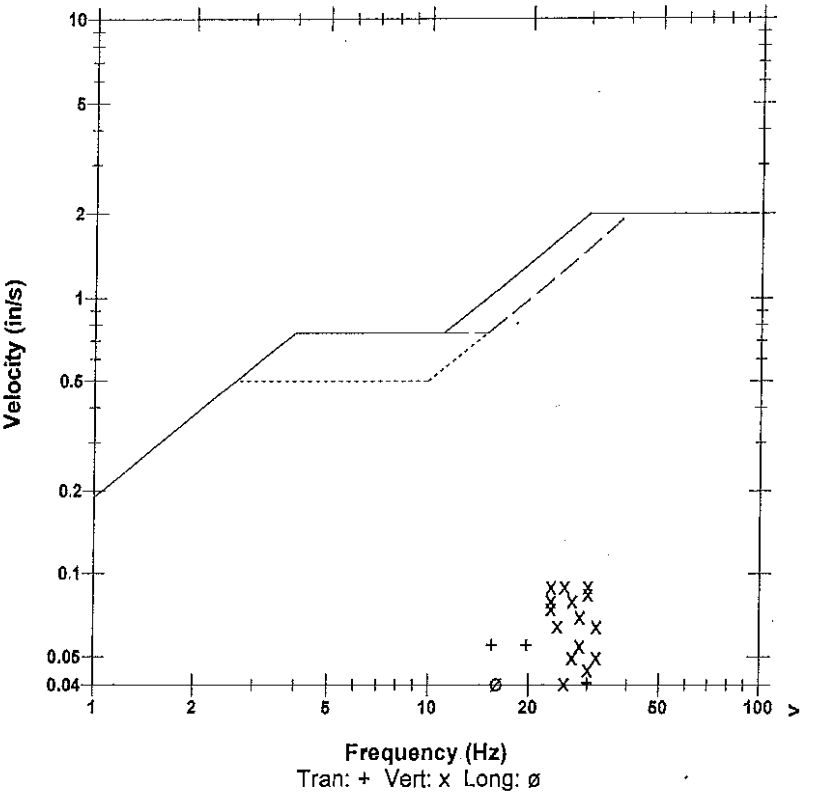
Extended Notes
Blast at stn 126+50

Post Event Notes

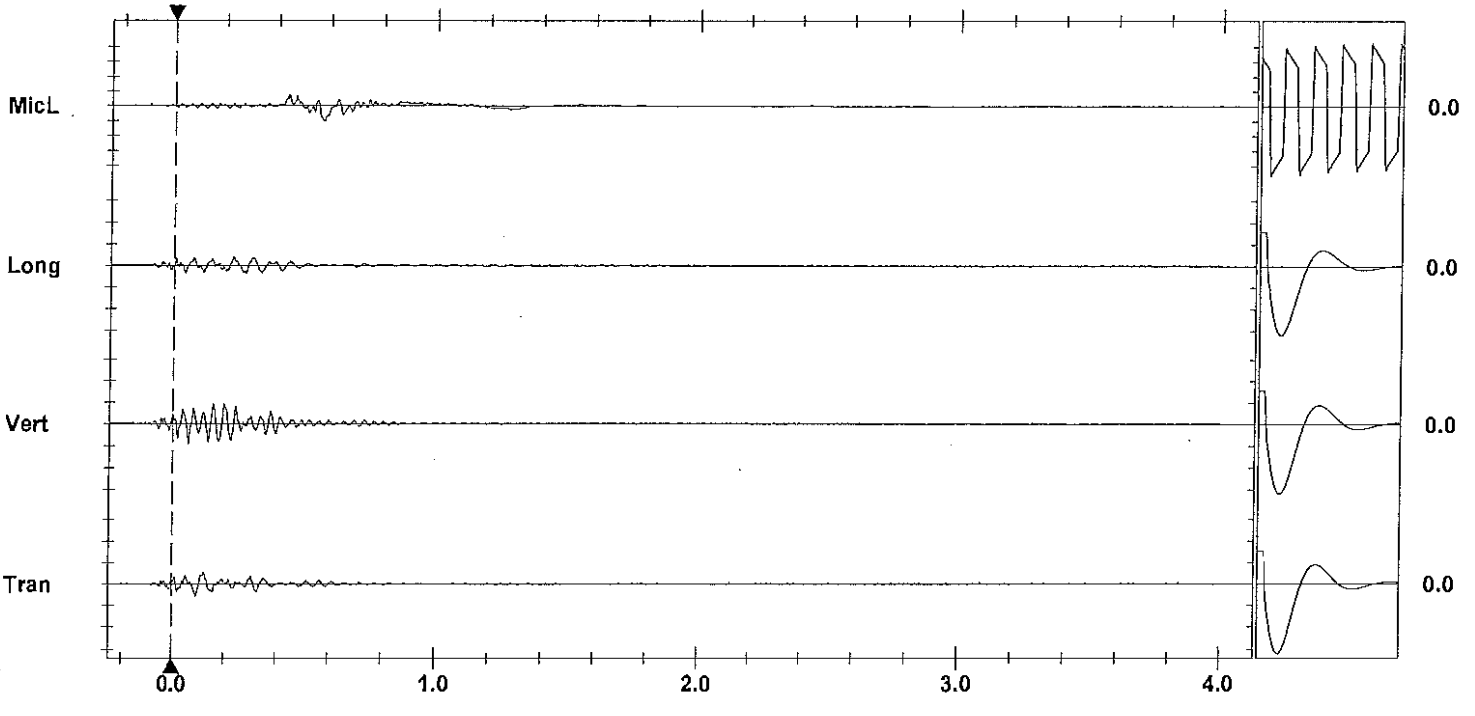
Microphone Linear Weighting
PSPL 0.00105 psi(L) at 0.571 sec
ZC Freq 9.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 704 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0900	0.0400	in/s
ZC Freq	20	30	16	Hz
Time (Rel. to Trig)	0.095	0.062	0.229	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00054	0.00062	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0967 in/s at 0.158 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: November 13, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel®

Event Report

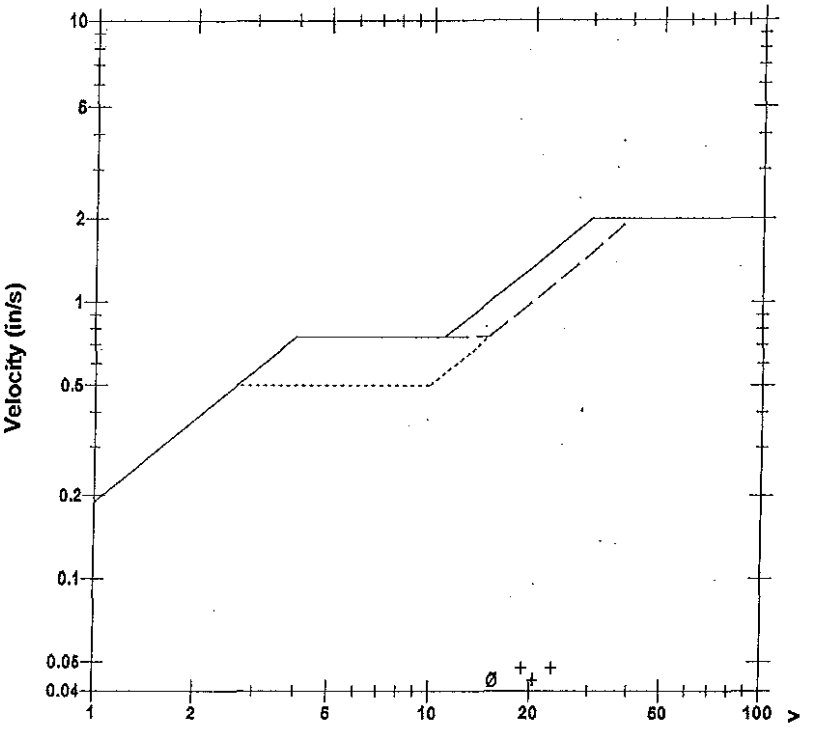
Date/Time	Tran at 12:30:57 November 7, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E0G8.3L0
Job Number:	1		

Notes
location:on curb ifo 13117 Cliffstone Court
User Name:W Verwey
General:Blast at Stn 126+50

Extended Notes

Post Event Notes

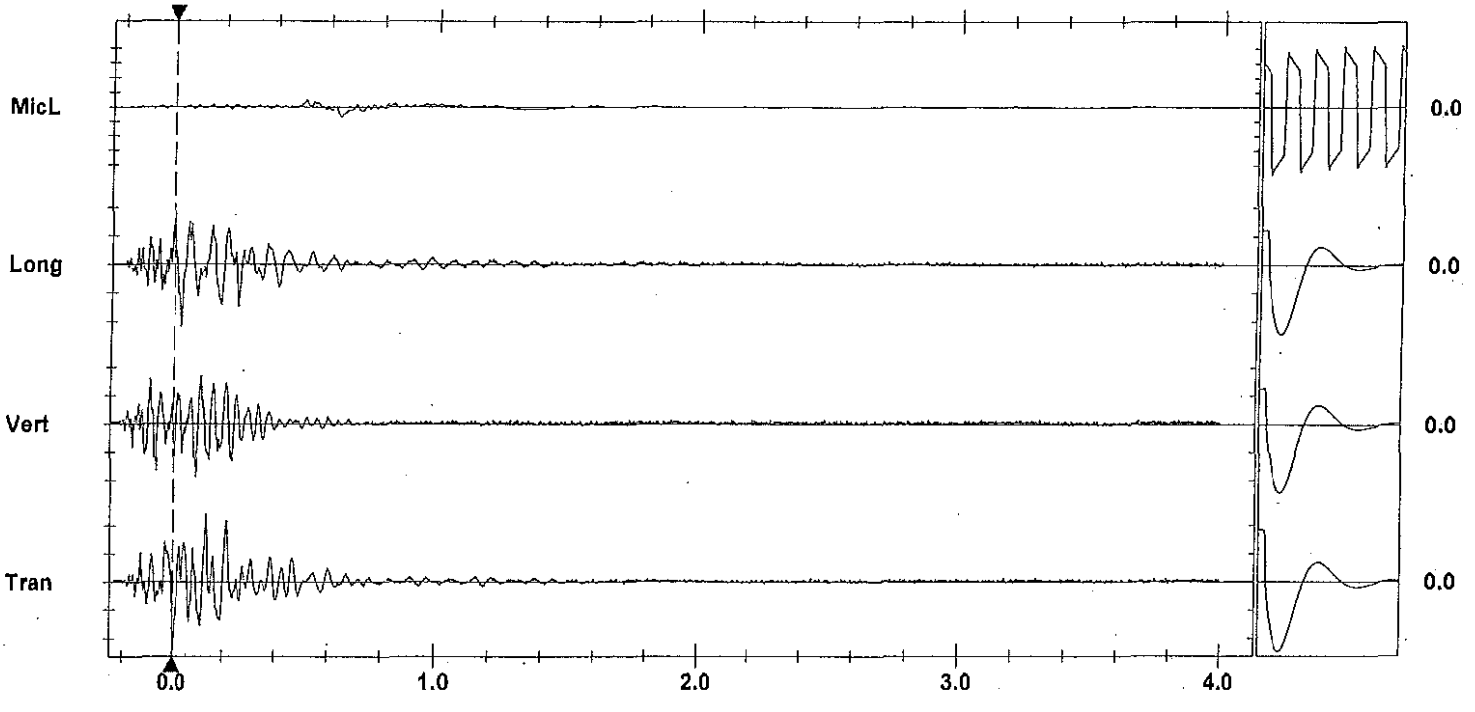
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00069 psi(L) at 0.638 sec
ZC Freq 7.4 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.0475	0.0375	0.0437	in/s
ZC Freq	19	24	16	Hz
Time (Rel. to Trig)	0.002	0.094	0.027	sec
Peak Acceleration	0.0215	0.0199	0.0166	g
Peak Displacement	0.00032	0.00023	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.0544 in/s at 0.214 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-1001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verway
BLASTER'S CERTIFICATE NUMBER SB34B9

DATE PREPARED Nov 9/11
ACTUAL BLAST DATE Nov 9/11
BLAST # 92 2:15 PM

HIGHWAY# 97
BLAST LOCATION AT: STN 134+90 - 135+20 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Andesite Greenstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 500 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 40
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.0 (m)
TOTAL DEPTH 250 (m)

TOTAL NUMBER OF HOLES 40/11 + 60 Prod.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
we every 2nd hole loaded w/ Emogrip det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 100
TOTAL NUMBER OF DELAYS 85

EXPLOSIVE SIZE 30 mm by 400 mm
TOTAL WEIGHT 1250 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

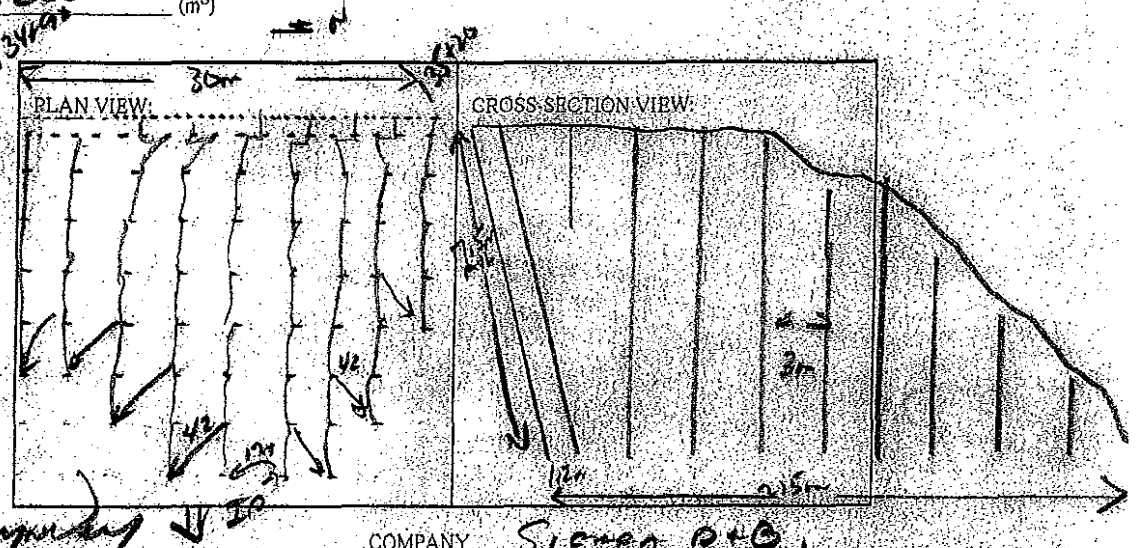
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Emog Initiation of Nonel System
BLASTING MACHINE: TYPE HD320 CAPACITY 86 CAPS

VOLUME OF ROCK BLASTED 3200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verway COMPANY Sierra D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

6c

B/L Holes - 1 cart 2"x16" dynamite + 20lbs - shot cord 4½' collar

Buffer Holes - 1 cart 2"x16" dynamite + 6-9 cart 2"x16" Blastex

Stad Holes - 0.5 cart 2"x16" dynamite + 1.5' ANFO

Prod Holes - 0.5 cart 2"x16" dynamite + 7'-16' ANFO/hole

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sicamous Drilling & Blasting
BLASTER'S NAME WAYNE UCHMAN
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED Nov 10/11
ACTUAL BLAST DATE Nov 10/11 12:22 PM
BLAST # 04

HIGHWAY# 97
BLAST LOCATION AT: S-N 126+60 - 126+90 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 200 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 38
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 9
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 650 (m)

TOTAL NUMBER OF HOLES 384 / 150 holes / 9 rows / 36 Rem.
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE & ANFO
TOTAL NUMBER OF CARTRIDGES 90
TOTAL NUMBER OF DELAYS 85

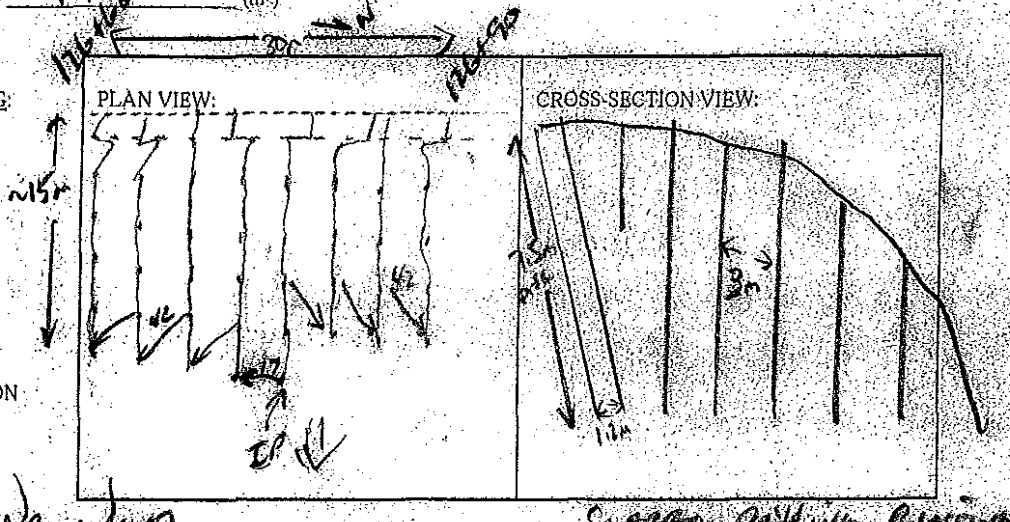
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 650 (kg)
DELAY TYPE AND LENGTH 25 - 42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) DSC INITIATION OF NONELECTRIC
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 1900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Uchman COMPANY Sicamous Drilling Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Rows - 10 -16 ANFO / Hole primed w/ 0.5 cart 2x16 Dyn.

Stab Holes - 1'-2' ANFO + 0.5 cart 1½" x 16" Dyn.

Bttms - 1 cart 2"x16" Dynamite + 8-10 cart 2"x16" Blasties

B/L Holes - 1 cart 2x16" Dynamite + 200gr det. cord to 4' collar

Instantel®

Event Report

Date/Time	Tran at 12:21:59 November 10, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E0LR.ON0
Job Number:	1		

Notes
location:on bedrock 15m NW of 13050 Old Mission Road
User Name:W Verwey
General:Blast at Stn 126+90

Extended Notes

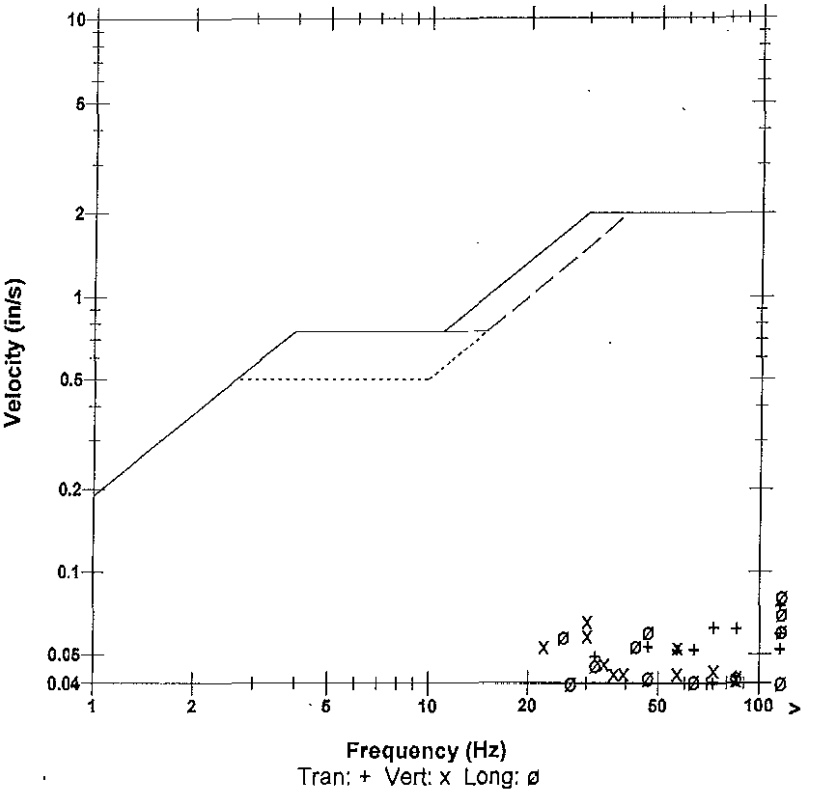
Post Event Notes

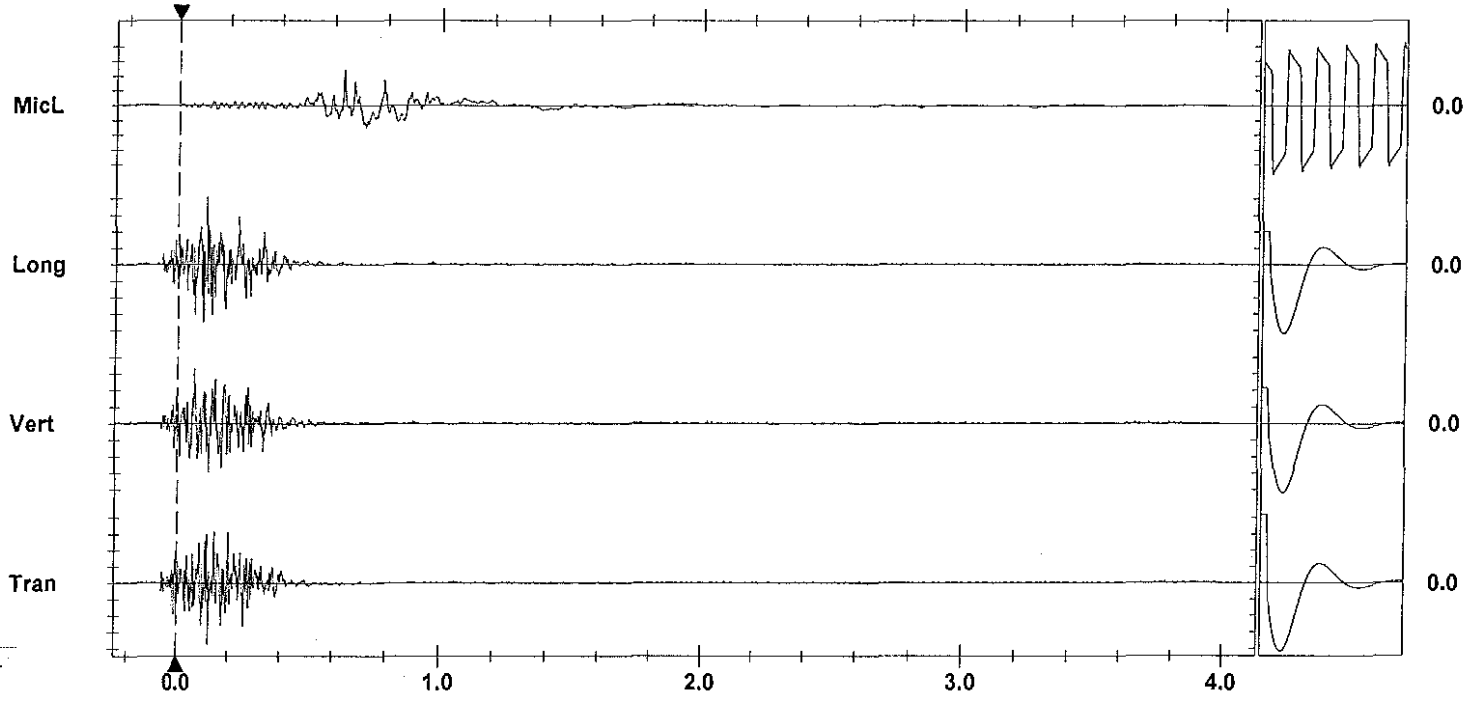
Microphone Linear Weighting
PSPL 0.00243 psi(L) at 0.635 sec
ZC Freq 34 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 663 mv)

	Tran	Vert	Long	
PPV	0.0750	0.0662	0.0812	in/s
ZC Freq	>100	30	>100	Hz
Time (Rel. to Trig)	0.126	0.067	0.114	sec
Peak Acceleration	0.118	0.0945	0.121	g
Peak Displacement	0.00016	0.00030	0.00021	in
Sensorcheck	Check	Passed	Passed	
Frequency	7.7	7.5	7.5	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.101 in/s at 0.126 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: November 13, 2011 07:08:01 PM
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Instantel

Event Report

Date/Time	Long at 12:21:57 November 10, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E0LR.OL0

Notes
location:13973 Cliffstone Crt on driveway
User Name: james m
General:

Extended Notes
Blast at stn 126+50

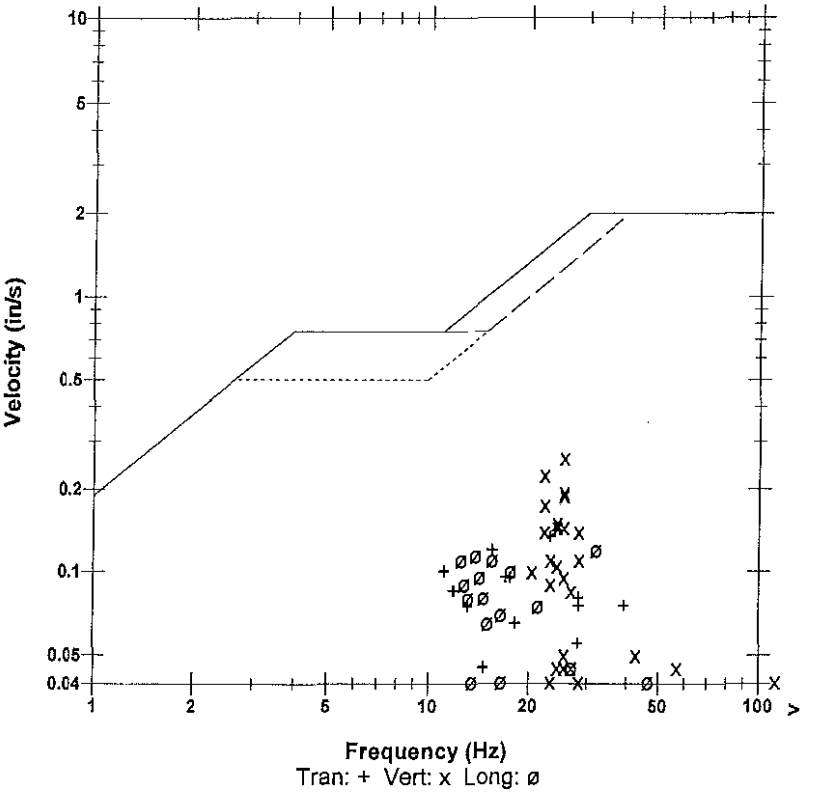
Post Event Notes

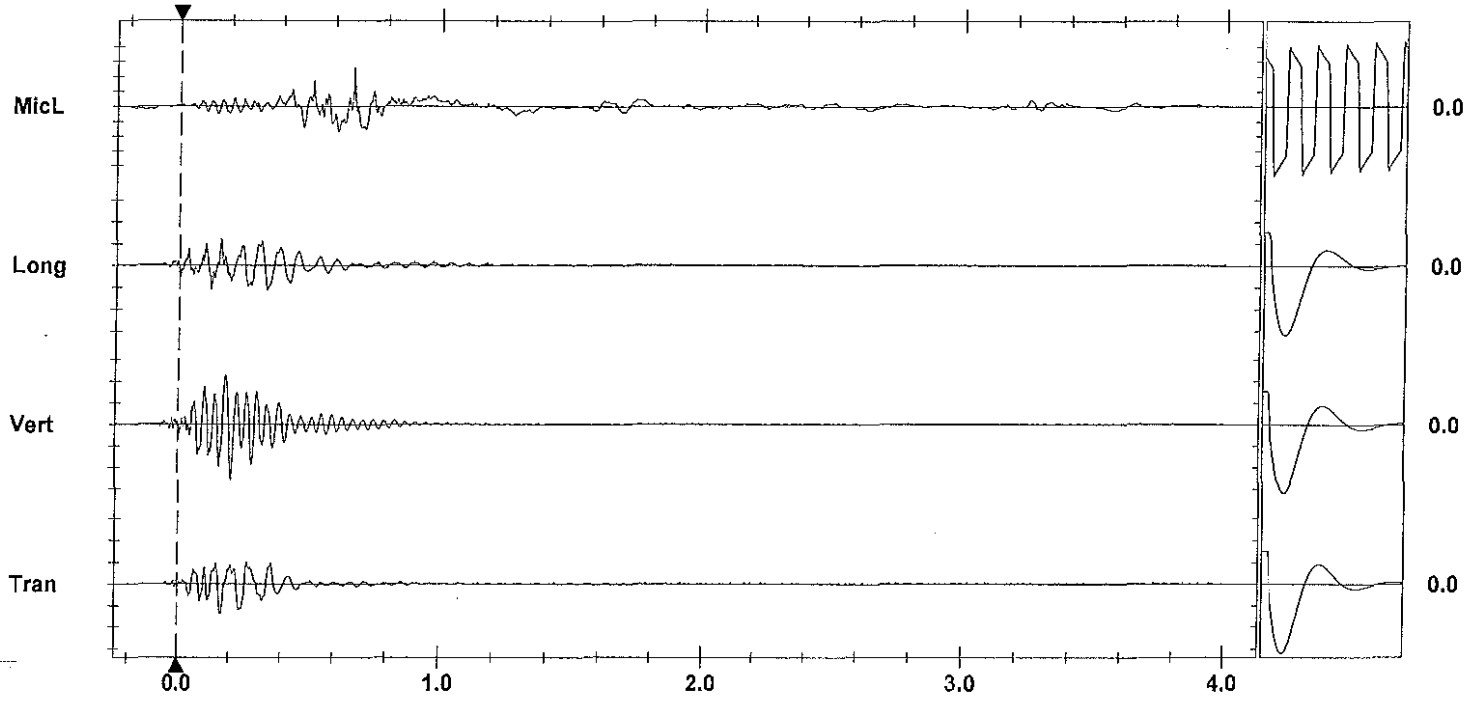
Microphone Linear Weighting
PSPL 0.00261 psi(L) at 0.670 sec
ZC Freq 34 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 631 mv)

	Tran	Vert	Long	
PPV	0.135	0.260	0.120	in/s
ZC Freq	23	26	32	Hz
Time (Rel. to Trig)	0.167	0.207	0.161	sec
Peak Acceleration	0.0663	0.133	0.0663	g
Peak Displacement	0.00133	0.00173	0.00135	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.277 in/s at 0.207 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 14/11
ACTUAL BLAST DATE Nov 14/11 12:20 PM
BLAST # MW-001

HIGHWAY # 97
BLAST LOCATION AT: SHN 128+25 - 128+37

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Layered Greywacke
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 15 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 75 (mm)
HOLE SPACING 2.2 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

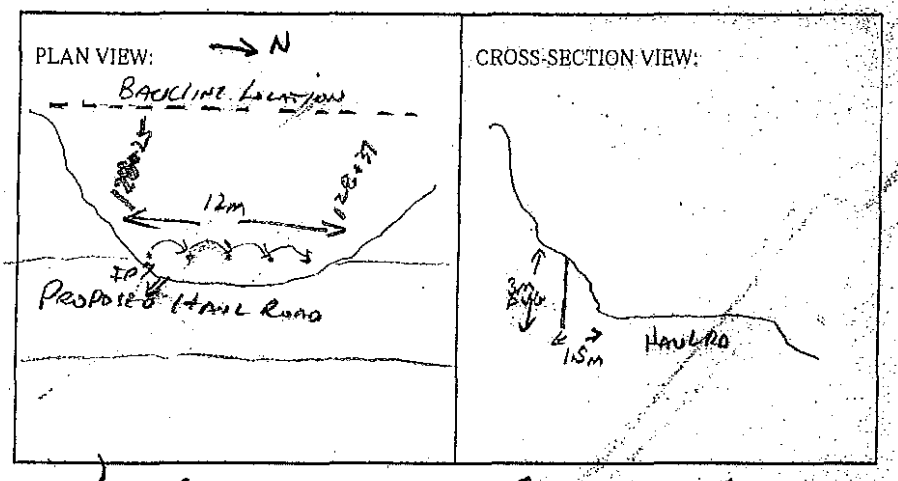
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Panel Pattern
BLASTING MACHINE: TYPE HD 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

* Seismographs @ 13050 ALD Mission Rd - 0.14 mm/s / 30.0 Hz
- 13033 Cliff Lake Court - 0.19 mm/s / 51 Hz

2 ANFO / Hole Primed w/ 1 each 2"x16" DYNAMITE

Instantel

Event Report

Date/Time Long at 12:20:19 November 14, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.4 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E0T6.9V0

Notes
location:on bedrock 15m NW of 13050 Old Mission Road
User Name:W Verwey
General:Blast at Stn 128+25

Extended Notes

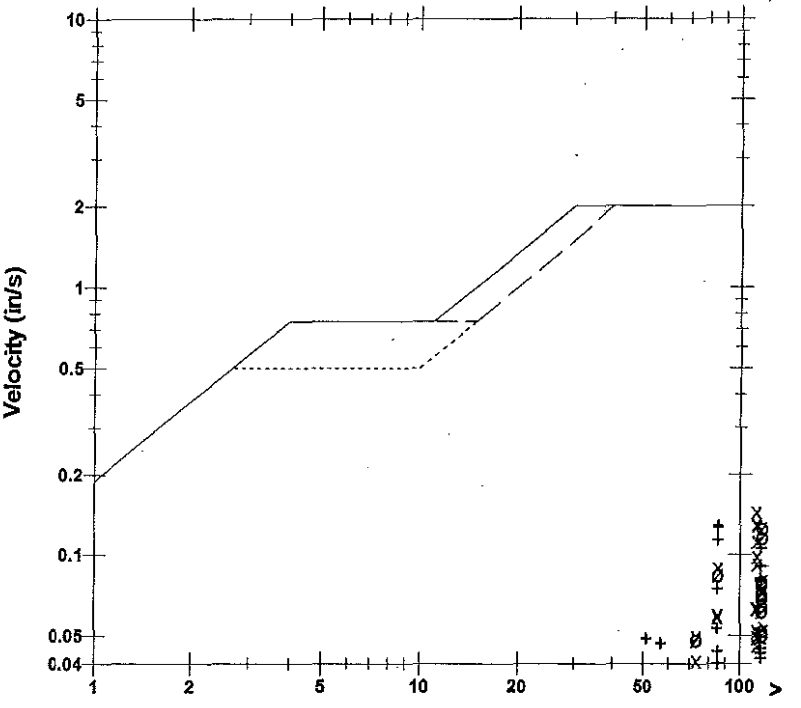
Post Event Notes

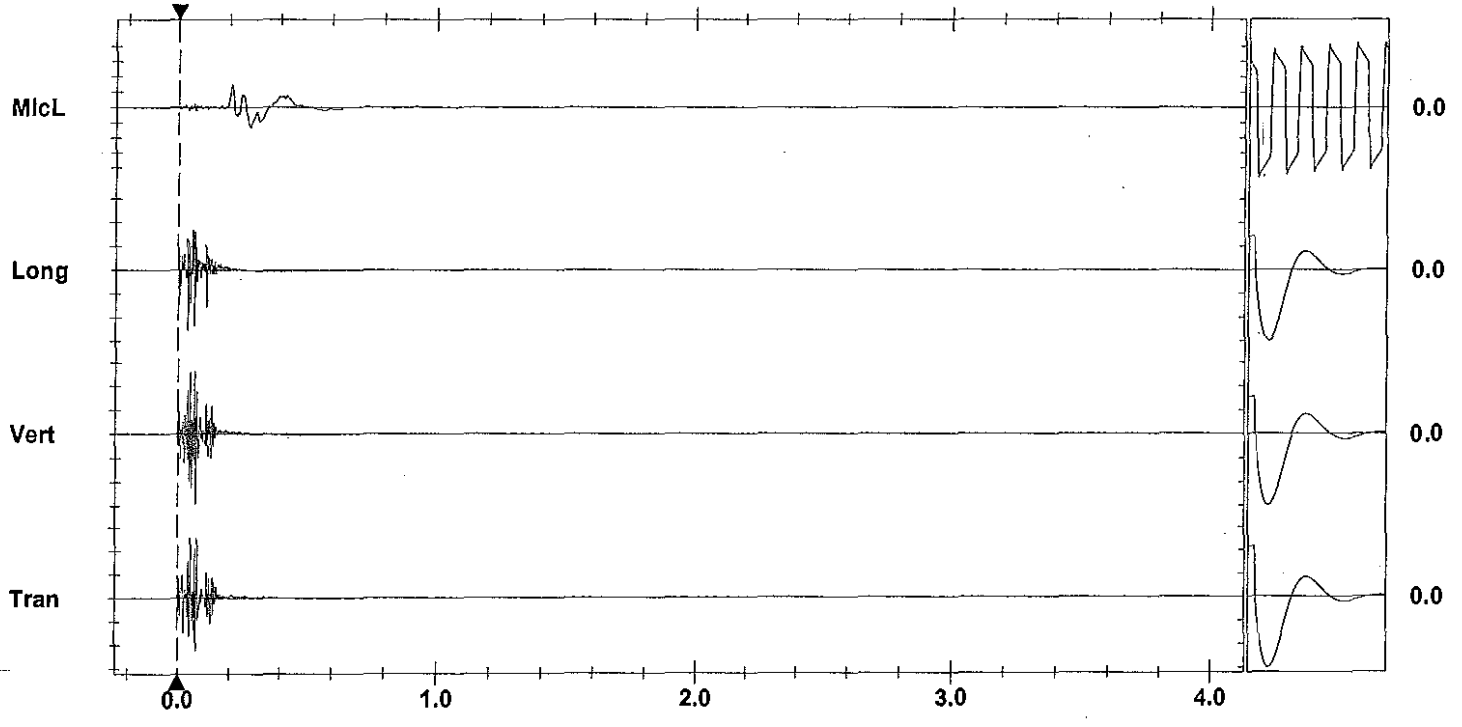
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.206 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 672 mv)

	Tran	Vert	Long	
PPV	0.128	0.146	0.126	in/s
ZC Freq	85	>100	>100	Hz
Time (Rel. to Trig)	0.052	0.071	0.040	sec
Peak Acceleration	0.282	0.249	0.219	g
Peak Displacement	0.00022	0.00025	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.6	7.7	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.189 in/s at 0.066 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time Long at 12:20:14 November 14, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E0T6.9Q0

Notes
location:13073 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

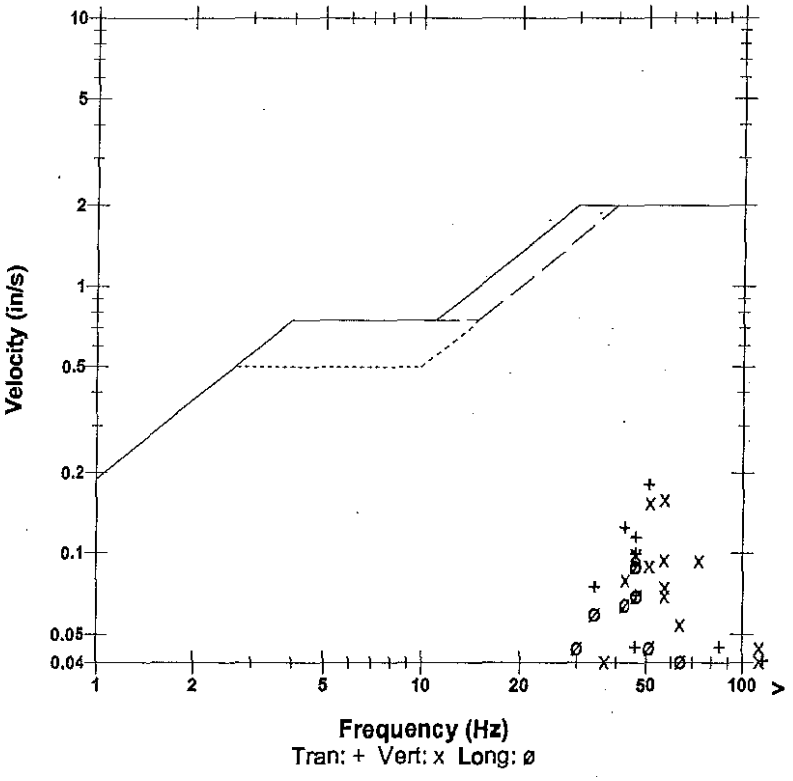
Extended Notes
Blast at stn 128+25

Post Event Notes

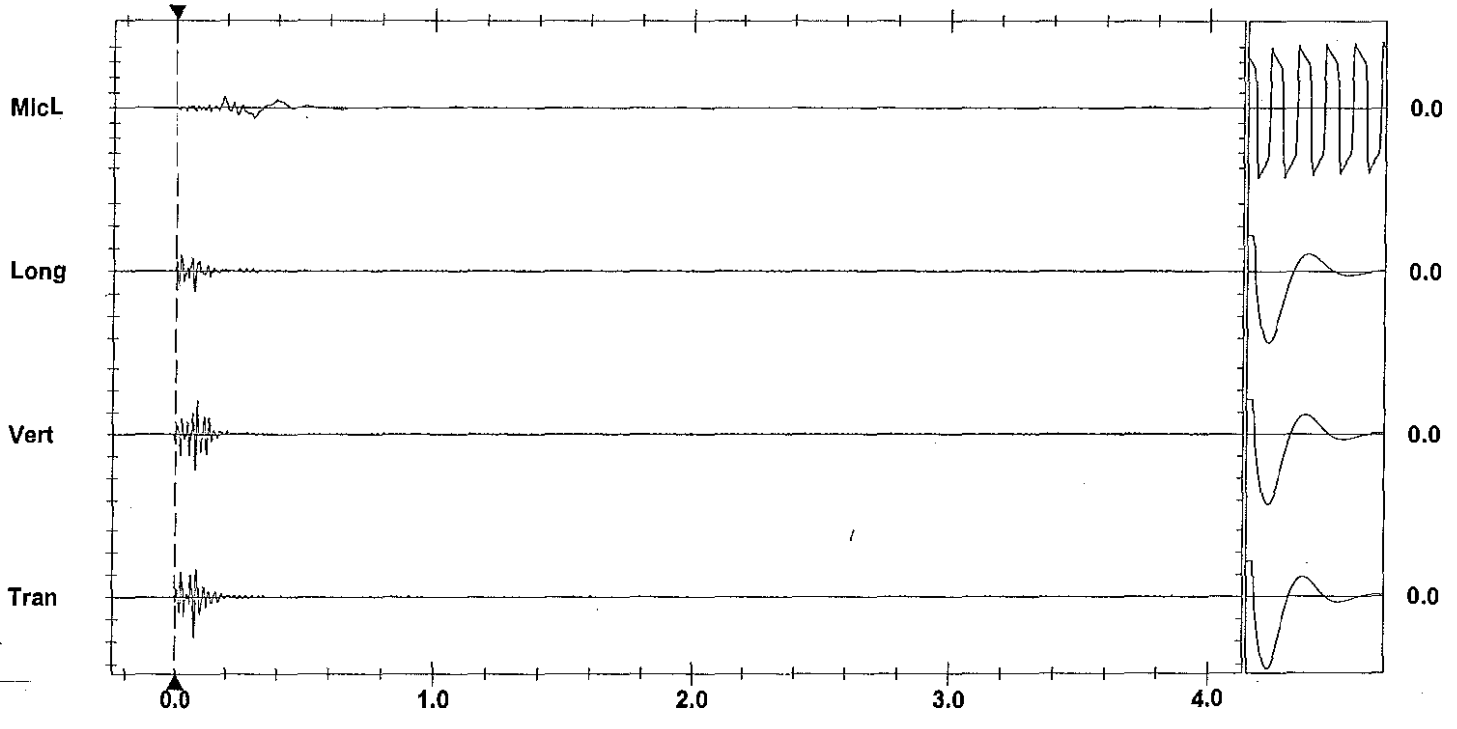
Microphone Linear Weighting
PSPL 0.00073 psi(L) at 0.187 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 610 mv)

	Tran	Vert	Long	
PPV	0.180	0.160	0.0900	in/s
ZC Freq	51	57	47	Hz
Time (Rel. to Trig)	0.077	0.079	0.073	sec
Peak Acceleration	0.159	0.146	0.0663	g
Peak Displacement	0.00055	0.00046	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.6	4.2	

USBM RI8507 And OSMRE



Peak Vector Sum 0.213 in/s at 0.078 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: November 20, 2011 (V 8.01 - 8.01)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Downey
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED NOV 14/11
ACTUAL BLAST DATE Nov 14/11 1:37 PM
BLAST # NW-002

HIGHWAY # 97
BLAST LOCATION AT: STN 128+495 - 128+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * 5 HOLE MISSED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 75 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamex + Anfo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 18.1 (kg)
DELAY TYPE AND LENGTH 17 + 25 (ms)

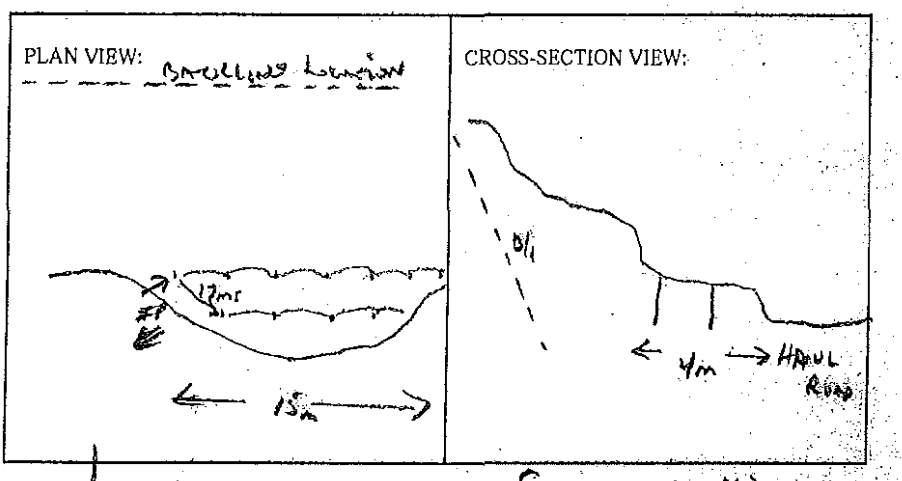
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBE Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



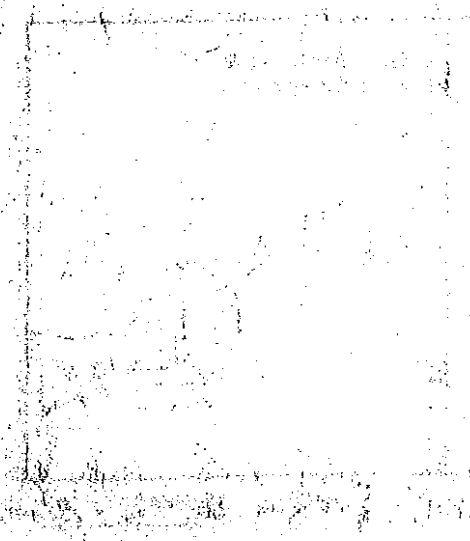
BLASTER'S SIGNATURE Wayne Downey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismographs @ - 13050 DCO Mission Rd - 0.130 ips / >100Hz
- 13073 Clifton Crt. - 0.14 ips / 47Hz

1 Coer 2x16" dynamite/hole à l'ANFO



Instantel

Event Report

Date/Time Long at 13:37:36 November 14, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.1 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E0T9.UO0

Notes
location:13073 Cliffstone Crt on rear patio slab sandbagged
User Name: james m
General:

Extended Notes
Blast at stn 128+25

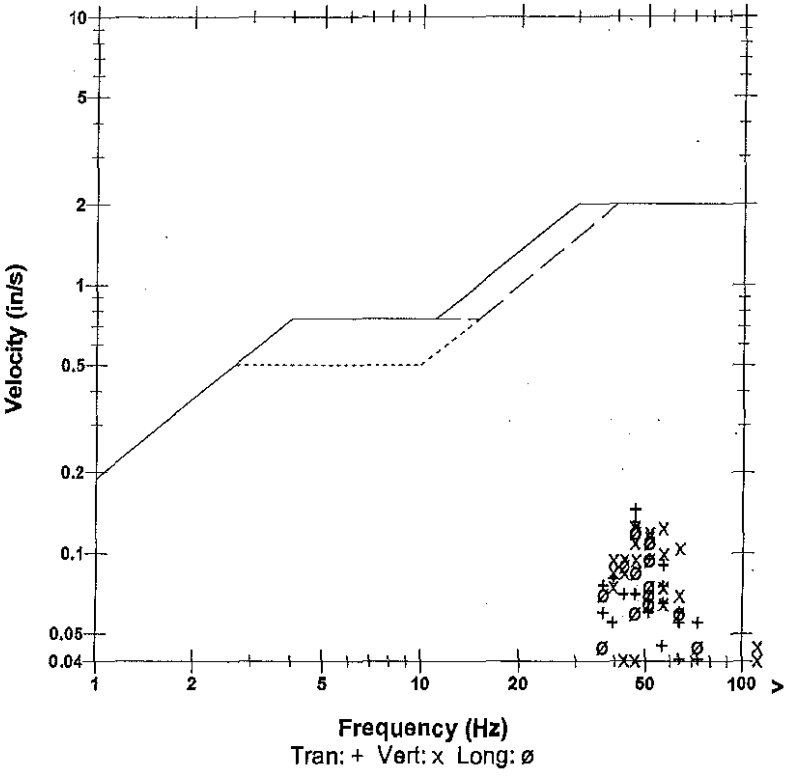
Post Event Notes

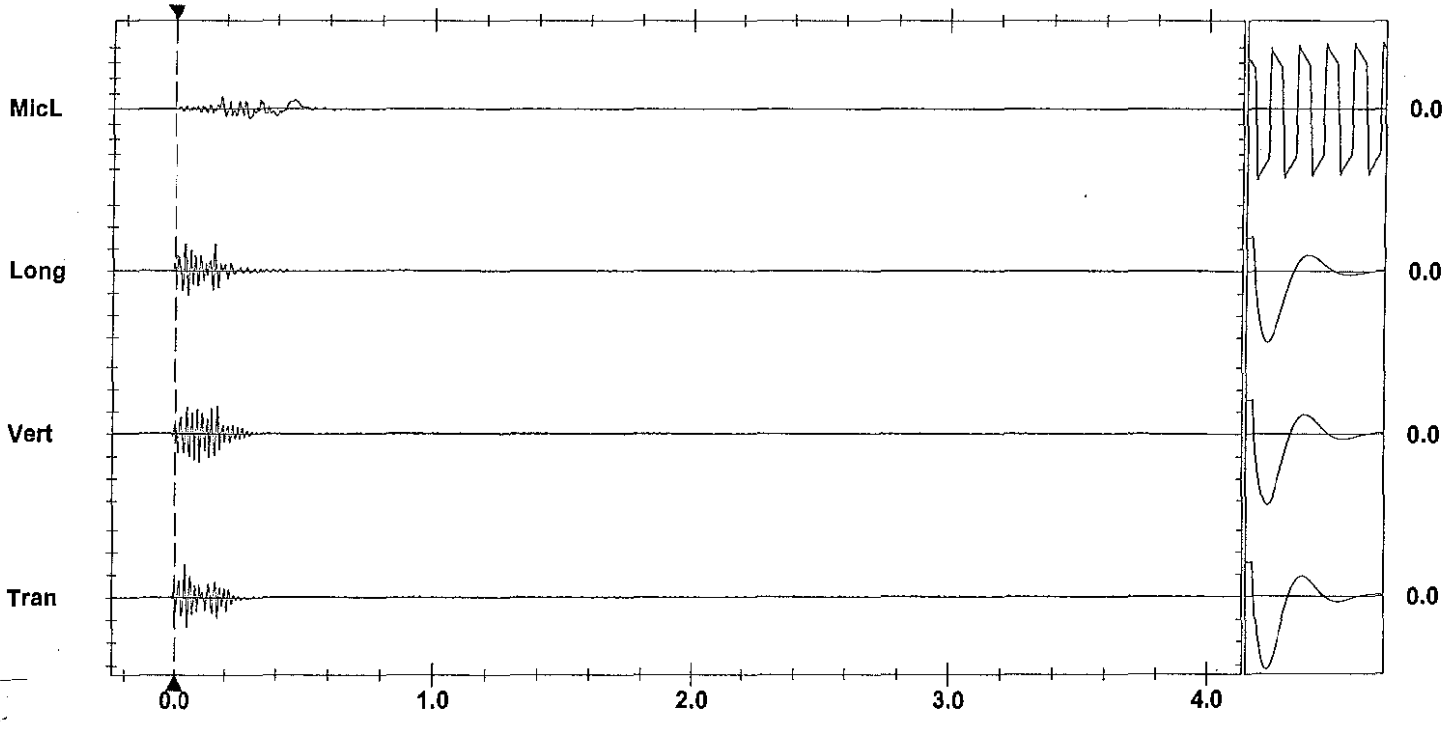
Microphone Linear Weighting
PSPL 0.00080 psi(L) at 0.183 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 650 mv)

	Tran	Vert	Long	
PPV	0.145	0.125	0.120	in/s
ZC Freq	47	57	47	Hz
Time (Rel. to Trig)	0.043	0.099	0.040	sec
Peak Acceleration	0.119	0.133	0.106	g
Peak Displacement	0.00043	0.00040	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.176 in/s at 0.042 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: November 20, 2011 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time Long at 13:37:41 November 14, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E0T9.UT0

Notes
location:on bedrock 15m NW of 13050 Old Mission Road
User Name:W Verwey
General:Blast at Stn 128+25

Extended Notes

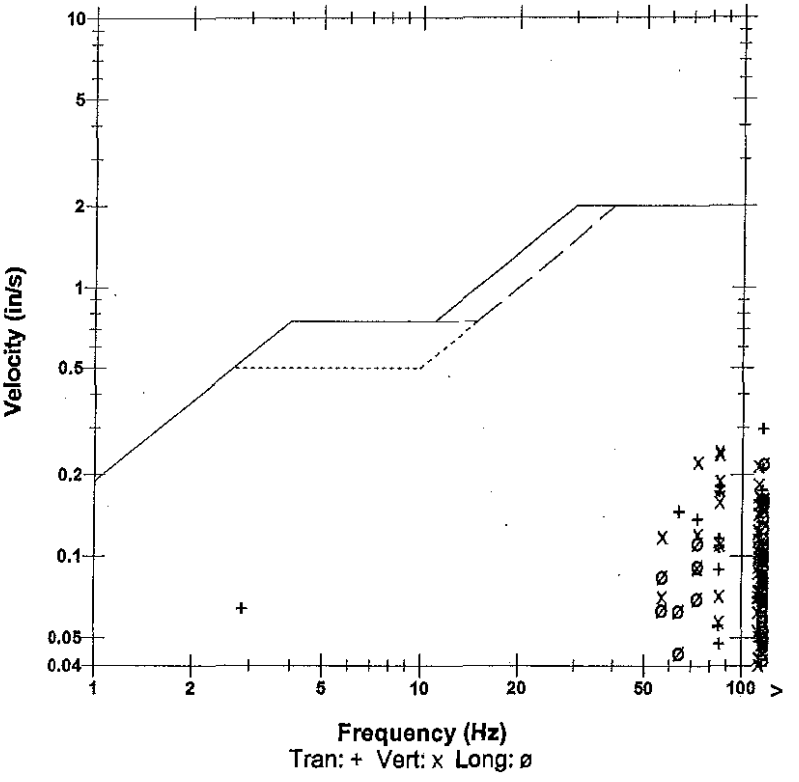
Post Event Notes

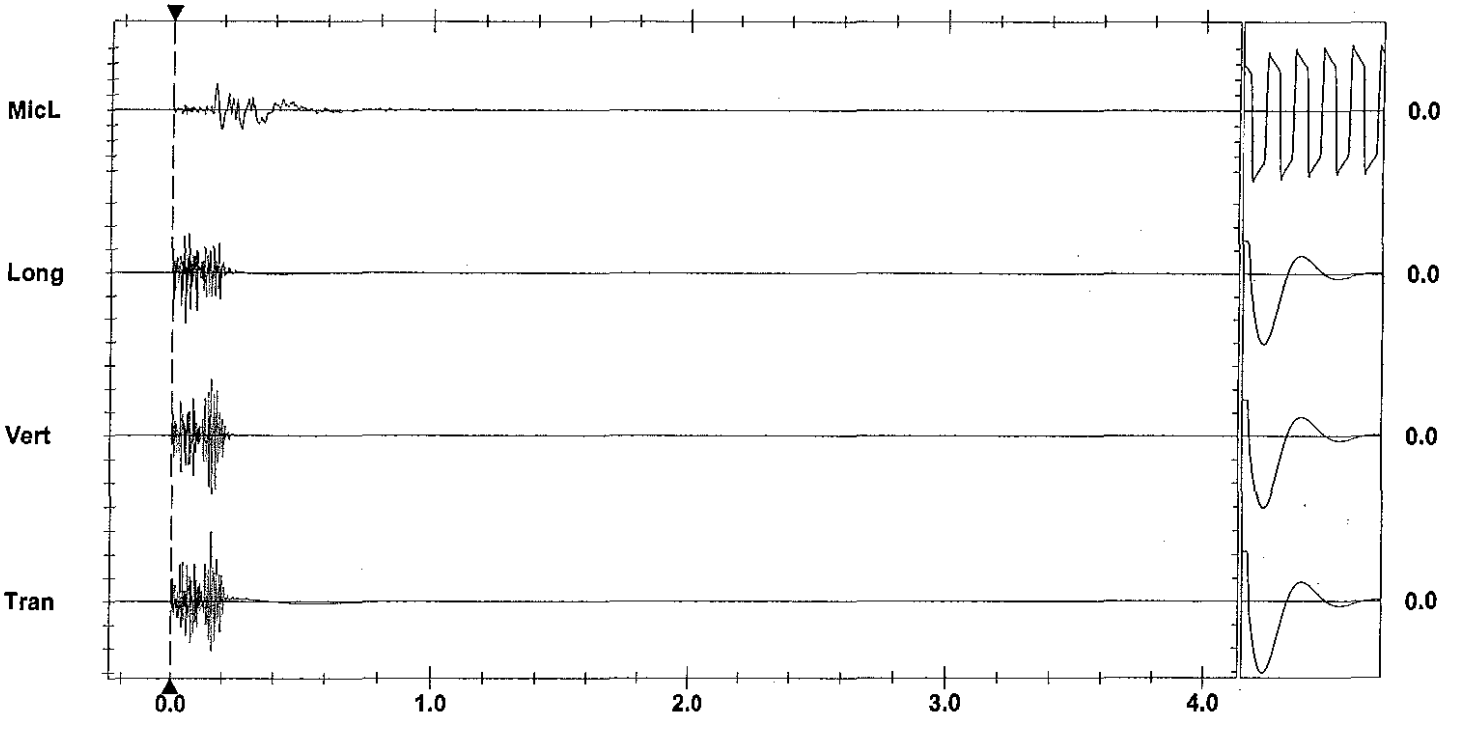
Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.170 sec
ZC Freq 26 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 705 mv)

	Tran	Vert	Long	
PPV	0.296	0.247	0.221	in/s
ZC Freq	>100	85	>100	Hz
Time (Rel. to Trig)	0.154	0.159	0.052	sec
Peak Acceleration	0.477	0.469	0.413	g
Peak Displacement	0.00103	0.00047	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.393 in/s at 0.154 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: November 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veenman
BLASTER'S CERTIFICATE NUMBER 5034489

DATE PREPARED Nov 14/11
ACTUAL BLAST DATE Nov 14/11 4:44 pm
BLAST # MCW-003

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+00 - 129+10

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.8 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 75 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + AN-FO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 18 (kg)
DELAY TYPE AND LENGTH 25 (ms)

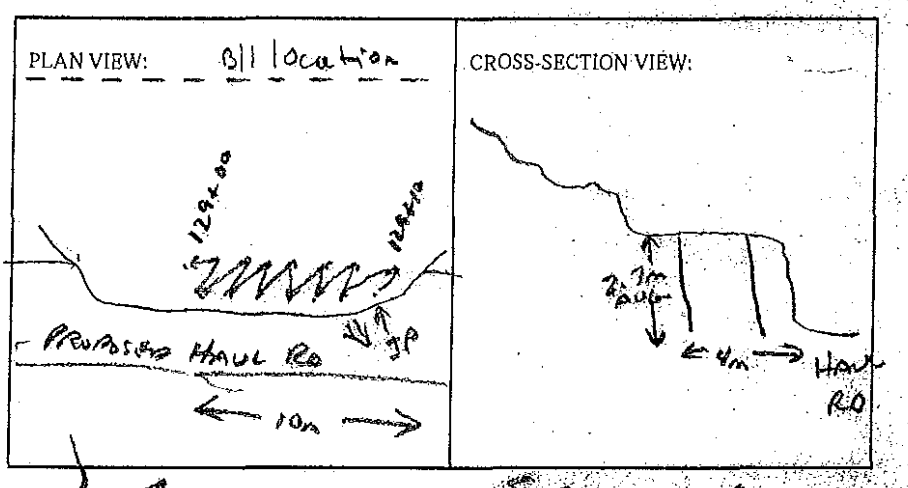
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 32-4 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Veenman COMPANY Sierra B+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph - 13050 Transmission Rd - 0.17 in/s > 100 Hz
- 13093 Cliffstone Ct - 0.095 in/s / 64 Hz

1 CAST 2x16" DYNAMITE/HOLE & 0.5' ANFO

Instantel

Event Report

Date/Time Vert at 16:44:53 November 14, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E0TI.IT0

Notes
location:13093 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

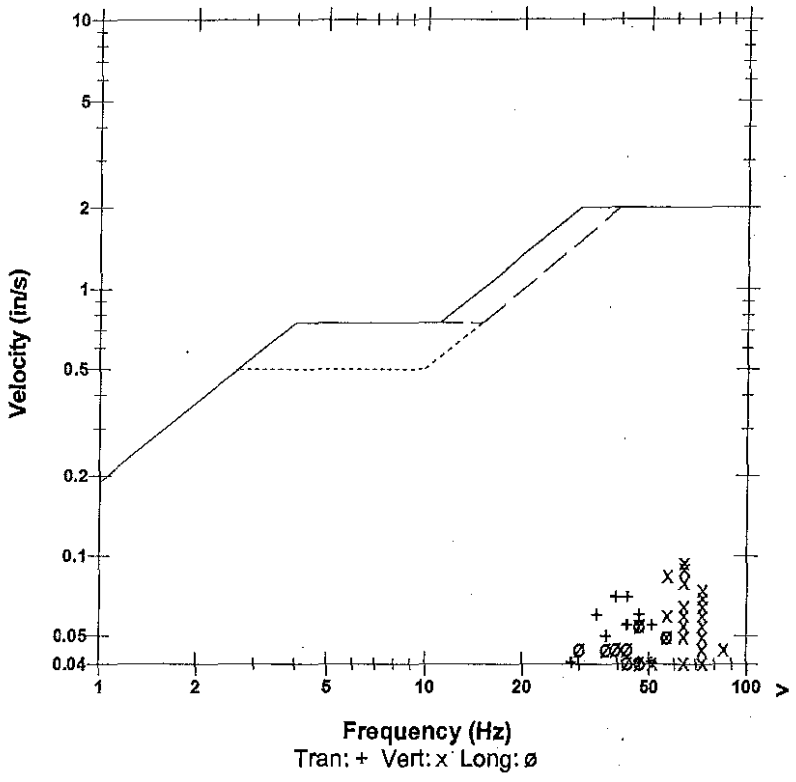
Extended Notes
Blast at stn 129

Post Event Notes

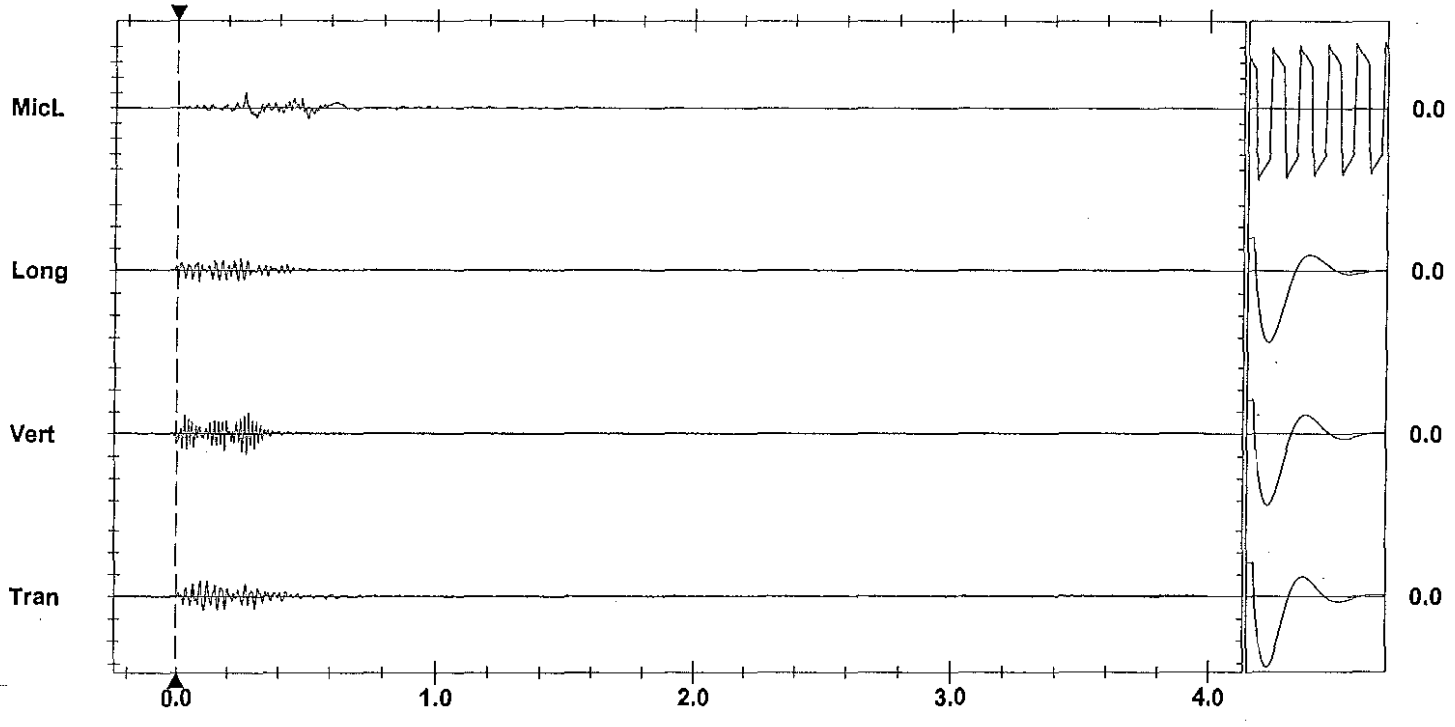
Microphone Linear Weighting
PSPL 0.00098 psi(L) at 0.266 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 751 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0950	0.0550	in/s
ZC Freq	43	64	47	Hz
Time (Rel. to Trig)	0.096	0.285	0.250	sec
Peak Acceleration	0.0530	0.106	0.0530	g
Peak Displacement	0.00030	0.00024	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.101 in/s at 0.285 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Tran at 16:44:59 November 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo: 1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E0TI.IZ0
Job Number:	1		

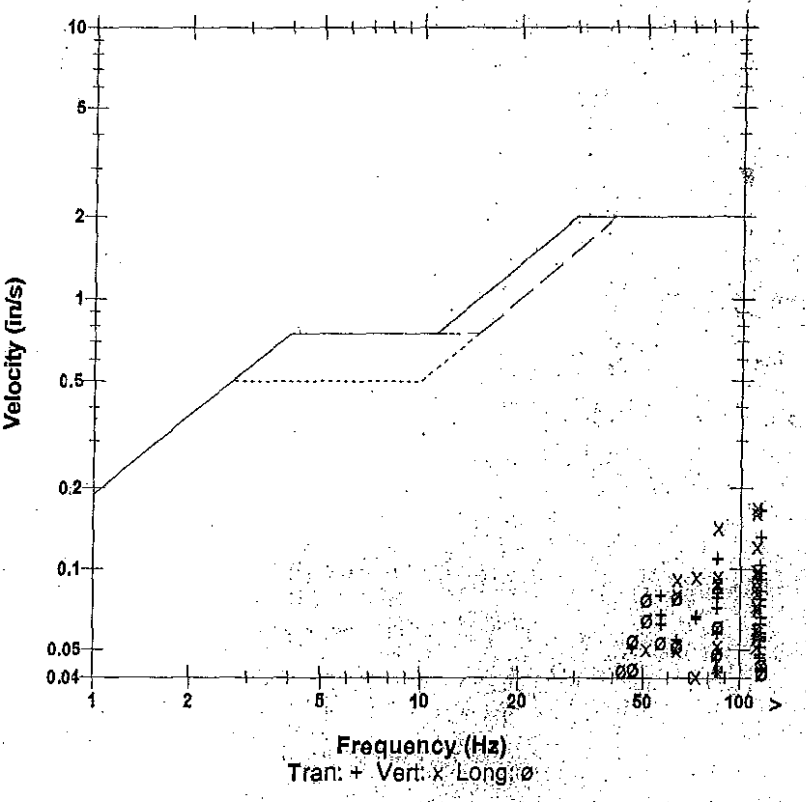
Notes

location:on bedrock	15m NW of 13050 Old
Mission Road	
User Name:W Verwey	
General Blast at Stn	128+25

Extended Notes

Post Event Notes

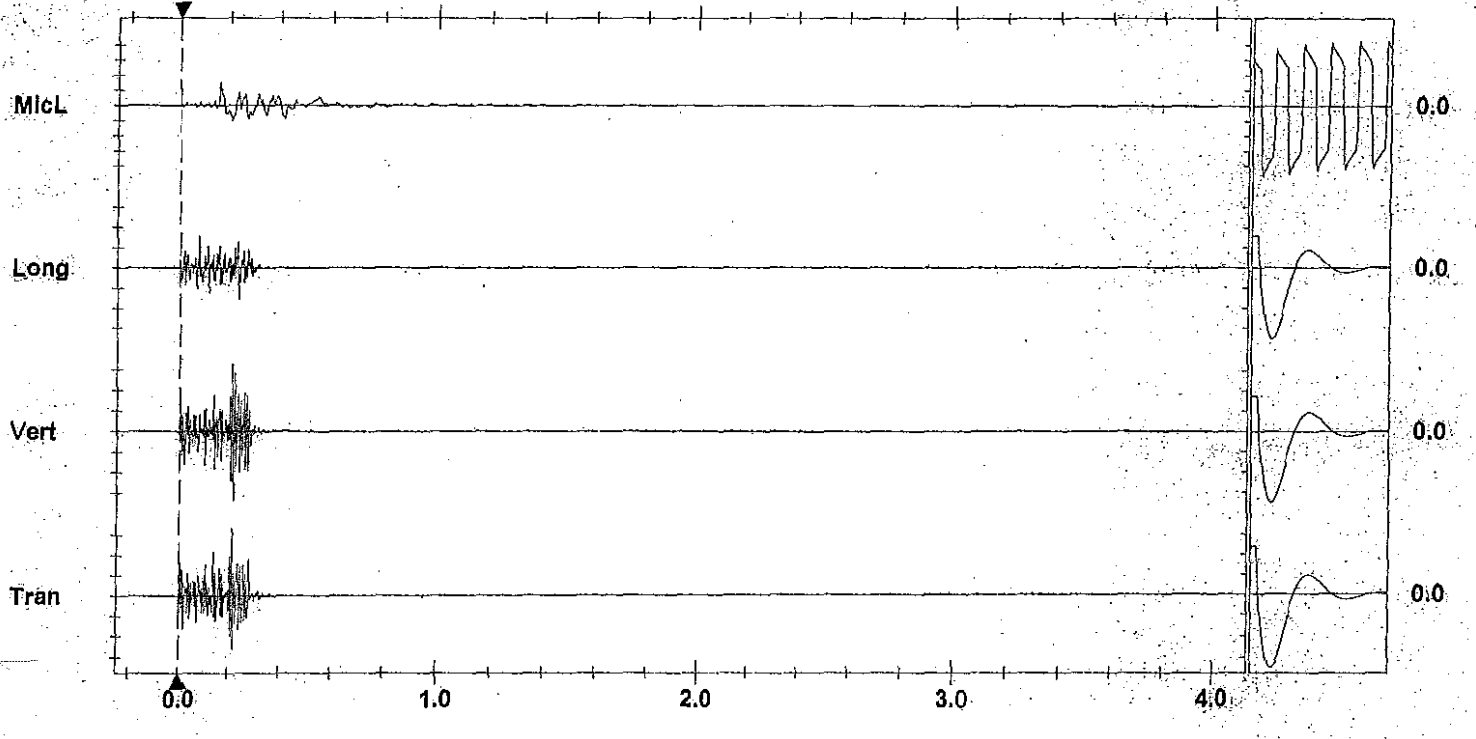
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.160 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 741 mv)

	Tran	Vert	Long	
PPV	0.165	0.170	0.0787	in/s
ZC Freq	>100	>100	64	Hz
Time (Rel. to Trig)	0.215	0.220	0.079	sec
Peak Acceleration	0.317	0.278	0.144	g
Peak Displacement	0.00025	0.00025	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.232 in/s at 0.215 sec



Time Scale: 0.20 sec/div **Amplitude Scale** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =▶ ——— ◀=

Sensorcheck

Printed: November 28, 2011 (V 9.01 - 9.01)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veenon
BLASTER'S CERTIFICATE NUMBER 5324 BS

DATE PREPARED Nov 16/11
ACTUAL BLAST DATE Nov 16/11 1:31 PM
BLAST # MW-004

HIGHWAY # 97
BLAST LOCATION AT: 128+90 - 129+120

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Short Manson

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 18 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite Hand
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 12 (kg)
DELAY TYPE AND LENGTH 25 (ms)

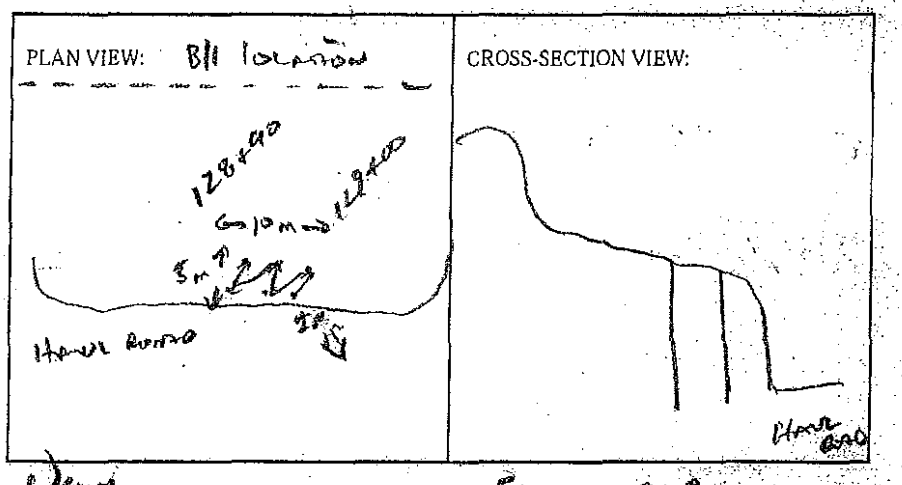
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Use minimum of Nonel Primers
BLASTING MACHINE: TYPE HB320 CAPACITY 50 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veenon COMPANY Sierra D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 130+78 cliff line ext - 0.14/1.98) 22 Hz

1 CART 2x16' DYNAMITE / HOLE +0.5' ANFO

Instantel

Event Report

Date/Time Vert at 13:31:52 November 16, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E0WY.X40

Notes
location:13093 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

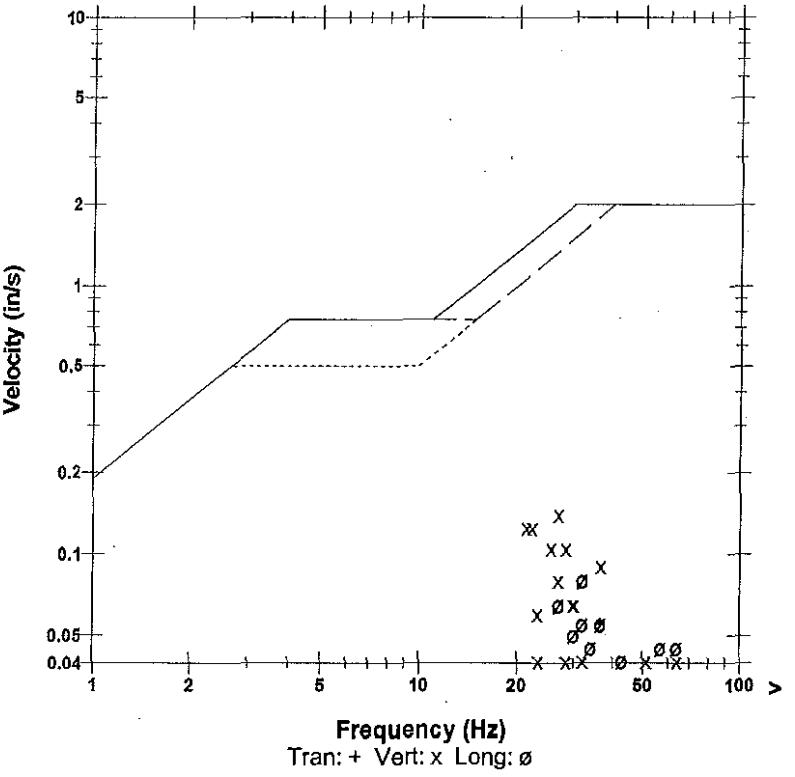
Extended Notes
Blast at stn 129

Post Event Notes

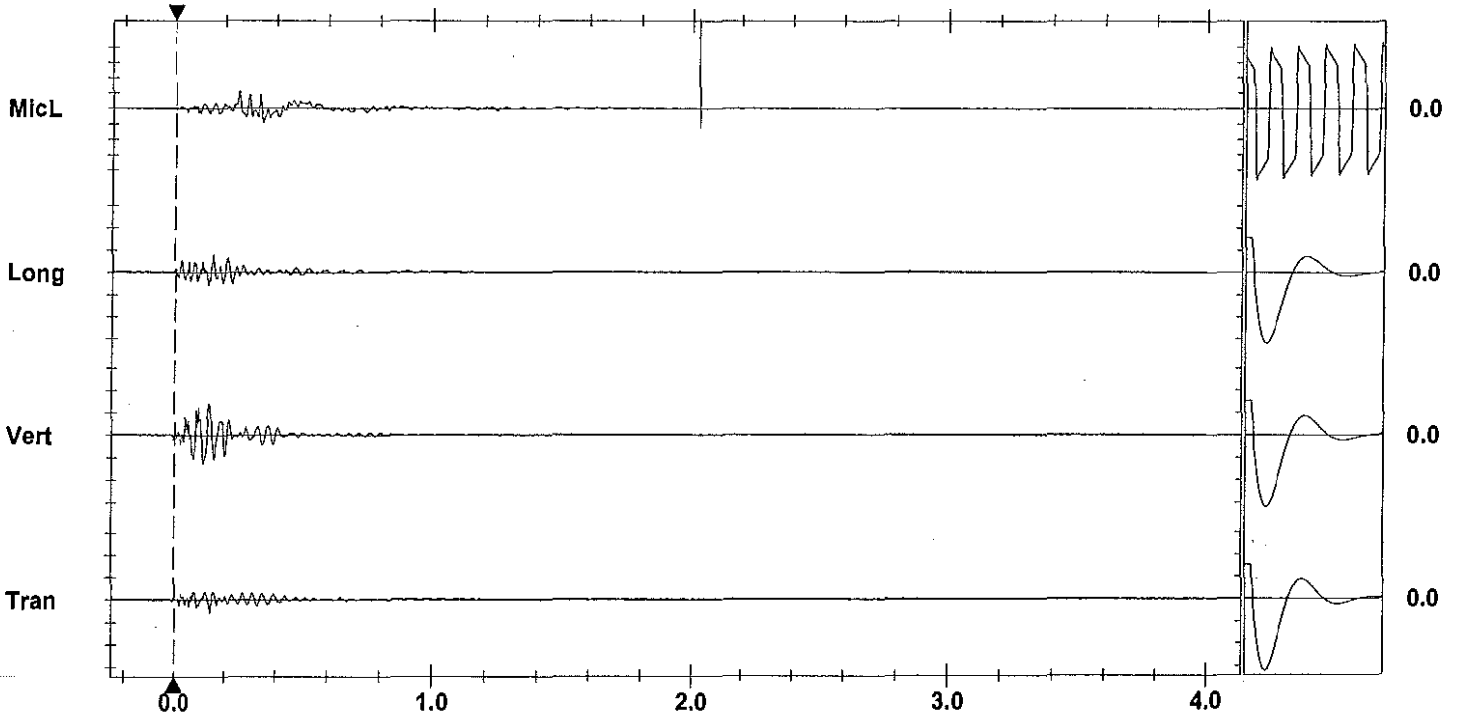
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 0.250 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 713 mv)

	Tran	Vert	Long	
PPV	0.0550	0.140	0.0800	in/s
ZC Freq	37	27	32	Hz
Time (Rel. to Trig)	0.144	0.143	0.153	sec
Peak Acceleration	0.0398	0.0795	0.0530	g
Peak Displacement	0.00021	0.00090	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.151 in/s at 0.143 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: November 20, 2011 (V 8.01 - 8.01)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vanderley
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 16/11
ACTUAL BLAST DATE Nov 16/11 2:12 pm
BLAST # MW-005

HIGHWAY# 97
BLAST LOCATION AT: 128+420 - 128+490

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: NO SHOT MARKED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 18.9 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO EXPLOSIVE SIZE 58 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7
TOTAL WEIGHT 13 (kg)
DELAY TYPE AND LENGTH 25 (ms)

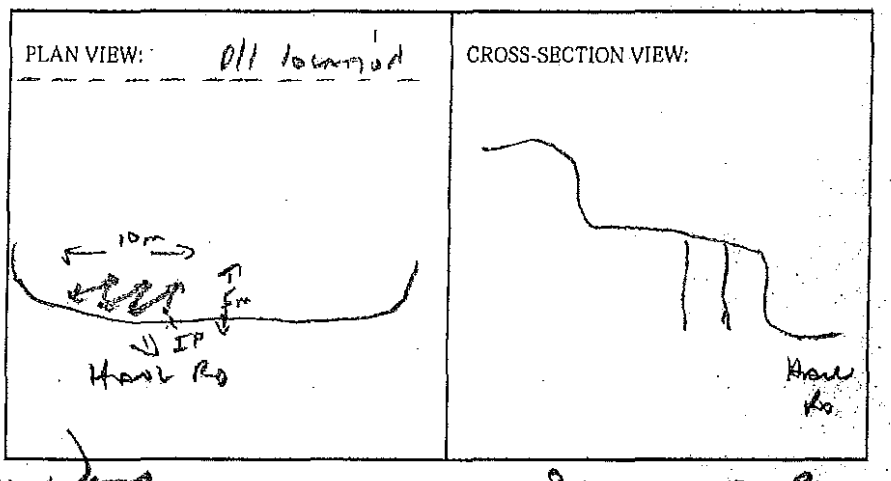
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Cable Initiation of Nonel Primers
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vanderley COMPANY Sierra Dr & B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 critical dist - 0.18 ips / 57m/L

1 CAST 2½/16" DYNAMITE / HOLE + 1' AMMO

Instantel

Event Report

Date/Time Vert at 14:12:06 November 16, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E0X0.S60

Notes
location:13093 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

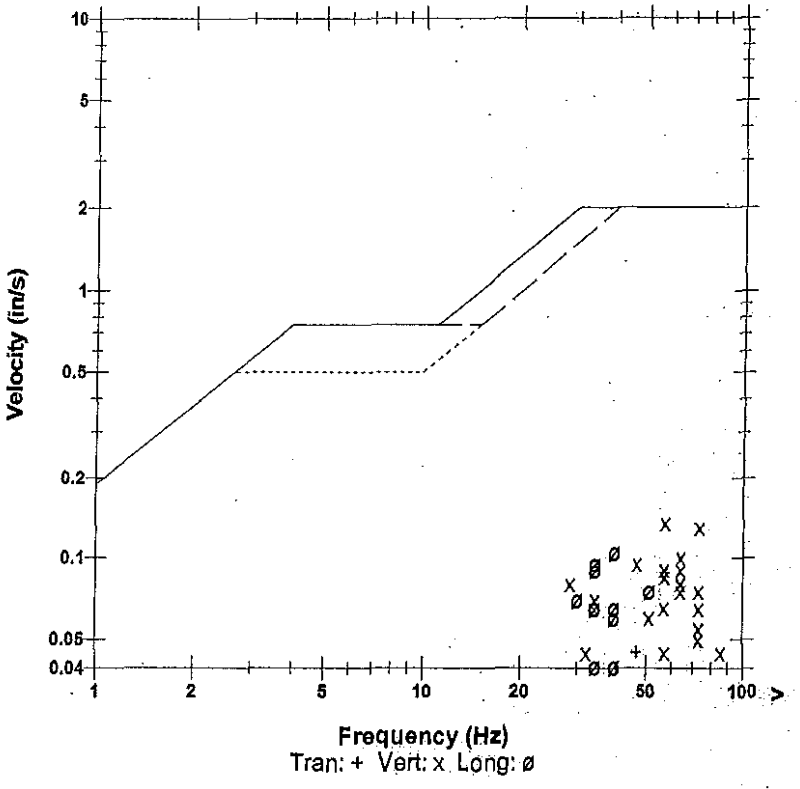
Extended Notes
Blast at stn 129

Post Event Notes

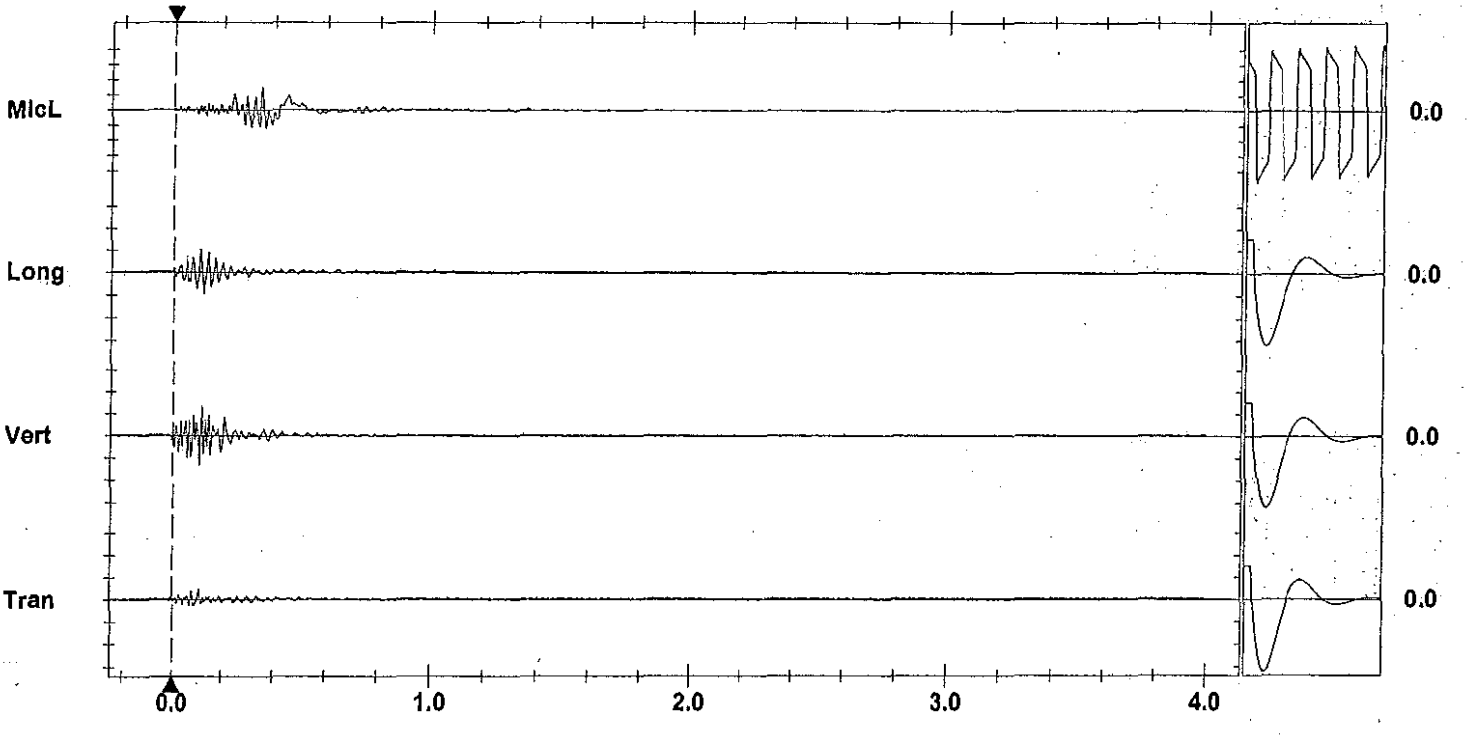
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.350 sec
ZC Freq 39 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 747 mv)

	Tran	Vert	Long	
PPV	0.0450	0.135	0.105	in/s
ZC Freq	47	57	39	Hz
Time (Rel. to Trig)	0.112	0.111	0.109	sec
Peak Acceleration	0.0398	0.146	0.0928	g
Peak Displacement	0.00014	0.00039	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.163 in/s at 0.111 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verboven
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 21/11
ACTUAL BLAST DATE Nov 21/11 1212 2PM
BLAST # MW-006

HIGHWAY# 97
BLAST LOCATION AT: 130+25 - 130+35 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ok Shot was marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 14

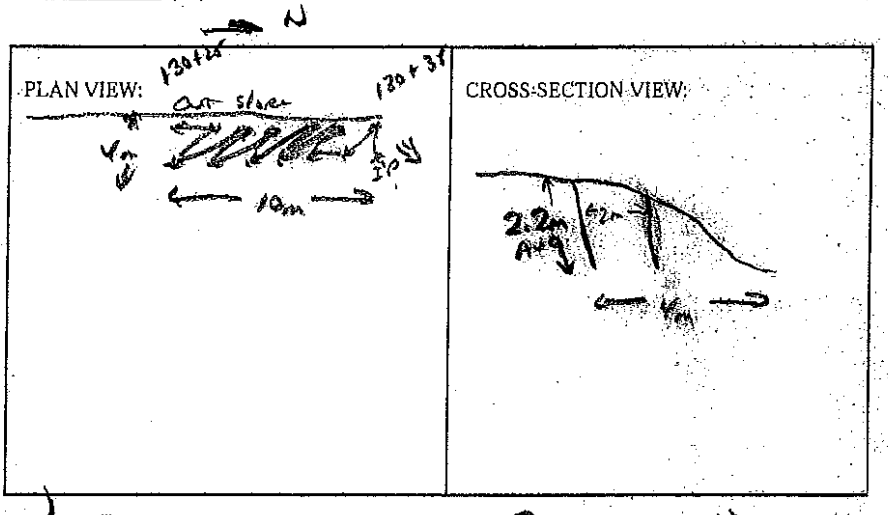
EXPLOSIVE SIZE 50 mm by 400 mm.
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESG Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 15 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismographs @ 13221 Cliffstone ext - 0.10 ips / 37Hz
AND 13167 Cliffstone ext - 0.079 ips / 57Hz

1 Bag Apple
Tchst Lyle Unimax
14 7m Exhausts
1 elec SP.

max 6.5 15c/dely

Instantel

Event Report

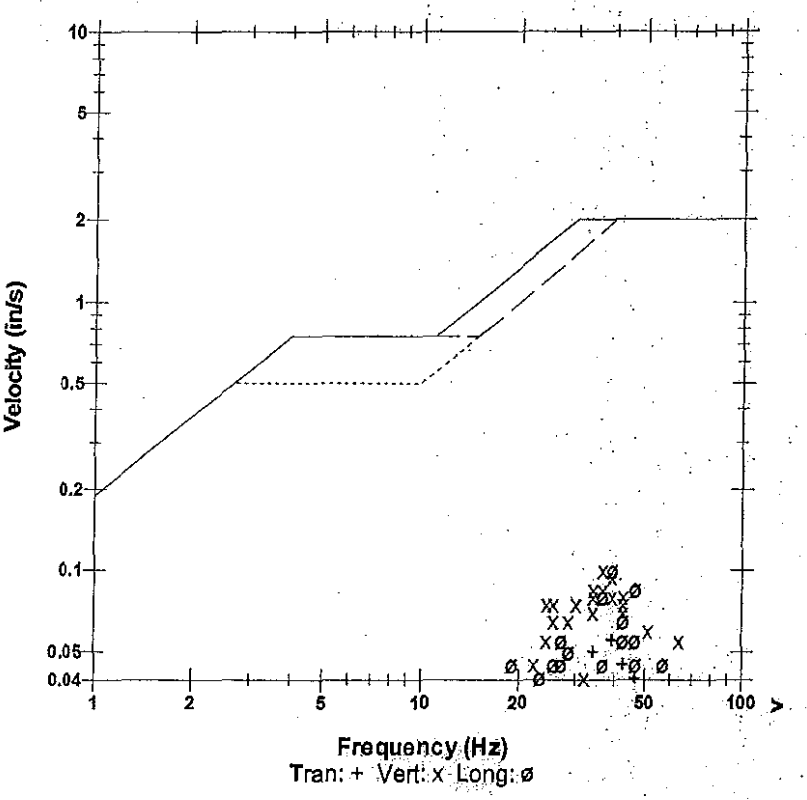
Date/Time	Vert at 12:22:58 November 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E165.2A0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

Extended Notes
Blast at stn 130 +30

Post Event Notes

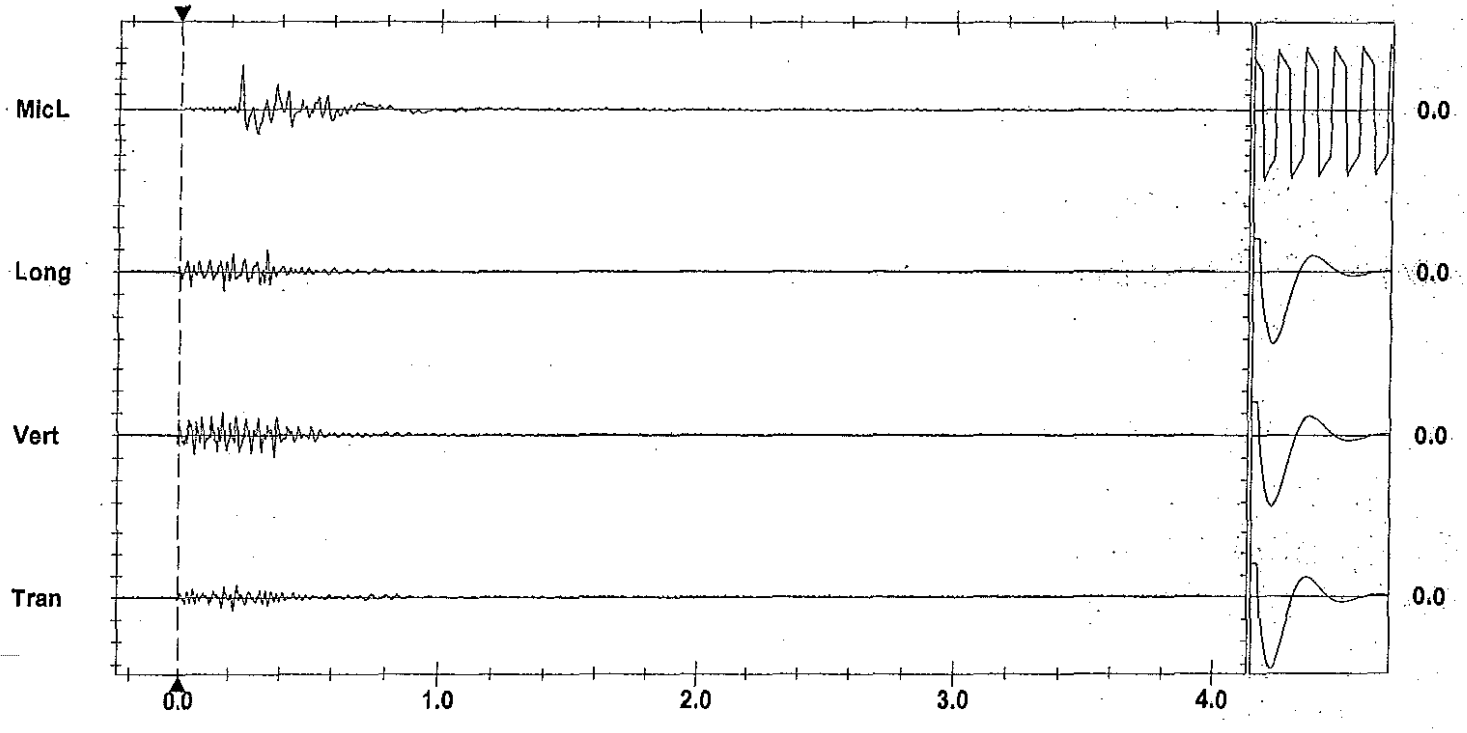
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00290 psi(L) at 0.240 sec		
ZC Freq	21 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 683 mv)		

	Tran	Vert	Long	
PPV	0.0550	0.1000	0.1000	in/s
ZC Freq	39	37	39	Hz
Time (Rel. to Trig)	0.219	0.177	0.346	sec
Peak Acceleration	0.0530	0.0795	0.0663	g
Peak Displacement	0.00023	0.00041	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.137 in/s at 0.177 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 00:22:57 November 22, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E172.E90
Job Number:	1		

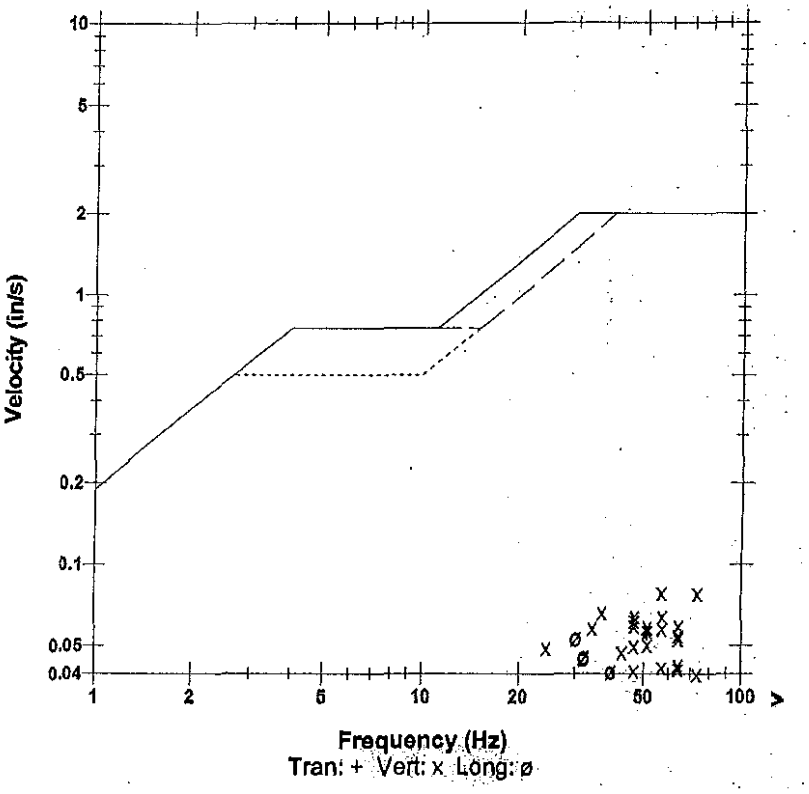
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+30

Extended Notes

Post Event Notes

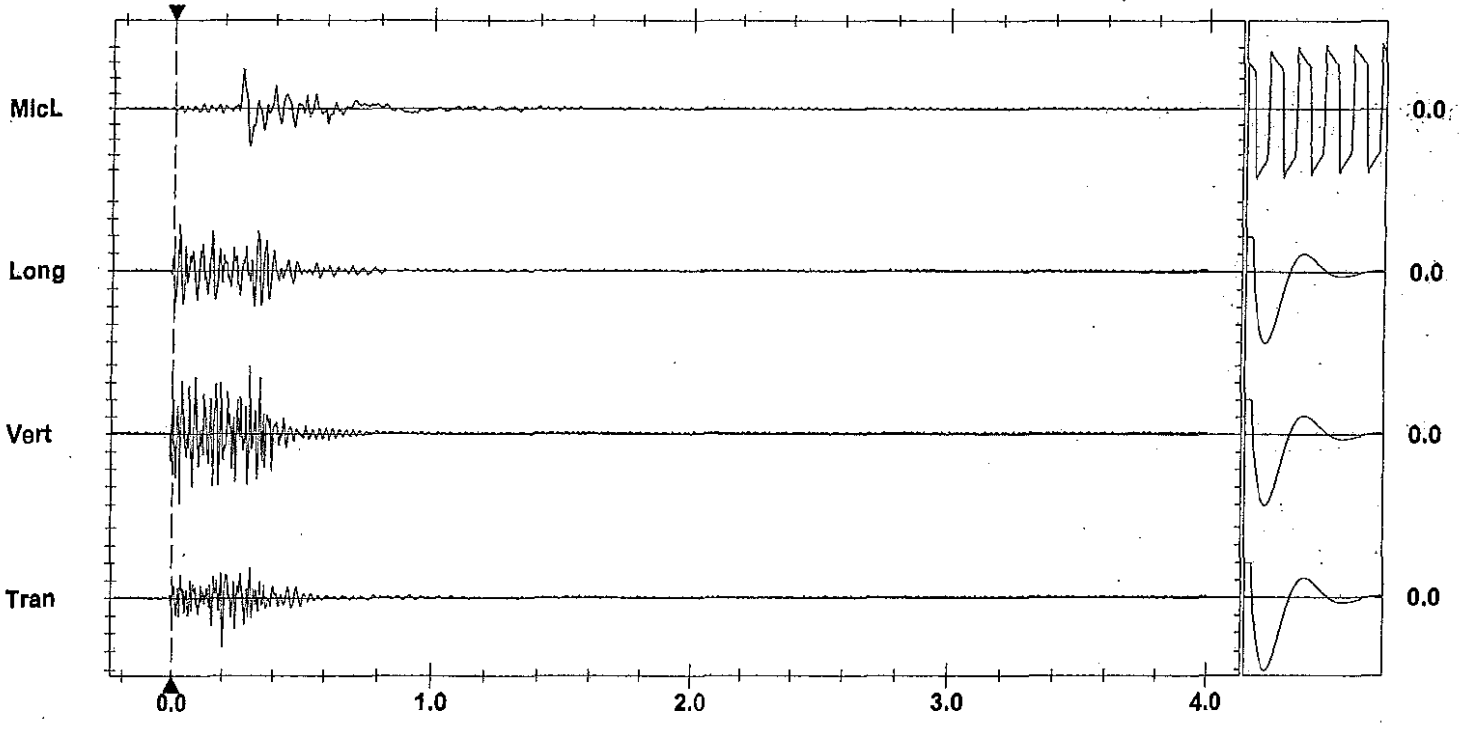
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00254 psi(L) at 0.271 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 693 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0787	0.0531	in/s
ZC Freq	51	57	30	Hz
Time (Rel. to Trig)	0.201	0.309	0.022	sec
Peak Acceleration	0.0497	0.0978	0.0481	g
Peak Displacement	0.00016	0.00024	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.0867 in/s at 0.309 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶— — — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vickery
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Nov 21/11
ACTUAL BLAST DATE Nov 21/11 1:48 PM
BLAST # MW-007

HIGHWAY# 97
BLAST LOCATION AT: 130+20 - 130+25 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ← Shot was marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) _____ (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 2.9 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 6 BLL + 9 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

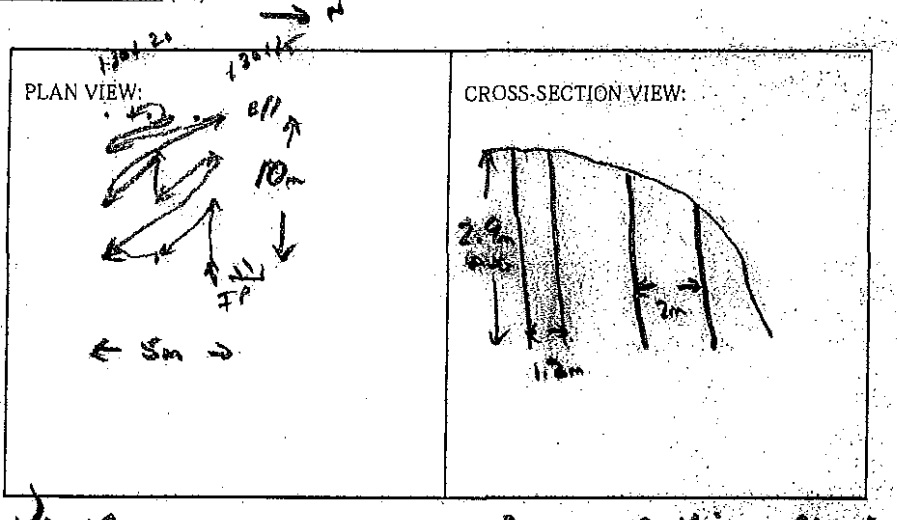
INITIATION DEVICE: (GIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HD320 CAPACITY 8 Decks

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



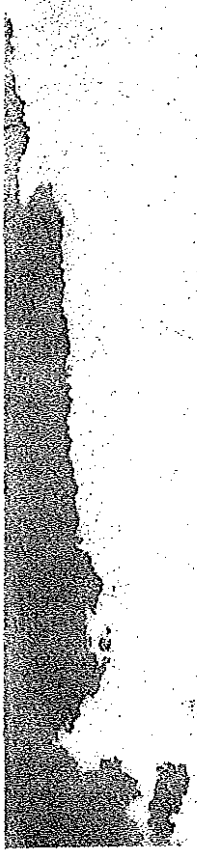
BLASTER'S SIGNATURE Wayne Vickery COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismographs @ 13221 cliffstone ext - 0.22 ips / 43 Hz
AND 13167 cliffstone ext - 0.16 ips / 43 Hz

max. 7.5 lb/delay



Instantel

Event Report

Date/Time	Tran at 01:48:13 November 22, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E176.CD0
Job Number:	1		

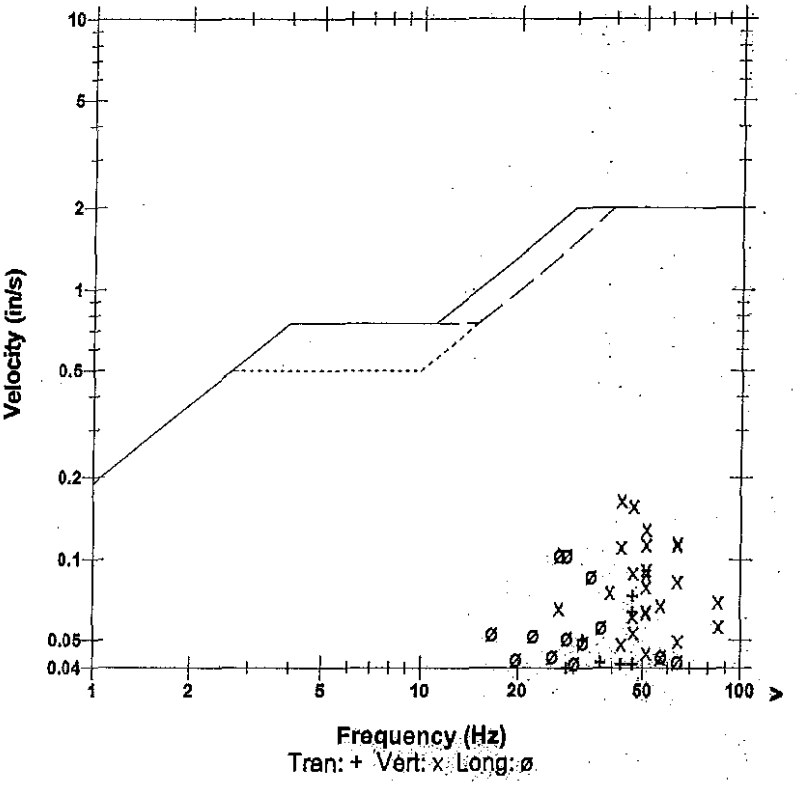
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+30

Extended Notes

Post Event Notes

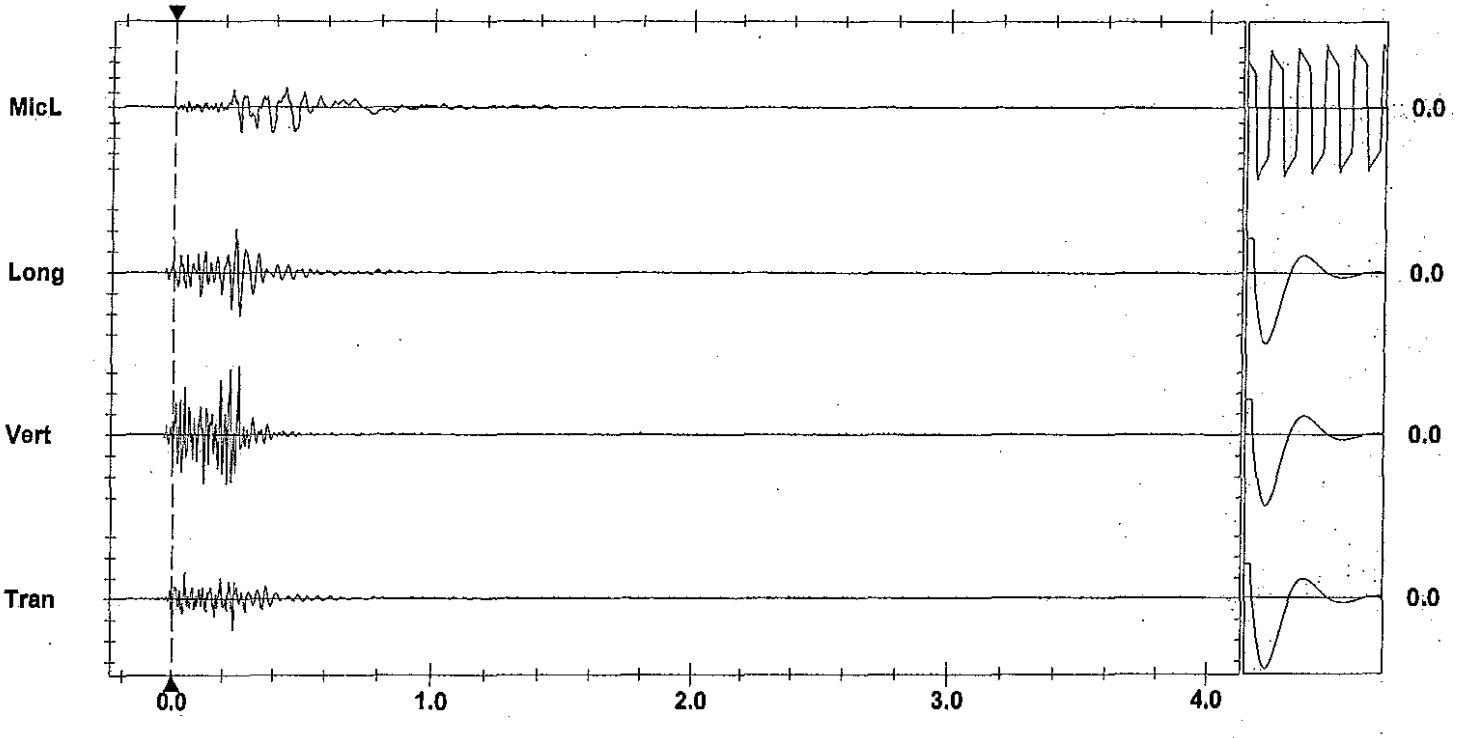
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.382 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 700 mv)

	Tran	Vert	Long	
PPV	0.0731	0.165	0.104	in/s
ZC Freq	47	43	28	Hz
Time (Rel. to Trig)	0.240	0.261	0.248	sec
Peak Acceleration	0.0696	0.162	0.0646	g
Peak Displacement	0.00023	0.00057	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.187 in/s at 0.262 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Instantel

Event Report

Date/Time Vert at 13:48:14 November 21, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E169.0E0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name: james m
General:

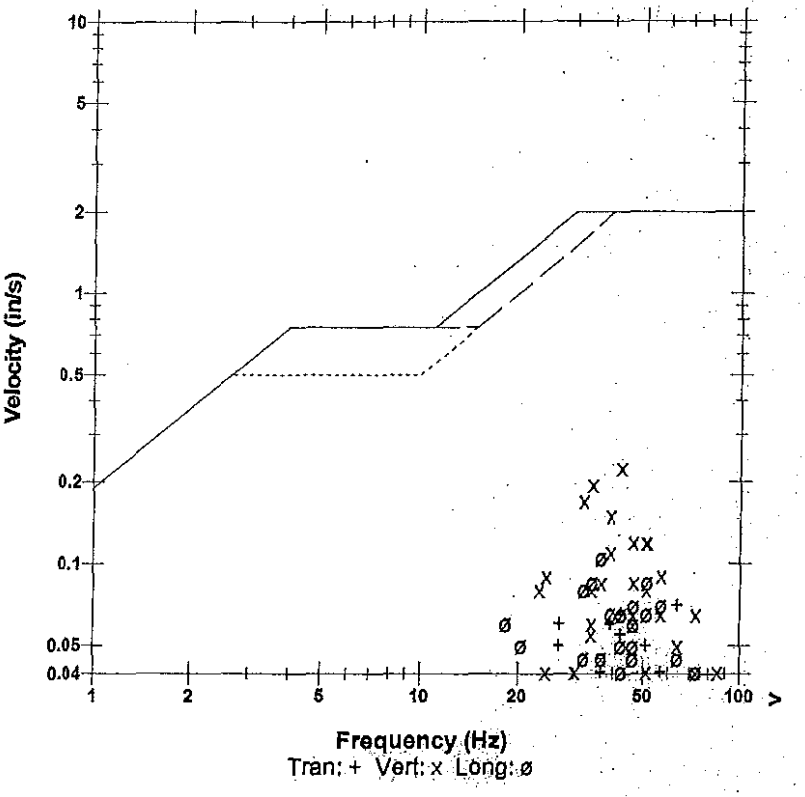
Extended Notes
Blast at stn 130 +30

Post Event Notes

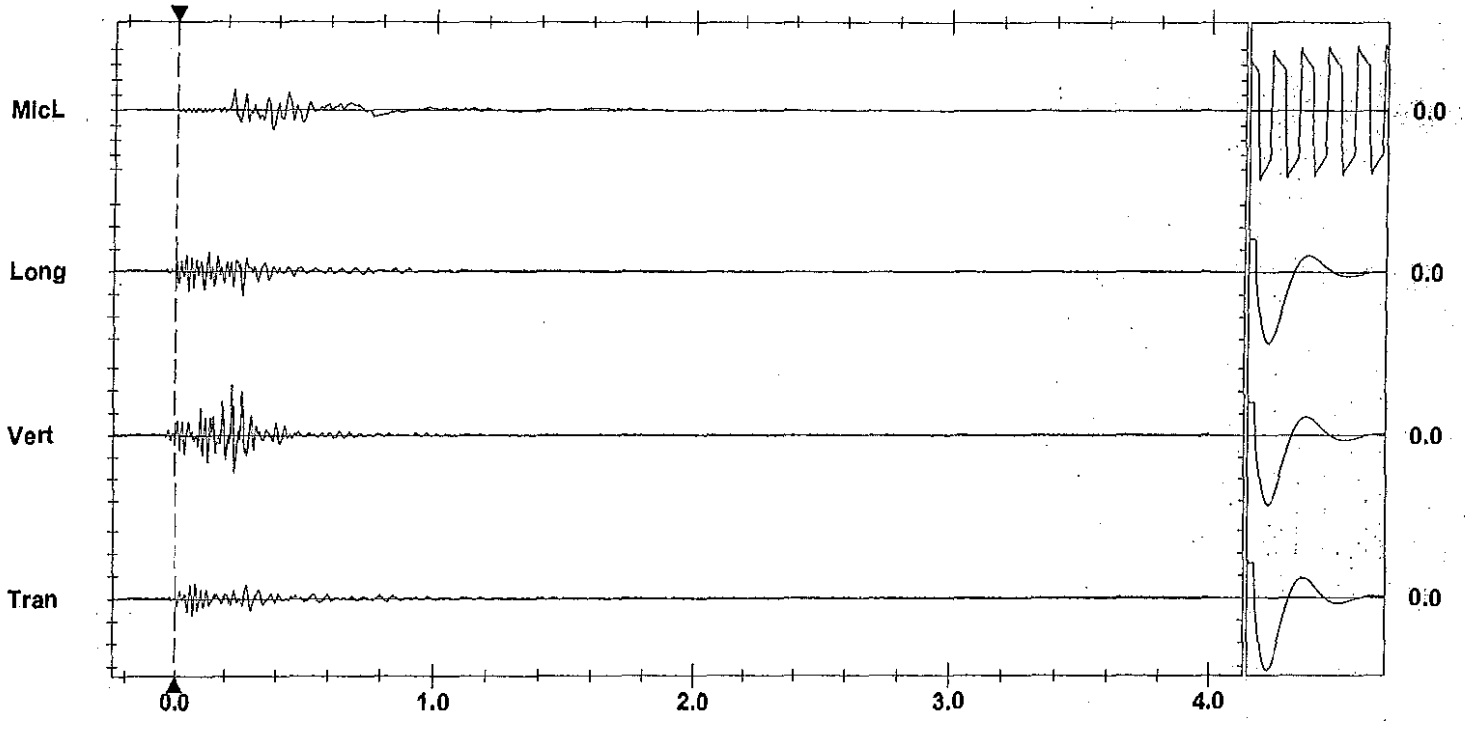
Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.223 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 743 mv)

	Tran	Vert	Long	
PPV	0.0700	0.225	0.105	in/s
ZC Freq	64	43	37	Hz
Time (Rel. to Trig)	0.072	0.226	0.265	sec
Peak Acceleration	0.0663	0.172	0.0663	g
Peak Displacement	0.00036	0.00079	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.230 in/s at 0.226 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21342-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vanasse
BLASTER'S CERTIFICATE NUMBER 5834 89

DATE PREPARED Nov 23/11
ACTUAL BLAST DATE Nov 23/11 10:24 am
BLAST # MW-008

HIGHWAY# 97
BLAST LOCATION AT: 130+10 - 130+15 LS (TS subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH _____ (m)
ROCK TYPE Metamorphic Greywacke
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd 6/11 hole loaded w/2 orig. det. cord

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 6/11 / 11 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

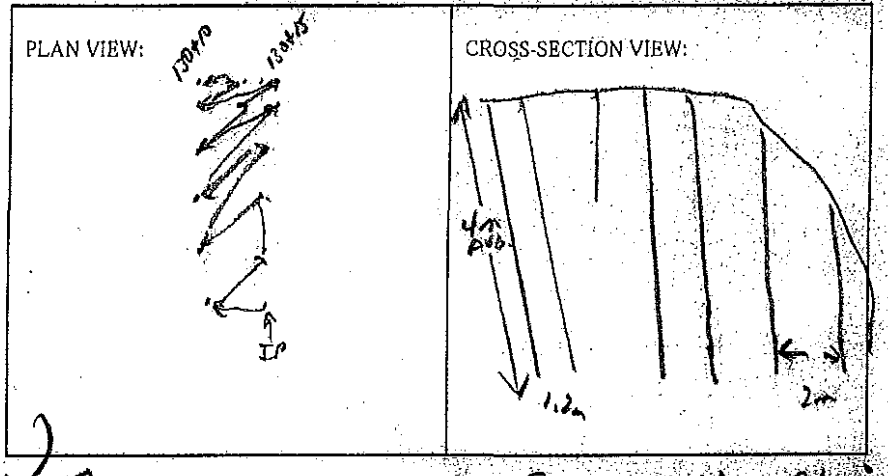
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone ent - 0.12 ips / 47 Hz
Seismograph @ 13224 cliffstone ent - 0.22 ips / 47 Hz

7 cent. 2 bill minimum

25 000 gross cent.

max 10 lbs/day

instantel

Event Report

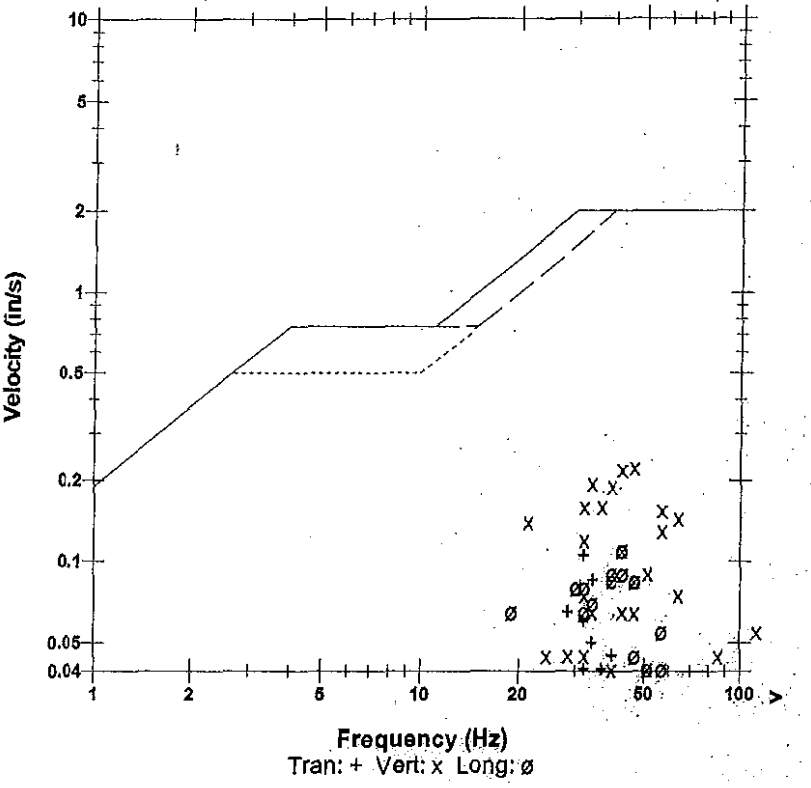
Date/Time	Long at 10:24:54 November 23, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E190.XI0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

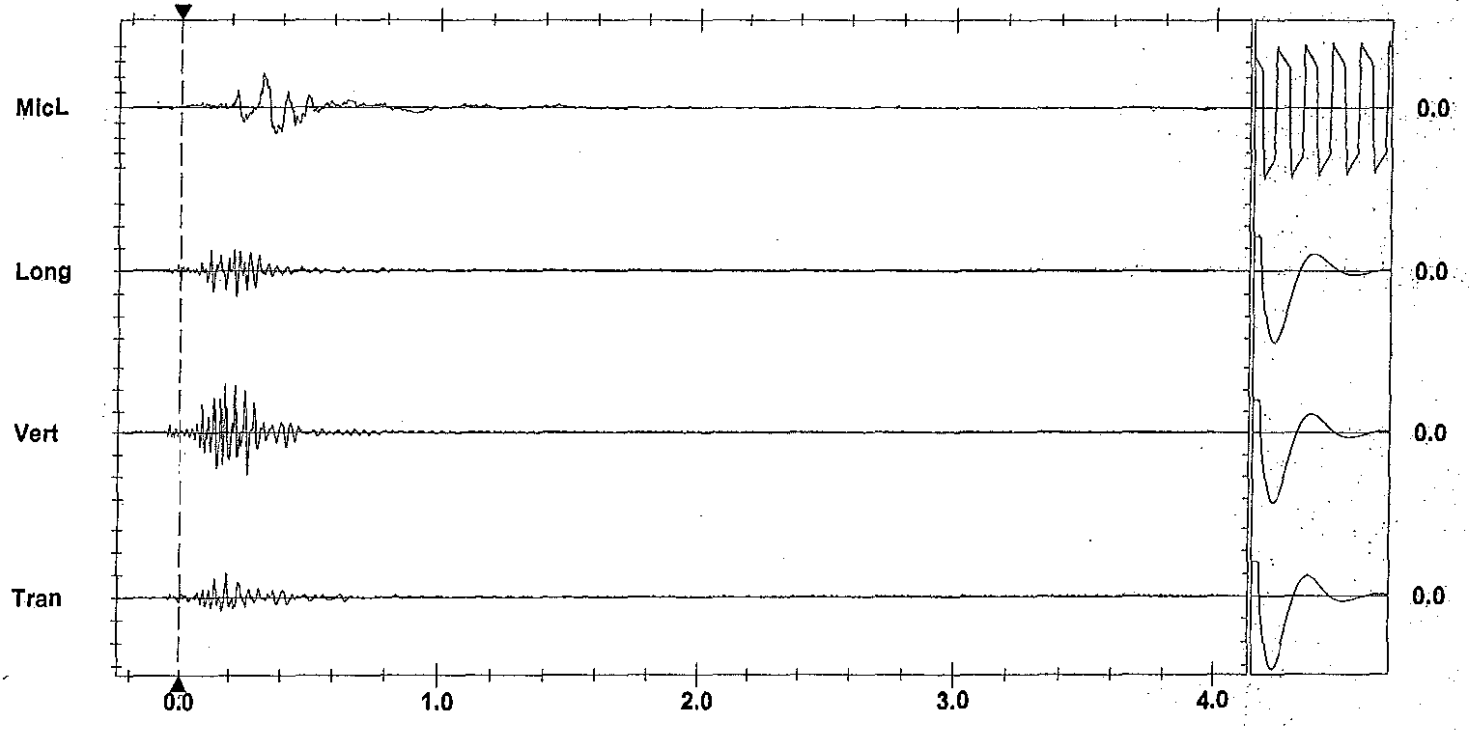
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00221 psi(L) at 0.325 sec		
ZC Freq	9.3 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 638 mv)		

	Tran	Vert	Long	
PPV	0.105	0.225	0.110	in/s
ZC Freq	32	47	43	Hz
Time (Rel. to Trig)	0.189	0.183	0.223	sec
Peak Acceleration	0.0663	0.186	0.0795	g
Peak Displacement	0.00044	0.00079	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.244 in/s at 0.221 sec



Time Scale:0.20 sec/div **Amplitude Scale**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 22:24:55 November 23, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1AM.9J0
Job Number:	1		

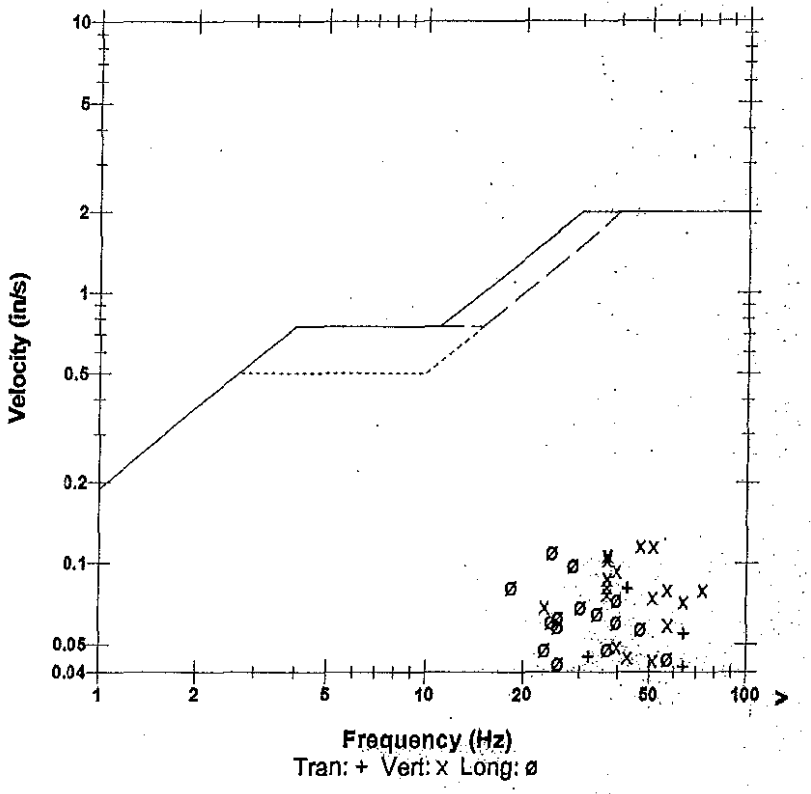
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
Generel:Blast at Stn	130+10

Extended Notes

Post Event Notes

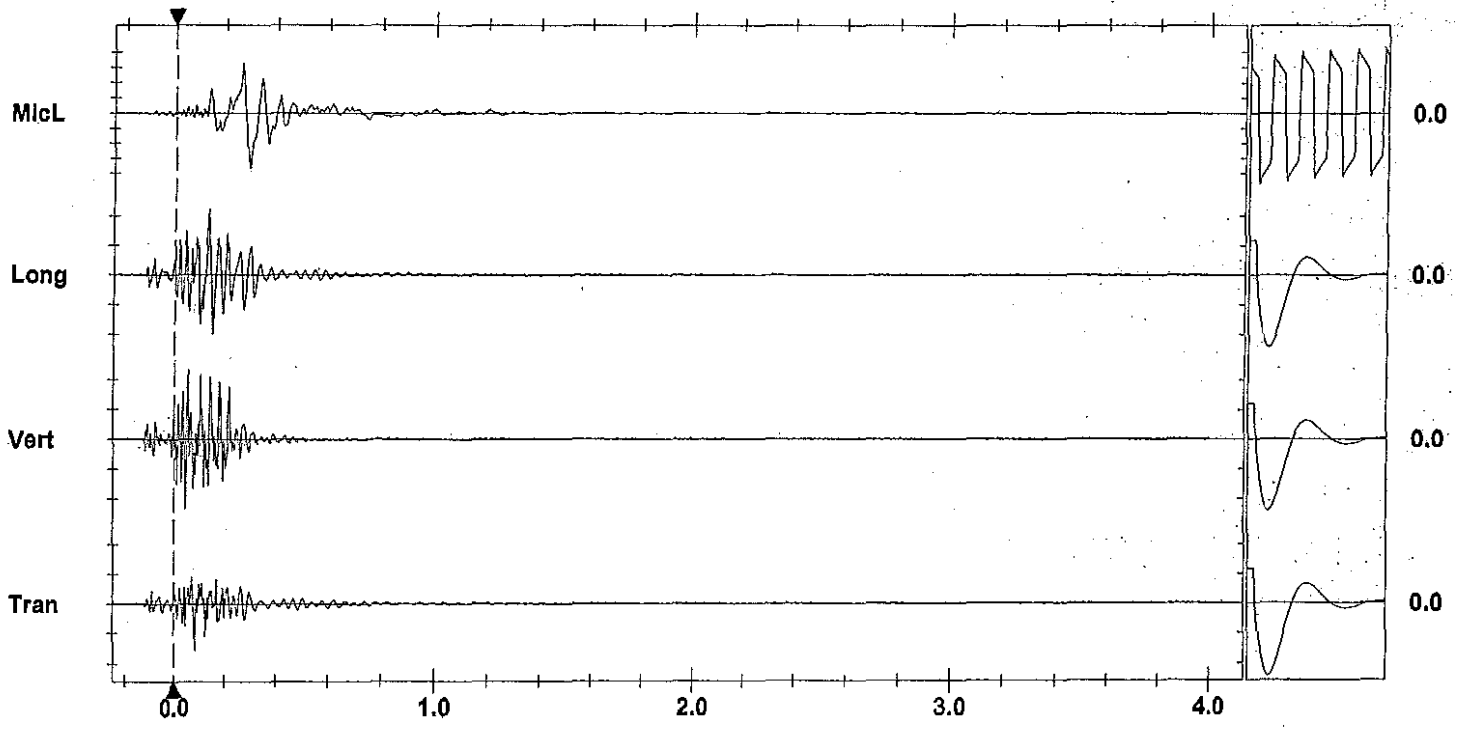
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00366 psi(L) at 0.292 sec			
ZC Freq	11 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 668 mv)			

	Tran	Vert	Long	
PPV	0.0806	0.116	0.110	in/s
ZC Freq	43	47	24	Hz
Time (Rel. to Trig)	0.086	0.044	0.135	sec
Peak Acceleration	0.0646	0.144	0.0663	g
Peak Displacement	0.00025	0.00043	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.138 in/s at 0.045 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div **Sensorcheck**
Trigger = ▶— — — —◀

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling Inc. / Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 23/11 11:41 AM
ACTUAL BLAST DATE Nov 23/11
BLAST # MW-009

HIGHWAY # 99
BLAST LOCATION AT: 1304+00 - 1301+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Signs marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 13
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 3" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 26 kg (kg)
DELAY TYPE AND LENGTH 25 (ms)

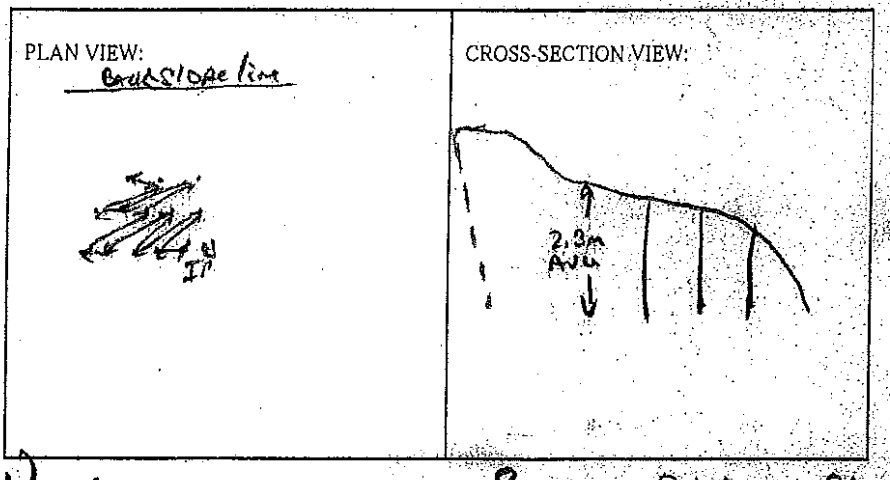
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE AG 320 CAPACITY 60 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 cliffstone crt - 0.079 ips / 64 Hz
Seismograph 1324 cliffstone crt - 0.090 ips / 64 Hz

65 cart 2016 Unimog
MAX 7.5 lbs/day

Instantel

Event Report

Date/Time	Vert at 11:40:17 November 23, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

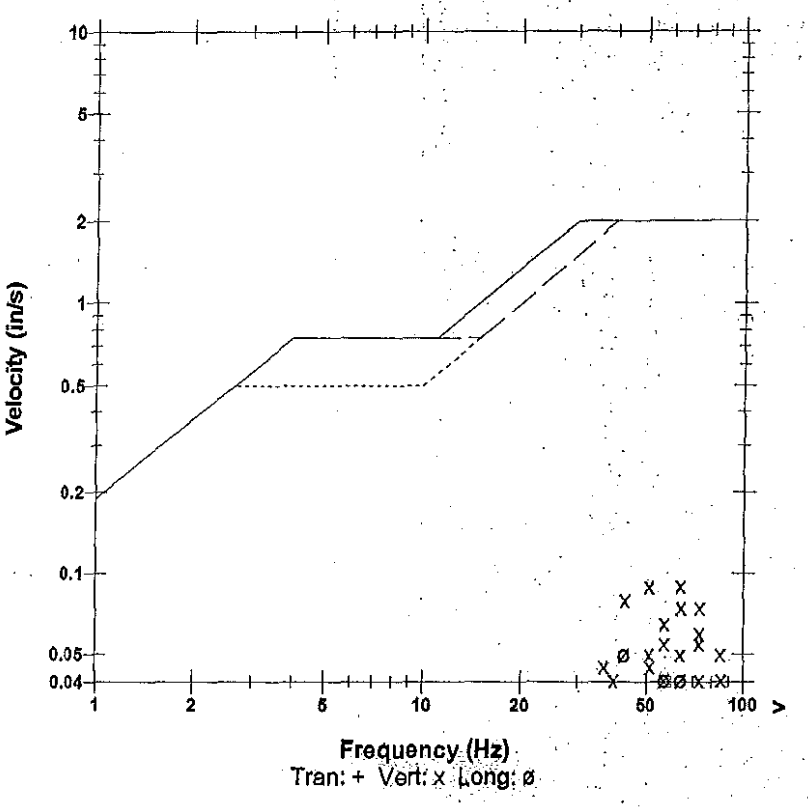
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E19S.F50

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

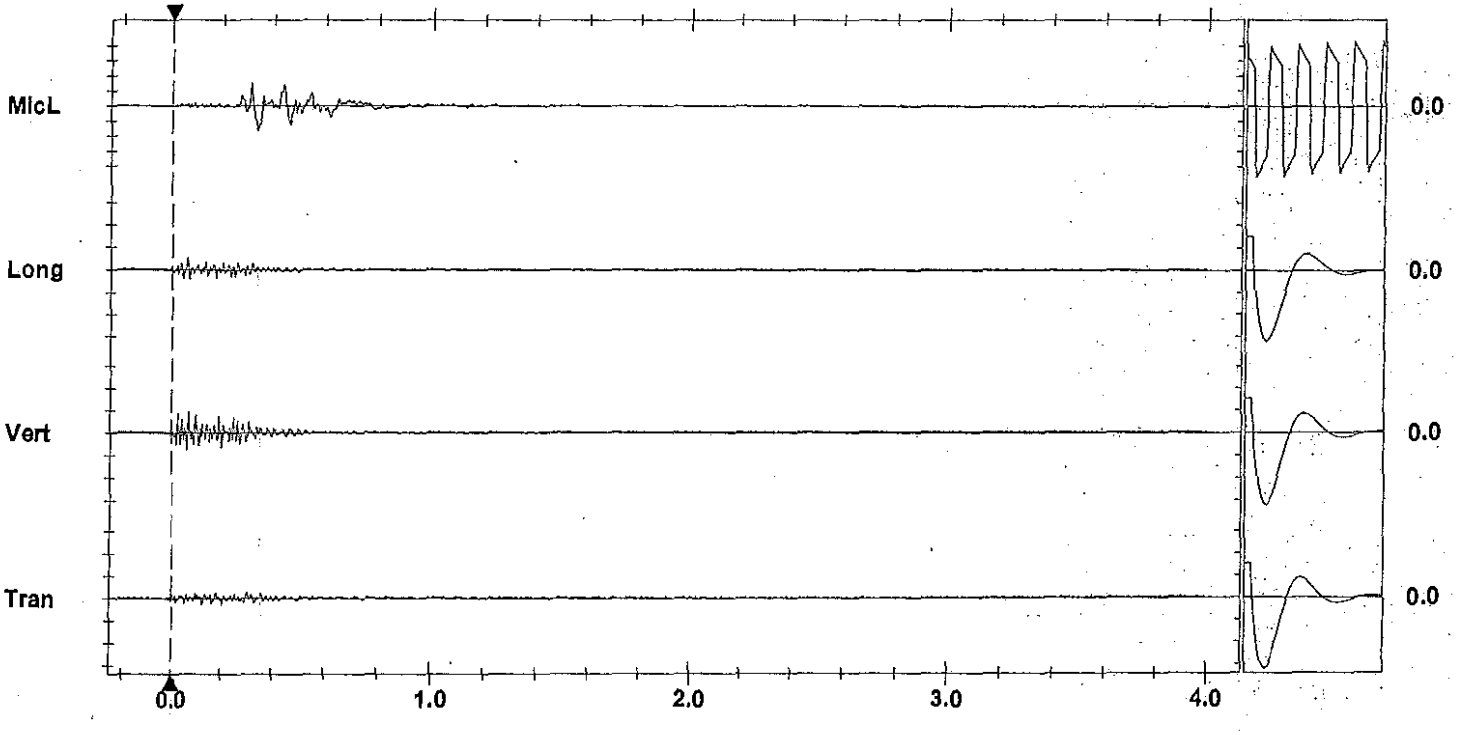
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.335 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 622 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0900	0.0500	in/s
ZC Freq	57	64	43	Hz
Time (Rel. to Trig)	0.128	0.026	0.061	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00011	0.00027	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.0986 in/s at 0.070 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time Long at 23:40:17 November 23, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E1AP.R50

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

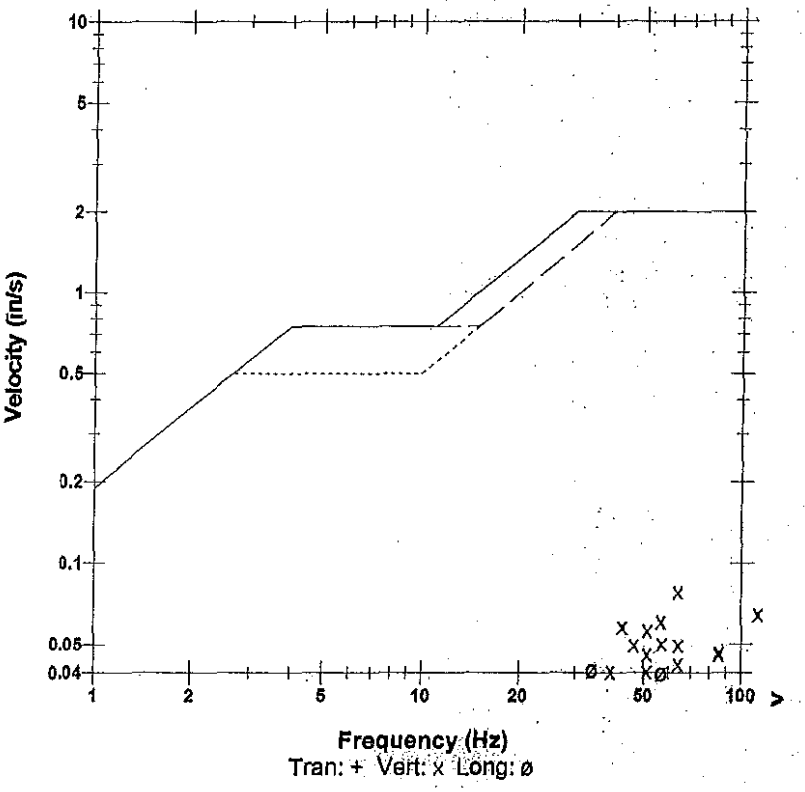
Post Event Notes

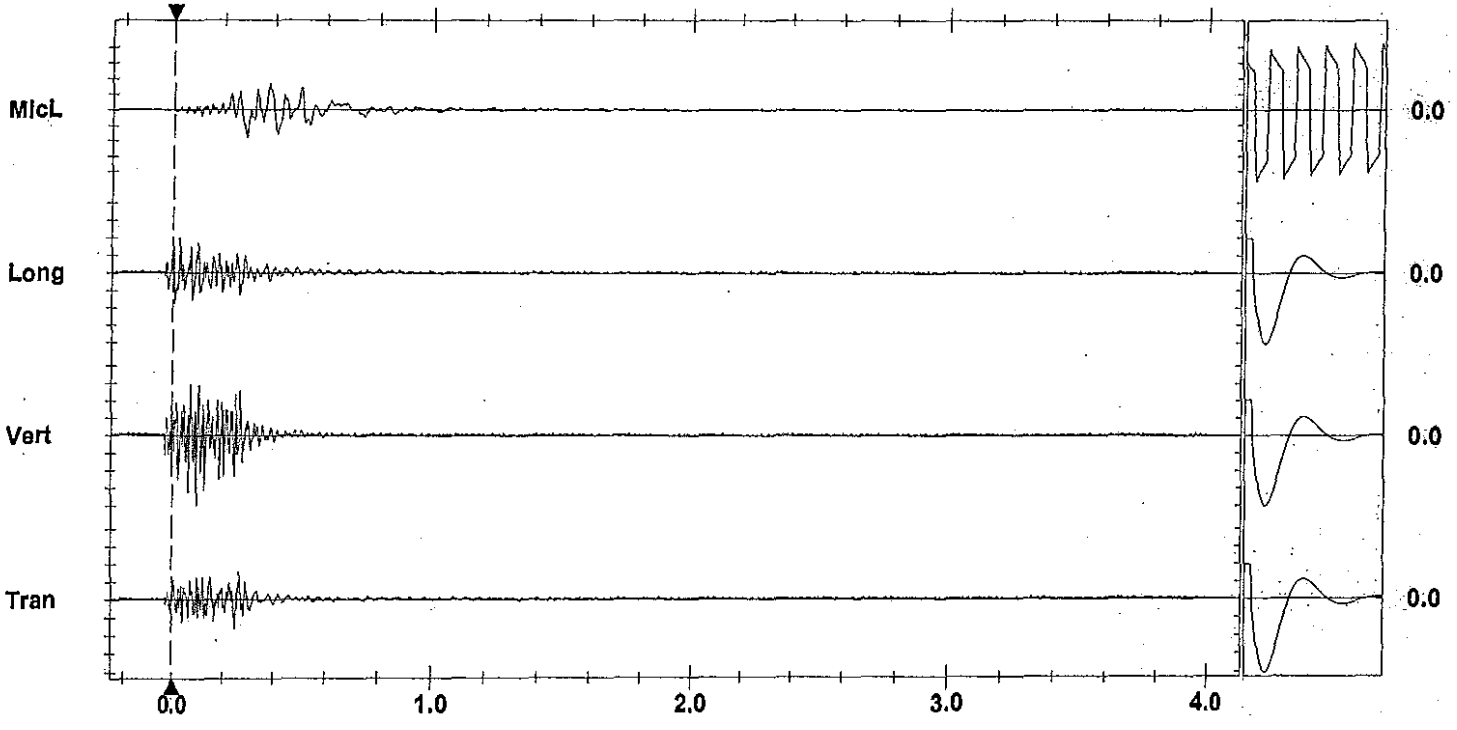
Microphone Linear Weighting
PSPL 0.00181 psi(L) at 0.289 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 685 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0787	0.0406	in/s
ZC Freq	34	64	34	Hz
Time (Rel. to Trig)	0.251	0.099	0.000	sec
Peak Acceleration	0.0398	0.109	0.0398	g
Peak Displacement	0.00014	0.00019	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.0862 in/s at 0.099 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sverco Drilling & Blasting
BLASTER'S NAME Wayne Verchen
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 23/11 12:56 PM
ACTUAL BLAST DATE Nov 23/11
BLAST # NW-0010

HIGHWAY# 97
BLAST LOCATION AT: 130 Km - 130 Km + 45 (to Submarine)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: *Shot marked

HEIGHT ABOVE HWY 40 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd b/l 4h loaded w/Leo main det. cord.

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 10 (m)

TOTAL NUMBER OF HOLES 6 b/l + 3 pres.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

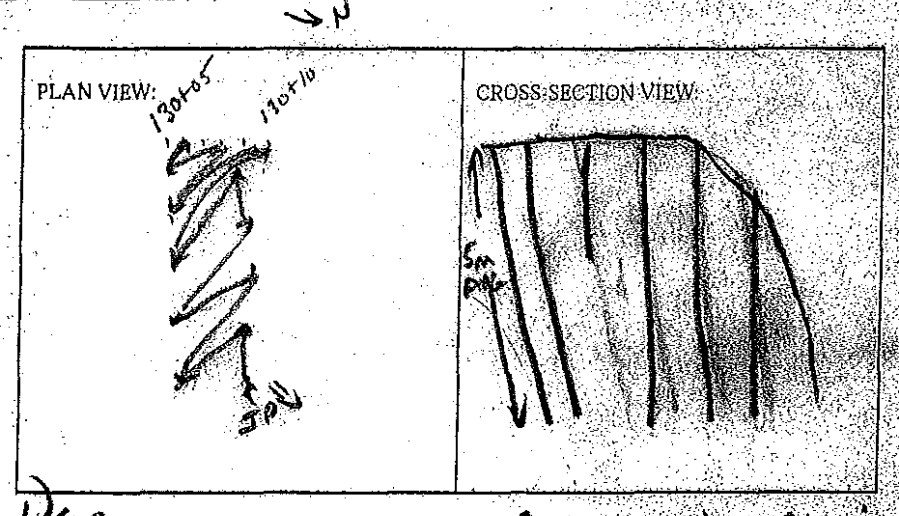
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) CBL in main of down portion
BLASTING MACHINE: TYPE HB 720 CAPACITY 30 caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verchen COMPANY Sverco Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph 13167 Cliffstone Crt - 0.30 ips / 49 Hz
Seismograph 13224 Cliffstone Crt - 0.15 ips / 43 Hz

5.5 2KB Unimax

30' 200 gpm adt. cond.

MAX. 10 lbs/duty

Instantel

Event Report

Date/Time Vert at 12:56:40 November 23, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E19V.YG0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

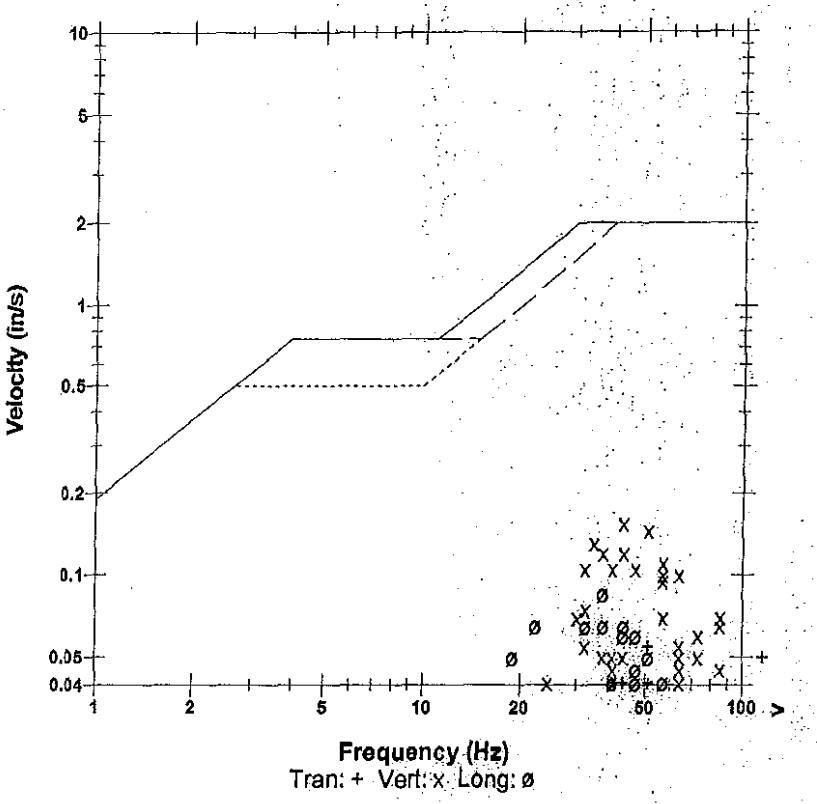
Extended Notes
Blast at stn 130 +10

Post Event Notes

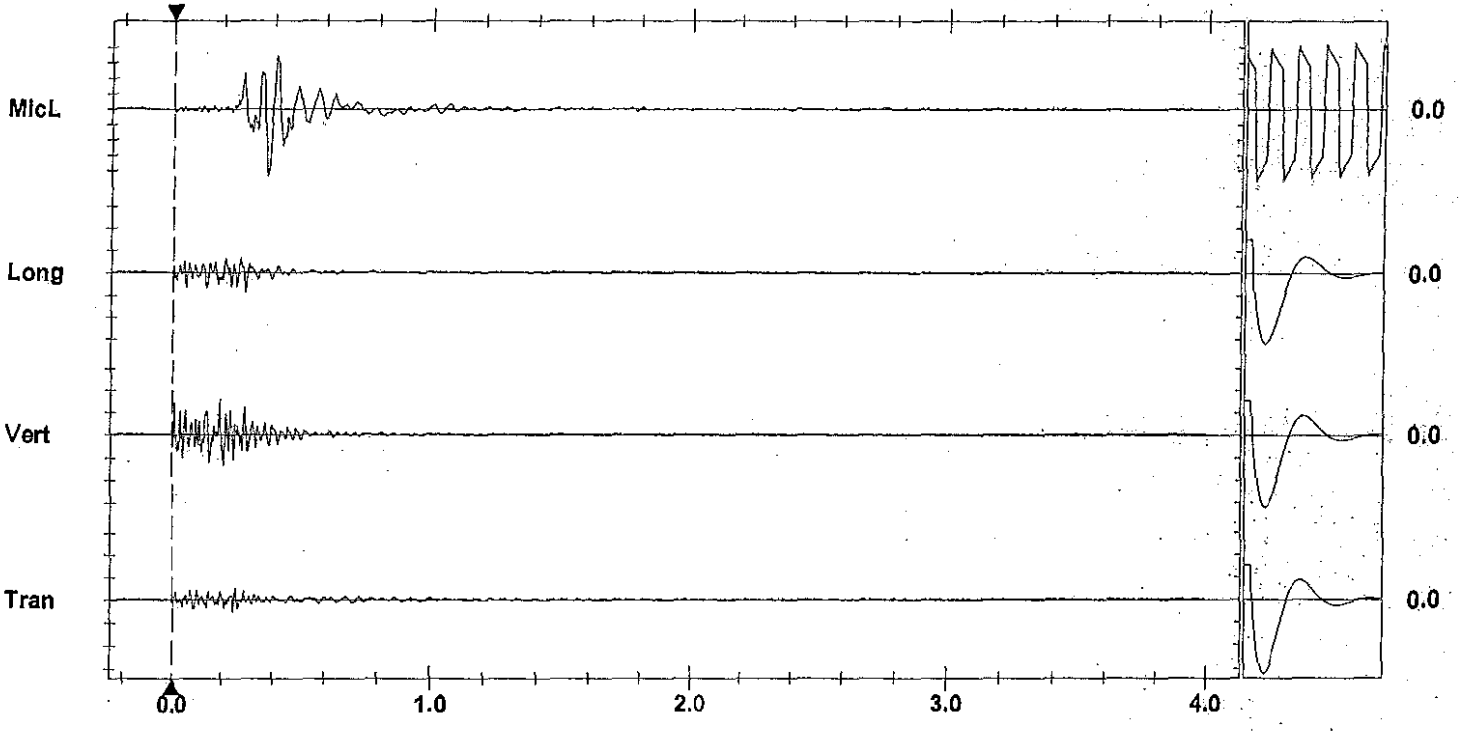
Microphone Linear Weighting
PSPL 0.00435 psi(L) at 0.374 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 687 mv)

	Tran	Vert	Long	
PPV	0.0550	0.155	0.0850	in/s
ZC Freq	51	43	37	Hz
Time (Rel. to Trig)	0.254	0.192	0.290	sec
Peak Acceleration	0.0663	0.146	0.0530	g
Peak Displacement	0.00019	0.00062	0.00039	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.158 in/s at 0.192 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Instantel

Event Report

Date/Time Vert at 00:56:41 November 24, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E1AT.AH0

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

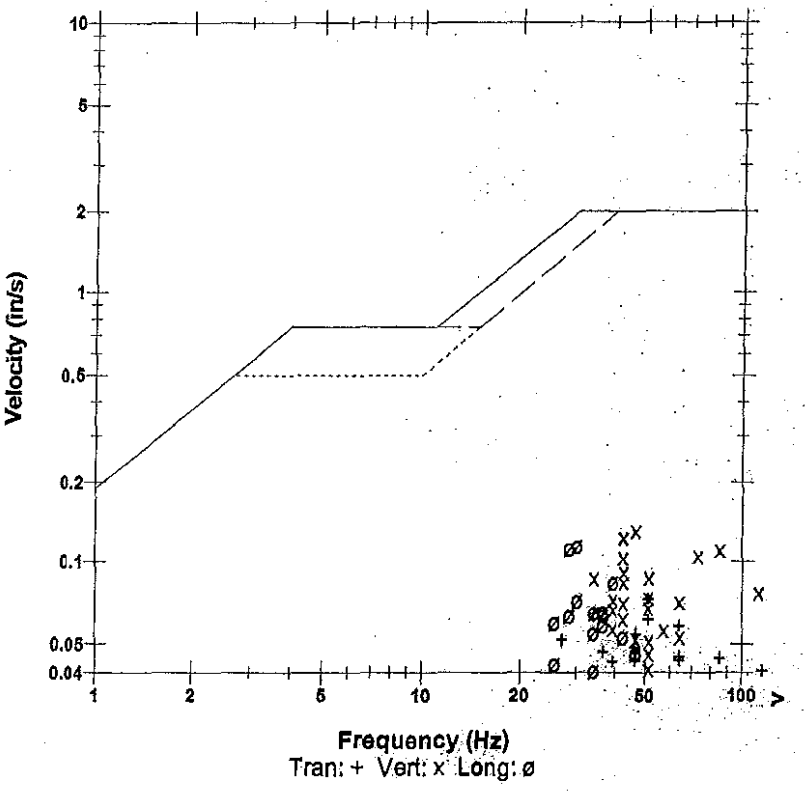
Post Event Notes

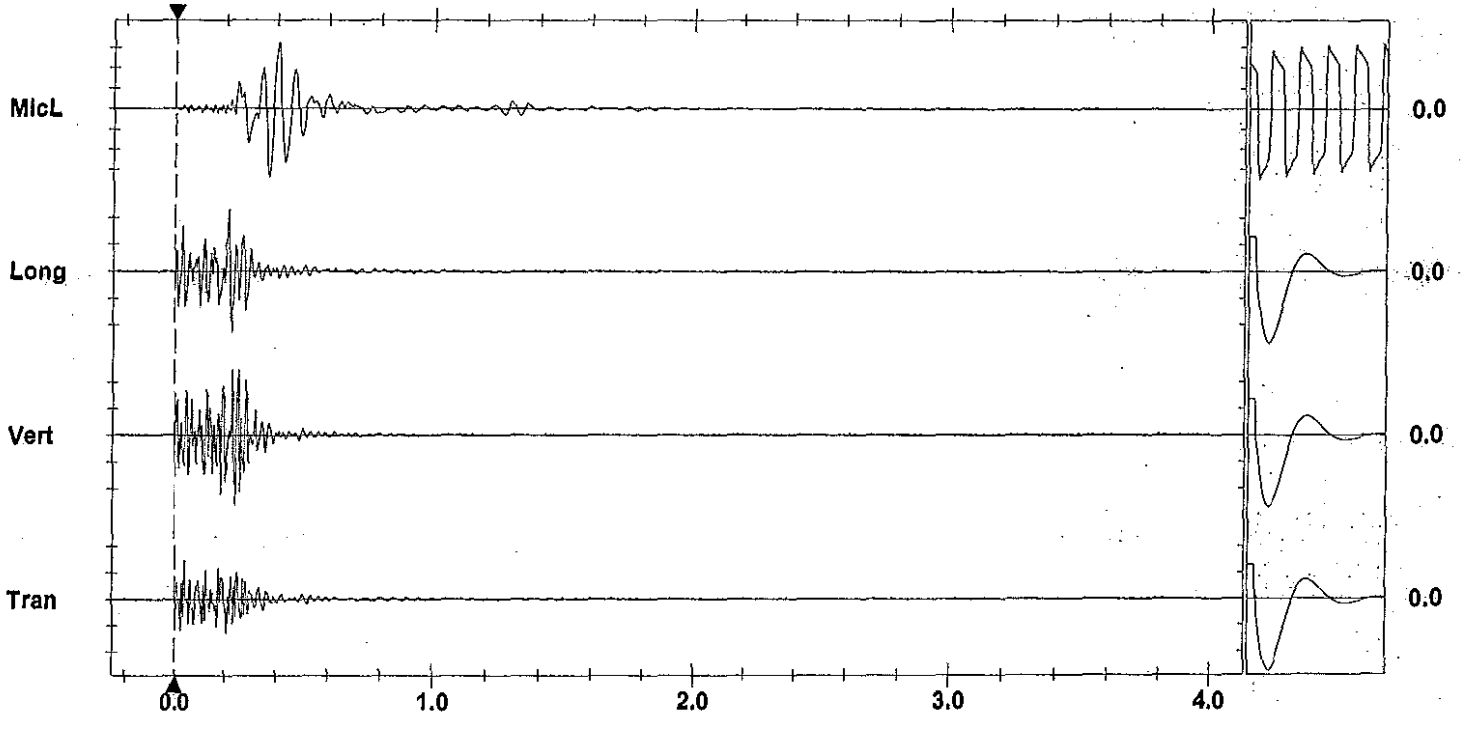
Microphone Linear Weighting
PSPL 0.00682 psi(L) at 0.369 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 641 mv)

	Tran	Vert	Long	
PPV	0.0725	0.131	0.115	in/s
ZC Freq	51	47	30	Hz
Time (Rel. to Trig)	0.043	0.240	0.211	sec
Peak Acceleration	0.0795	0.239	0.0845	g
Peak Displacement	0.00022	0.00051	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.142 in/s at 0.228 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Nov 23/11 2:29
ACTUAL BLAST DATE Nov 23/11 PM
BLAST # MW-0011

HIGHWAY# 97
BLAST LOCATION AT: 130+00 - 130+05 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot Matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS: * every 2nd b/l hole loaded w/200 grain det. cord

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 62 (m)

TOTAL NUMBER OF HOLES 6 b/l + 5 Presp.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 4
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 57 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

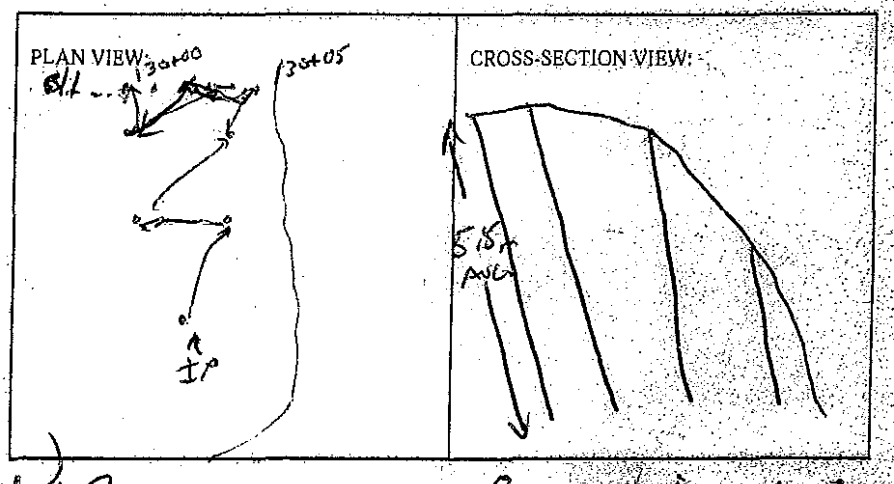
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERC Initiation Electronic System
BLASTING MACHINE: TYPE _____ CAPACITY _____

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

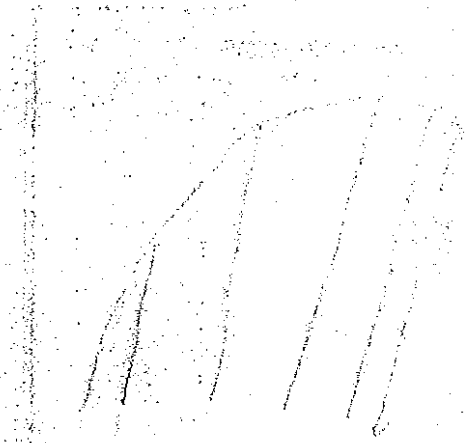
Seismograph 13167 cliffstone crt - 0.15 ips / 80 Hz
Seismograph 13221 cliffstone crt - 0.22 ips / 39 Hz

using anode

CAST. 5"x4.00 universal

30' 200 gpm det. cont.

max 10 lbs/delay



Instantel

Event Report

Date/Time Vert at 14:29:46 November 23, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1A0.9M0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

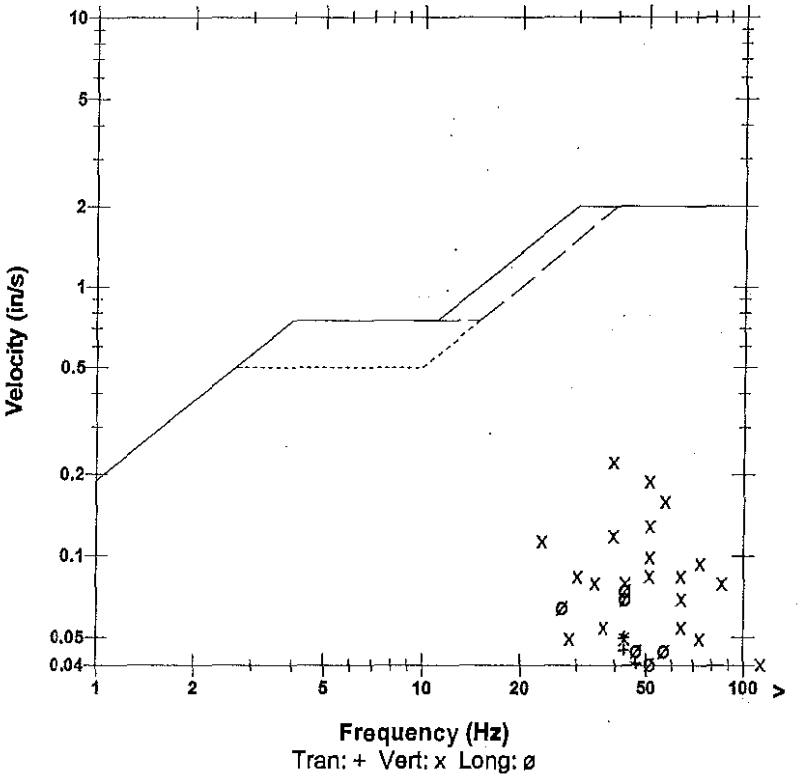
Extended Notes
Blast at stn 130 +10

Post Event Notes

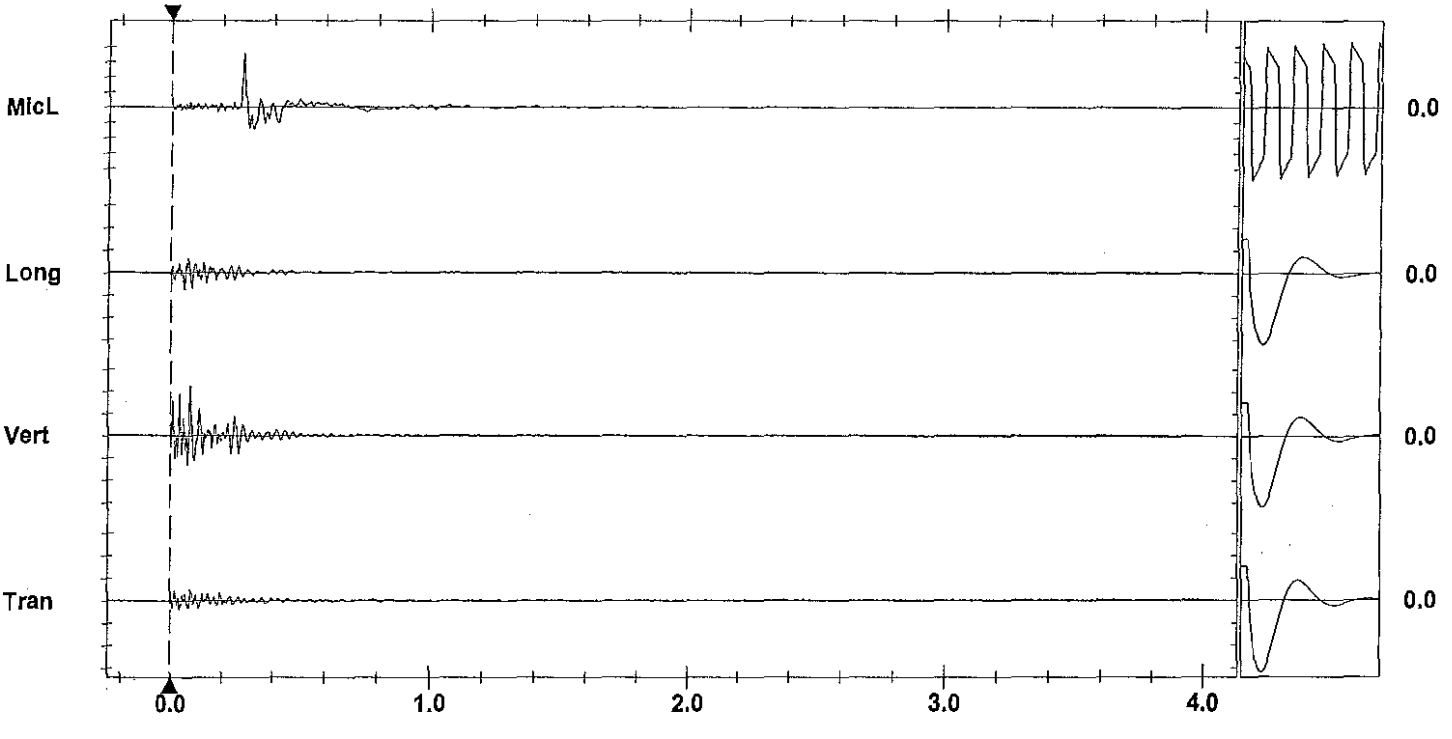
Microphone Linear Weighting
PSPL 0.00355 psi(L) at 0.283 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 647 mv)

	Tran	Vert	Long	
PPV	0.0500	0.225	0.0750	in/s
ZC Freq	43	39	43	Hz
Time (Rel. to Trig)	0.080	0.080	0.054	sec
Peak Acceleration	0.0663	0.186	0.0663	g
Peak Displacement	0.00021	0.00081	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.235 in/s at 0.080 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 02:29:47 November 24, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1AX.LN0
Job Number:	1		

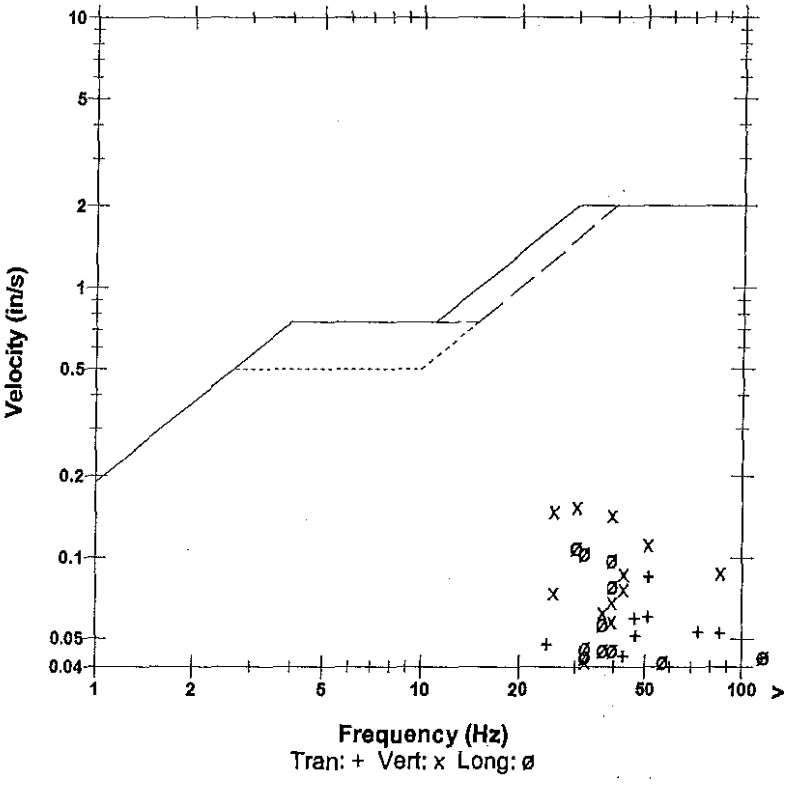
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

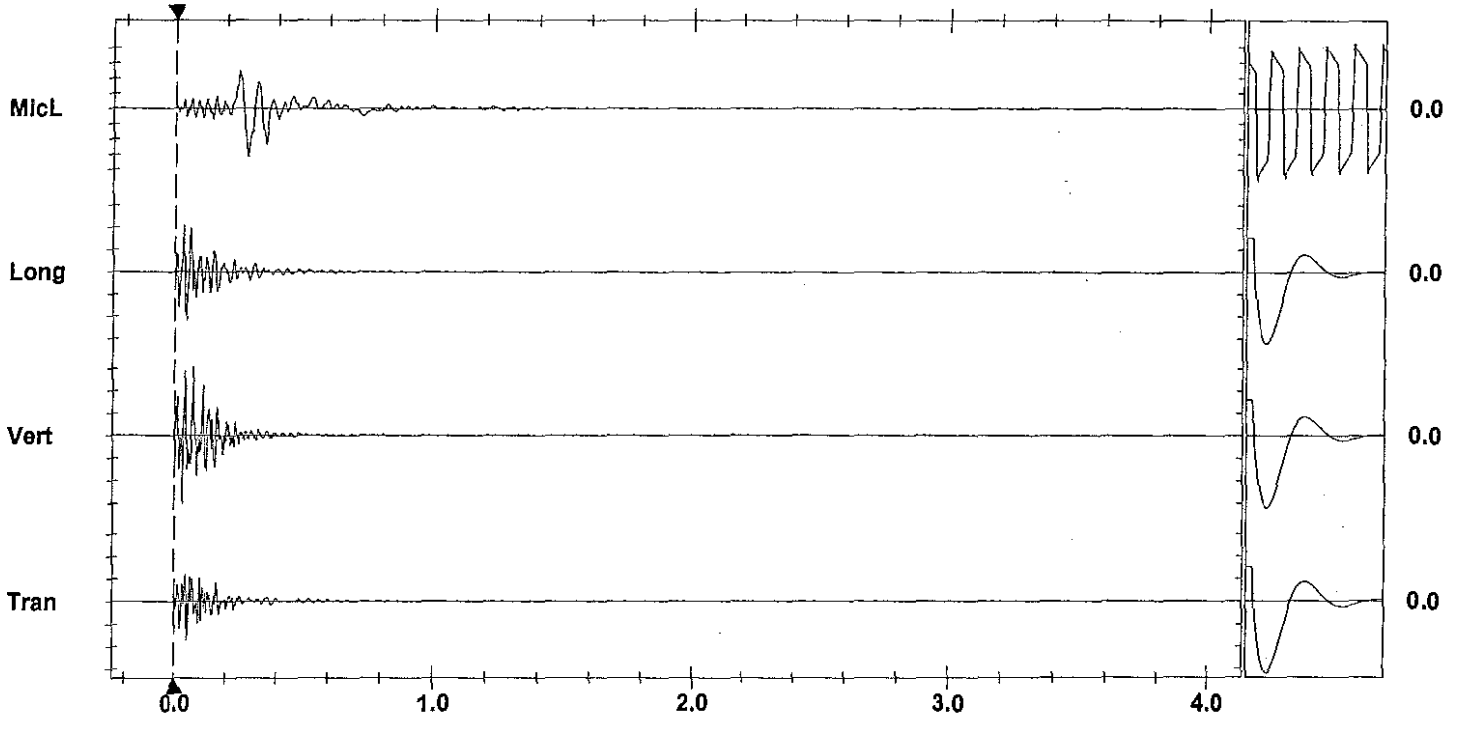
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00315 psi(L) at 0.281 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 679 mv)

	Tran	Vert	Long	
PPV	0.0850	0.155	0.109	in/s
ZC Freq	51	30	30	Hz
Time (Rel. to Trig)	0.054	0.074	0.045	sec
Peak Acceleration	0.0829	0.199	0.0878	g
Peak Displacement	0.00027	0.00052	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.182 in/s at 0.043 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck

Trigger = ▶——————◀

Printed: November 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1999-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 2134 - 0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling Ltd + Blasting
BLASTER'S NAME Wayne Verigin
BLASTER'S CERTIFICATE NUMBER 5834489

DATE PREPARED Nov 25/11
ACTUAL BLAST DATE Nov 25/11 10:24 am
BLAST # MW-0012

HIGHWAY # 97
BLAST LOCATION AT: Stn 1301+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Sierra Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 13
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

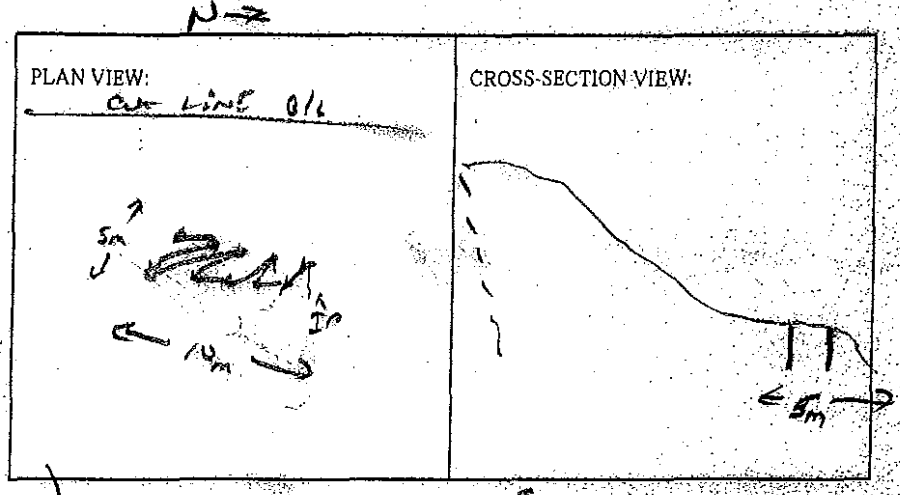
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 820 CAPACITY 90 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Dissonance 1322 Cliffton Crt - 0.025 pc / 57 m2
e 1316 Cliffton Crt - 0.11 pc / 72 m2

1 BAG ANTO

13 CAST 1"x8" DYNAMICS

18 5M EZ RETS

1 4.5M ELEC DET

Instantel

Event Report

Date/Time Vert at 10:24:15 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.1 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1DE.8F0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

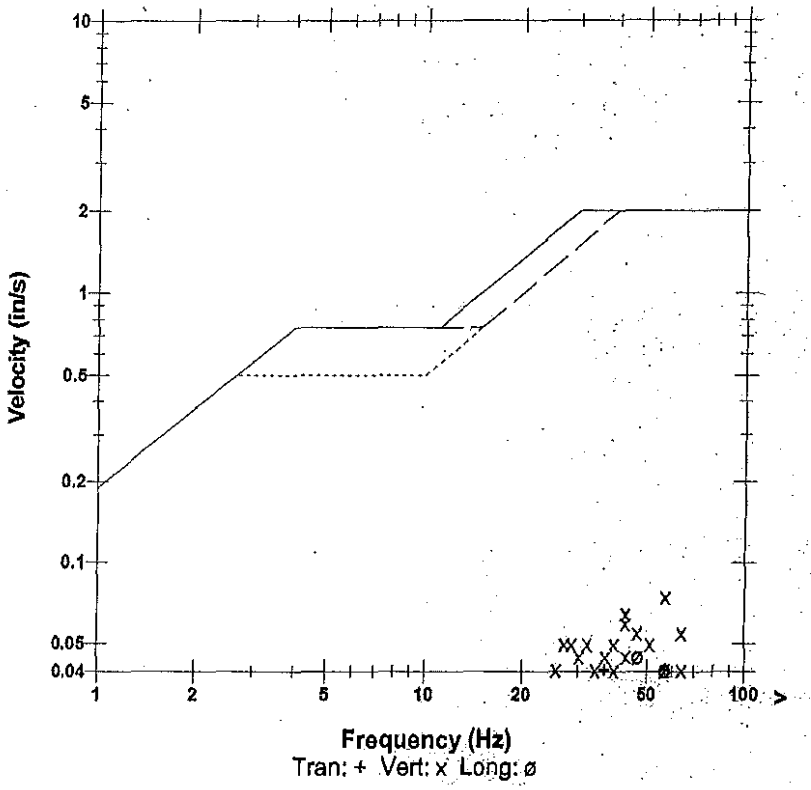
Extended Notes
Blast at stn 130 +10

Post Event Notes

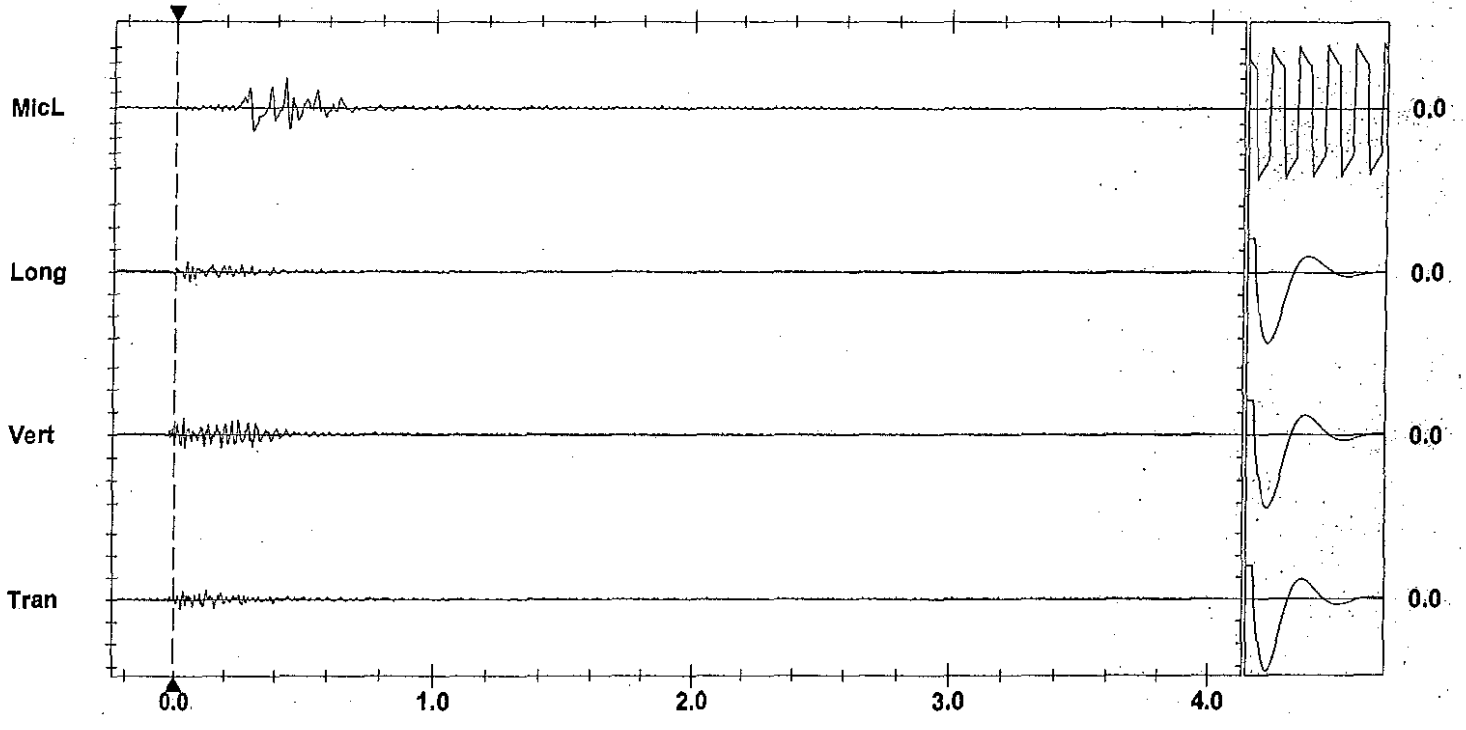
Microphone Linear Weighting
PSPL 0.00192 psi(L) at 0.431 sec
ZC Freq 24 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 620 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0750	0.0450	in/s
ZC Freq	57	57	47	Hz
Time (Rel. to Trig)	0.027	0.035	0.047	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00014	0.00025	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0829 in/s at 0.036 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Instantel

Event Report

Date/Time Vert at 10:24:55 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

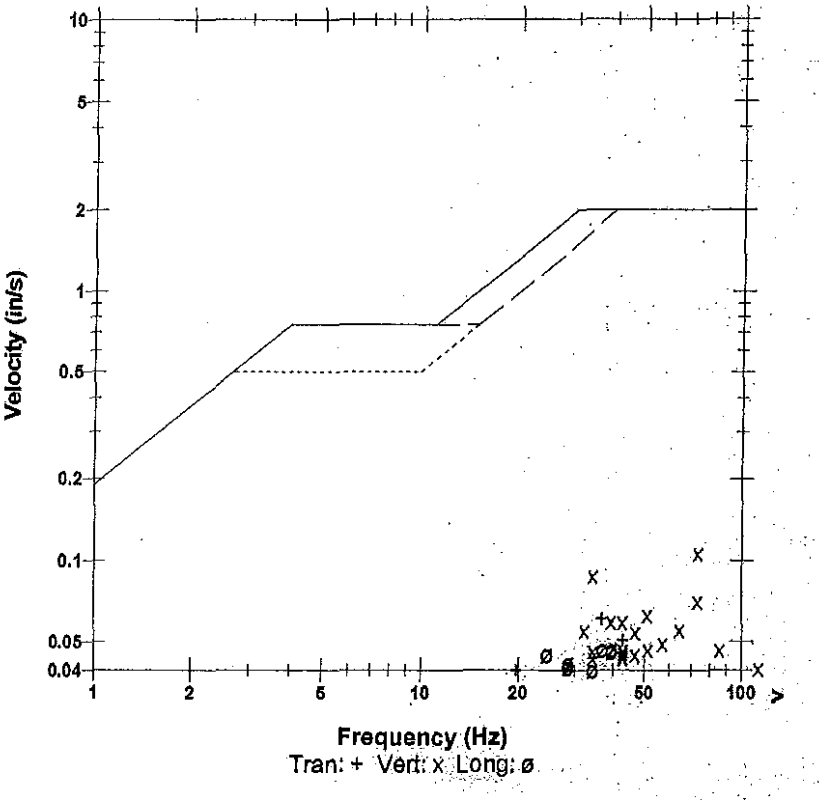
Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E1DE.9J0

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

Post Event Notes

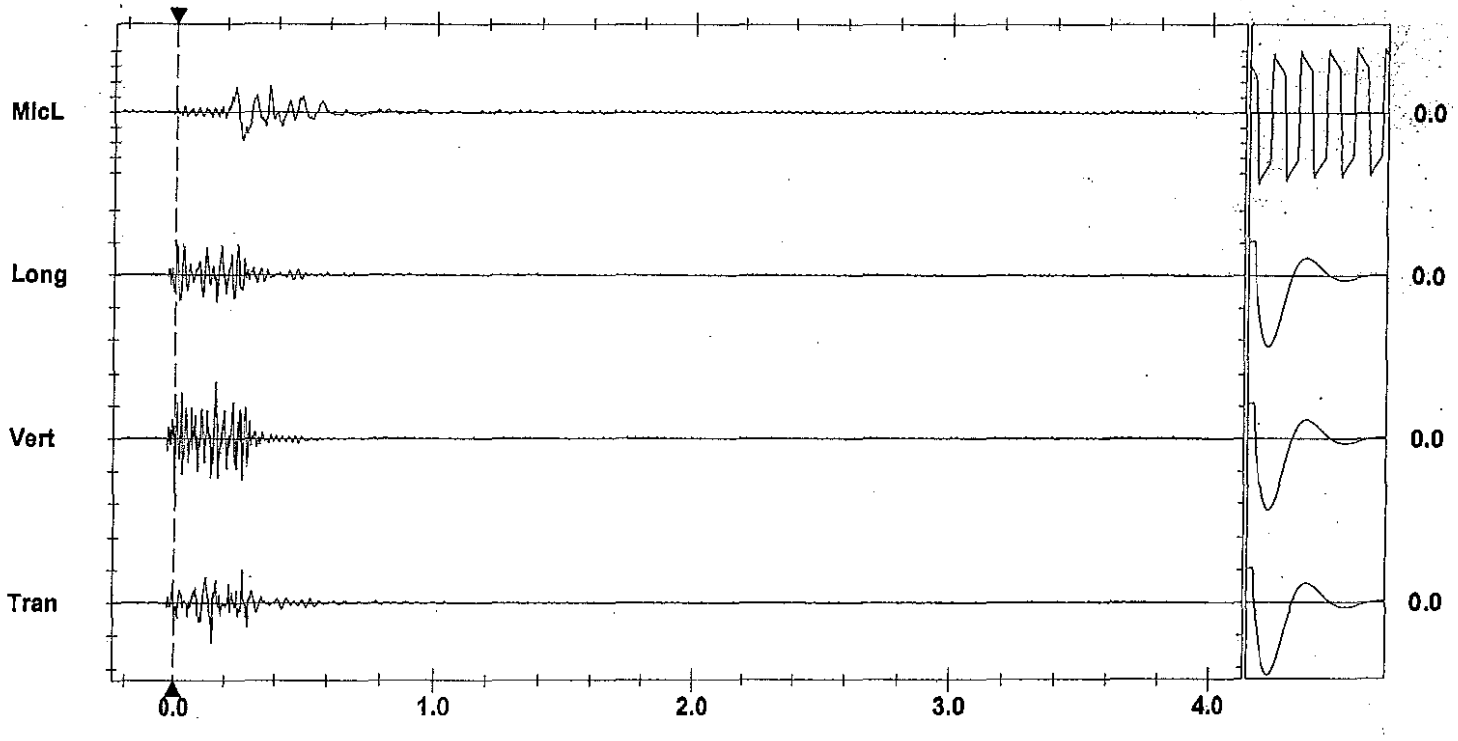
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.262 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 600 mv)

	Tran	Vert	Long	
PPV	0.0606	0.107	0.0469	in/s
ZC Freq	37	73	39	Hz
Time (Rel. to Trig)	0.152	0.002	0.007	sec
Peak Acceleration	0.0597	0.111	0.0447	g
Peak Displacement	0.00026	0.00033	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.114 in/s at 0.002 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— - - - ——◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Kearney
BLASTER'S CERTIFICATE NUMBER 581489

DATE PREPARED NOV 25/11
ACTUAL BLAST DATE NOV 25/11 11:30AM
BLAST # MW-0013

HIGHWAY# 97
BLAST LOCATION AT: 130+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: NO ENVIRONMENTAL

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 30 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite - AMFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH Low 25 (ms)

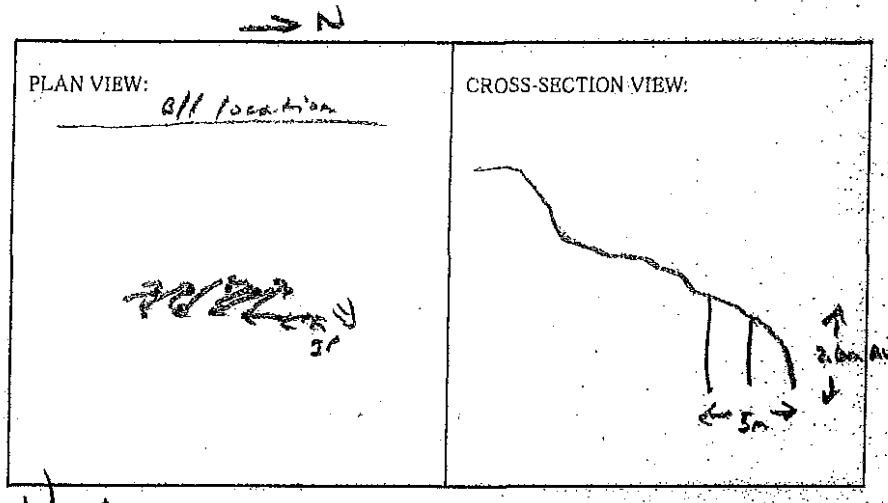
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) CAP INITIATION OF ANFO CARTRIDGES
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Kearney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffside ext - 0.24 in/s / 37Hz
@ 13161 cliffside ext - 0.20 in/s / 34Hz

1 BAG ANFO

11 5m EZ Dets

11 1¼" x 8" Cart. Dynamite

1 4.5m Elec. Det

Instantel

Event Report

Date/Time Vert at 11:30:54 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.3 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E1DH.BI0

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

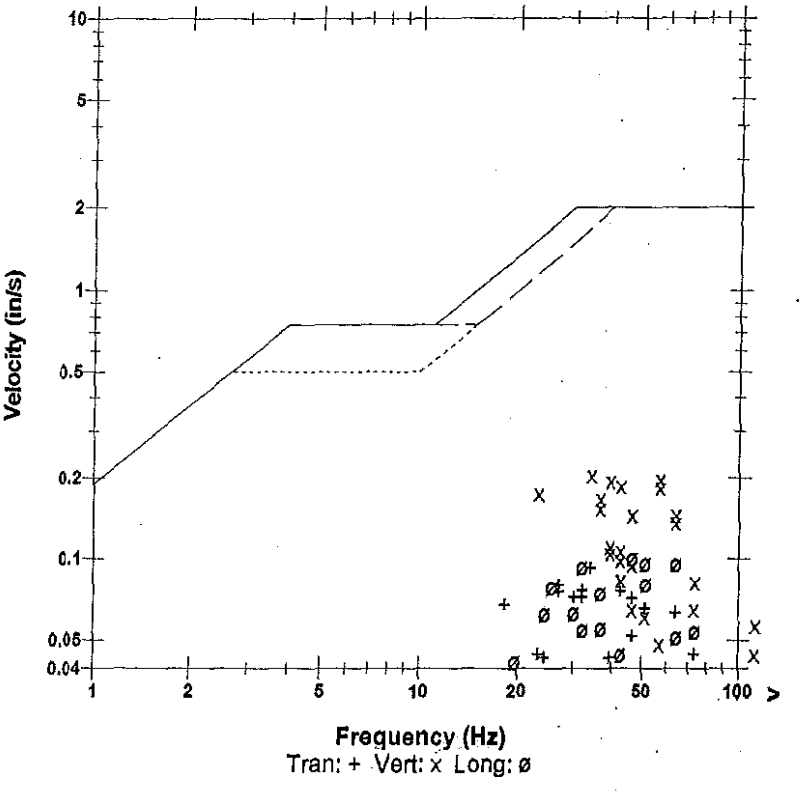
Post Event Notes

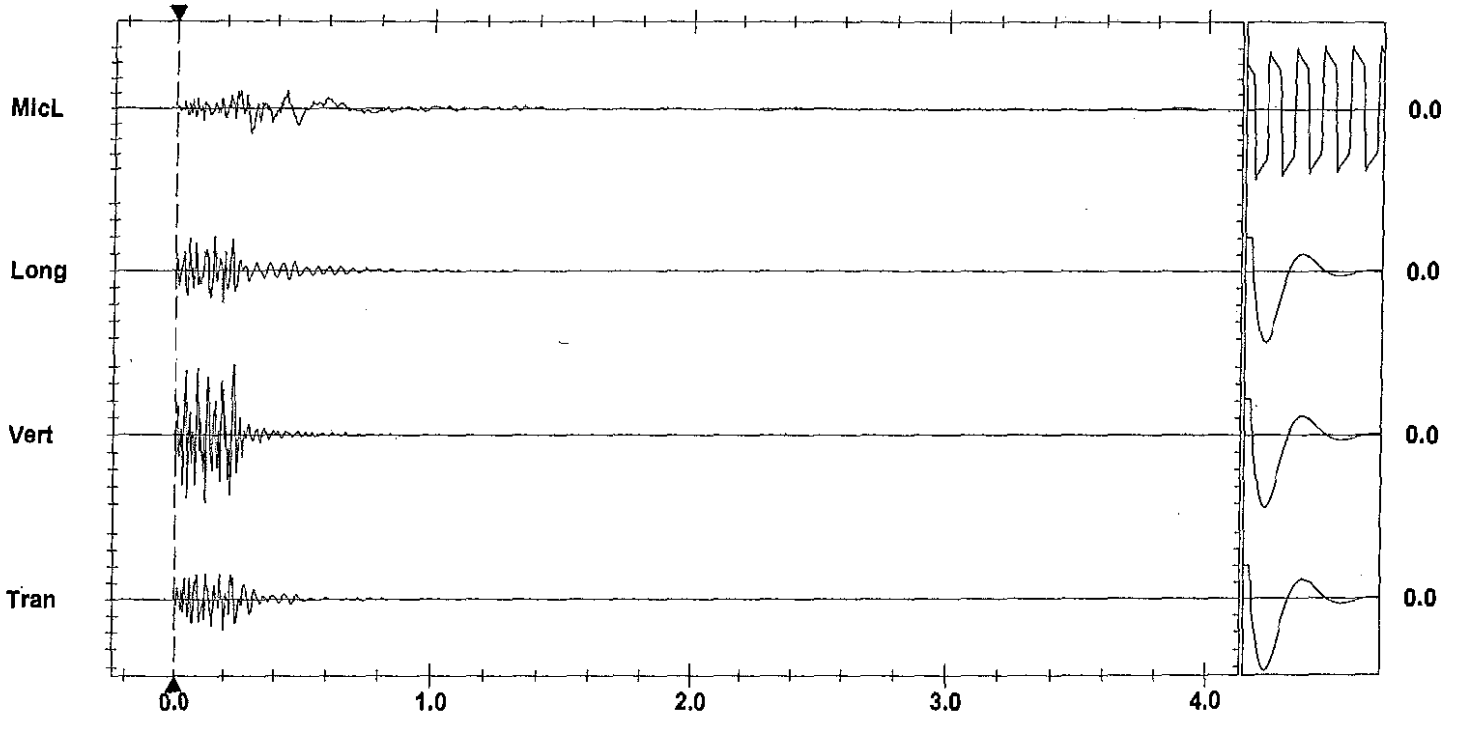
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.298 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 625 mv)

	Tran	Vert	Long	
PPV	0.0925	0.204	0.101	in/s
ZC Freq	34	34	47	Hz
Time (Rel. to Trig)	0.200	0.234	0.157	sec
Peak Acceleration	0.0845	0.278	0.106	g
Peak Displacement	0.00045	0.00098	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.220 in/s at 0.235 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: November 28, 2011 07:8.01 -8.04)

Instantel

Event Report

Date/Time Vert at 11:30:14 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.1 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1DH.AE0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

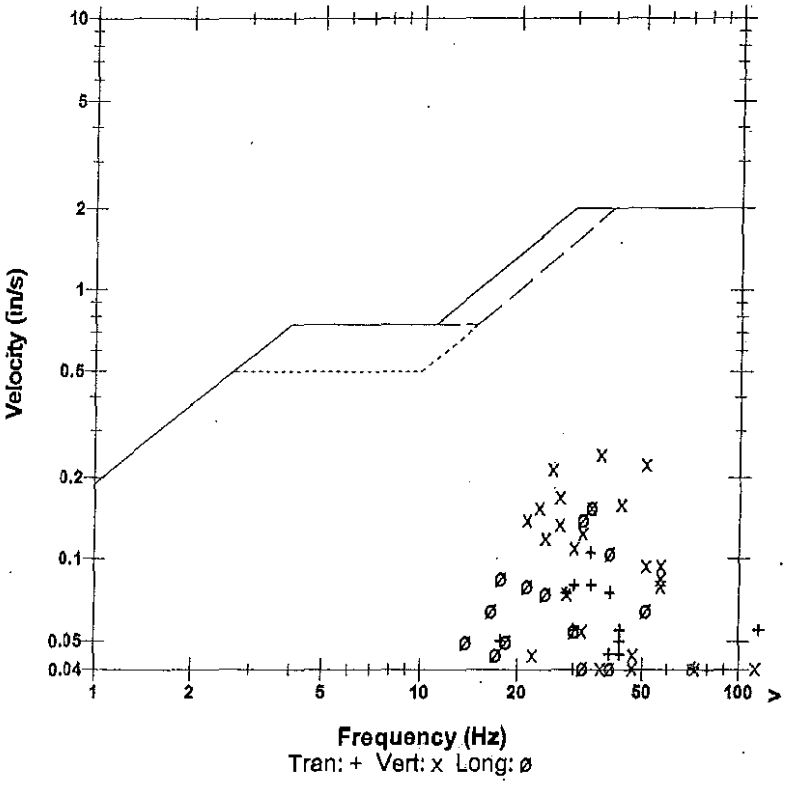
Extended Notes
Blast at stn 130 +10

Post Event Notes

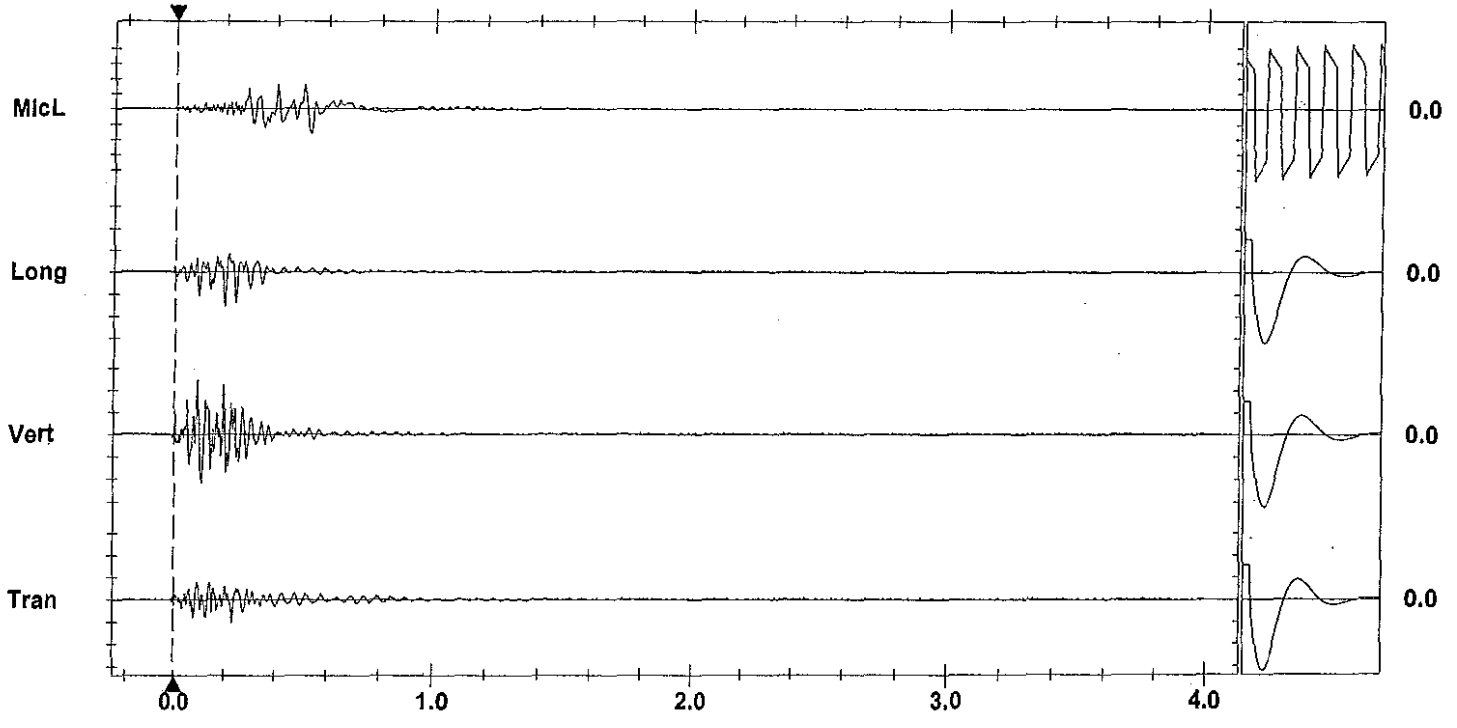
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.399 sec
ZC Freq 27 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 602 mv)

	Tran	Vert	Long	
PPV	0.105	0.245	0.155	in/s
ZC Freq	34	37	34	Hz
Time (Rel. to Trig)	0.233	0.095	0.199	sec
Peak Acceleration	0.0795	0.199	0.0928	g
Peak Displacement	0.00046	0.00133	0.00073	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.275 in/s at 0.096 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21847-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5836/89

DATE PREPARED Nov 25/11
ACTUAL BLAST DATE Nov 25/11 12:30PM
BLAST # MW-0014

HIGHWAY# 97
BLAST LOCATION AT: 129+96 - 130+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: WET + MUDDY

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 44 / 5 Mud
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

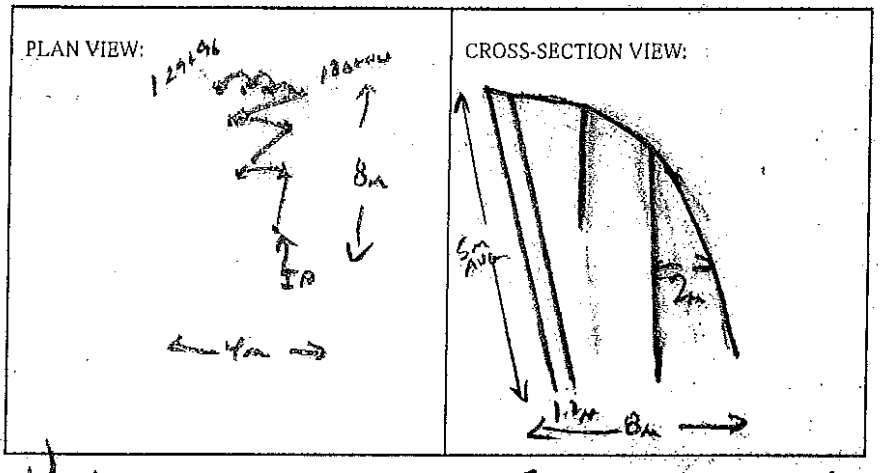
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) See information of Nonel Pattern
BLASTING MACHINE: TYPE HSB 32a CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13221 Cliffside ext - 0.13 ips / 37Hz
13167 Cliffside ext - 0.11 ips / 43Hz

100kg anfo

9 Count 1x8 Unimax

35' 200 grain cord

4 12' MS Nonels

5 30' c2 Nonels

1 4.5 m. Elec. Det

4 Count 2½/16" Dynamite in B/L

Instantel

Event Report

Date/Time	Vert at 12:40:33 November 25, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1DK.JL0
Job Number:	1		

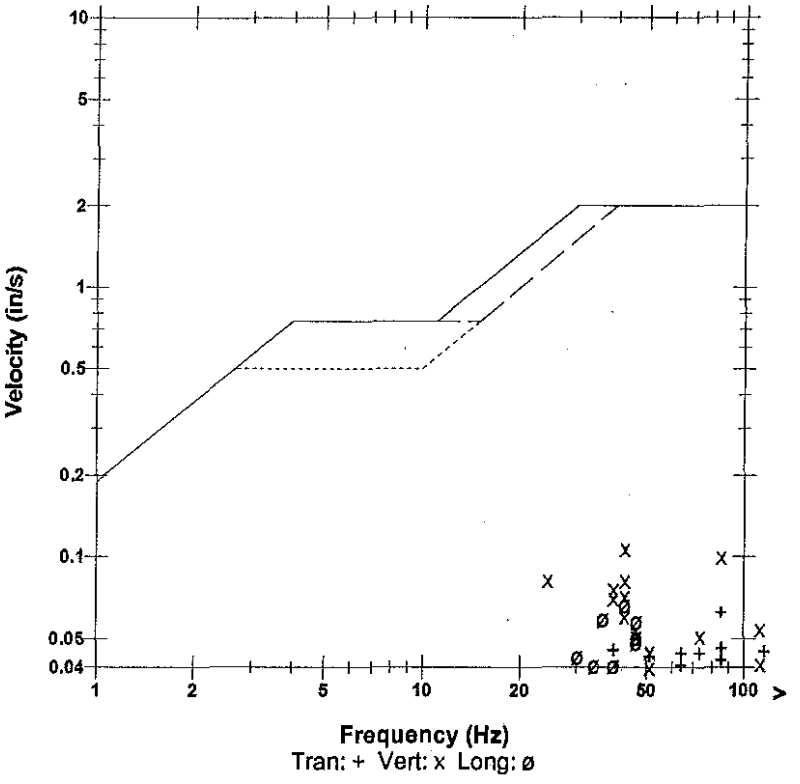
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

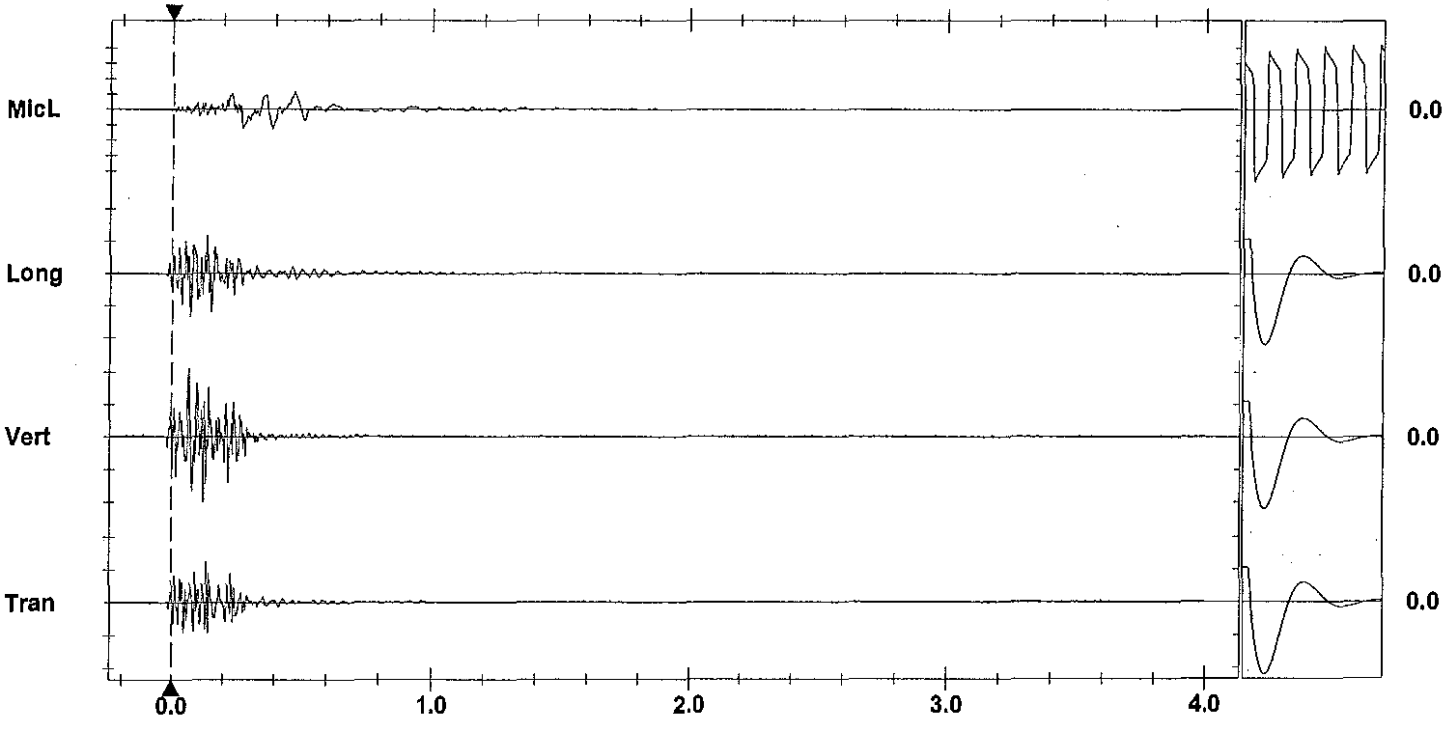
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.385 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 684 mv)

	Tran	Vert	Long	
PPV	0.0625	0.107	0.0669	in/s
ZC Freq	85	43	43	Hz
Time (Rel. to Trig)	0.136	0.068	0.071	sec
Peak Acceleration	0.0862	0.123	0.0580	g
Peak Displacement	0.00015	0.00042	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.111 in/s at 0.069 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶— — —◀

Sensorcheck

Printed: November 28, 2011 9:(8:04 - 8:04)
Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time Vert at 12:39:52 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1DK.IG0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

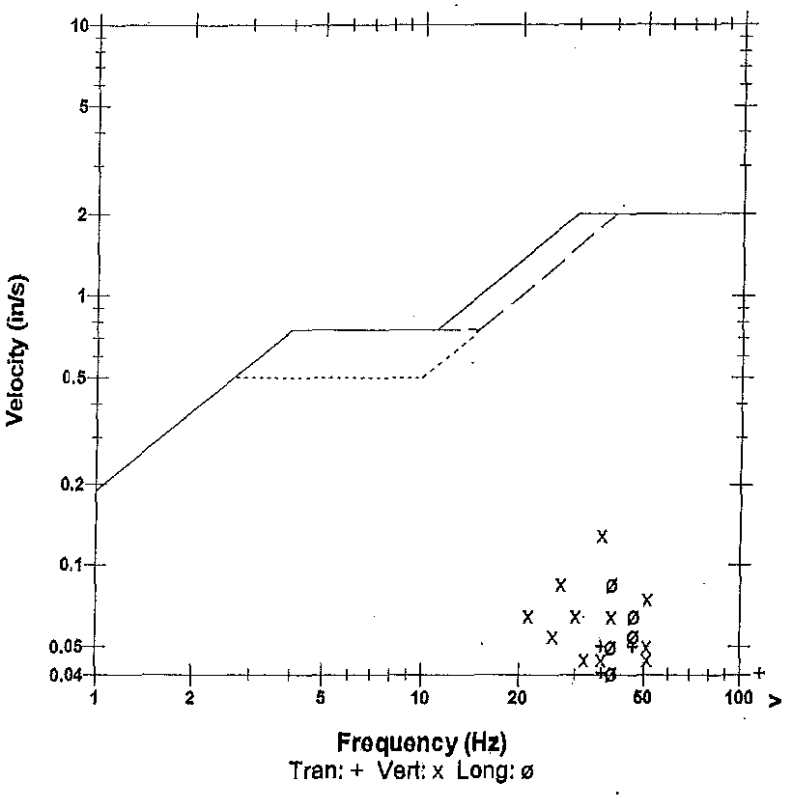
Extended Notes
Blast at stn 130 +10

Post Event Notes

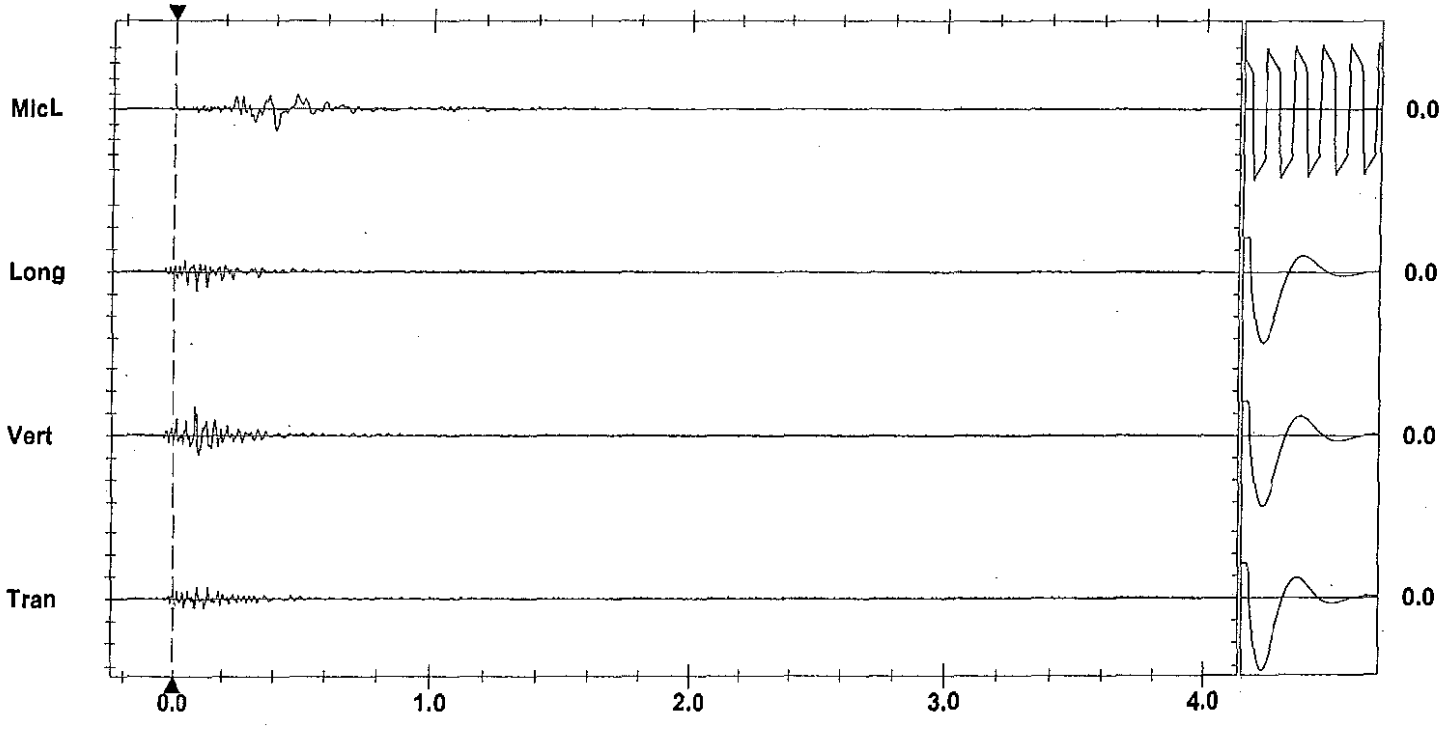
Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.400 sec
ZC Freq 8.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.0500	0.130	0.0850	in/s
ZC Freq	37	37	39	Hz
Time (Rel. to Trig)	0.099	0.089	0.092	sec
Peak Acceleration	0.0795	0.146	0.0530	g
Peak Displacement	0.00018	0.00057	0.00028	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.141 in/s at 0.091 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5034 B9

DATE PREPARED Nov 25/11
ACTUAL BLAST DATE Nov 25/11 1:35 PM
BLAST # MW-0015

HIGHWAY # 97
BLAST LOCATION AT: SBM 129+92 – 129+96

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * SHOT MARKED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 44 / 3 rock
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE 4 AMP
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

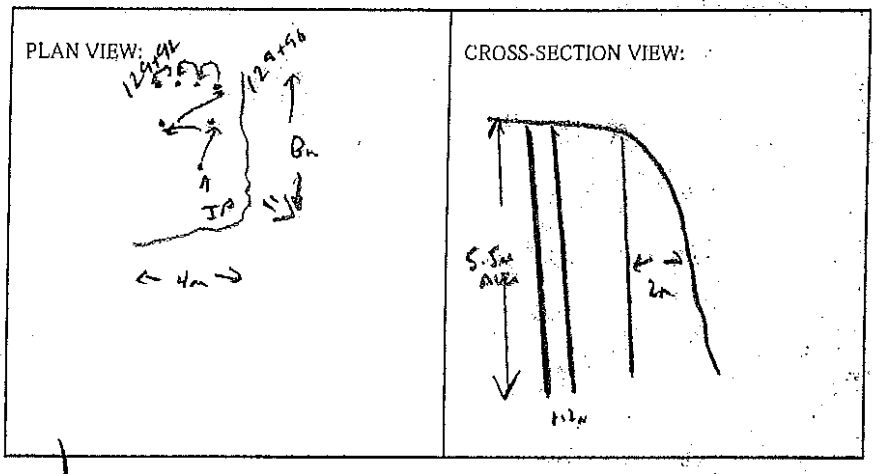
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) CAP IN MAXIMUM OF ANFO HOLES
BLASTING MACHINE: TYPE _____ CAPACITY _____

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffside ext. – 0.16 ips / 34 Hz
@ 13167 cliffside ext. – 0.15 ips / 37 Hz

20 Kg AMMO

4 CART 2½"x8" DYNAMITE, N B/L

15m 200 gr. det cord

7 CART. 1½"x8" DYNAMITE PRIMERS

3 7m @ 2 DETS

4 12' NONEL MS

1 4.5m LEAD DET.

Instantel

Event Report

Date/Time	Vert at 13:33:50 November 25, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1DN.0E0
Job Number:	1		

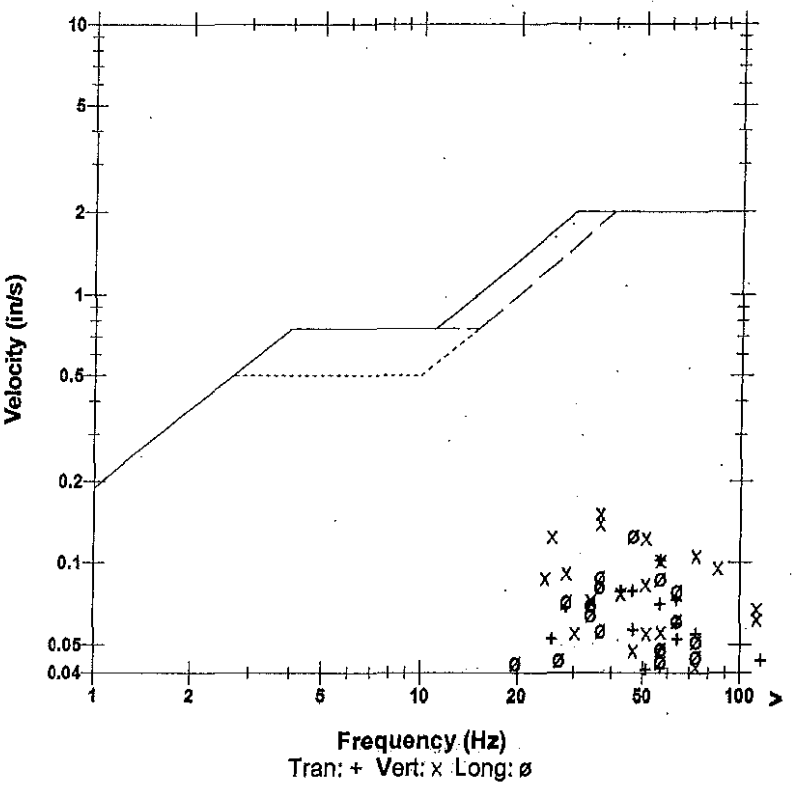
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

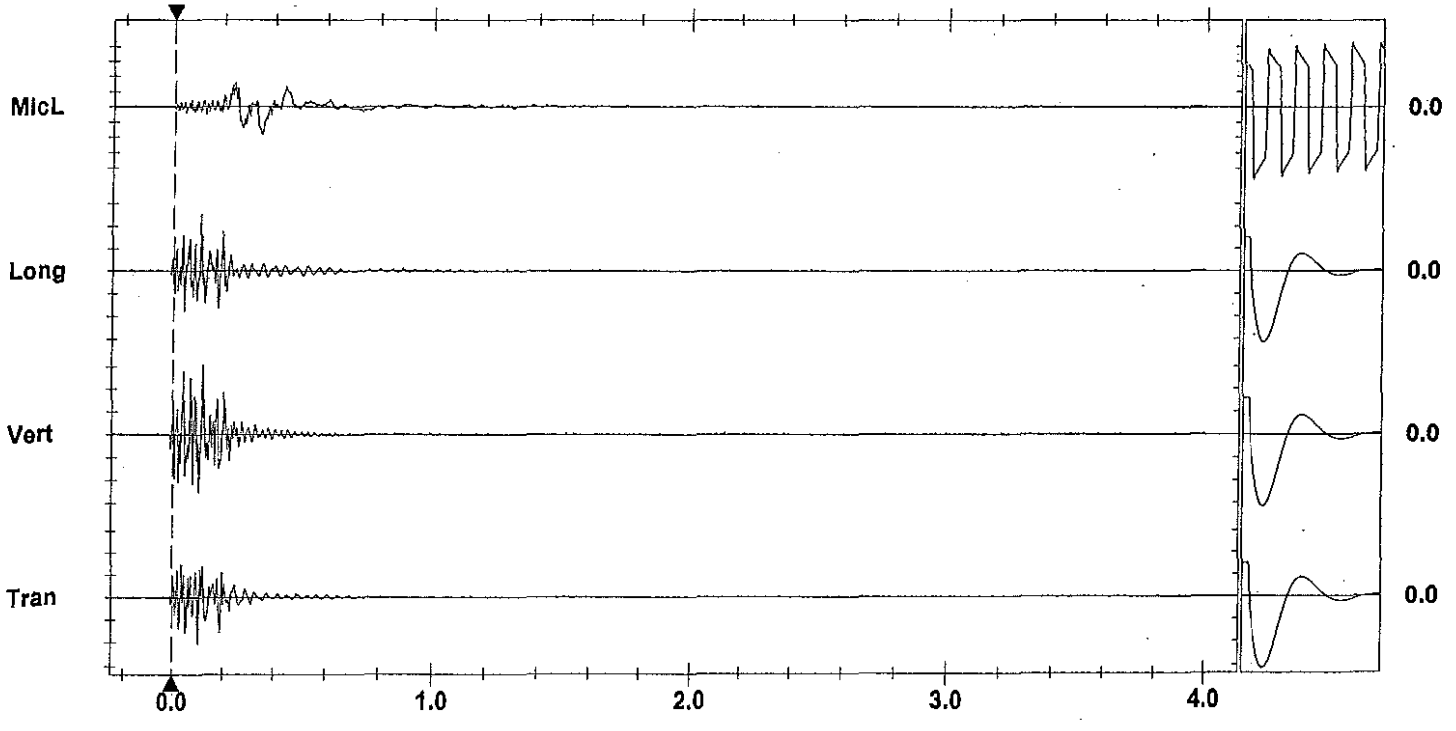
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00181 psi(L) at 0.344 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 694 mv)

	Tran	Vert	Long	
PPV	0.102	0.152	0.126	In/s
ZC Freq	57	37	47	Hz
Time (Rel. to Trig)	0.104	0.120	0.110	sec
Peak Acceleration	0.106	0.152	0.0961	g
Peak Displacement	0.00034	0.00053	0.00037	In
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.8	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.169 In/s at 0.044 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 In/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time Vert at 13:33:09 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1DM.Z90

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

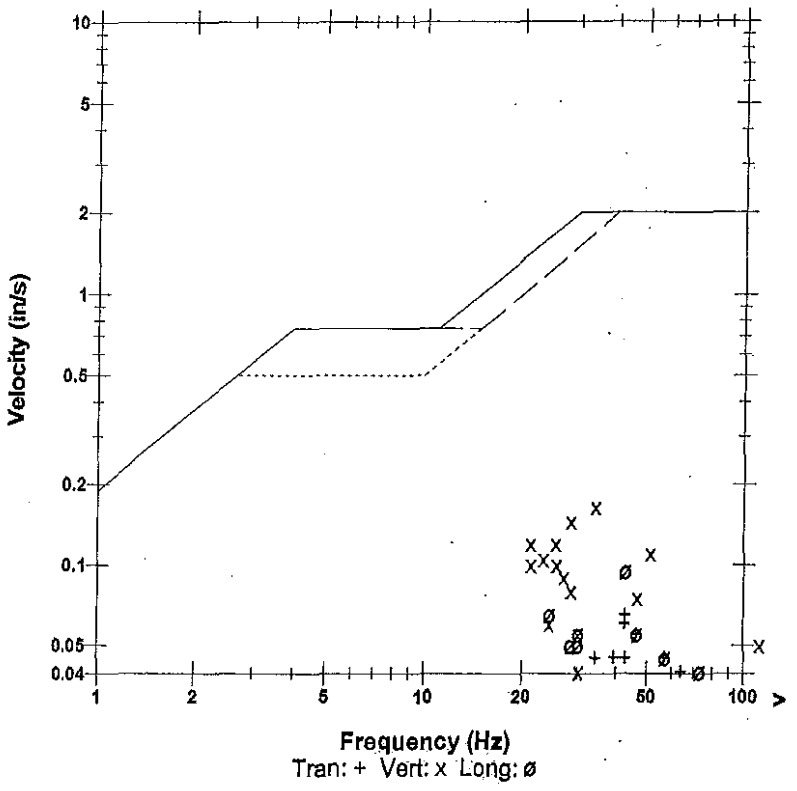
Extended Notes
Blast at stn 130 +10

Post Event Notes

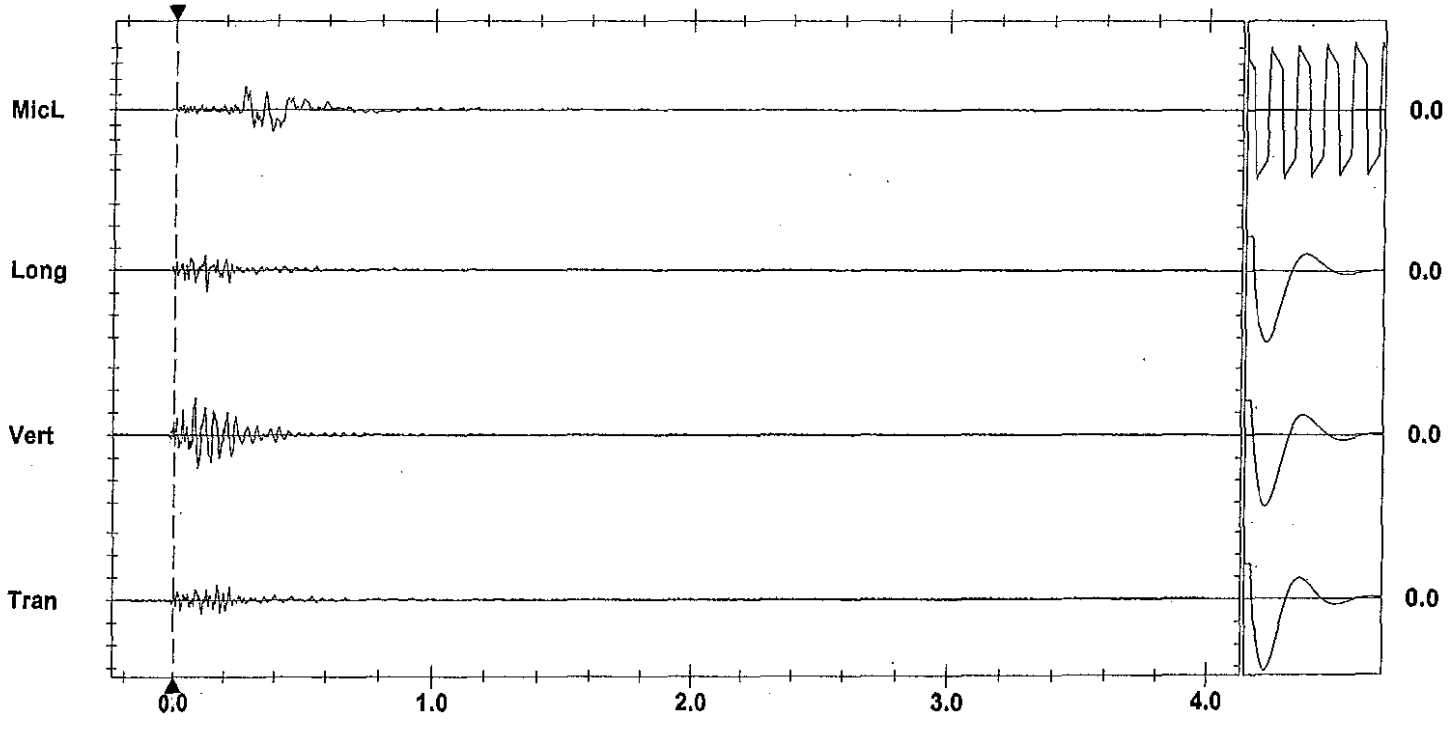
Microphone Linear Weighting
PSPL 0.00152 psi(L) at 0.274 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0650	0.165	0.0950	in/s
ZC Freq	43	34	43	Hz
Time (Rel. to Trig)	0.175	0.085	0.128	sec
Peak Acceleration	0.0530	0.146	0.0663	g
Peak Displacement	0.00025	0.00082	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.168 in/s at 0.085 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0301

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vanderley
BLASTER'S CERTIFICATE NUMBER 8884489

DATE PREPARED Nov 25/11
ACTUAL BLAST DATE Nov 25/11 2:41 PM
BLAST # NW-0016

HIGHWAY # 97
BLAST LOCATION AT: 129+92 Rt

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shaw marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynawire + Pyrod
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

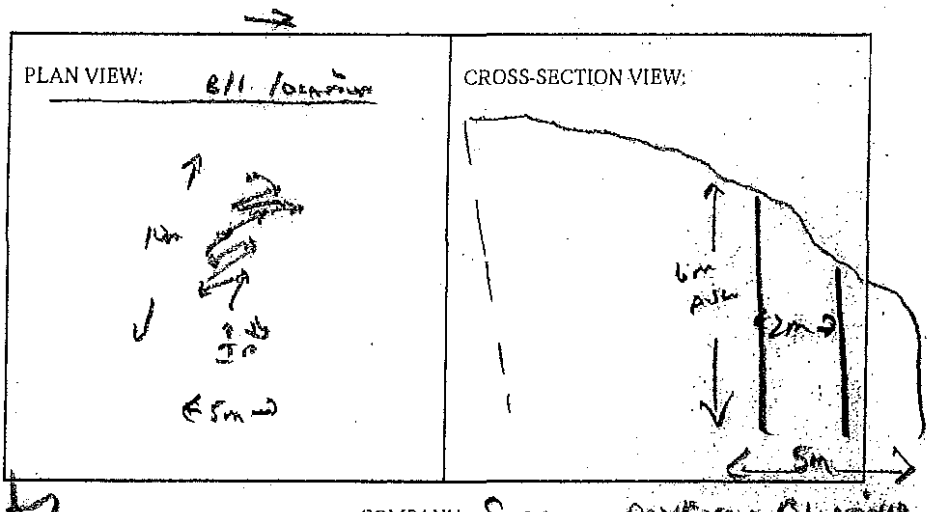
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Elec initiation of Nonel system
BLASTING MACHINE: TYPE HB 32M CAPACITY 32 Guard

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting Ltd

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffside east = 0.41 in/s / 22Hz
@ 13167 cliffside east = 0.48 in/s / 30Hz

SU rig [illegible]

11 CAST 1¼" DYNAMITE Primers

11 30' EZ REELS

1 4.5m ELEC. DET.

Instantel

Event Report

Date/Time	Vert at 14:41:42 November 25, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1DQ.5I0
Job Number:	1		

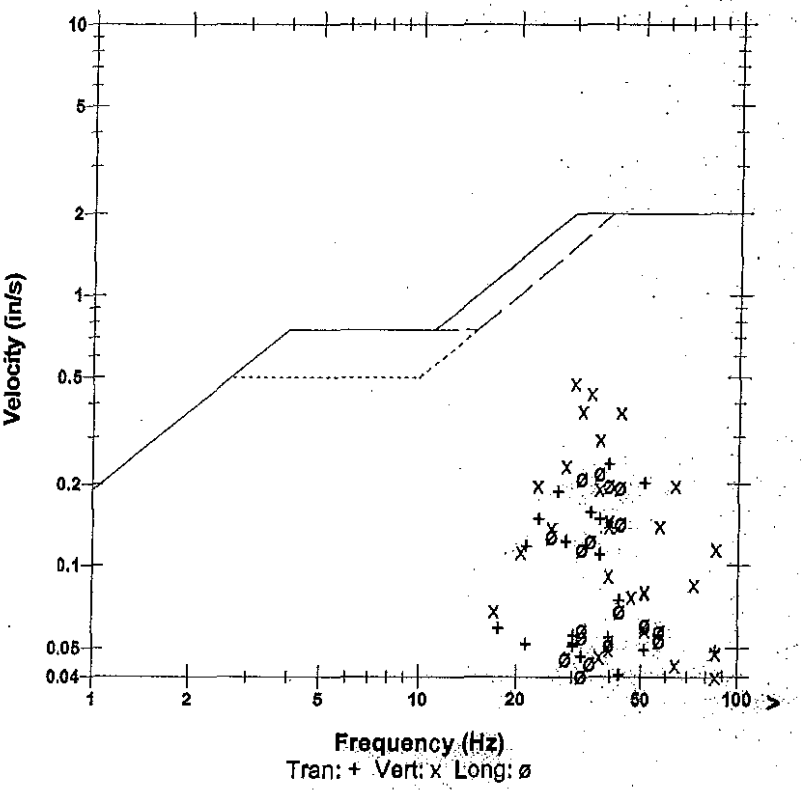
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

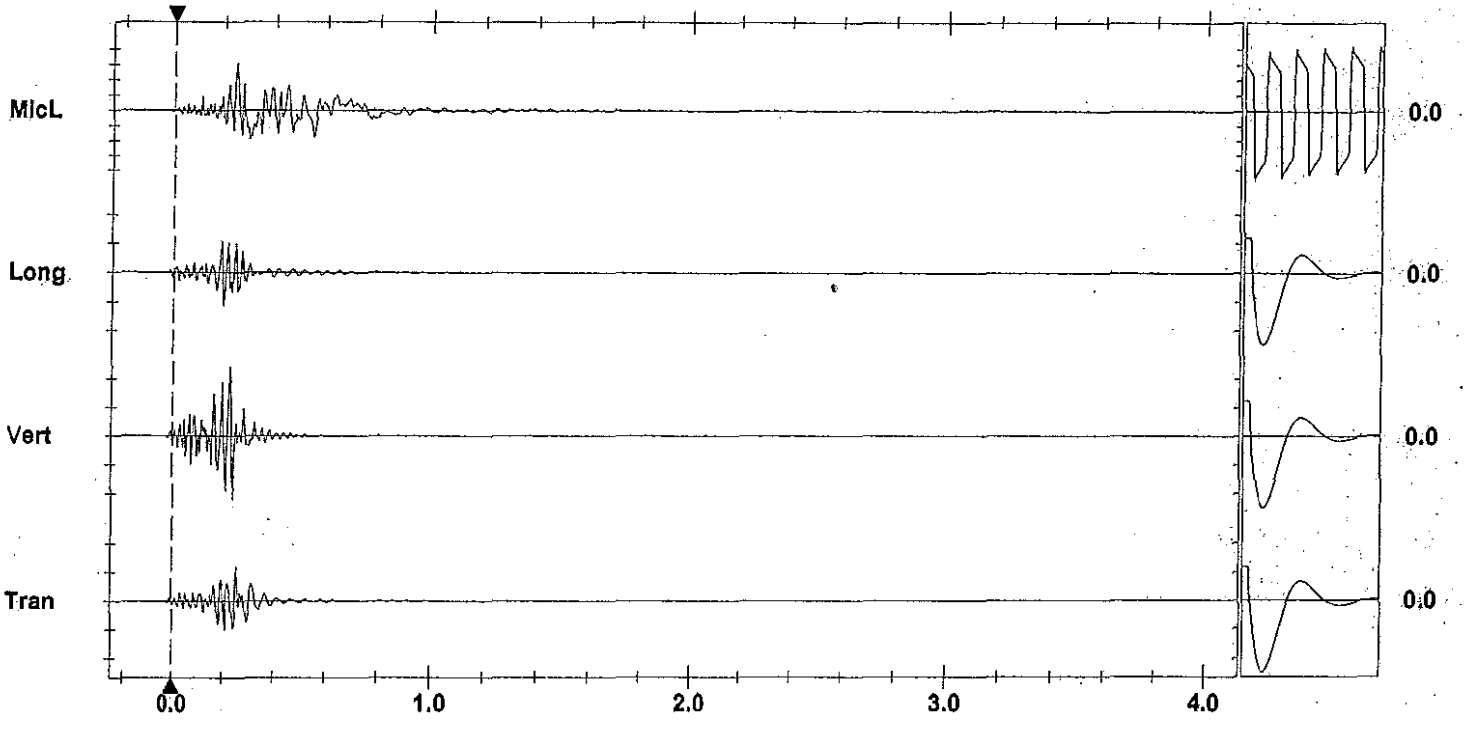
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00305 psi(L) at 0.245 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 709 mv)

	Tran	Vert	Long	
PPV	0.237	0.480	0.220	in/s
ZC Freq	39	30	37	Hz
Time (Rel. to Trig)	0.256	0.227	0.198	sec
Peak Acceleration	0.177	0.293	0.187	g
Peak Displacement	0.00112	0.00244	0.00088	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.494 in/s at 0.226 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Instantel

Event Report

Date/Time Vert at 14:41:01 November 25, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.1 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1DQ.4D0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

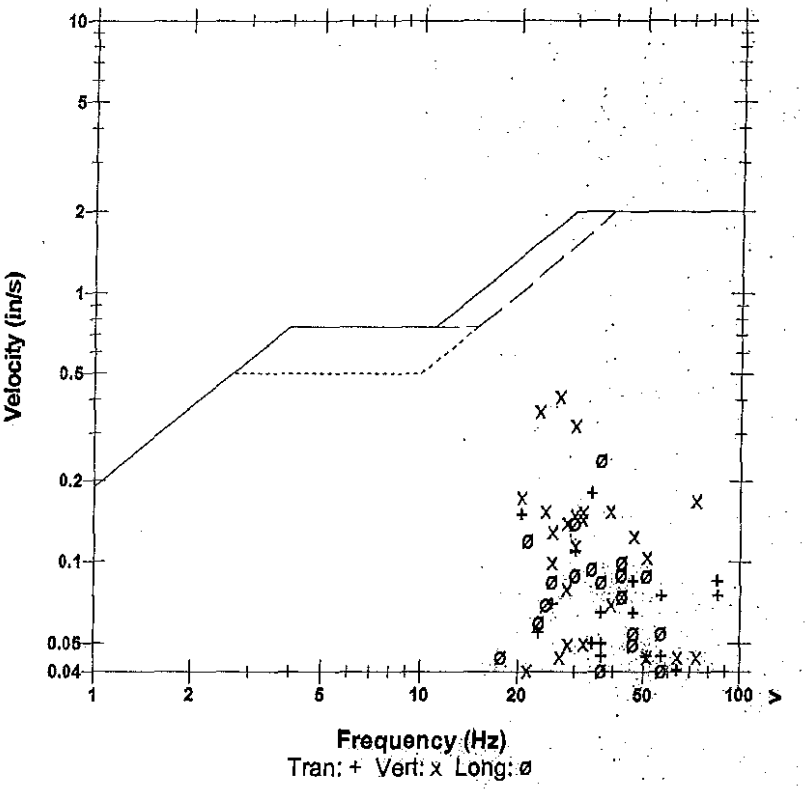
Extended Notes
Blast at stn 130 +10

Post Event Notes

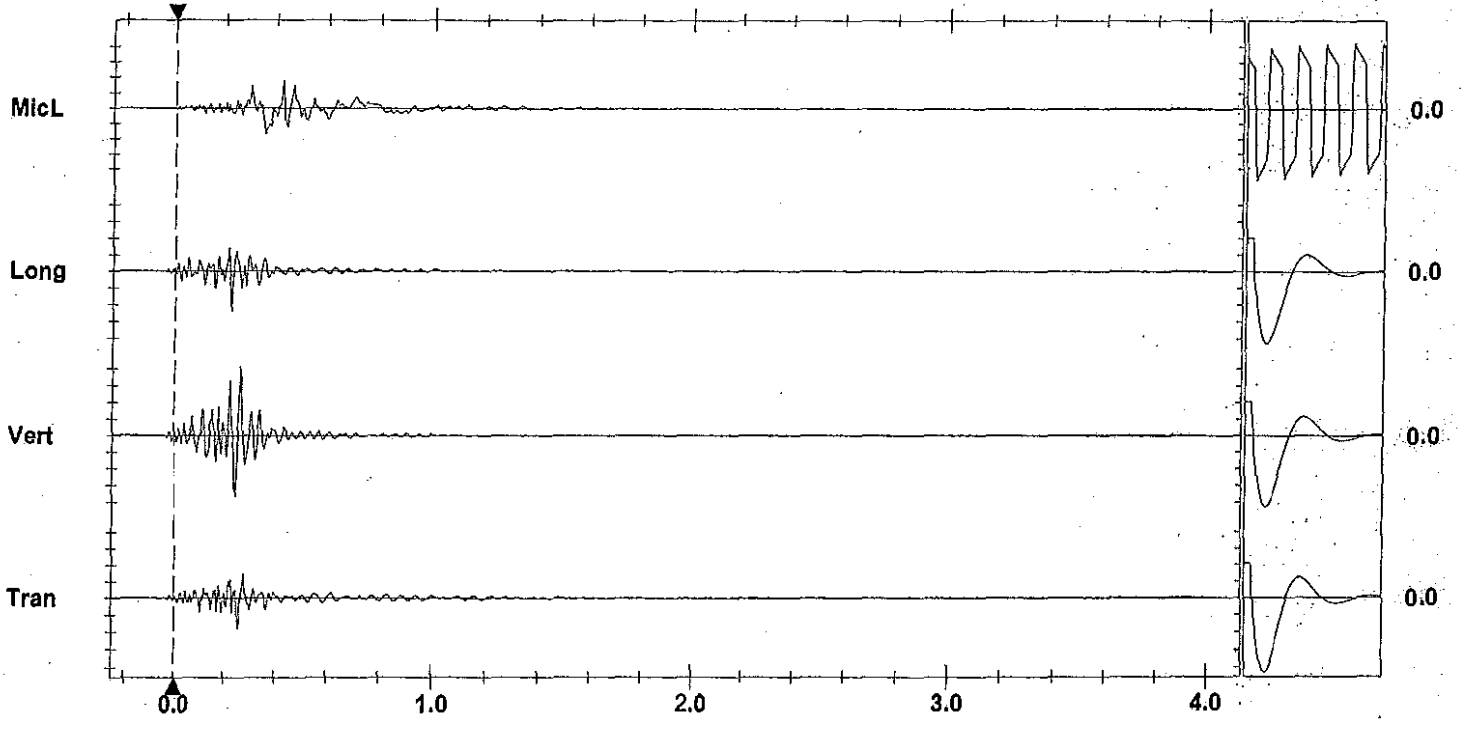
Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.423 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 689 mv)

	Tran	Vert	Long	
PPV	0.180	0.415	0.240	in/s
ZC Freq	34	27	37	Hz
Time (Rel. to Trig)	0.257	0.264	0.226	sec
Peak Acceleration	0.119	0.225	0.133	g
Peak Displacement	0.00077	0.00229	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.424 in/s at 0.264 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 11:44AM
BLAST # MW-0017

HIGHWAY# 97
BLAST LOCATION AT: 129+900 LT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) ; SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 500 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 5 Ctl + 5 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

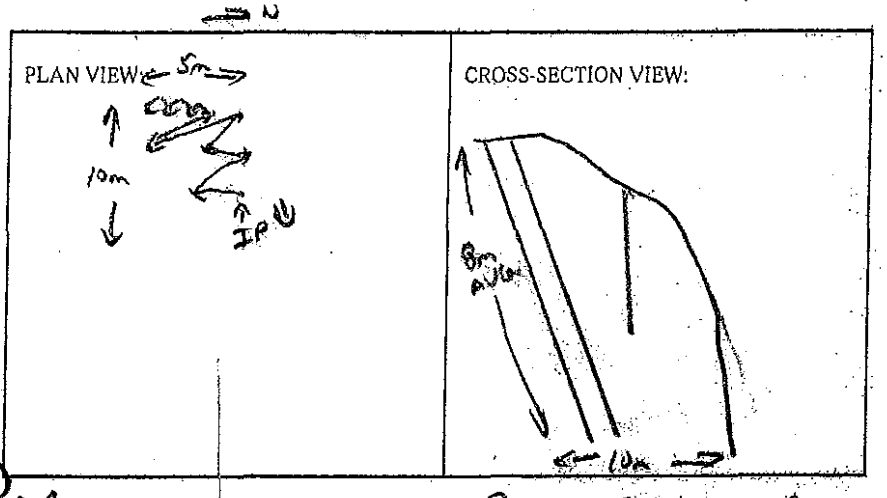
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 decks

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 Cliffstone Crt - 0.11 ips / 32Hz
@ 13167 Cliffstone Crt. 0.17 ips / 37Hz

5 CASES 1½" x 16" DYNAMITE PRIMERS

5 CASES 2" x 16" DYNAMITE IN B/L

30m 2700 gr. det. cord

5 40' EZ DETS

5 12' NONEL MS

1 4.5m ELEC DET.

Instantel

Event Report

Date/Time	Vert at 11:44:50 November 29, 2011
Trigger Source	Geo: 1.02 mm/s
Range	Geo :31.7 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.3 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E1KW.MQ0

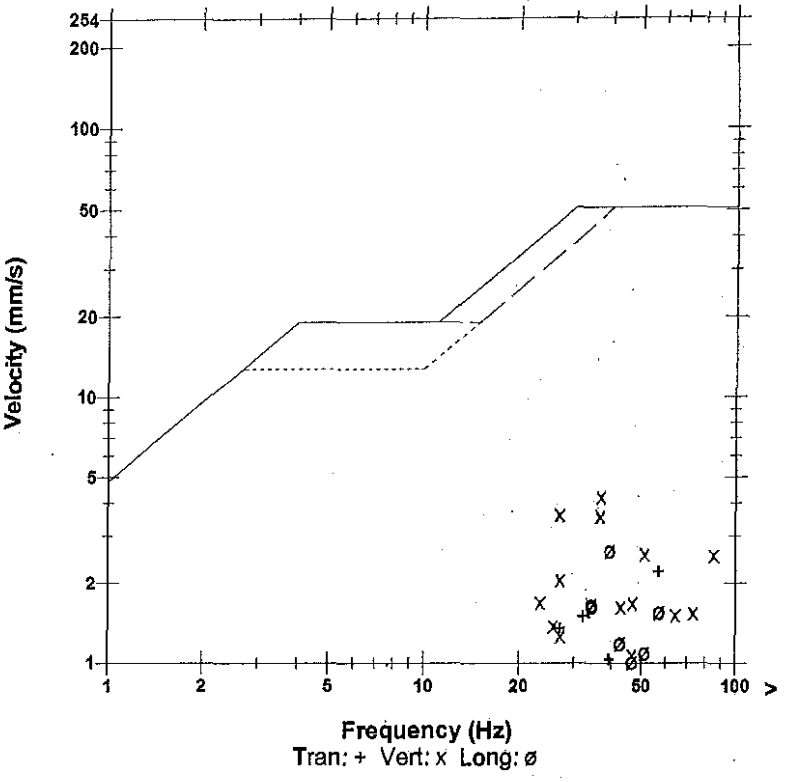
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

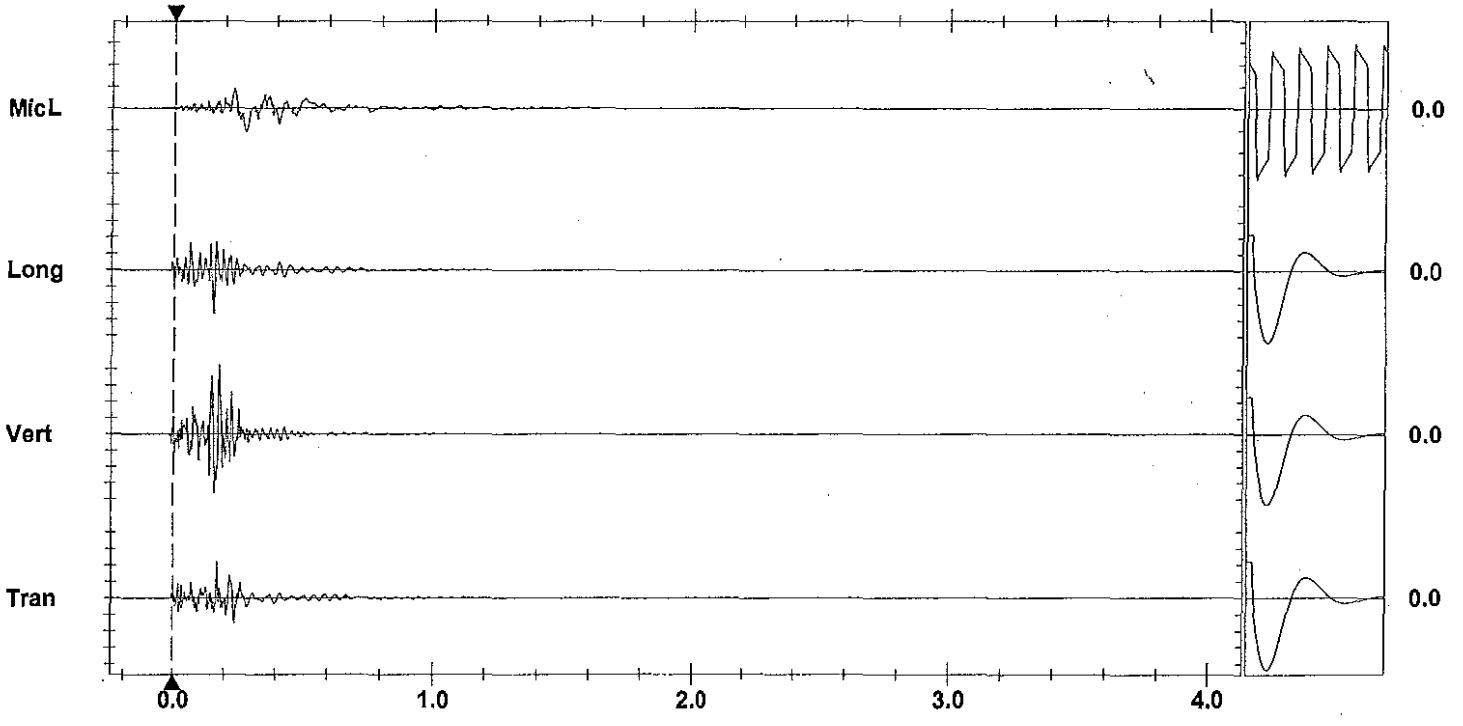
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	10.5 pa.(L) at 0.279 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 606 mv)

	Tran	Vert	Long	
PPV	2.21	4.24	2.65	mm/s
ZC Freq	57	37	39	Hz
Time (Rel. to Trig)	0.171	0.180	0.154	sec
Peak Acceleration	0.0696	0.182	0.0845	g
Peak Displacement	0.00797	0.0202	0.0101	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 4.29 mm/s at 0.180 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶—— —— ——◀

Instantel

Event Report

Date/Time	Vert at 11:44:05 November 29, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

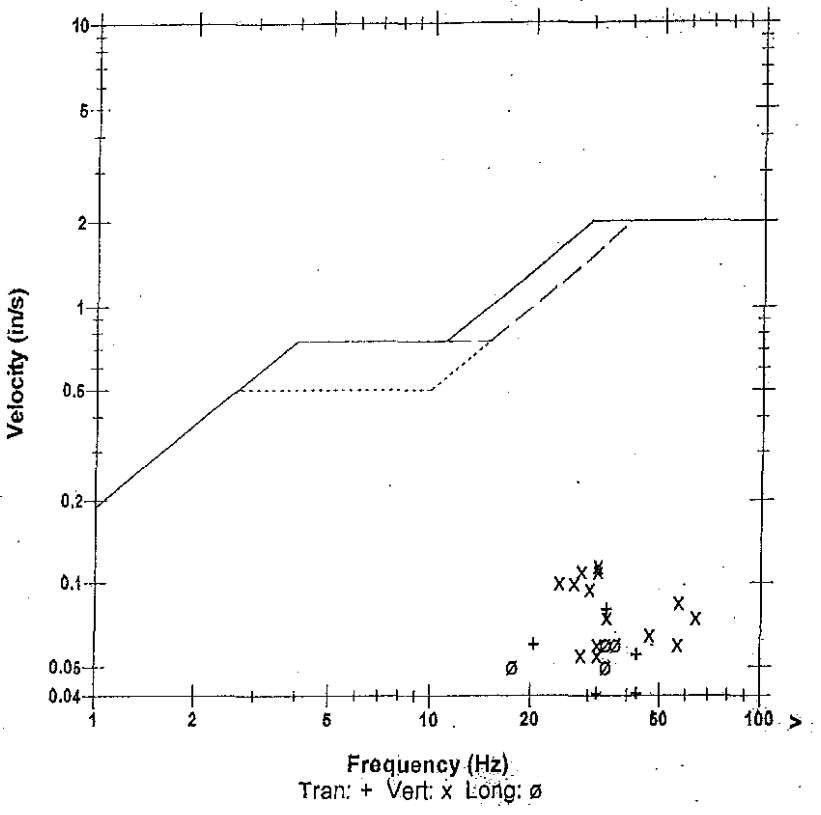
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.3 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E1KW.LH0

Notes
location:13221 rear patio slab — Cliffstone Crt on sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

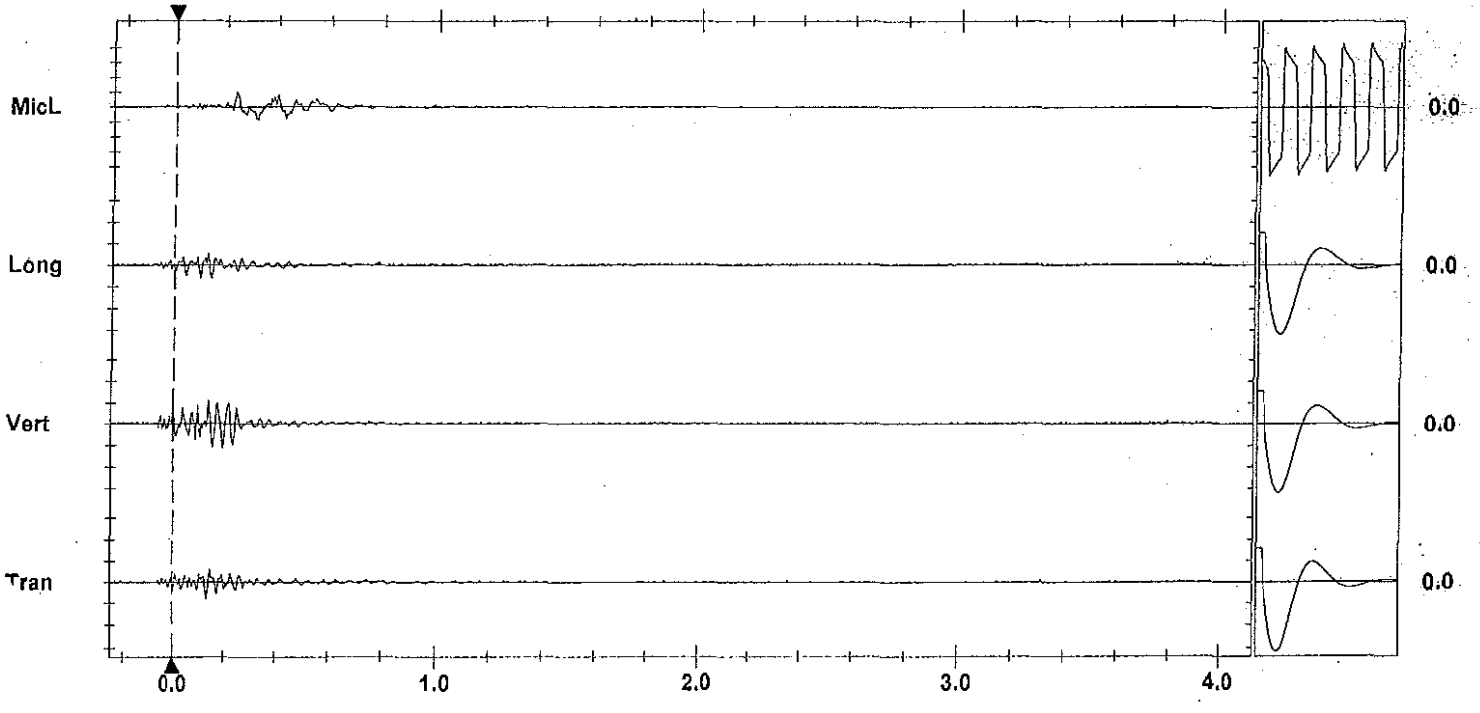
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.238 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 695 mv)

	Tran	Vert	Long	
PPV	0.0800	0.115	0.0600	in/s
ZC Freq	34	32	37	Hz
Time (Rel. to Trig)	0.139	0.197	0.104	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00035	0.00065	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.121 in/s at 0.143 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 3:38 PM
BLAST # MW-0020

HIGHWAY # 97
BLAST LOCATION AT: STN 1291-80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

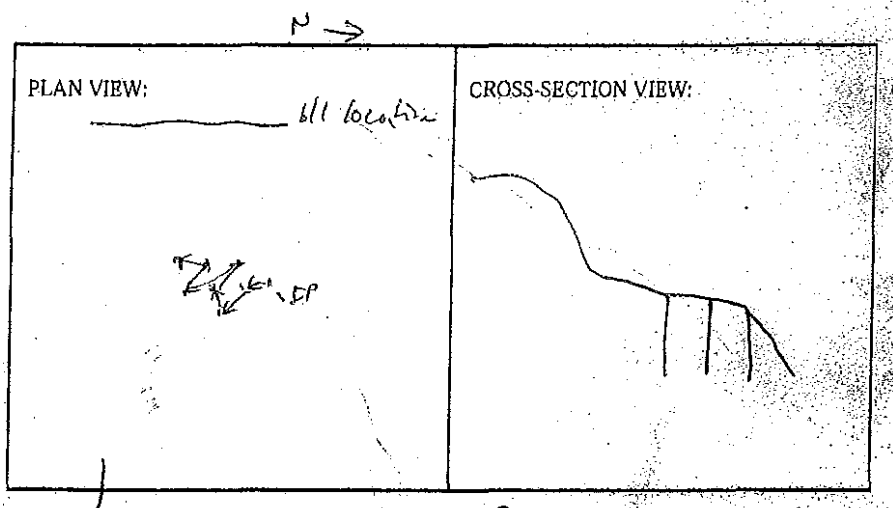
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 holes

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

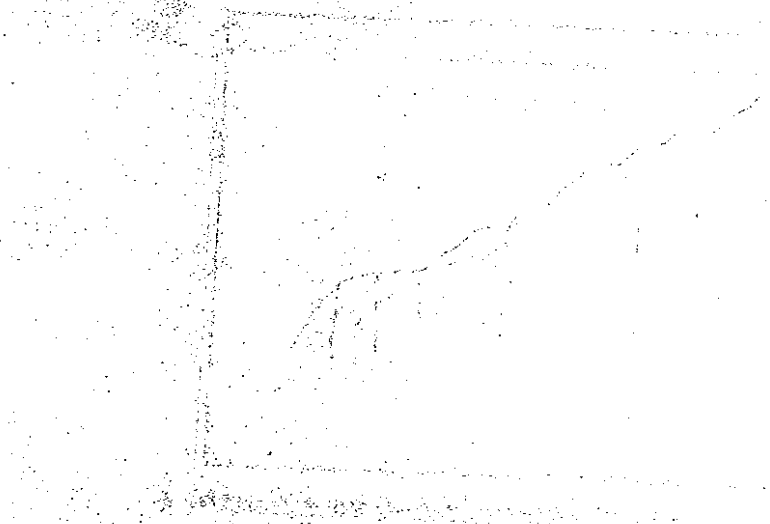
seismograph @ 13221 cliffstone ct - 0.070 ips / 43Hz
@ 13167 cliffstone ct. 0.10 ips / 37Hz

1. [illegible]

8. CASE 1½x16" DYNAMITE PRIMERS

8 30' EZ DETS

1 4.5m ELEC DET.



Instantel

Event Report

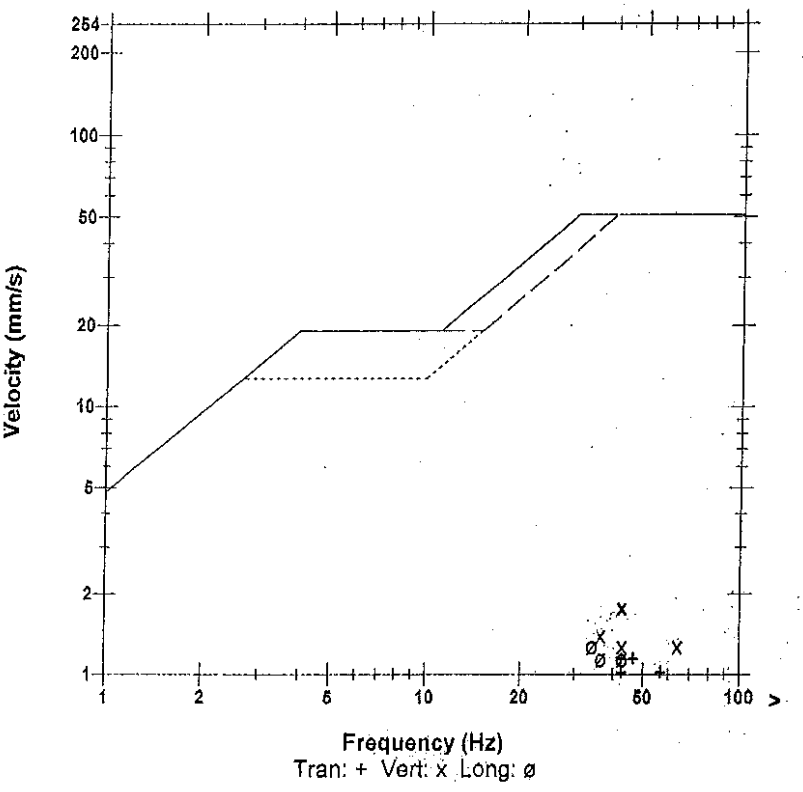
Date/Time	Vert at 15:38:03 November 29, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1L7.FF0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

USBM RI8507 And OSMRE

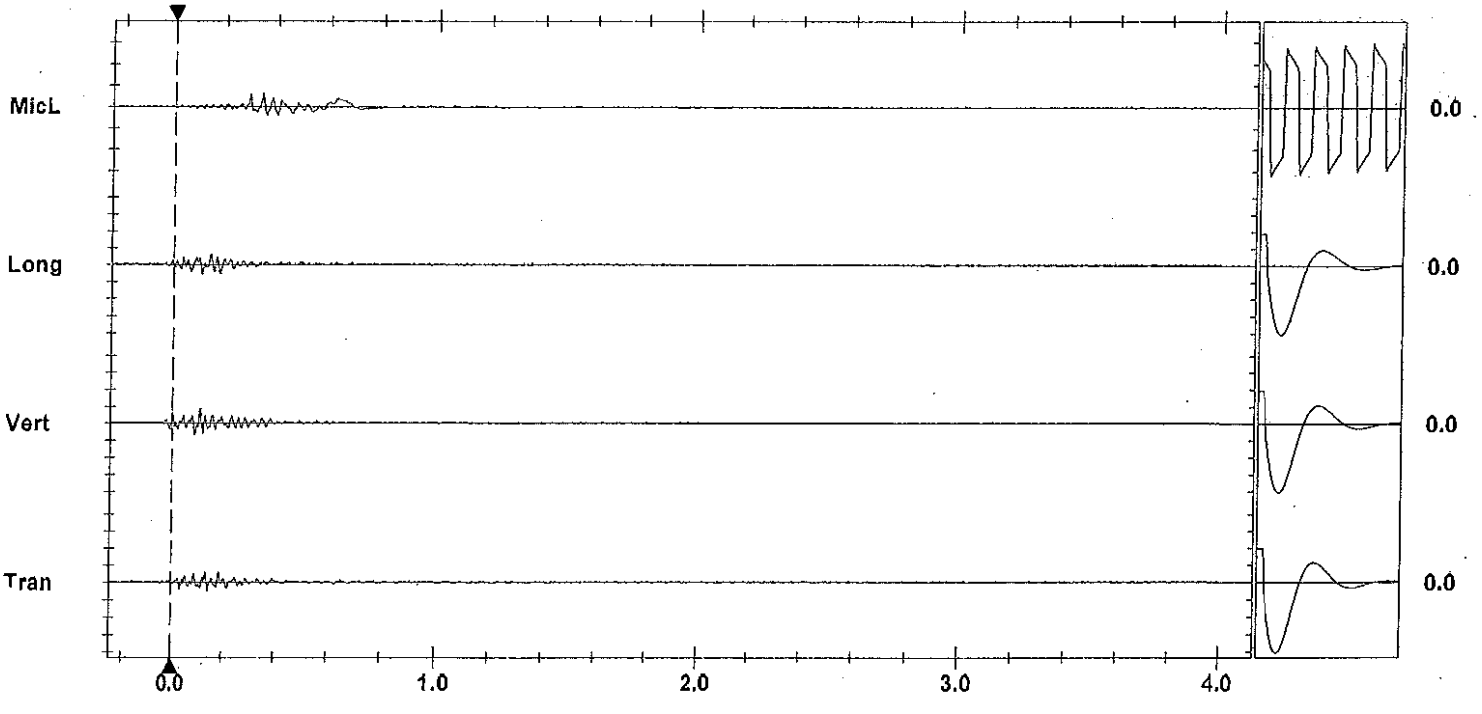


Tran: + Vert: x Long: ø

Microphone Linear Weighting
PSPL 6.25 pa.(L) at 0.343 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 678 mv)

	Tran	Vert	Long	
PPV	1.14	1.78	1.27	mm/s
ZC Freq	47	43	34	Hz
Time (Rel. to Trig)	0.137	0.112	0.148	sec
Peak Acceleration	0.0398	0.0530	0.0398	g
Peak Displacement	0.00422	0.00651	0.00670	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 2.04 mm/s at 0.113 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

Date/Time	Long at 15:38:48 November 29, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1L7.GO0
Job Number:	1		

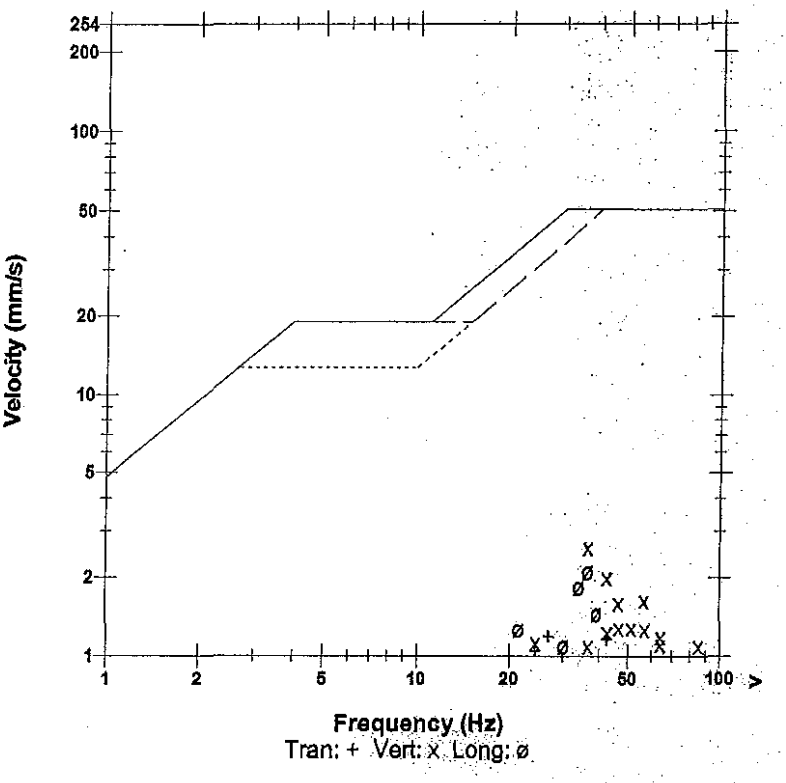
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

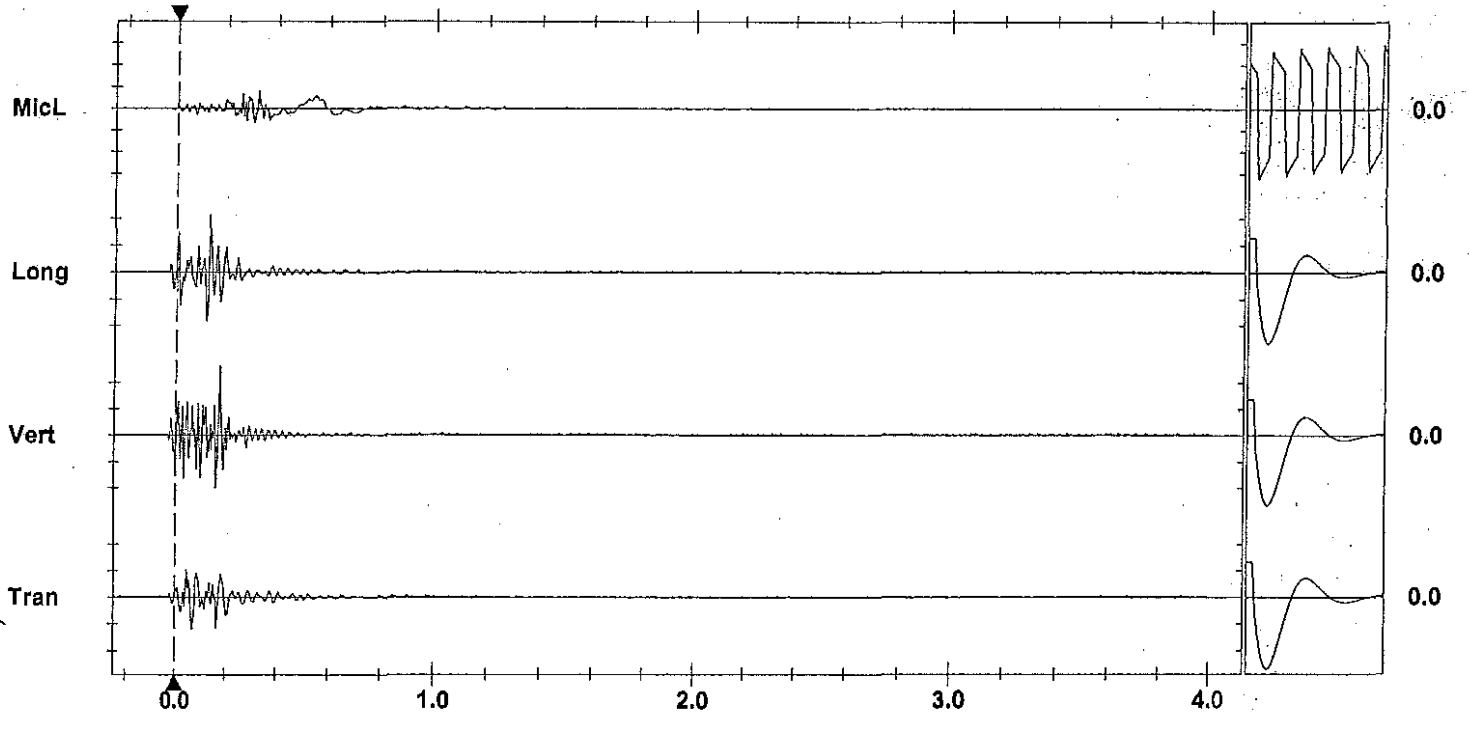
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	7.76 pa.(L) at 0.321 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 720 mv)

	Tran	Vert	Long	
PPV	1.19	2.60	2.11	mm/s
ZC Freq	27	37	37	Hz
Time (Rel. to Trig)	0.070	0.176	0.134	sec
Peak Acceleration	0.0315	0.0895	0.0746	g
Peak Displacement	0.00693	0.00948	0.00873	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.9	3.8	4.1	

Peak Vector Sum 2.83 mm/s at 0.176 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div

Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO: 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME: SIERRA DRILLING & BLASTING
BLASTER'S NAME: WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER: 5B3489

DATE PREPARED: NOV 29/11
ACTUAL BLAST DATE: NOV 29/11 2:27PM
BLAST #: MW-0019

HIGHWAY #: 97
BLAST LOCATION AT: STN 1294 BR

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION: _____

SITE DETAILS: * shotcrete

HEIGHT ABOVE HWY: N/A (m) SLOPE ANGLE: 63 (°) SLOPE LENGTH: 5 (m)
ROCK TYPE: METAMO GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY): 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES: 5
AVERAGE DEPTH: 3 (m)
NUMBER OF ROWS: 2
MAXIMUM DEPTH: 6.3 (m)
TOTAL DEPTH: 65 (m)

TOTAL NUMBER OF HOLES: 8 PROD / 5 BL (3 aborted)
HOLE DIAMETER: 76 (mm)
HOLE SPACING: 2 (m) BURDEN: 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE: 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES: 11
TOTAL NUMBER OF DELAYS: 11

EXPLOSIVE SIZE: 40 mm by 400 mm
TOTAL WEIGHT: 50 (kg)
DELAY TYPE AND LENGTH: 25 (ms)

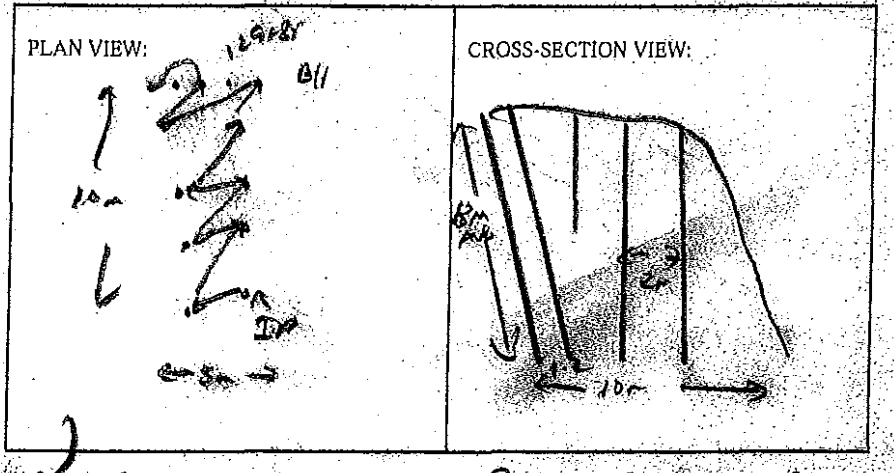
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY): _____
BLASTING MACHINE: TYPE: HB 320 CAPACITY: 80 CAPS

VOLUME OF ROCK BLASTED: 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE: _____ COMPANY: SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE): _____

(Use Additional Sheets If Necessary)

Seismograph @ 1324 cliffside ext - 0.24 ips / 39 Hz
@ 1317 cliffside ext - 0.37 ips / 39 Hz

5 CASE 1½"x16" DYNAMITE PRIMERS

3 CASE 2"x16" DYNAMITE IN BIL

18m 200 gr. det cord

5 40' EZ DETS

3 12' NONEL MS

1 4.5m ELEC DET

Instantel

Event Report

Date/Time	Vert at 14:27:34 November 29, 2011
Trigger Source	Geo: 1.02 mm/s
Range	Geo :254 mm/s
Record Time	4.0 sec at 1024 sps

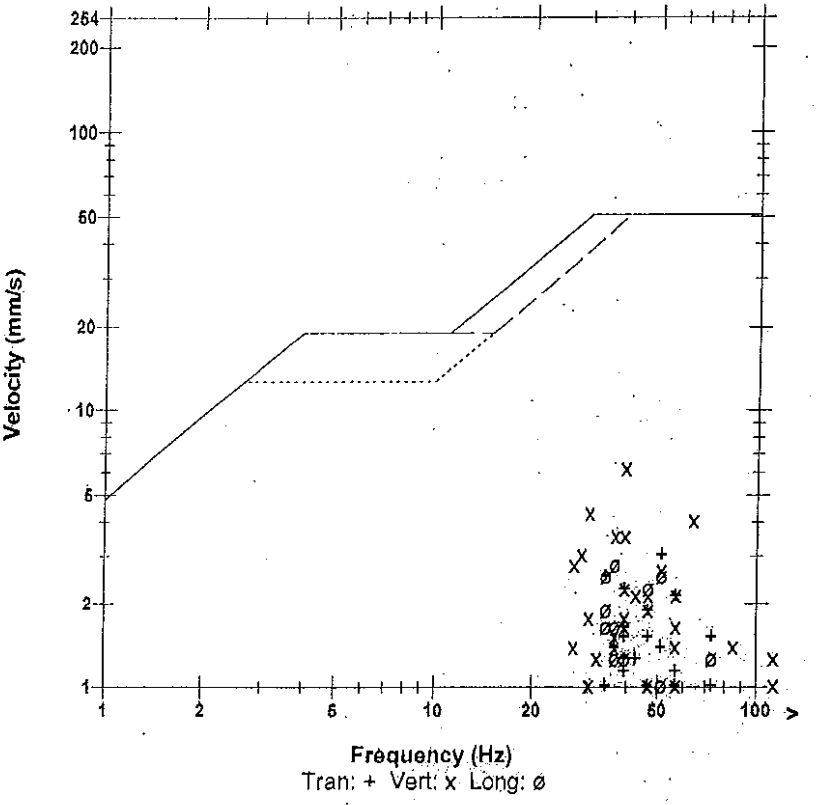
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E1L4.5Y0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

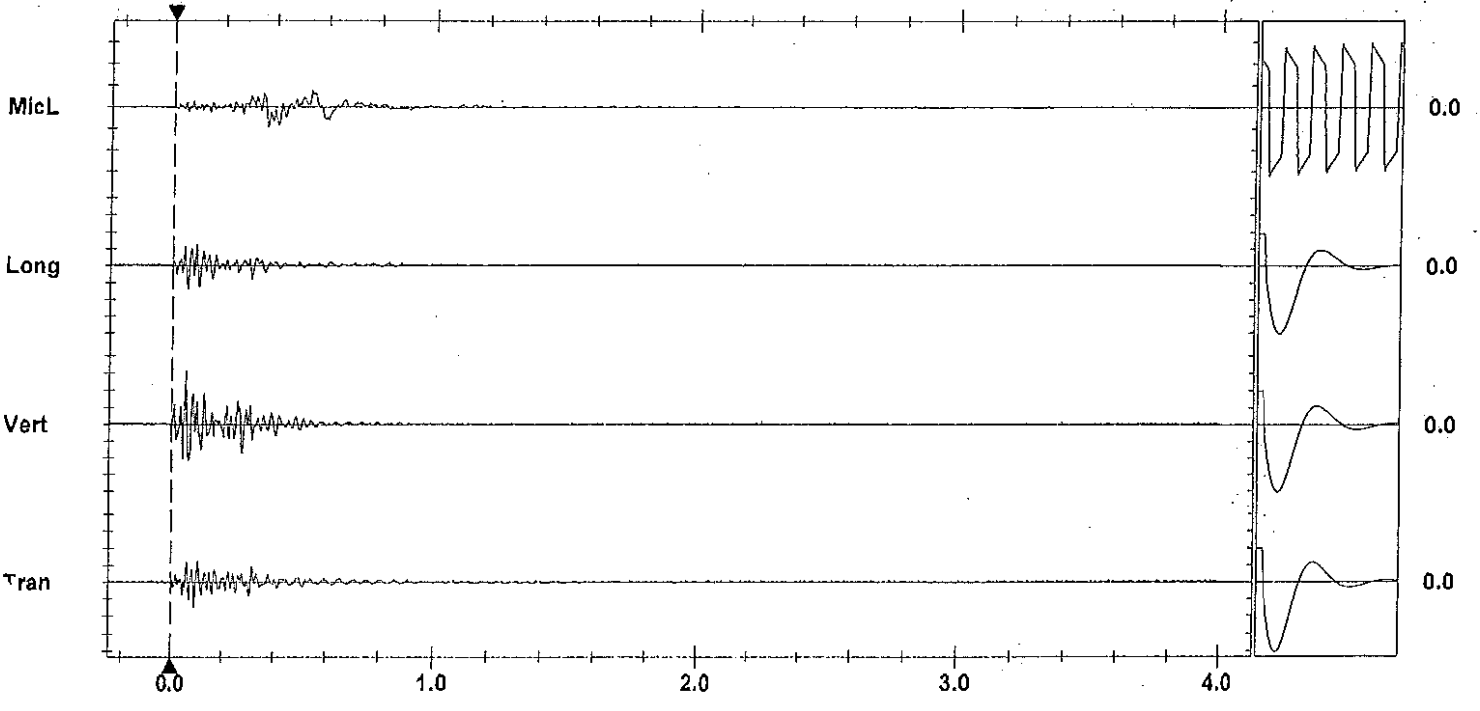
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	9.50 pa.(L) at 0.368 sec
ZC Freq	8.4 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 698 mv)

	Tran	Vert	Long	
PPV	3.05	6.22	2.79	mm/s
ZC Freq	51	39	37	Hz
Time (Rel. to Trig)	0.093	0.056	0.061	sec
Peak Acceleration	0.0928	0.186	0.0928	g
Peak Displacement	0.0105	0.0264	0.0123	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 6.51 mm/s at 0.057 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 14:28:19 November 29, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.2 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1L4.770
Job Number:	1		

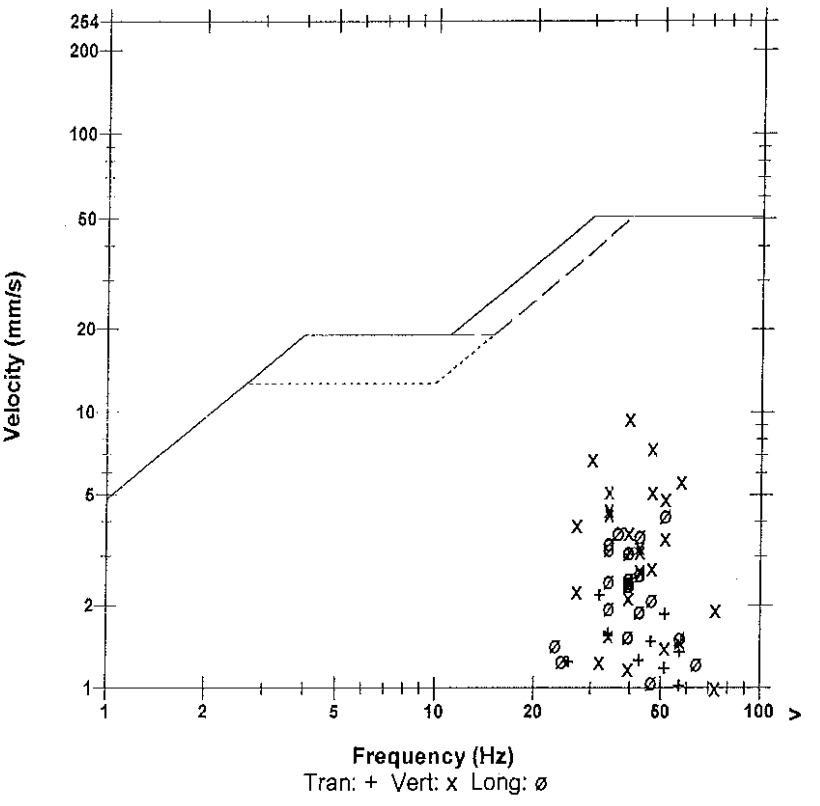
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

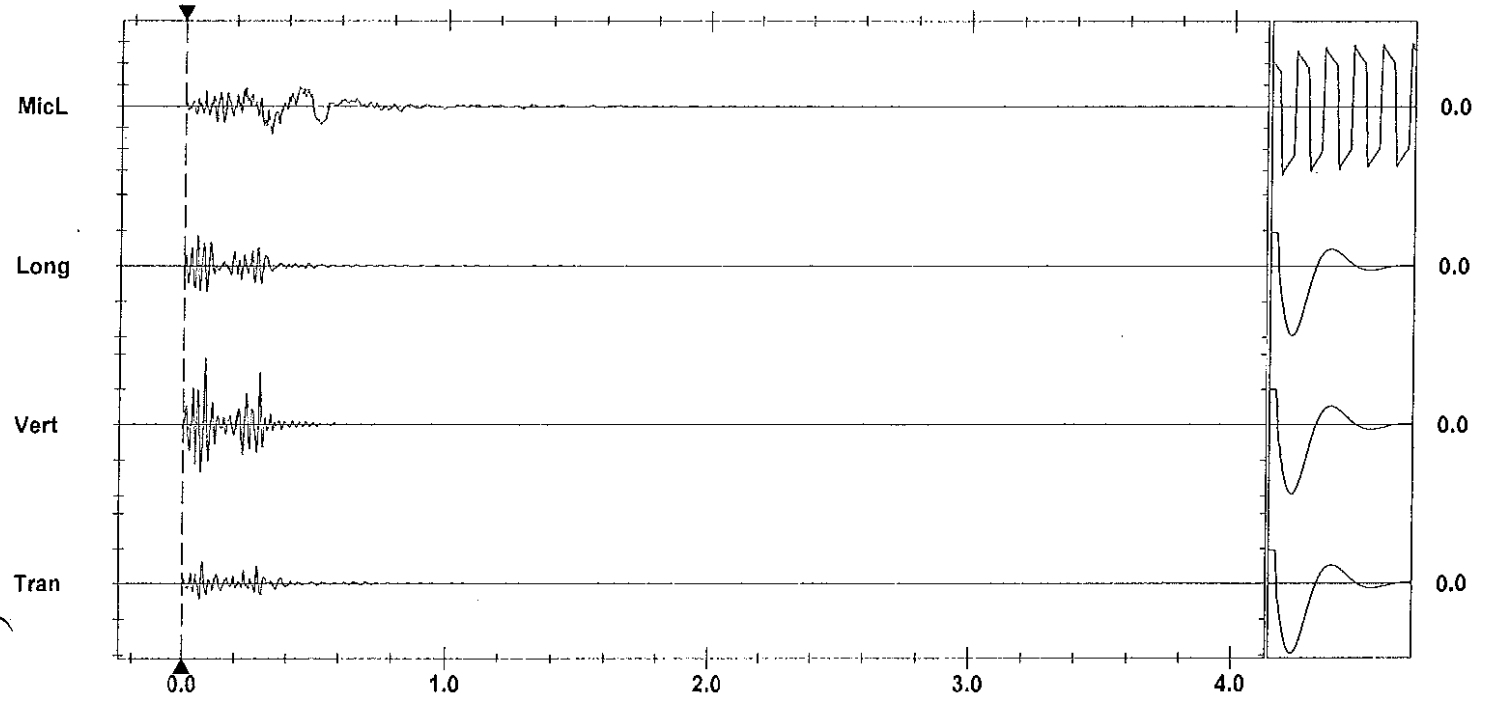
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	13.0 pa.(L) at 0.336 sec			
ZC Freq	6.1 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 659 mv)			

	Tran	Vert	Long	
PPV	3.05	9.48	4.21	mm/s
ZC Freq	39	39	51	Hz
Time (Rel. to Trig)	0.079	0.087	0.052	sec
Peak Acceleration	0.0945	0.230	0.199	g
Peak Displacement	0.0124	0.0334	0.0153	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 10.1 mm/s at 0.087 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶— — — —◀

Printed: December 14, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11
BLAST # MW-0318

1:23 PM

HIGHWAY # 97
BLAST LOCATION AT: STN 129+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: & std matted

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Blasted Quartzite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

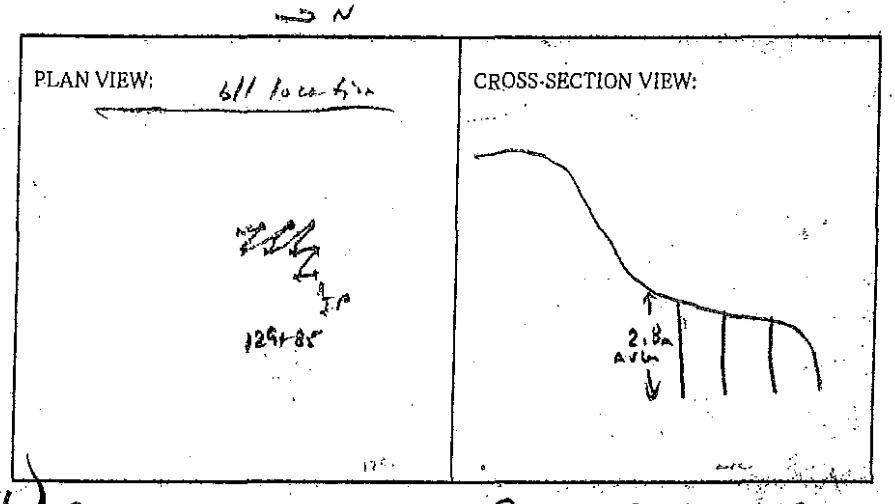
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13221 client ref - 0.12in/s 47Hz
@ 13167 client ref - 0.12in/s 43Hz

1 BAG ANFO

10 CAST 1½" x 16" DYNAMITE PRIMERS

10 40' E2 DETS

1 4.5m ELEC DET

Instantel

Event Report

Date/Time	Vert at 13:22:45 November 29, 2011
Trigger Source	Geo: 1.02 mm/s
Range	Geo :254 mm/s
Record Time	4.0 sec at 1024 sps

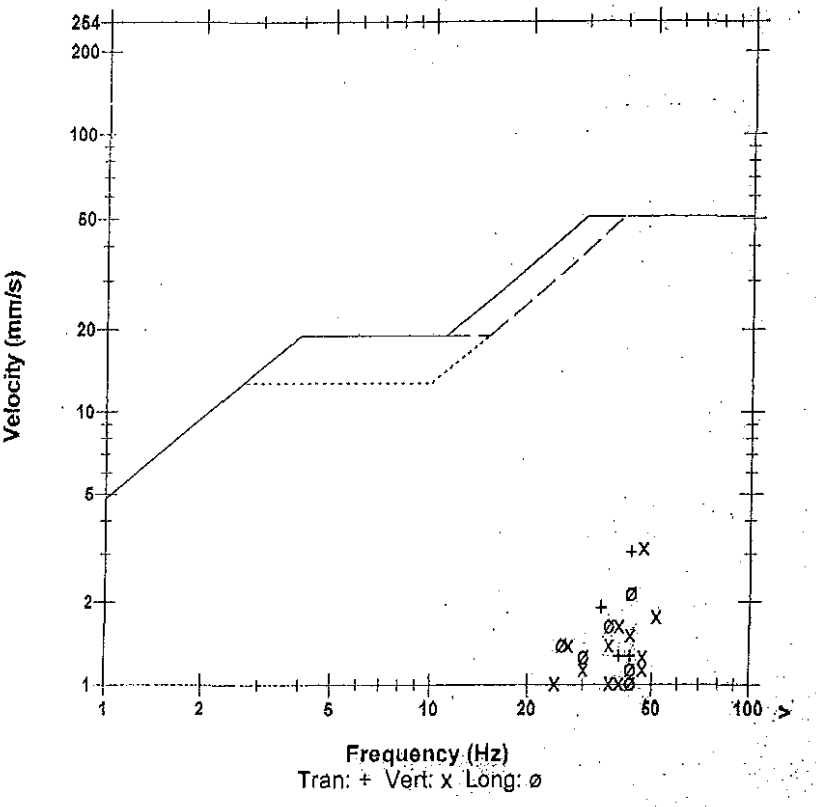
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E1L1.5X0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

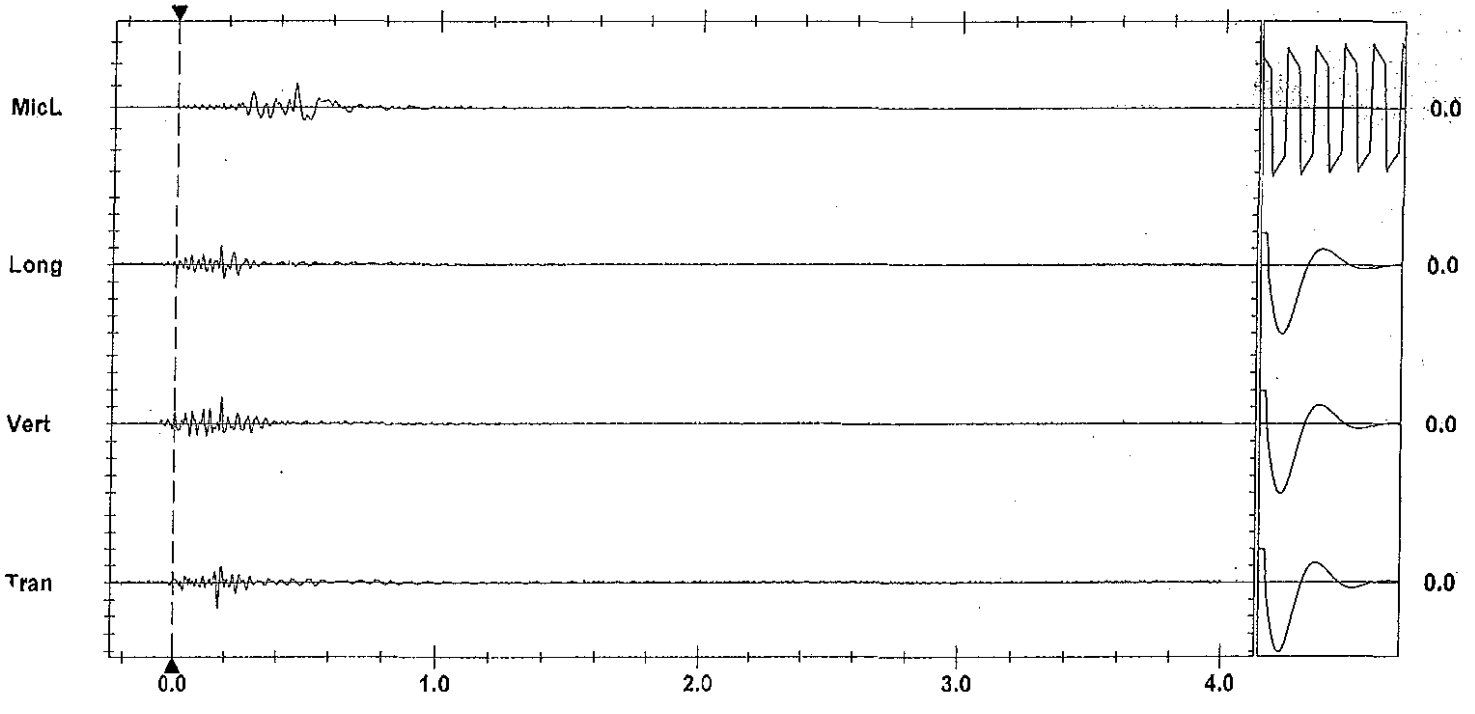
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	10.5 pa.(L) at 0.460 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 689 mv)

	Tran	Vert	Long	
PPV	3.05	3.17	2.16	mm/s
ZC Freq	43	47	43	Hz
Time (Rel. to Trig)	0.177	0.185	0.178	sec
Peak Acceleration	0.0795	0.0795	0.0663	g
Peak Displacement	0.0113	0.0101	0.00936	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 3.77 mm/s at 0.178 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶—— ——◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 13:22:45 November 29, 2011
Trigger Source	Geo: 1.02 mm/s
Range	Geo :254 mm/s
Record Time	4.0 sec at 1024 sps

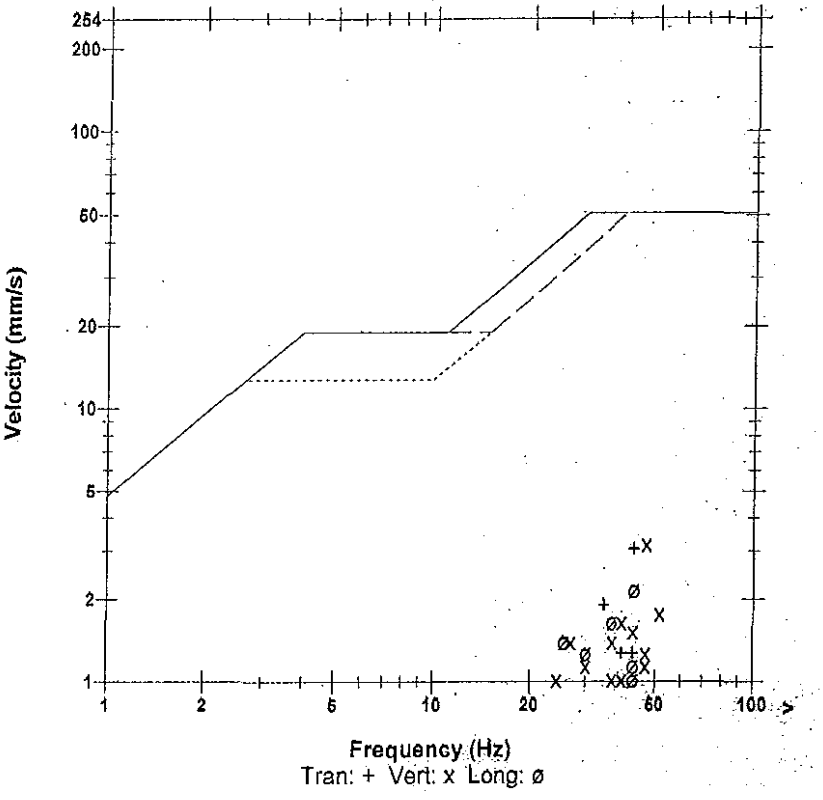
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E1L1.5X0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 130 +10

Post Event Notes

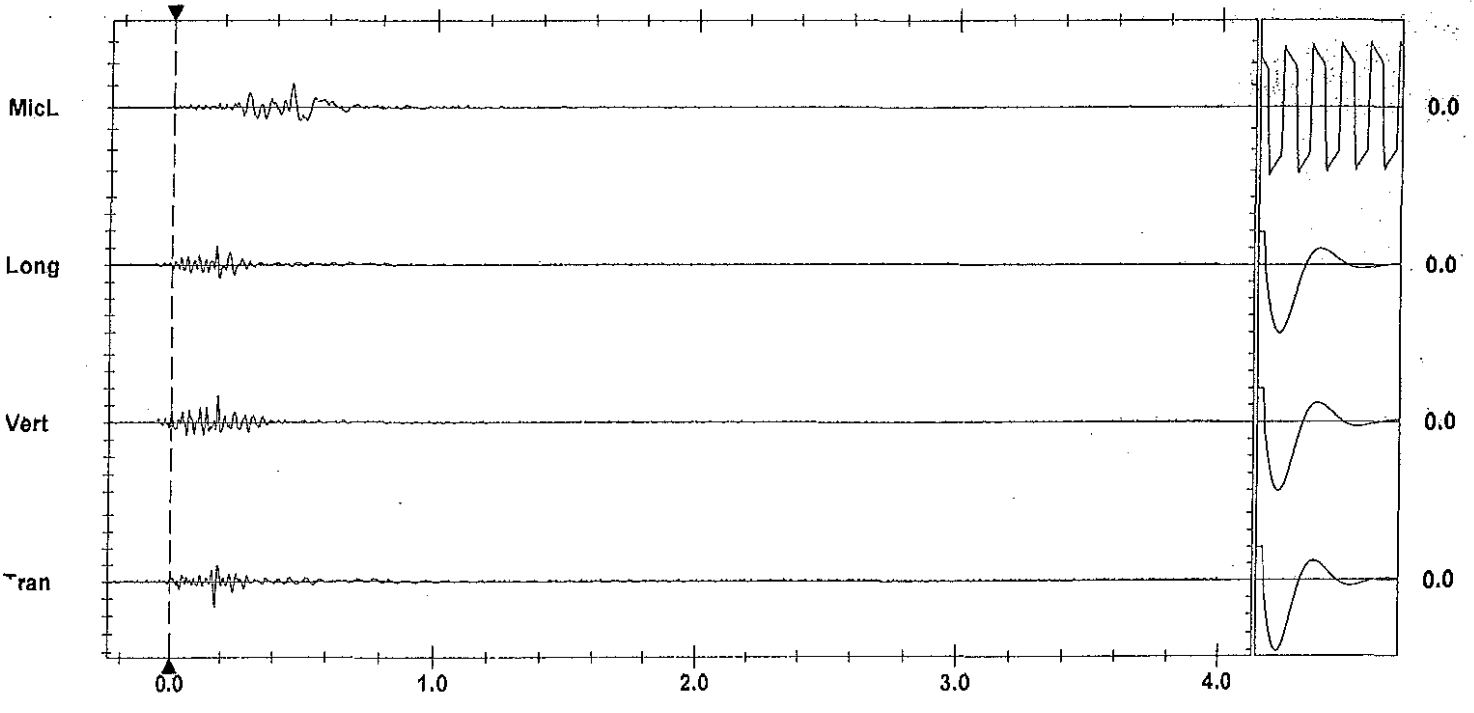
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	10.5 pa.(L) at 0.460 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 689 mv)

	Tran	Vert	Long	
PPV	3.05	3.17	2.16	mm/s
ZC Freq	43	47	43	Hz
Time (Rel. to Trig)	0.177	0.185	0.178	sec
Peak Acceleration	0.0795	0.0795	0.0663	g
Peak Displacement	0.0113	0.0101	0.00936	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 3.77 mm/s at 0.178 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 29/11
ACTUAL BLAST DATE Nov. 29/11
BLAST # 114

HIGHWAY # 97
BLAST LOCATION AT: STN. # 126+45 - 126+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY Ø (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS _____
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 167 (m)

TOTAL NUMBER OF HOLES 67 production
HOLE DIAMETER 89 (mm)
HOLE SPACING 3.2 (m) BURDEN 3.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo.
TOTAL NUMBER OF CARTRIDGES 67
TOTAL NUMBER OF DELAYS 67

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25+42 (ms)

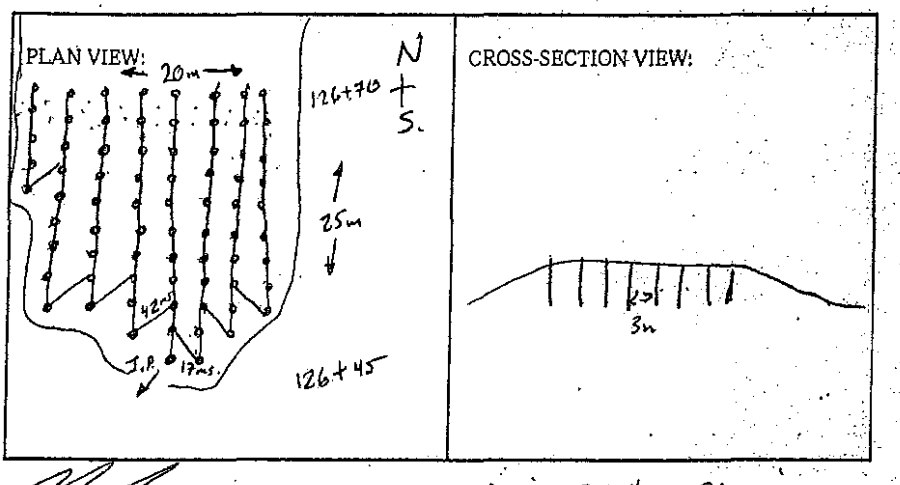
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system.
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

67 - 7m (24') EZ dets.

7 - 42ms connectadet.

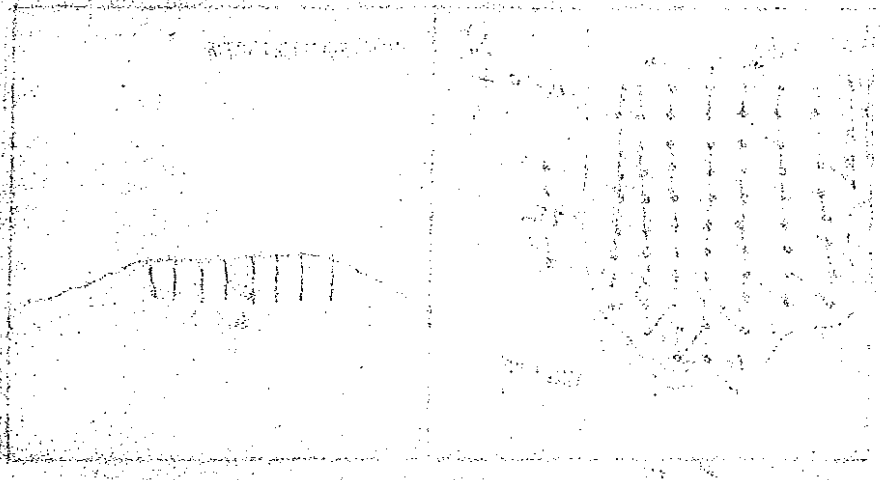
2 - 17ms Connectodet

1 - Elec det.

12 - Bags Anfo

1 - Bag cut.

67 sticks 1x8.



Instantel

Event Report

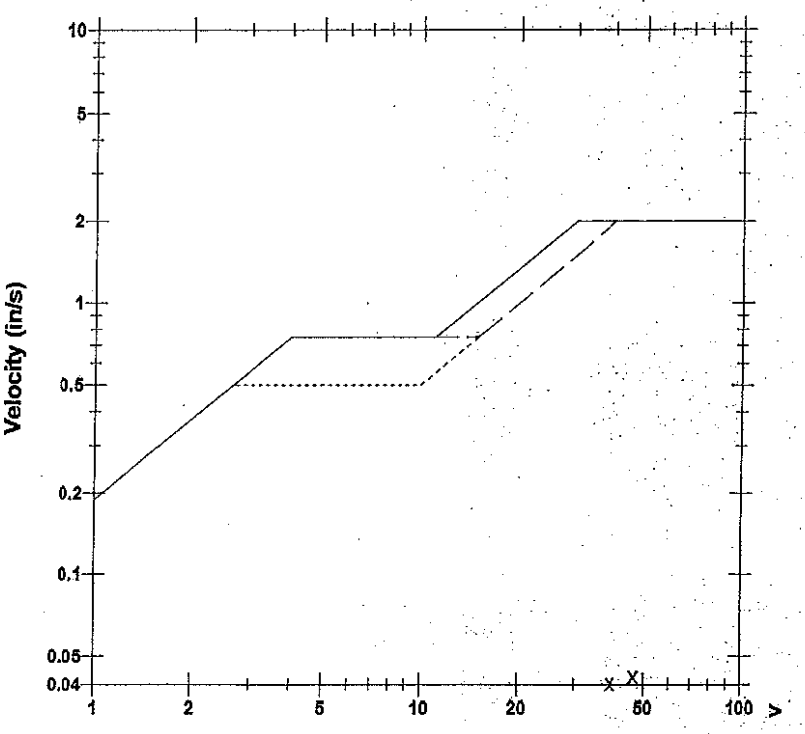
Date/Time	Vert at 16:24:04 November 29, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1L9.K40
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

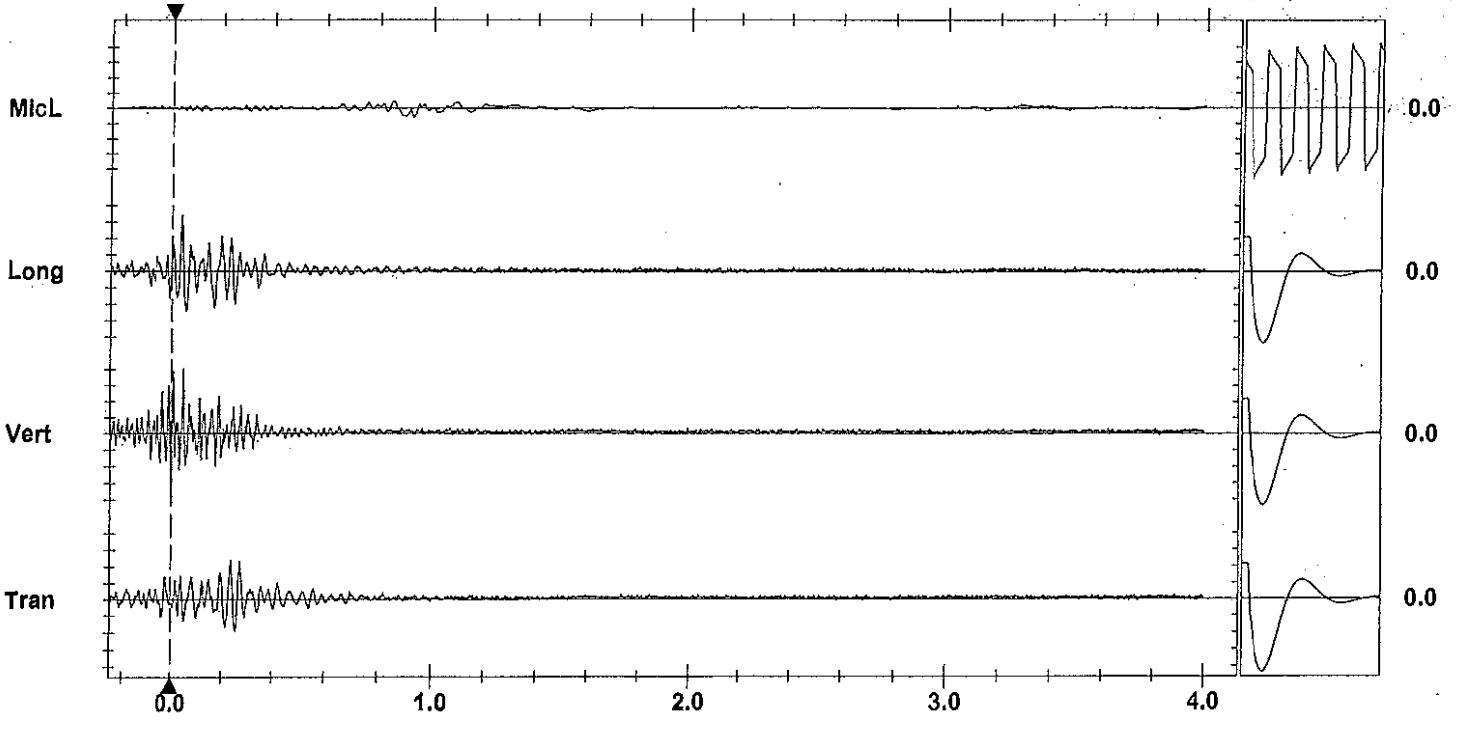


Tran: + Vert: x Long: ø

Microphone Linear Weighting
PSPL 0.00058 psi(L) at 0.927 sec
ZC Freq 6.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 675 mv)

	Tran	Vert	Long	
PPV	0.0237	0.0425	0.0337	in/s
ZC Freq	26	47	32	Hz
Time (Rel. to Trig)	0.238	0.000	0.040	sec
Peak Acceleration	0.0133	0.0431	0.0182	g
Peak Displacement	0.00013	0.00013	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.9	3.8	4.2	

Peak Vector Sum 0.0446 in/s at 0.001 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

Date/Time Vert at 16:23:19 November 29, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :10.00 in/s
Record Time 4.0 sec at 1024 sps

Serial Number BA11866 V 10.10-8.17 BlastMate III
Battery Level 6.2 Volts
Calibration January 26, 2011 by Instantel Inc.
File Name M866E1L9.IV0

Notes
location:13073 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

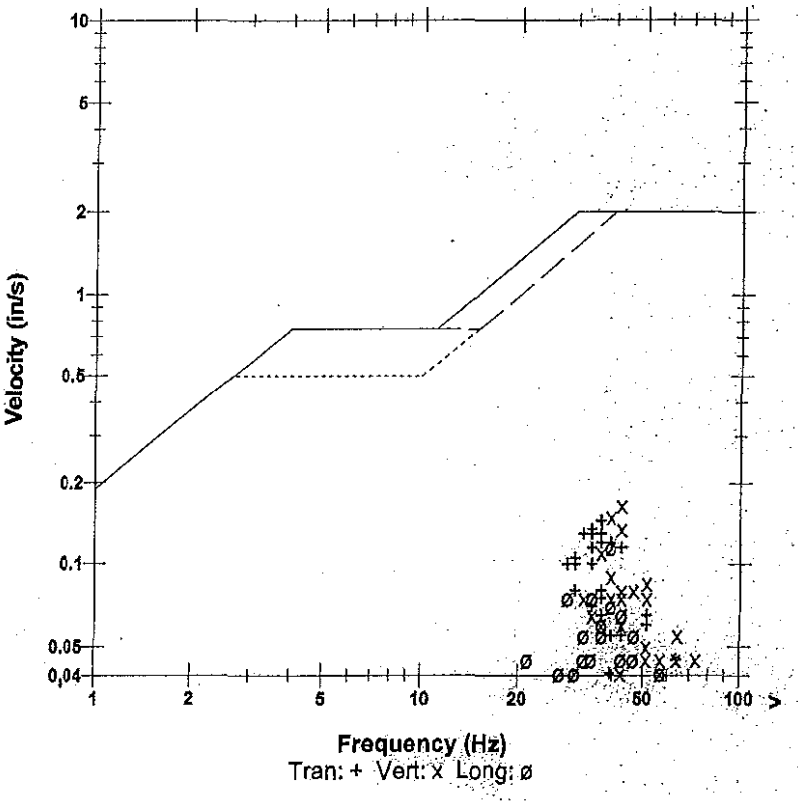
Extended Notes
Blast at sm 12s

Post Event Notes

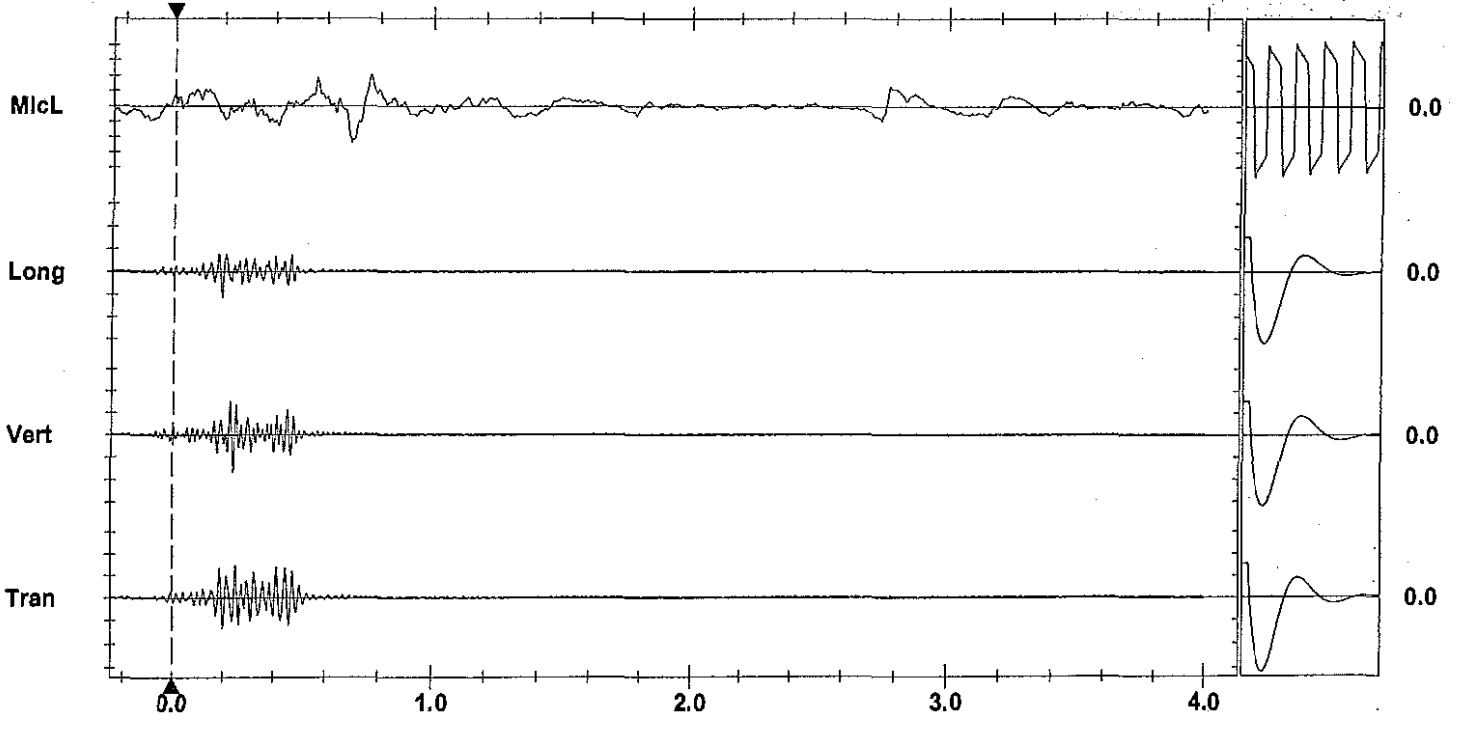
Microphone Linear Weighting
PSPL 0.00239 psi(L) at 0.691 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 722 mv)

	Tran	Vert	Long	
PPV	0.145	0.165	0.115	in/s
ZC Freq	37	43	39	Hz
Time (Rel. to Trig)	0.252	0.239	0.192	sec
Peak Acceleration	0.0928	0.119	0.0663	g
Peak Displacement	0.00064	0.00064	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.198 in/s at 0.252 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Nov. 30/11
ACTUAL BLAST DATE Nov. 30/11 @ 16:30
BLAST # 116

HIGHWAY # 97
BLAST LOCATION AT: STN # 126+90 – 126+70 RS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 4 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 262 (m)

TOTAL NUMBER OF HOLES 10 B/L / 65 production
HOLE DIAMETER 100 (mm)
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 75
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 825 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

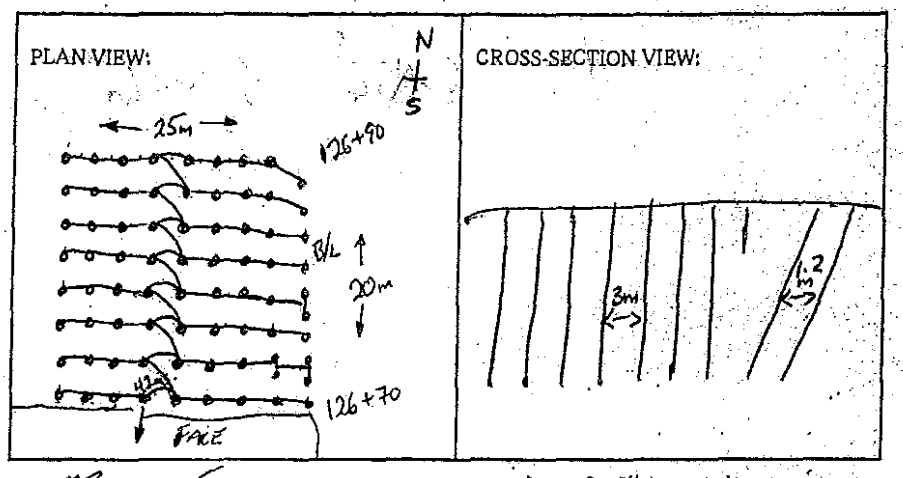
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 1800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

45 - 30' Ez dets.

20 - 7m (24') Ez dets.

10 - 12' ms dets.

10 - 42ms. connectadet.

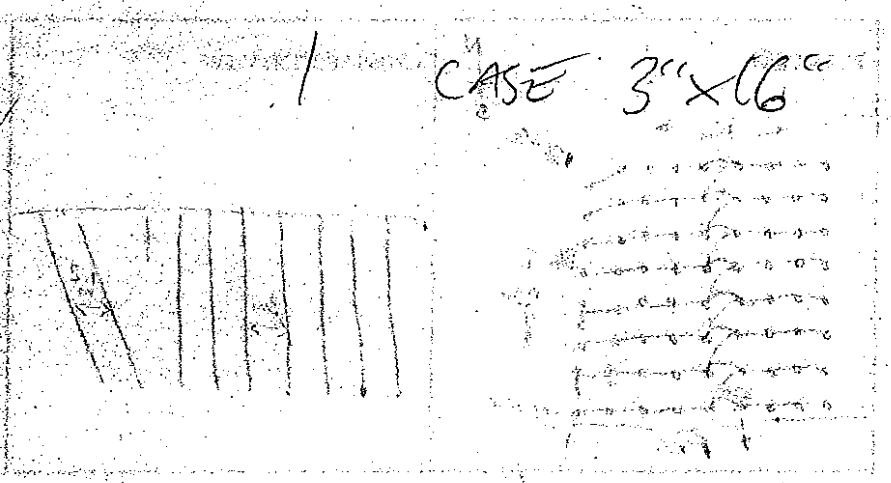
3 - 17ms connectadet

1 - Elec det.

32 - bags Anfo

75 sticks 1 1/4 x 8"

1 CASE 3" x 16"



Instantel

Event Report

Date/Time Vert at 16:37:52 November 30, 2011
Trigger Source Geo: 0.0400 in/s
Range Geo :1.25 in/s
Record Time 4.0 sec at 1024 sps
Job Number: 1

Serial Number BA13960 V 10.10-8.17 BlastMate III
Battery Level 6.4 Volts
Calibration December 22, 2010 by Instantel Inc.
File Name O960E1N4.V40

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

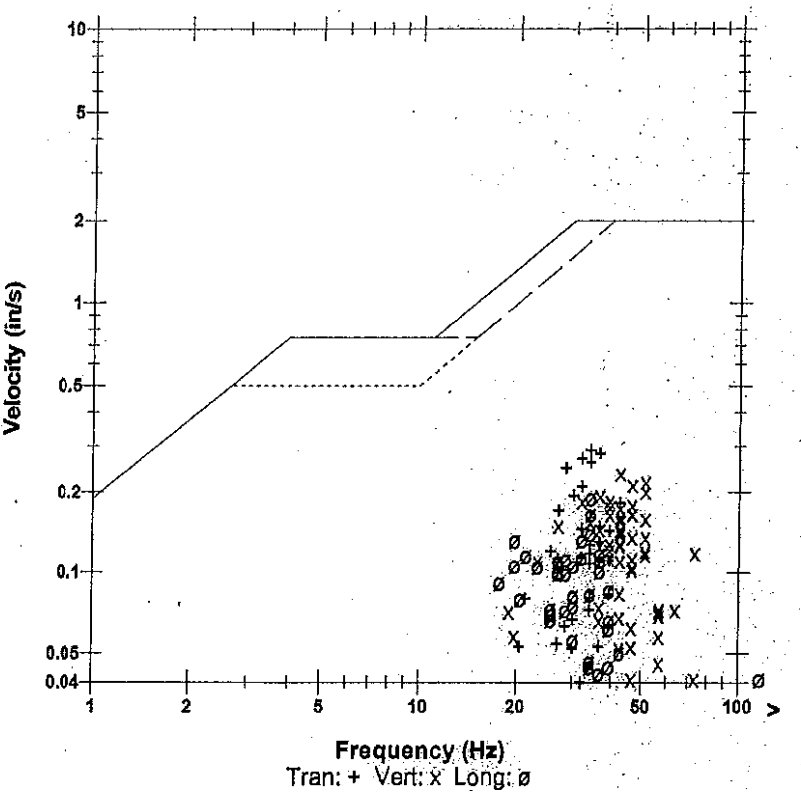
Post Event Notes

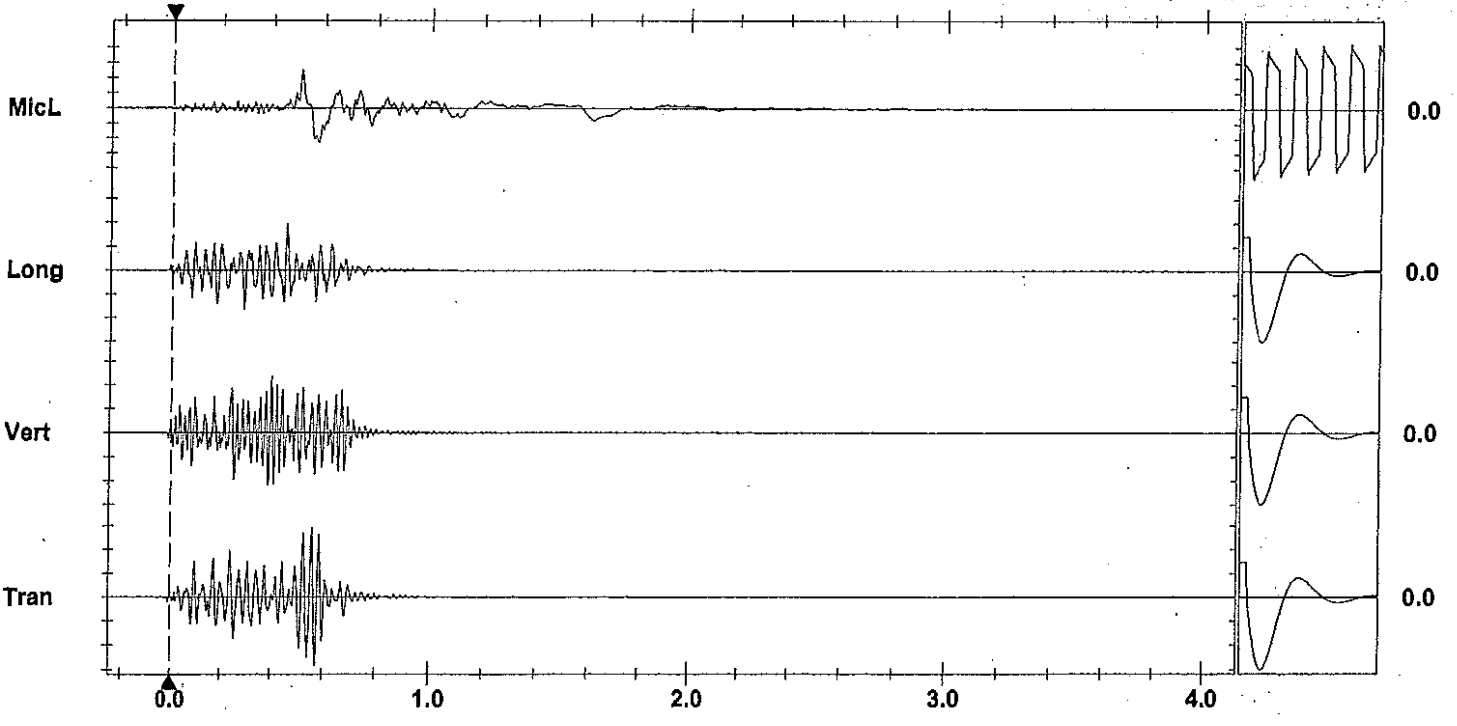
Microphone Linear Weighting
PSPL 0.00247 psi(L) at 0.507 sec
ZC Freq 7.2 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 676 mv)

	Tran	Vert	Long	
PPV	0.289	0.236	0.191	in/s
ZC Freq	34	43	34	Hz
Time (Rel. to Trig)	0.560	0.399	0.455	sec
Peak Acceleration	0.244	0.212	0.116	g
Peak Displacement	0.00132	0.00096	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.309 in/s at 0.560 sec

USBM RI8507 And OSMRE





Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀ Sensorcheck

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 11:49 am
BLAST # MW-00081

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 CS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * SHOT MATTED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 67 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd b/l hole loaded w/200 grain det. cord

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 36/1 / 8 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

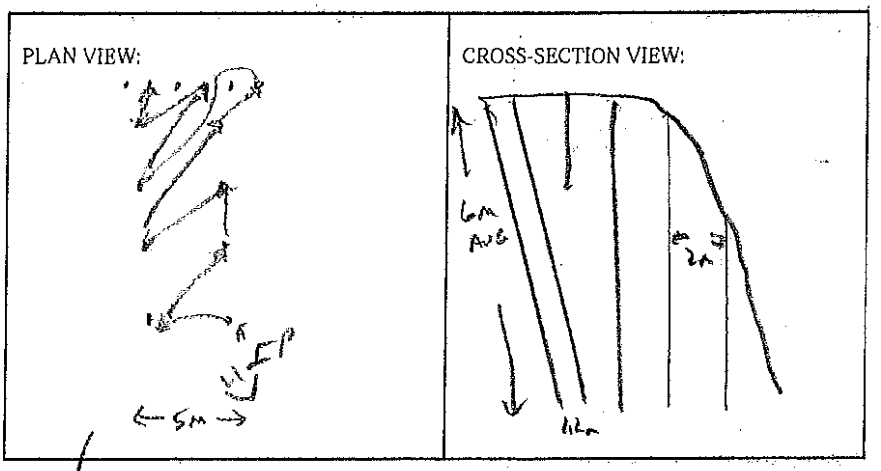
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) DET INITIATION OF NONELS & SHOCK
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13221 Cliffstone Cnt. - 0.141 ips / 37 Hz
@ 13167 Cliffstone Cnt - 0.21 ips / 39 Hz

Prod Holes - 3'-5' ANFO / Hole

STAB Holes - 1.5' ANFO / Hole

Buffer Holes - 3 count 2"x16" Blastrex / Hole

Primed w/ ~~6. count~~ 1"x8" DYNAMITE

B/L Holes - 1 count 2"x16" DYNAMITE + 200 gr. det cord to 4' collar

Instantel

Event Report

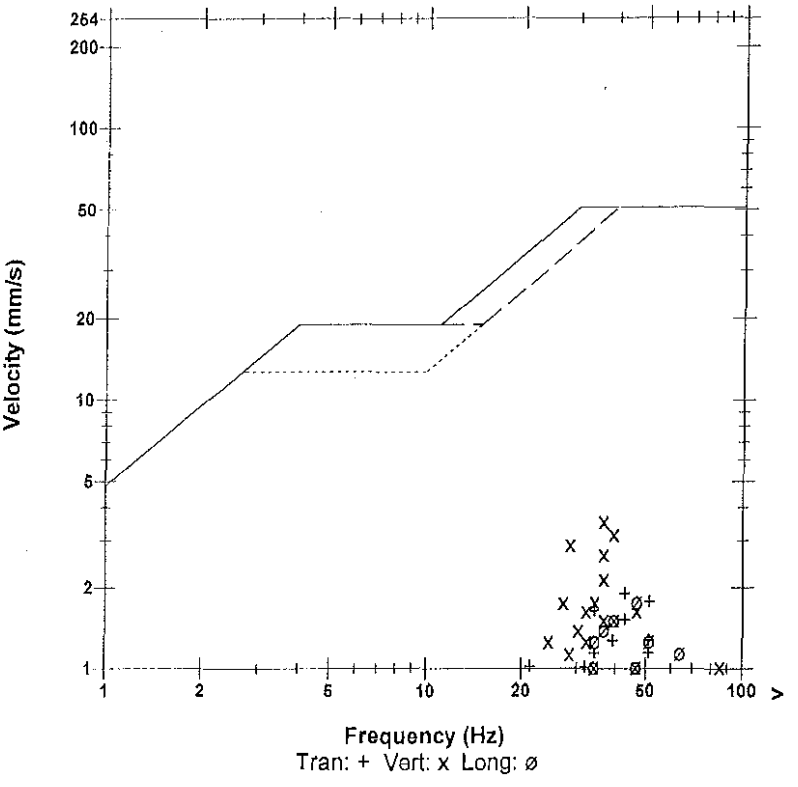
Date/Time	Vert at 11:48:21 December 1, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1OM.4L0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

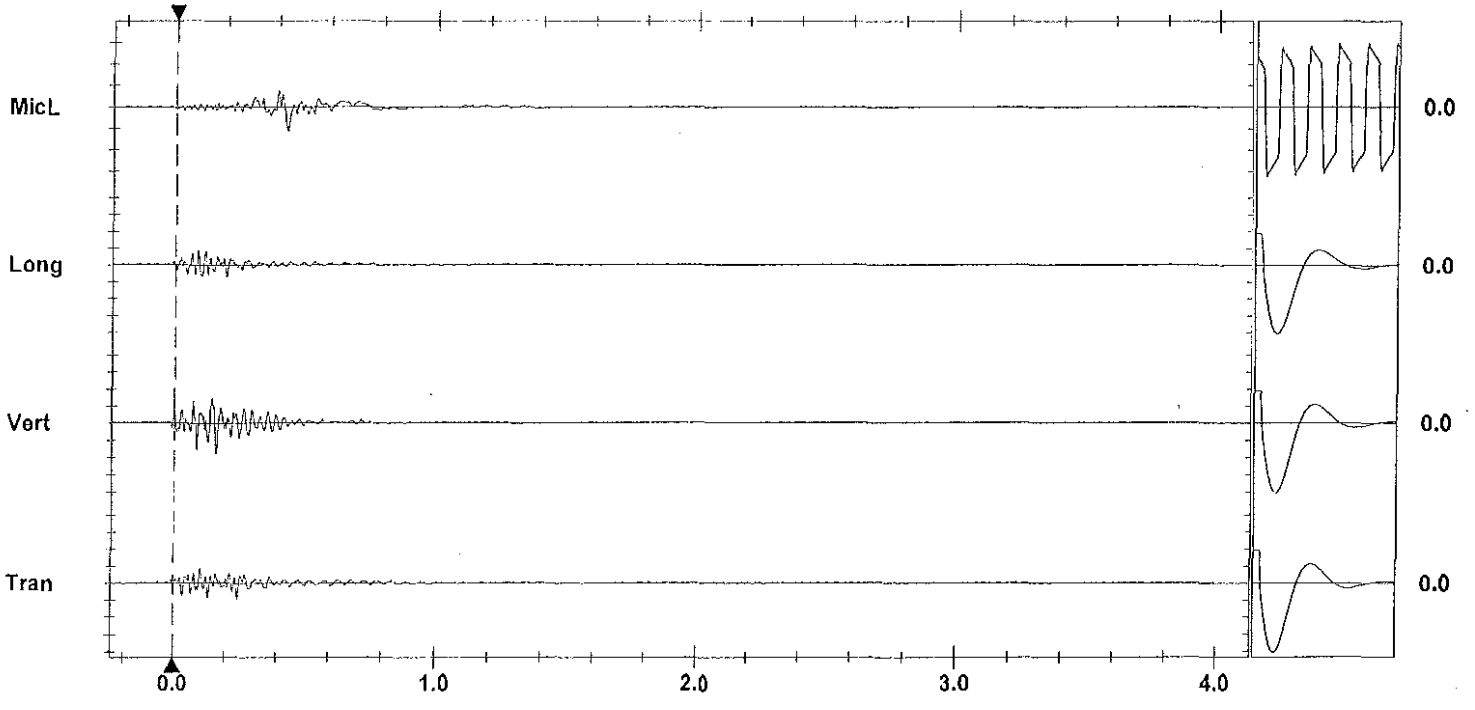
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	11.5 pa.(L) at 0.433 sec		
ZC Freq	16 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 705 mv)		

	Tran	Vert	Long	
PPV	1.90	3.56	1.78	mm/s
ZC Freq	43	37	47	Hz
Time (Rel. to Trig)	0.252	0.164	0.091	sec
Peak Acceleration	0.0663	0.106	0.0530	g
Peak Displacement	0.00732	0.0173	0.00707	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 3.80 mm/s at 0.165 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶---- — —◀

Printed: December 11, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:49:08 December 1, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1OM.5W0
Job Number:	1		

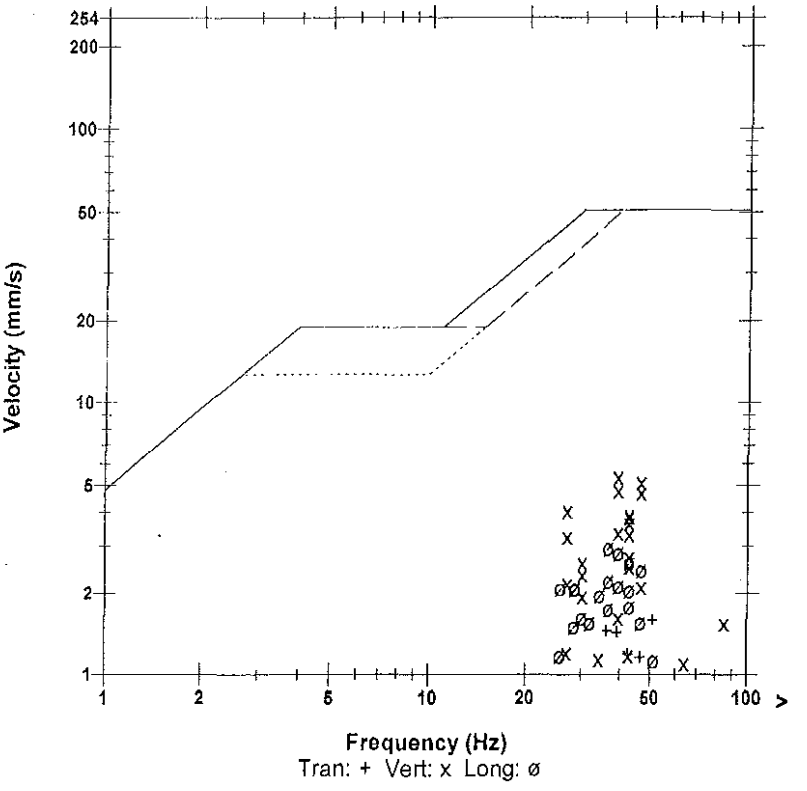
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

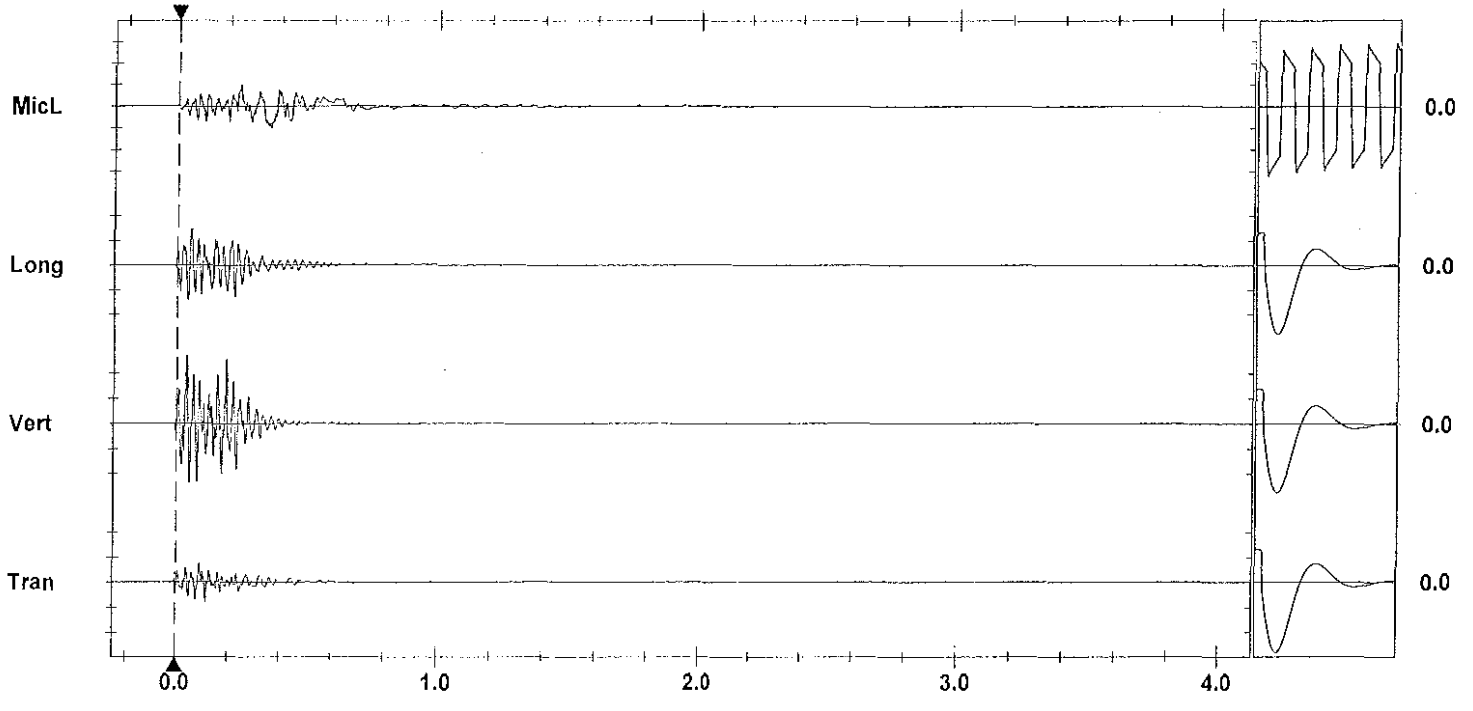
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	10.0 pa.(L) at 0.358 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 673 mv)

	Tran	Vert	Long	
PPV	1.59	5.35	2.95	mm/s
ZC Freq	51	39	37	Hz
Time (Rel. to Trig)	0.119	0.039	0.057	sec
Peak Acceleration	0.0530	0.207	0.0878	g
Peak Displacement	0.00462	0.0206	0.0140	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 5.52 mm/s at 0.039 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶———◀

Printed: December 11, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 12:59 PM
BLAST # MW-0022

HIGHWAY # 97
BLAST LOCATION AT: 124 90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 600 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 18 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1/4 Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

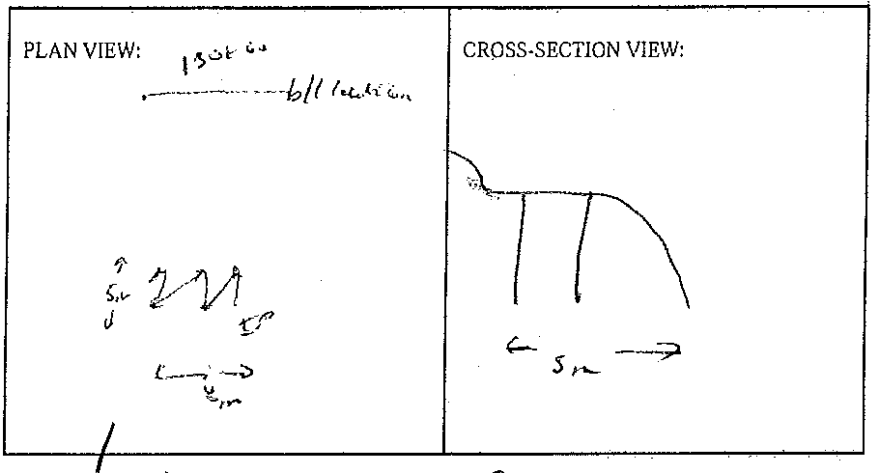
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 13 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL initiation of NONEL system.
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13221 Cliffside est - 0.095 ips / 30 Hz
" 13167 Cliffside est - 0.081 ips / 39 Hz

2' ANFO/ Hole primed w/ 1 each 1¼ x 8" DYNAMITE

Instantel

Event Report

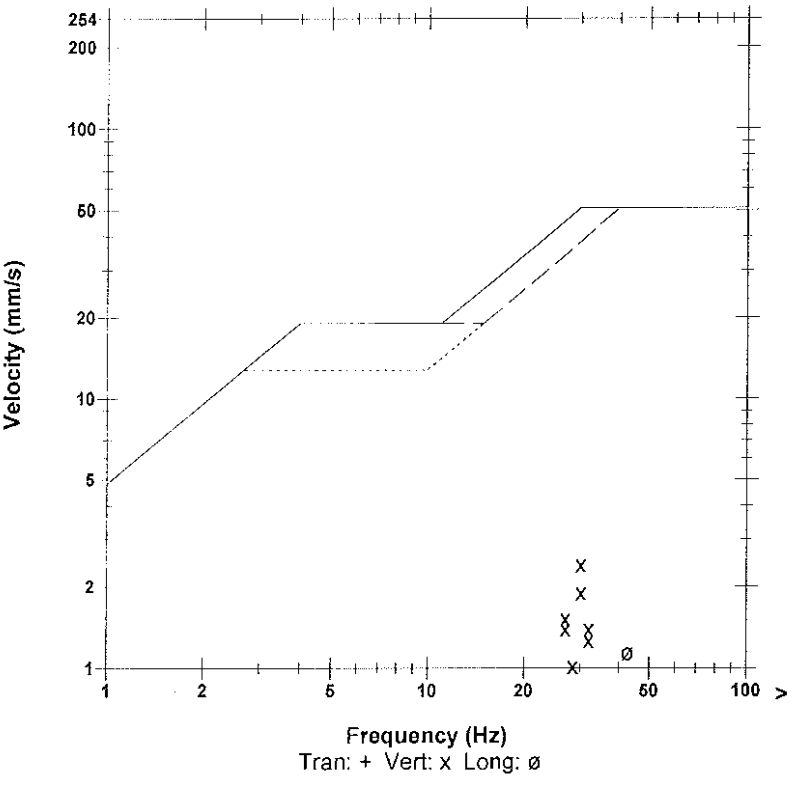
Date/Time	Long at 12:58:42 December 1, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1OP.DU0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

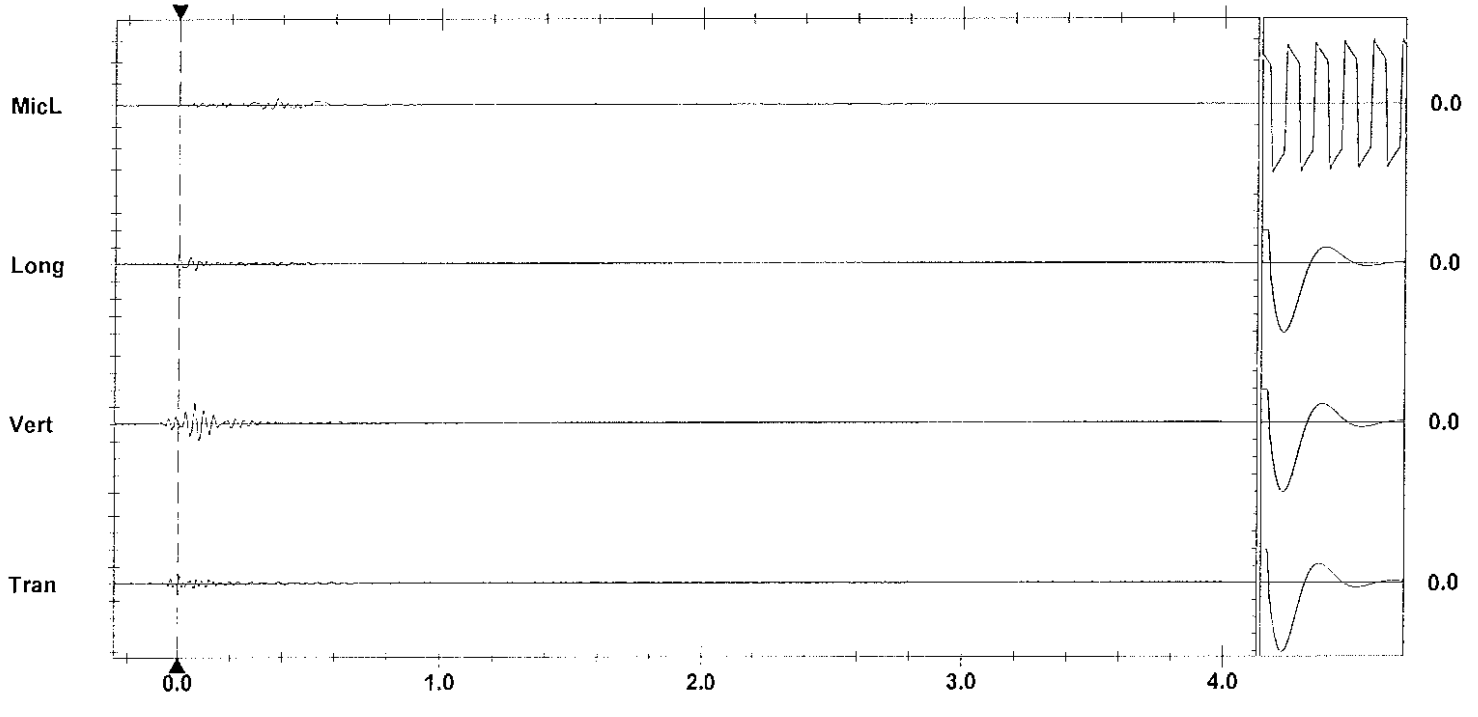
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	3.00 pa.(L) at 0.377 sec			
ZC Freq	20 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 690 mv)			

	Tran	Vert	Long	
PPV	0.889	2.41	1.14	mm/s
ZC Freq	57	30	43	Hz
Time (Rel. to Trig)	0.005	0.063	0.001	sec
Peak Acceleration	0.0398	0.0530	0.0398	g
Peak Displacement	0.00273	0.0119	0.00477	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 2.52 mm/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Long at 12:59:29 December 1, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1OP.F50
Job Number:	1		

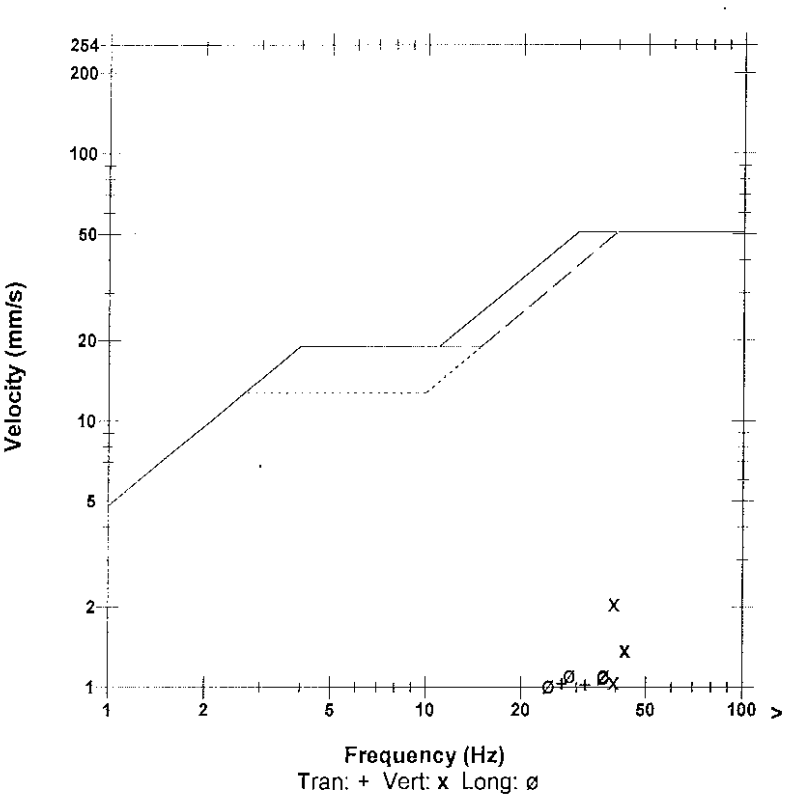
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

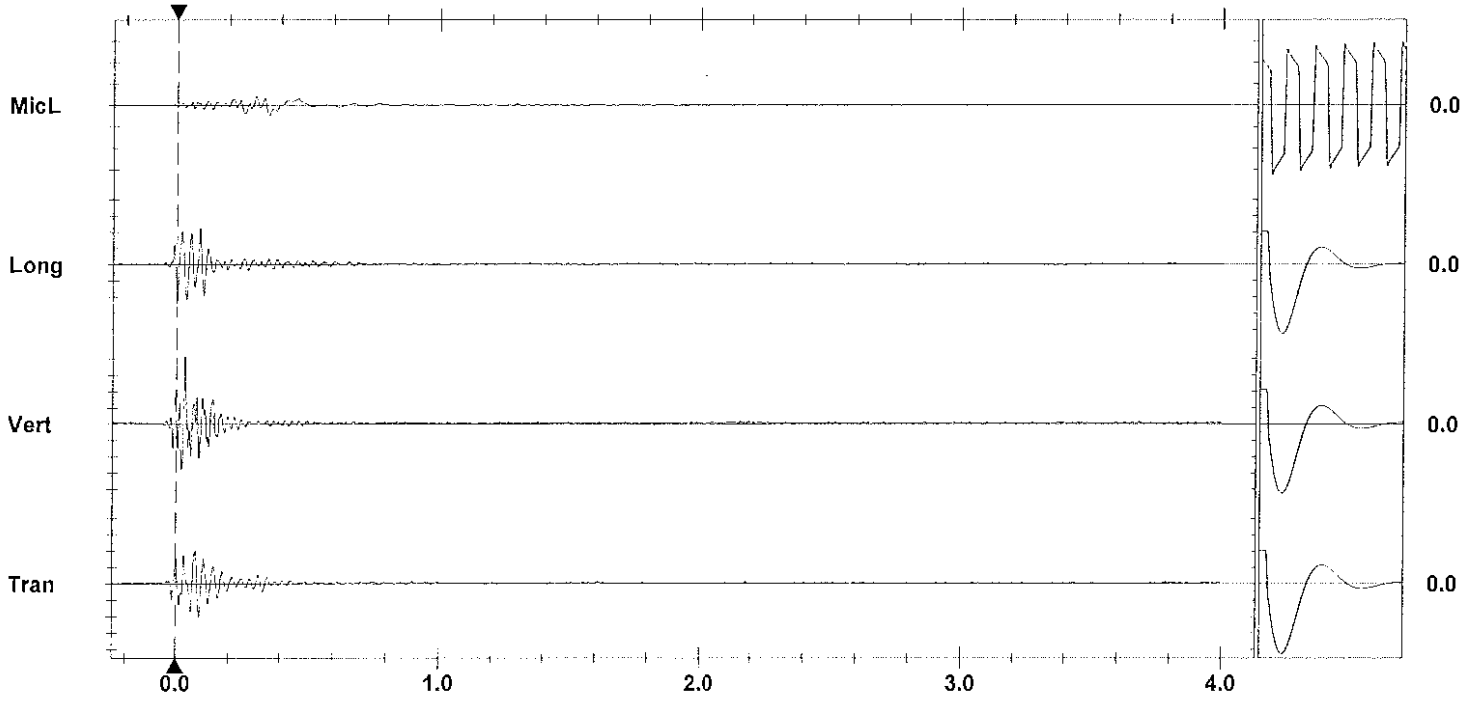
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	4.75 pa.(L) at 0.351 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 690 mv)

	Tran	Vert	Long	
PPV	1.03	2.06	1.11	mm/s
ZC Freq	27	39	28	Hz
Time (Rel. to Trig)	0.077	0.033	0.037	sec
Peak Acceleration	0.0282	0.0547	0.0282	g
Peak Displacement	0.00610	0.00773	0.00610	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 2.37 mm/s at 0.033 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶——◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 9:03 PM
BLAST # MW-0023

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 2 SHOT MATTED

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 203 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

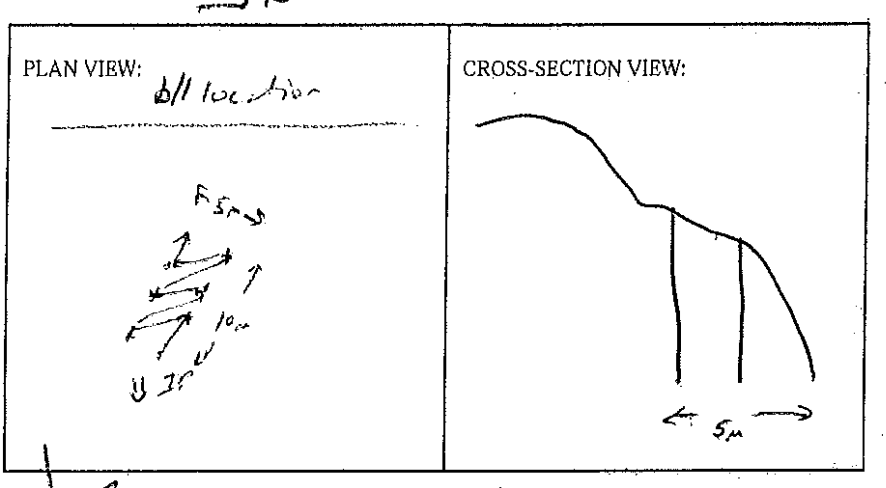
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBE INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1322' Cliffside end - 0.11 ips / 37 Hz
@ 1367' cliffside end - 0.19 ips / 30 Hz

2.5'- 3' auger / hole pointed with [illegible] to [illegible]

Instantel

Event Report

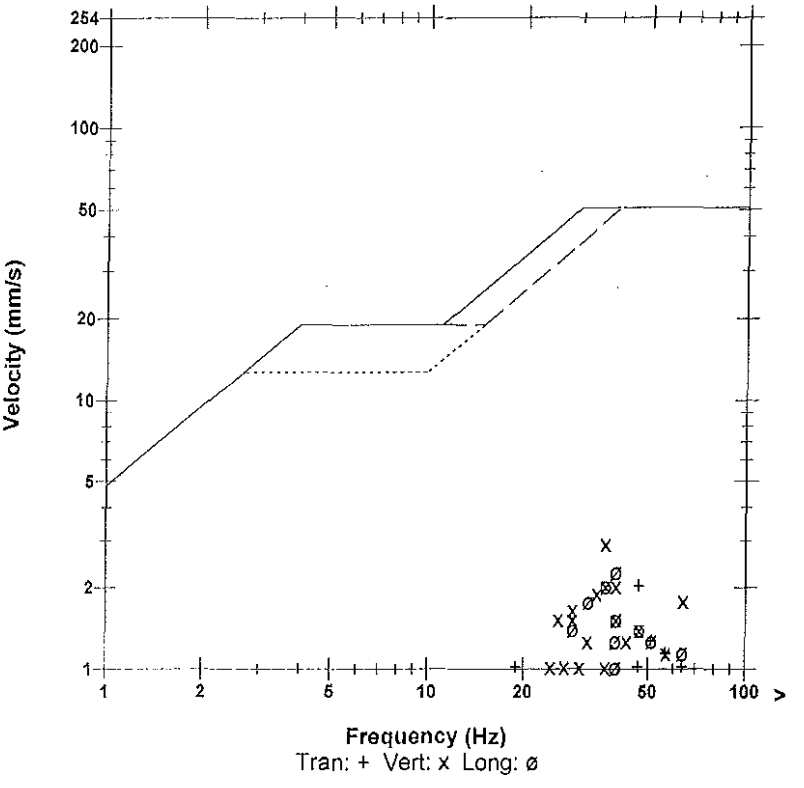
Date/Time	Vert at 14:02:45 December 1, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.0 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1OS.CL0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

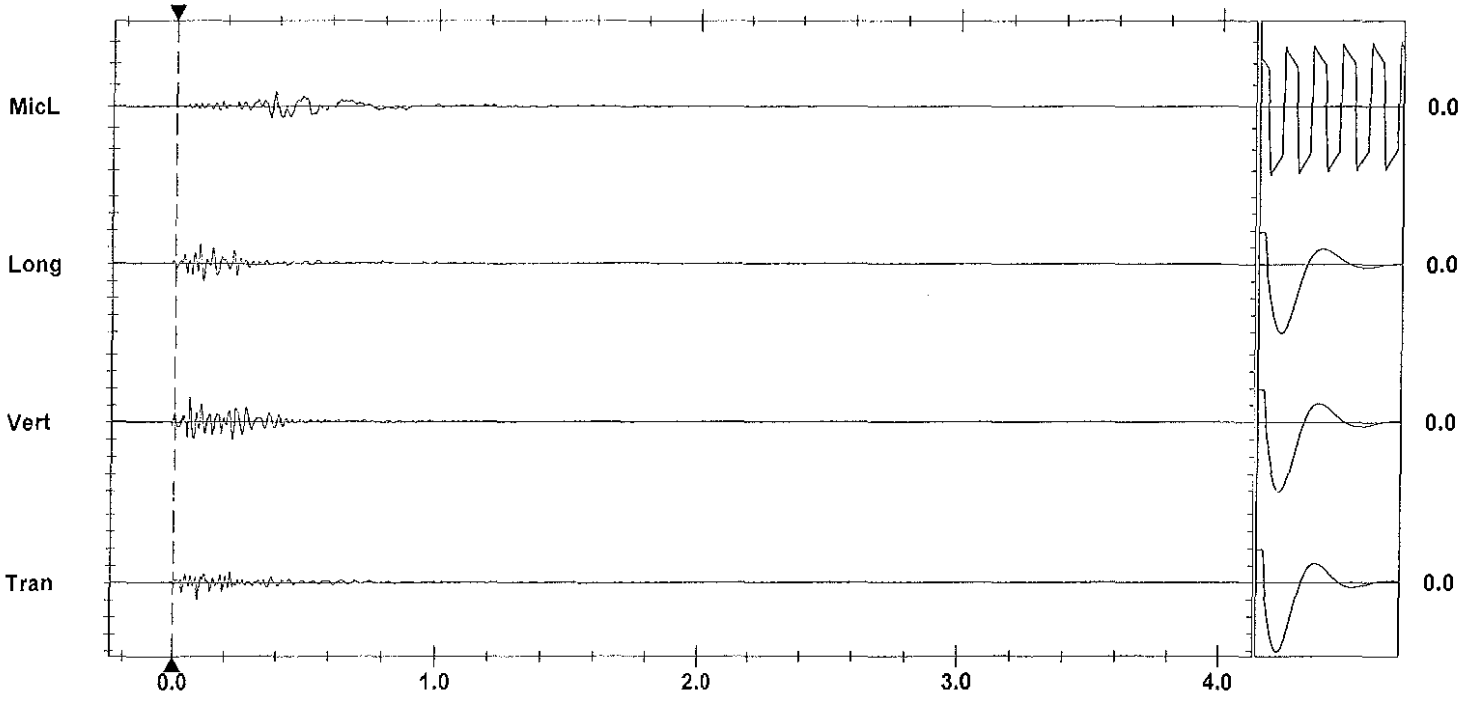
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	6.50 pa.(L) at 0.383 sec			
ZC Freq	32 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 748 mv)			

	Tran	Vert	Long	
PPV	2.03	2.92	2.29	mm/s
ZC Freq	47	37	39	Hz
Time (Rel. to Trig)	0.098	0.062	0.099	sec
Peak Acceleration	0.0530	0.0795	0.0663	g
Peak Displacement	0.00800	0.0107	0.00887	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 3.01 mm/s at 0.098 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:03:32 December 1, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1OS.DW0
Job Number:	1		

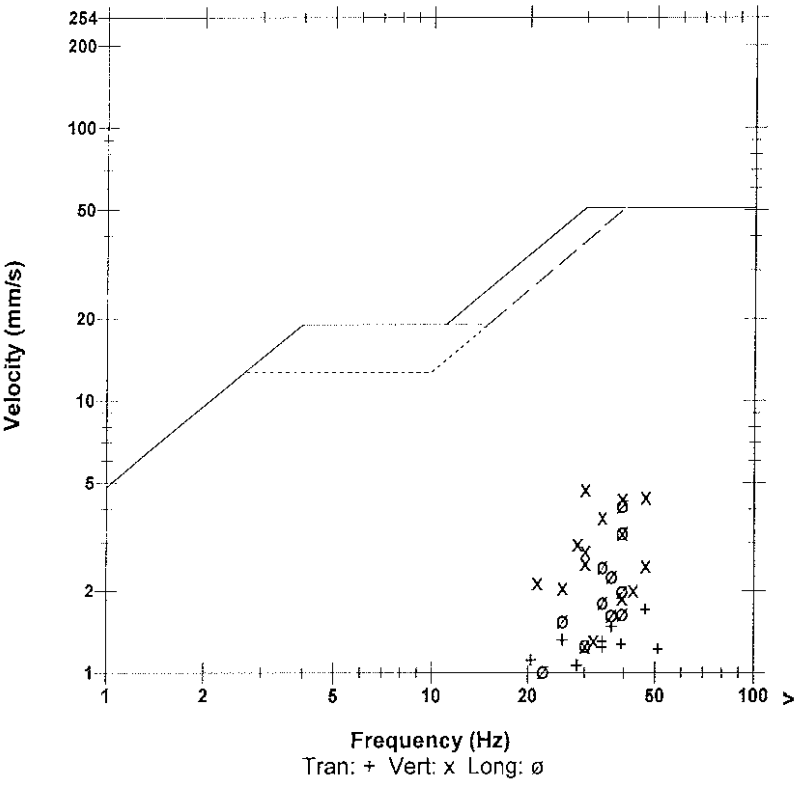
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

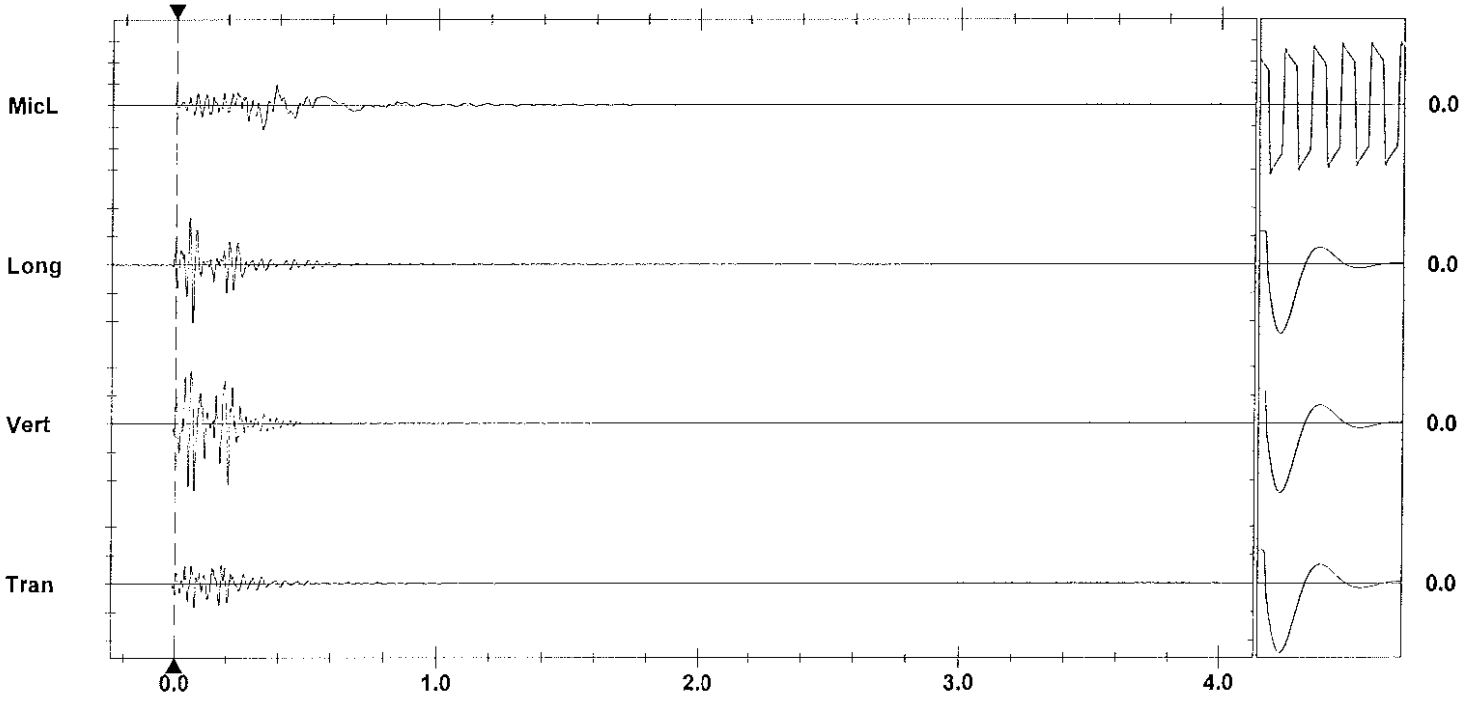
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	11.5 pa.(L) at 0.334 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 685 mv)

	Tran	Vert	Long	
PPV	1.70	4.75	4.14	mm/s
ZC Freq	47	30	39	Hz
Time (Rel. to Trig)	0.077	0.075	0.066	sec
Peak Acceleration	0.0563	0.192	0.108	g
Peak Displacement	0.00712	0.0198	0.0163	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 5.40 mm/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶——◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Dec 1/11 2:55 PM
BLAST # MW-00324

HIGHWAY# 97 * Shotmarked
BLAST LOCATION AT: 129+75 - 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE _____
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m) * every 2nd b/l was loaded w/ 200 grain det. cord

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 36 11 / 8 area
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

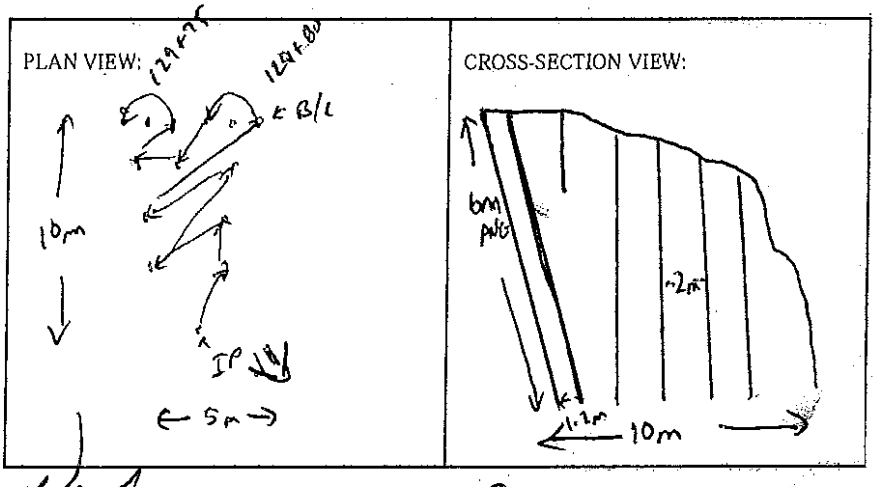
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 Cliffstone Crt - 0.12 ips / 37 Hz
@ 13167 Cliffstone Crt - 0.21 ips / 43 Hz

3' apart / Holes in rows. . . .

1½" x 8" Dynamite

B/L Holes Loaded w/ 1 cart. 2"x16" Dynamite
+ 200 grain det. cord to 4' collar

Instantel

Event Report

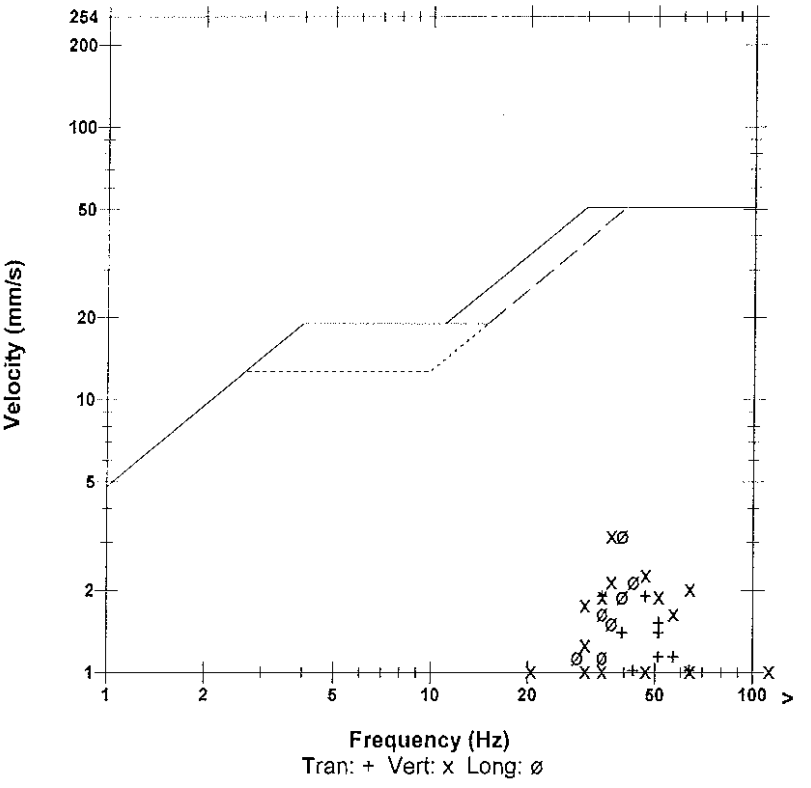
Date/Time	Vert at 14:54:13 December 1, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1OU.QD0

Notes
location:13221 Cliffstone Crt on
rear patio slab sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

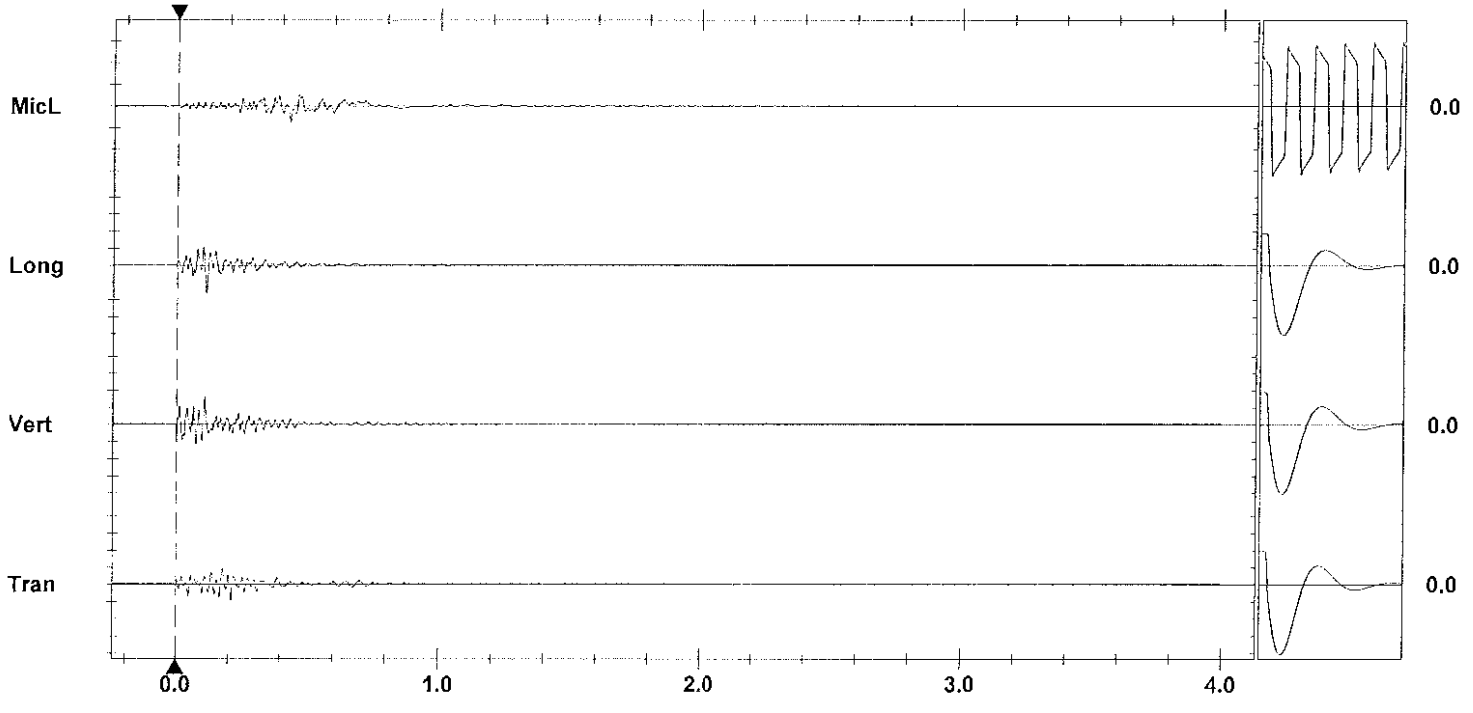
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	1.90	3.17	3.17	mm/s
ZC Freq	34	37	39	Hz
Time (Rel. to Trig)	0.180	0.109	0.113	sec
Peak Acceleration	0.0530	0.0928	0.0663	g
Peak Displacement	0.00837	0.0122	0.0125	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 7.50 pa.(L) at 0.431 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 732 mv)

Peak Vector Sum 3.91 mm/s at 0.110 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: December 11, 2011 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 14:55:00 December 1, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1OU.RO0
Job Number:	1		

Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

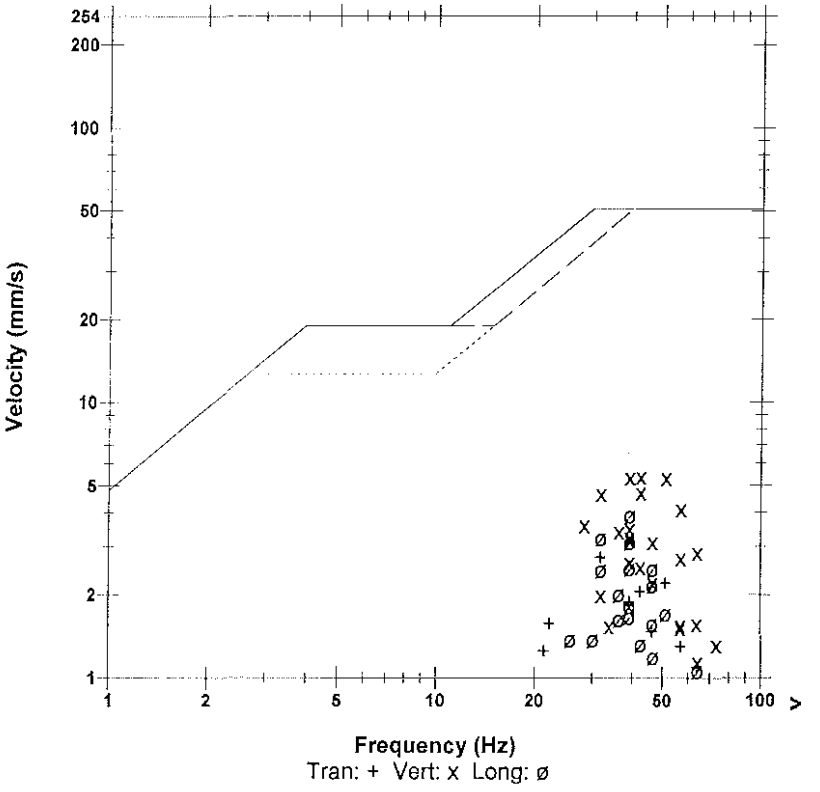
Post Event Notes

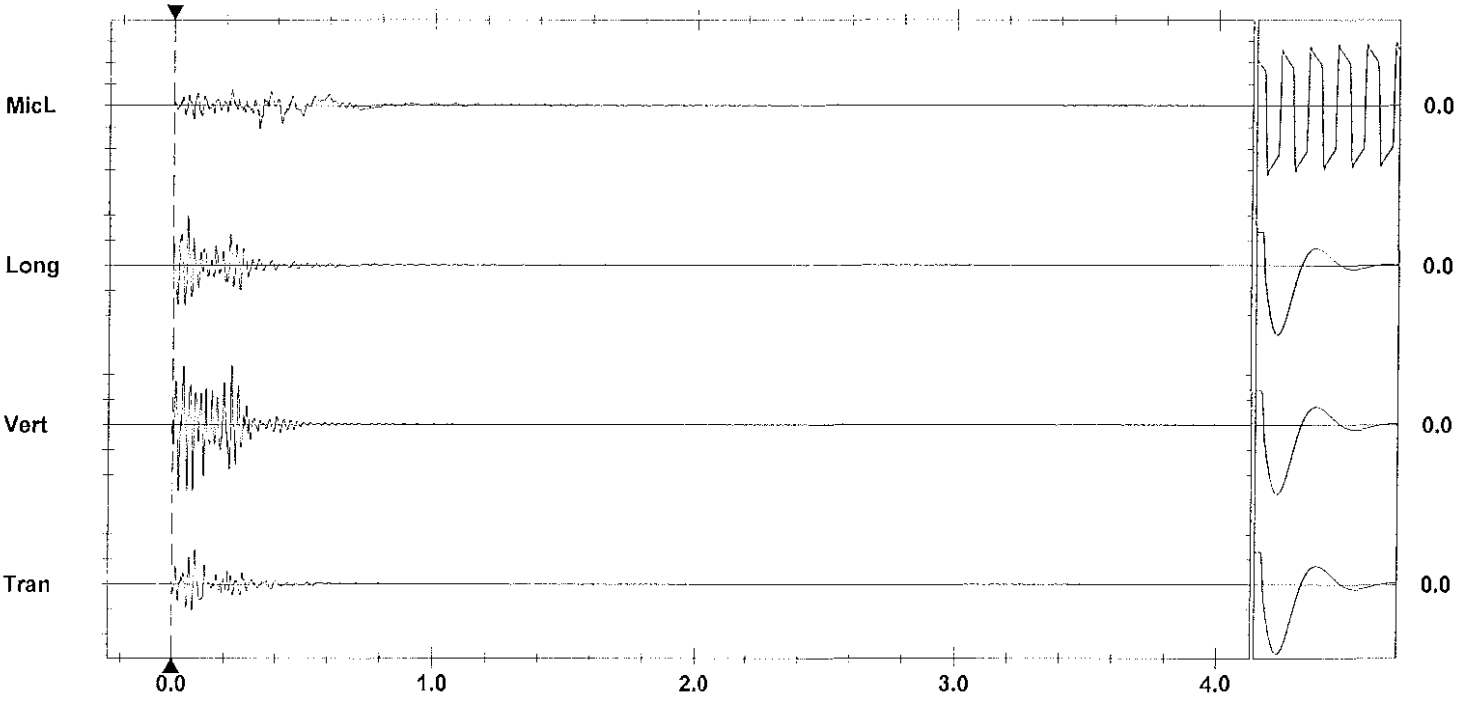
Microphone Linear Weighting
PSPL 10.8 pa.(L) at 0.331 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 732 mv)

	Tran	Vert	Long	
PPV	2.75	5.38	3.91	mm/s
ZC Freq	32	43	39	Hz
Time (Rel. to Trig)	0.090	0.058	0.059	sec
Peak Acceleration	0.0829	0.187	0.123	g
Peak Displacement	0.0110	0.0187	0.0148	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 6.70 mm/s at 0.058 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 2/11
ACTUAL BLAST DATE Dec 2/11 11:25 AM
BLAST # MW-0025

HIGHWAY # 97
BLAST LOCATION AT: 129+75

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY NA (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Augen Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (3 loaded)
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 36 11/18 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

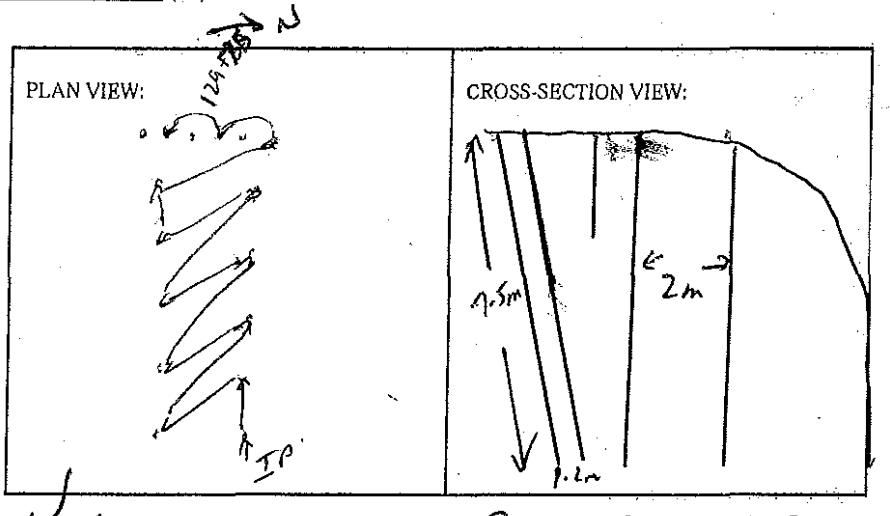
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL Initiation by Nonel 5.4 system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Cliffshore ent - 0.20 ips / 47 Hz
@ 13093 Cliffshore ent - 0.17 ips / 23 Hz

PROD. HOLES - 3'-4' ANFO/HOLE primed w/ 1 CAST 1X0 DYN.

STAB HOLES - 1.5' ANFO/HOLE

BUFFER HOLE - 4 CAST 2"X16" BLASTEX

B/L HOLES - 1 CAST. 2"X16" BLASTEX + 200gr. det. cord to 4' collar

Instantel

Event Report

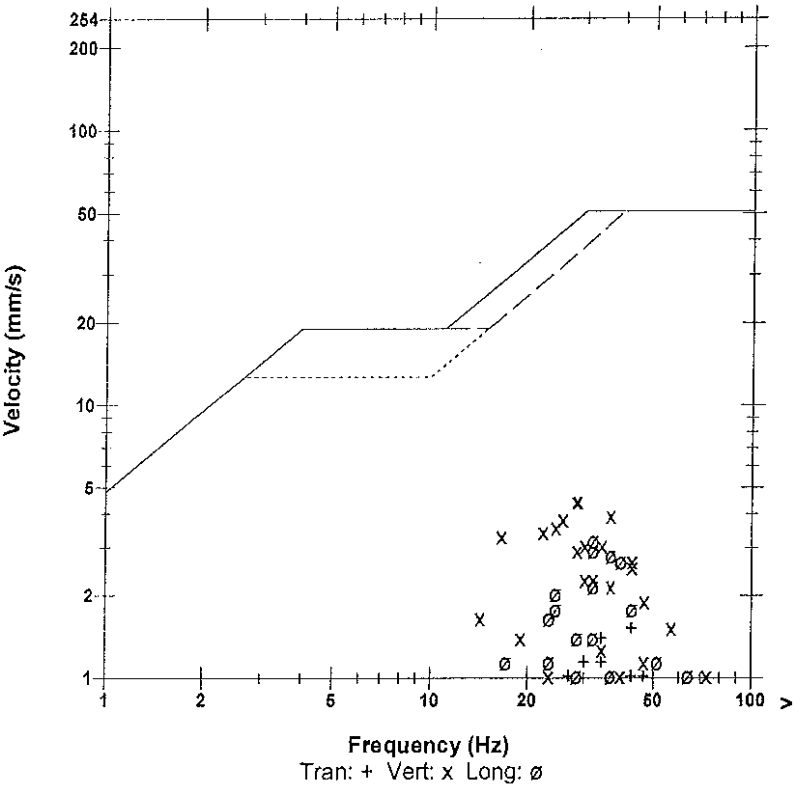
Date/Time	Long at 11:24:12 December 2, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1QF.OC0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

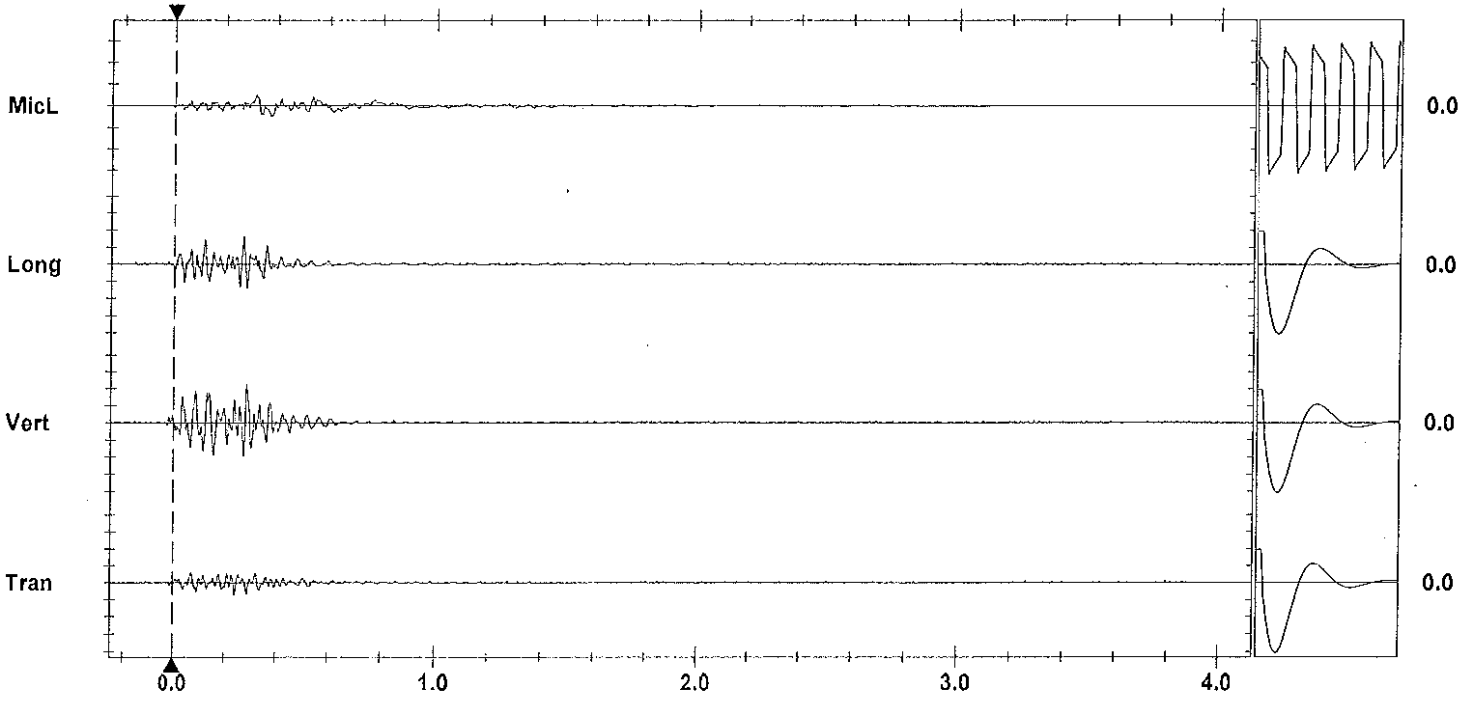
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 5.00 pa.(L) at 0.316 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 668 mv)

	Tran	Vert	Long	
PPV	1.52	4.44	3.17	mm/s
ZC Freq	43	28	32	Hz
Time (Rel. to Trig)	0.241	0.286	0.271	sec
Peak Acceleration	0.0530	0.133	0.0795	g
Peak Displacement	0.00639	0.0272	0.0145	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 5.22 mm/s at 0.286 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

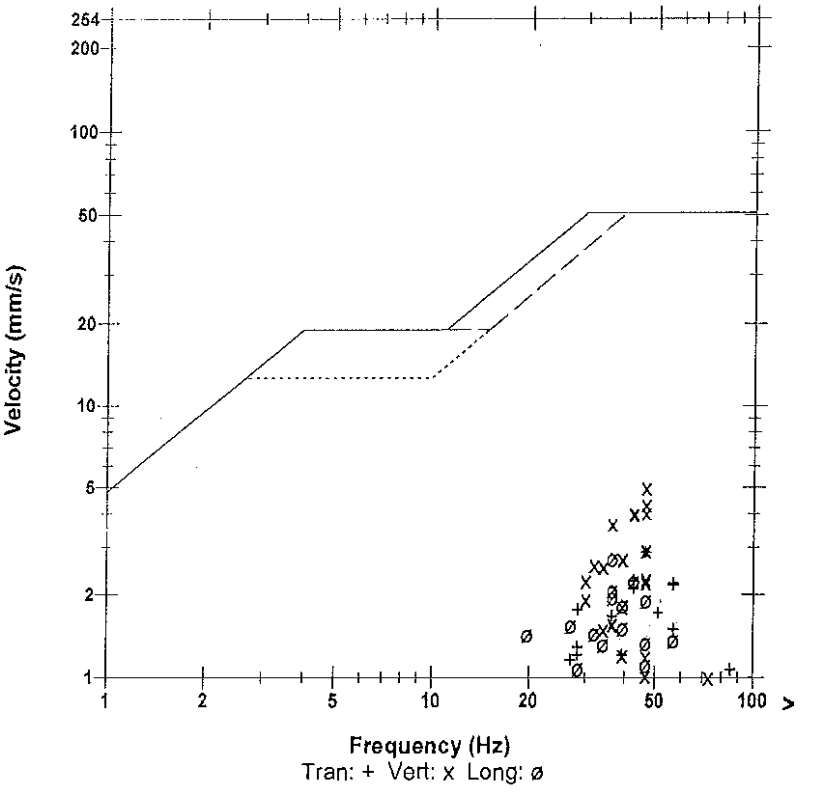
Date/Time	Vert at 11:25:00 December 2, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.5 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1QF.PO0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 130+10

Extended Notes

Post Event Notes

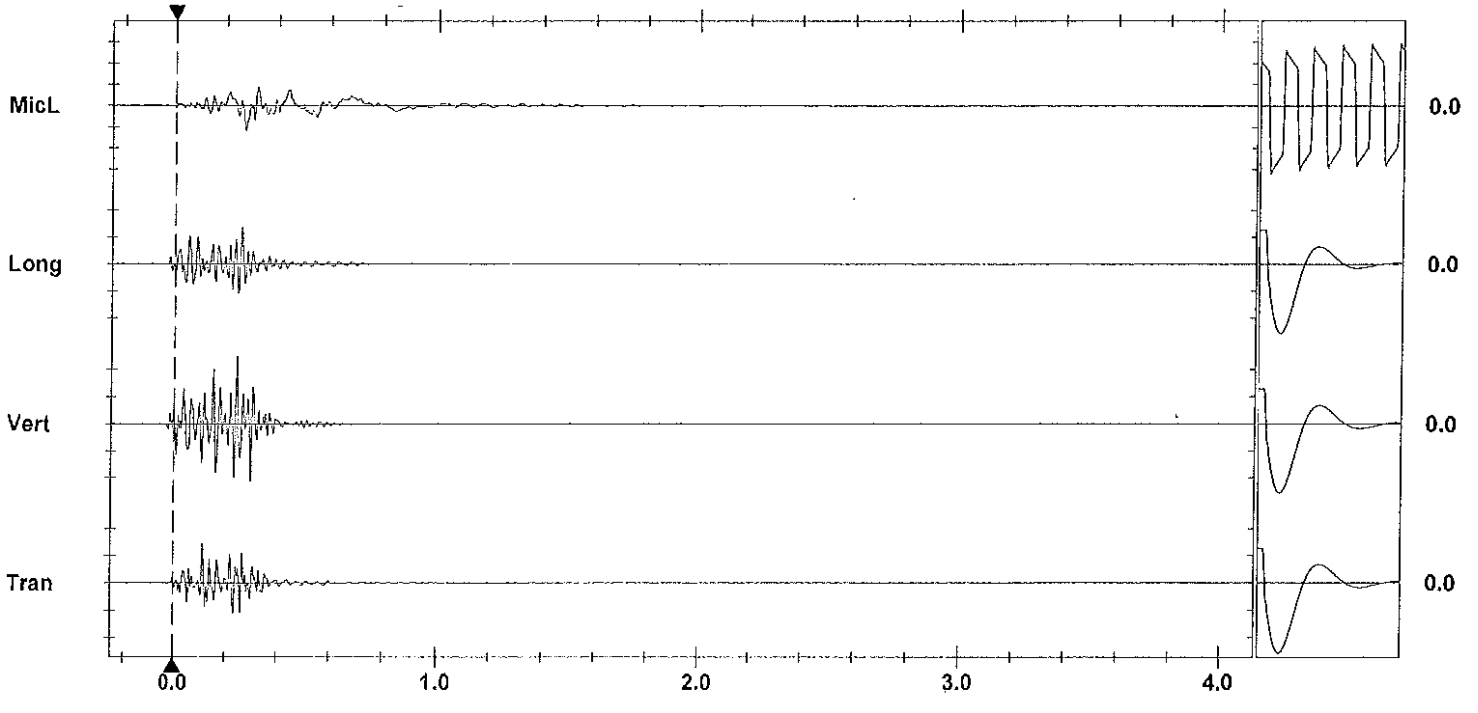
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	12.0 pa.(L) at 0.271 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 685 mv)

	Tran	Vert	Long	
PPV	2.87	4.98	2.71	mm/s
ZC Freq	47	47	37	Hz
Time (Rel. to Trig)	0.117	0.245	0.261	sec
Peak Acceleration	0.0978	0.186	0.0746	g
Peak Displacement	0.00951	0.0159	0.0113	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 5.39 mm/s at 0.245 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 2/11
ACTUAL BLAST DATE Dec 2/11 1:12 PM
BLAST # MW-0026

HIGHWAY# 97
BLAST LOCATION AT: 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL / HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

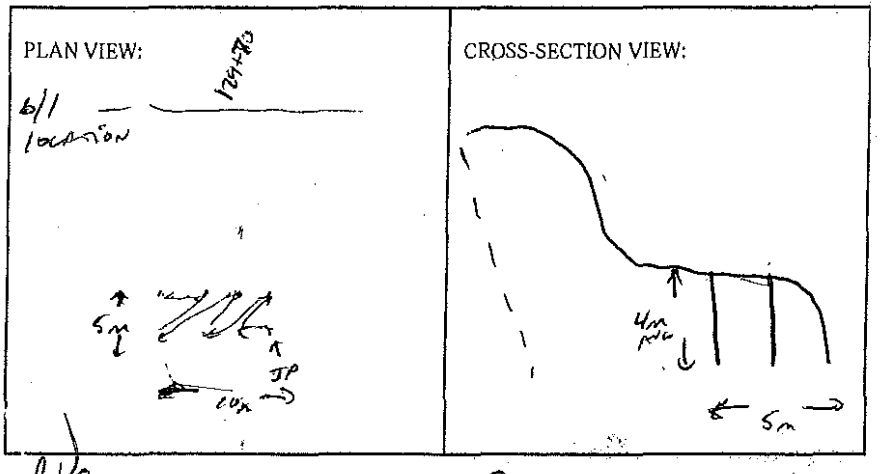
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3) → N

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt – 0.19 ips / 39 Hz
@ 13093 Cliffstone Crt – 0.15 ips / 32 Hz

4" AWRO / HOLE PRIMED WITH EMTL ICE DYNAMITE

Instantel

Event Report

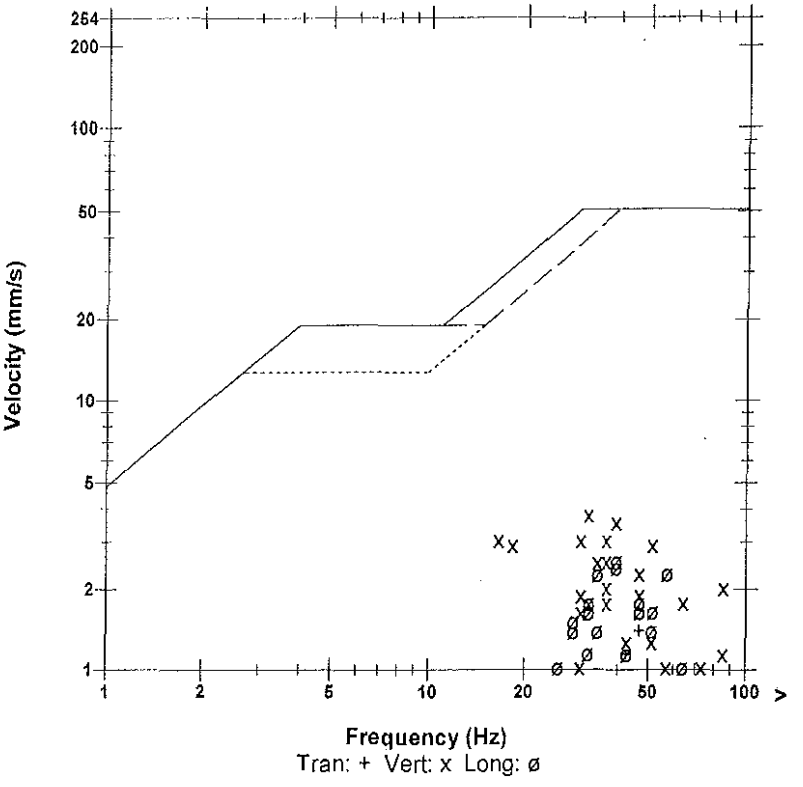
Date/Time	Vert at 13:12:06 December 2, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1QK.O60

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

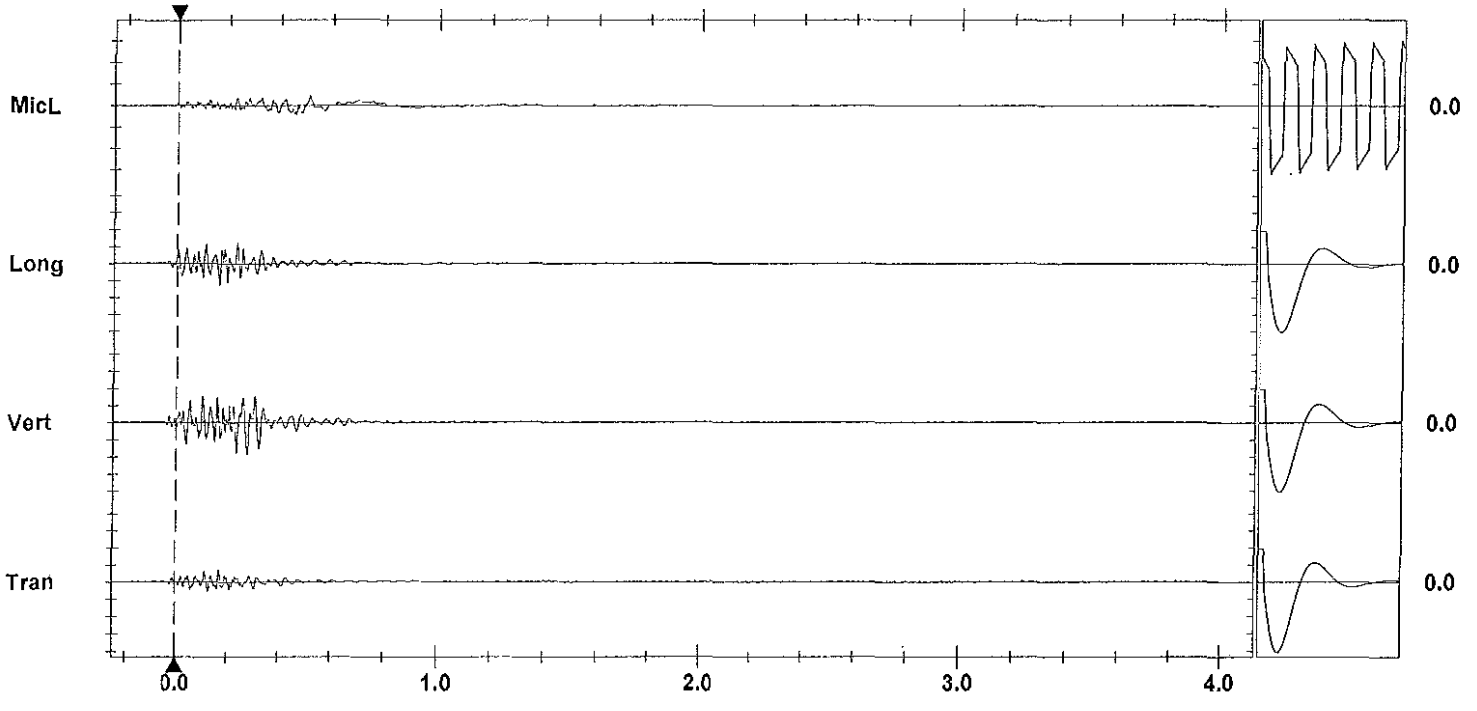
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 4.25 pa.(L) at 0.458 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 686 mv)

	Tran	Vert	Long	
PPV	1.40	3.81	2.54	mm/s
ZC Freq	47	32	39	Hz
Time (Rel. to Trig)	0.174	0.279	0.166	sec
Peak Acceleration	0.0663	0.133	0.0795	g
Peak Displacement	0.00484	0.0200	0.00998	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 4.34 mm/s at 0.235 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶——◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:12:54 December 2, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.4 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1QK.PI0
Job Number:	1		

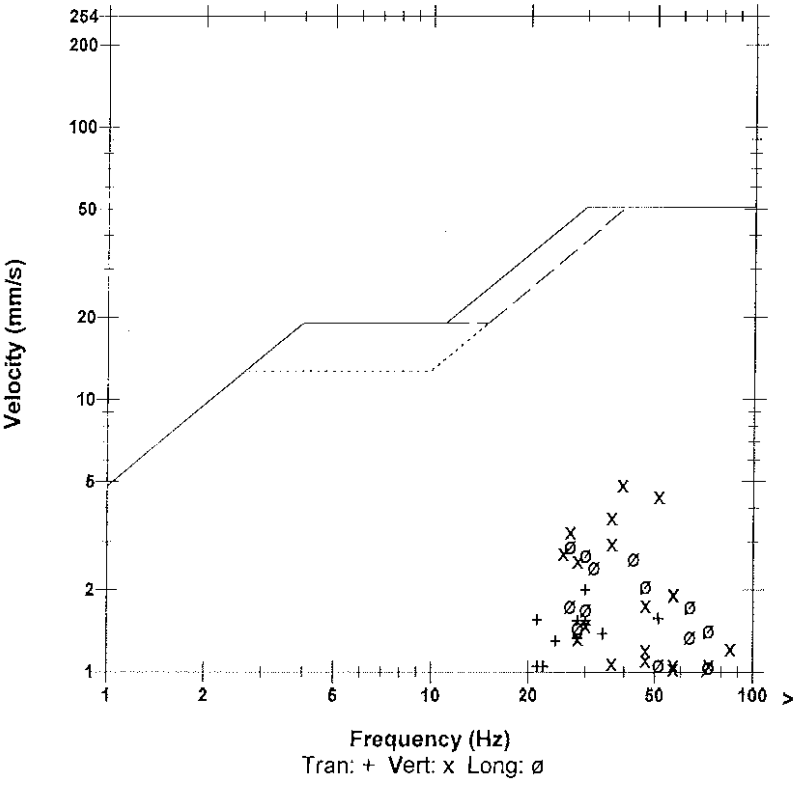
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

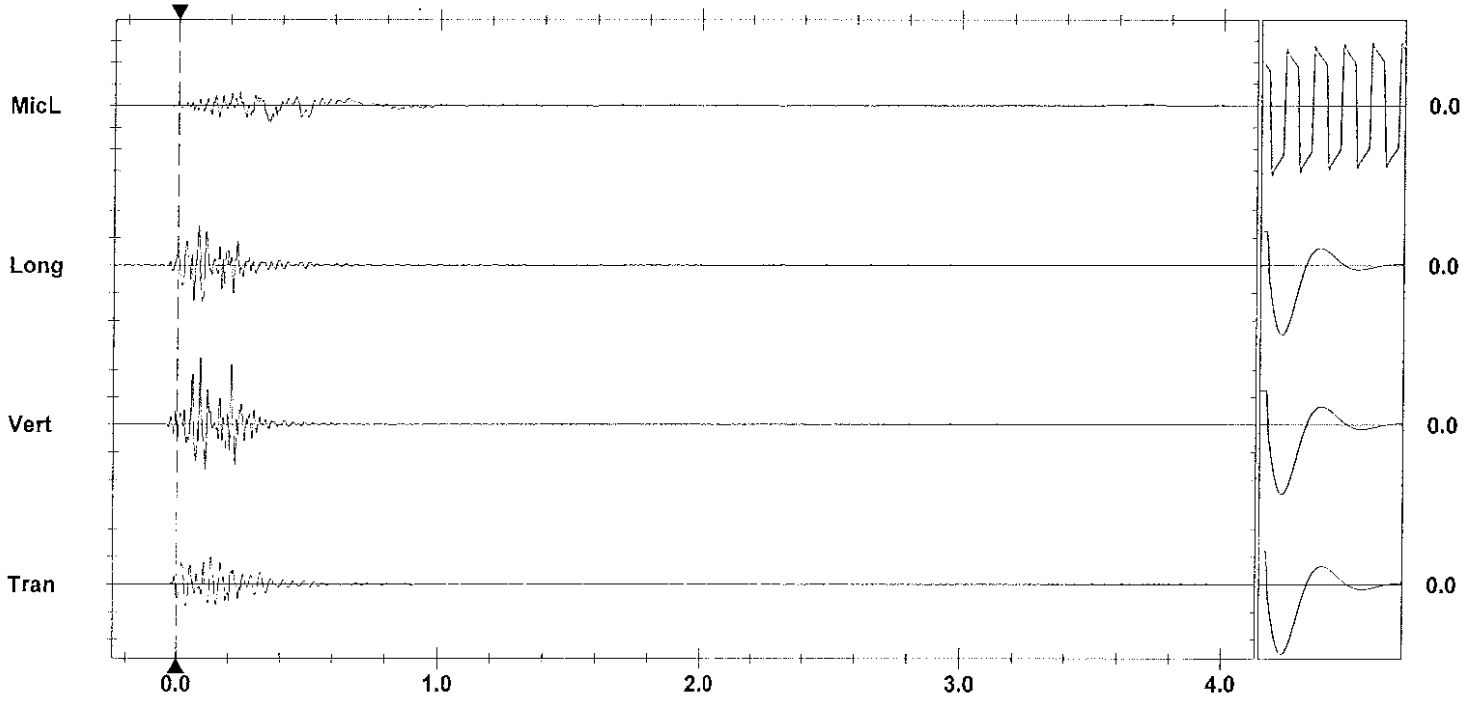
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	7.50 pa.(L) at 0.353 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 661 mv)

	Tran	Vert	Long	
PPV	2.00	4.87	2.89	mm/s
ZC Freq	30	39	27	Hz
Time (Rel. to Trig)	0.134	0.090	0.082	sec
Peak Acceleration	0.0663	0.182	0.101	g
Peak Displacement	0.00990	0.0162	0.0155	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 5.18 mm/s at 0.090 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div

Sensorcheck

Trigger = ▶ ◀

Printed: December 11, 2011 (V 8.01 - 8.01)

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 2/11 2:54 PM
ACTUAL BLAST DATE Dec 2/11
BLAST # MW-0027

HIGHWAY # 97
BLAST LOCATION AT: SW 129+71

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 (3 loaded)
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 36/11 / 6 Proto.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

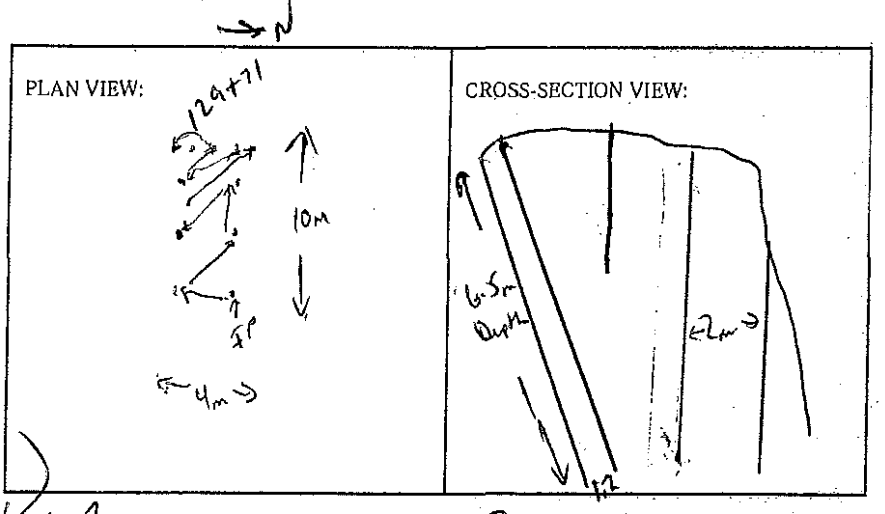
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.151 pc/ 47 1/2
@ 13093 Cliffstone Crt - 0.17 in/ 23 1/2

Prod. Holes – 5' ANFO/Hole
Stab Holes - 10.5' ANFO/Hole
Buffer Holes - ½ Cart 2"x16" Blastex

} primed w/ 1 cart 1"x8" DYNAMITE

B/L Holes - 1 cart 2"x16" DYNAMITE + 200 grain det cord to 4' collar

Instantel

Event Report

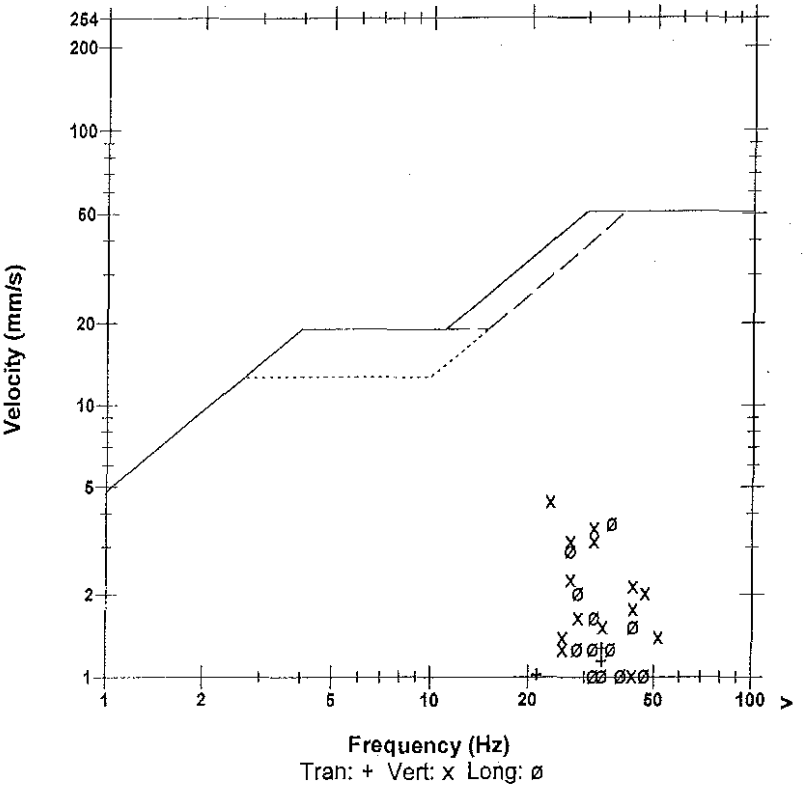
Date/Time	Long at 14:53:59 December 2, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1QP.DZ0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

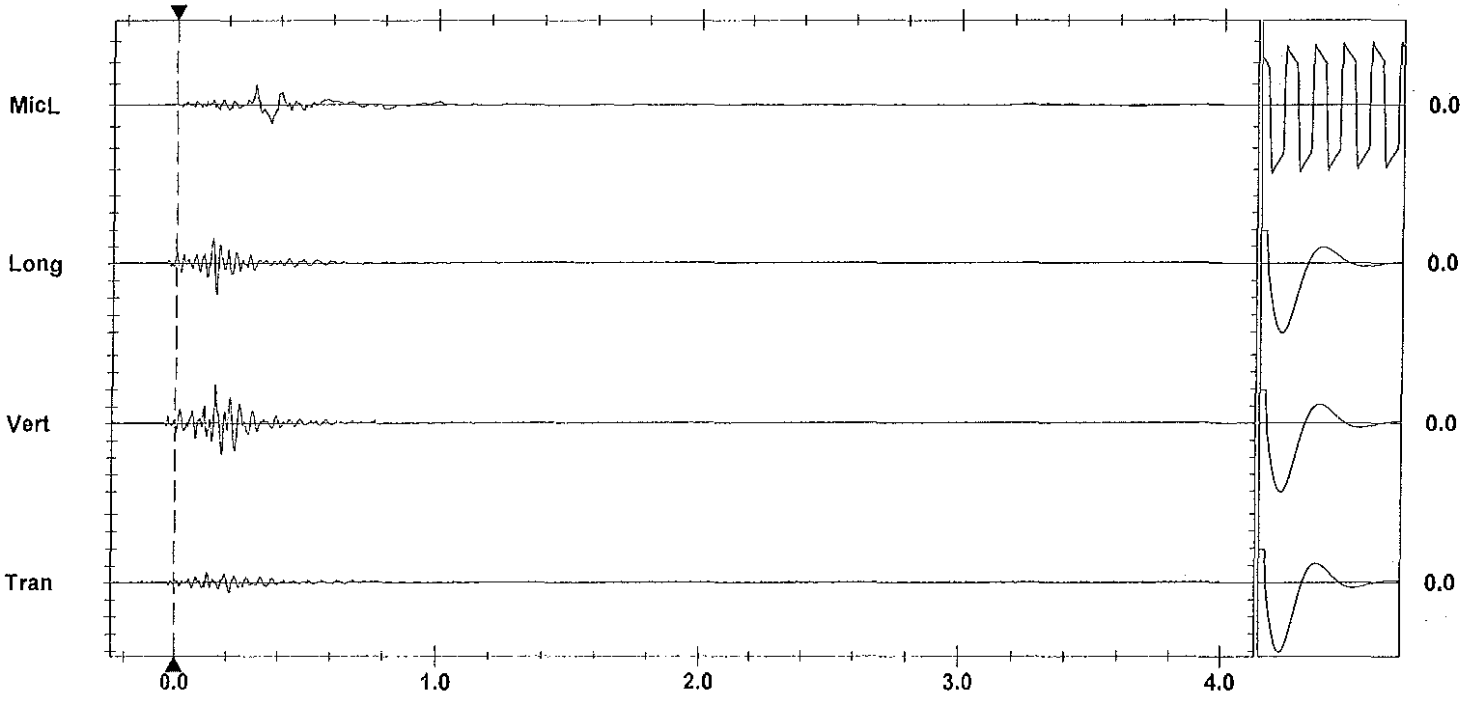
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	9.25 pa.(L) at 0.307 sec			
ZC Freq	9.5 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 701 mv)			

	Tran	Vert	Long	
PPV	1.27	4.44	3.68	mm/s
ZC Freq	34	23	37	Hz
Time (Rel. to Trig)	0.128	0.157	0.155	sec
Peak Acceleration	0.0398	0.119	0.106	g
Peak Displacement	0.00719	0.0215	0.0163	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 5.70 mm/s at 0.157 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

Date/Time	Vert at 14:54:47 December 2, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1QP.FB0
Job Number:	1		

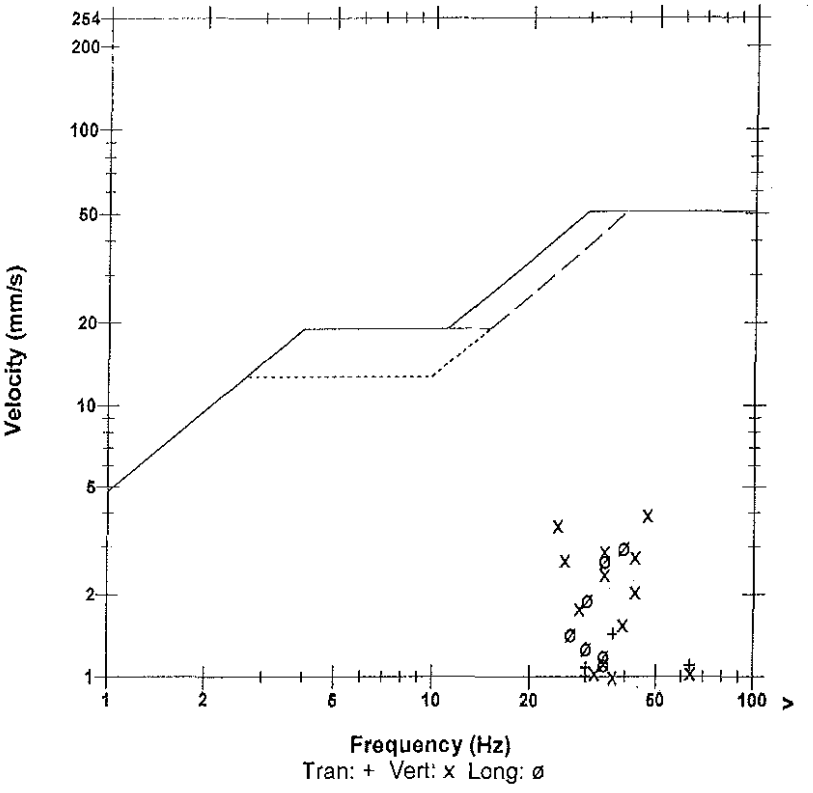
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

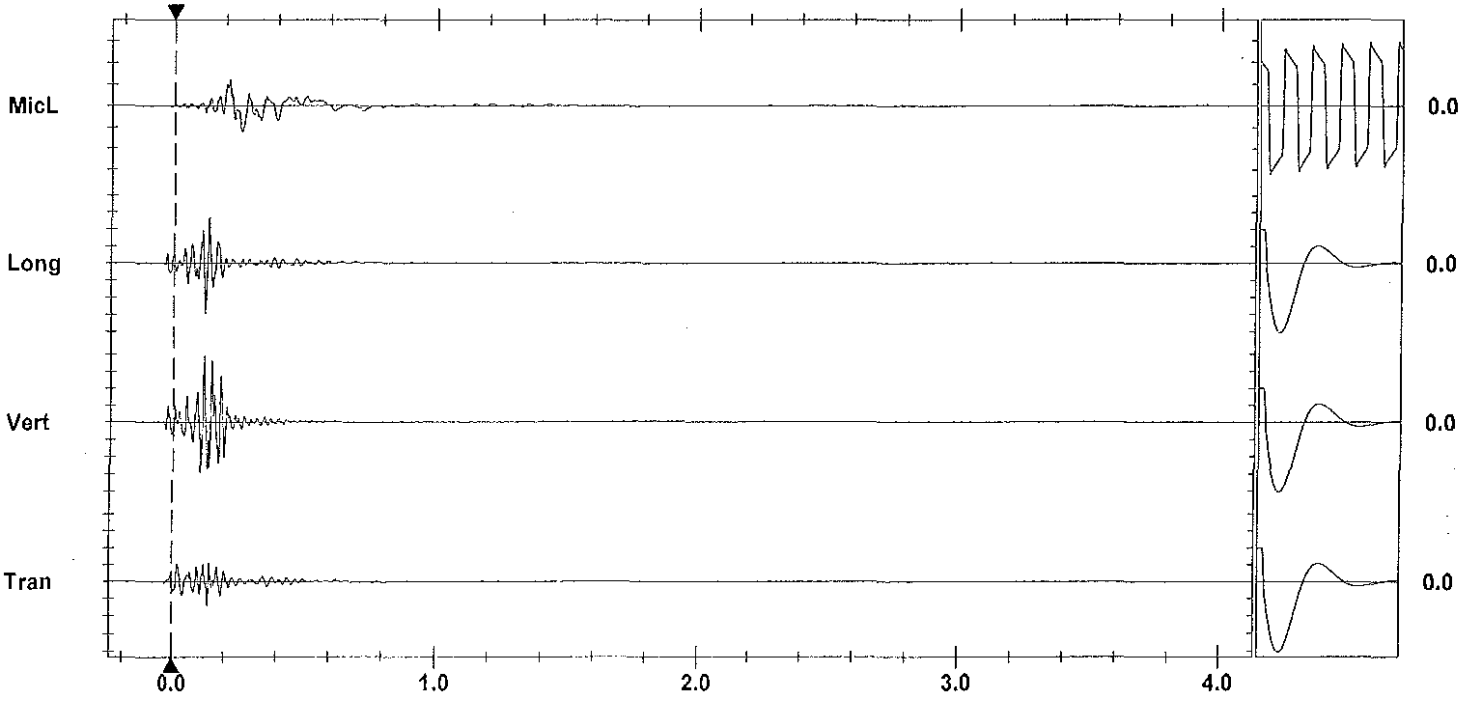
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	12.3 pa.(L) at 0.258 sec			
ZC Freq	9.7 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 679 mv)			

	Tran	Vert	Long	
PPV	1.43	3.94	2.97	mm/s
ZC Freq	37	47	39	Hz
Time (Rel. to Trig)	0.141	0.121	0.122	sec
Peak Acceleration	0.0663	0.161	0.0994	g
Peak Displacement	0.00528	0.0168	0.0111	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.7	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 4.96 mm/s at 0.122 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 02/11
ACTUAL BLAST DATE Dec. 02/11 3:50 PM
BLAST # 120

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+90 - 127+10 RS (1 Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 7 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 19
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 640 (m)

TOTAL NUMBER OF HOLES 19 B/L/80 production.
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING [redacted] 2.2 (m) BURDEN [redacted] 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 95
TOTAL NUMBER OF DELAYS 867

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1425 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

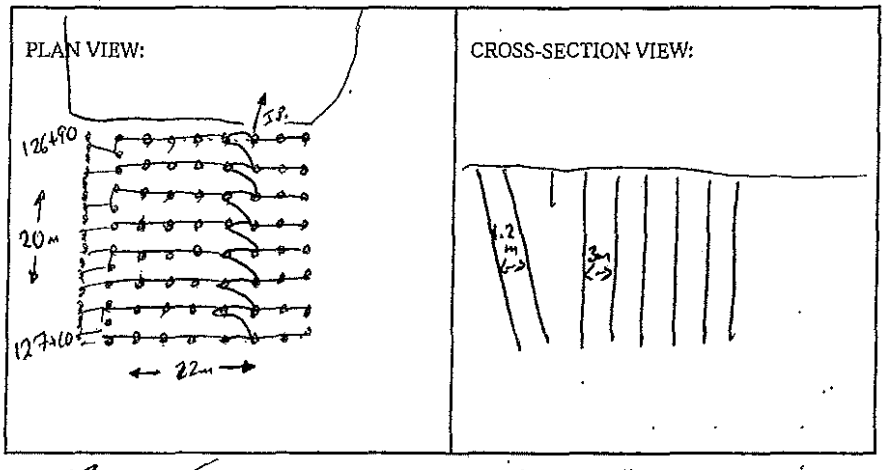
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

22 - 40' EZ dets.

48 - 30' EZ dets.

10 - 24' EZ dets

19 - 12' ms dets.

11 - 42ms connectadet.

5 - 17ms Connectadet.

1 - Elec det.

56 bags Anfo.

1 case 1½ x 16

Instantel

Event Report

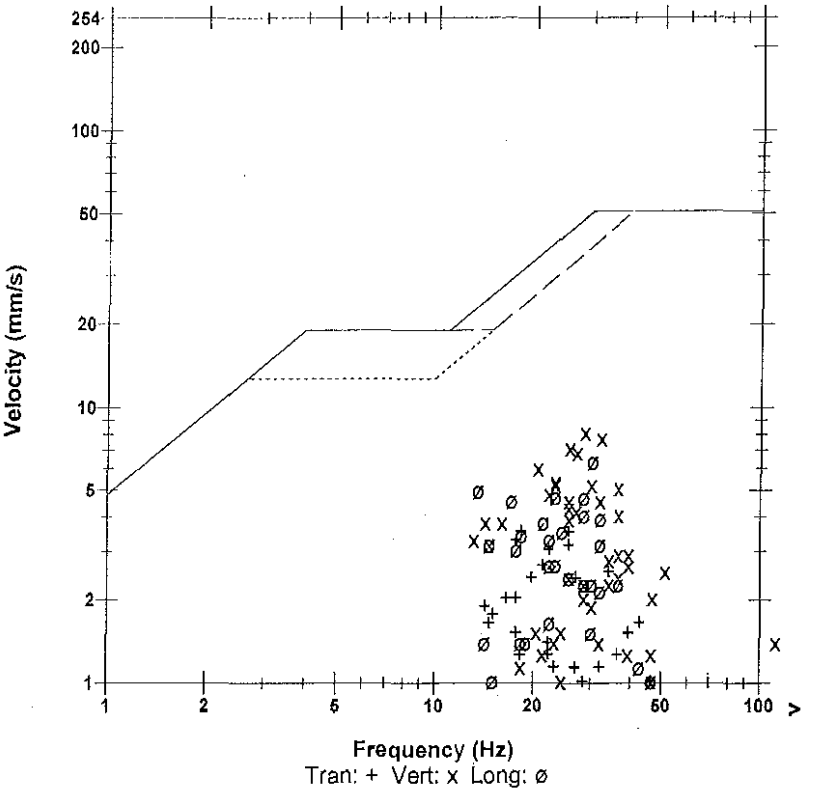
Date/Time	Vert at 15:55:58 December 2, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1QS.9A0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

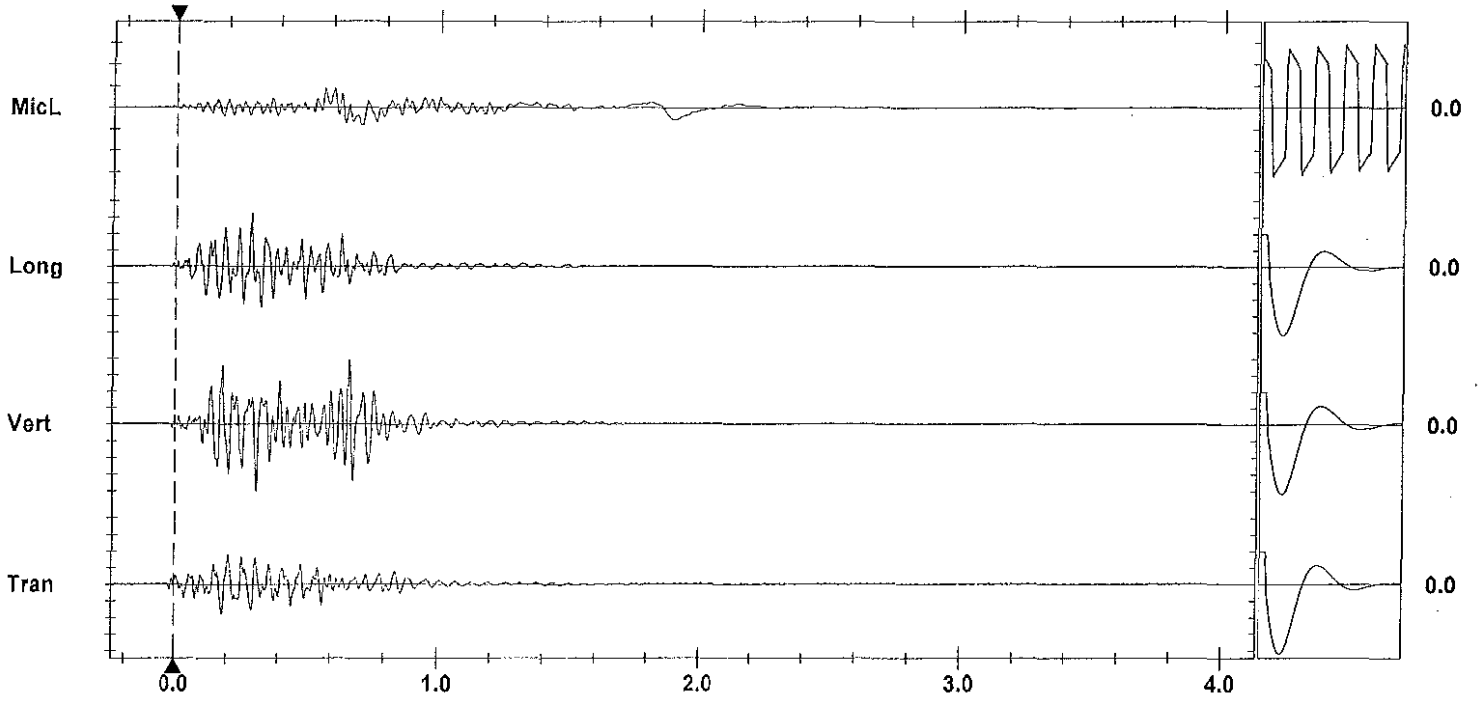
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	8.75 pa.(L) at 0.605 sec			
ZC Freq	8.7 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 644 mv)			

	Tran	Vert	Long	
PPV	3.56	8.13	6.35	mm/s
ZC Freq	26	28	30	Hz
Time (Rel. to Trig)	0.186	0.315	0.295	sec
Peak Acceleration	0.0795	0.159	0.119	g
Peak Displacement	0.0264	0.0409	0.0362	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 8.74 mm/s at 0.316 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

Date/Time	Vert at 15:56:46 December 2, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1QS.AM0
Job Number:	1		

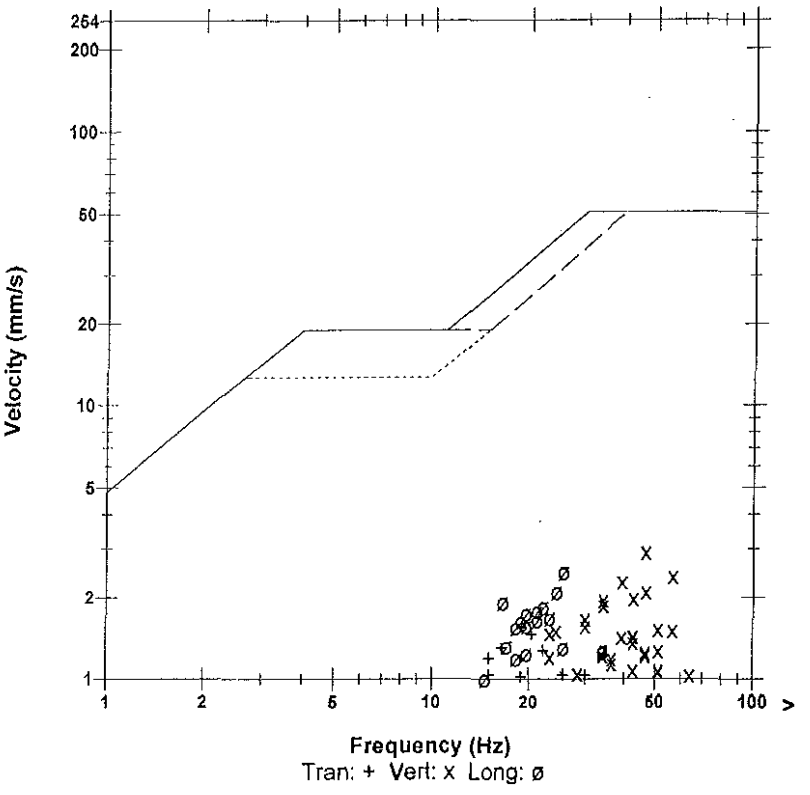
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	130+10

Extended Notes

Post Event Notes

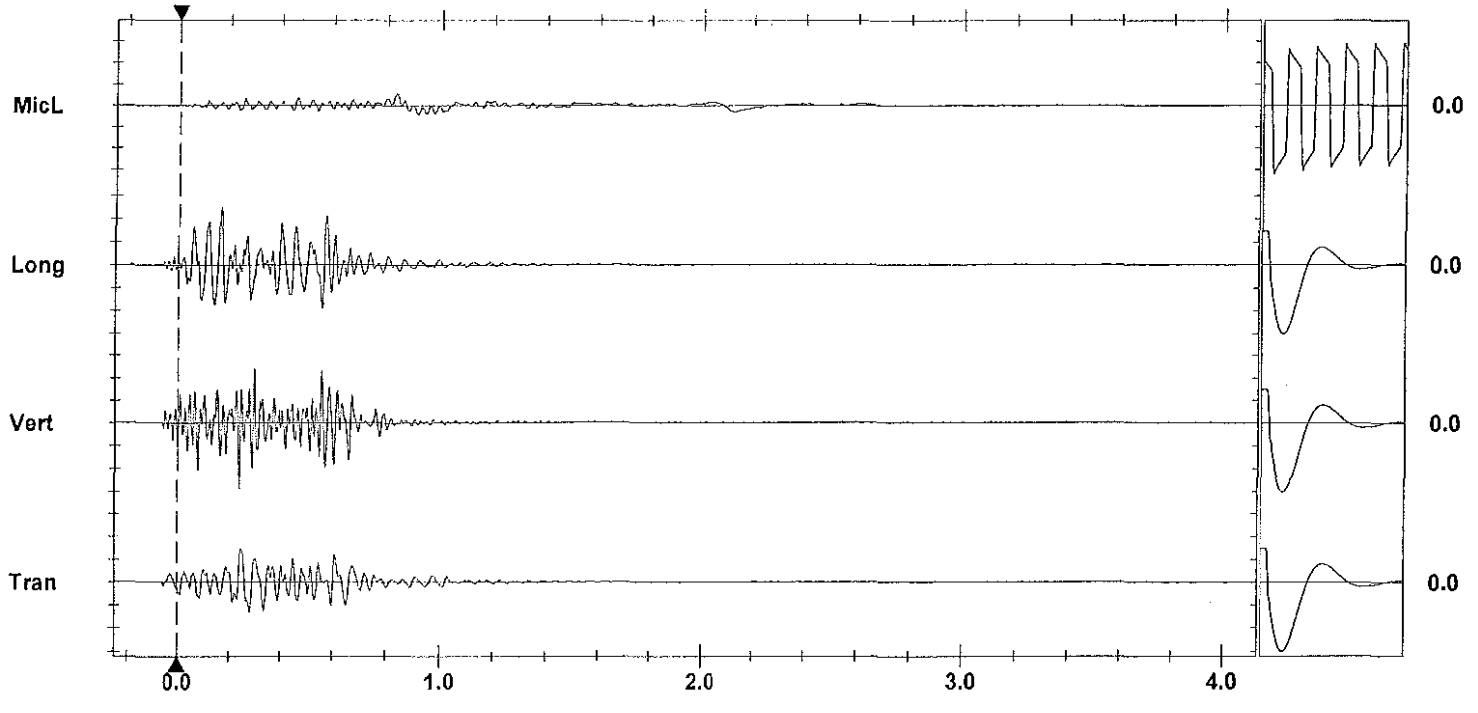
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	5.50 pa.(L) at 0.832 sec			
ZC Freq	7.5 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 695 mv)			

	Tran	Vert	Long	
PPV	1.46	2.92	2.48	mm/s
ZC Freq	20	47	26	Hz
Time (Rel. to Trig)	0.248	0.239	0.165	sec
Peak Acceleration	0.0298	0.0878	0.0464	g
Peak Displacement	0.0127	0.00912	0.0153	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 2.99 mm/s at 0.559 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶——— ◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Dec. 06/11
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE Dec. 05/11
BLAST # 122

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+93 - 127+30 LS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 16 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 29
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 925 (m)

TOTAL NUMBER OF HOLES 29 B/L / 143 productions.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 172
TOTAL NUMBER OF DELAYS 143

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2150 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

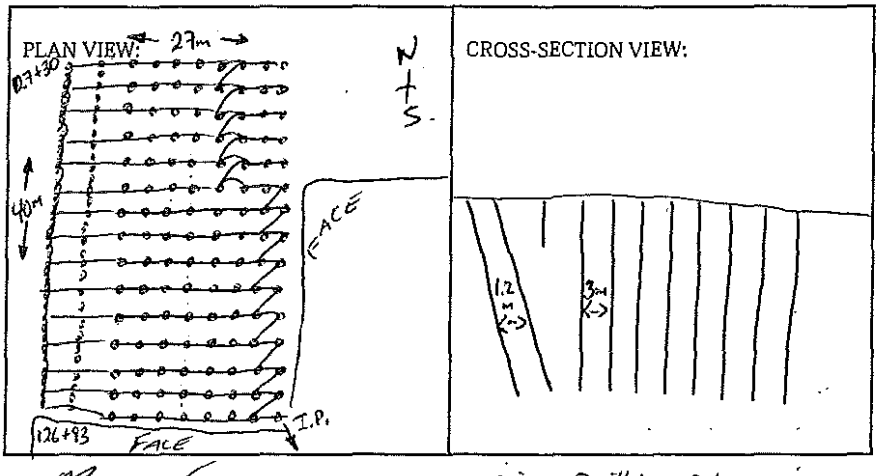
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 5200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

7 - BAGS WR.
75 - BAGS Anfo.
3½ CASE 1½x16

28-40' dets. Ez.
42-30' Ez dets.
73-24' Ez dets.
29-12' ms dets.
22-42ms ~~A~~ connectadel.
4-17ms connectadel.
1 Zlee det

Instantel

Event Report

Date/Time	Long at 15:32:20 December 5, 2011
Trigger Source	Geo: 1.02 mm/s
Range	Geo :254 mm/s
Record Time	4.0 sec at 1024 sps

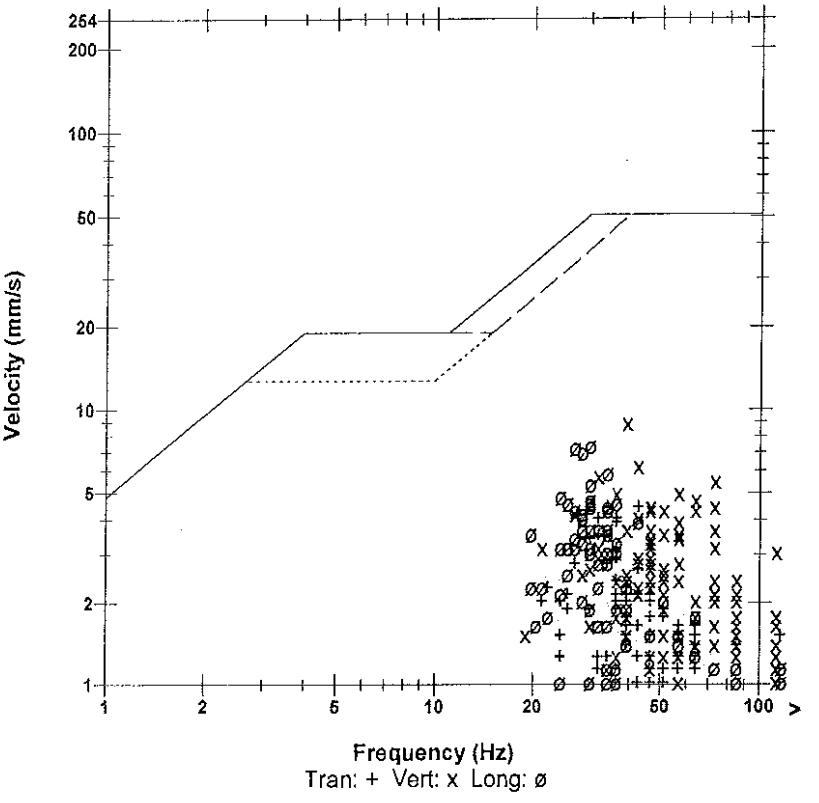
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E1WB.5W0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

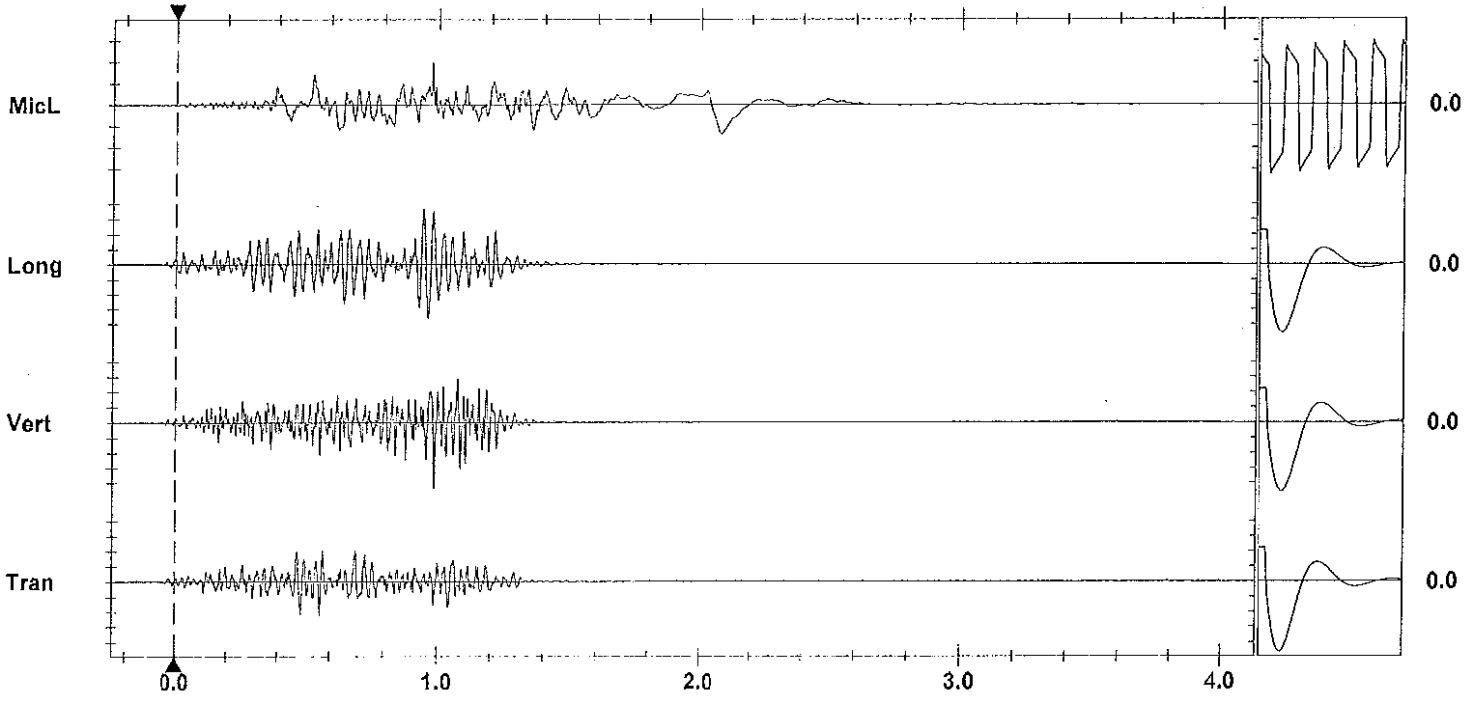
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	19.5 pa.(L) at 0.976 sec
ZC Freq	9.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 669 mv)

	Tran	Vert	Long	
PPV	4.44	8.89	7.37	mm/s
ZC Freq	34	39	30	Hz
Time (Rel. to Trig)	0.489	0.987	0.945	sec
Peak Acceleration	0.119	0.265	0.159	g
Peak Displacement	0.0197	0.0277	0.0428	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 10.1 mm/s at 0.987 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 10:53 AM
BLAST # MW-0028

HIGHWAY # 97
BLAST LOCATION AT: STN 129+65 - 129+70 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 66/11 + 6 presp.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

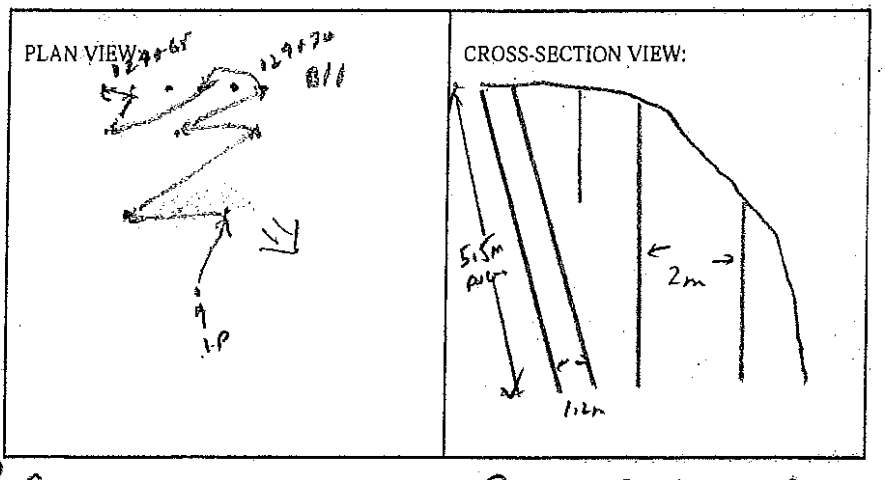
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffside east = 0.191 ips / 51 Hz
@ 13072 cliffside east = 0.075 ips / 43 Hz

PROD. Holes - 4'-6' apart/Hole

STEM Holes. 1.5' apart/Hole

Buffer Holes - 3-4 count 2"x16" Blasting

All primed w/ 1 each 1"x8" Dynamite

B/L Holes. 1 each 2"x16" Dynamite + 200 gr. det. cord to 4' collar

Instantel

Event Report

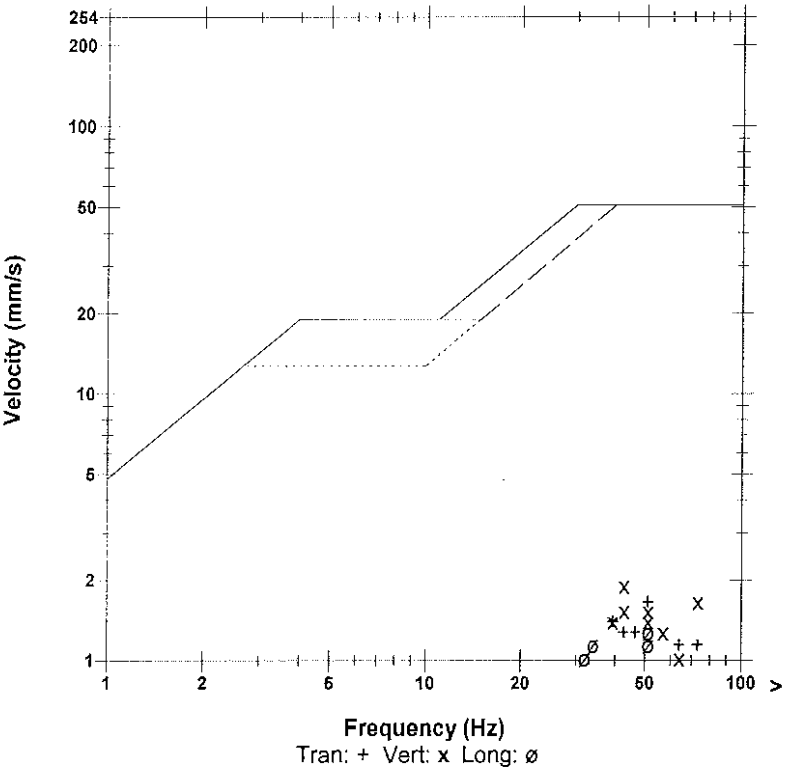
Date/Time	Vert at 10:52:57 December 6, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1XS.W90

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

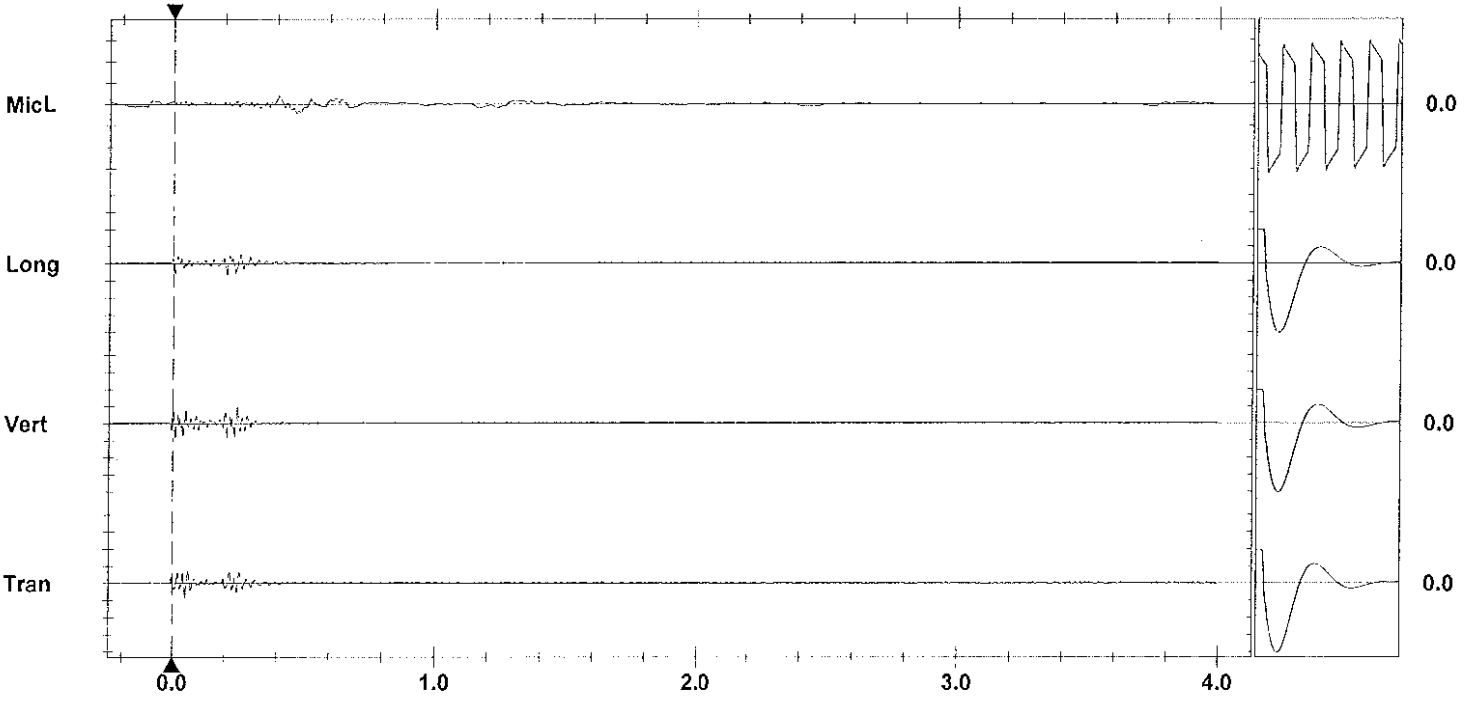
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 4.25 pa.(L) at 0.467 sec
ZC Freq 6.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 688 mv)

	Tran	Vert	Long	
PPV	1.65	1.90	1.27	mm/s
ZC Freq	51	43	51	Hz
Time (Rel. to Trig)	0.050	0.249	0.205	sec
Peak Acceleration	0.0530	0.0795	0.0530	g
Peak Displacement	0.00540	0.00595	0.00577	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 2.25 mm/s at 0.050 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — — ◀

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Instantel

Event Report

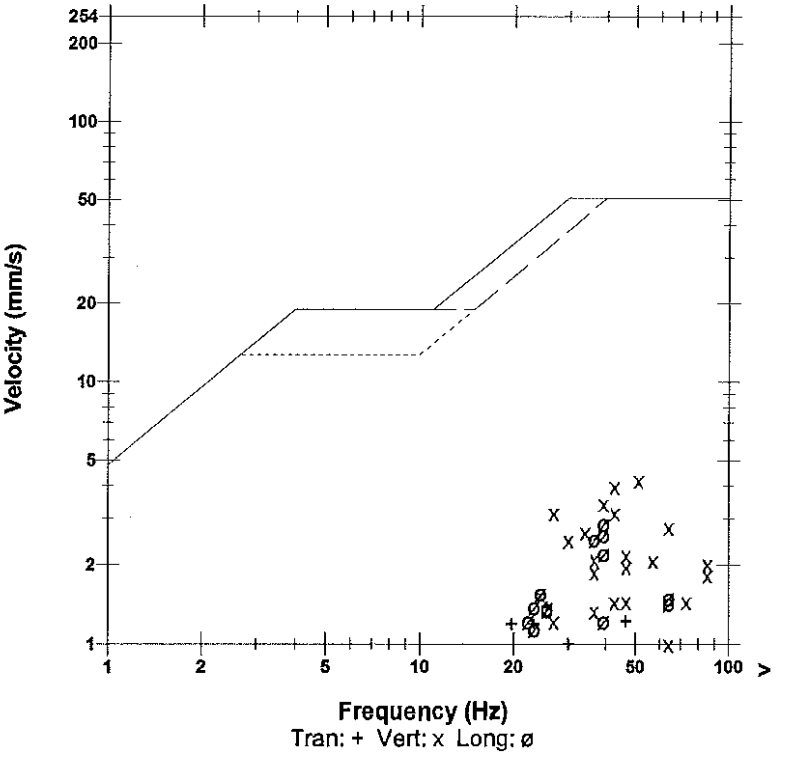
Date/Time	Vert at 10:53:48 December 6, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1XS.XO0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

Post Event Notes

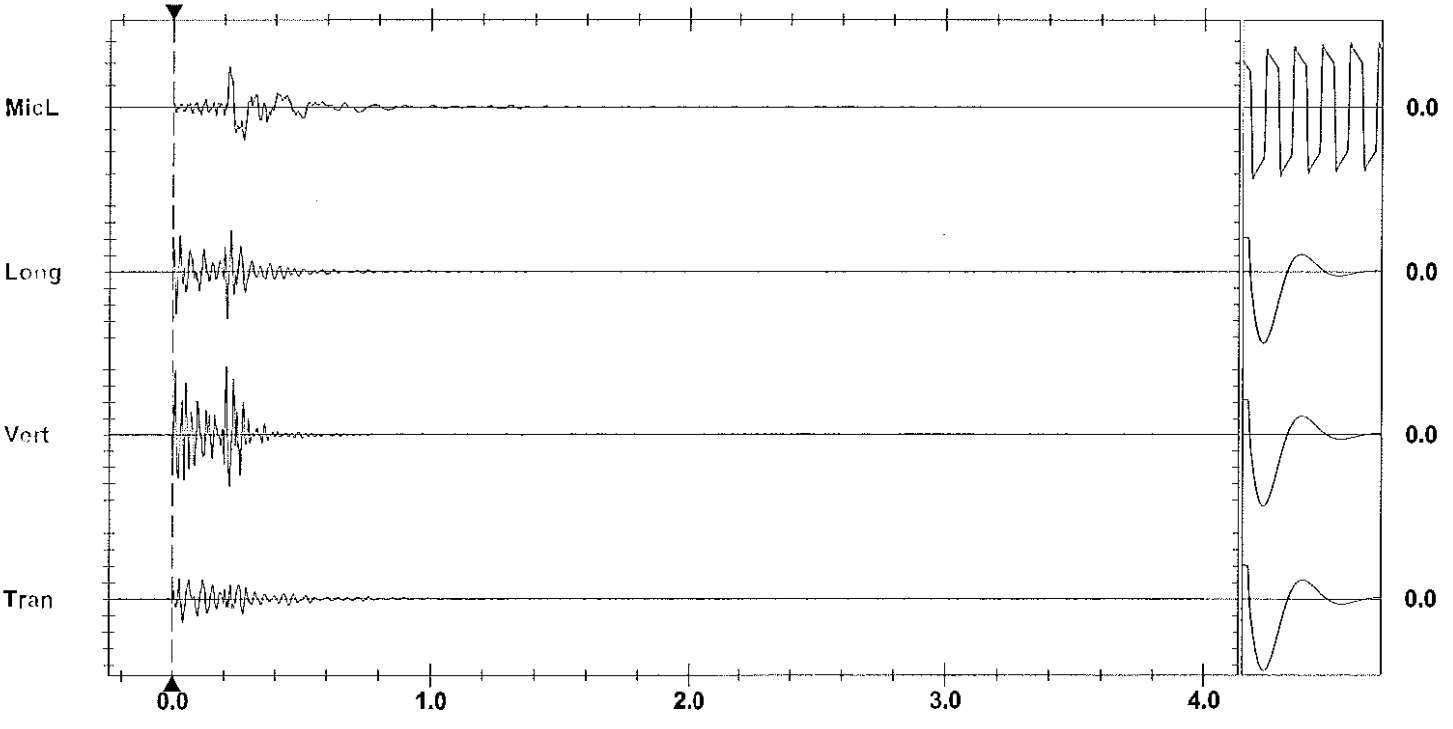
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 18.3 pa.(L) at 0.219 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 687 mv)

	Tran	Vert	Long	
PPV	1.38	4.21	2.87	mm/s
ZC Freq	26	51	39	Hz
Time (Rel. to Trig)	0.042	0.209	0.211	sec
Peak Acceleration	0.0381	0.210	0.113	g
Peak Displacement	0.00731	0.0152	0.00946	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 4.82 mm/s at 0.210 sec



Time Scale:0.20 sec/div **Amplitude Scale**Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5133489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 11:44 AM
BLAST # MW-0029

HIGHWAY # 97
BLAST LOCATION AT: SW 12942.0

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE QUARTZ GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.8 (m)
TOTAL DEPTH 44 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

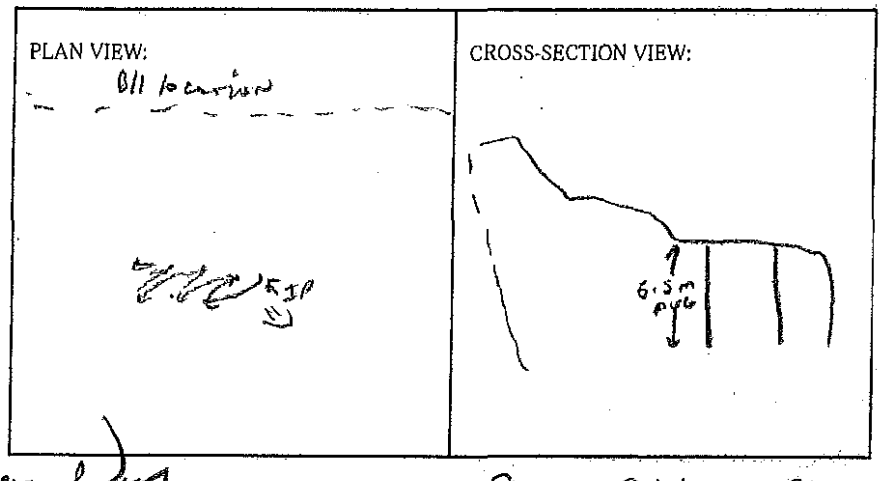
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF PANEL FUSEON
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 c11 Radial cmp - 0.43 in/s / 32 Hz
@ 13073 c11 Radial cmp - 0.18 in/s / 51 Hz

5'-6' ANFO/Hole primed w/ 1 CART. 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:43:53 December 6, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.0 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1XV.950

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

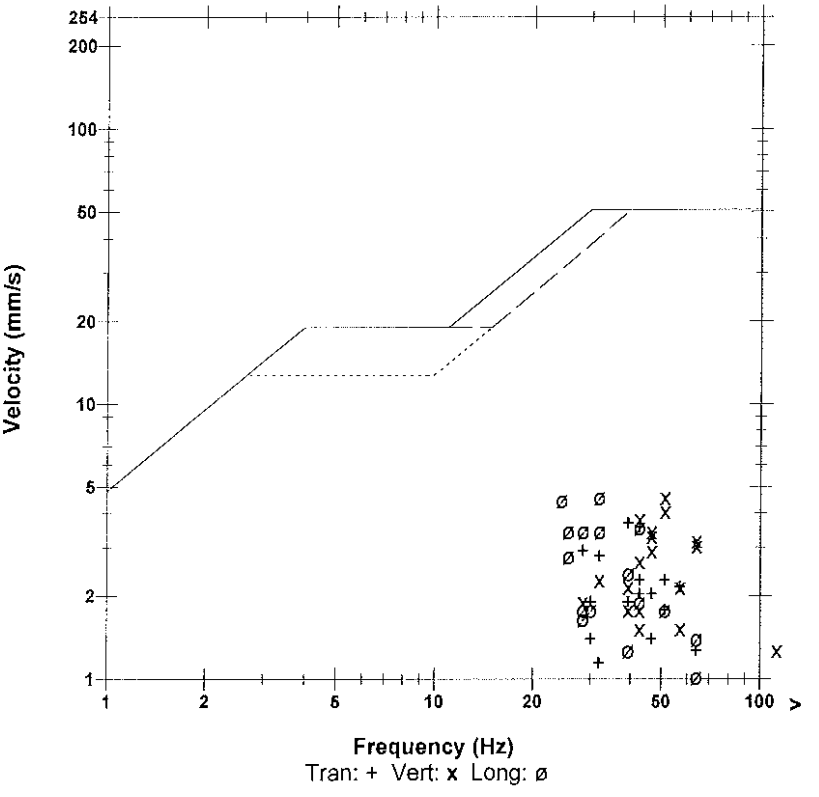
Extended Notes
Blast at stn 128

Post Event Notes

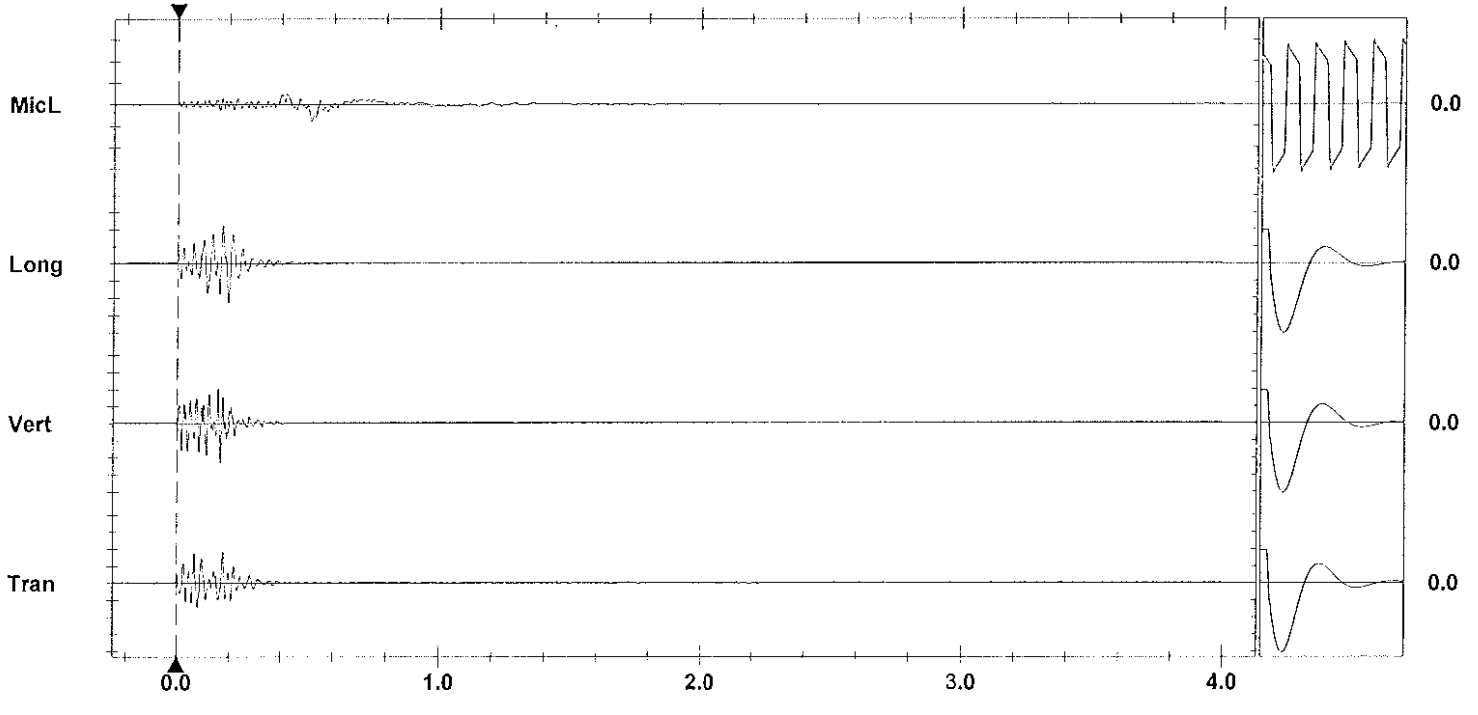
Microphone Linear Weighting
PSPL 7.75 pa.(L) at 0.512 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 645 mv)

	Tran	Vert	Long	
PPV	3.68	4.57	4.57	mm/s
ZC Freq	39	51	32	Hz
Time (Rel. to Trig)	0.179	0.167	0.195	sec
Peak Acceleration	0.106	0.159	0.119	g
Peak Displacement	0.0147	0.0124	0.0220	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 5.47 mm/s at 0.176 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶ ◀

Printed: December 11, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:44:45 December 6, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1XV.AL0
Job Number:	1		

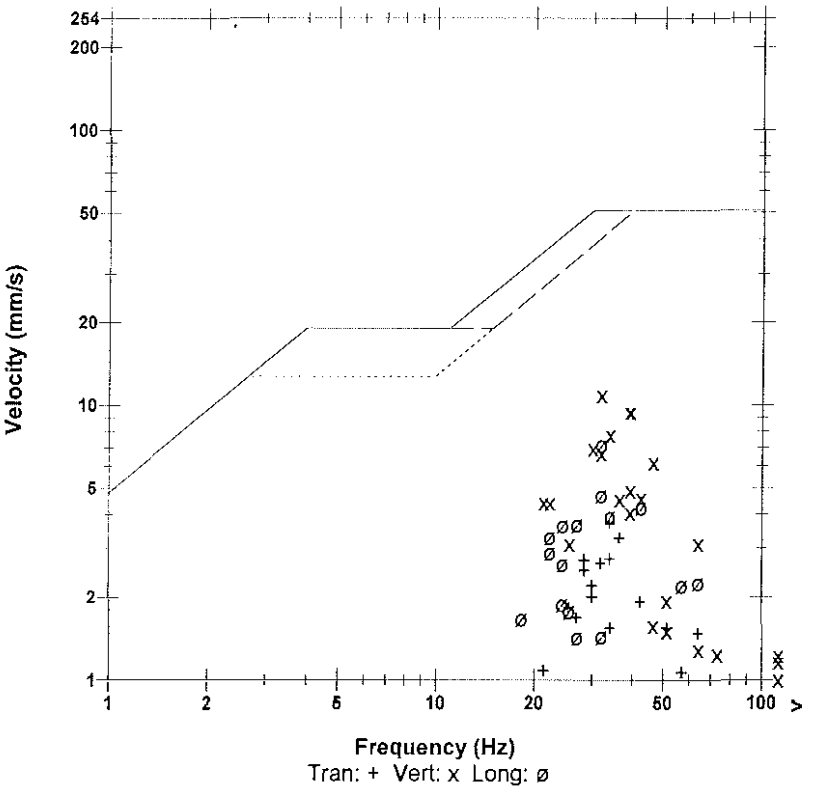
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

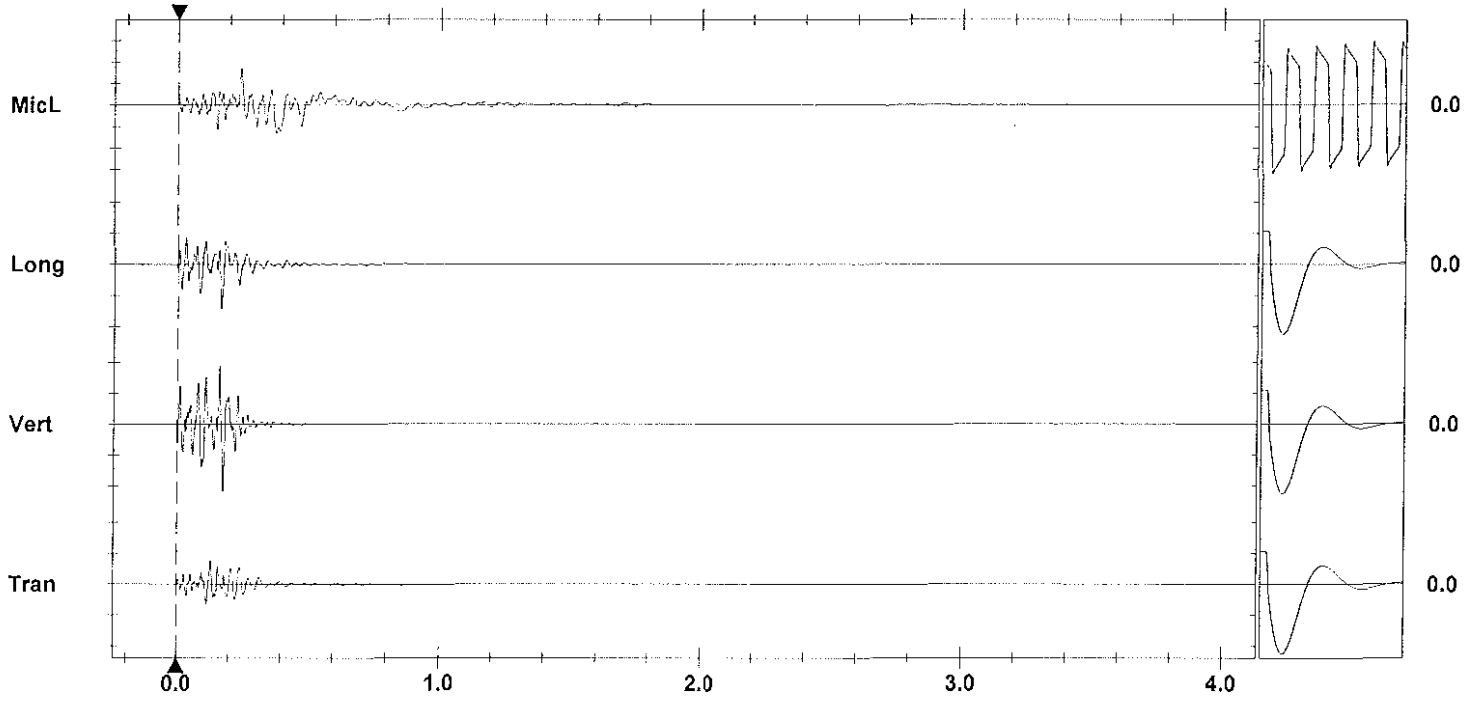
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	17.0 pa.(L) at 0.244 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 650 mv)

	Tran	Vert	Long	
PPV	3.70	10.9	7.18	mm/s
ZC Freq	34	32	32	Hz
Time (Rel. to Trig)	0.132	0.177	0.167	sec
Peak Acceleration	0.103	0.310	0.156	g
Peak Displacement	0.0157	0.0460	0.0337	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 10.9 mm/s at 0.178 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 10.00 pa.(L)/div

Sensorcheck

Trigger = ▶ ---- ◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 1:19 PM
BLAST # MW-0036

HIGHWAY# 97
BLAST LOCATION AT: STN 129 + 65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 56 (m)

DRILLING DETAILS: * shot marked.

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

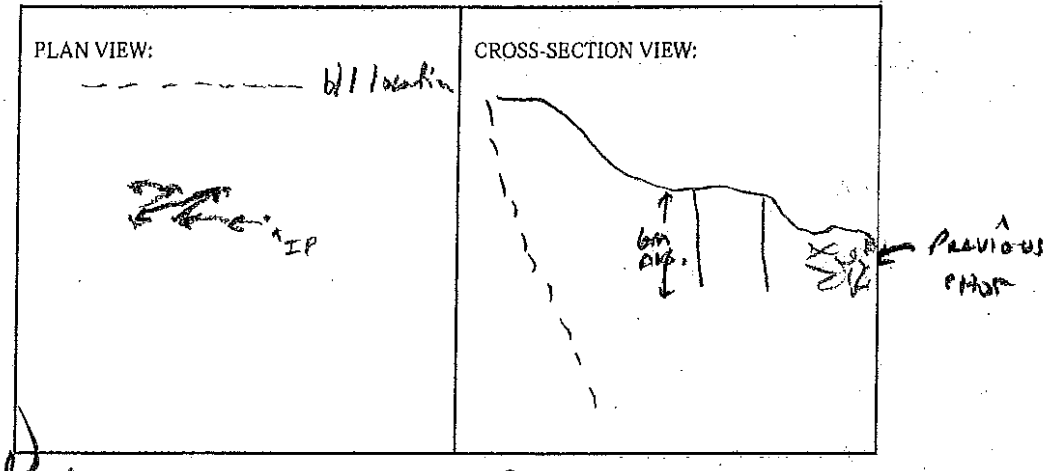
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESG Initiation of Nonel Systems
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffside crk - 0.19 ips / 43 Hz
@ 13073 cliffside crk - 0.078 ips / 64 Hz

4'-5' AUGERHOLE

Instantel

Event Report

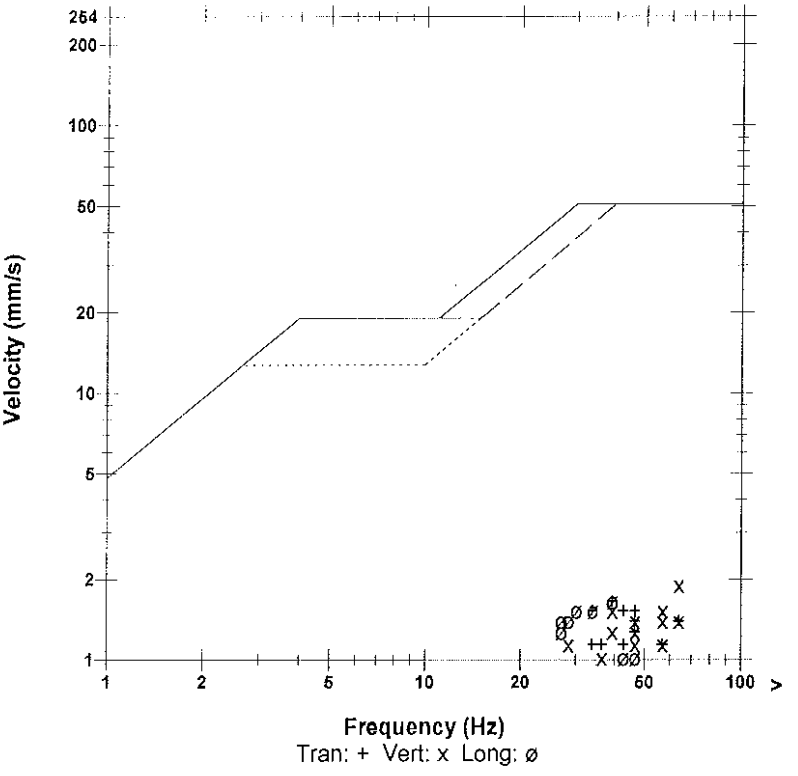
Date/Time	Vert at 13:18:03 December 6, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1XZ.M30

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

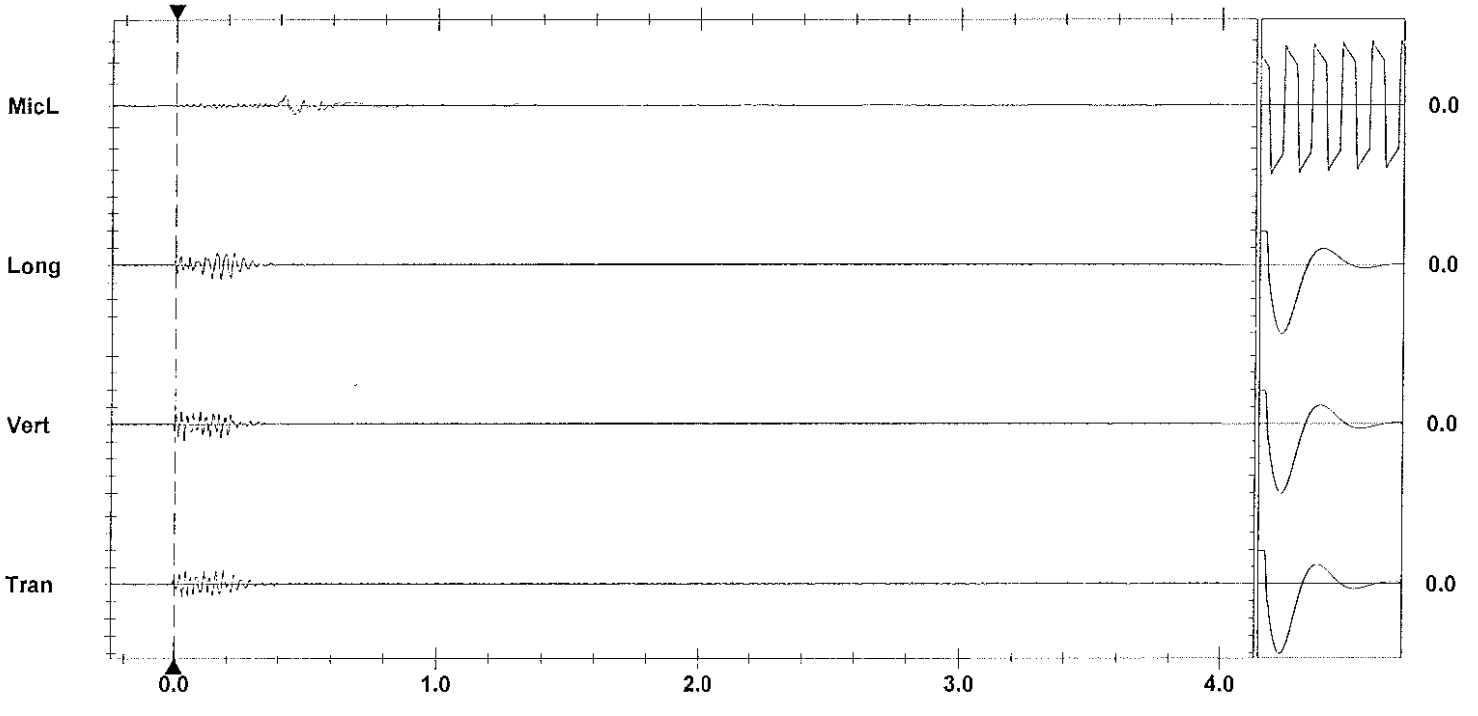
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	4.75 pa.(L) at 0.416 sec			
ZC Freq	12 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 704 mv)			

	Tran	Vert	Long	
PPV	1.65	1.90	1.65	mm/s
ZC Freq	39	64	39	Hz
Time (Rel. to Trig)	0.188	0.034	0.171	sec
Peak Acceleration	0.0663	0.0928	0.0530	g
Peak Displacement	0.00577	0.00521	0.00868	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 2.36 mm/s at 0.175 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — — —◀

Printed: December 11, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 13:18:55 December 6, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1XZ.NJ0
Job Number:	1		

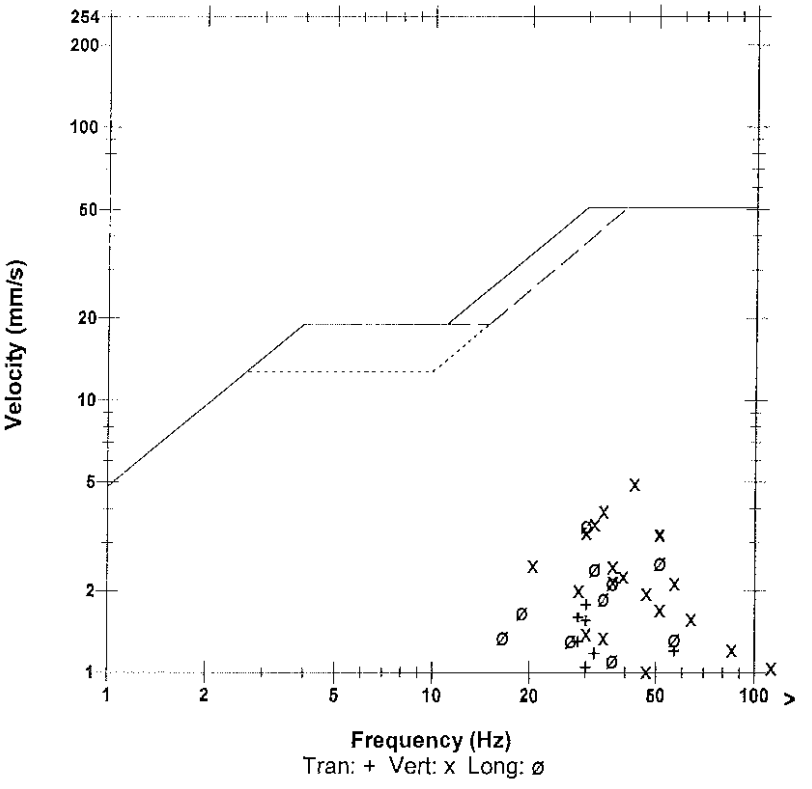
Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

Post Event Notes

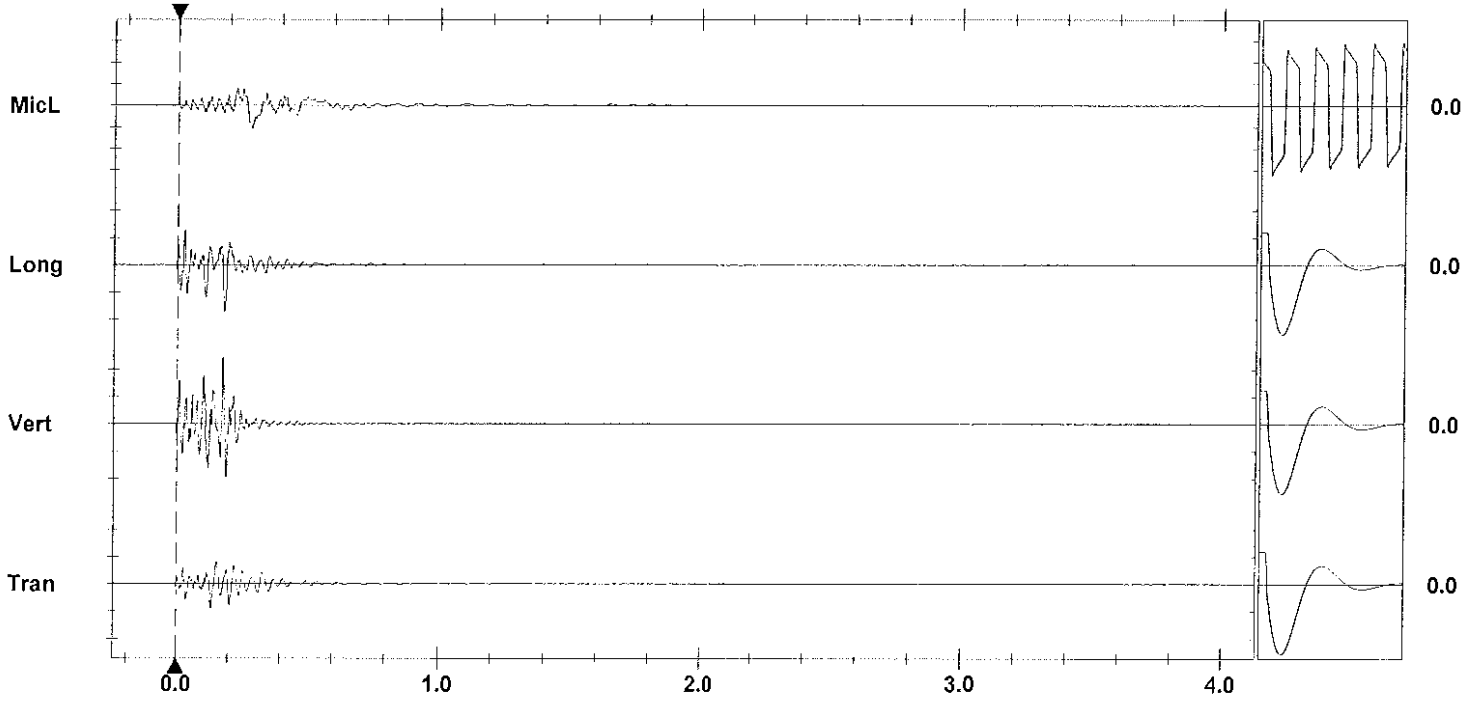
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	1.78	4.95	3.46	mm/s
ZC Freq	30	43	30	Hz
Time (Rel. to Trig)	0.134	0.177	0.181	sec
Peak Acceleration	0.0481	0.146	0.0978	g
Peak Displacement	0.00820	0.0169	0.0191	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Microphone Linear Weighting
PSPL 10.5 pa.(L) at 0.283 sec
ZC Freq 9.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 705 mv)

Peak Vector Sum 5.32 mm/s at 0.177 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — — -◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Dec 6/14
CONTRACTOR'S NAME Sierra Drilling + Blasting
ACTUAL BLAST DATE Dec 6/14 2:37 PM
BLASTER'S NAME Wayne Verney
BLAST # MW-0031
BLASTER'S CERTIFICATE NUMBER 583489

HIGHWAY# 97
BLAST LOCATION AT: STN 129+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot indirectly

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alteration Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

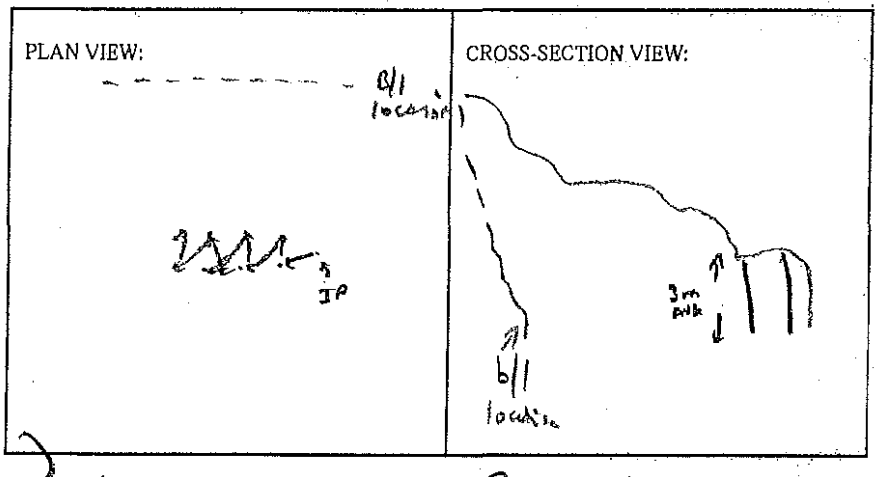
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Kiss - initiation of main system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crt = 0.13 ips / 51 Hz
@ 13073 cliffstone crt = 0.11 ips / 57 Hz

2'-3' amphibole pierced w/ 1"x8" aquamarine

Instantel

Event Report

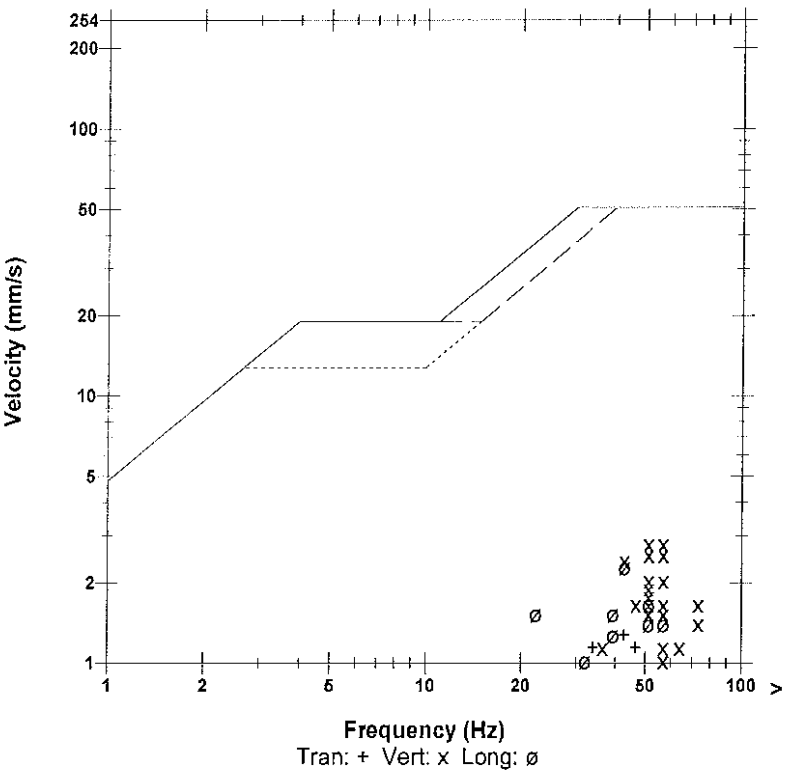
Date/Time	Vert at 14:36:32 December 6, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1Y3.8W0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

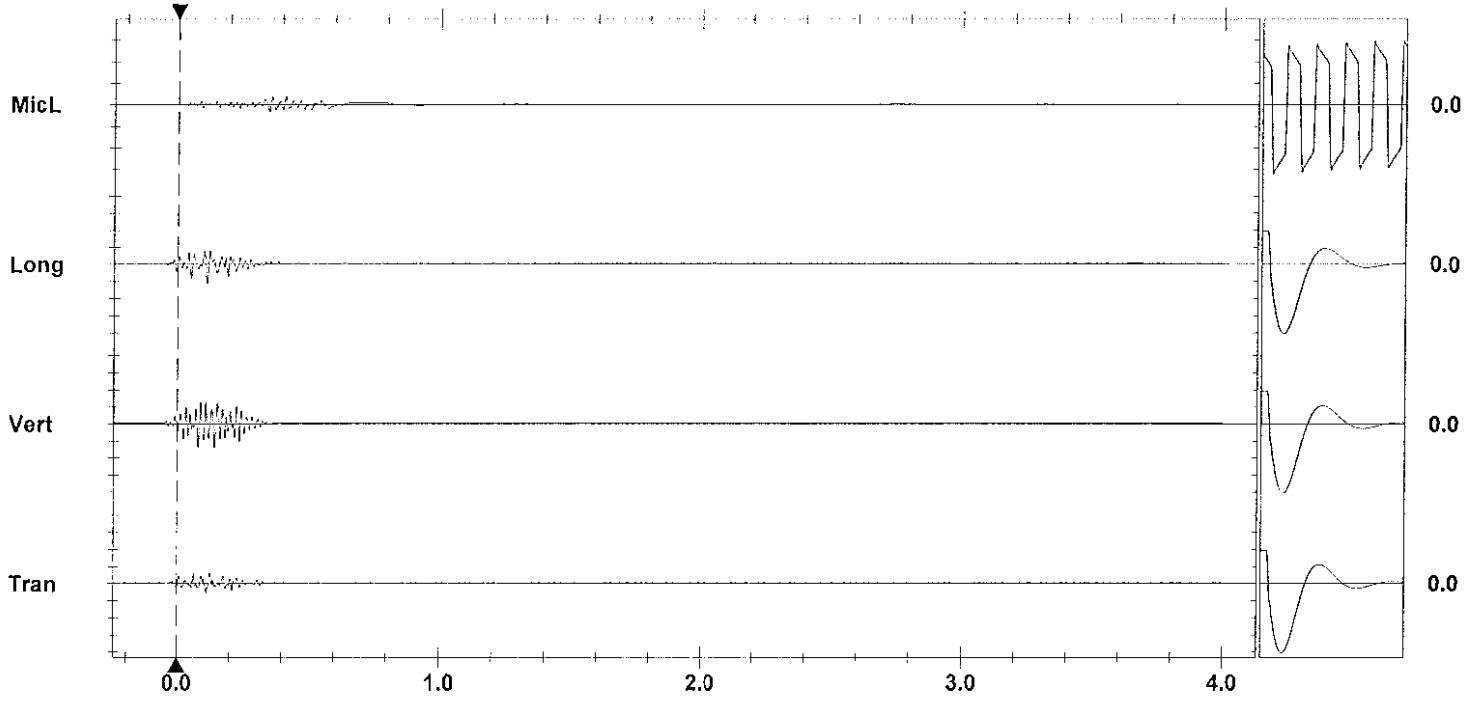
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 3.75 pa.(L) at 0.409 sec
ZC Freq 39 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 721 mv)

	Tran	Vert	Long	
PPV	1.27	2.79	2.29	mm/s
ZC Freq	43	57	43	Hz
Time (Rel. to Trig)	0.128	0.081	0.111	sec
Peak Acceleration	0.0398	0.106	0.0663	g
Peak Displacement	0.00477	0.00912	0.00806	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 3.37 mm/s at 0.110 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶ ◀

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Instantel

Event Report

Date/Time	Vert at 14:37:23 December 6, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1Y3.AB0
Job Number:	1		

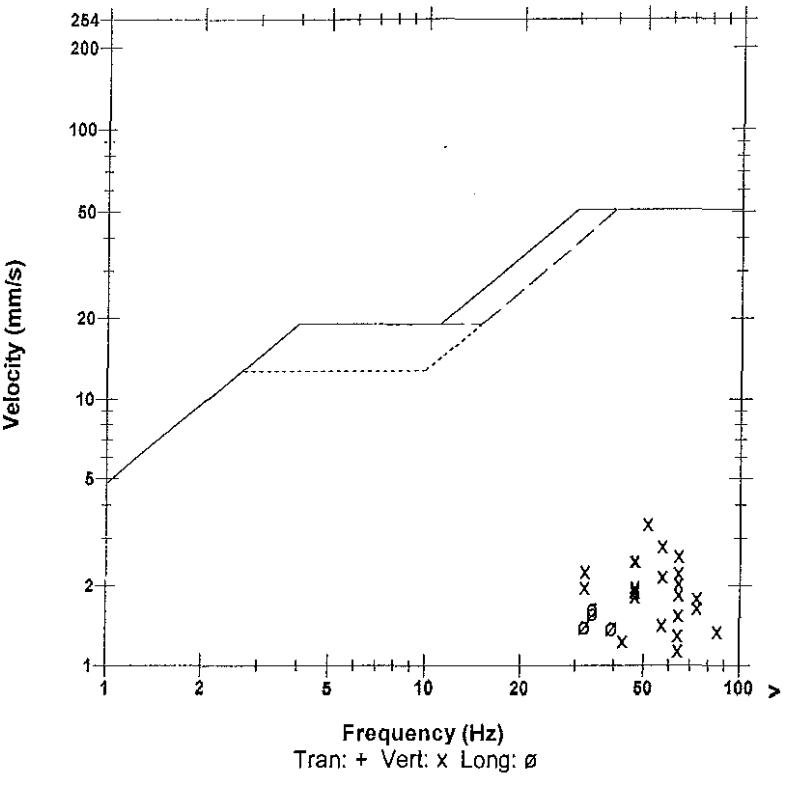
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

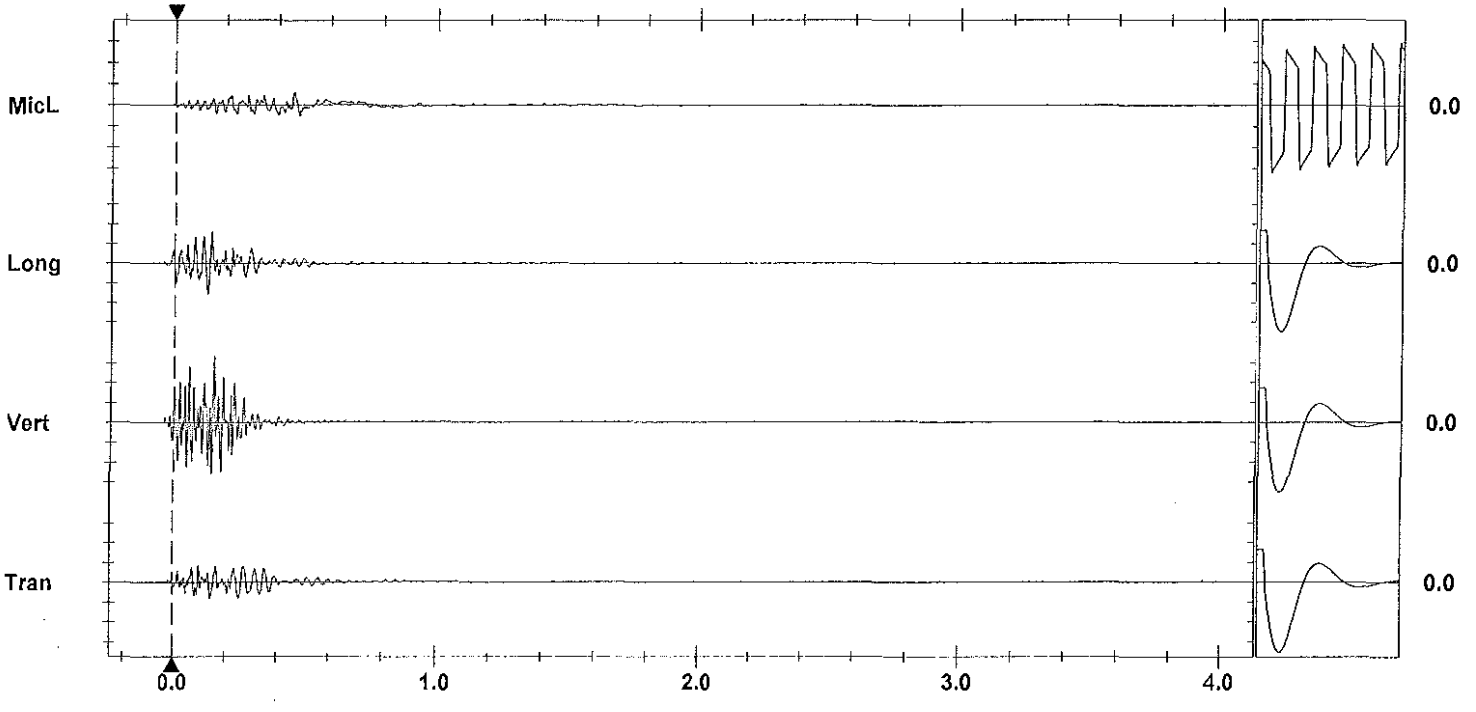
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	6.00 pa.(L) at 0.455 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 690 mv)

	Tran	Vert	Long	
PPV	0.857	3.41	1.64	mm/s
ZC Freq	57	51	34	Hz
Time (Rel. to Trig)	0.104	0.155	0.146	sec
Peak Acceleration	0.0348	0.123	0.0348	g
Peak Displacement	0.00557	0.00990	0.00706	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 3.45 mm/s at 0.155 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶— — — —◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 06/11
ACTUAL BLAST DATE Dec. 06/11 2:38 PM
BLAST # 124

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+10 - 127+40 RS (1 Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 8 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 30 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80. (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 29
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 11
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 760 (m)

TOTAL NUMBER OF HOLES 29 B/L / 72 production
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 101
TOTAL NUMBER OF DELAYS 72

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1800 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

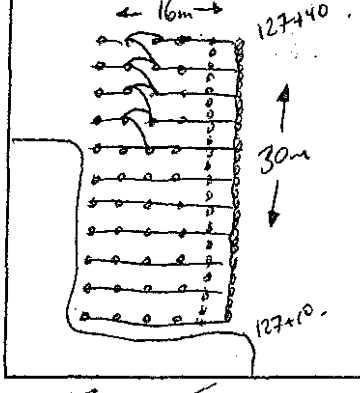
VOLUME OF ROCK BLASTED 3800 (m^3)

BLAST SKETCH:

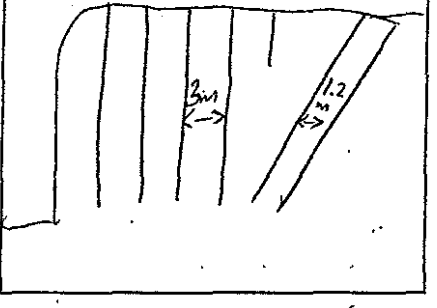
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

72

66- BAGS Anfo.

4 - BAGS WR.

2 - case 1½x16

17 - 30' Ez dets.

45 - 40' Ez dets

10 - 24' Ez dets.

29 - 12' ms dets.

14 - 42ms connectadel.

1 Elec del.

Instantel

Event Report

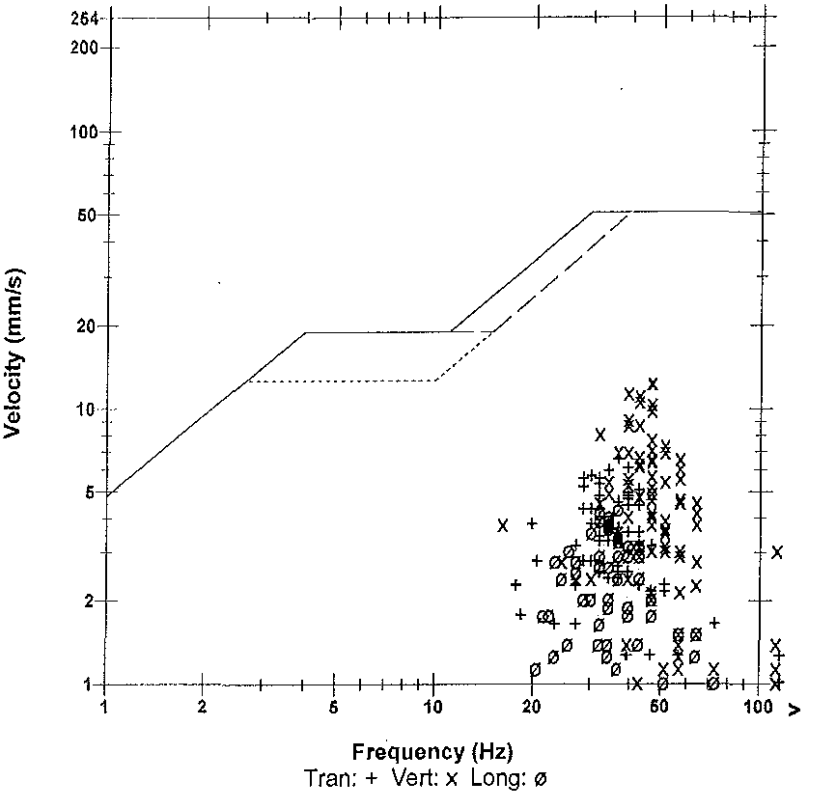
Date/Time	Vert at 14:37:18 December 6, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1Y3.A60

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

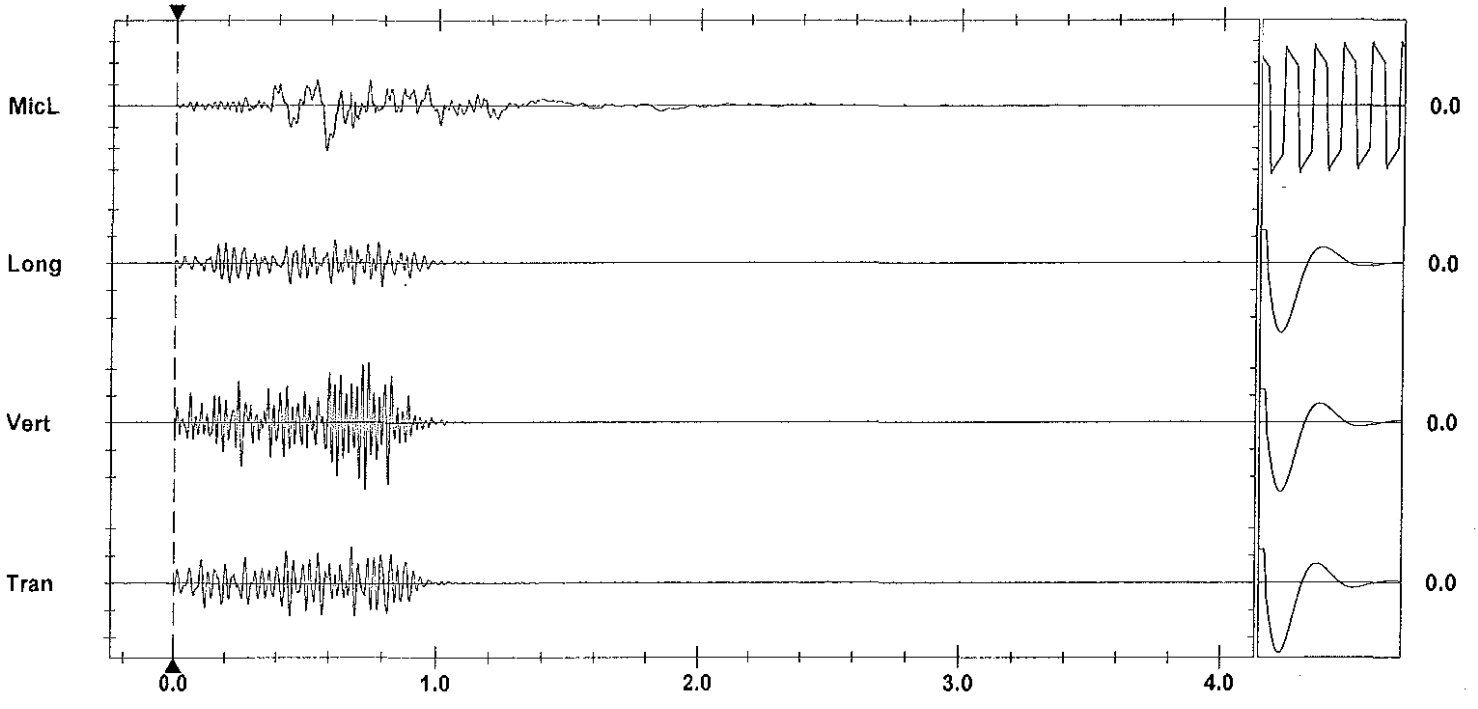
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	21.3 pa.(L) at 0.582 sec			
ZC Freq	9.0 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 643 mv)			

	Tran	Vert	Long	
PPV	6.60	12.4	4.32	mm/s
ZC Freq	37	47	37	Hz
Time (Rel. to Trig)	0.687	0.736	0.796	sec
Peak Acceleration	0.172	0.345	0.119	g
Peak Displacement	0.0312	0.0429	0.0201	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 12.8 mm/s at 0.821 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶———◀

Printed: December 11, 2011 07:8:04 -8:01 Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:38:09 December 6, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E1Y3.BL0
Job Number:	1		

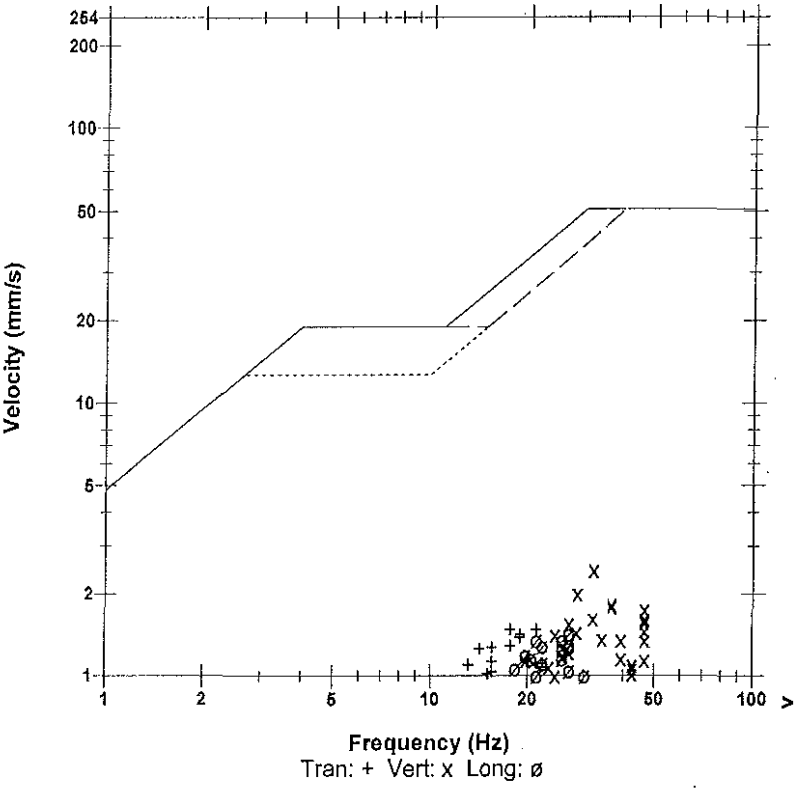
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

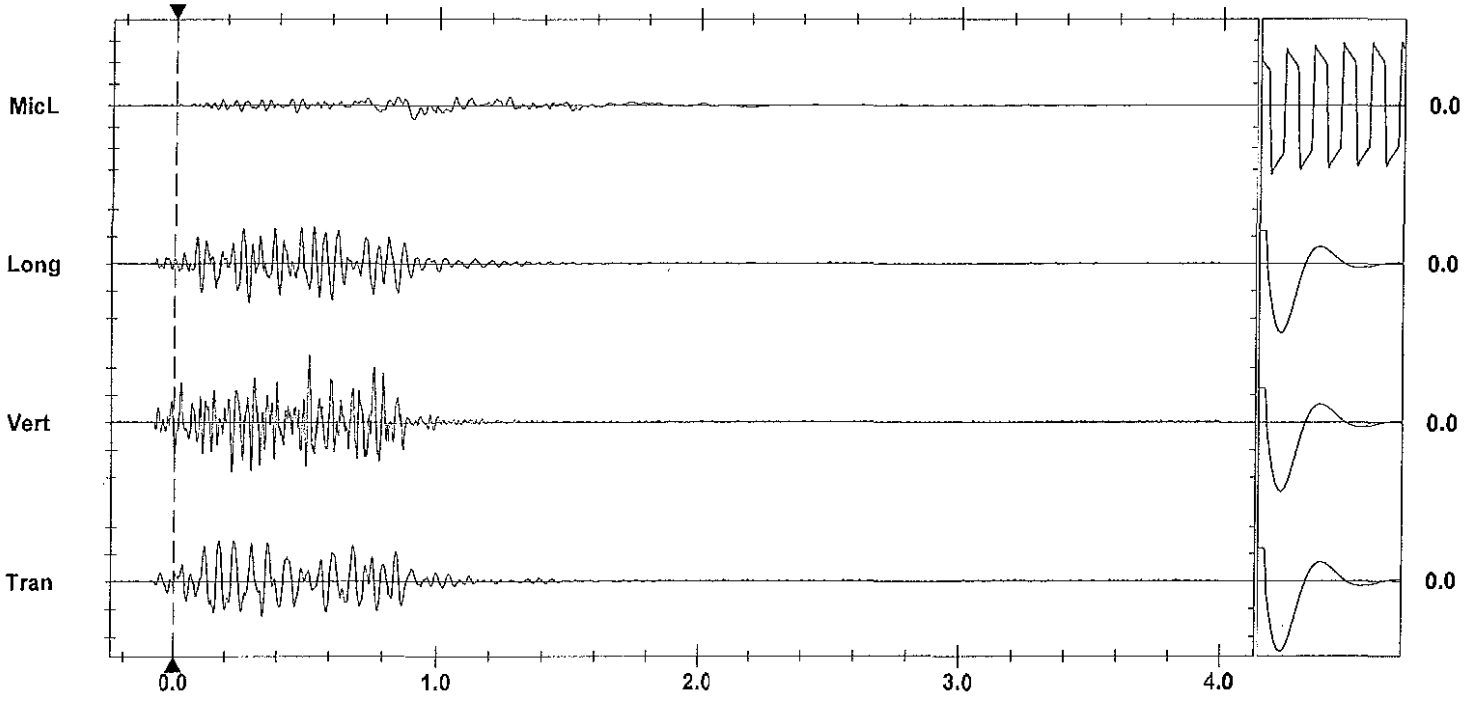
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	6.25 pa.(L) at 0.907 sec
ZC Freq	7.2 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 668 mv)

	Tran	Vert	Long	
PPV	1.48	2.44	1.43	mm/s
ZC Freq	21	32	27	Hz
Time (Rel. to Trig)	0.177	0.521	0.291	sec
Peak Acceleration	0.0265	0.0663	0.0282	g
Peak Displacement	0.0134	0.0113	0.00943	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 2.64 mm/s at 0.521 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 07/11
ACTUAL BLAST DATE Dec. 07/11
BLAST # 126

3:01 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+30 - 127+50 LS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 14 (m) SLOPE ANGLE — (°) SLOPE LENGTH — (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 260 (m)

TOTAL NUMBER OF HOLES 65 production.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 65
TOTAL NUMBER OF DELAYS 65

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

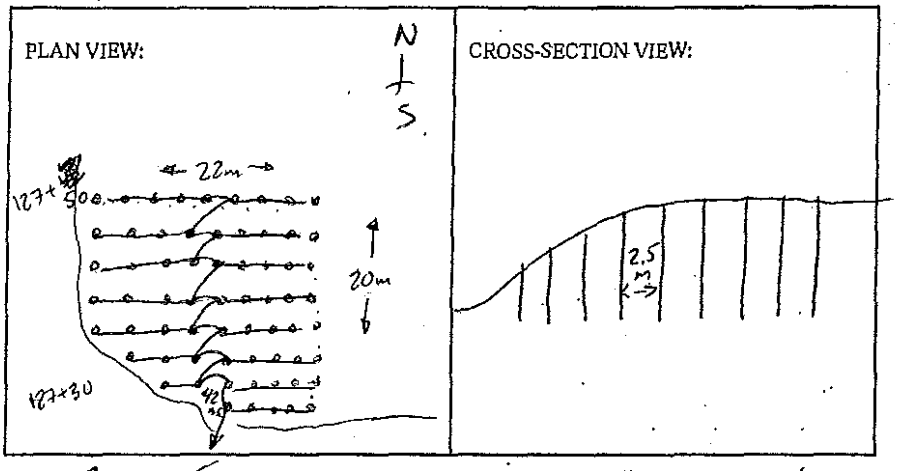
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1760 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

18 bags Anfo
32 sticks 1½ x 16"

65 - 7m (24') Ez dets.
1 - 17ms connectadet
14 - 42ms connectadets
1 Elec det.

Instantel

Event Report

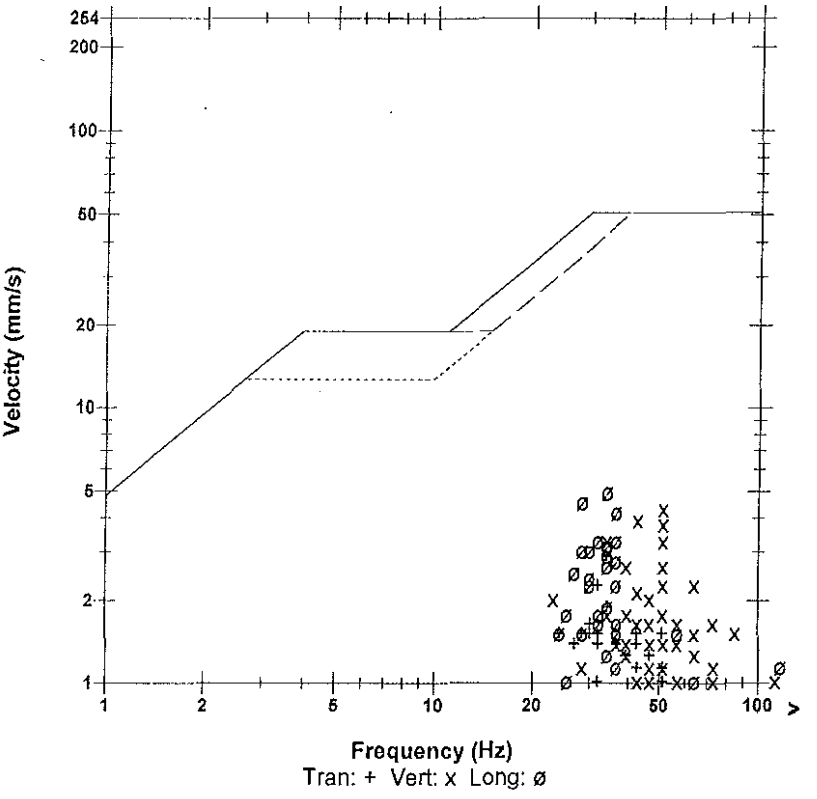
Date/Time	Long at 15:01:06 December 7, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E1ZZ.1U0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

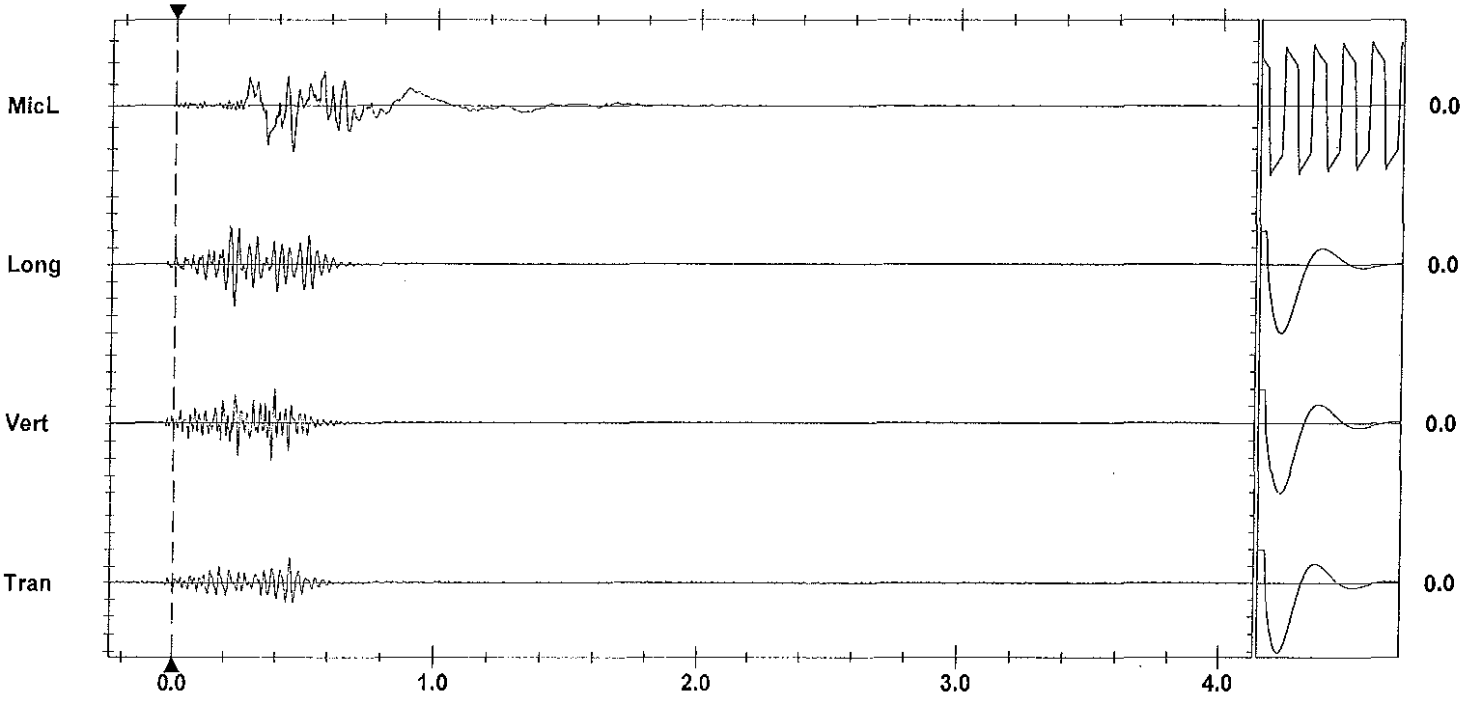
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	2.92	4.32	4.95	mm/s
ZC Freq	34	51	34	Hz
Time (Rel. to Trig)	0.453	0.382	0.230	sec
Peak Acceleration	0.0663	0.146	0.119	g
Peak Displacement	0.0136	0.0156	0.0254	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.3	Hz
Overswing Ratio	3.6	3.8	4.4	

Microphone Linear Weighting
PSPL 21.5 pa.(L) at 0.455 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 712 mv)

Peak Vector Sum 5.02 mm/s at 0.230 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 8/11
ACTUAL BLAST DATE Dec 8/11 12:00 PM
BLAST # MW-0032

HIGHWAY# 97
BLAST LOCATION AT: STN 1291+40 - 1291+50

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Chainage marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

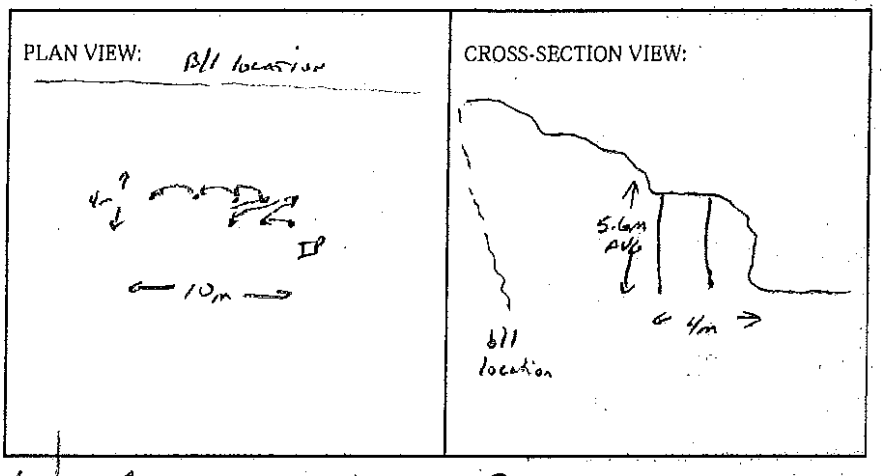
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 diffraction - 0.14 ips / 32Hz
@ 13093 diffraction - 0.27 ips / 39Hz

3'-4' [illegible] primed w/ 1 coat [illegible]

Instantel

Event Report

Date/Time	Vert at 12:10:29 December 8, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E21L.TH0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

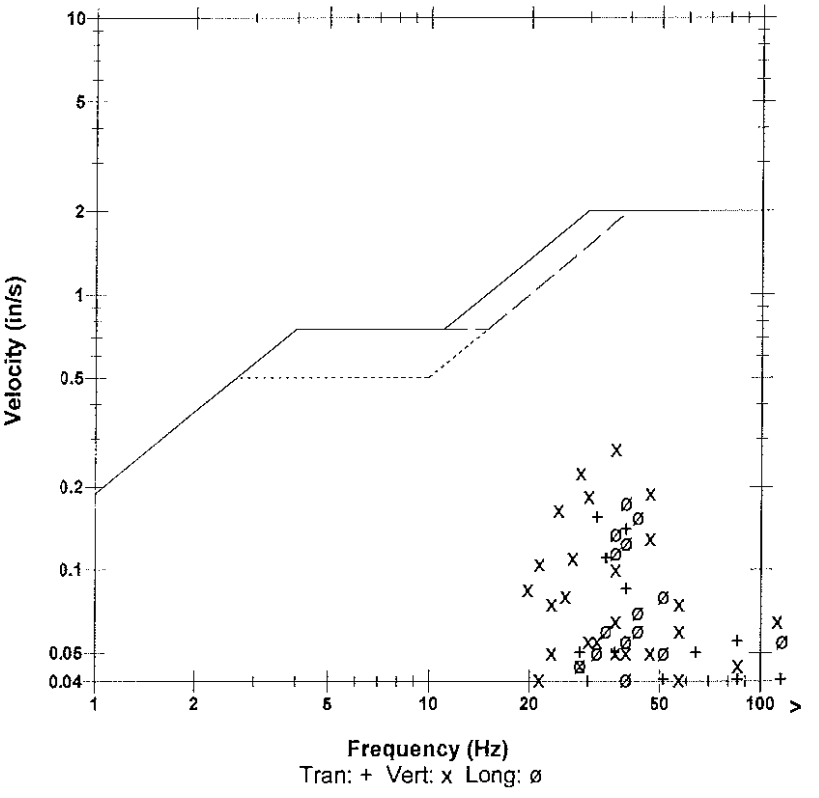
Post Event Notes

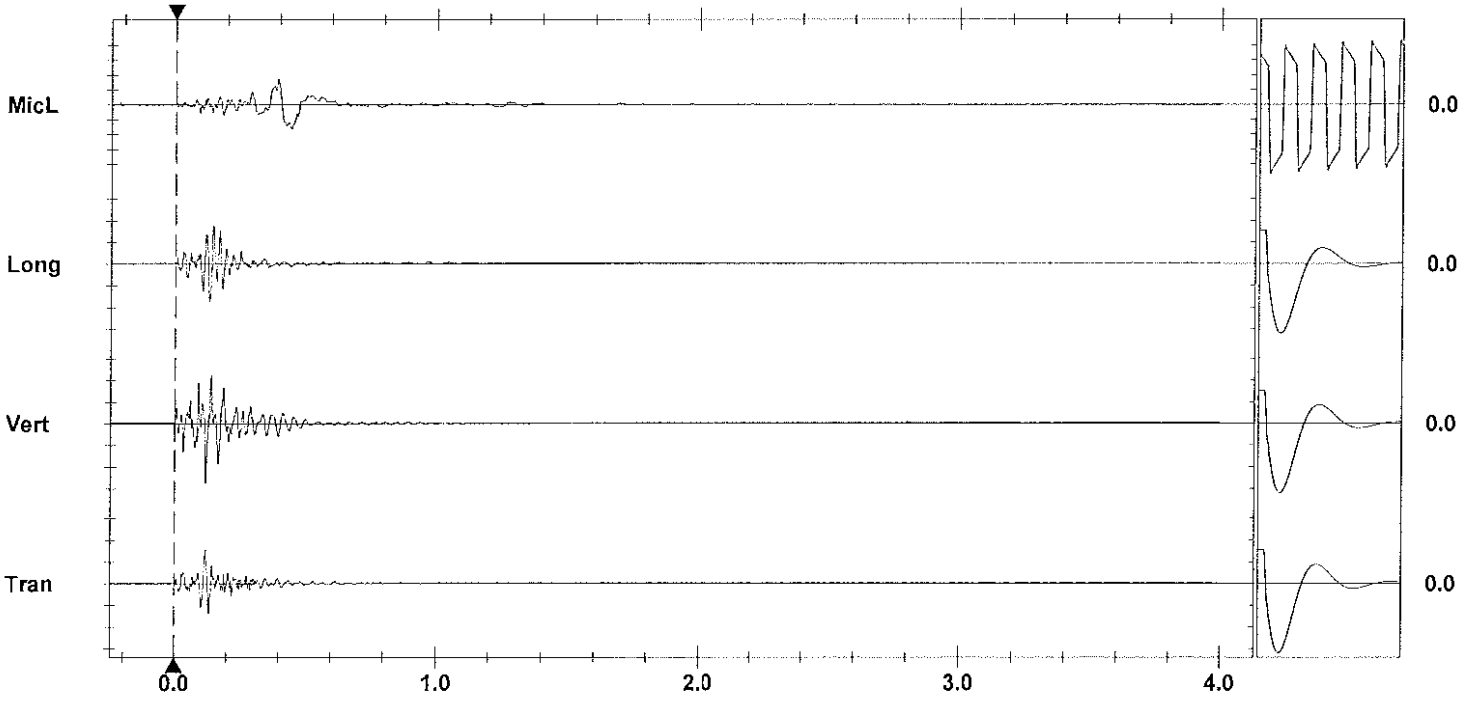
Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.393 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 737 mv)

	Tran	Vert	Long	
PPV	0.155	0.275	0.175	in/s
ZC Freq	32	37	39	Hz
Time (Rel. to Trig)	0.120	0.120	0.131	sec
Peak Acceleration	0.106	0.212	0.159	g
Peak Displacement	0.00069	0.00094	0.00075	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.343 in/s at 0.120 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

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Instantel

Event Report

Date/Time	Vert at 12:10:31 December 8, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.2 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E21L.TJ0
Job Number:	1		

Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

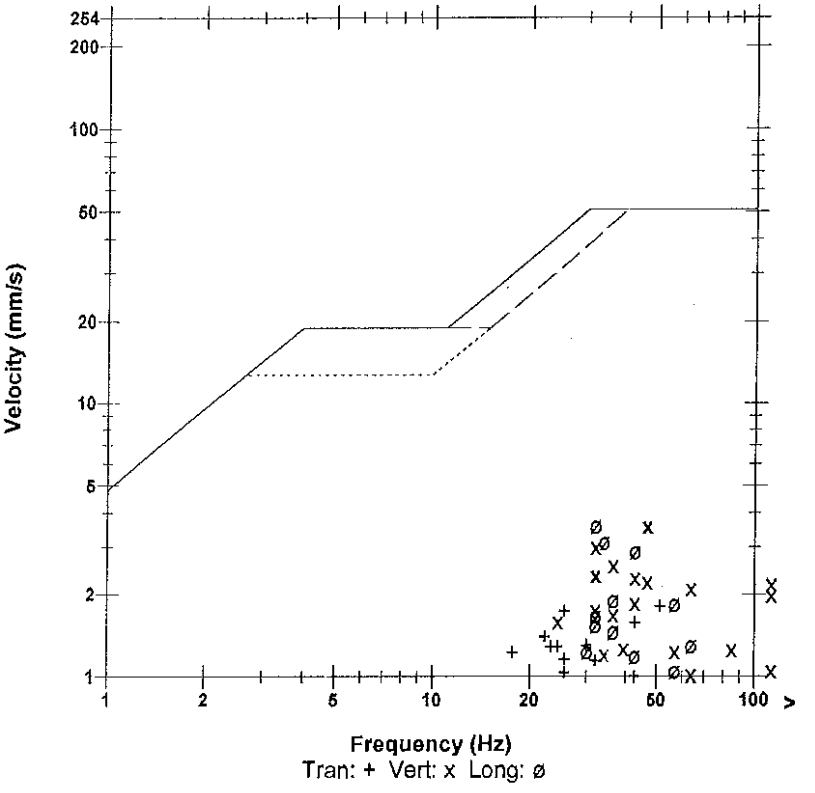
Post Event Notes

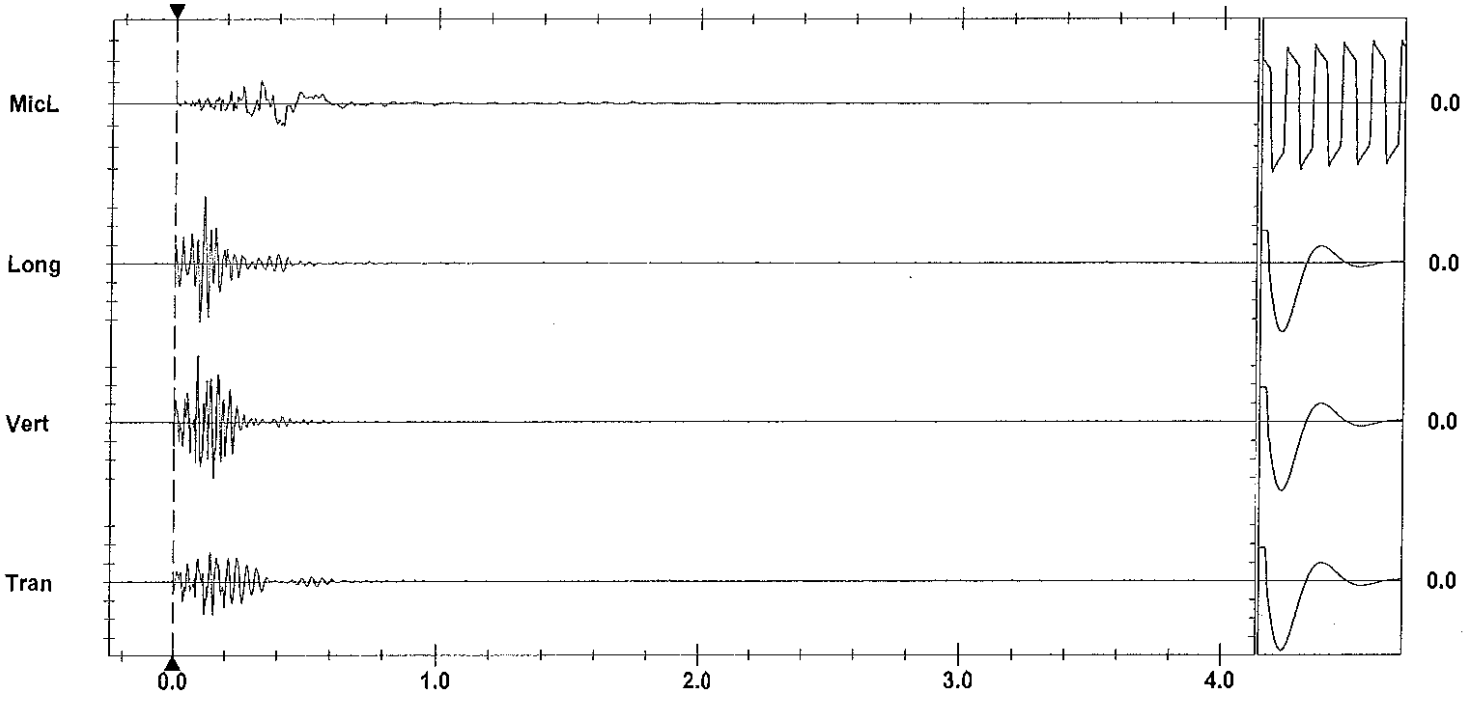
Microphone Linear Weighting
PSPL 10.8 pa.(L) at 0.330 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 766 mv)

	Tran	Vert	Long	
PPV	1.81	3.57	3.59	mm/s
ZC Freq	51	47	32	Hz
Time (Rel. to Trig)	0.155	0.094	0.117	sec
Peak Acceleration	0.0663	0.186	0.0878	g
Peak Displacement	0.00857	0.0132	0.0157	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 3.77 mm/s at 0.117 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶— — — —◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 8/11
ACTUAL BLAST DATE Dec 8/11 1:29 PM
BLAST # MW-0033

HIGHWAY# 97
BLAST LOCATION AT: STN 129+50 - 129+55 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * 5 Hor mapped

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 6011 7 PADS.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

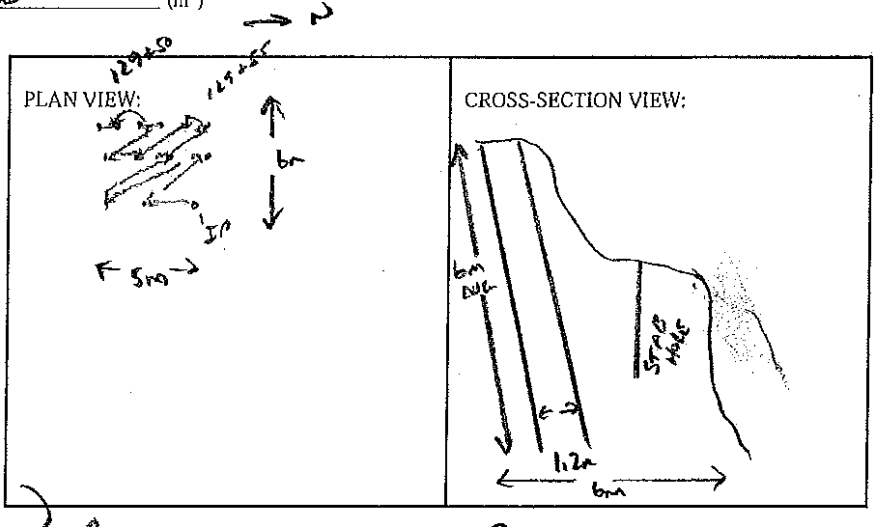
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 cliffstone crt. 0.11 in/s 93Hz
@ 13083 cliffstone crt. 0.21 in/s 32Hz

STAB Holes - 2' ANFO/Hole

Border Holes - 4 each 2"x16" Blasters/Hole

Primed w/0.5 each 1½"x16" Dynamite

BL Holes - 1 each 2"x16" Dynamite + 200 grain
det cord to 4' collar

Instantel

Event Report

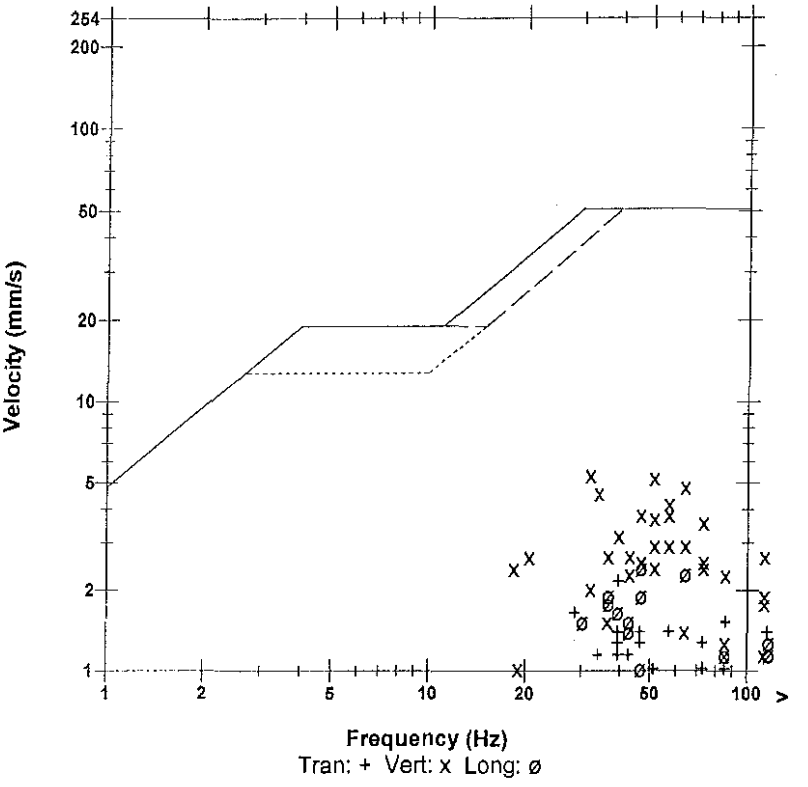
Date/Time	Vert at 13:29:06 December 8, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.0 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E21P.GI0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

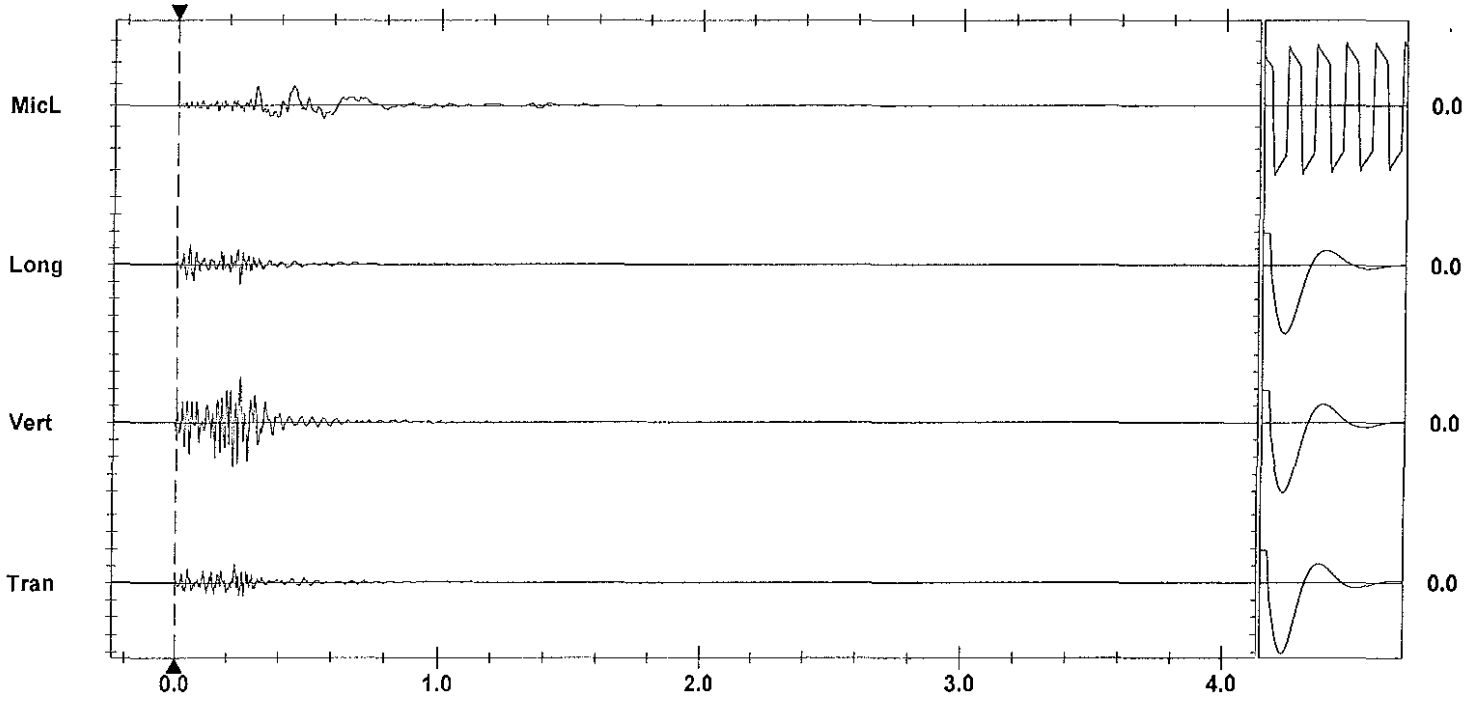
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 9.00 pa.(L) at 0.445 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 744 mv)

	Tran	Vert	Long	
PPV	2.16	5.33	2.41	mm/s
ZC Freq	39	32	47	Hz
Time (Rel. to Trig)	0.231	0.248	0.053	sec
Peak Acceleration	0.0928	0.225	0.106	g
Peak Displacement	0.00775	0.0221	0.00837	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 5.46 mm/s at 0.248 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

Date/Time	Vert at 13:29:08 December 8, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E21P.GK0
Job Number:	1		

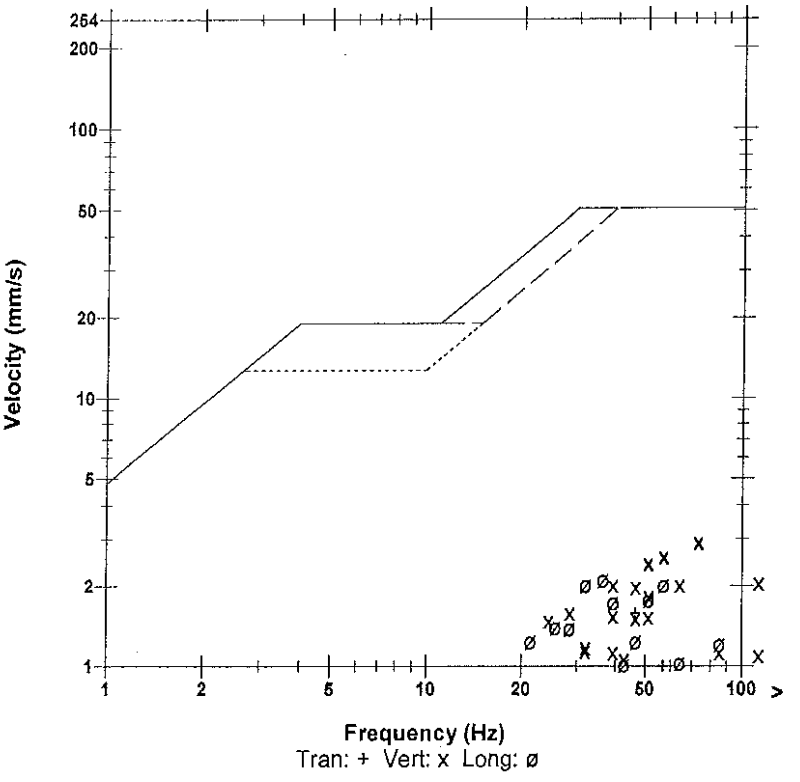
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

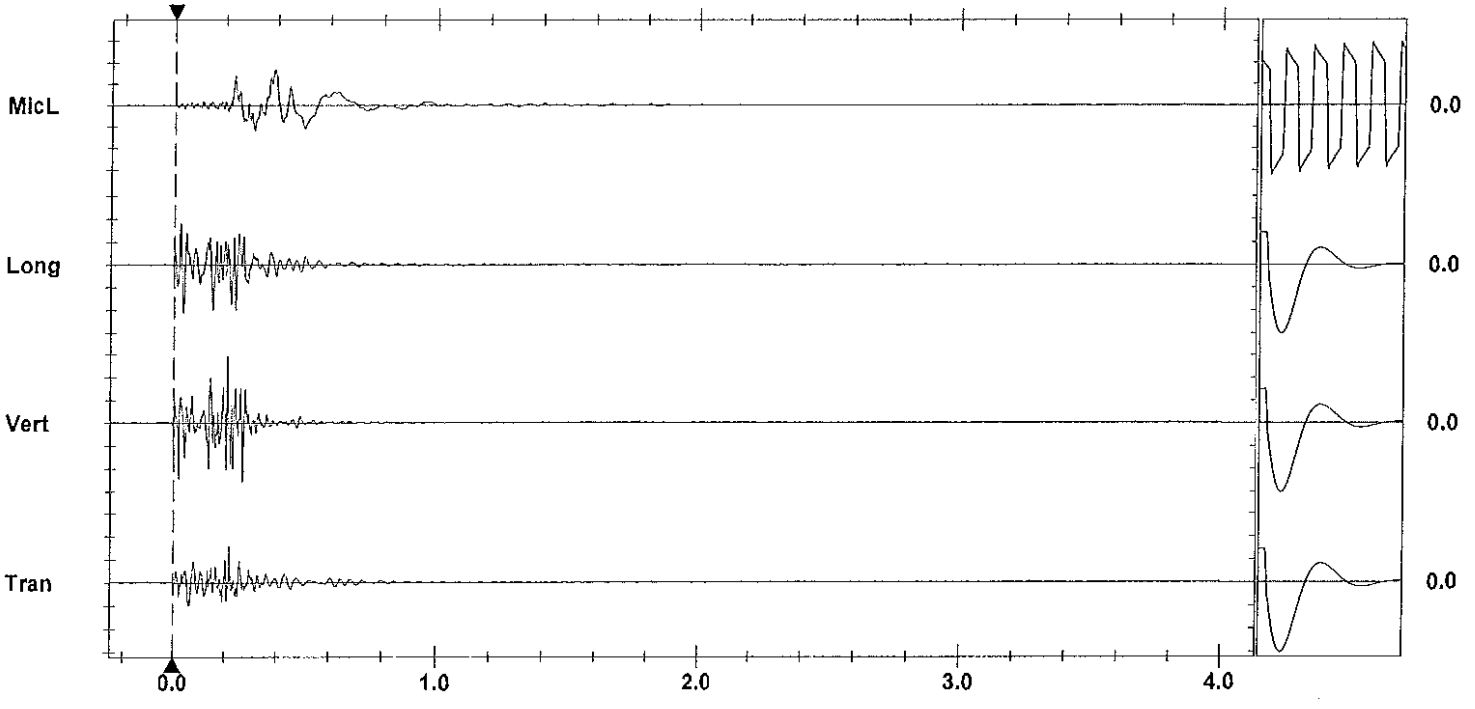
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	16.5 pa.(L) at 0.387 sec
ZC Freq	9.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 746 mv)

	Tran	Vert	Long	
PPV	1.57	2.92	2.11	mm/s
ZC Freq	47	73	37	Hz
Time (Rel. to Trig)	0.220	0.211	0.038	sec
Peak Acceleration	0.0812	0.217	0.0779	g
Peak Displacement	0.00531	0.00695	0.00880	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 3.03 mm/s at 0.211 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 9/11
ACTUAL BLAST DATE Dec 9/11 2:45 PM
BLAST # MW-0034

HIGHWAY# 97
BLAST LOCATION AT: STN: 1284 45 LS (2nd bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 66 11/ 4 Pads
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

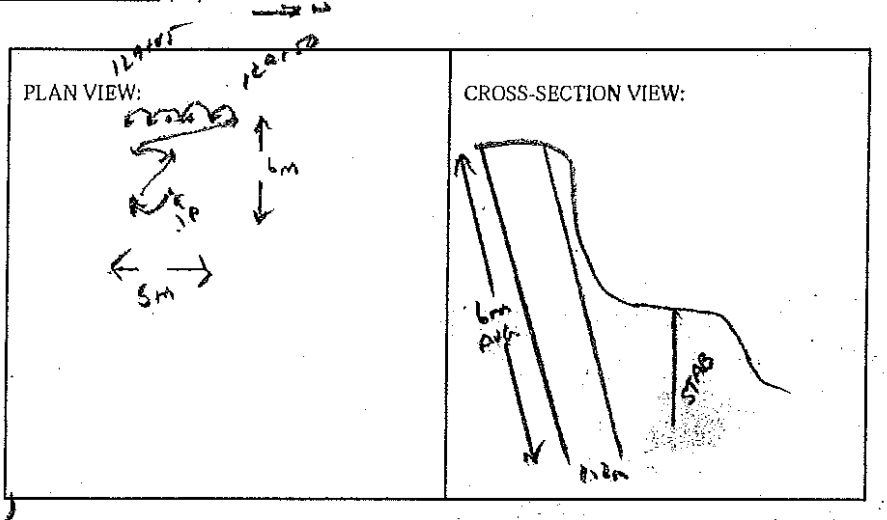
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE UB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Diamond 19167 cliffside Ent - 0.096 ipl / 47 Hz
@ 13093 cliffside ent - 0.151 ipl / 51 Hz

STAB HOLES - 2' AND / HOLE
BUFFER HOLES - 4 EACH 2"X16" BLASTEX } Primed w/ 0.5 EMULITE 1½"x16" DYNAMITE

B/L HOLES - 1 EMULITE 2"X16" DYNAMITE + 200 g. DET. CORD to 4' collar

Instantel

Event Report

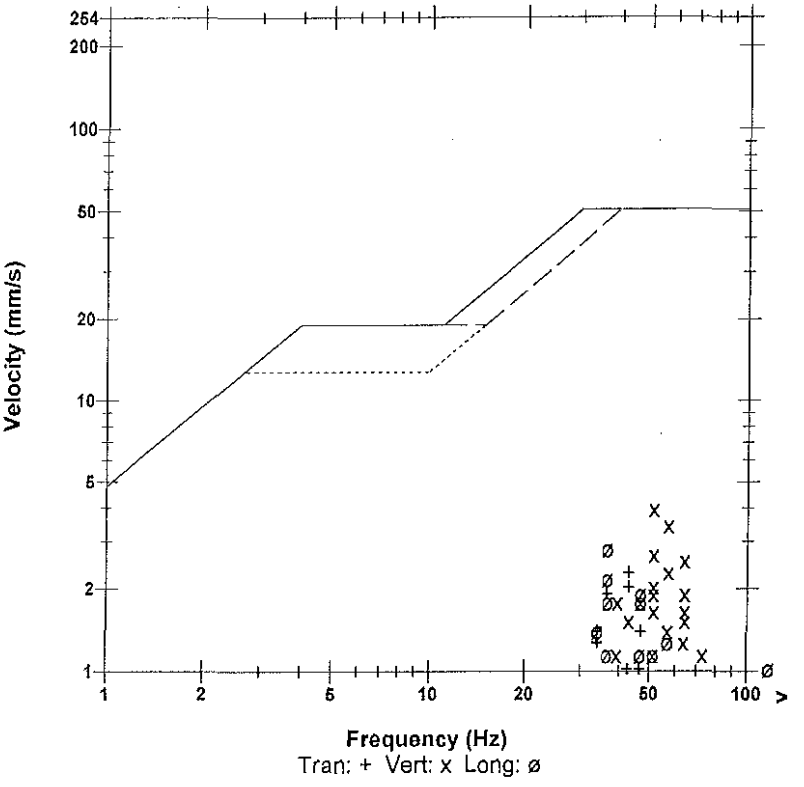
Date/Time	Vert at 14:45:37 December 8, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.0 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E21T.010

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

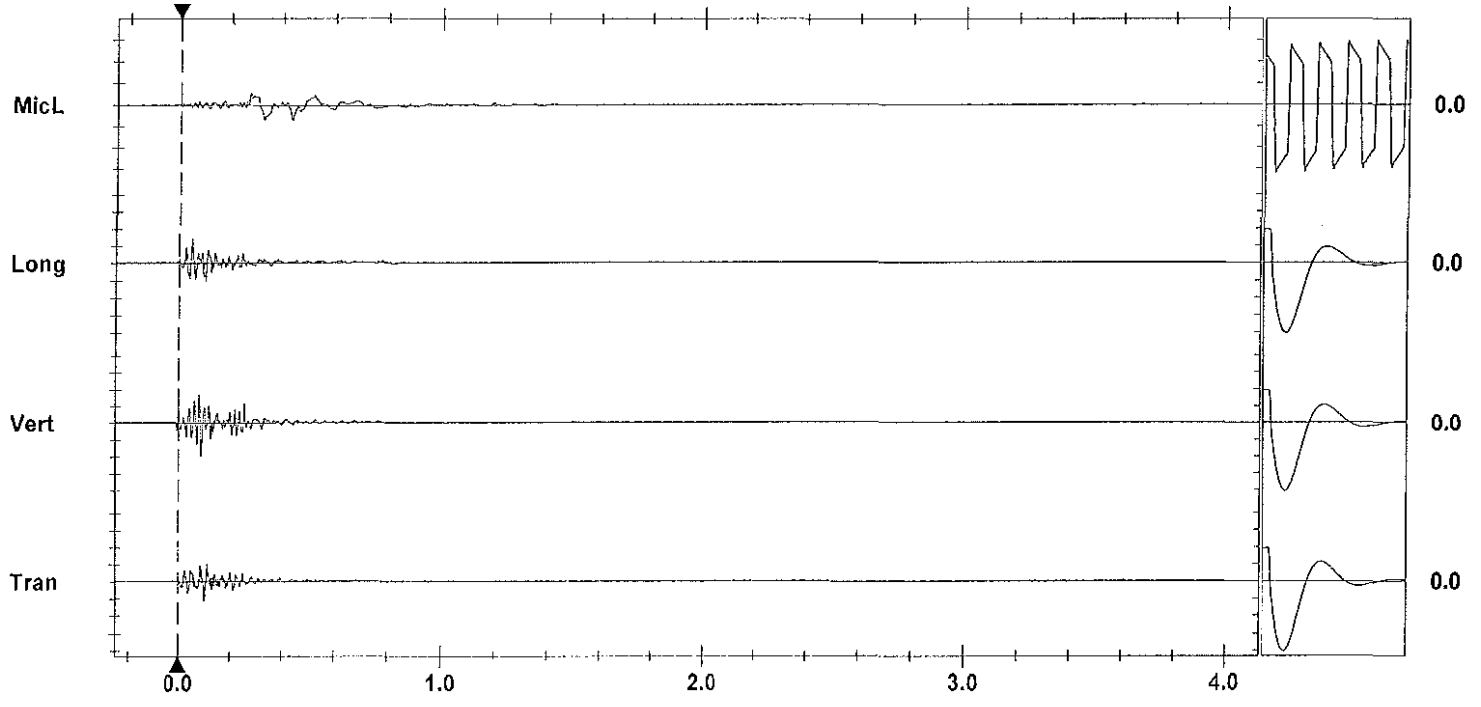
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	7.00 pa.(L) at 0.432 sec			
ZC Freq	8.4 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 726 mv)			

	Tran	Vert	Long	
PPV	2.29	3.94	2.79	mm/s
ZC Freq	43	51	37	Hz
Time (Rel. to Trig)	0.104	0.090	0.052	sec
Peak Acceleration	0.0663	0.239	0.0795	g
Peak Displacement	0.00701	0.0106	0.00980	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 4.36 mm/s at 0.090 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: December 11, 2011 07:8:01 -8:01
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Instantel

Event Report

Date/Time	Long at 14:45:39 December 8, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E21T.030
Job Number:	1		

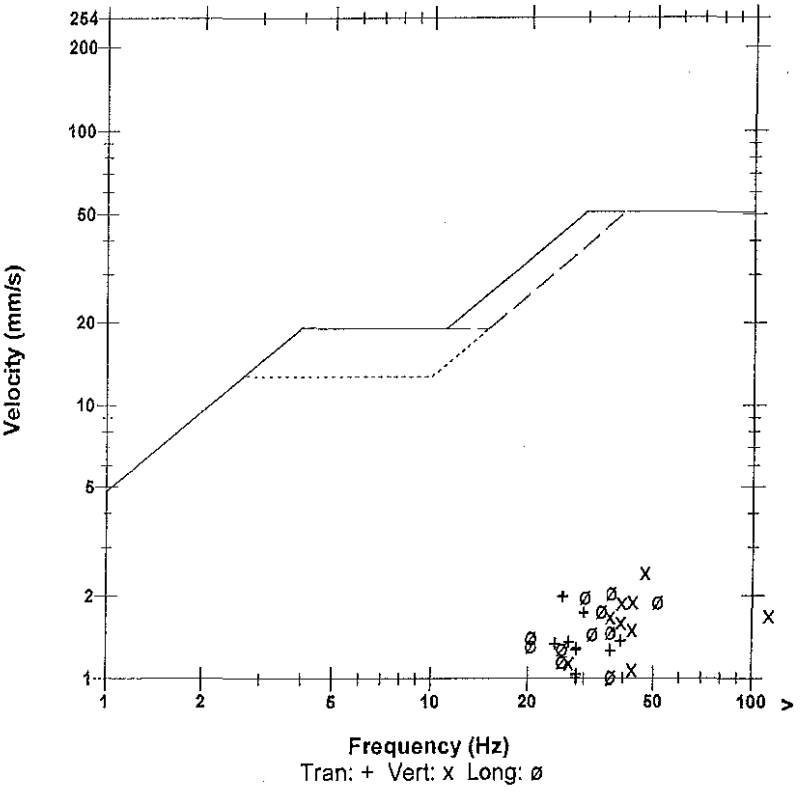
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

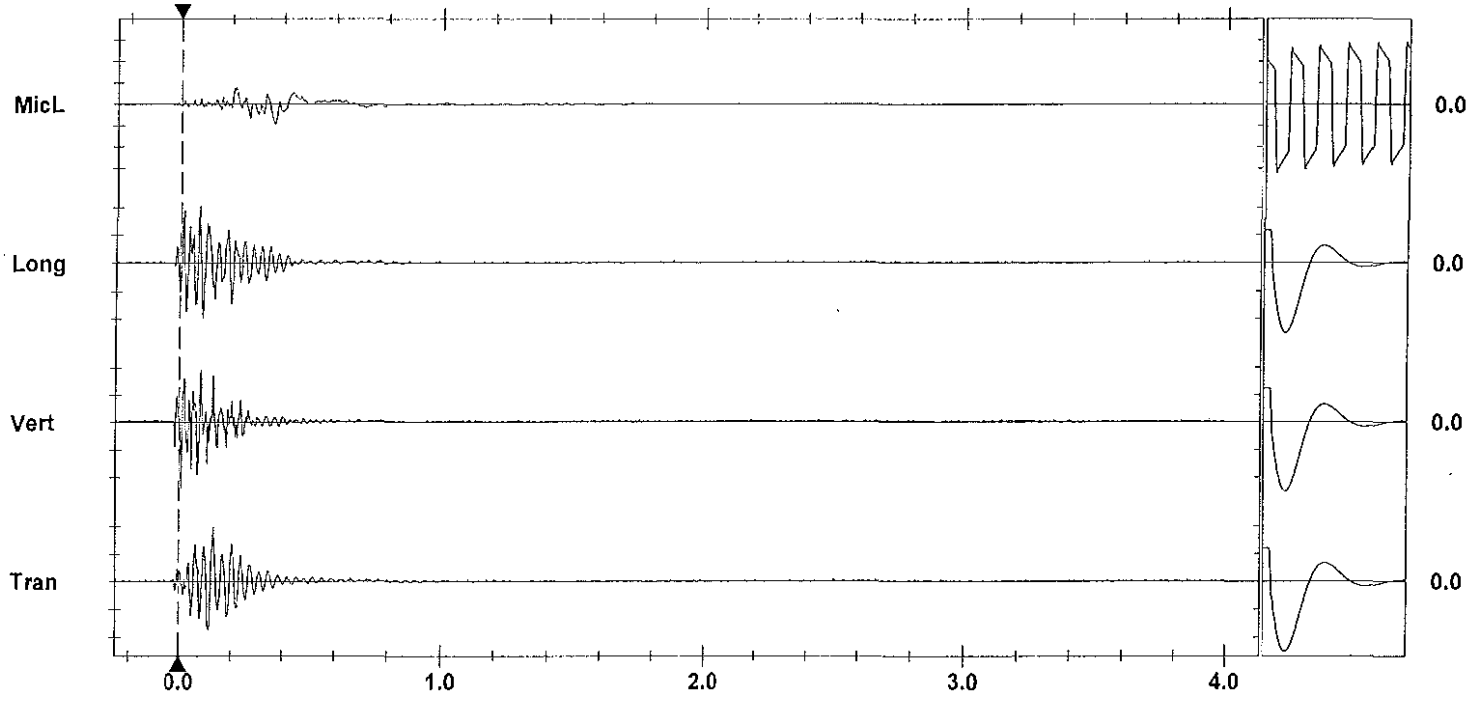
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	9.50 pa.(L) at 0.361 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 743 mv)

	Tran	Vert	Long	
PPV	1.98	2.43	2.05	mm/s
ZC Freq	26	47	37	Hz
Time (Rel. to Trig)	0.136	0.010	0.075	sec
Peak Acceleration	0.0746	0.118	0.0580	g
Peak Displacement	0.0102	0.00686	0.0103	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 2.69 mm/s at 0.135 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div

Sensorcheck

Trigger = ▶——— ———◀

Printed: December 14, 2011 (V 8.01 - 8.01) Format Copyrighted 1999-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 08/11
ACTUAL BLAST DATE Dec. 08/11 3:15 PM
BLAST # 129

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+55 - 127+70 (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 0
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 198 (m)

TOTAL NUMBER OF HOLES 36 production
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 36

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 700 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

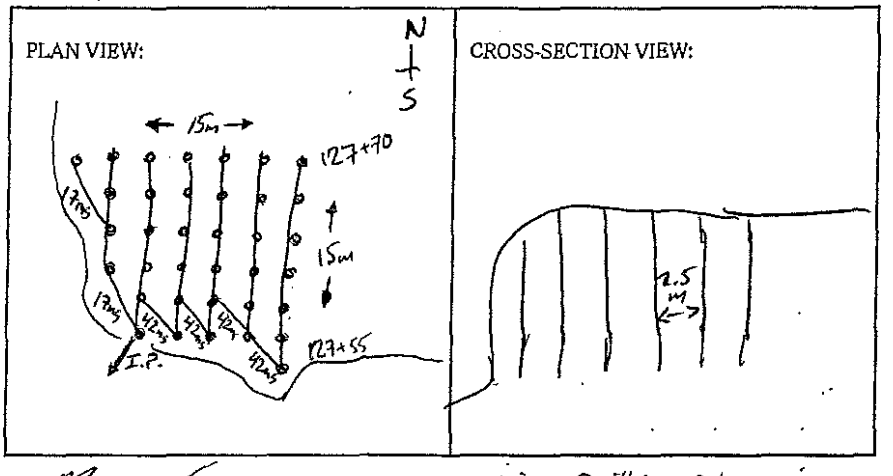
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

36 - 30' EZ dets.

4 - 42 ms connectadet

2 - 17 ms connectadet.

1 - Elec det.

25 Bags Anfo.

2 - BAGS WR.

1/2 ~~CASE~~ 1½x16"

Instantel

Event Report

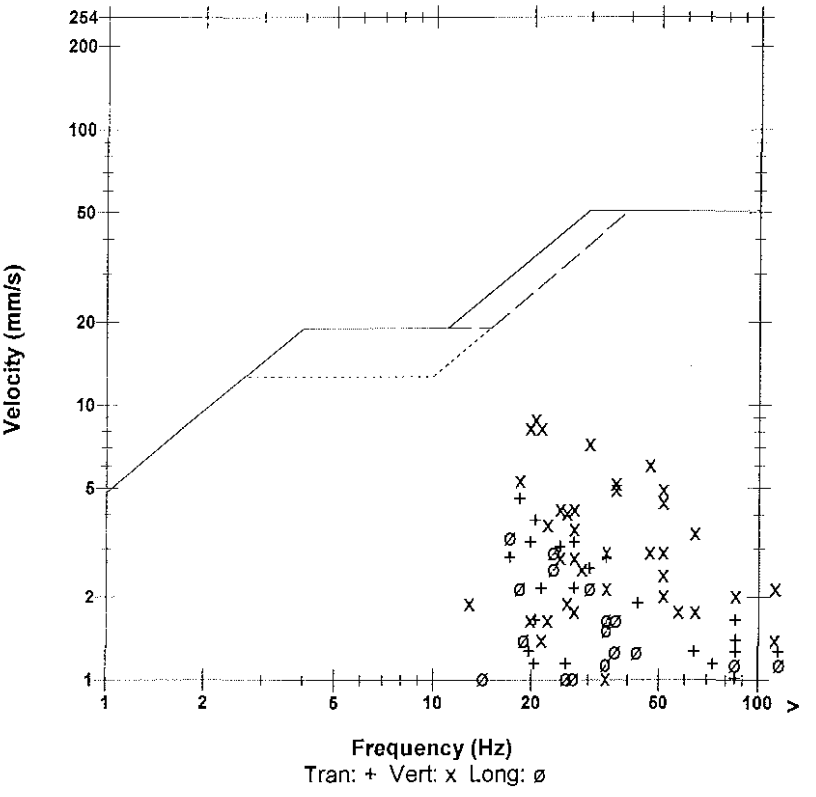
Date/Time	Vert at 15:16:53 December 8, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.0 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E21U.G50

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

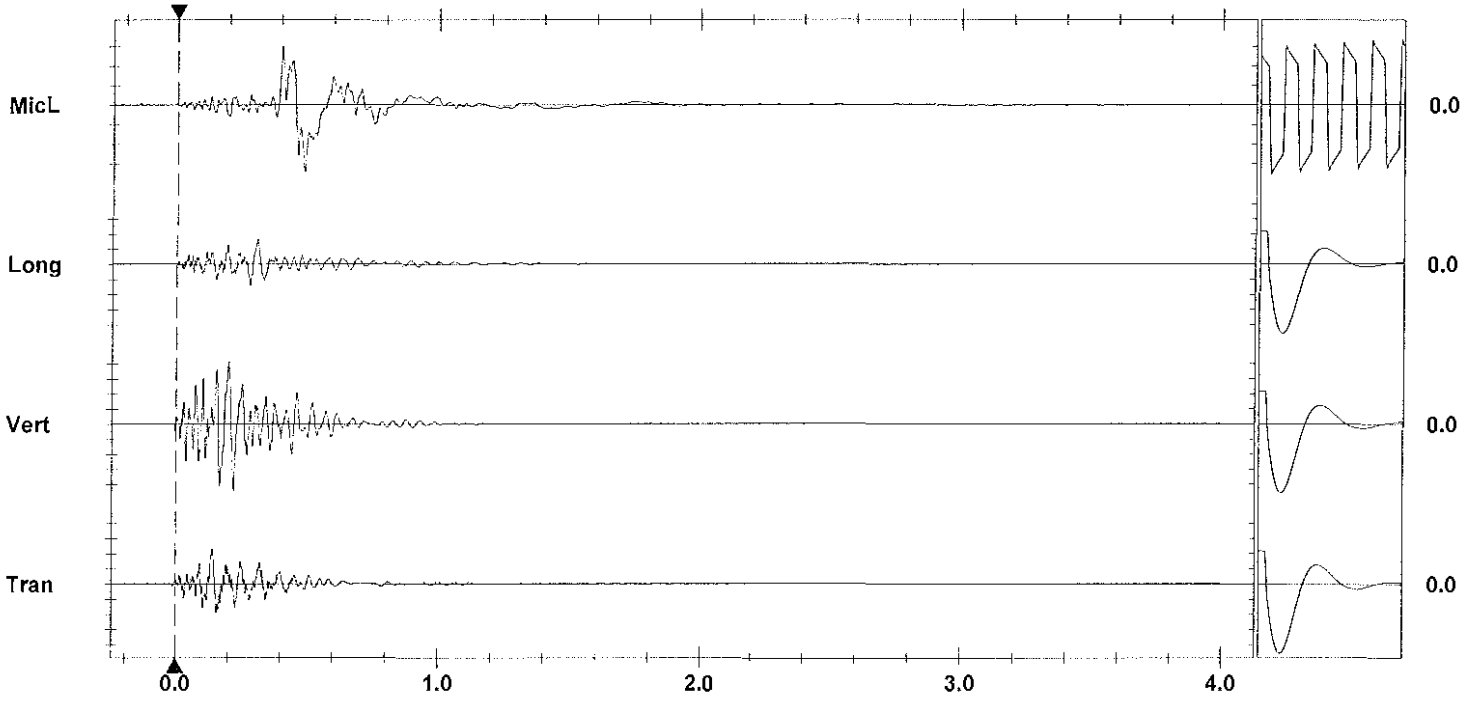
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	4.57	8.89	3.30	mm/s
ZC Freq	18	20	17	Hz
Time (Rel. to Trig)	0.140	0.223	0.311	sec
Peak Acceleration	0.106	0.252	0.0795	g
Peak Displacement	0.0309	0.0631	0.0272	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Microphone Linear Weighting
PSPL 34.5 pa.(L) at 0.488 sec
ZC Freq 4.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 740 mv)

Peak Vector Sum 8.97 mm/s at 0.223 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger = ▶----------◀

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Instantel

Event Report

Date/Time	Tran at 15:16:55 December 8, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E21U.G70
Job Number:	1		

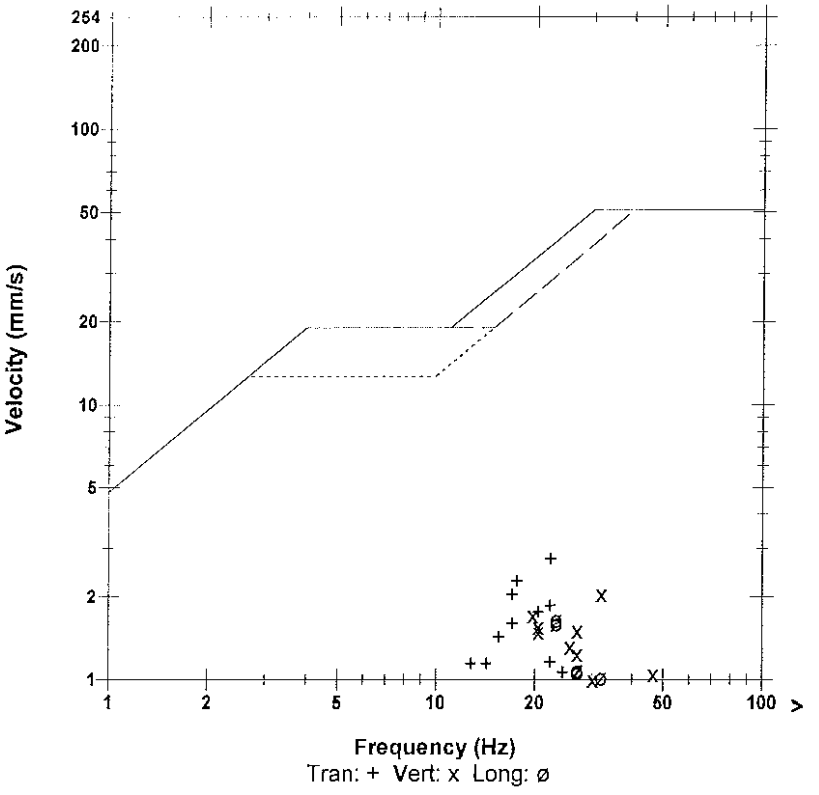
Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

Post Event Notes

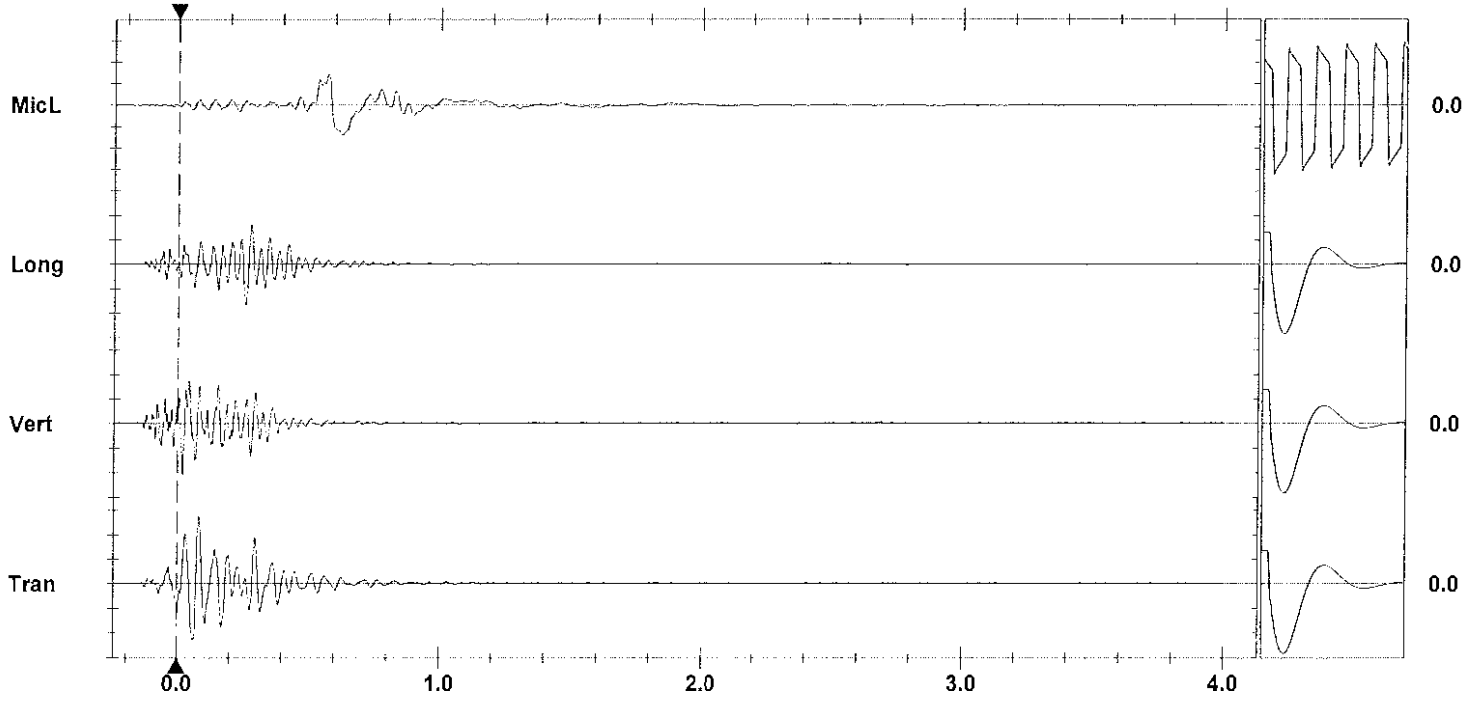
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	14.3 pa.(L) at 0.571 sec			
ZC Freq	6.2 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 729 mv)			

	Tran	Vert	Long	
PPV	2.75	2.05	1.65	mm/s
ZC Freq	22	32	23	Hz
Time (Rel. to Trig)	0.085	0.020	0.261	sec
Peak Acceleration	0.0497	0.0431	0.0298	g
Peak Displacement	0.0218	0.0130	0.0116	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 3.26 mm/s at 0.086 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 10/11
ACTUAL BLAST DATE Dec. 09/11
BLAST # 131

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+90 - 127+70 (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE ~ (°) SLOPE LENGTH ~ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 0
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 306 (m)

TOTAL NUMBER OF HOLES 51 production
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 51
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1075 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

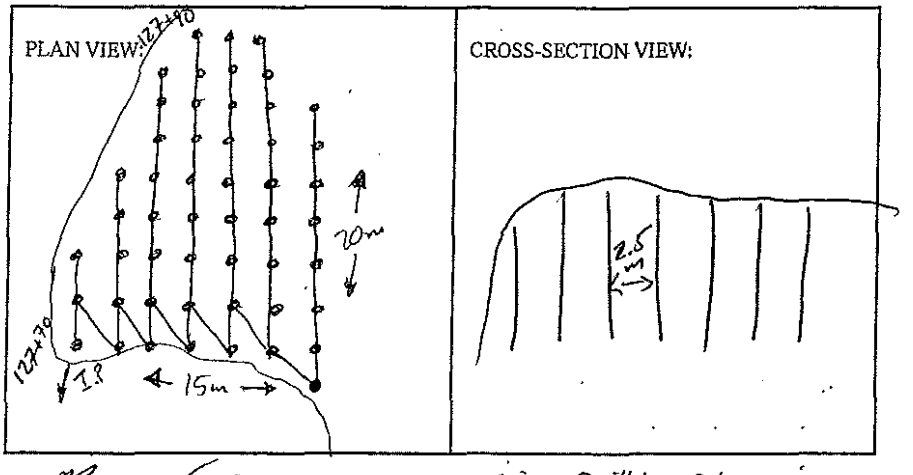
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

41 - Anfo.

1 - wR.

1 - 1 1/2 x 16

51 - 30' dets.

6 - 42ms connectadet.

1 - 17ms connectadet

1 Elec.

Instantel

Event Report

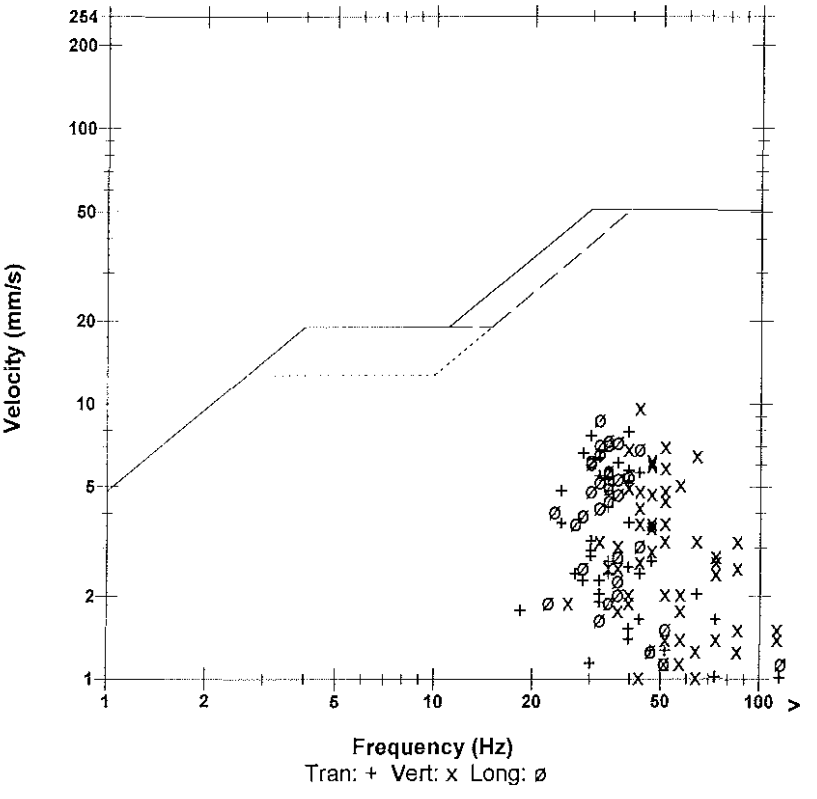
Date/Time	Vert at 16:08:37 December 9, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E23R.ID0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

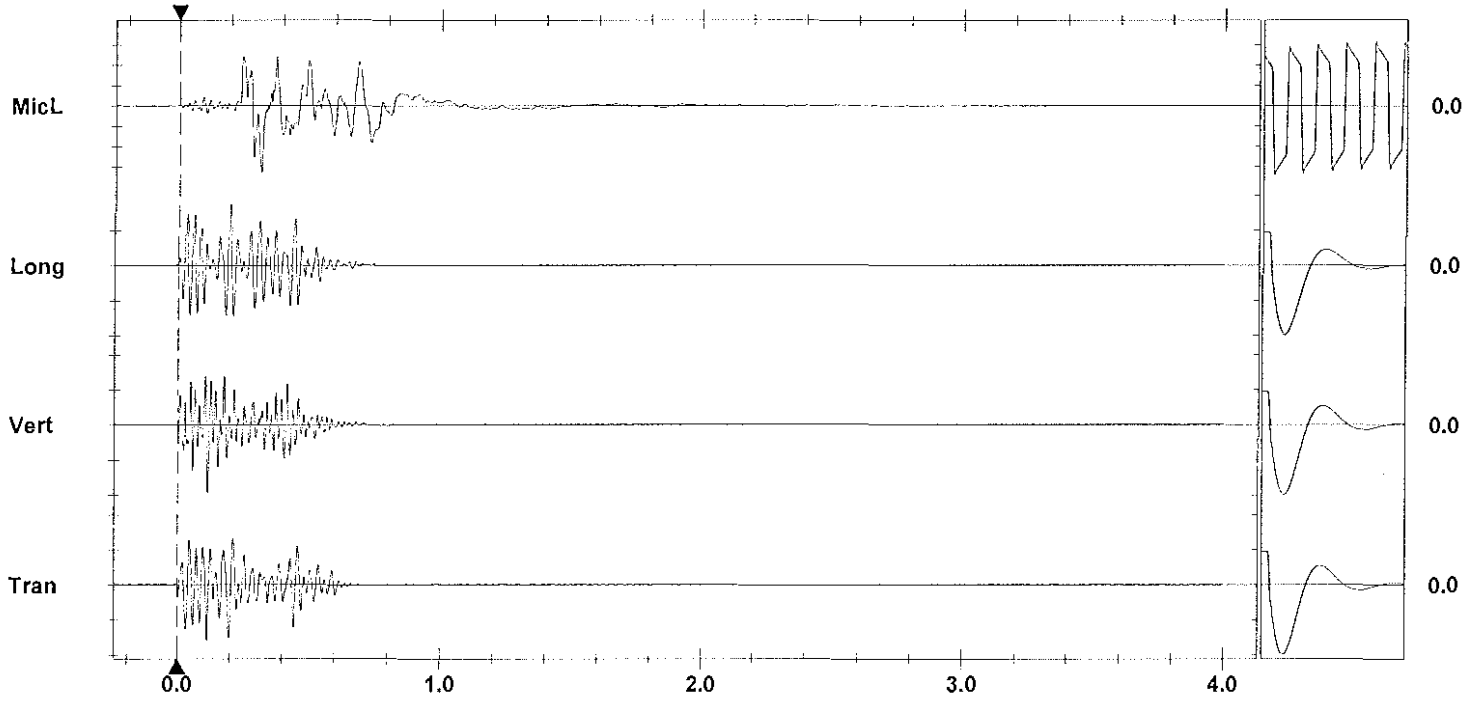
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	7.87	9.65	8.76	mm/s
ZC Freq	39	43	32	Hz
Time (Rel. to Trig)	0.114	0.115	0.198	sec
Peak Acceleration	0.186	0.331	0.212	g
Peak Displacement	0.0401	0.0329	0.0432	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 66.0 pa.(L) at 0.314 sec
ZC Freq 8.5 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 787 mv)

Peak Vector Sum 12.2 mm/s at 0.114 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 20.0 pa.(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: December 11, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT RECORD
[redacted] BLAST DESIGN
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 8/11
PROPOSED BLAST DATE Dec 8/11 3:28 PM
BLAST # MW-0015

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 [redacted]

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS: * STN MARKED

HEIGHT ABOVE HWY N/A (m). SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 27.5 (m)
PROPOSED APPROX. NO. OF HOLES 5 Total.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 5
EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

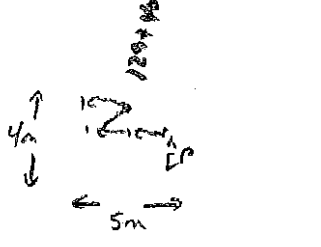
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERL INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

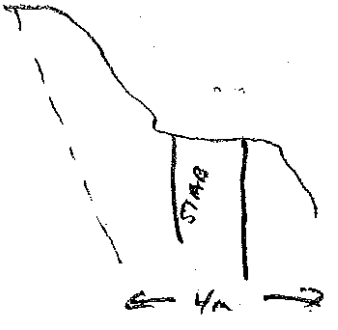
PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: All 10 main



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fieger SIGNATURE [redacted] COMPANY Fieger Rock Eng.
BLASTER'S SIGNATURE [redacted] COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) [redacted]

(Use Additional Sheets If Necessary)

Seismograph @ 13169 all PPV and = 0.100 ips / 43 Hz
@ 13093 all PPV and = 0.241 ips / 30 Hz

STAB Holes - 1.5' ANFO/HOLE
PROD Holes - 5'-6' ANFO/HOLE
} 1½" x 16 primers (0.5 pent)

Instantel

Event Report

Date/Time	Vert at 15:28:16 December 8, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.1 Volts
Range	Geo :254 mm/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E21U.Z40

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

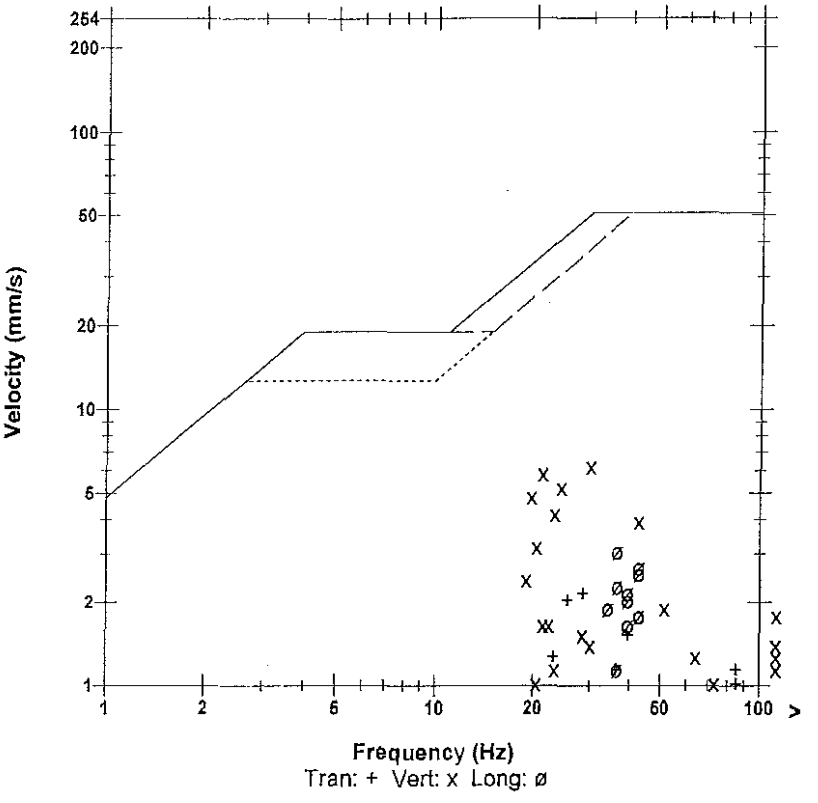
Extended Notes
Blast at stn 128

Post Event Notes

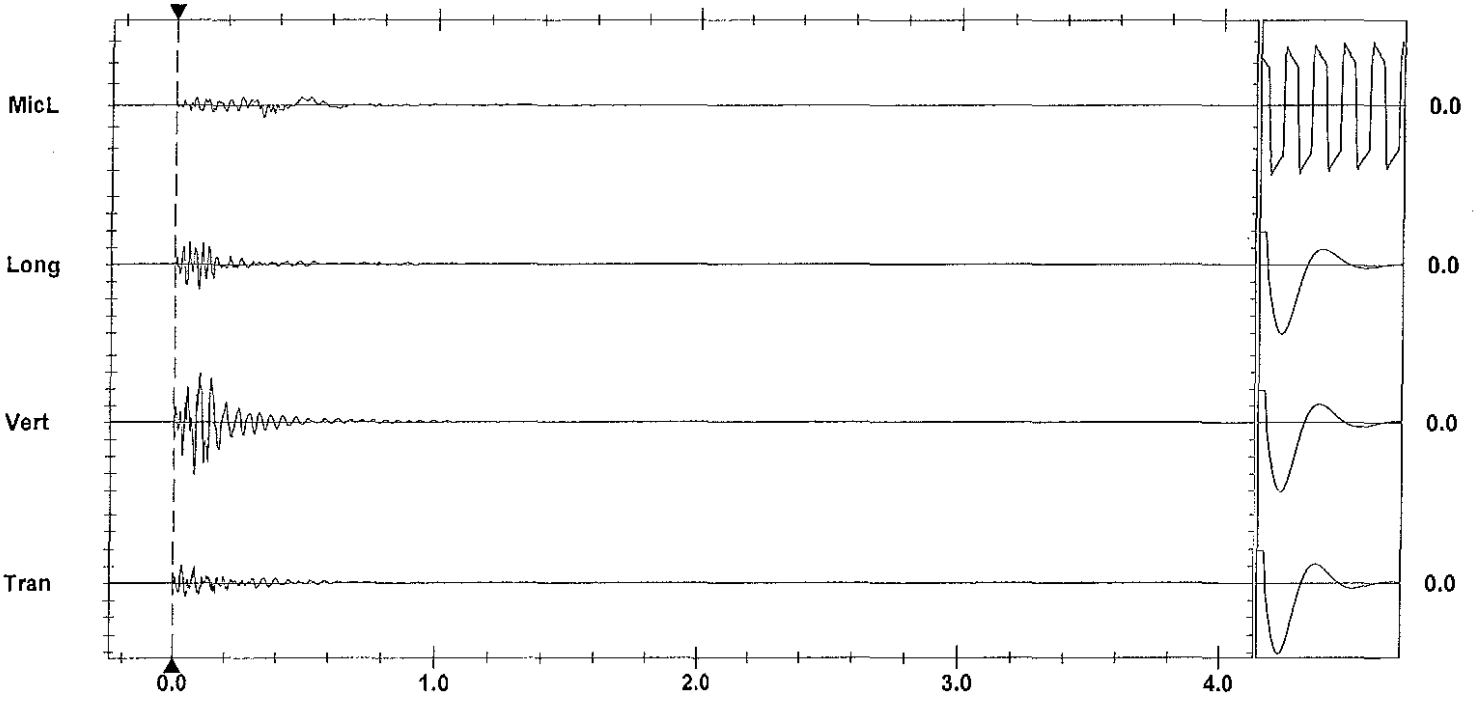
Microphone Linear Weighting
PSPL 6.00 pa.(L) at 0.342 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	2.16	6.22	3.05	mm/s
ZC Freq	28	30	37	Hz
Time (Rel. to Trig)	0.035	0.081	0.096	sec
Peak Acceleration	0.0795	0.172	0.106	g
Peak Displacement	0.0109	0.0405	0.0123	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 6.61 mm/s at 0.081 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensorcheck

Printed: December 11, 2011 01:01:01 PM
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Instantel

Event Report

Date/Time	Vert at 15:28:18 December 8, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 1.02 mm/s	**Battery Level**	6.3 Volts
Range	Geo :31.7 mm/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E21U.Z60
Job Number:	1		

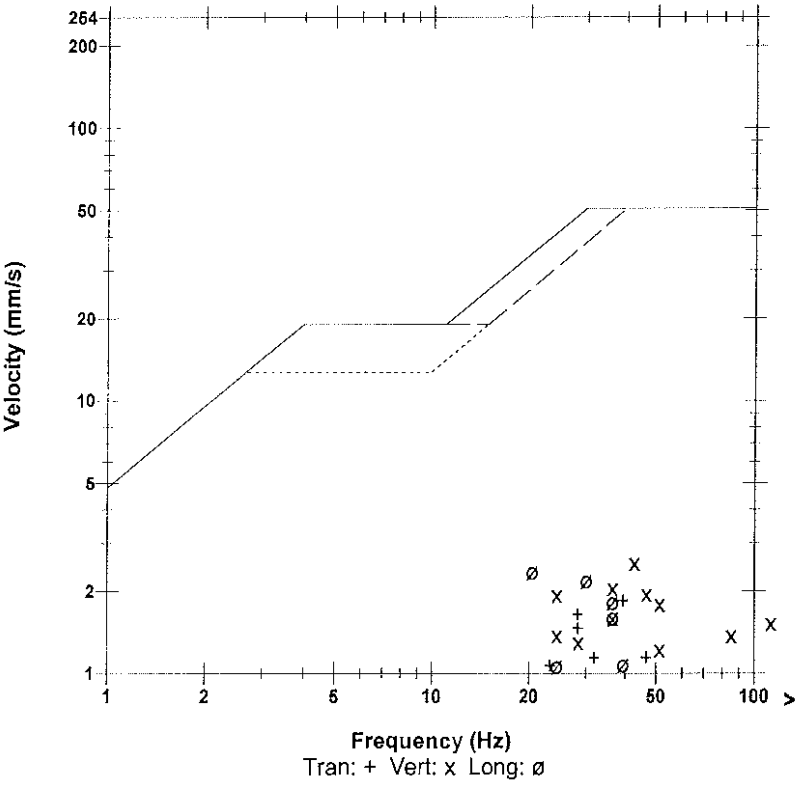
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

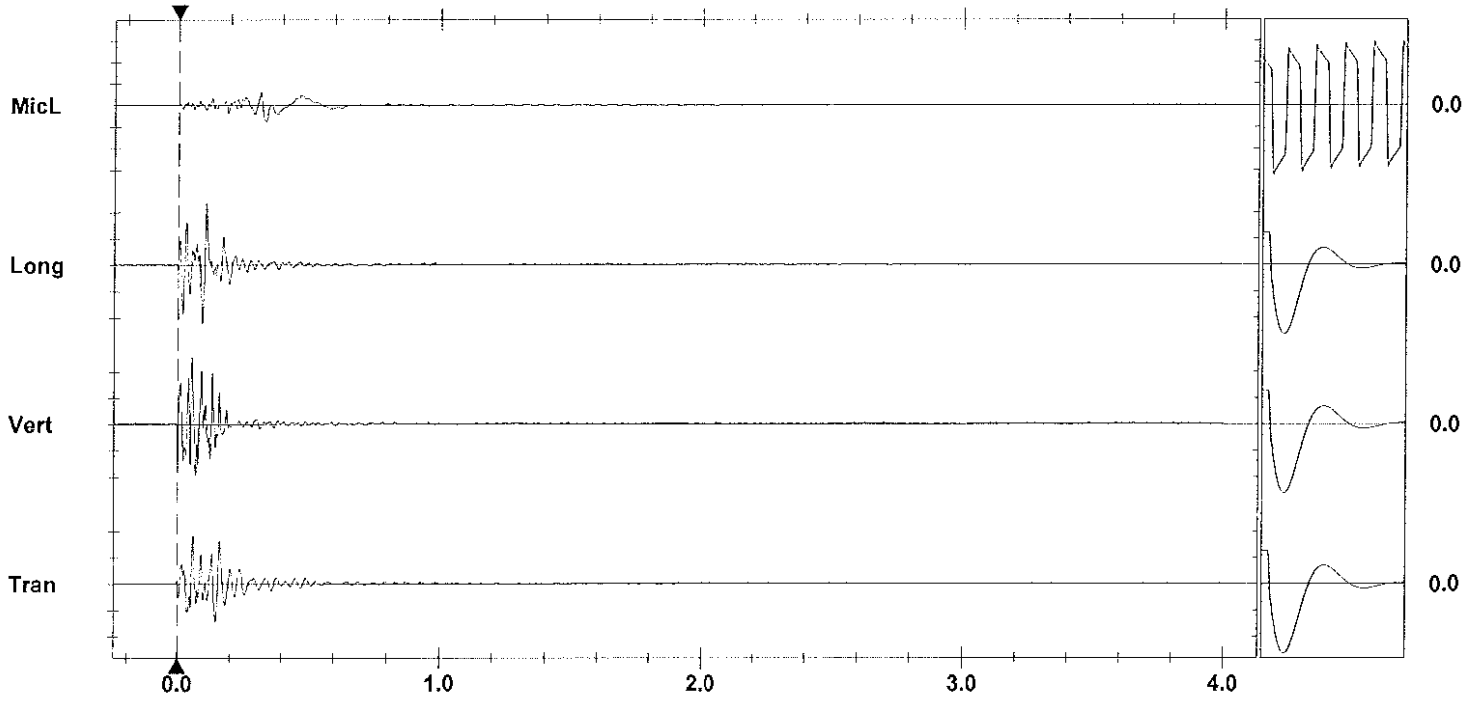
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	7.25 pa.(L) at 0.334 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 747 mv)

	Tran	Vert	Long	
PPV	1.84	2.54	2.35	mm/s
ZC Freq	39	43	20	Hz
Time (Rel. to Trig)	0.062	0.056	0.107	sec
Peak Acceleration	0.0547	0.133	0.0646	g
Peak Displacement	0.00813	0.0120	0.0112	mm
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 3.07 mm/s at 0.093 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensorcheck

Trigger = ▶ ◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 12/11
ACTUAL BLAST DATE Dec 12/11
BLAST # MW-0036 10:53 AM

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * cut marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 13
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

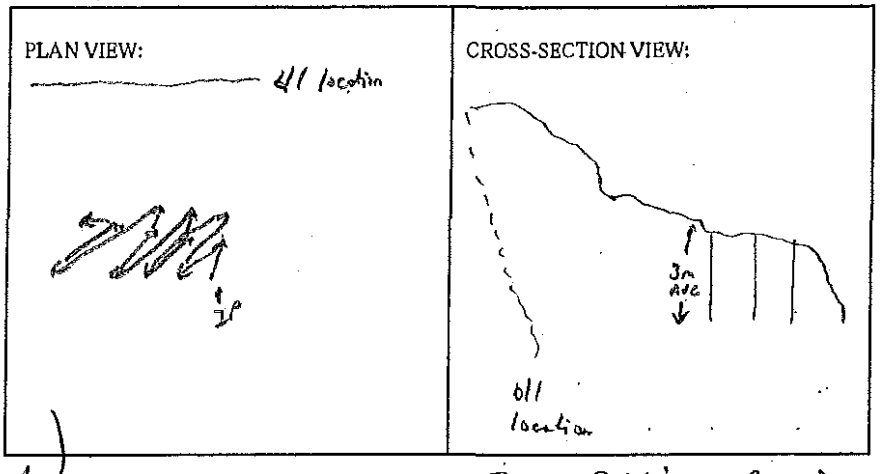
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13169 Cliffstone Cut - 0.191ips / 51Hz
@ 13093 Cliffstone cut - 0.097ips / 47Hz

2'-3' anfo/Hole primed w/ 0.5 emulsion 1½" x 16" dynamite

Instantel

Event Report

Date/Time	Vert at 10:53:11 December 12, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

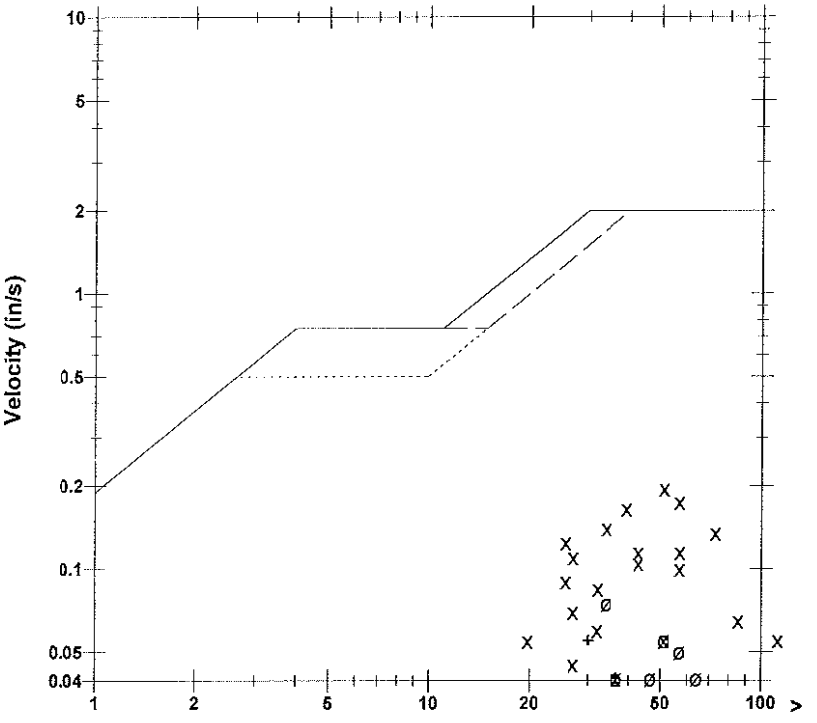
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	5.9 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E28W.WN0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

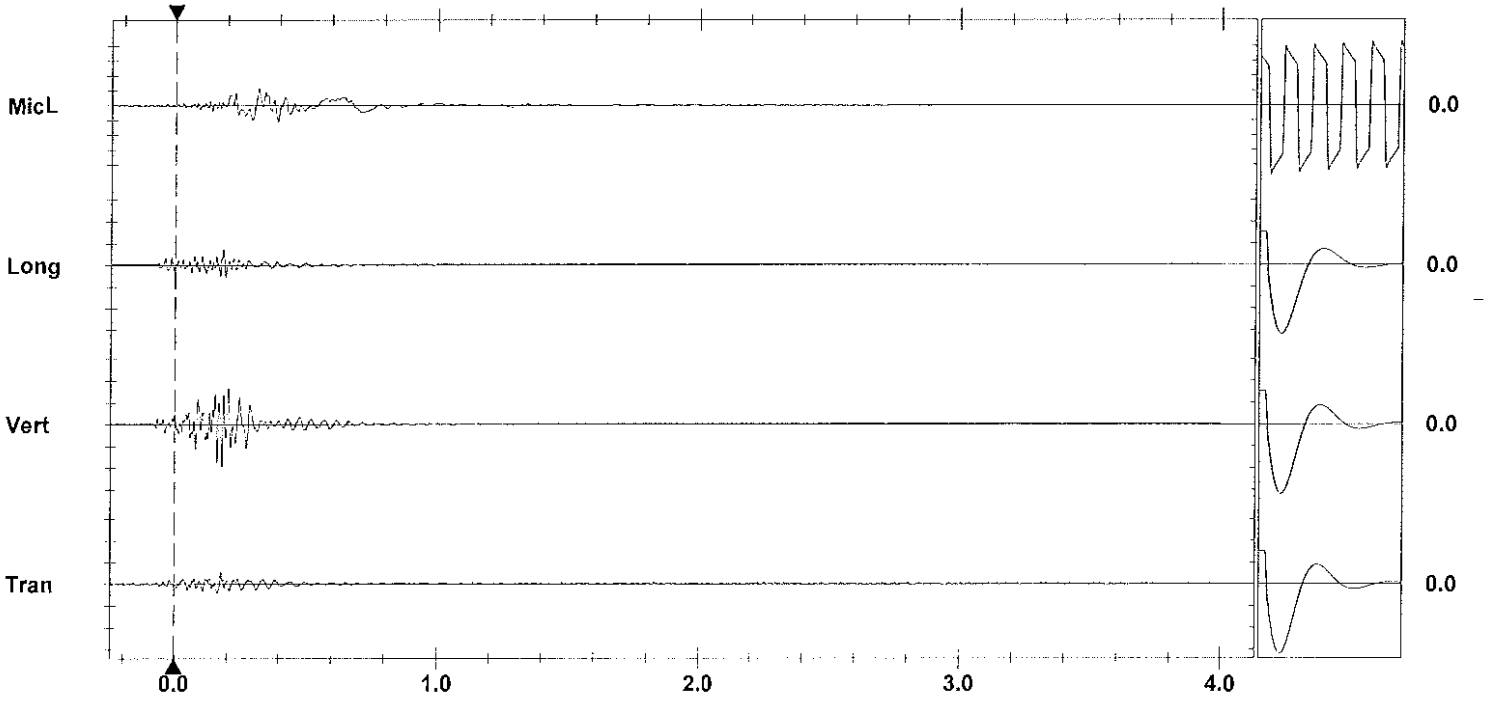
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.316 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 757 mv)

	Tran	Vert	Long	
PPV	0.0550	0.195	0.0750	in/s
ZC Freq	30	51	34	Hz
Time (Rel. to Trig)	0.178	0.180	0.185	sec
Peak Acceleration	0.0398	0.186	0.0795	g
Peak Displacement	0.00022	0.00062	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.5	

Peak Vector Sum 0.201 in/s at 0.180 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 10:53:17 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E28W.WT0
Job Number:	1		

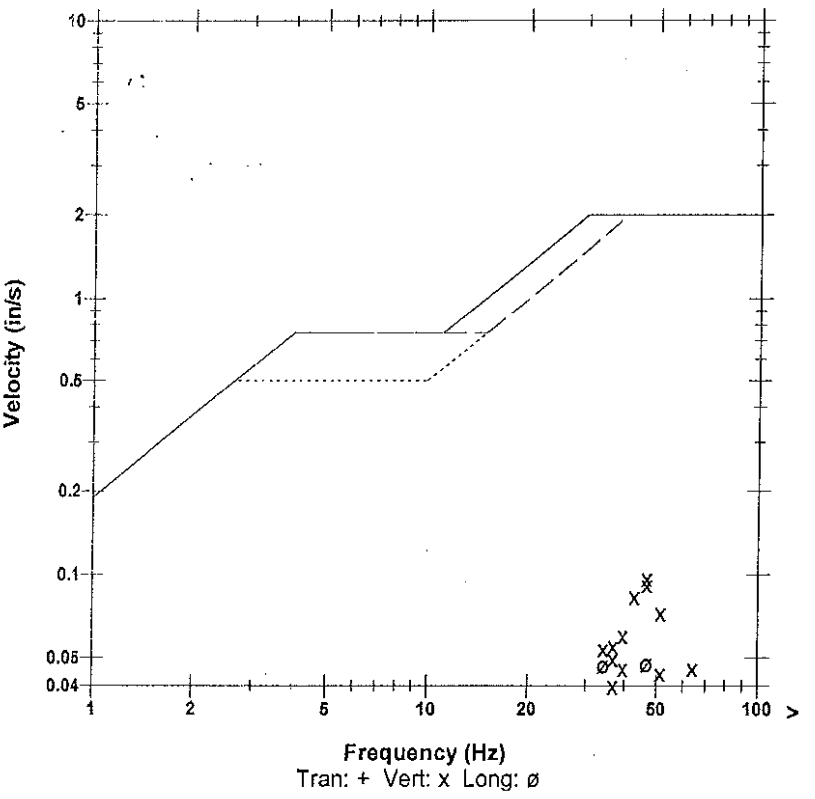
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

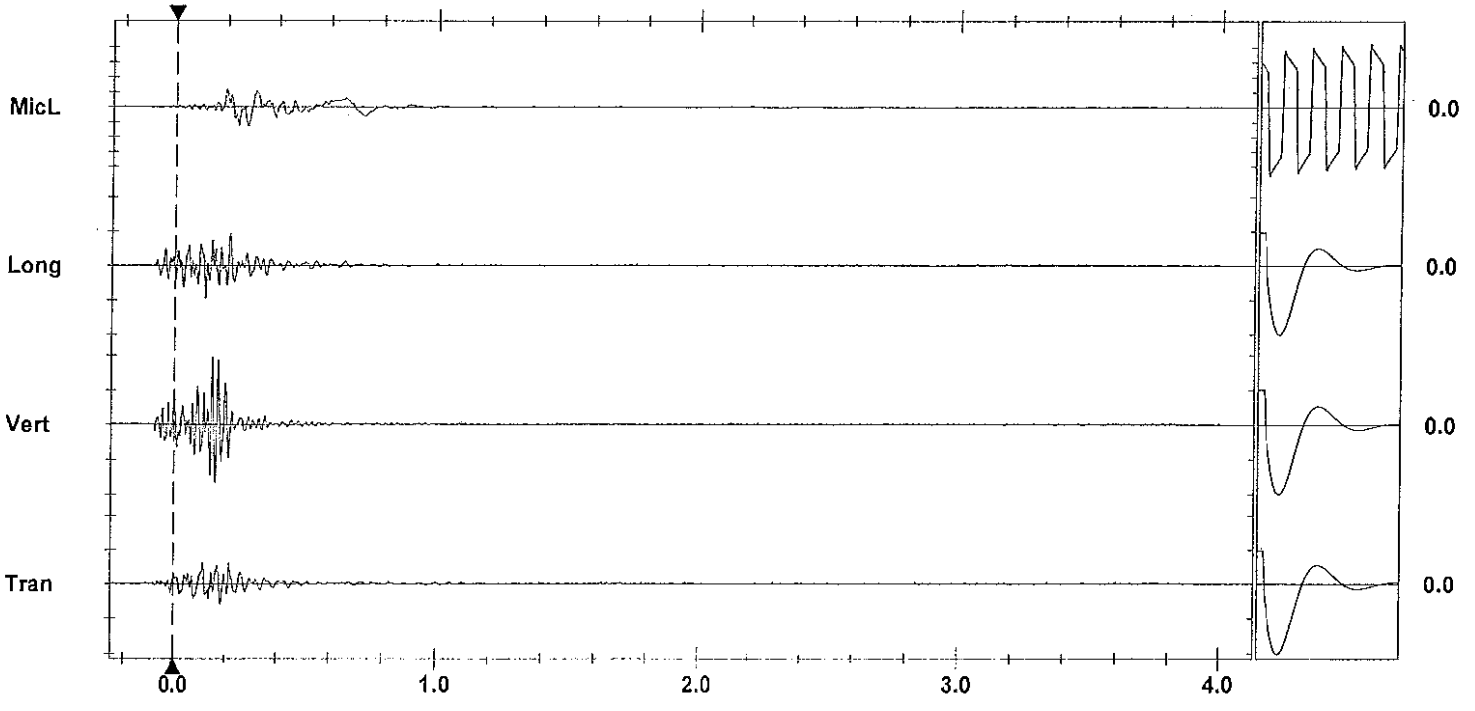
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00127 psi(L) at 0.277 sec
ZC Freq 6.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 679 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0969	0.0475	in/s
ZC Freq	20	47	47	Hz
Time (Rel. to Trig)	0.116	0.150	0.121	sec
Peak Acceleration	0.0298	0.0994	0.0331	g
Peak Displacement	0.00021	0.00032	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0996 in/s at 0.173 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 12/11
ACTUAL BLAST DATE Dec. 12/11 11:00 AM
BLAST # 133

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+40 - 127+65 RS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 6
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 306 (m)

TOTAL NUMBER OF HOLES 51 prod.
HOLE DIAMETER [illegible] (mm) 89
HOLE SPACING 3 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 51
TOTAL NUMBER OF DELAYS 51

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 450 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

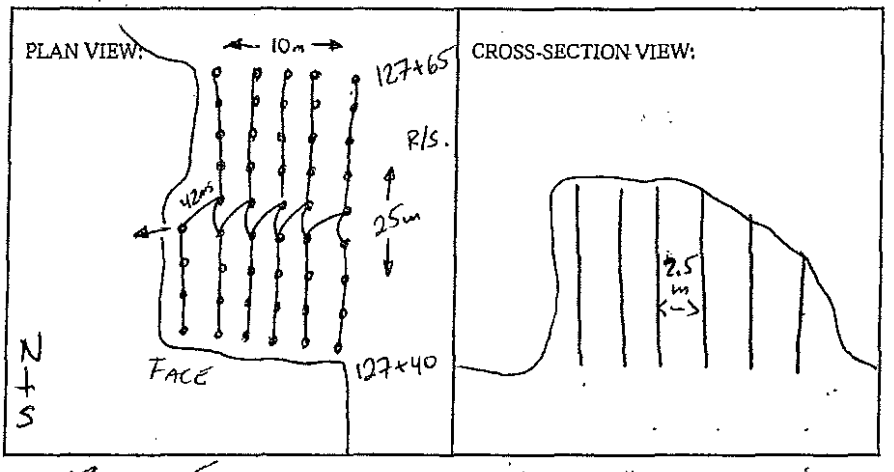
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffside – no trig (< 0.04 ips)
" @ 13093 cliffside – 0.09 PPV 32 Hz

51 - 30' Ezdets.
11 - 42ms connectadet.
2 - 17ms connectadet
1 - Elec det.

17 bags Anfo.
22 sticks 1½x16"

Instantel

Event Report

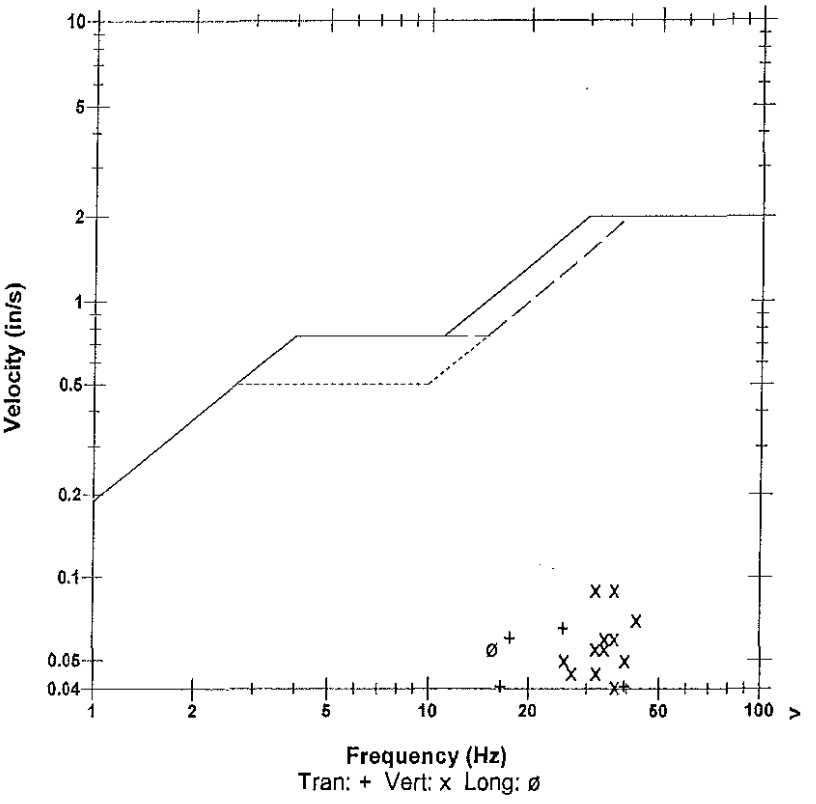
Date/Time	Vert at 11:10:14 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E28X.P20

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

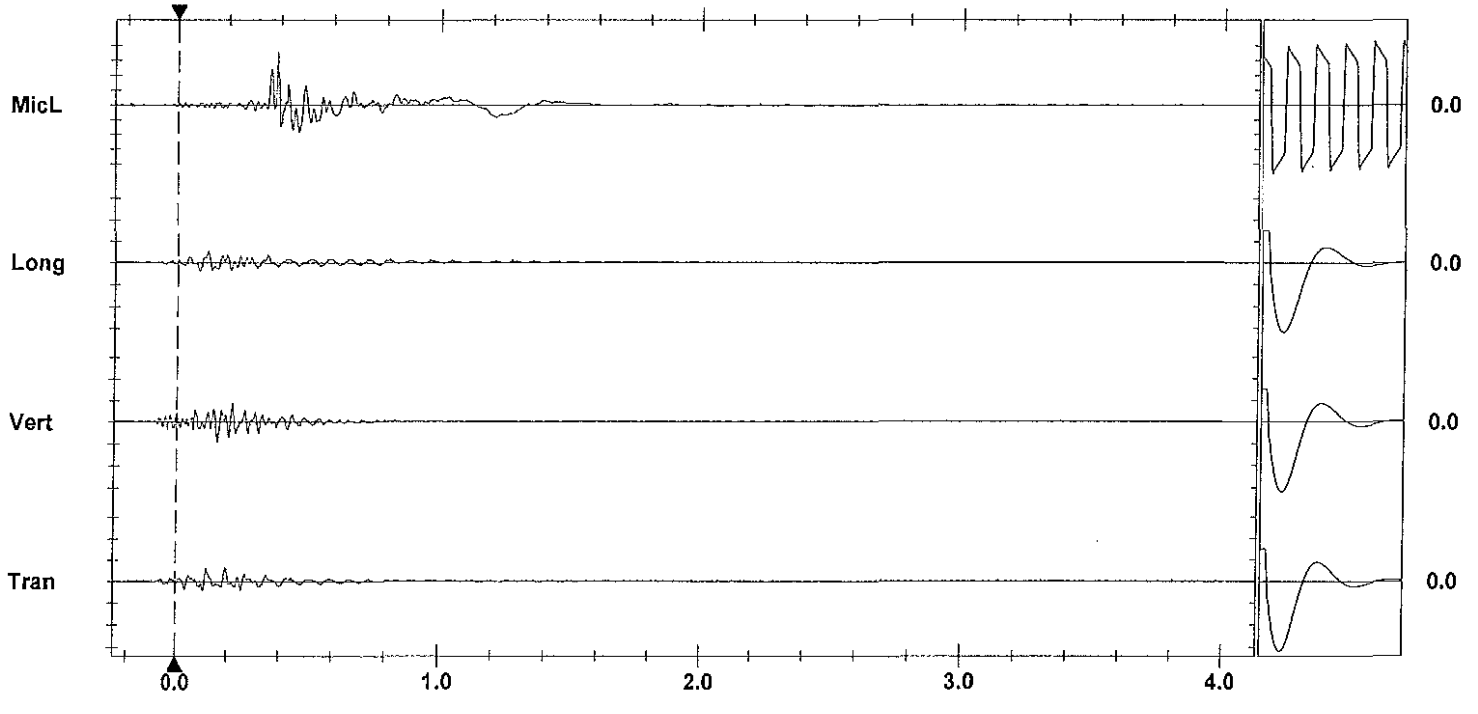
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00359 psi(L) at 0.386 sec
ZC Freq	34 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 740 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0900	0.0550	in/s
ZC Freq	26	32	16	Hz
Time (Rel. to Trig)	0.196	0.161	0.120	sec
Peak Acceleration	0.0398	0.0530	0.0265	g
Peak Displacement	0.00044	0.00043	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0939 in/s at 0.161 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 12:40 PM
BLAST # MW-0037

HIGHWAY # 97
BLAST LOCATION AT: 1291+85 - 1291+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

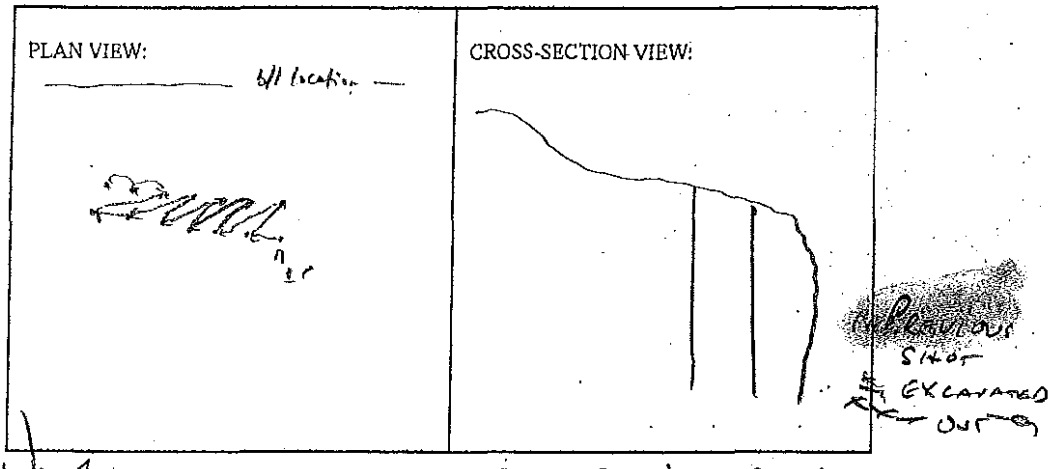
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBX initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



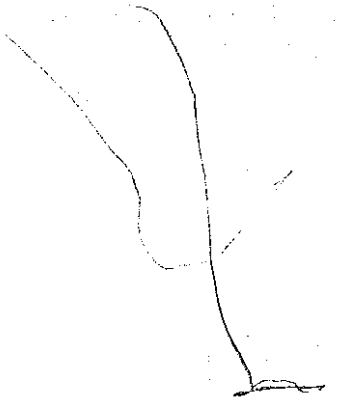
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13167 @ Cliffstone cut - 0.24 ips/20Hz
@ 13093 cliffstone cut - 0.12 ips/28Hz

3'-4" [illegible] pole [illegible] w/ D.S. and 1½ V16 dynamite



Instantel®

Event Report

Date/Time	Vert at 12:40:31 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E291.VJ0
Job Number:	1		

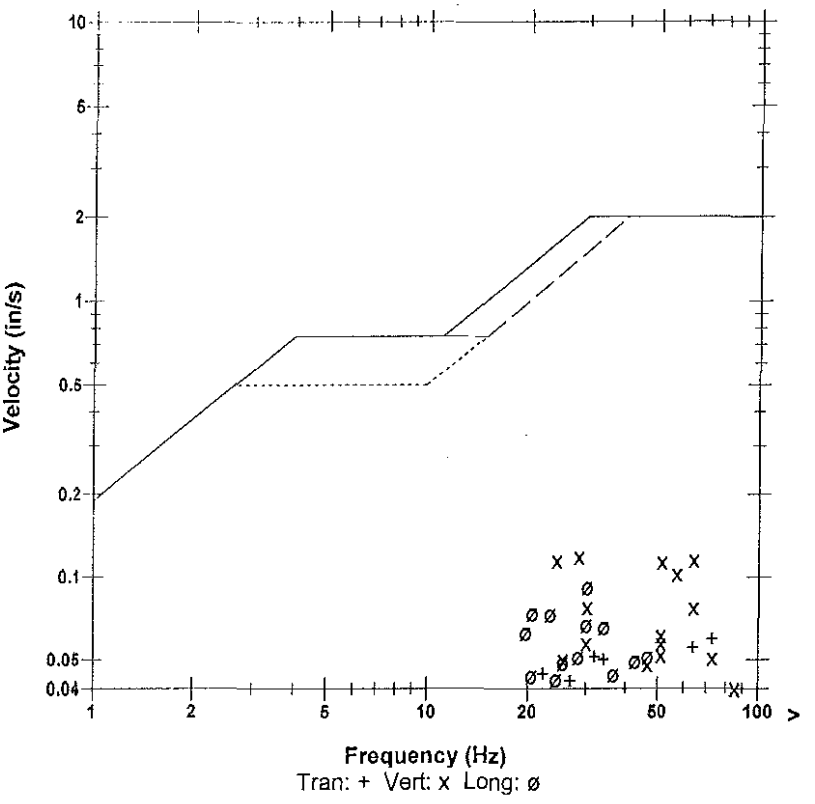
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

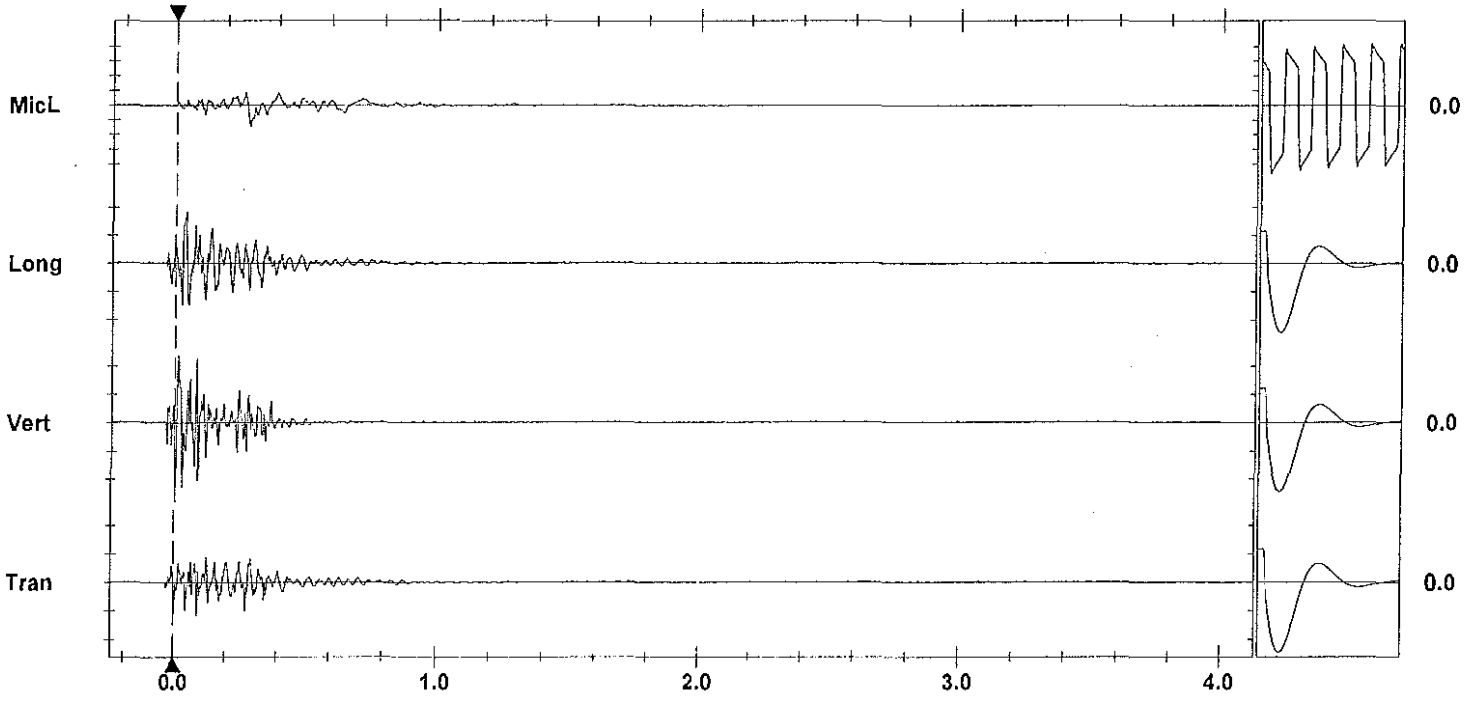


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00149 psi(L) at 0.286 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	0.0594	0.119	0.0919	in/s
ZC Freq	73	28	30	Hz
Time (Rel. to Trig)	0.093	0.014	0.040	sec
Peak Acceleration	0.0679	0.133	0.0829	g
Peak Displacement	0.00024	0.00061	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.134 in/s at 0.003 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:40:25 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E291.VD0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

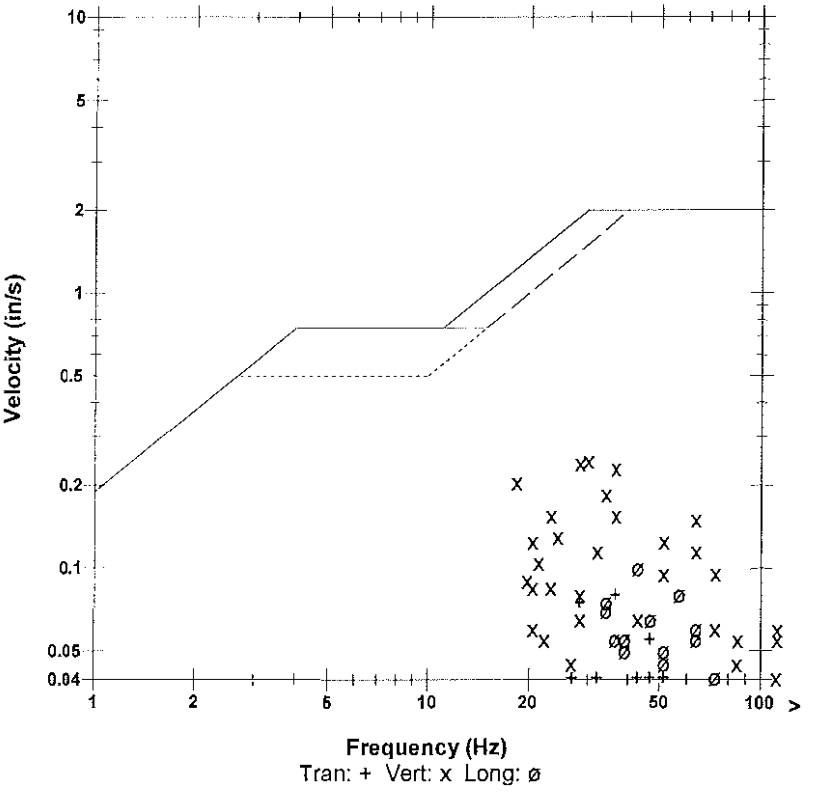
Post Event Notes

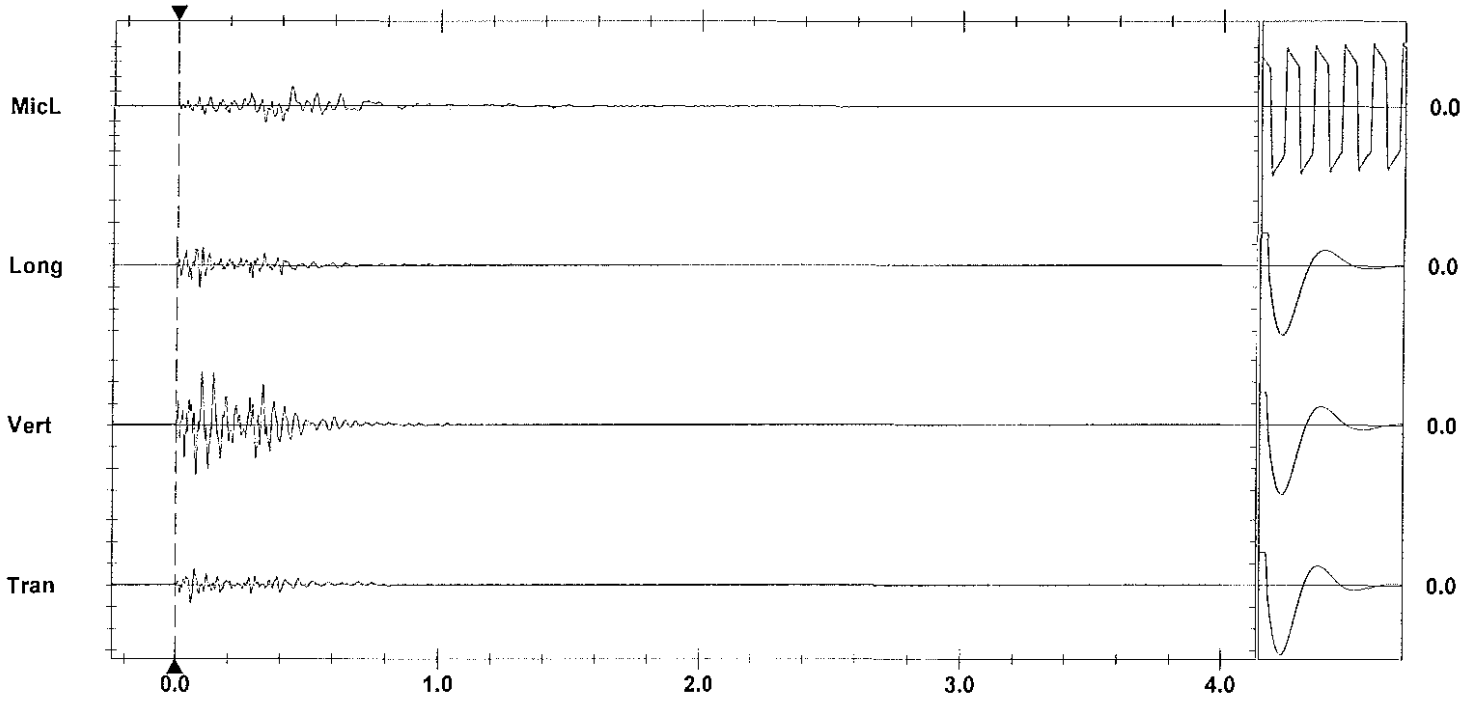
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.436 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 744 mv)

	Tran	Vert	Long	
PPV	0.0800	0.245	0.1000	in/s
ZC Freq	37	30	43	Hz
Time (Rel. to Trig)	0.060	0.100	0.088	sec
Peak Acceleration	0.0530	0.186	0.0795	g
Peak Displacement	0.00037	0.00113	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.258 in/s at 0.100 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/11
ACTUAL BLAST DATE Dec. 12/11 2:05PM
BLAST # 134

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+65 – 127+85 RS (1st Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 35 prod.
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 35

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

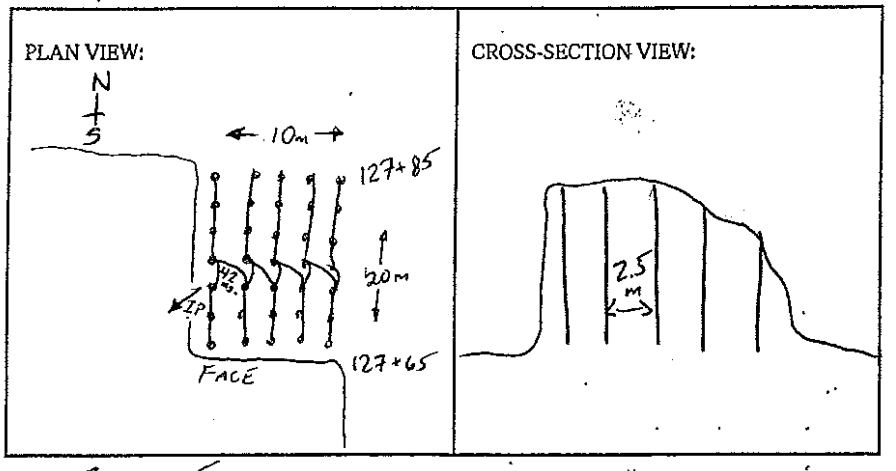
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

35 - 30' Ez dets.

8 - 42ms connectadet

1 - 17ms connectadet

18 bags Anfo.

17 sticks 1½ x 16.

Instantel

Event Report

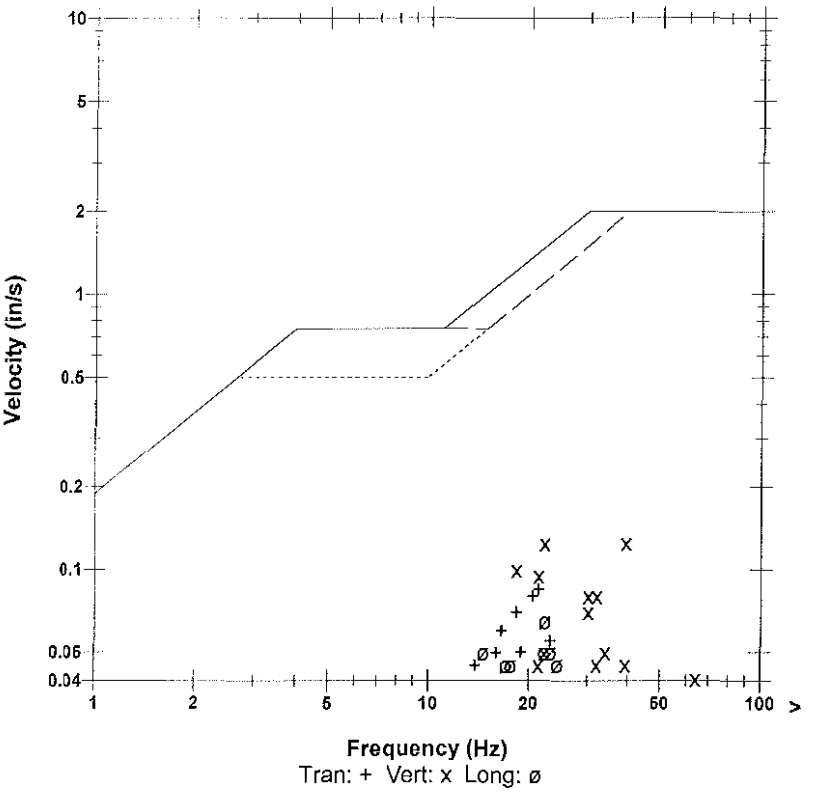
Date/Time	Tran at 14:05:35 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E295.TB0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

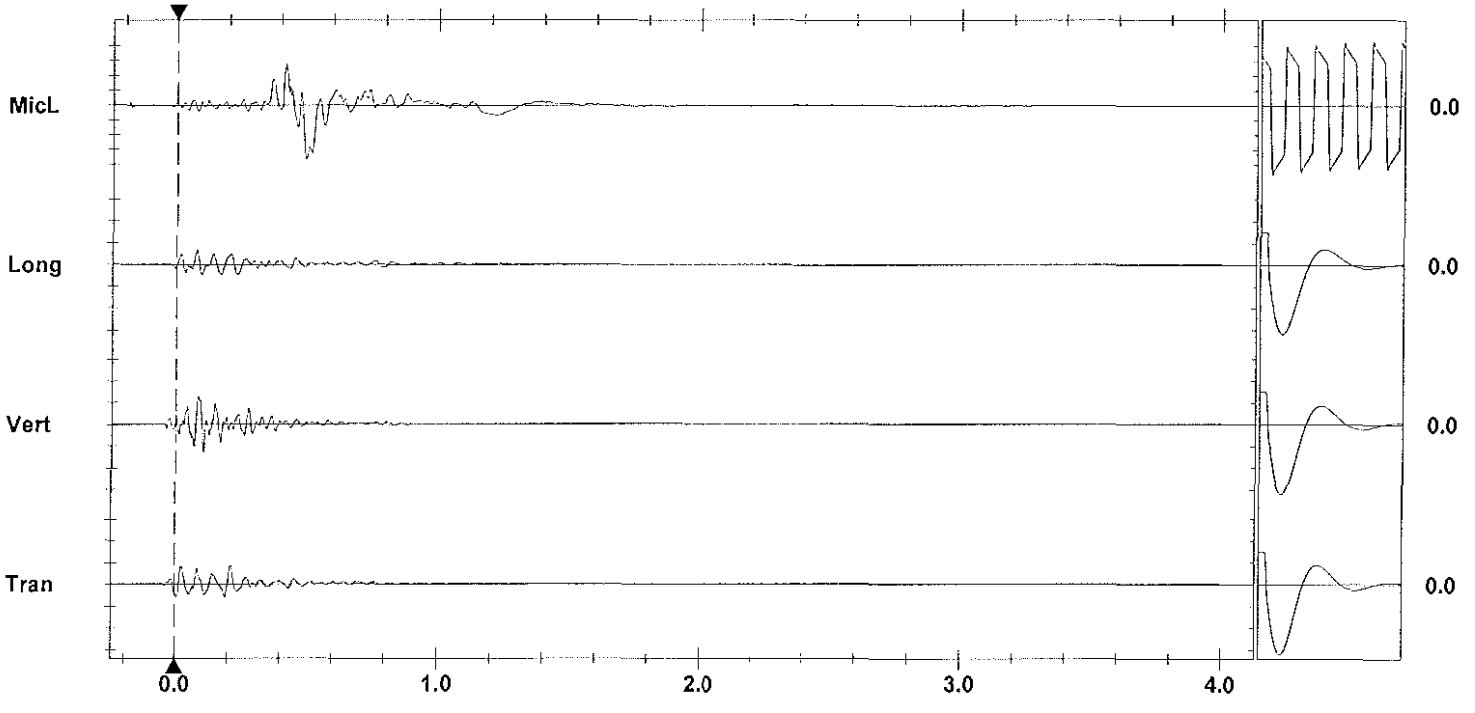
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00363 psi(L) at 0.492 sec
ZC Freq 8.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 718 mv)

	Tran	Vert	Long	
PPV	0.0850	0.125	0.0650	in/s
ZC Freq	21	22	22	Hz
Time (Rel. to Trig)	0.213	0.086	0.078	sec
Peak Acceleration	0.0398	0.0795	0.0398	g
Peak Displacement	0.00062	0.00099	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.149 in/s at 0.086 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶---- — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:05:41 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E295.THO
Job Number:	1		

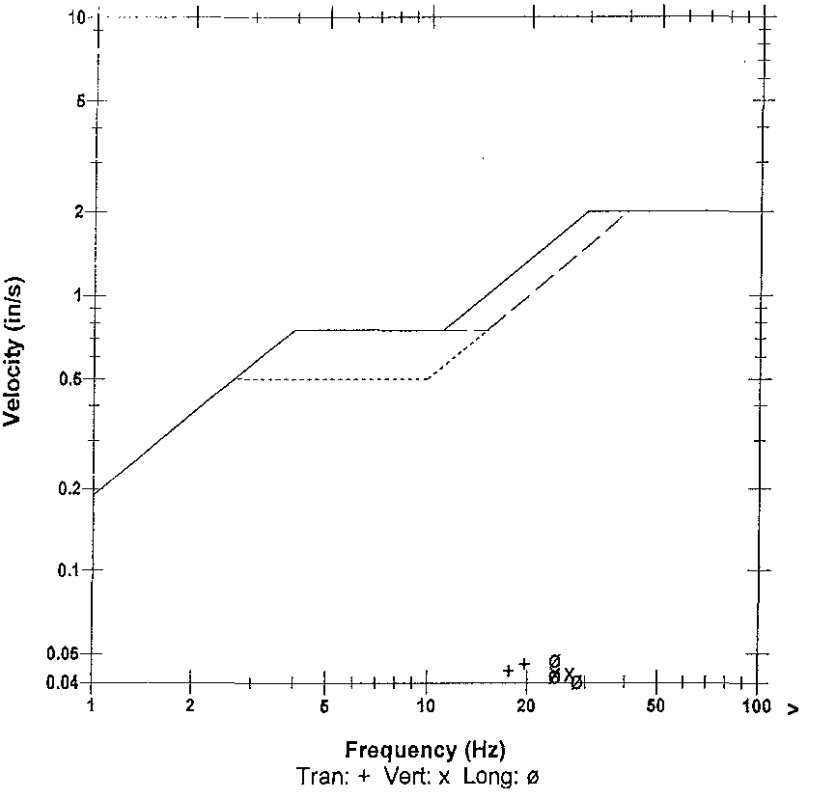
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

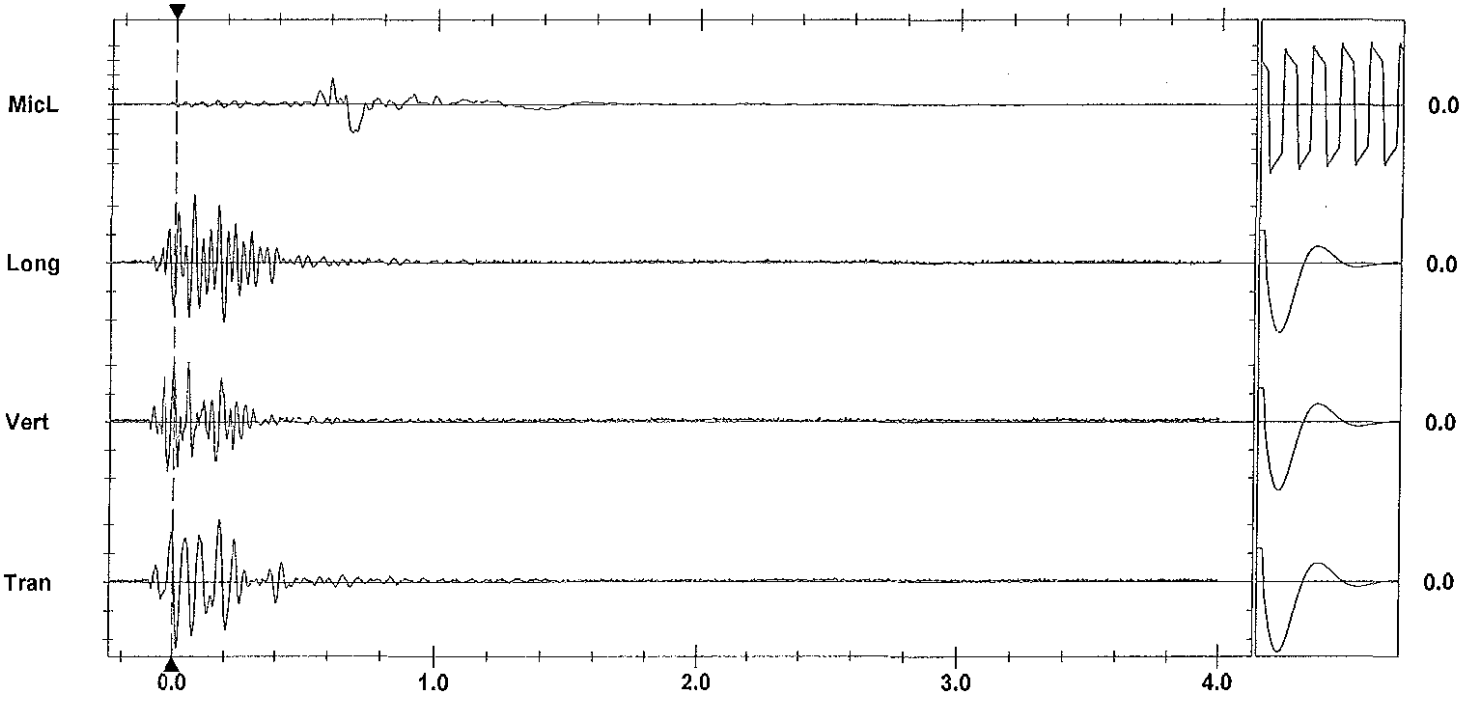
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.679 sec
ZC Freq	7.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 736 mv)

	Tran	Vert	Long	
PPV	0.0456	0.0425	0.0475	in/s
ZC Freq	20	24	24	Hz
Time (Rel. to Trig)	0.015	0.001	0.079	sec
Peak Acceleration	0.0215	0.0215	0.0215	g
Peak Displacement	0.00038	0.00027	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0661 in/s at 0.016 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Printed: December 17, 2011 (V 9.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 12/11
ACTUAL BLAST DATE Dec 12/11 2:25 PM
BLAST # MW-0038

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 - 129+50 US (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS: 12 6/11 holes loaded w/200 gr. det. cord.

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 140 (m)

TOTAL NUMBER OF HOLES 18b/l + 6 Buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 17 + 25 (ms)

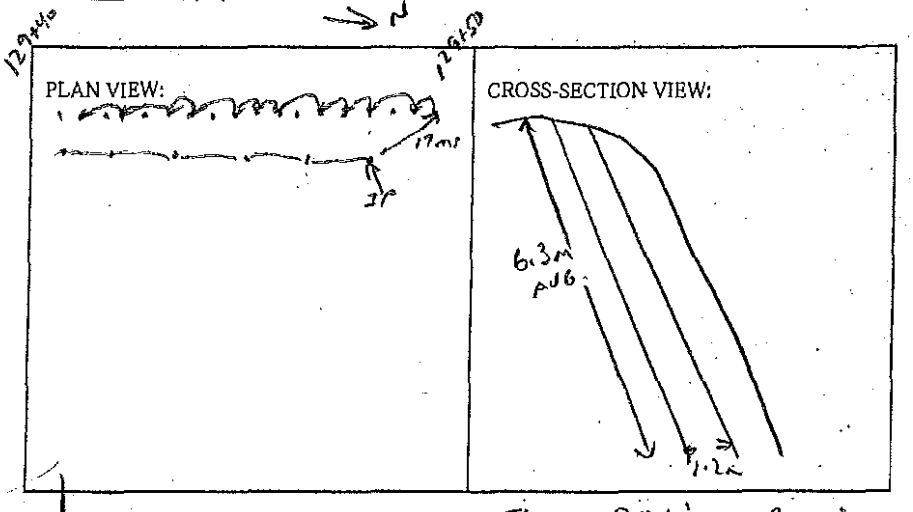
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 260 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167. c:\ll\blast.cal - 0.15 ips/ 34 Hz
@ 13093 c:\ll\blast.cal - 0.088 ips/ 47 Hz

BUFFER HOLES - 4 CART 2"x16" BLASTRITE / HOLE
PRIMED W/ 0.5 CART 1½" x 16" DYNAMITE

B/L HOLES: 1 CART 2"x16" DYNAMITE + 200 gr
det cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 14:28:03 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E296.UR0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

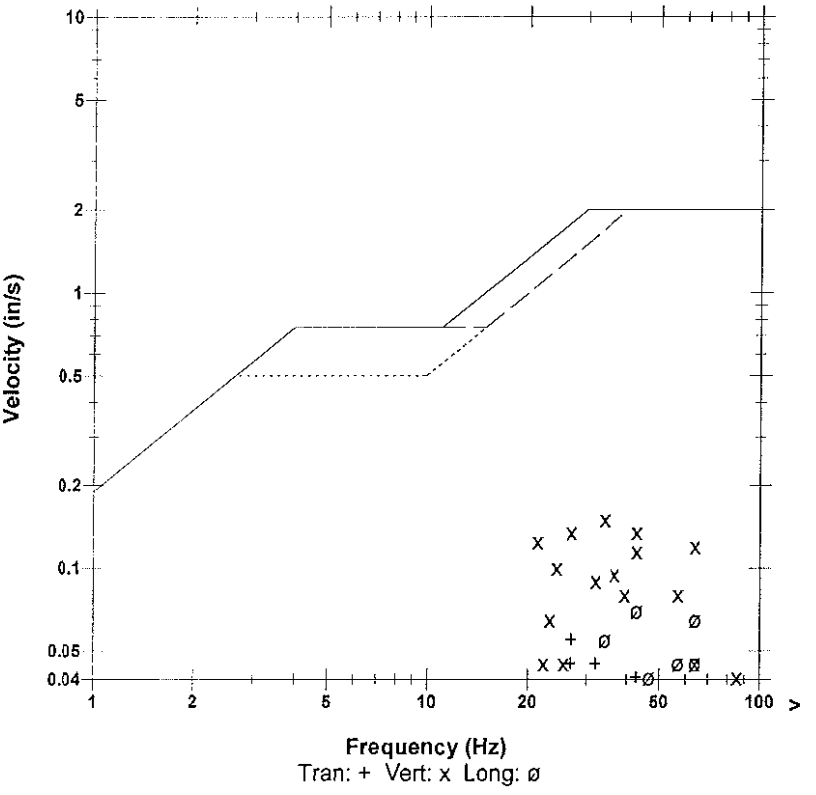
Post Event Notes

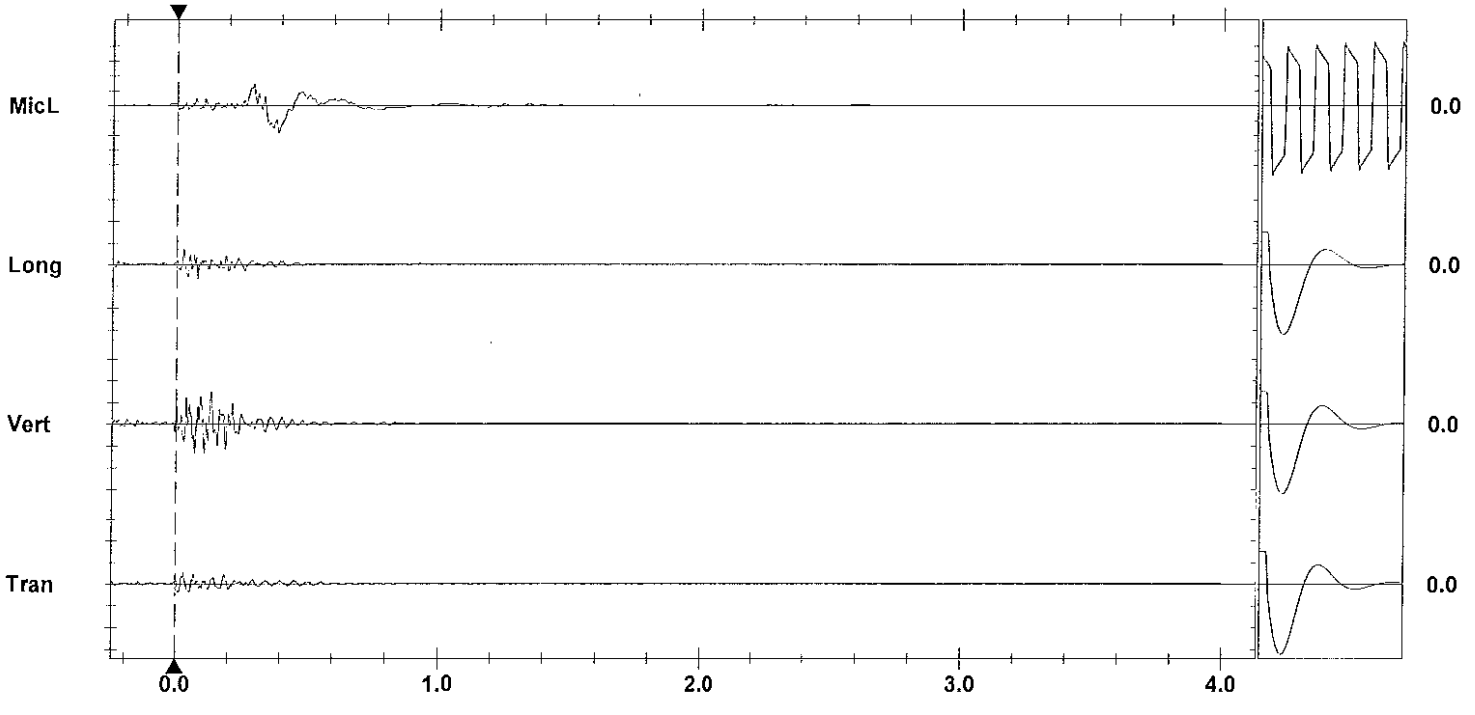
Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.389 sec
ZC Freq 4.9 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 766 mv)

	Tran	Vert	Long	
PPV	0.0550	0.150	0.0700	in/s
ZC Freq	27	34	43	Hz
Time (Rel. to Trig)	0.032	0.136	0.028	sec
Peak Acceleration	0.0398	0.133	0.0663	g
Peak Displacement	0.00028	0.00078	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.151 in/s at 0.136 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:28:10 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E296.UY0
Job Number:	1		

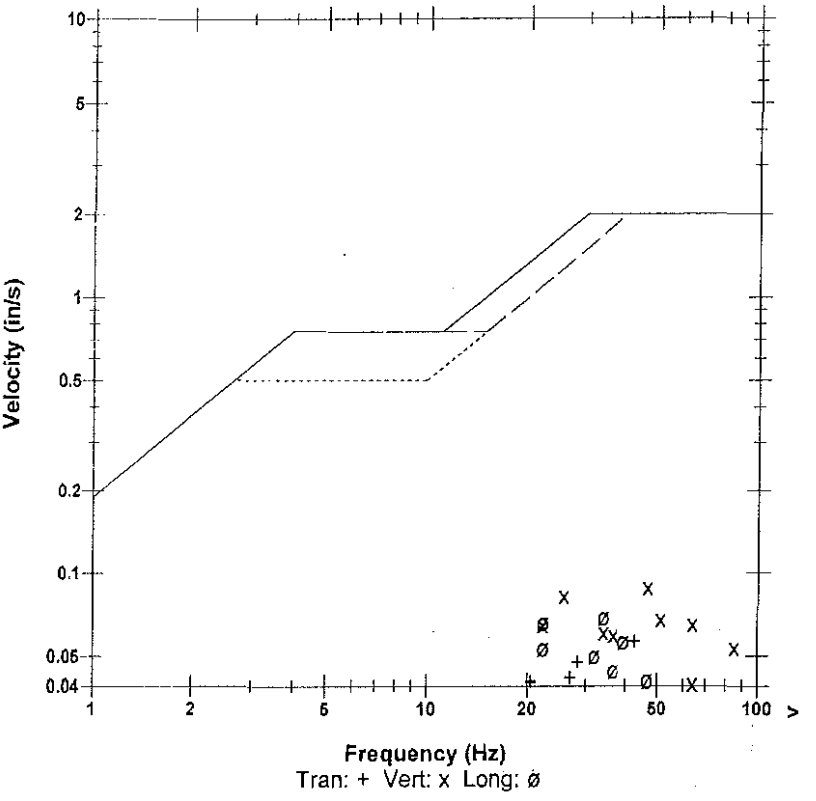
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

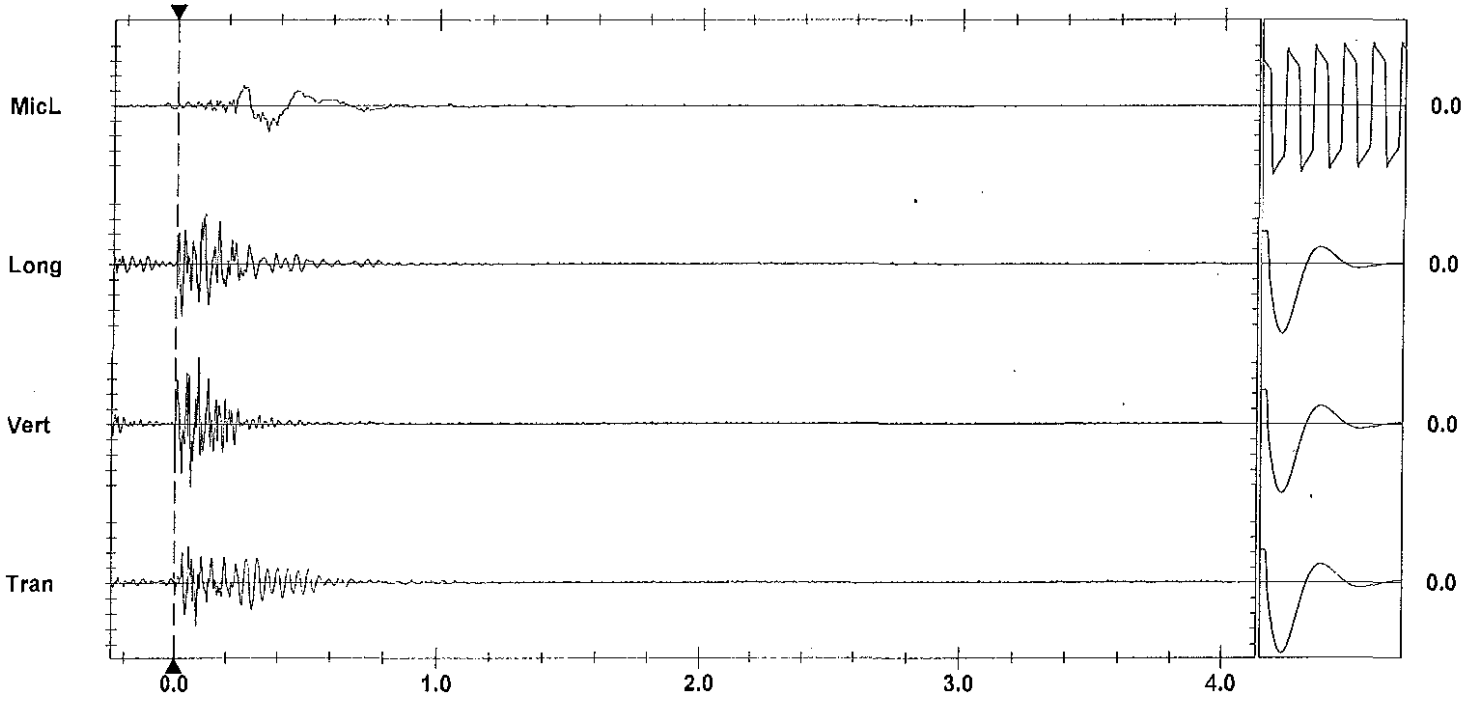
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.351 sec
ZC Freq	3.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 749 mv)

	Tran	Vert	Long	
PPV	0.0562	0.0881	0.0687	in/s
ZC Freq	43	47	34	Hz
Time (Rel. to Trig)	0.086	0.093	0.020	sec
Peak Acceleration	0.0547	0.0878	0.0431	g
Peak Displacement	0.00024	0.00033	0.00047	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0965 in/s at 0.092 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶——————◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 8/11
BLAST # MW-0039

11:12 AM

HIGHWAY # 97
BLAST LOCATION AT: 129+30 - 129+40 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot matted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Hanfo
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

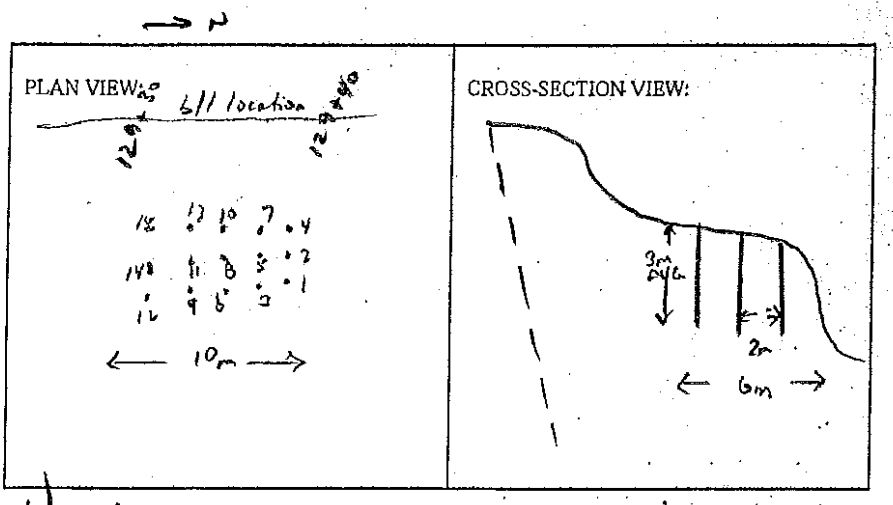
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HF 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13169 Cliffstone ent - 0.061 ips / 37 Hz
Seismograph @ 13093 Cliffstone ent - 0.151 ips / 21 Hz

3' ANFO / Holes primed w/ 0.5 emul. into boosters

Instantel

Event Report

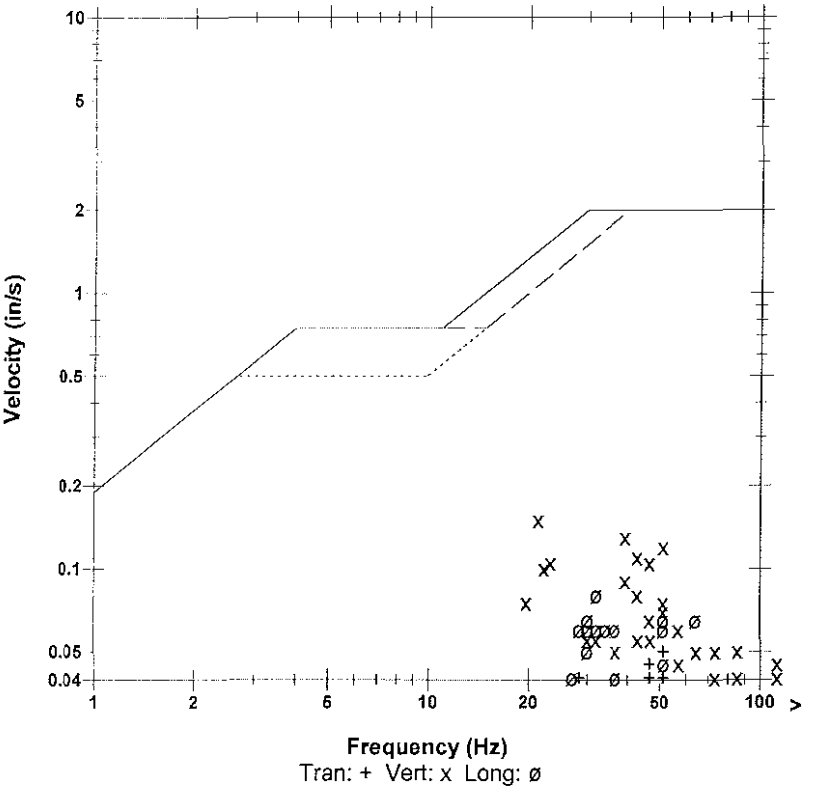
Date/Time	Vert at 11:19:46 December 13, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2AS.SY0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

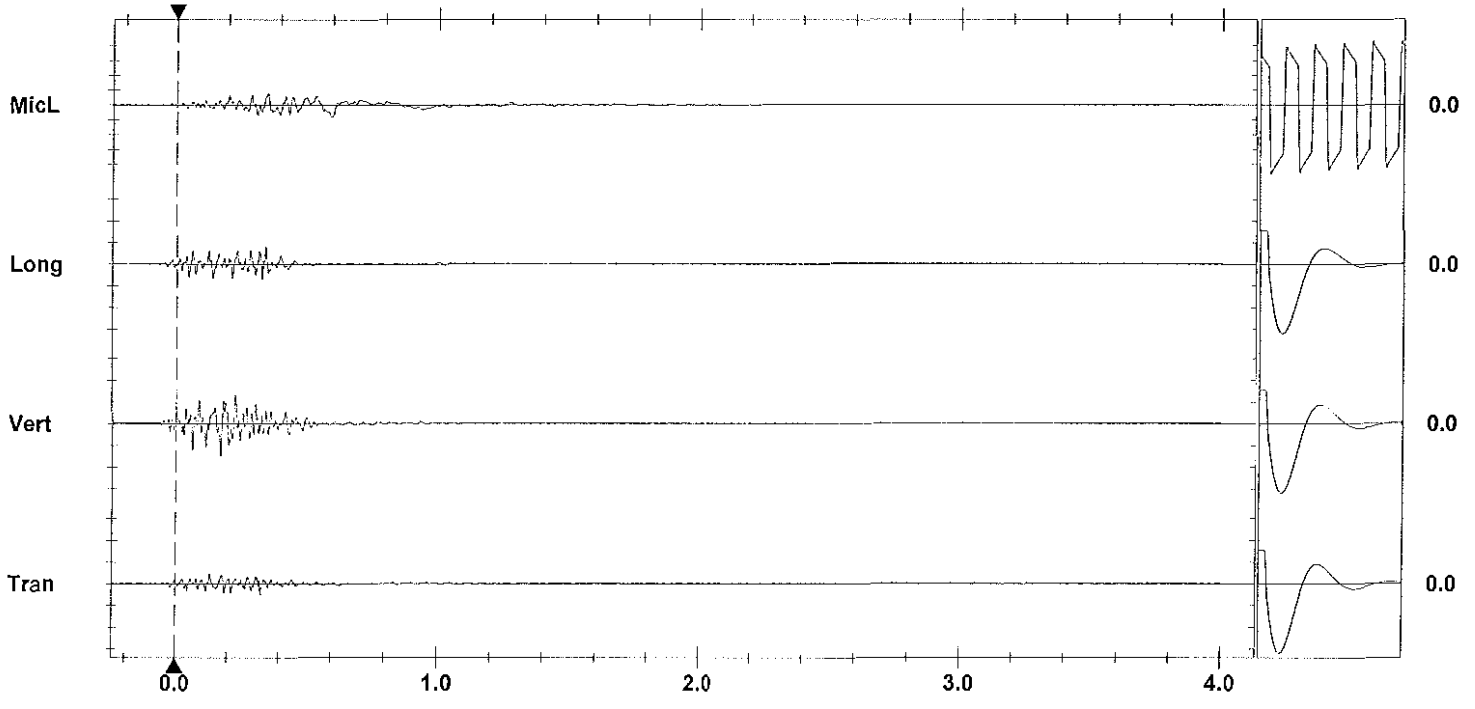
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00076 psi(L) at 0.350 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.0500	0.150	0.0800	in/s
ZC Freq	51	21	32	Hz
Time (Rel. to Trig)	0.330	0.172	0.342	sec
Peak Acceleration	0.0663	0.106	0.0928	g
Peak Displacement	0.00022	0.00078	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.5	

Peak Vector Sum 0.151 in/s at 0.172 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 11:19:54 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2AS.T60
Job Number:	1		

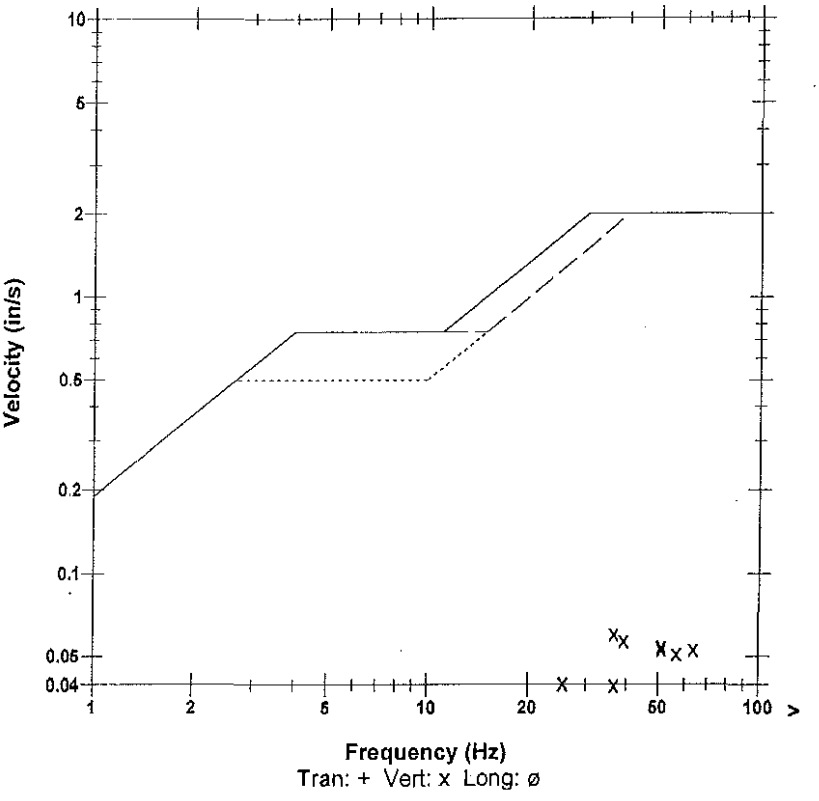
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

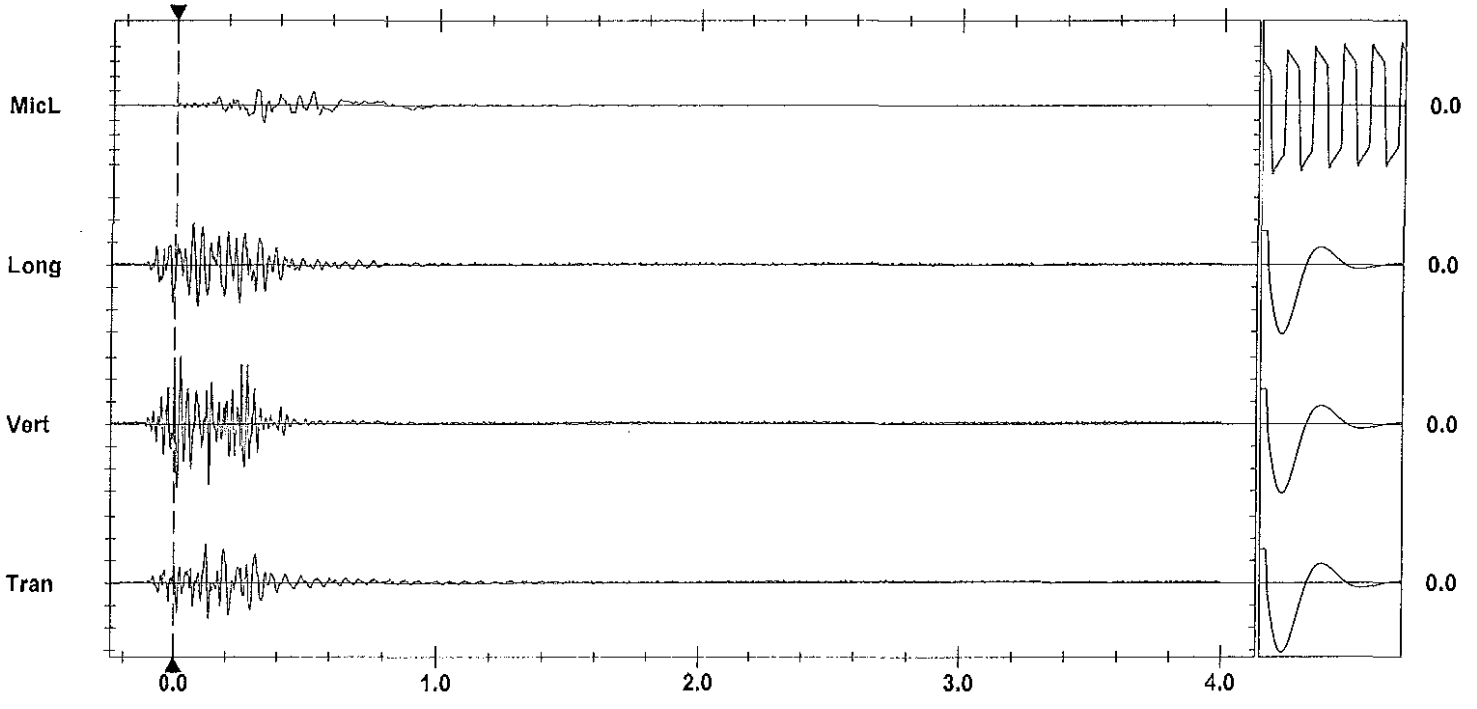


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.335 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0606	0.0369	in/s
ZC Freq	23	37	27	Hz
Time (Rel. to Trig)	0.127	0.025	0.069	sec
Peak Acceleration	0.0315	0.0746	0.0298	g
Peak Displacement	0.00020	0.00024	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.0648 in/s at 0.138 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger =

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11 1300 PM
BLAST # MW-0010

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 - 129+40 LS (approved)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot muffled

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3-5
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 140/1 (10 loaded) / 7 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 1
TOTAL NUMBER OF DELAYS

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

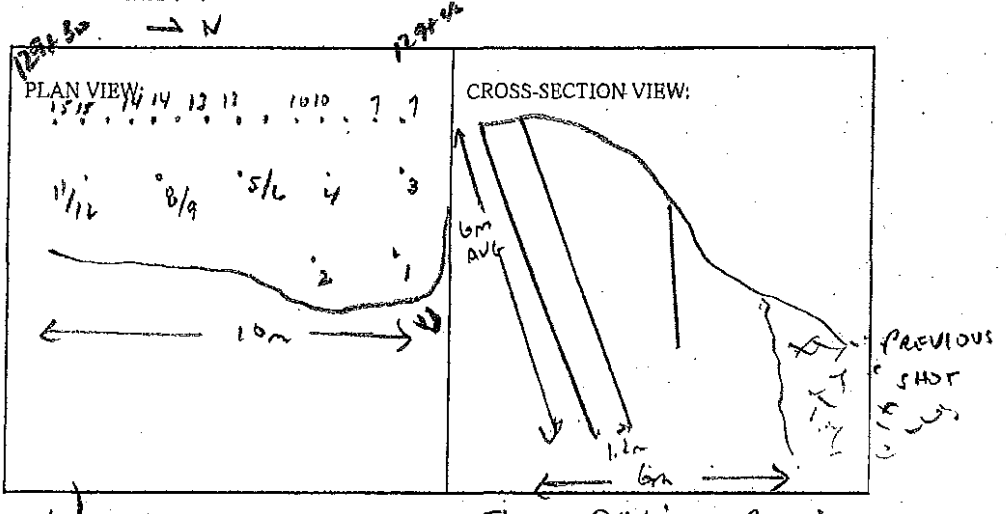
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HF 5320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13107 cliffside ext – 0.061 ips / 43Hz
@ 13093 cliffside ext – 0.18 ips / 57Hz

Stab Holes - 1.5' ANFO/Hour

Buffer Holes - Bottom Decks - 4 each 2½"x16" Blasting

- Top Decks - 1-2 each 2"x16" Blasting

Primed w/ 0.5 each 1¼"x16" Dynamite

B/L Holes - 1 each 2"x16" Dynamite + 200 grain det cord to 4' collar.

Instantel

Event Report

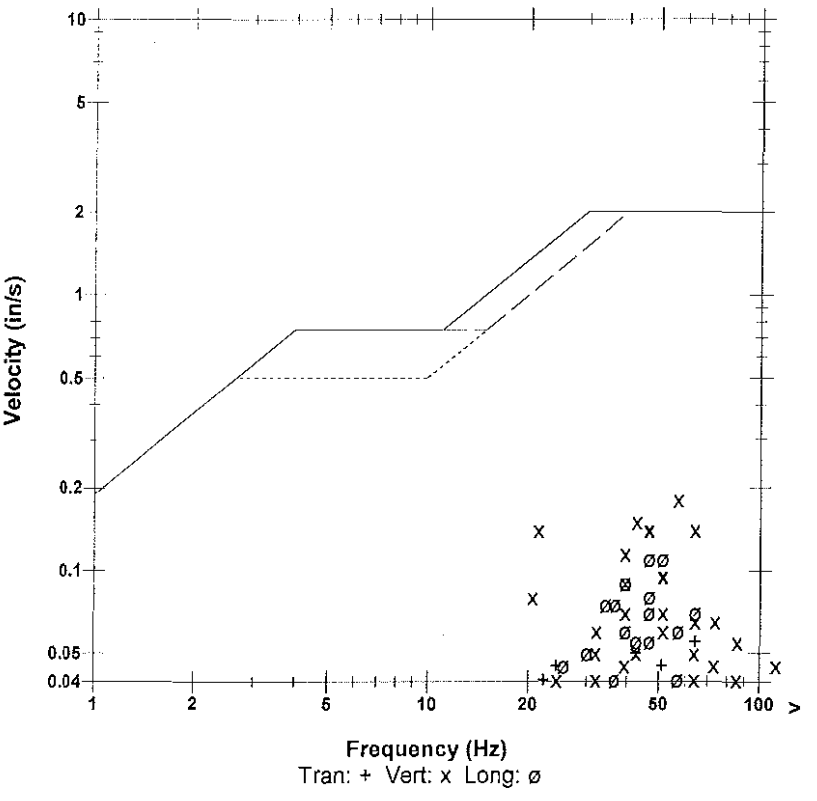
Date/Time	Vert at 13:00:29 December 13, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2AX.GT0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

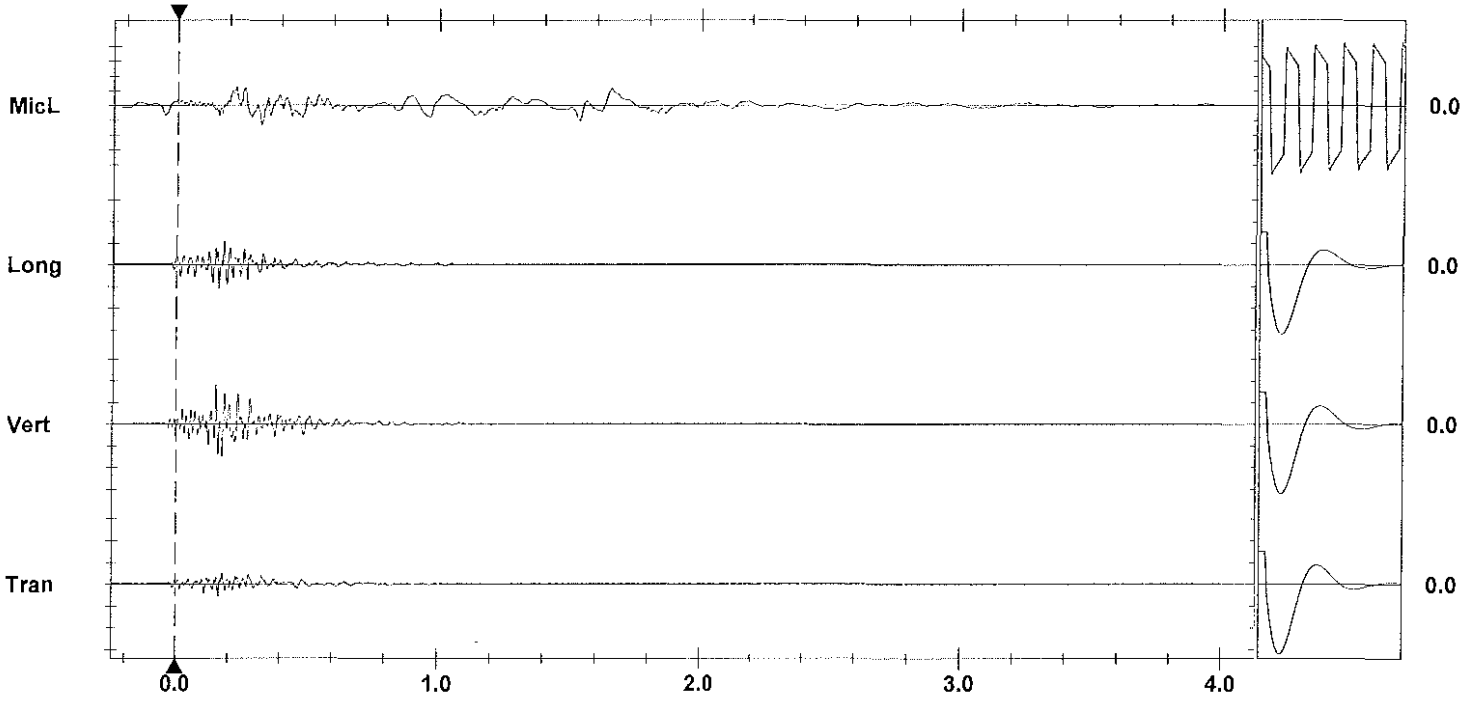
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0550	0.180	0.110	in/s
ZC Freq	64	57	51	Hz
Time (Rel. to Trig)	0.163	0.151	0.162	sec
Peak Acceleration	0.0663	0.239	0.106	g
Peak Displacement	0.00025	0.00066	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.321 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 714 mv)

Peak Vector Sum 0.184 in/s at 0.151 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 13:00:36 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2AX.H00
Job Number:	1		

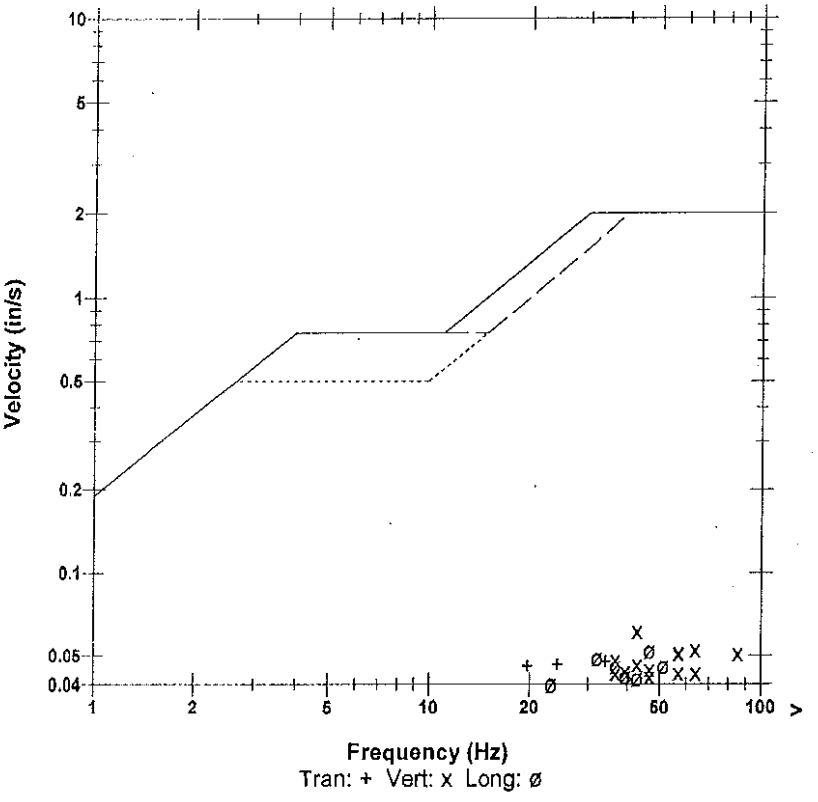
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

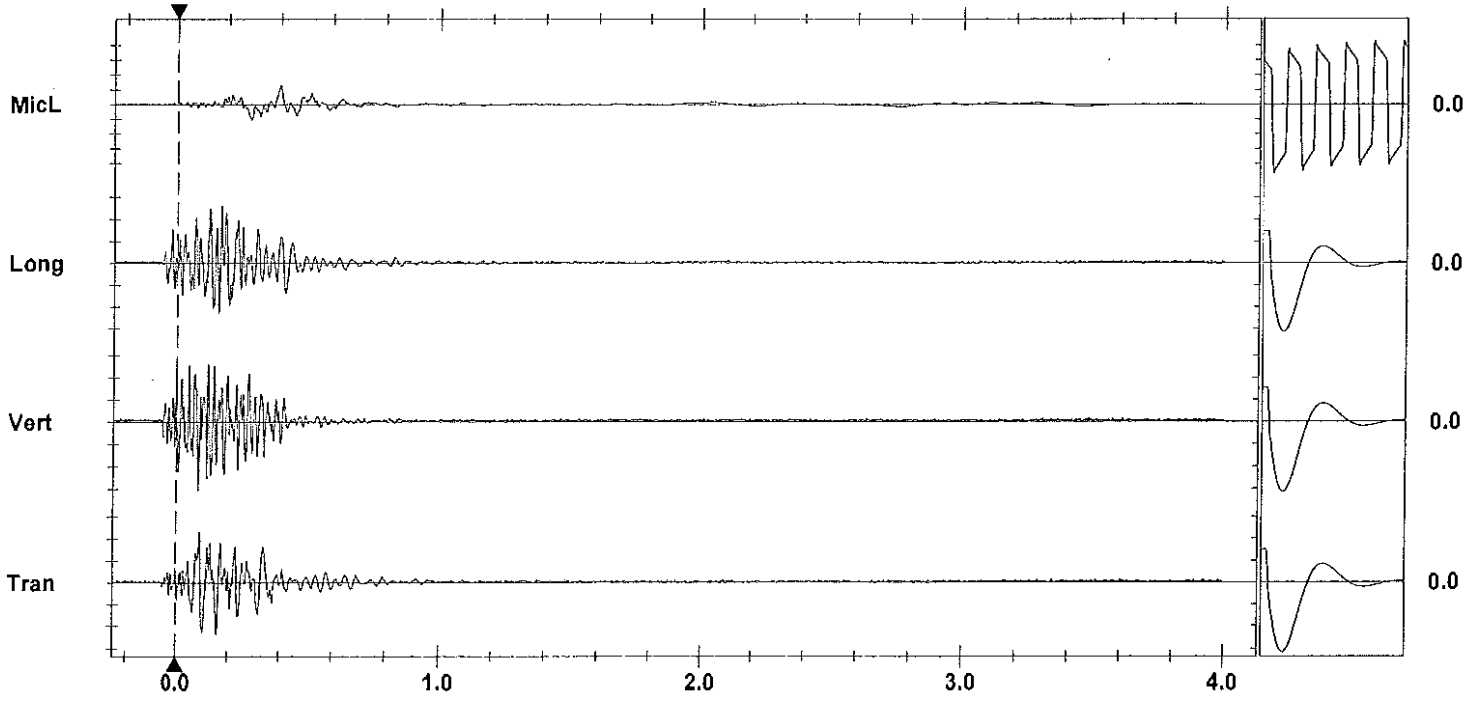
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.396 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 741 mv)

	Tran	Vert	Long	
PPV	0.0475	0.0612	0.0519	in/s
ZC Freq	34	43	47	Hz
Time (Rel. to Trig)	0.162	0.087	0.171	sec
Peak Acceleration	0.0514	0.118	0.0497	g
Peak Displacement	0.00031	0.00021	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.0732 in/s at 0.127 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-00021

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 18/11
ACTUAL BLAST DATE Dec 13/11 2221 PM
BLAST # MW-0041

HIGHWAY# 97
BLAST LOCATION AT: STN 1294+20 - 1294+70 (Approach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

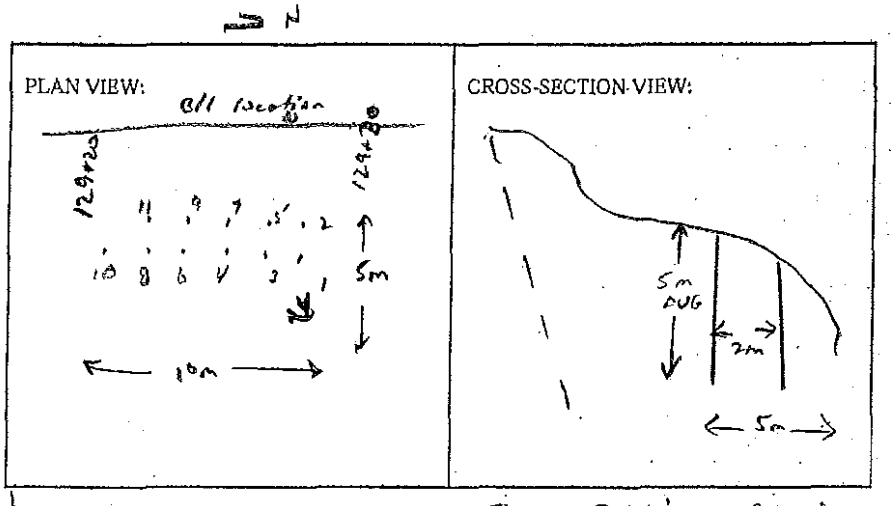
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 ch: Radial cmt - 0.092 ips / 39Hz
@ 13093 ch: Radial cmt - 0.241 ips / 43Hz

3'-4' ANFO/Hole primed w/ 0.5 emer 1½"x16" DYNAMITE

Instantel

Event Report

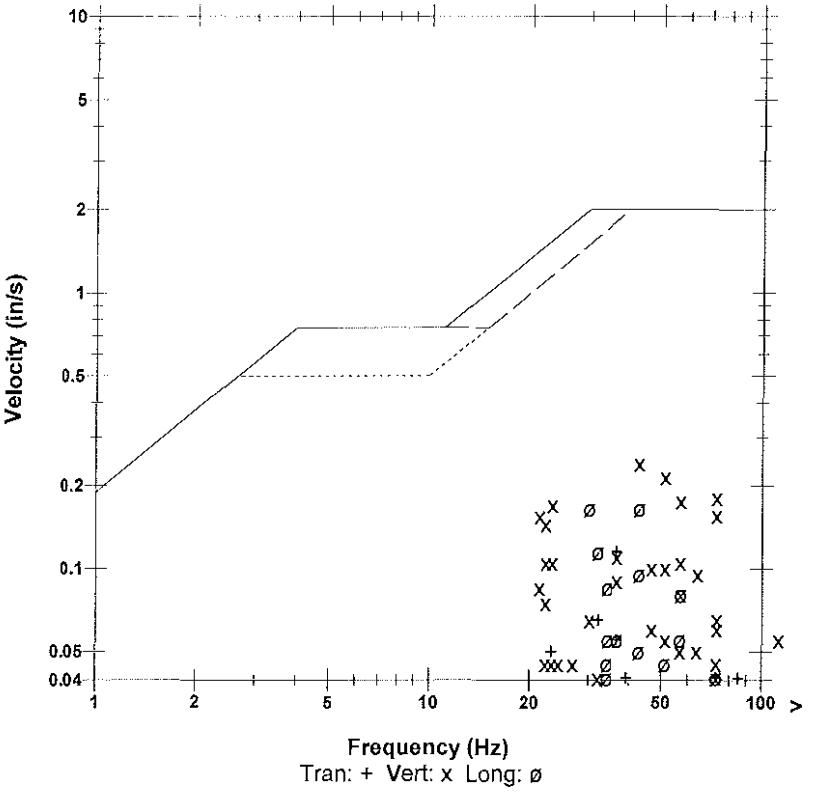
Date/Time	Vert at 14:21:49 December 13, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2B1.8D0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

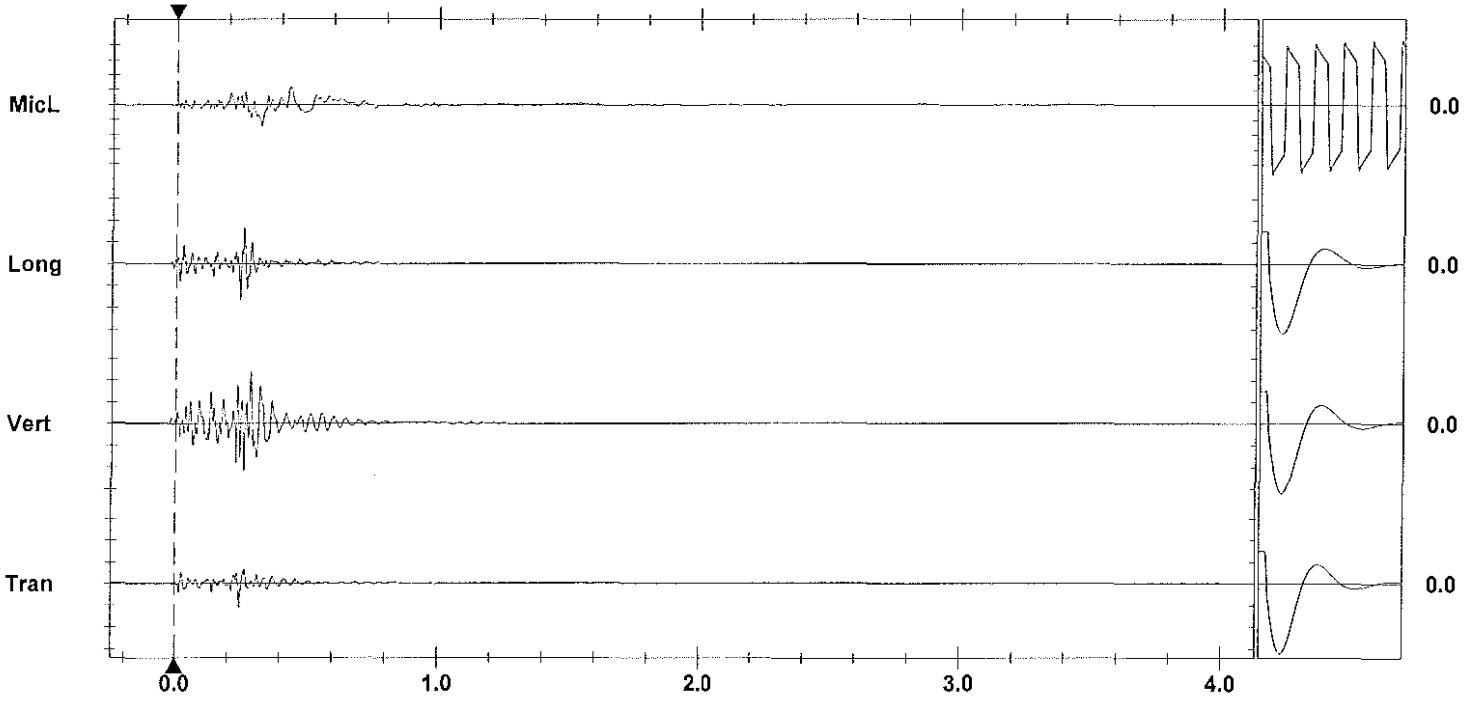
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00145 psi(L) at 0.322 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 735 mv)

	Tran	Vert	Long	
PPV	0.115	0.240	0.165	in/s
ZC Freq	37	43	43	Hz
Time (Rel. to Trig)	0.248	0.288	0.246	sec
Peak Acceleration	0.0928	0.265	0.133	g
Peak Displacement	0.00037	0.00118	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.275 in/s at 0.261 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 14:21:56 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2B1.8K0
Job Number:	1		

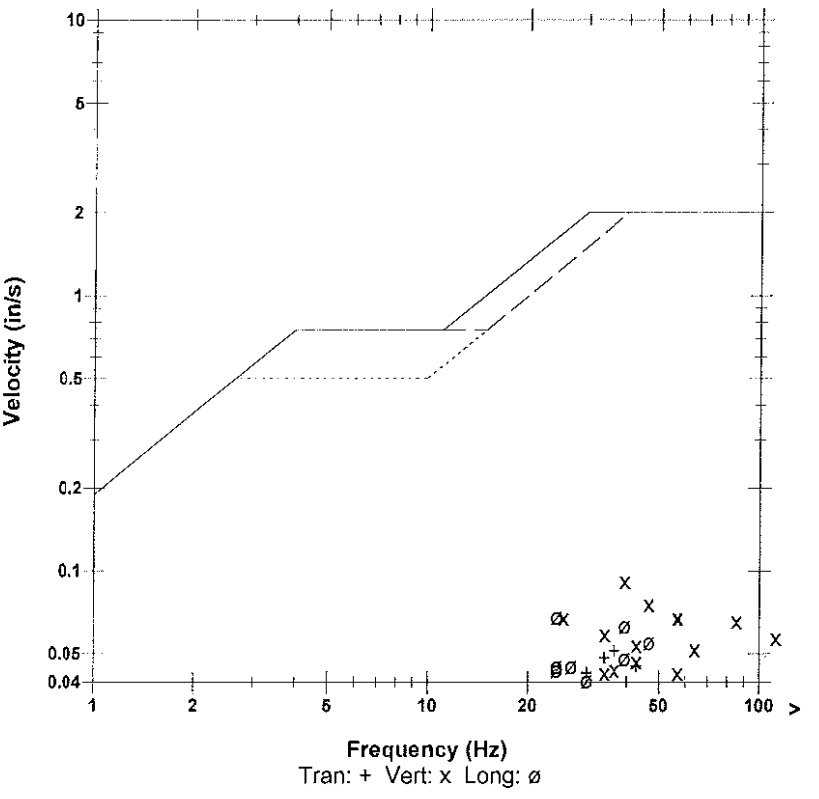
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

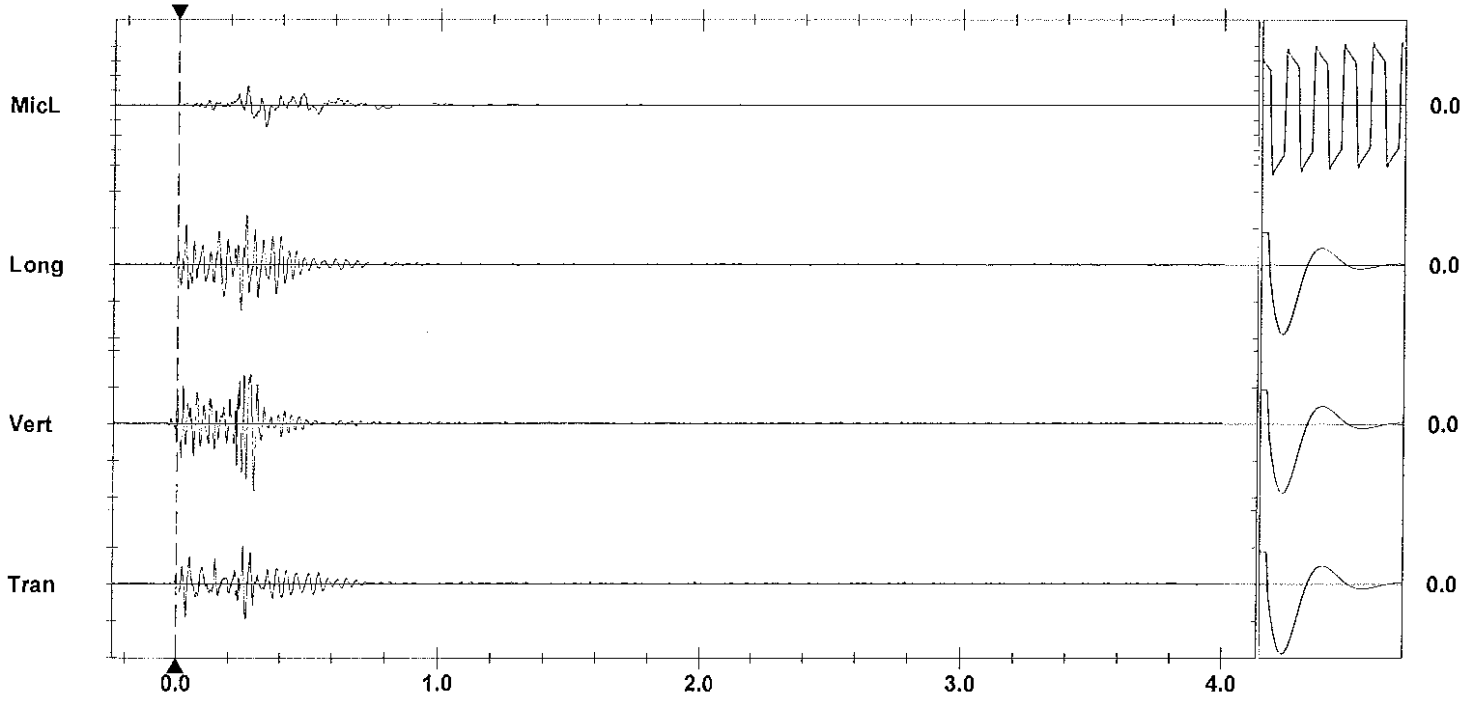
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.336 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 753 mv)

	Tran	Vert	Long	
PPV	0.0512	0.0919	0.0681	in/s
ZC Freq	37	39	24	Hz
Time (Rel. to Trig)	0.257	0.297	0.264	sec
Peak Acceleration	0.0414	0.116	0.0464	g
Peak Displacement	0.00021	0.00042	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.107 in/s at 0.297 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶— — — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01)

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/11
ACTUAL BLAST DATE Dec. 13/11
BLAST # 135 shot @ 16:00 pm 4:14 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+90 – 128+00 (1st Bench) RS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE ~~65~~ 80 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 0
AVERAGE DEPTH 14 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH ~~110~~ 110 (m)

TOTAL NUMBER OF HOLES 40 production
HOLE DIAMETER ~~102~~ (mm) 89
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 40

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

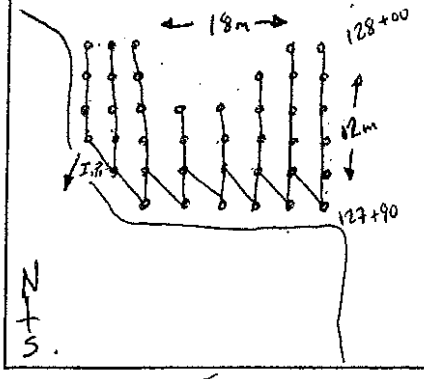
VOLUME OF ROCK BLASTED 870 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

40 - 7m(24)' Ez dets.

7 - 42ms connectadel.

1 Elec del.

12 - BAGS Anfo.

20 - sticks 1½x16

Instantel

Event Report

Date/Time	Vert at 16:14:48 December 13, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

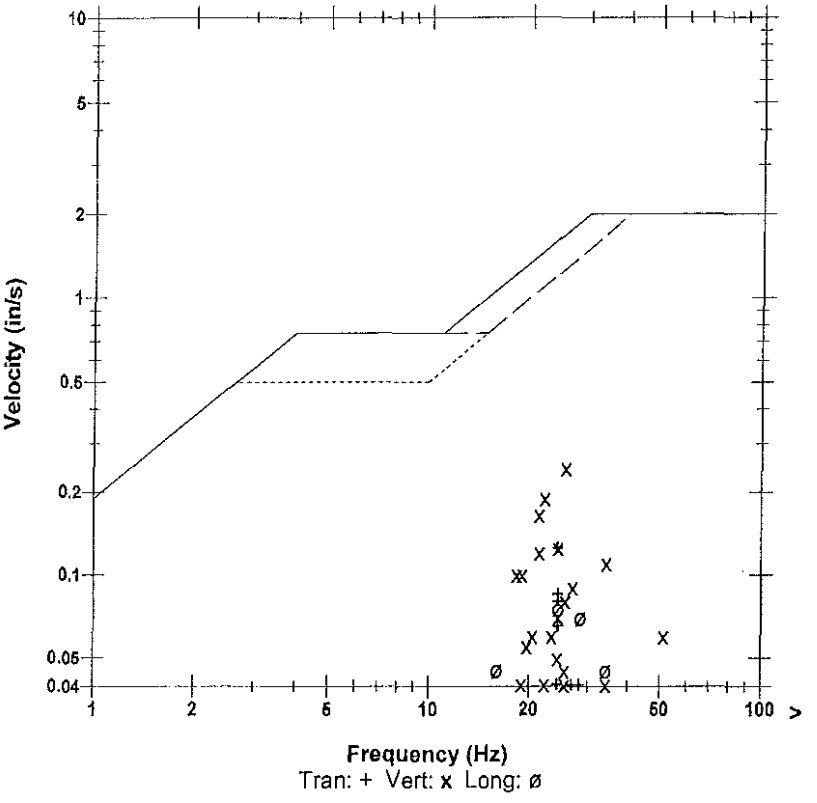
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2B6.GO0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

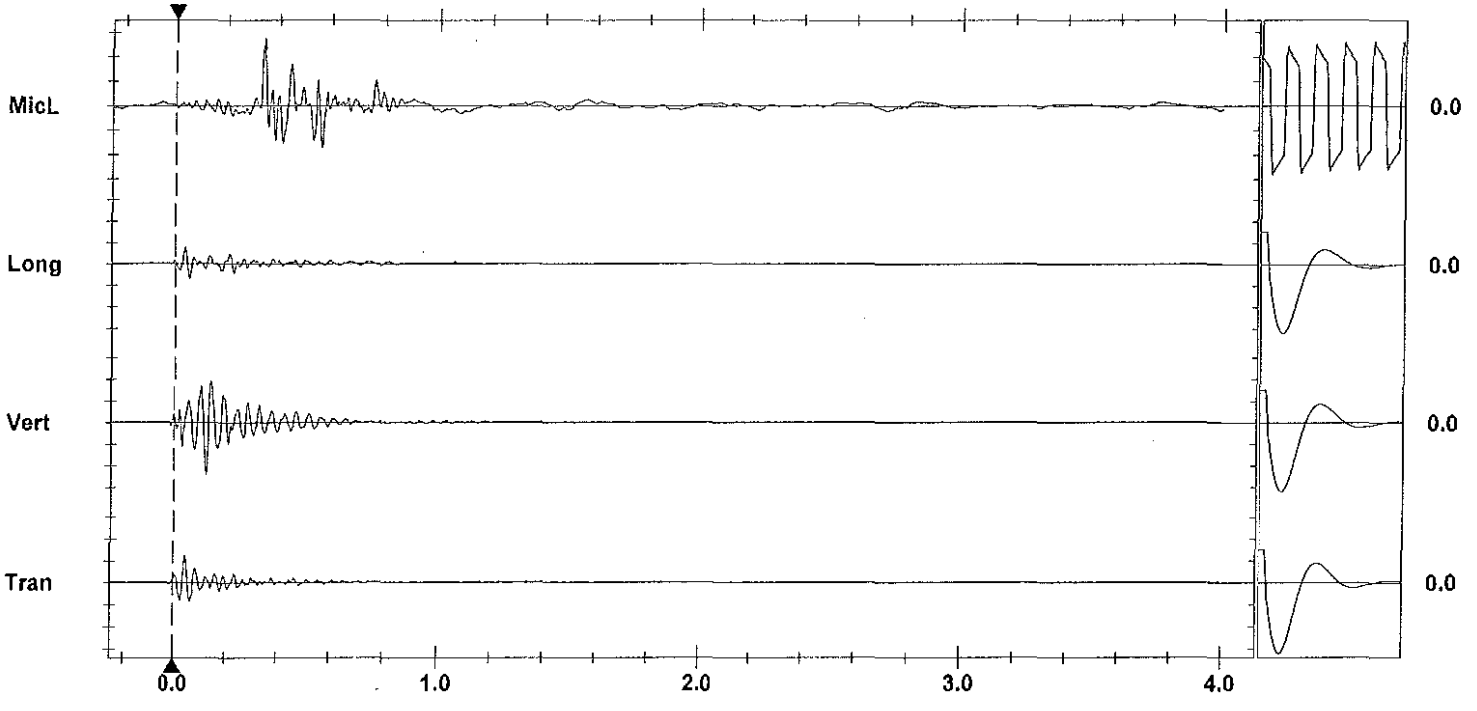
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00547 psi(L) at 0.342 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 742 mv)

	Tran	Vert	Long	
PPV	0.125	0.245	0.0750	in/s
ZC Freq	24	26	24	Hz
Time (Rel. to Trig)	0.047	0.126	0.039	sec
Peak Acceleration	0.0530	0.119	0.0398	g
Peak Displacement	0.00074	0.00151	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.246 in/s at 0.127 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 16:14:56 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2B6.GW0
Job Number:	1		

Notes
location:on main entrance slab
13050 Old Mission Road sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

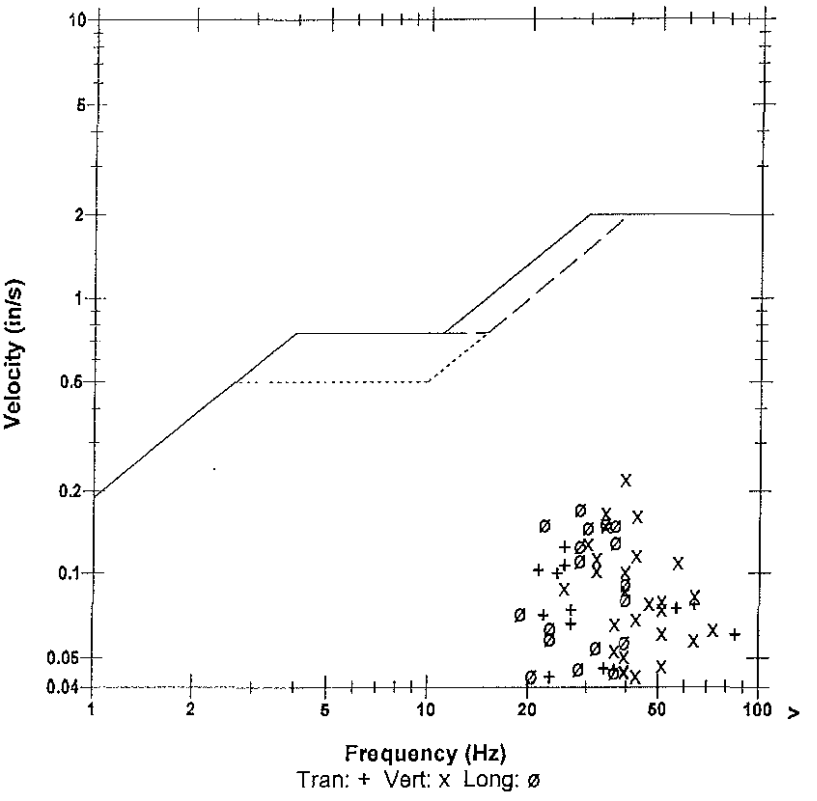
Post Event Notes

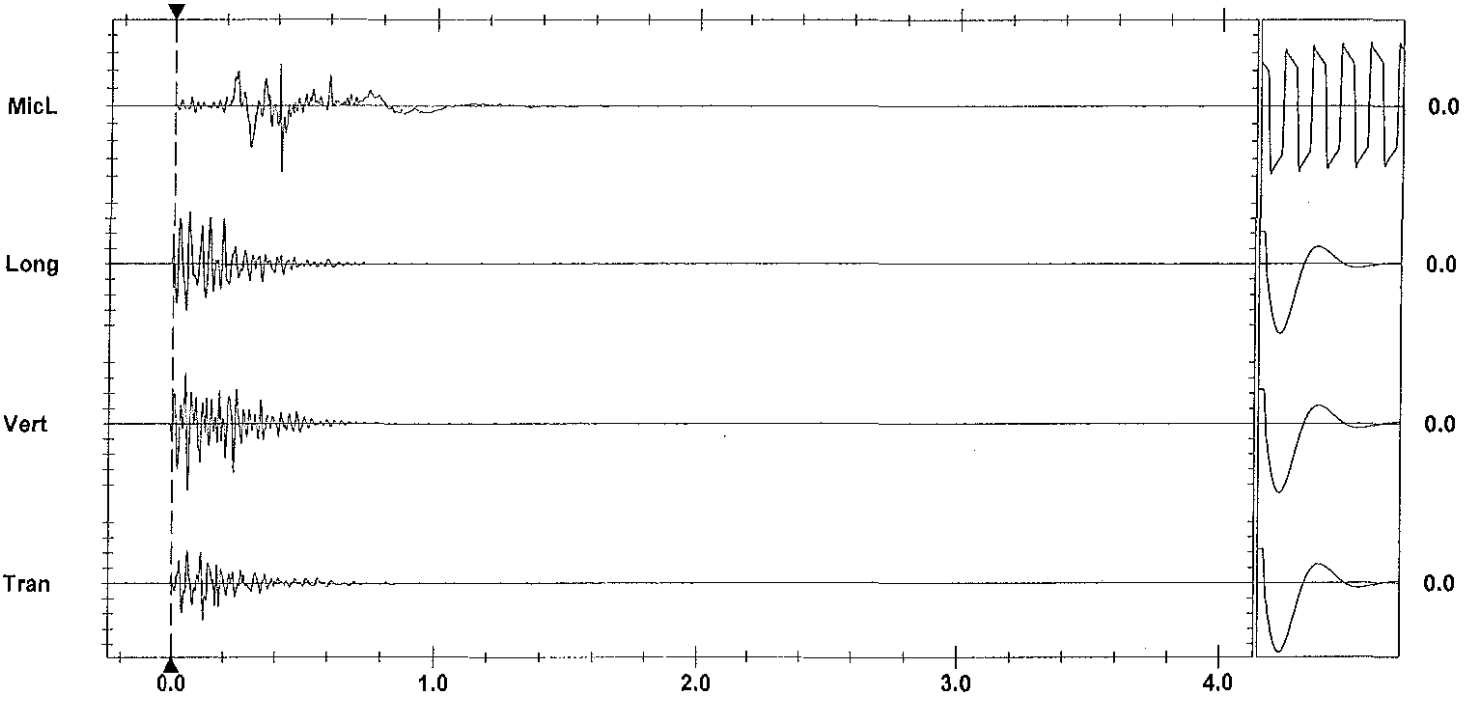
Microphone Linear Weighting
PSPL 0.00761 psi(L) at 0.414 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 688 mv)

	Tran	Vert	Long	
PPV	0.124	0.221	0.172	in/s
ZC Freq	26	39	28	Hz
Time (Rel. to Trig)	0.125	0.063	0.064	sec
Peak Acceleration	0.106	0.159	0.108	g
Peak Displacement	0.00059	0.00087	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.292 in/s at 0.063 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 12:00 PM
BLAST # MW-0042

HIGHWAY # 97
BLAST LOCATION AT: 129+20 - 129+30 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14 (10 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 14 & 11 & prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE HANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

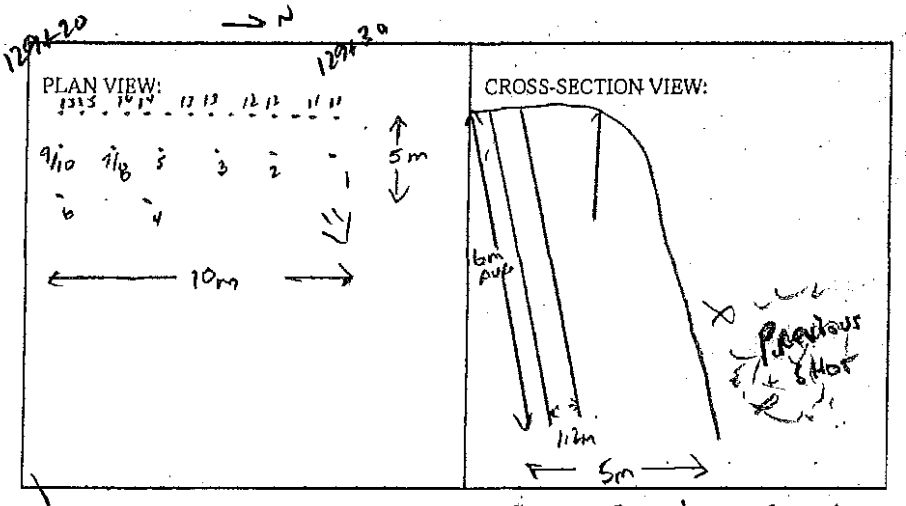
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.093 ips / 47 Hz
@ 13093 Cliffstone Crt - 0.173 ips / 47 Hz

Page 1489
FRA-2013-00119

STAB Holes - 1.5' ANFO/hole

BUFFER Holes - BOTTOM DECK - 4 CART 2"x 16" BLASTEX

- TOP DECK - 2 CART 2"x 16" BLASTEX

Primed w/ 1 CART 1"x 8" DYNAMITE

B/L Holes - 1 CART 2"x 16" DYNAMITE + 200gr det cord to 4' Below

Instantel

Event Report

Date/Time	Vert at 12:05:47 December 14, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2CP.LN0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

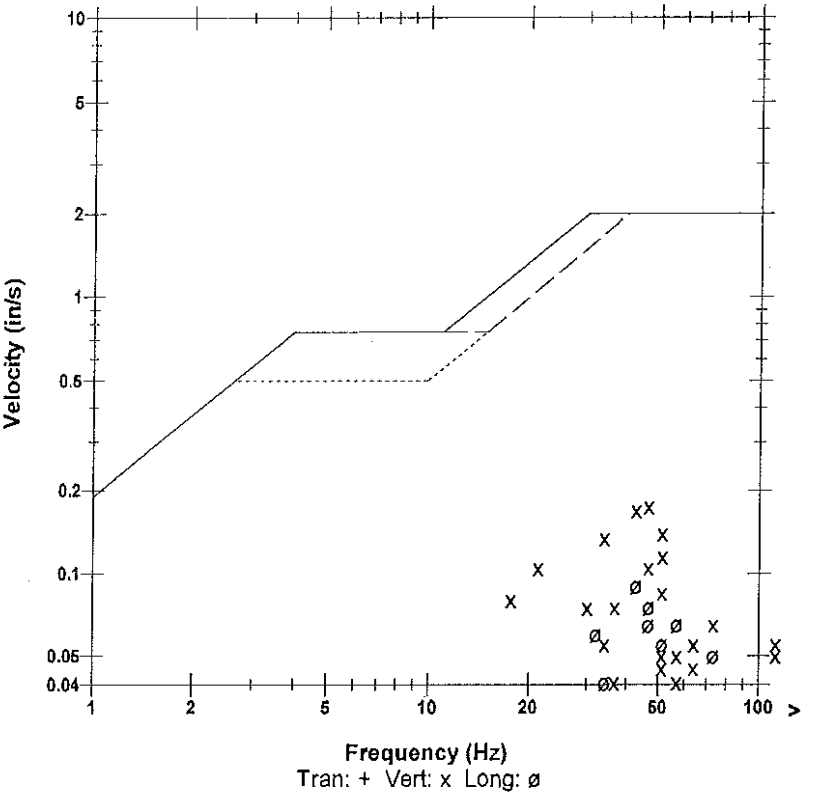
Extended Notes
Blast at stn 128

Post Event Notes

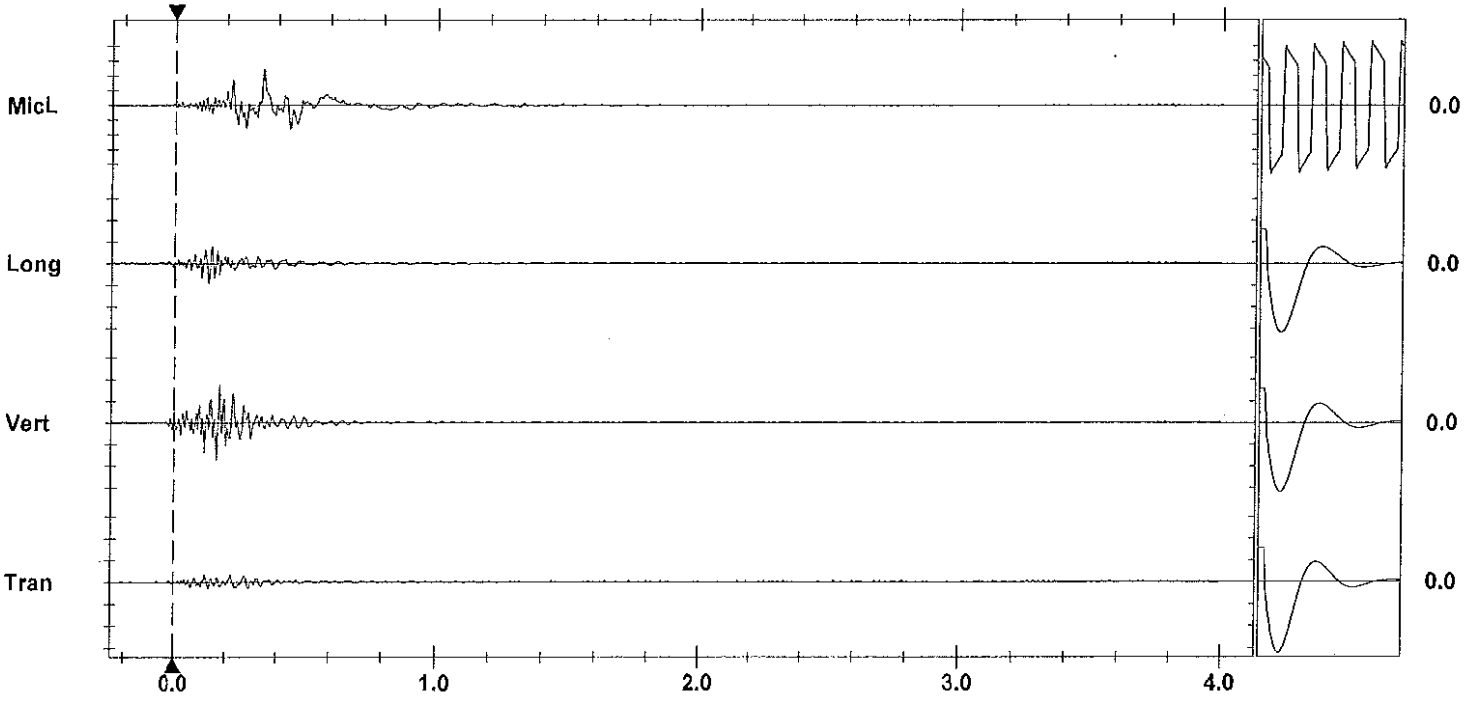
Microphone Linear Weighting
PSPL 0.00243 psi(L) at 0.344 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0350	0.175	0.0900	in/s
ZC Freq	32	47	43	Hz
Time (Rel. to Trig)	0.125	0.179	0.135	sec
Peak Acceleration	0.0265	0.133	0.0928	g
Peak Displacement	0.00018	0.00065	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.177 in/s at 0.167 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:05:55 December 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2CP.LV0
Job Number:	1		

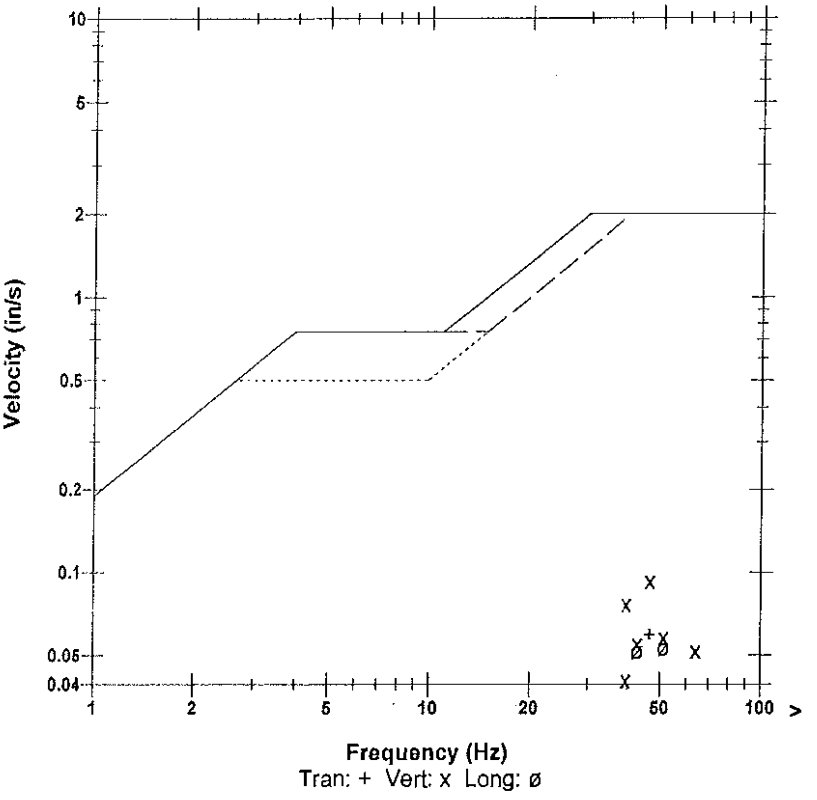
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

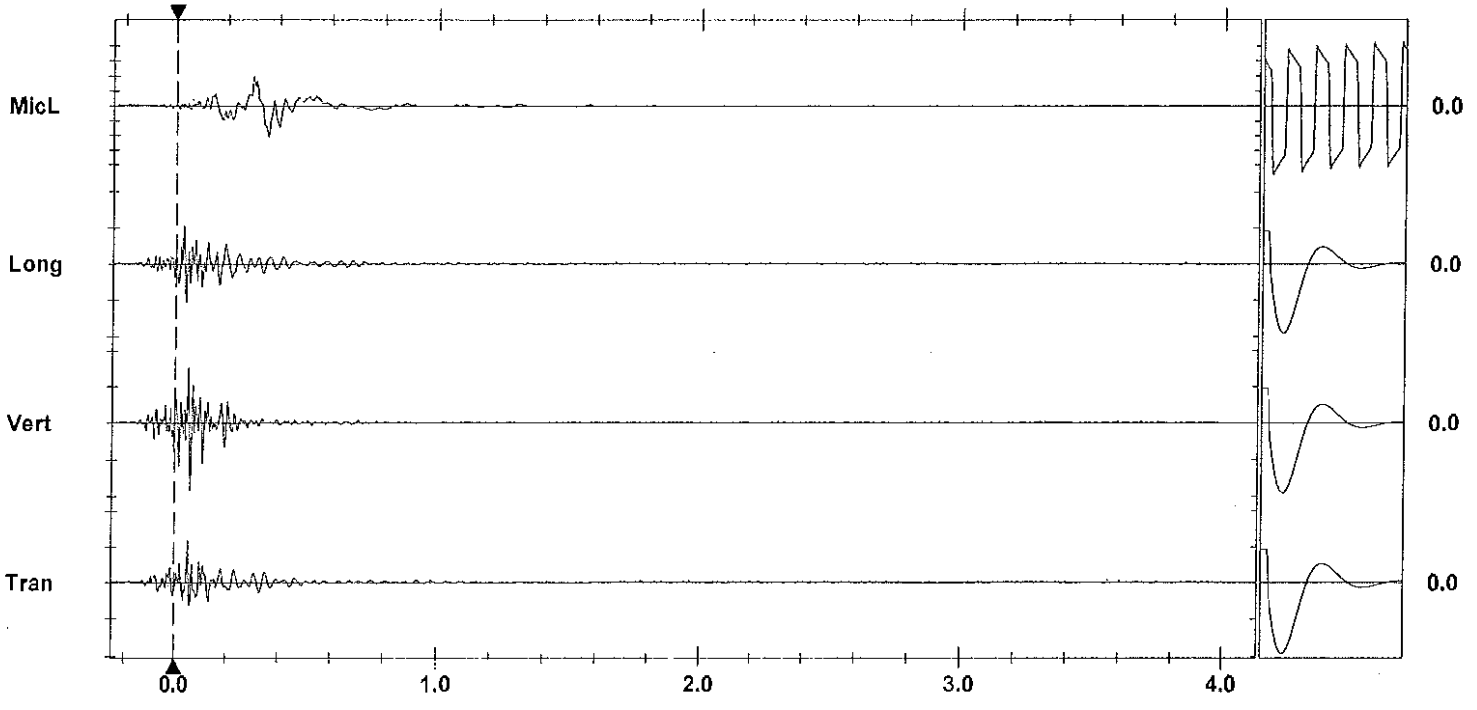
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0594	0.0931	0.0531	in/s
ZC Freq	47	47	51	Hz
Time (Rel. to Trig)	0.054	0.062	0.040	sec
Peak Acceleration	0.0563	0.0945	0.0481	g
Peak Displacement	0.00017	0.00032	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Microphone Linear Weighting
PSPL 0.00210 psi(L) at 0.355 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 731 mv)

Peak Vector Sum 0.100 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

1.5'-2' ANFO/Hole Primed w/ 1#B [illegible]

Instantel

Event Report

Date/Time	Vert at 13:20:15 December 14, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

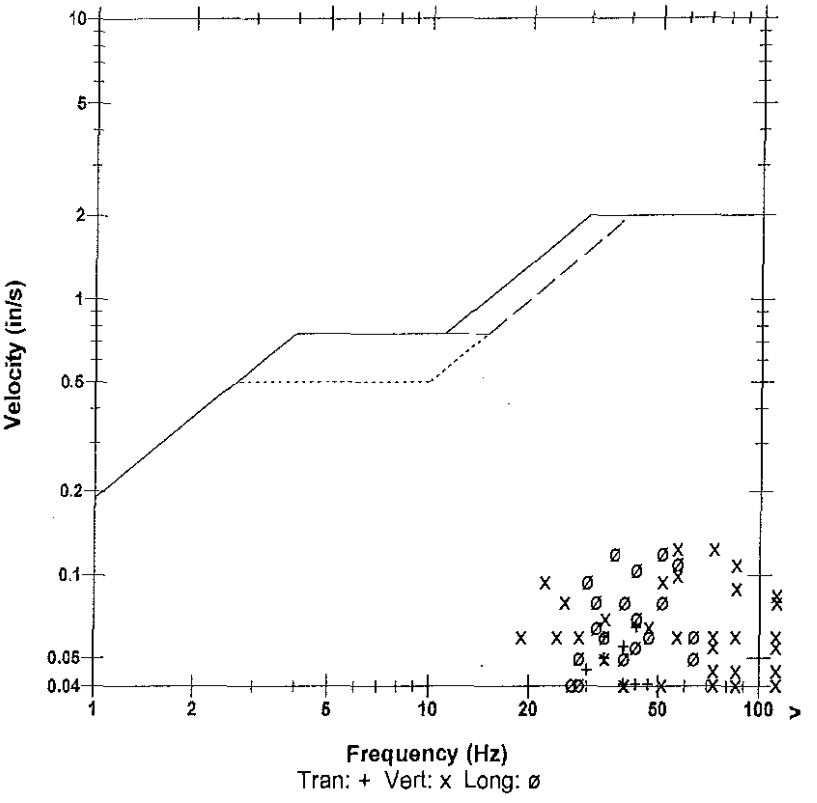
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2CT.1R0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

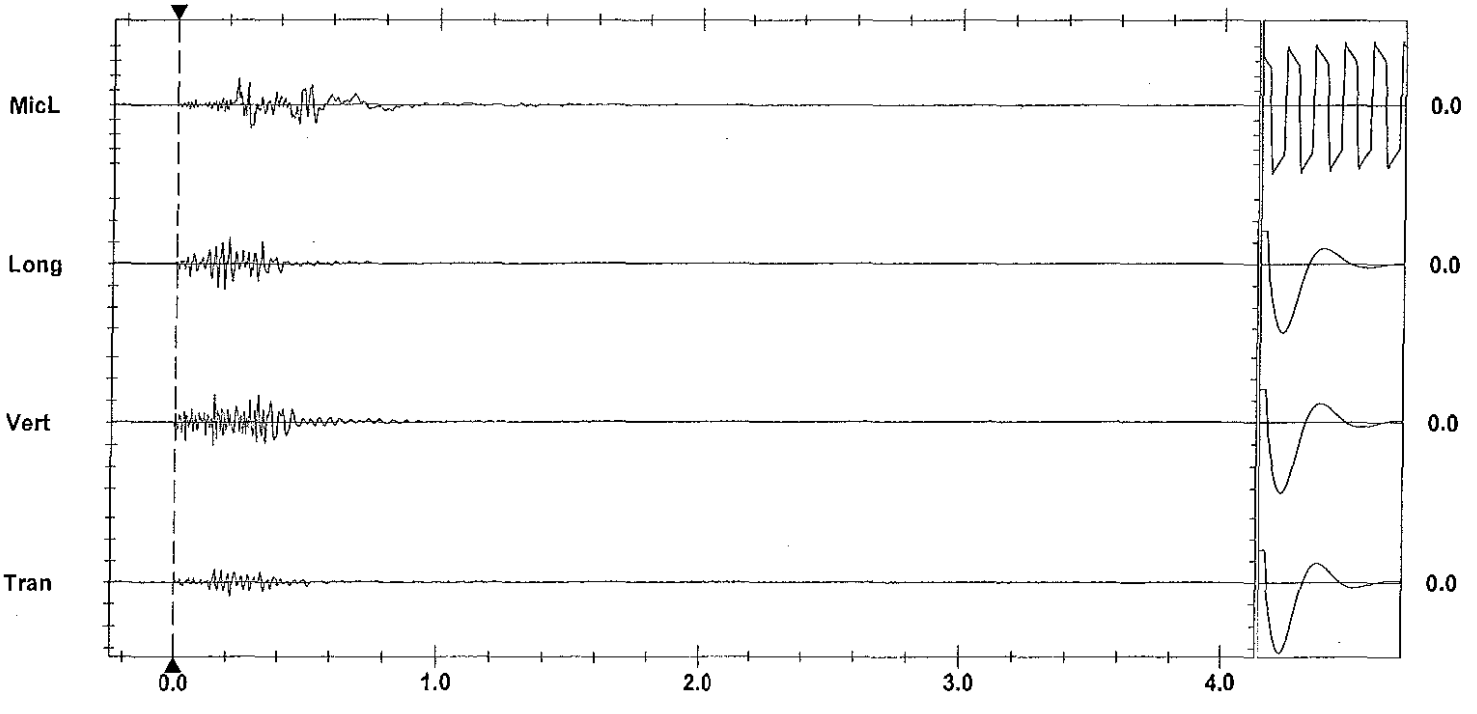
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00181 psi(L) at 0.234 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 714 mv)

	Tran	Vert	Long	
PPV	0.0650	0.125	0.120	in/s
ZC Freq	43	73	51	Hz
Time (Rel. to Trig)	0.219	0.152	0.186	sec
Peak Acceleration	0.0530	0.133	0.133	g
Peak Displacement	0.00025	0.00058	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.151 in/s at 0.152 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: December 28, 2011 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 13:20:23 December 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2CT.1Z0
Job Number:	1		

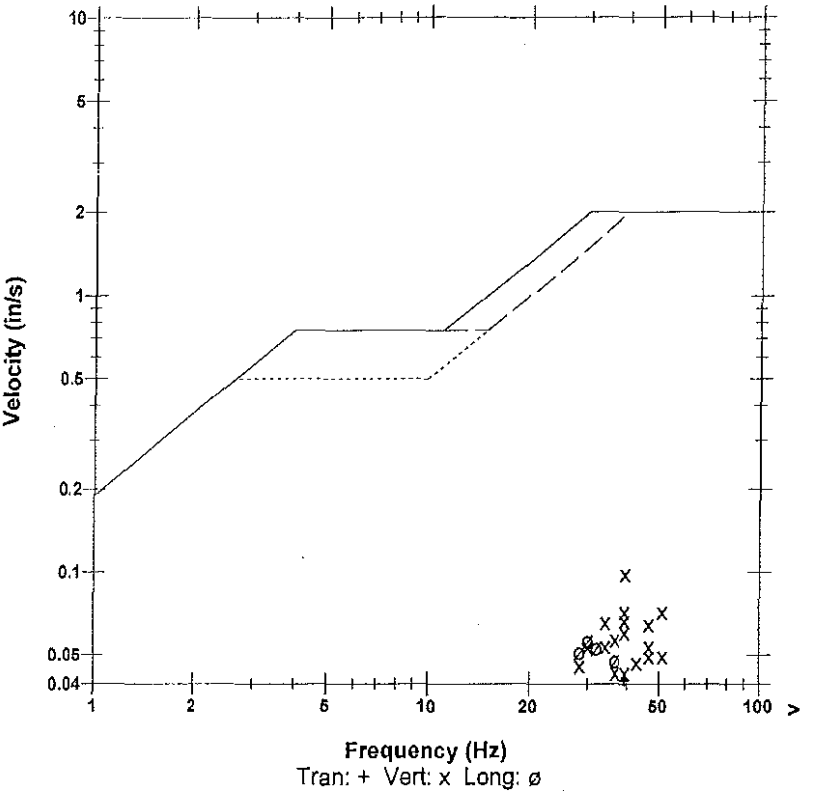
Notes

location:on rear	patio slab se crn
13167 Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

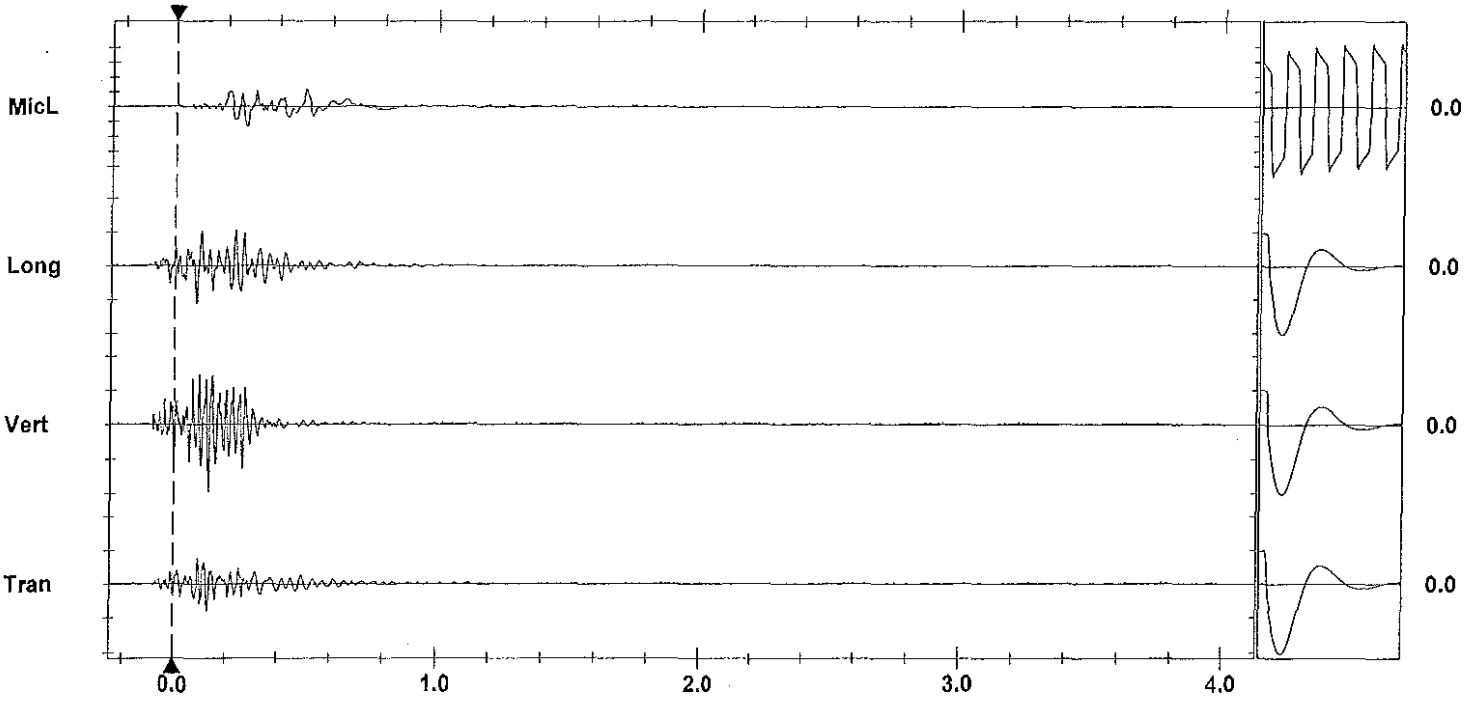


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00138 psi(L) at 0.273 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 722 mv)

	Tran	Vert	Long	
PPV	0.0406	0.0987	0.0562	in/s
ZC Freq	39	39	30	Hz
Time (Rel. to Trig)	0.136	0.136	0.084	sec
Peak Acceleration	0.0381	0.0878	0.0348	g
Peak Displacement	0.00017	0.00034	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.109 in/s at 0.136 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger =

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 2:39 PM
BLAST # MW-0044

HIGHWAY# 97
BLAST LOCATION AT: STN 129+13 - 129+20 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12 (8 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 12 bll / 3 pad
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 8 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

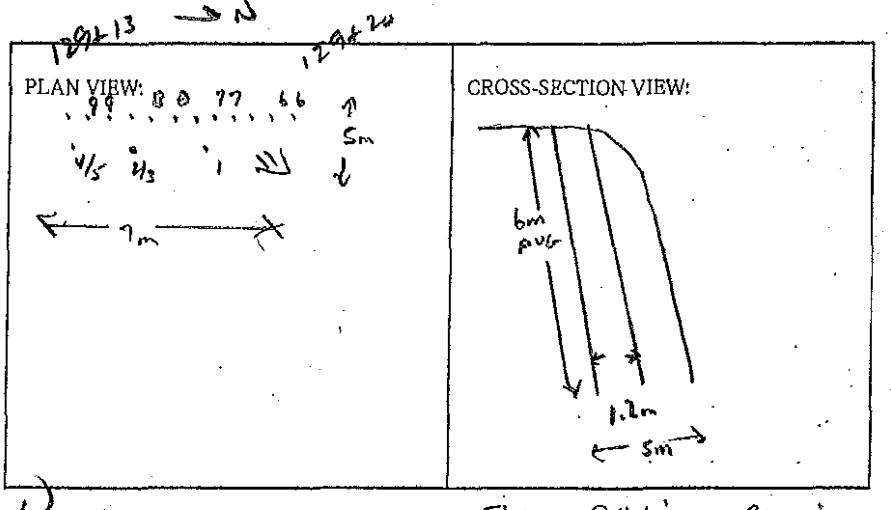
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cl; Alston cut - 0.059 ips / 47 Hz
@ 13093 cl; Alston cut - 0.131 ips / 51 Hz

Buffer Holes - Bottom Decks - 3-4 each 2x16 ignitex
- Top Decks - 1-2 each 2x16 blasting
Primed w/ 1½ dynamite

B/L Holes - 1 each 2x16 dynamite + 200 gr. det cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 14:39:48 December 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2CW.QC0
Job Number:	1		

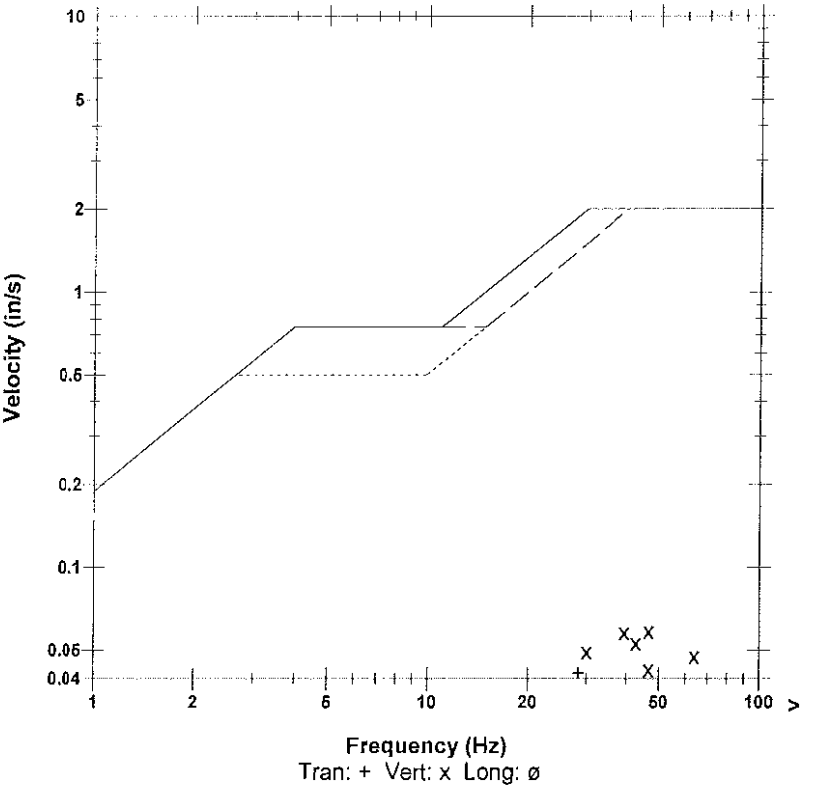
Notes

location:on rear	patio slab se crn
13167 Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129

Extended Notes

Post Event Notes

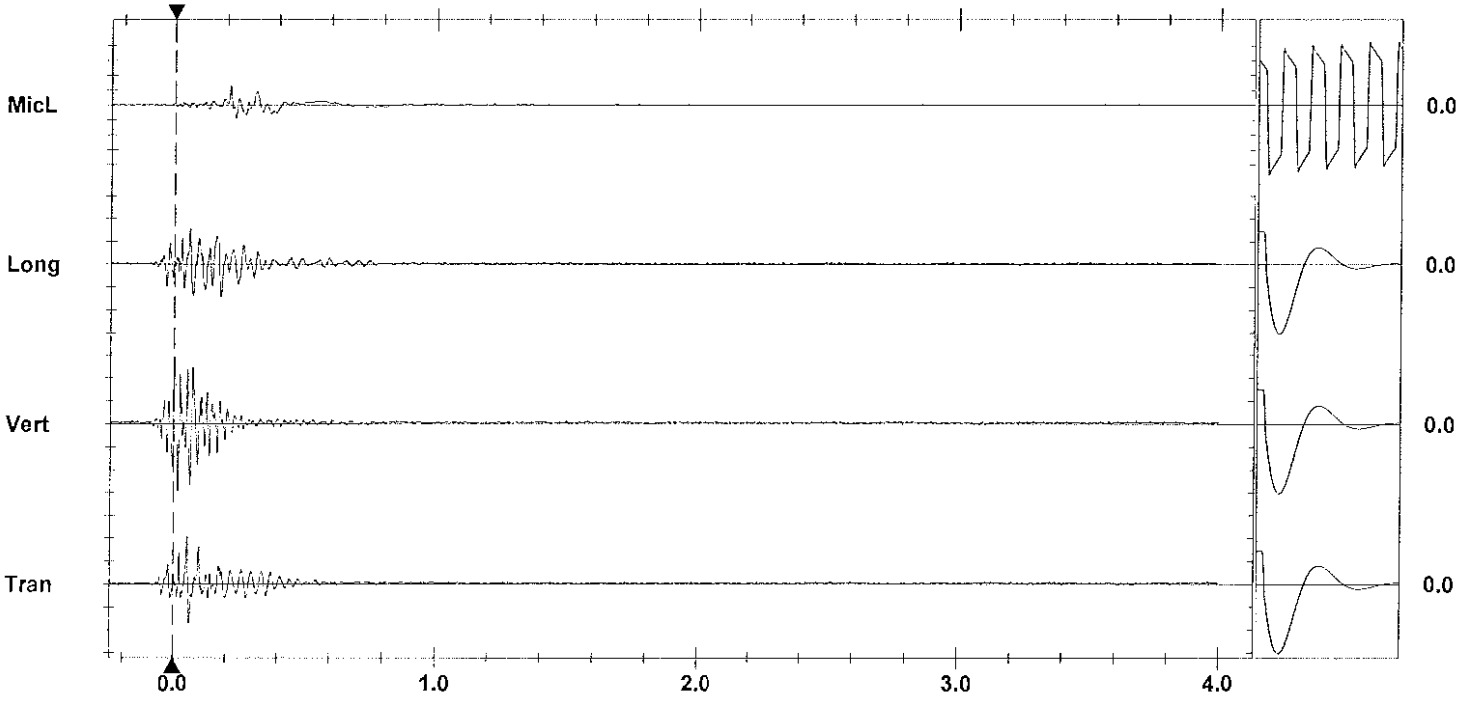
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.212 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 752 mv)

	Tran	Vert	Long	
PPV	0.0412	0.0587	0.0312	in/s
ZC Freq	28	47	26	Hz
Time (Rel. to Trig)	0.055	0.017	0.062	sec
Peak Acceleration	0.0331	0.0696	0.0249	g
Peak Displacement	0.00018	0.00023	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0666 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck

Trigger = ▶——————◀

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Instantel

Event Report

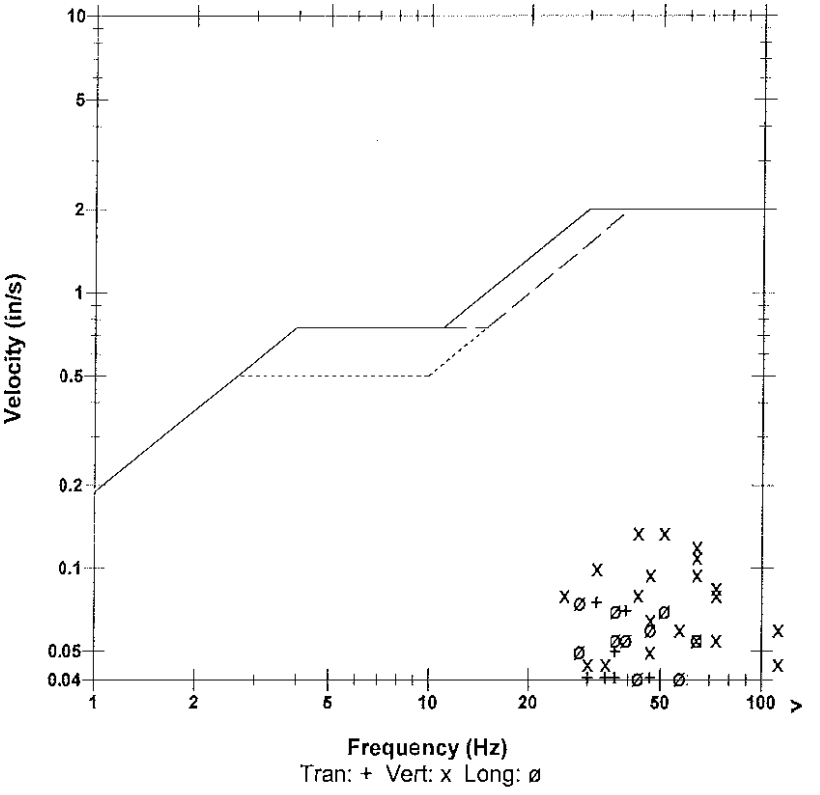
Date/Time	Vert at 14:39:40 December 14, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2CW.Q40

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

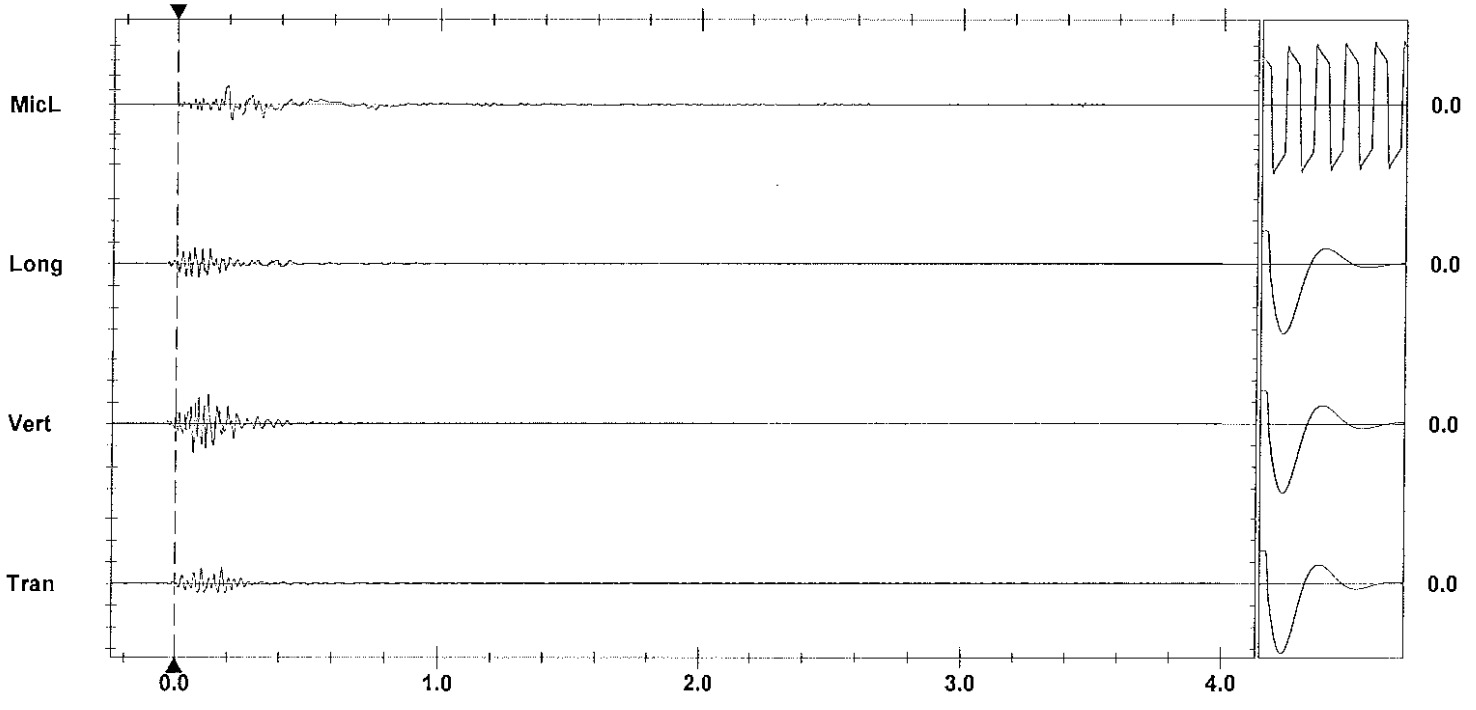
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.194 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 744 mv)

	Tran	Vert	Long	
PPV	0.0750	0.135	0.0750	in/s
ZC Freq	32	51	28	Hz
Time (Rel. to Trig)	0.181	0.069	0.069	sec
Peak Acceleration	0.0398	0.133	0.0663	g
Peak Displacement	0.00032	0.00050	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.154 in/s at 0.069 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 3:45 PM
BLAST # MW-0045

HIGHWAY # 97
BLAST LOCATION AT: Sta 129+00 - 129+10 (top bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

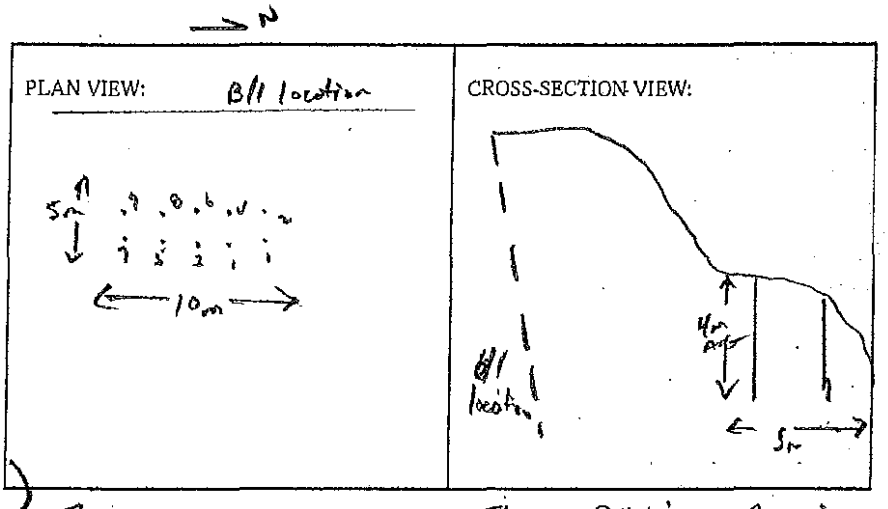
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13.67 Diffaston Cat - 0.067 ips/39Hz
@ 13.93 Diffaston Cat - 0.21 ips/57Hz

2'-3' ANFO / Hole Primed w/ 1 each 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 15:46:23 December 14, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

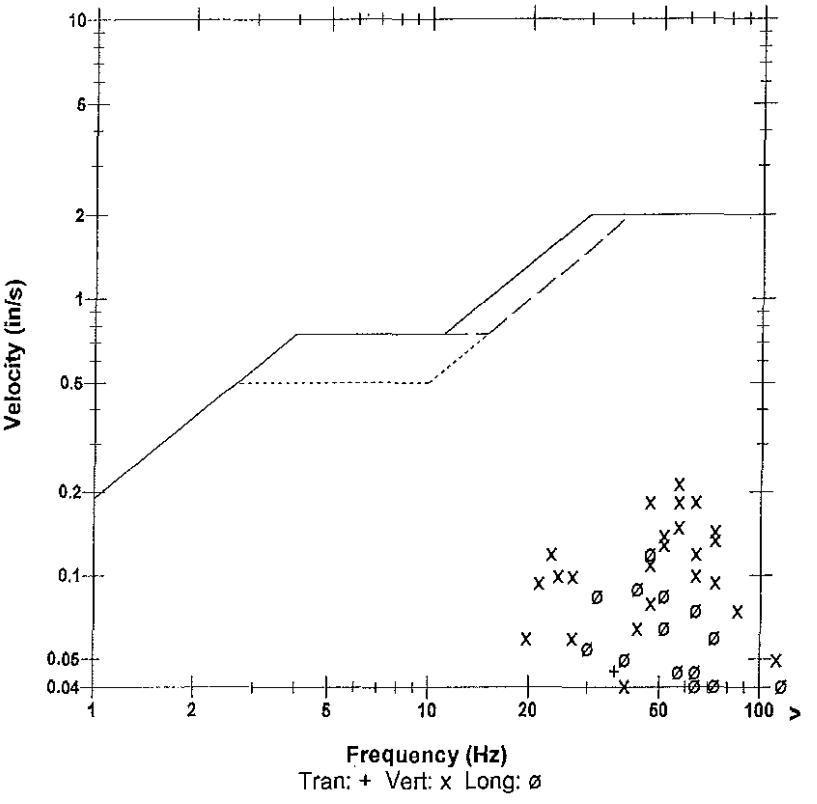
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2CZ.TB0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

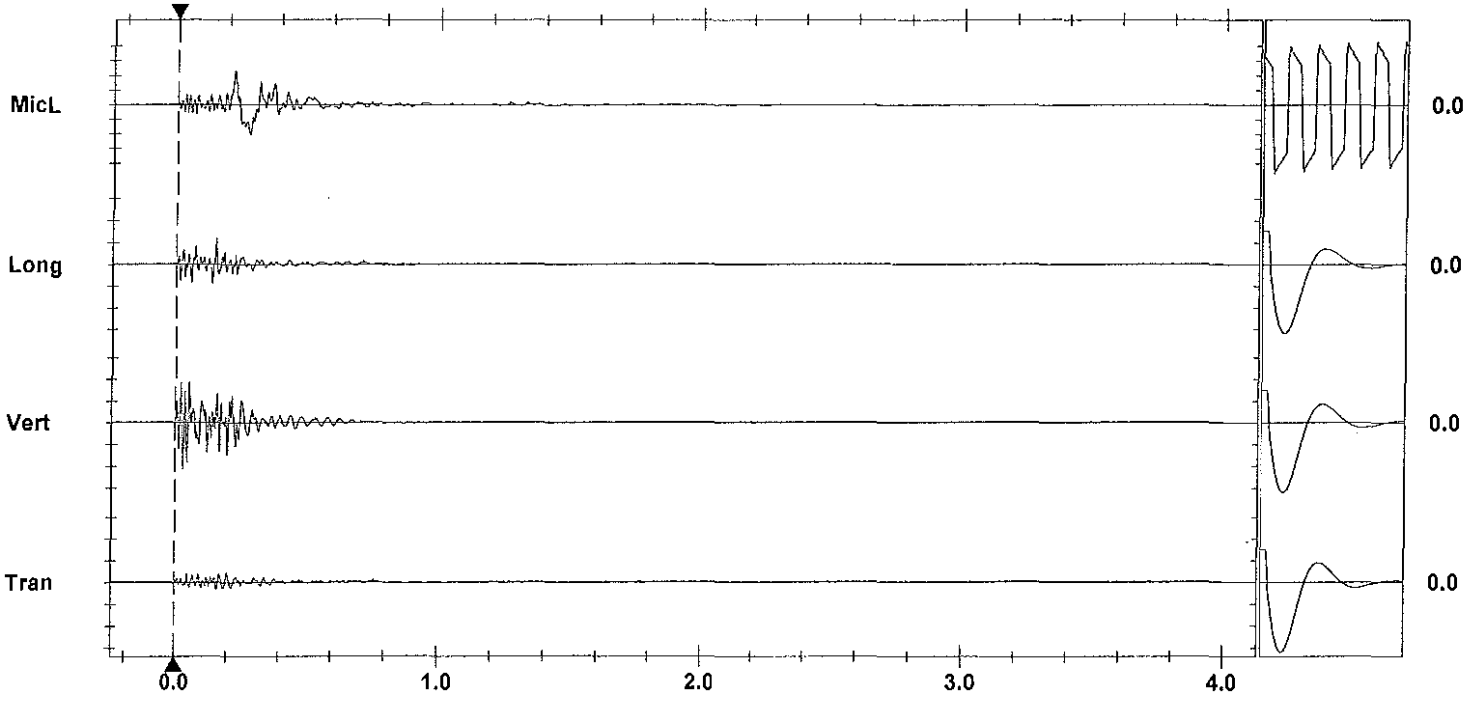
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00232 psi(L) at 0.222 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 708 mv)

	Tran	Vert	Long	
PPV	0.0450	0.215	0.120	in/s
ZC Freq	37	57	47	Hz
Time (Rel. to Trig)	0.204	0.031	0.155	sec
Peak Acceleration	0.0398	0.212	0.0795	g
Peak Displacement	0.00018	0.00068	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.215 in/s at 0.031 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 15:46:31 December 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2CZ.TJ0
Job Number:	1		

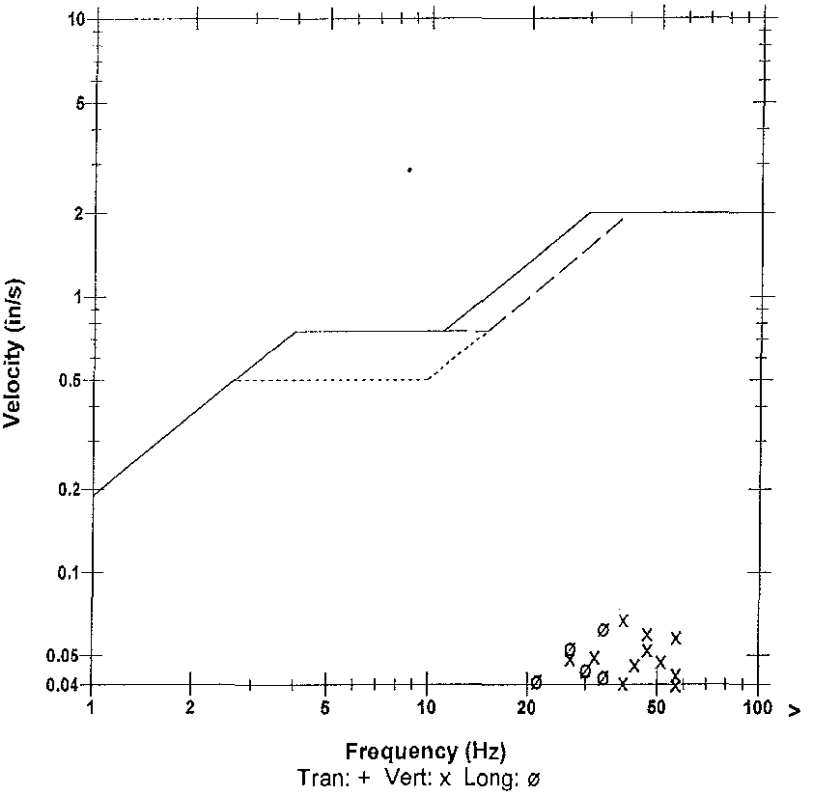
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

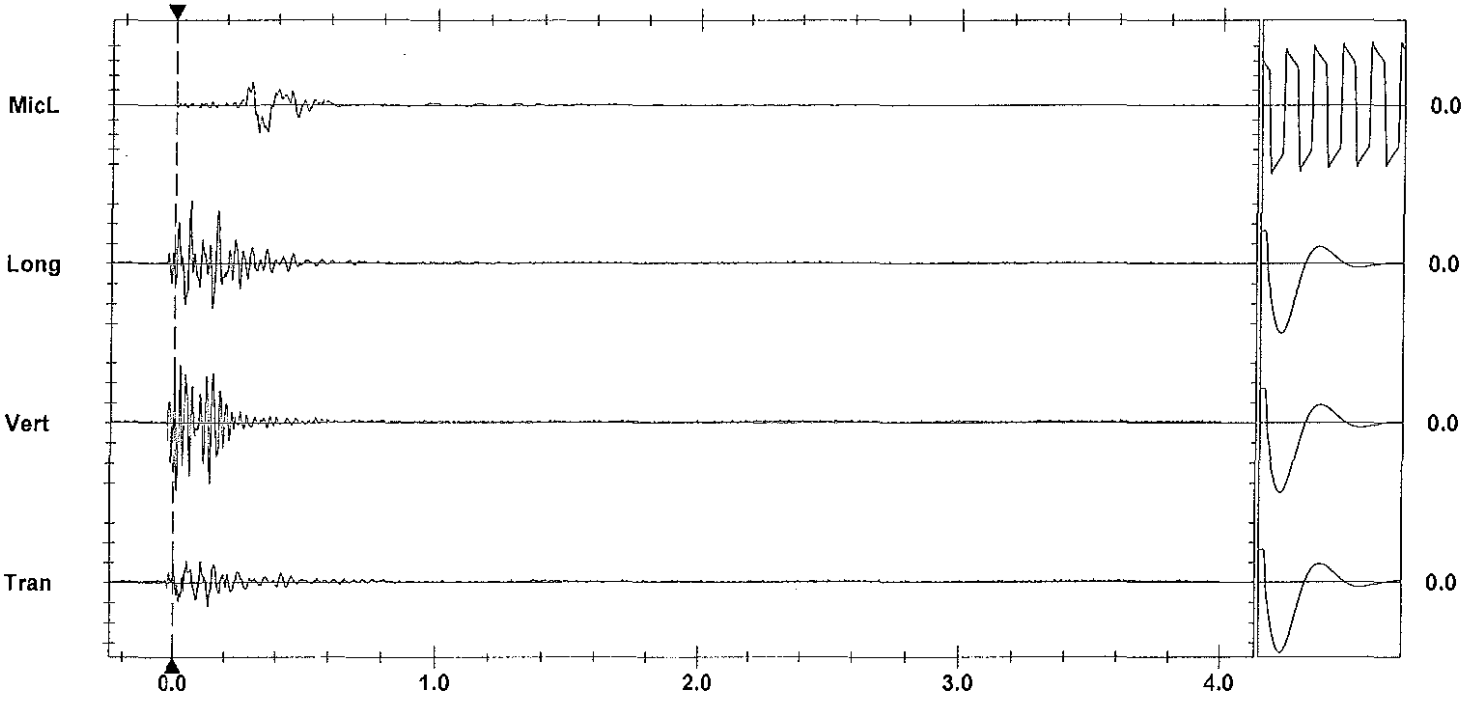
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.324 sec
ZC Freq	7.9 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 751 mv)

	Tran	Vert	Long	
PPV	0.0244	0.0675	0.0625	in/s
ZC Freq	22	39	34	Hz
Time (Rel. to Trig)	0.139	0.012	0.062	sec
Peak Acceleration	0.0199	0.0679	0.0331	g
Peak Displacement	0.00020	0.00027	0.00030	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0790 in/s at 0.013 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Seaweed
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 10:21 AM
BLAST # MW-0046

HIGHWAY# 97
BLAST LOCATION AT: 1294+08 - 1294+13 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ~ old material

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10 (9 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 10 H / 2 Burden
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Primacord Det. + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 210 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

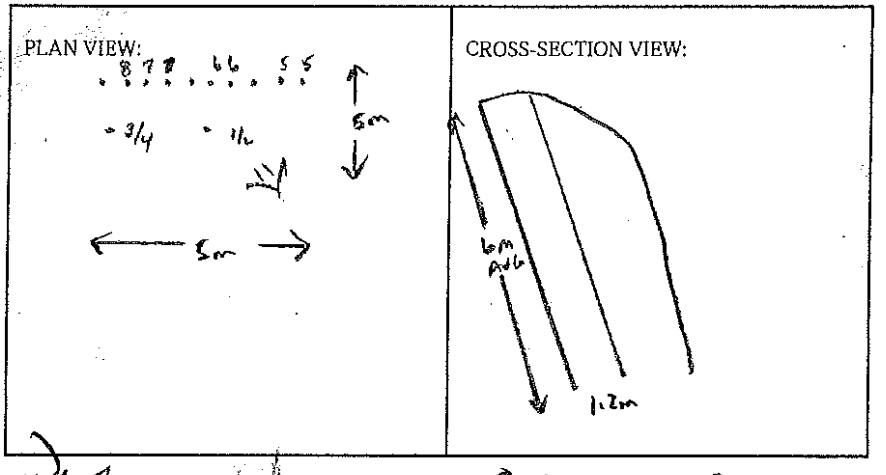
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE NB 120 CAPACITY 8 Decks

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Seaweed COMPANY SIERRA D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliff base ext. 0.057 ips/57Hz
@ 13093 cliff base ext. 0.181 ips/ 47Hz

BUFFER HOLES - BOTTOM ROWS - 3-4 cans 2x16" BLASTEX

- TOP ROWS: 1-2 cans 2x16 BLASTEX

1"x8" DYNAMITE Primers

B/L HOLES - 1 can 2"x16" DYNAMITE + 200g. det cord to 4' collar

Instantel

Event Report

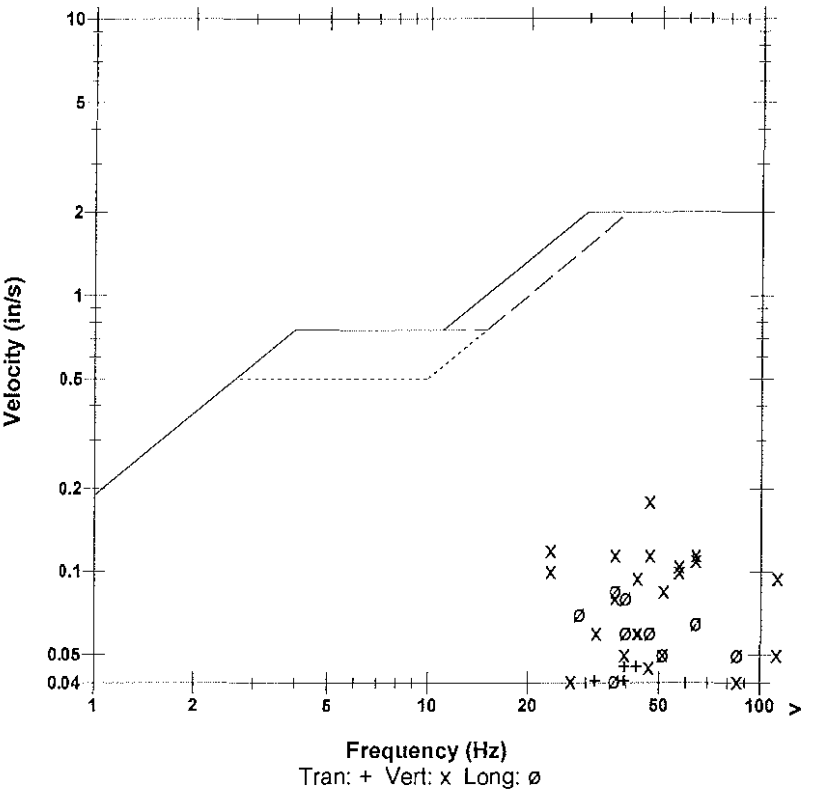
Date/Time	Vert at 10:20:56 December 15, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2EF.EW0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

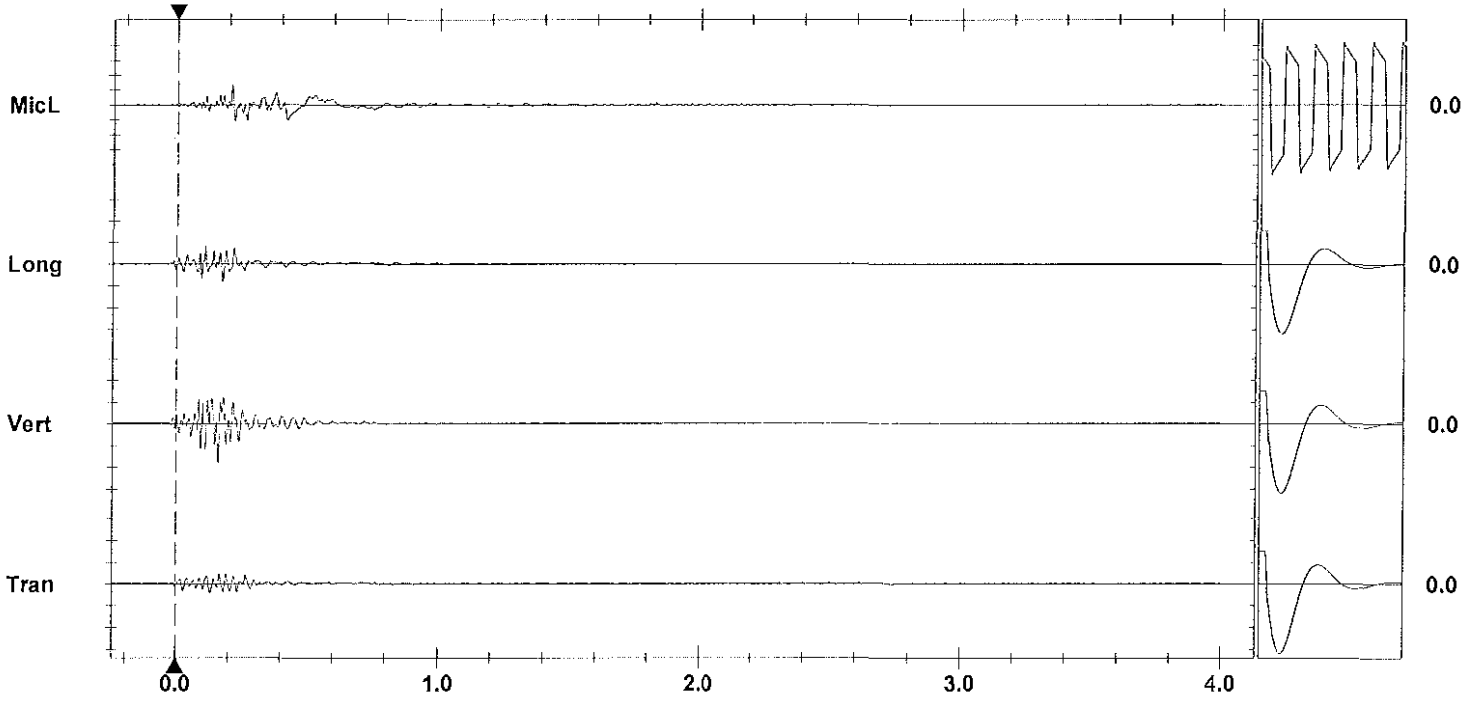
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0450	0.180	0.0850	in/s
ZC Freq	43	47	37	Hz
Time (Rel. to Trig)	0.167	0.160	0.111	sec
Peak Acceleration	0.0398	0.133	0.0795	g
Peak Displacement	0.00019	0.00082	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.209 sec
ZC Freq 43 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 679 mv)

Peak Vector Sum 0.180 in/s at 0.160 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 10:21:05 December 15, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2EF.F50
Job Number:	1		

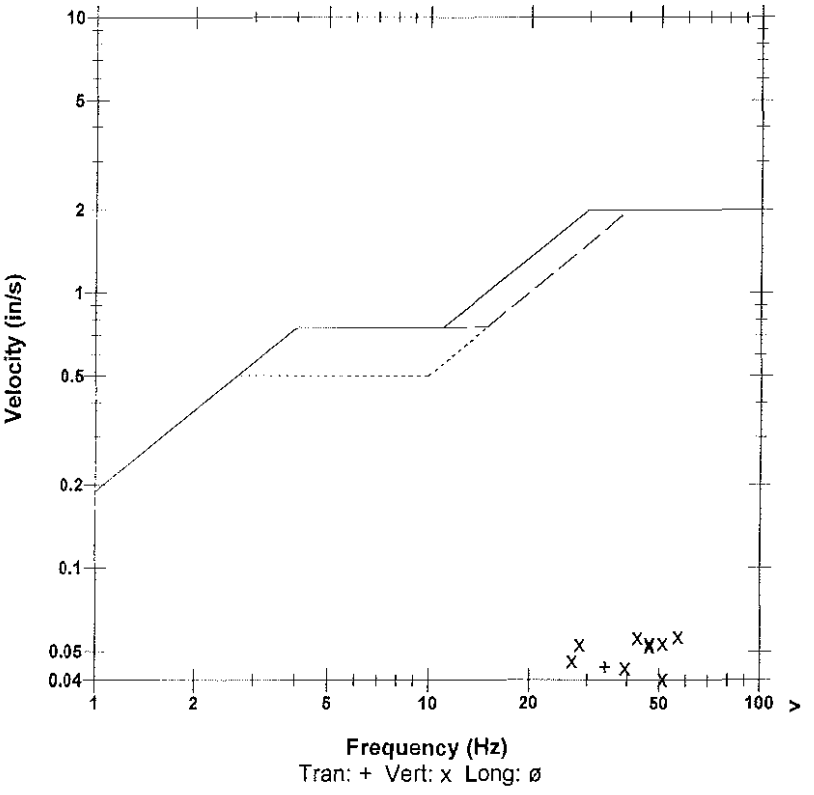
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

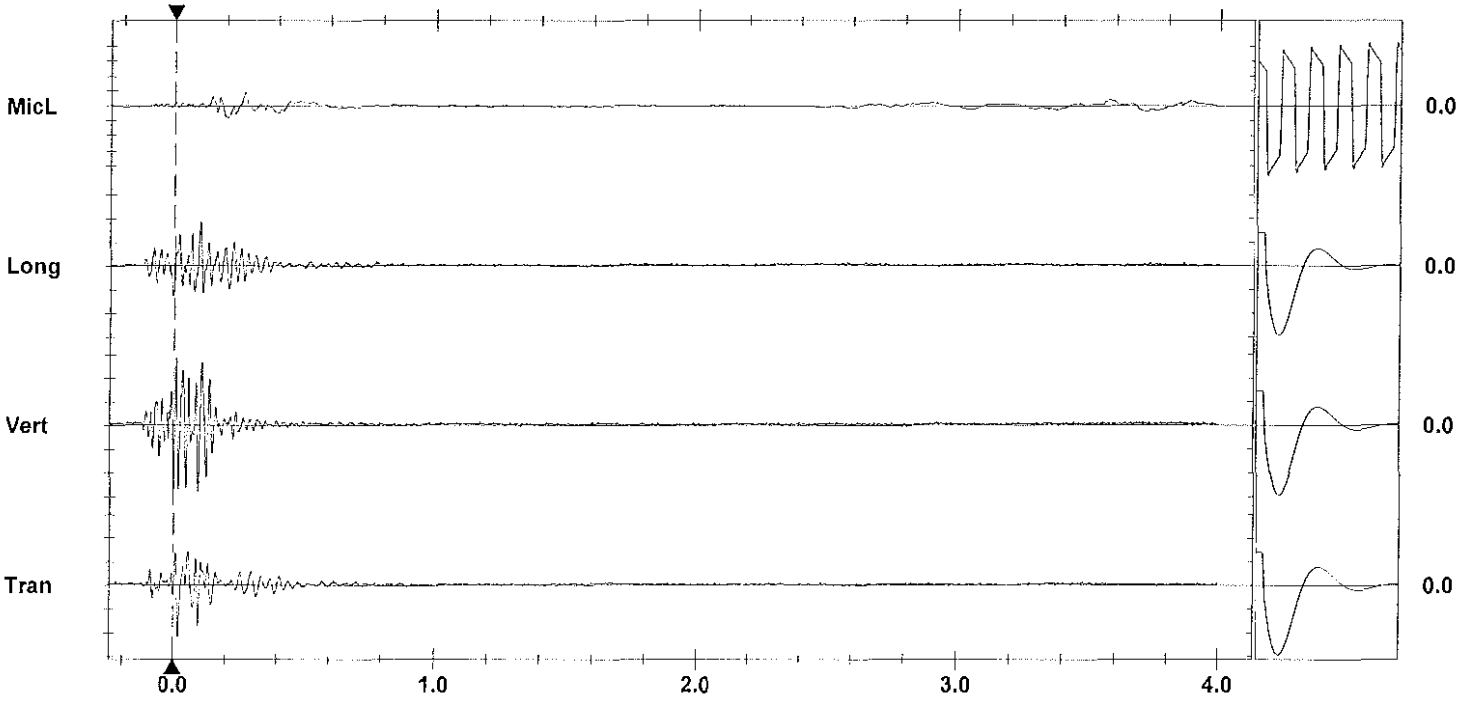
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00094 psi(L) at 0.271 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 715 mv)

	Tran	Vert	Long	
PPV	0.0437	0.0569	0.0369	in/s
ZC Freq	34	57	34	Hz
Time (Rel. to Trig)	0.020	0.010	0.099	sec
Peak Acceleration	0.0315	0.0597	0.0249	g
Peak Displacement	0.00018	0.00026	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0744 in/s at 0.098 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — ◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec. 15/11 11:10 AM
BLAST # MW-0047

HIGHWAY# 97
BLAST LOCATION AT: SRW 129+05 - 129+08 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Chat matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 (3 loaded)
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6.7 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 56 11/6 AMOD
HOLE DIAMETER 76 (mm)
HOLE SPACING 5 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

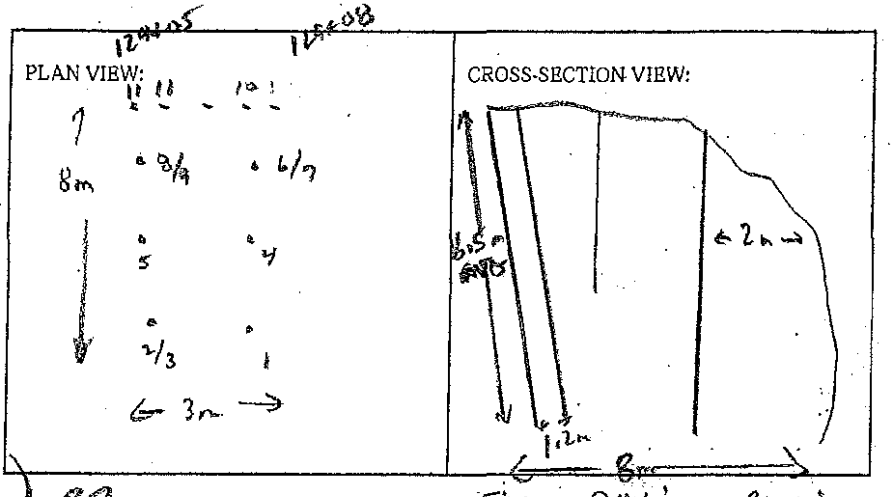
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Strongest @ 13169 cliffstone Cut: 0.052 ipd/ 47Hz
C 13093 cliffstone Cut: 0.14 ipd/ 43Hz

PROD. Holes - Bottom Decks - 4'-5' ANFO

- Top Deck - 1.5' ANFO

STAB Holes - 1.5' ANFO

Buffer Holes - Bottom Decks - 4 each 2"x16" Blastex

- Top Decks - 2 each 2"x16" Blastex

1"x8" Dynamite Primers

BL Holes - 1 each 2"x16" Dynamite + 200 grain det. cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 11:09:59 December 15, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

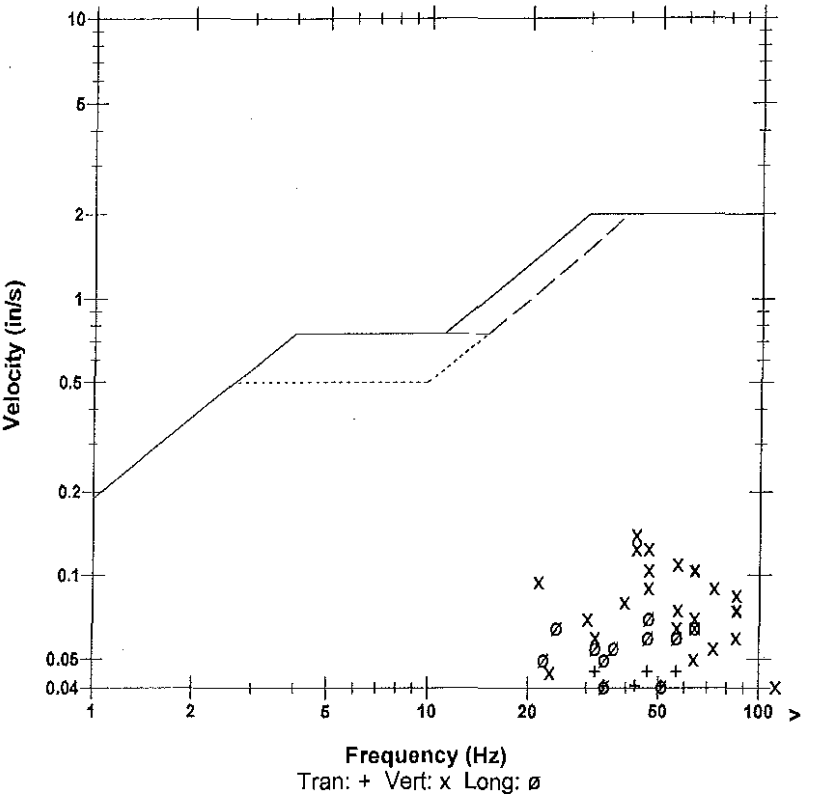
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2EH.ON0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

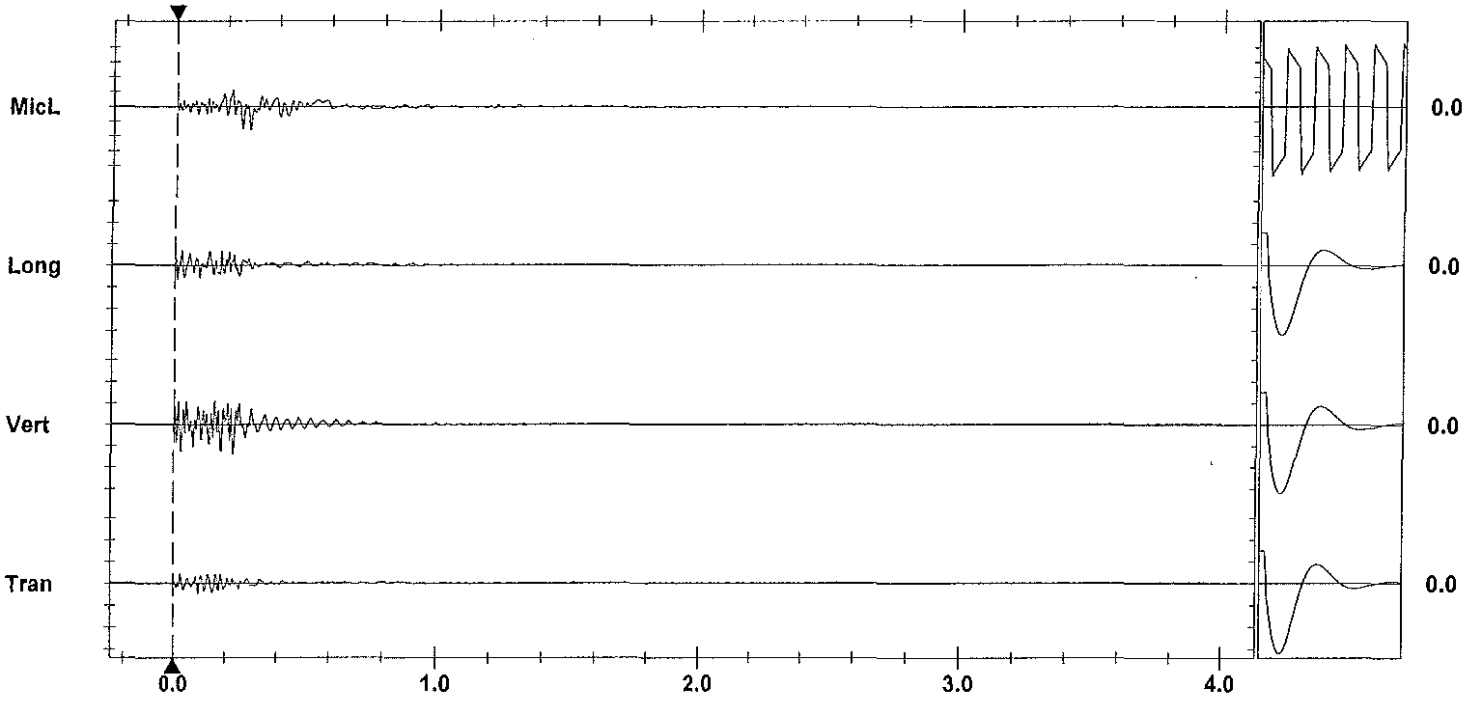
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00160 psi(L) at 0.287 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 720 mv)

	Tran	Vert	Long	
PPV	0.0450	0.140	0.0700	in/s
ZC Freq	47	43	47	Hz
Time (Rel. to Trig)	0.029	0.229	0.026	sec
Peak Acceleration	0.0530	0.119	0.0795	g
Peak Displacement	0.00021	0.00058	0.00034	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 0.145 in/s at 0.026 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:10:08 December 15, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2EH.OW0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

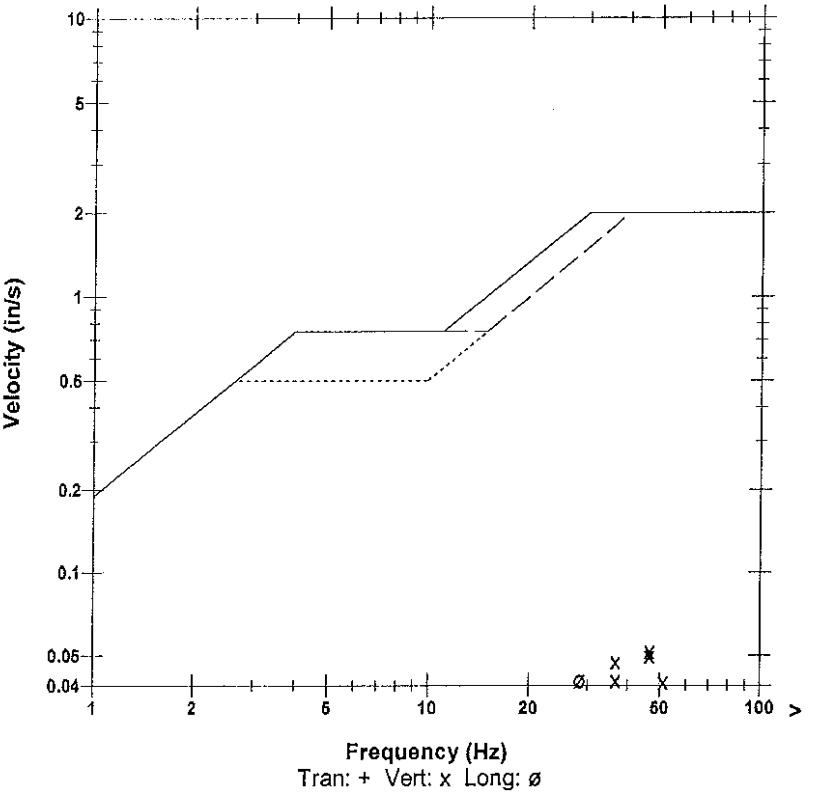
Post Event Notes

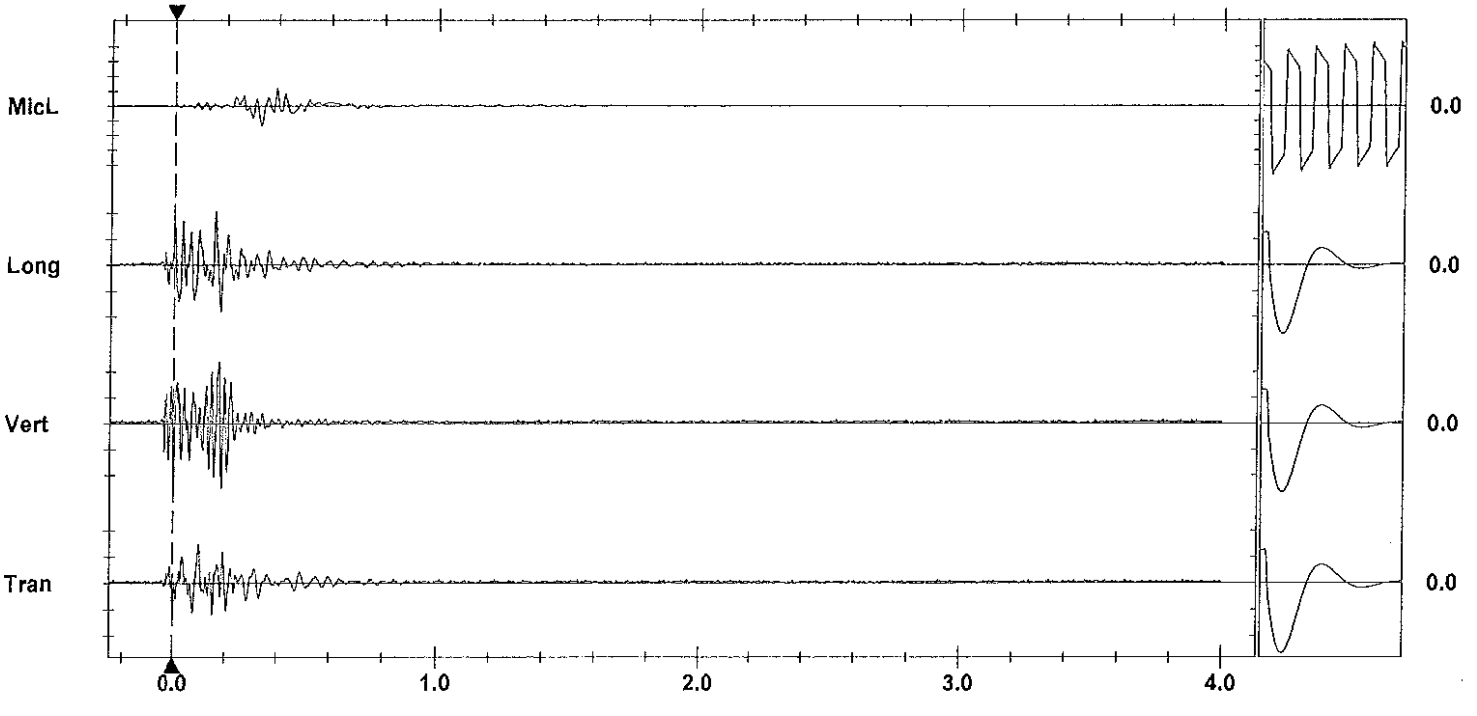
Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.332 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 723 mv)

	Tran	Vert	Long	
PPV	0.0294	0.0519	0.0412	in/s
ZC Freq	21	47	28	Hz
Time (Rel. to Trig)	0.102	0.001	0.161	sec
Peak Acceleration	0.0215	0.0464	0.0232	g
Peak Displacement	0.00018	0.00023	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0671 in/s at 0.001 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 12:20 PM
BLAST # MW-0048

HIGHWAY# 97
BLAST LOCATION AT: 128+95 - 129+05 (100 Stream)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Carbonate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 85 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES None
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

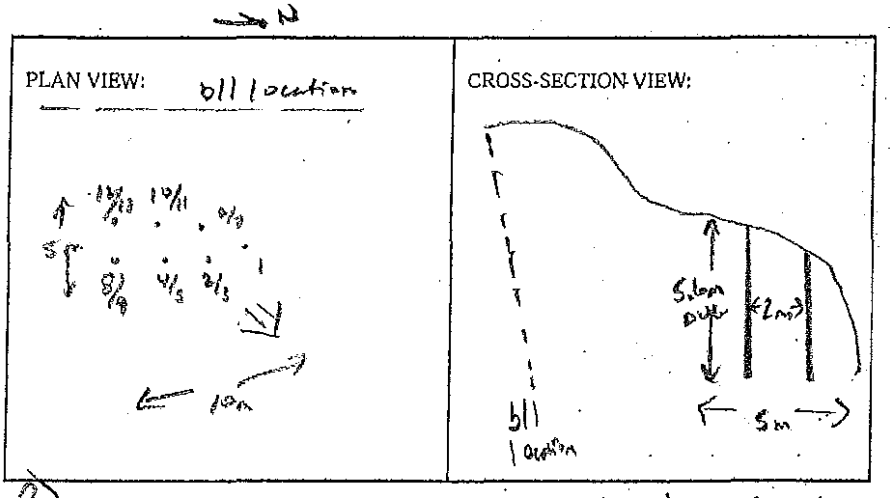
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 18167 Cliffside Cres. 0.080 ips/ 43Hz
@ 13093 Cliffside Cr. + Dribipel 51Hz

BOTTOM DECK - 3'-4' ANFO
TOP DECK - 1' ANFO
} primed w/ 1 each 1" x 8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 12:19:54 December 15, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2EK.X60

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

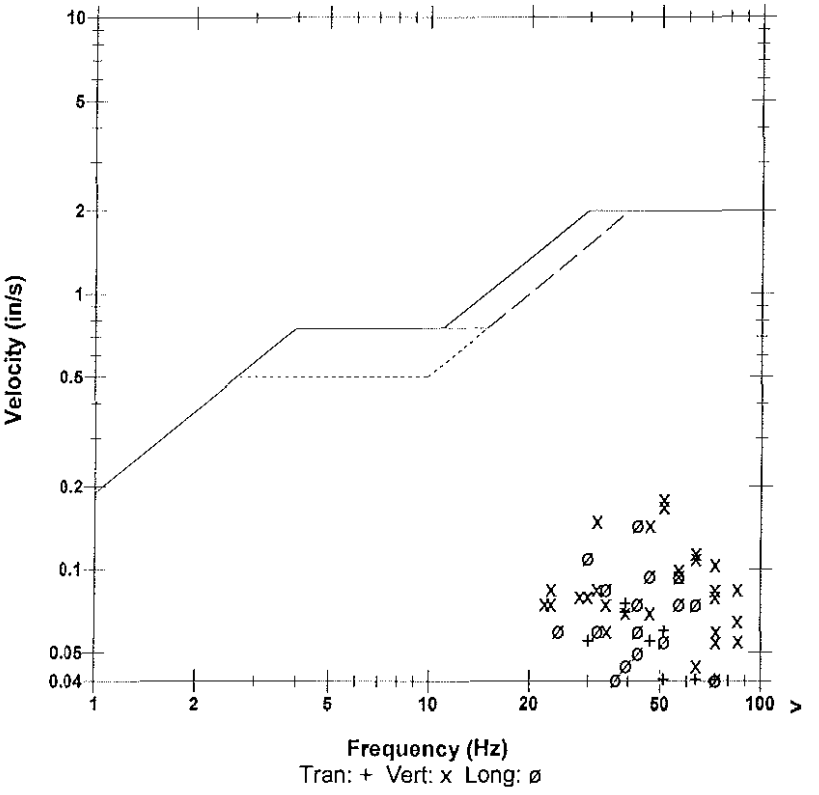
Extended Notes
Blast at stn 128

Post Event Notes

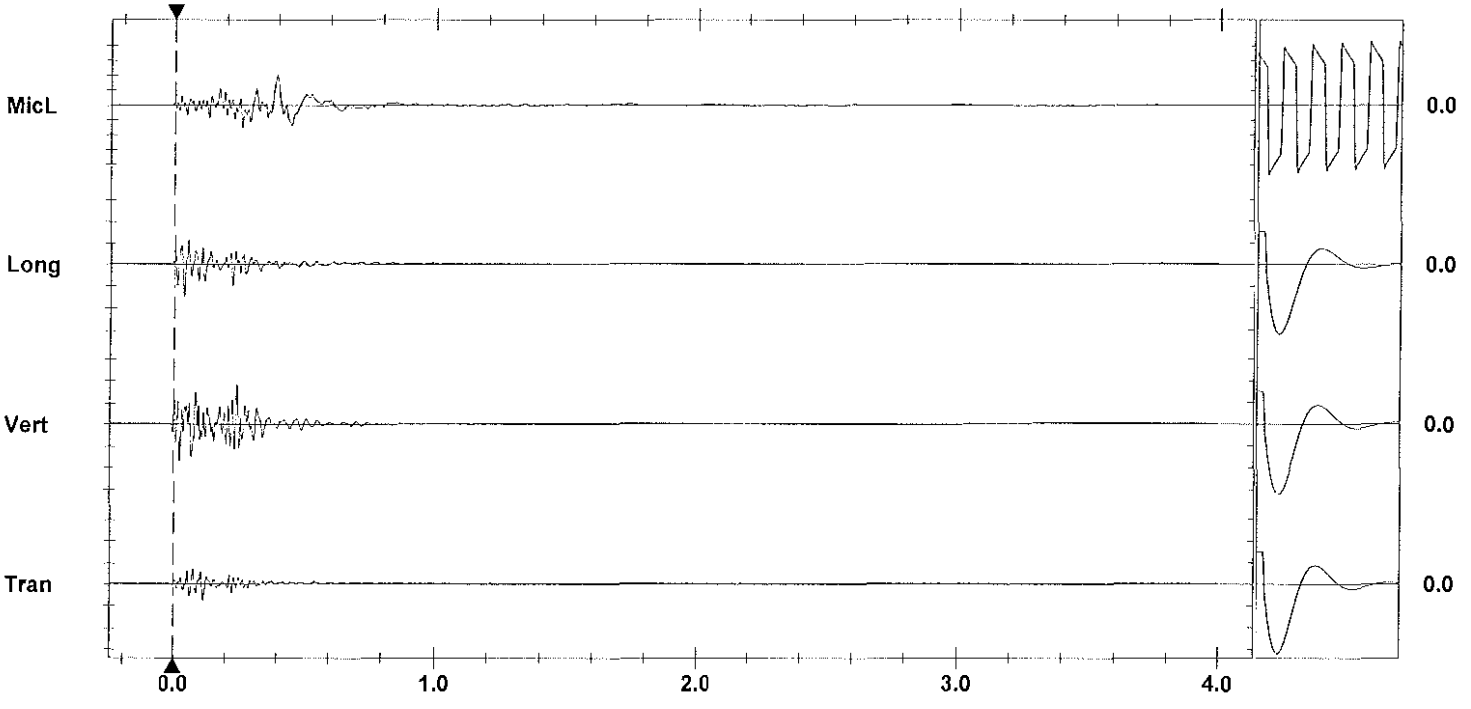
Microphone Linear Weighting
PSPL 0.00199 psi(L) at 0.395 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 657 mv)

	Tran	Vert	Long	
PPV	0.0750	0.180	0.145	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.118	0.244	0.039	sec
Peak Acceleration	0.0530	0.159	0.0928	g
Peak Displacement	0.00029	0.00078	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.190 in/s at 0.025 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ — — —◀

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Instantel

Event Report

Date/Time	Vert at 12:20:04 December 15, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2EK.XG0
Job Number:	1		

Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

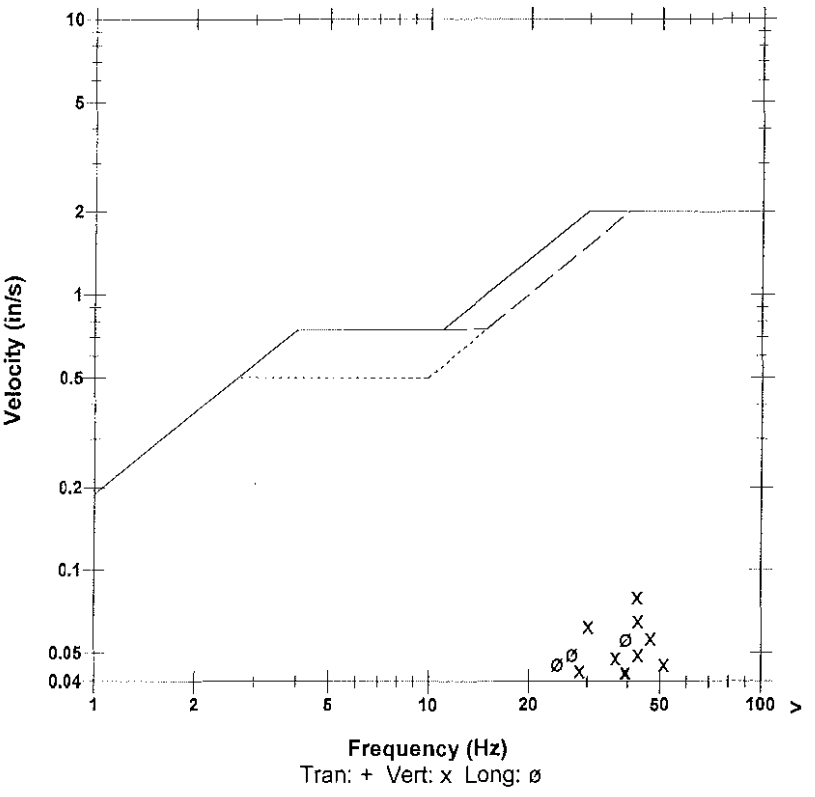
Post Event Notes

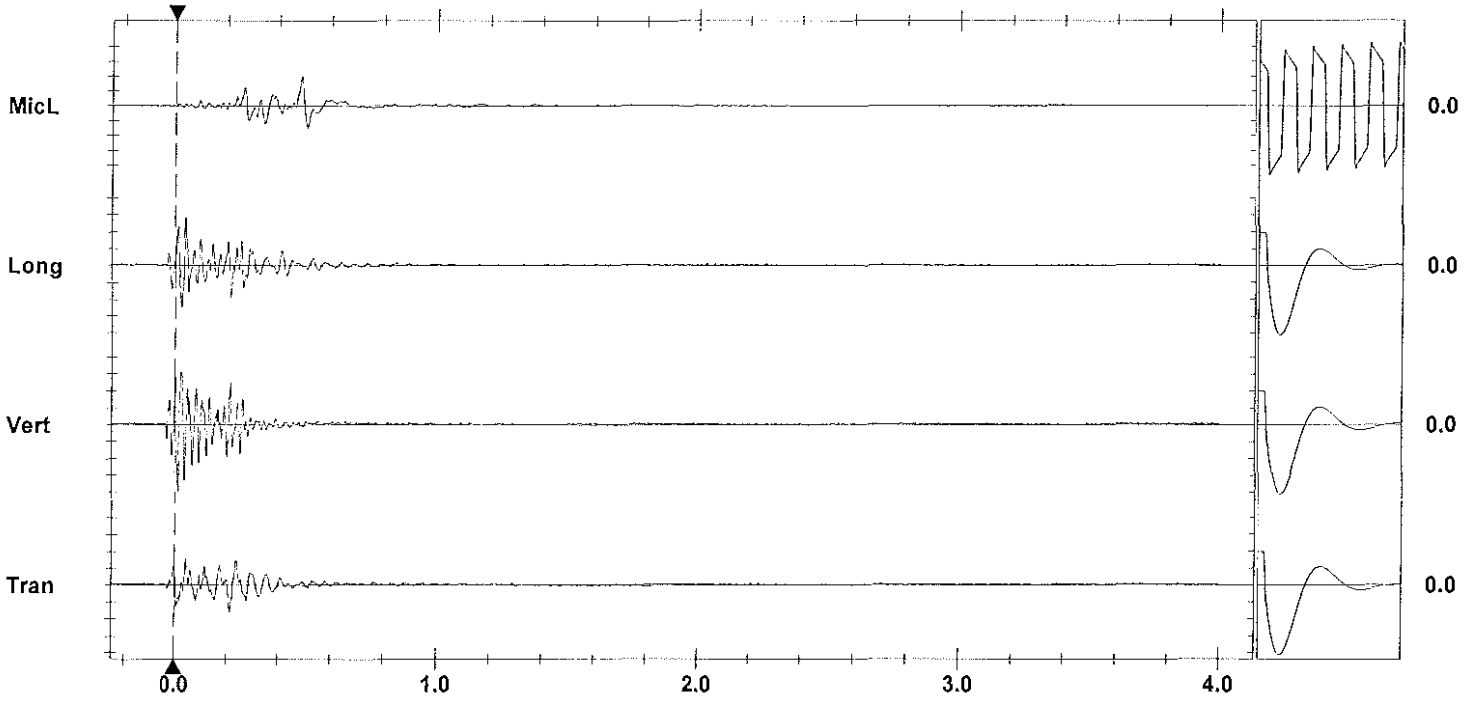
Microphone Linear Weighting
PSPL 0.00199 psi(L) at 0.483 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 726 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0800	0.0562	in/s
ZC Freq	26	43	39	Hz
Time (Rel. to Trig)	0.214	0.011	0.041	sec
Peak Acceleration	0.0232	0.0547	0.0331	g
Peak Displacement	0.00022	0.00037	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.0948 in/s at 0.011 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 5/11 2:01 PM
BLAST # MW-0049

HIGHWAY# 97
BLAST LOCATION AT: 128+95 - 129+05 ES (TOP Bench) * shot notched

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13 (to boundary)
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 13 buffer/46 buffer/1 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

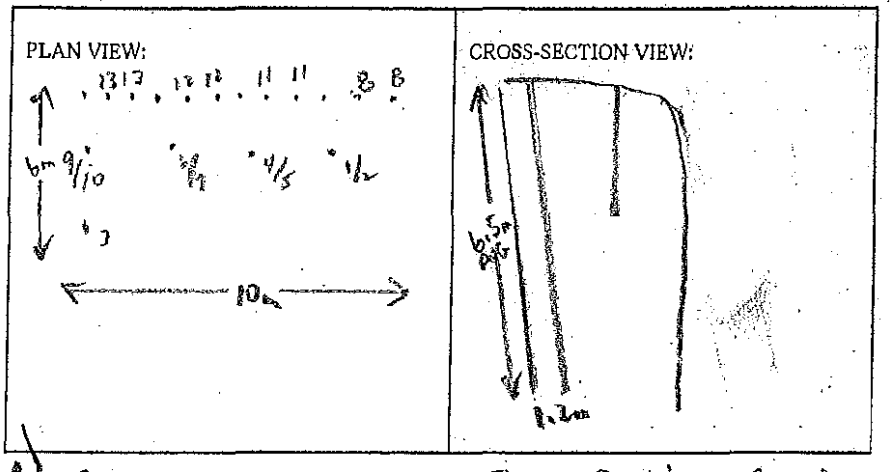
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13117 distance cal = 0.069 in/sec / 27 Hz
@ 13093 distance cal = 0.20 in/sec / 30 Hz

STAB HOLES - 1.5' AHED

BUFFER HOLES - BOTTOM DECK - 4 CART 2"X16" BLASTEX

- TOP DECK - 1-2 CART 2"X16" BLASTEX

Primed w/ 1 CART 1"X8" DYNAMITE

B/L HOLES - 1 CART. 2"X16" DYNAMITE + 200 gr det. cord to 4' collar

Instantel

Event Report

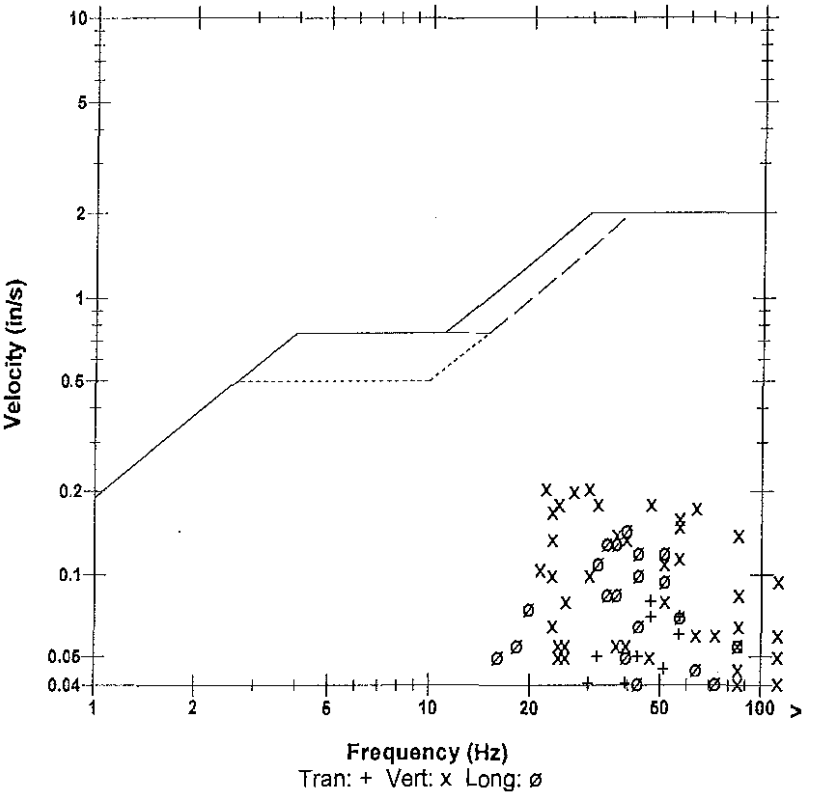
Date/Time	Vert at 14:00:57 December 15, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2EP.LL0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

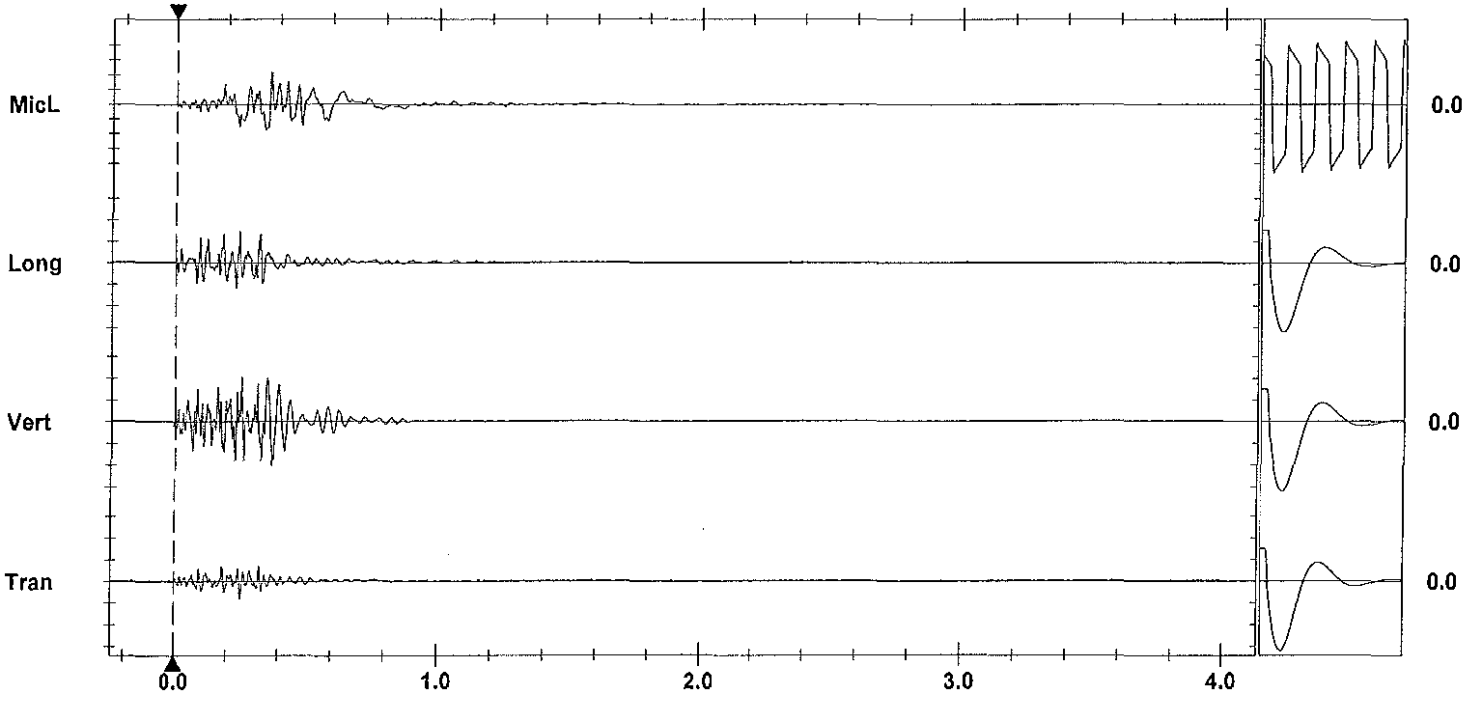
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00214 psi(L) at 0.364 sec			
ZC Freq	37 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 713 mv)			

	Tran	Vert	Long	
PPV	0.0800	0.205	0.145	in/s
ZC Freq	47	30	39	Hz
Time (Rel. to Trig)	0.257	0.257	0.248	sec
Peak Acceleration	0.0795	0.212	0.133	g
Peak Displacement	0.00028	0.00123	0.00057	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 0.229 in/s at 0.257 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

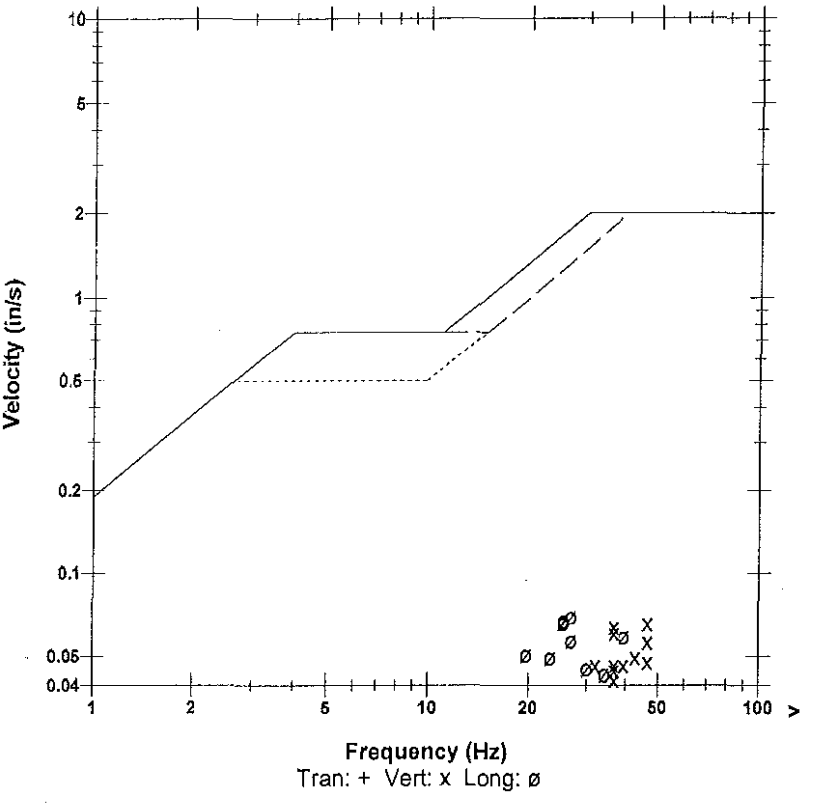
Date/Time	Vert at 14:01:07 December 15, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2EP.LV0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

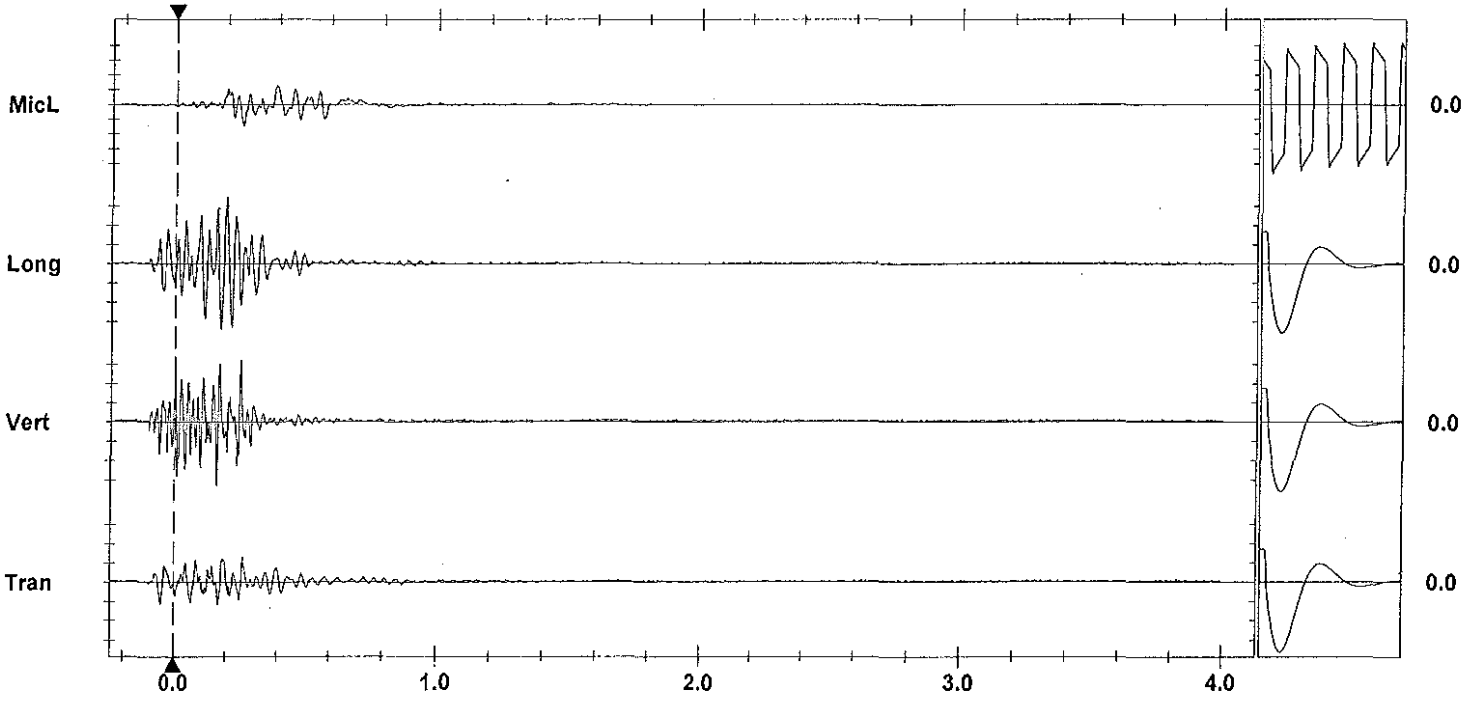
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00149 psi(L) at 0.259 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 698 mv)

	Tran	Vert	Long	
PPV	0.0262	0.0656	0.0694	in/s
ZC Freq	24	47	27	Hz
Time (Rel. to Trig)	0.268	0.163	0.197	sec
Peak Acceleration	0.0215	0.0547	0.0431	g
Peak Displacement	0.00019	0.00025	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0863 in/s at 0.164 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 3:06 PM
BLAST # MW-0050

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+05

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * blast matted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.7 (m)
TOTAL DEPTH 43.0 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.E. CAP) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP-320 CAPACITY 80 Caps

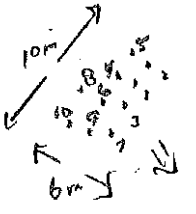
VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

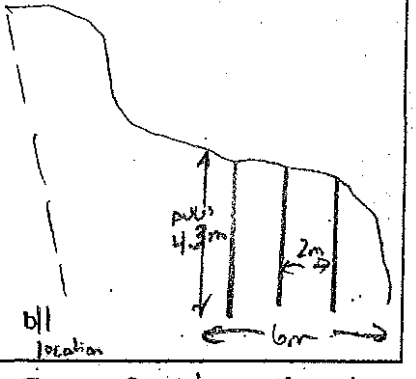
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: Bll location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 18167 Cliffston ct. = 0.059 in/s / 30 Hz
@ 13093 Cliffston ct = 0.20 in/s 64 Hz

3'-4' ANFO/Hole 1"x8" DYNAMITE PRIMERS

Instantel

Event Report

Date/Time	Vert at 15:06:35 December 15, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

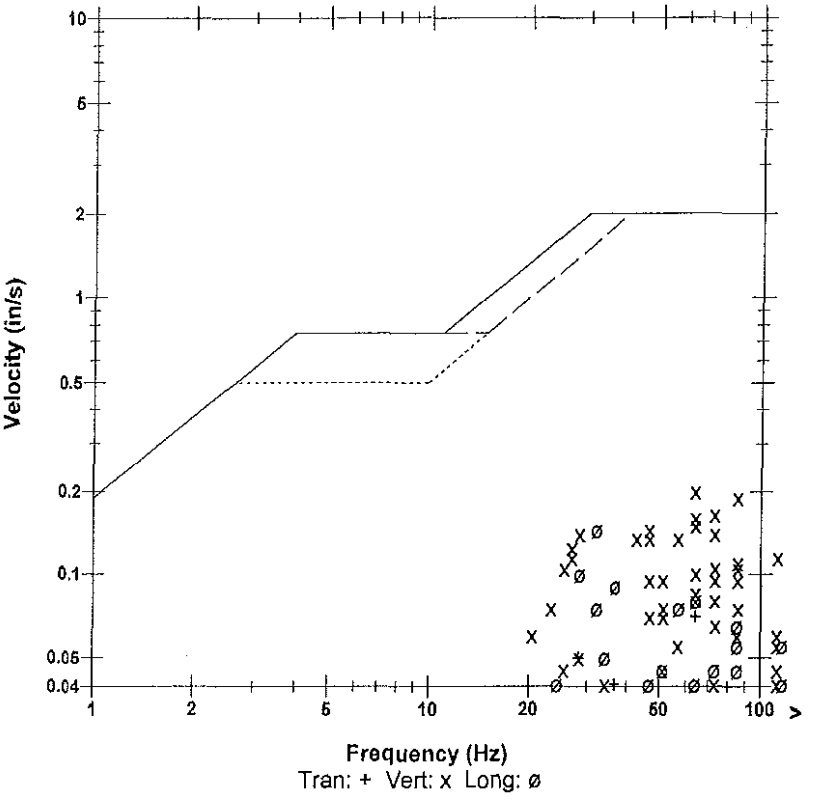
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2ES.MZ0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

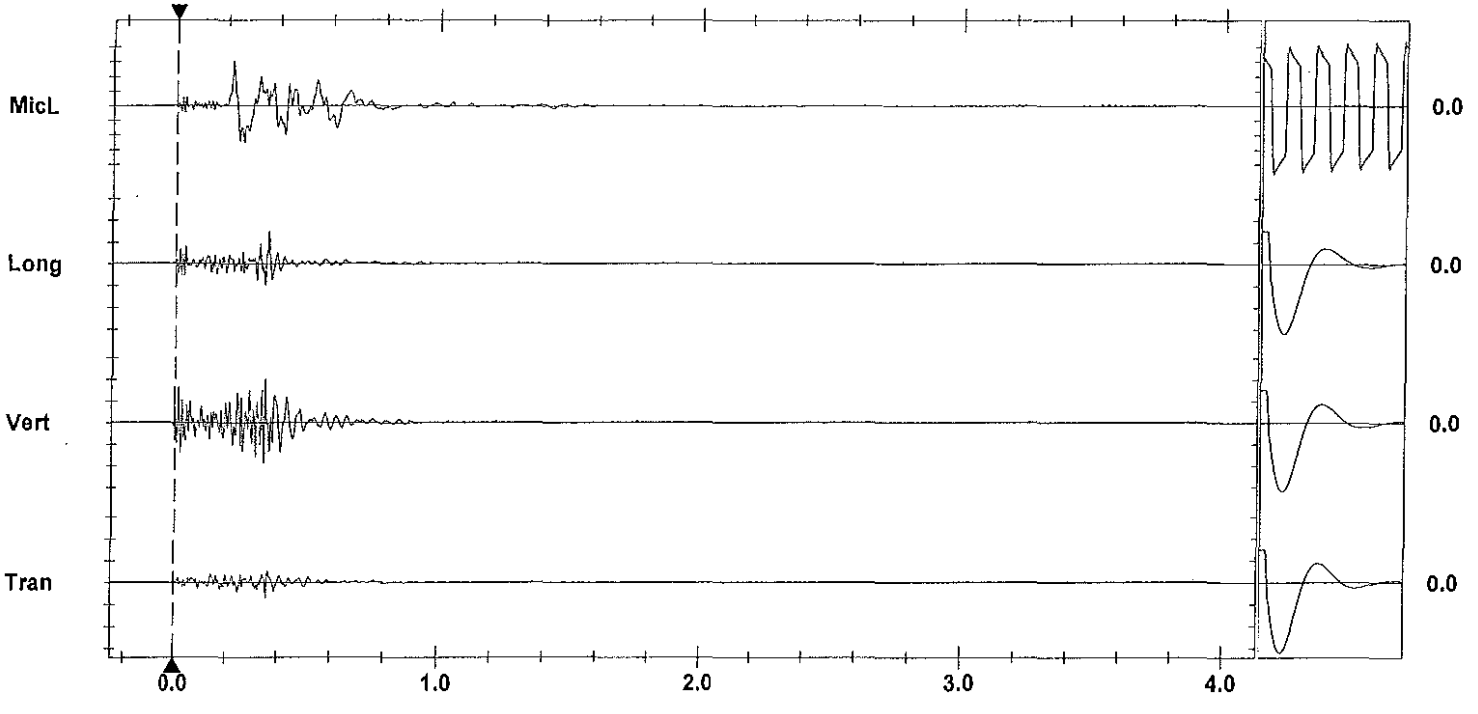
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00305 psi(L) at 0.221 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 723 mv)

	Tran	Vert	Long	
PPV	0.0700	0.200	0.145	in/s
ZC Freq	64	64	32	Hz
Time (Rel. to Trig)	0.359	0.354	0.363	sec
Peak Acceleration	0.0795	0.239	0.119	g
Peak Displacement	0.00025	0.00077	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.215 in/s at 0.348 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 15:06:45 December 15, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E2ES.N90

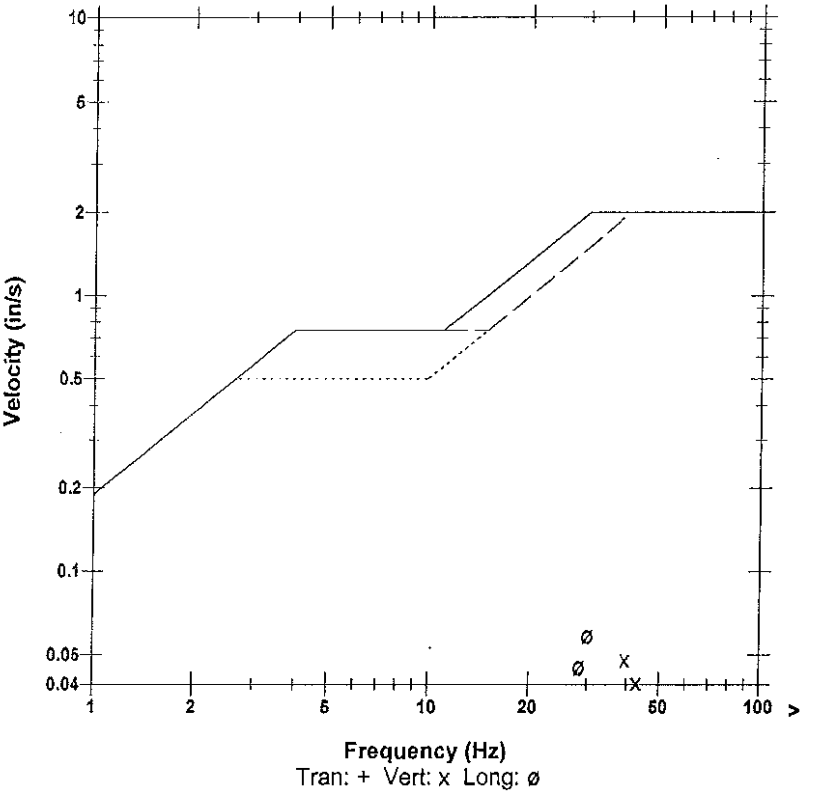
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

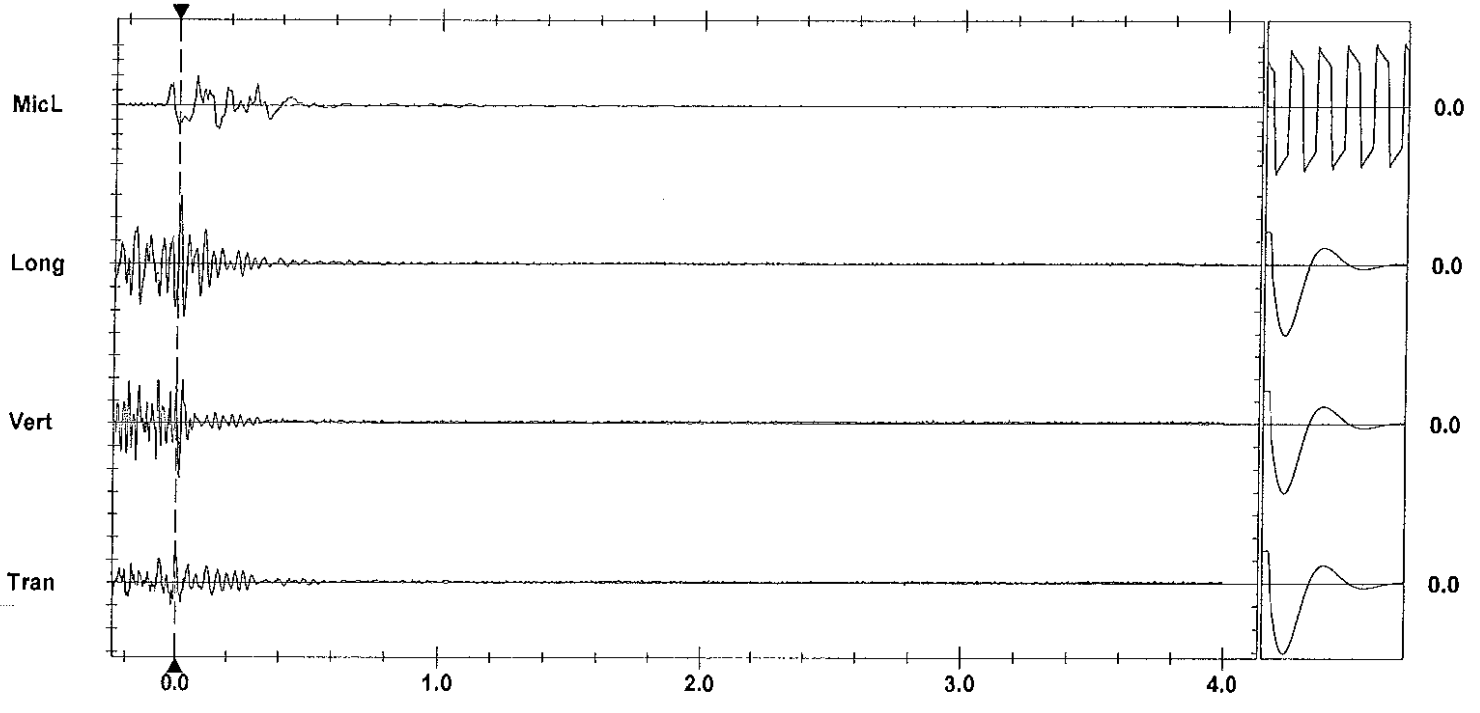
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.069 sec
ZC Freq	6.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 701 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0481	0.0587	in/s
ZC Freq	27	39	30	Hz
Time (Rel. to Trig)	0.001	0.012	0.009	sec
Peak Acceleration	0.0215	0.0365	0.0315	g
Peak Displacement	0.00019	0.00020	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0738 in/s at 0.010 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 16/11
ACTUAL BLAST DATE Dec 16/11 11:35 AM
BLAST # MW-0051

HIGHWAY# 97
BLAST LOCATION AT: 128+95 - 129+00 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: see sketch attached

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Quesnel Quartzite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 7.0 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 6 611 / 3 buffer / 2 stab / 2 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

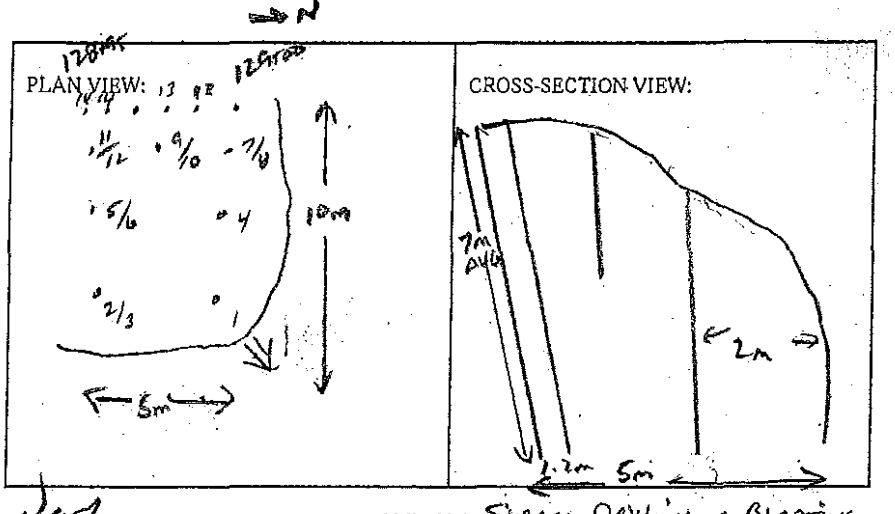
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1/5 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone ont - 0.084 ips / 43Hz
@ 13093 Cliffstone ont - 0.24 ips / 23Hz

Prod Holes. Bottom Decks - 5' ANFO
- Top Decks - 4' ANFO

Stab Holes. 1.5' ANFO

Buffer Holes - Bottom Decks - 6 cart 2"x16" Blasprex
- Top Decks - 1-2 cart 2"x16" Blasprex
1"x8" Dynamite Primers

B/L Holes. 1 cart 2"x16" Dynamite + 200gm. det. cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 11:34:31 December 16, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2GD.HJ0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

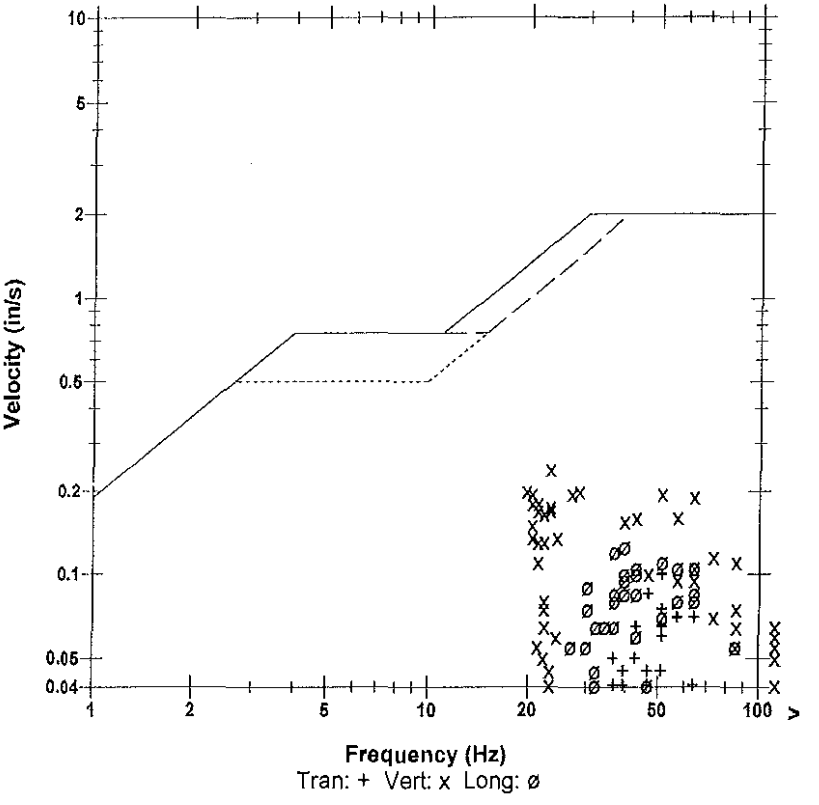
Extended Notes
Blast at stn 128

Post Event Notes

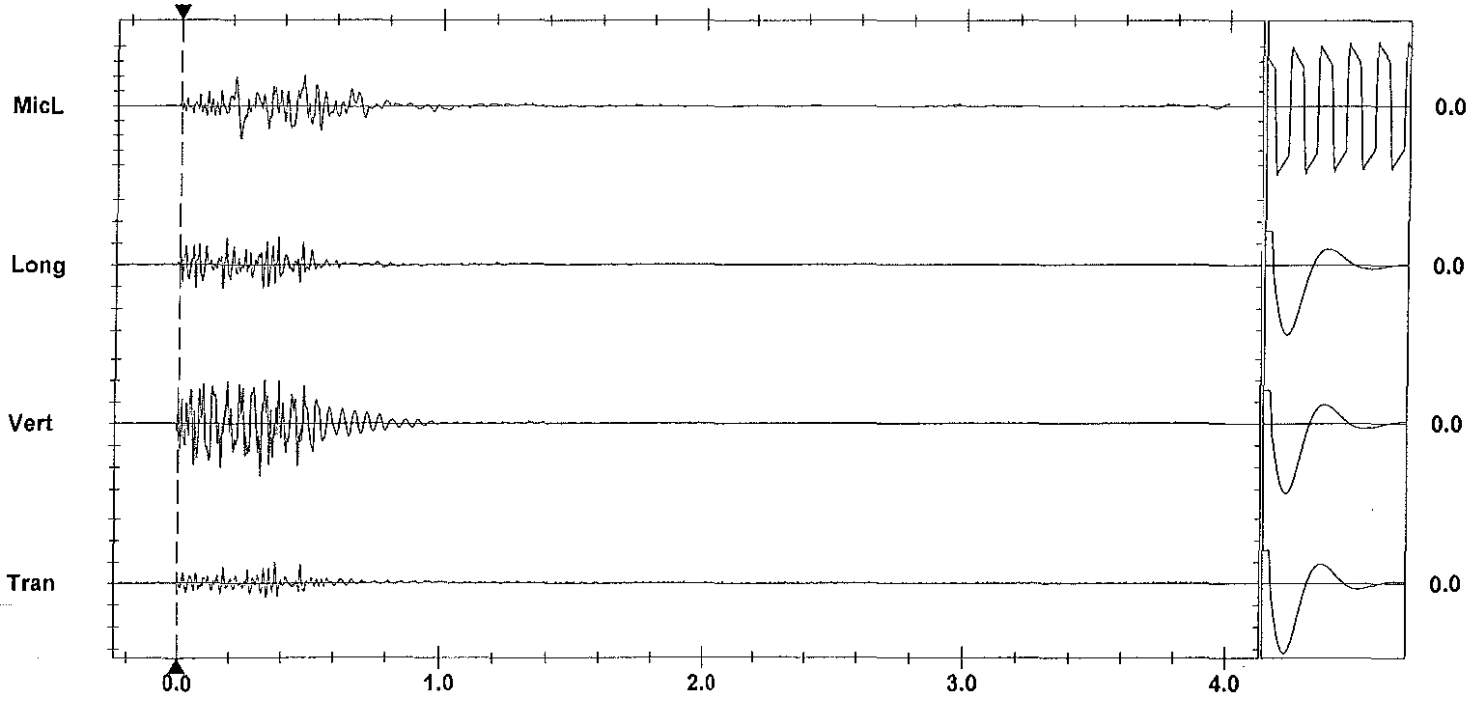
Microphone Linear Weighting
PSPL 0.00228 psi(L) at 0.231 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 672 mv)

	Tran	Vert	Long	
PPV	0.1000	0.240	0.125	in/s
ZC Freq	51	23	39	Hz
Time (Rel. to Trig)	0.381	0.319	0.383	sec
Peak Acceleration	0.0795	0.199	0.146	g
Peak Displacement	0.00029	0.00137	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.250 in/s at 0.320 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:34:41 December 16, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2GD.HT0
Job Number:	1		

Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

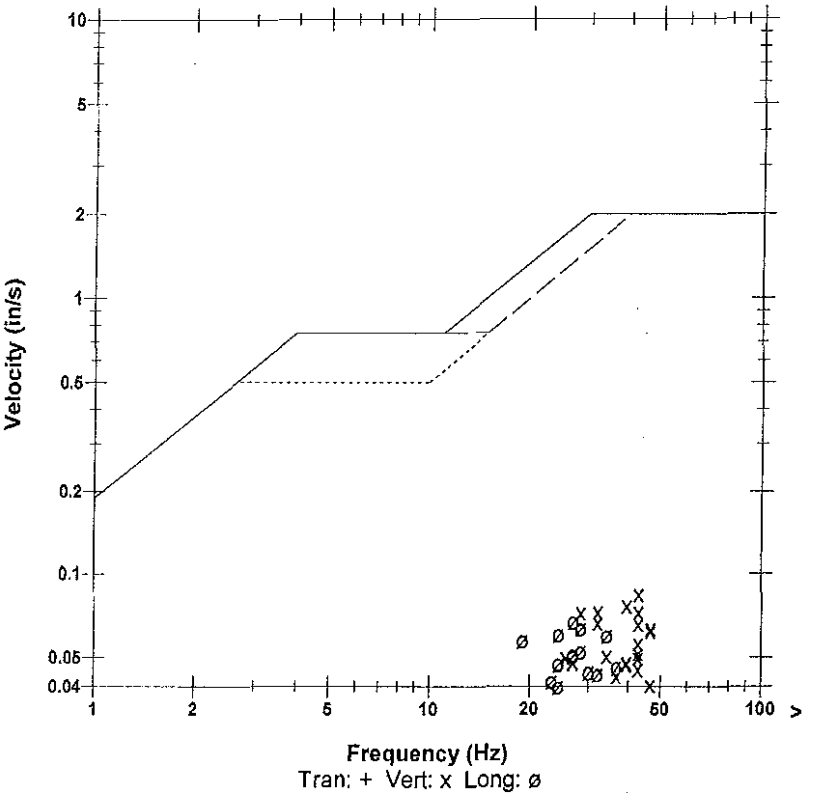
Post Event Notes

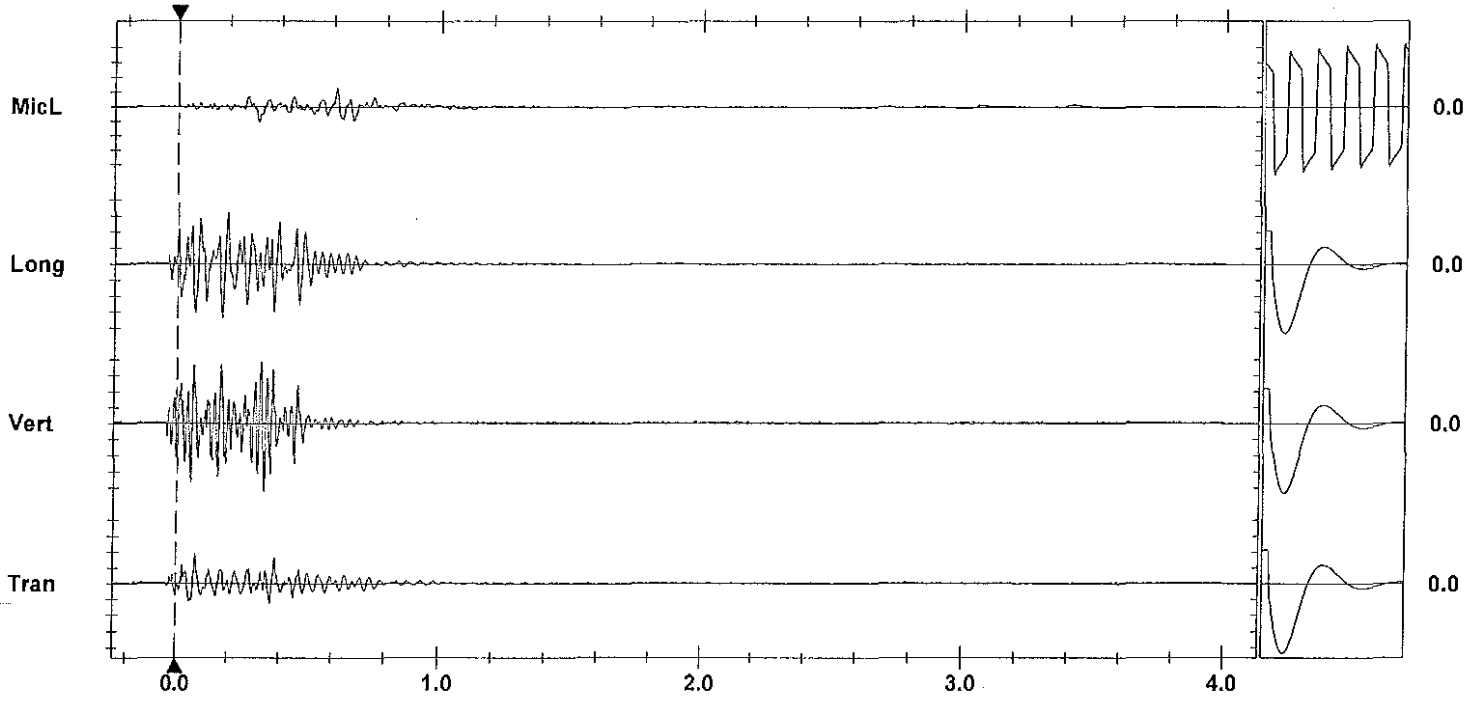
Microphone Linear Weighting
PSPL 0.00123 psi(L) at 0.611 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	0.0381	0.0844	0.0675	in/s
ZC Freq	20	43	27	Hz
Time (Rel. to Trig)	0.076	0.341	0.175	sec
Peak Acceleration	0.0215	0.0746	0.0381	g
Peak Displacement	0.00021	0.00036	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.0972 in/s at 0.174 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 16/11
ACTUAL BLAST DATE Dec 16/11 12:56 PM
BLAST # MW-0002

HIGHWAY # 97
BLAST LOCATION AT: STA 128+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Blast matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

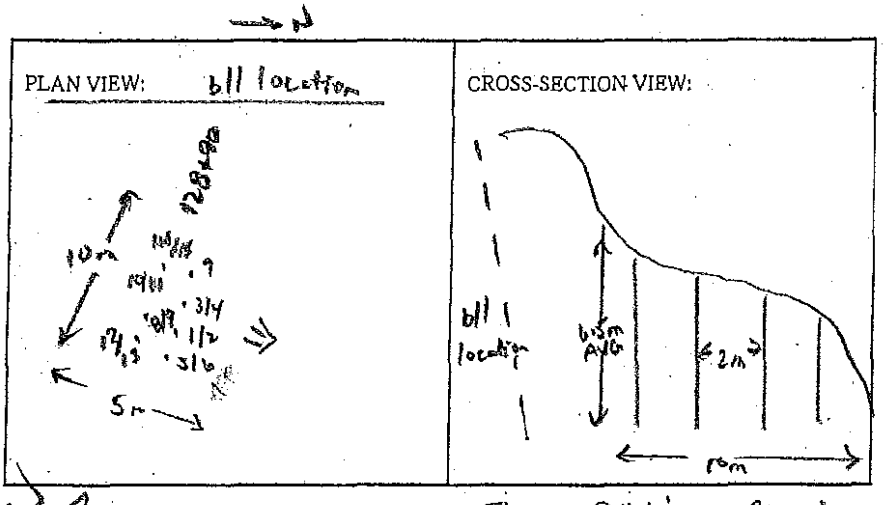
INITIATION DEVICE: (CIRCLE) EE CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 distance ext - 0.073 ips / 47Hz
@ 13093 distance ext - 0.26 ips / 43Hz

Bottom holes - 3'-4' apart/max

Top holes - 1' max

1 1/8" dynamite primers

Instantel®

Event Report

Date/Time	Vert at 12:55:47 December 16, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

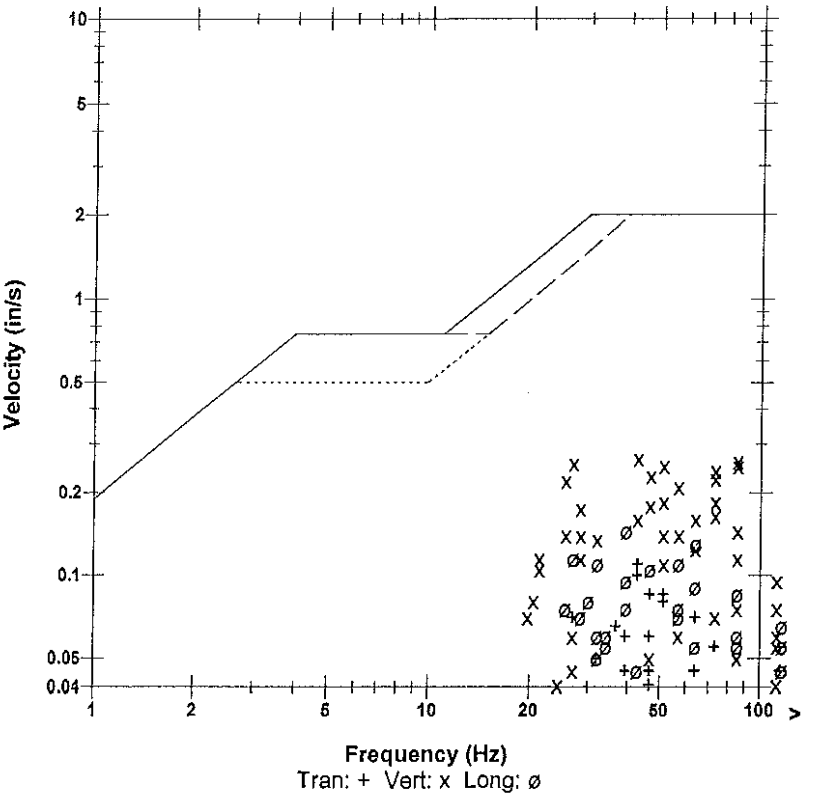
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.0 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2GH.8Z0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

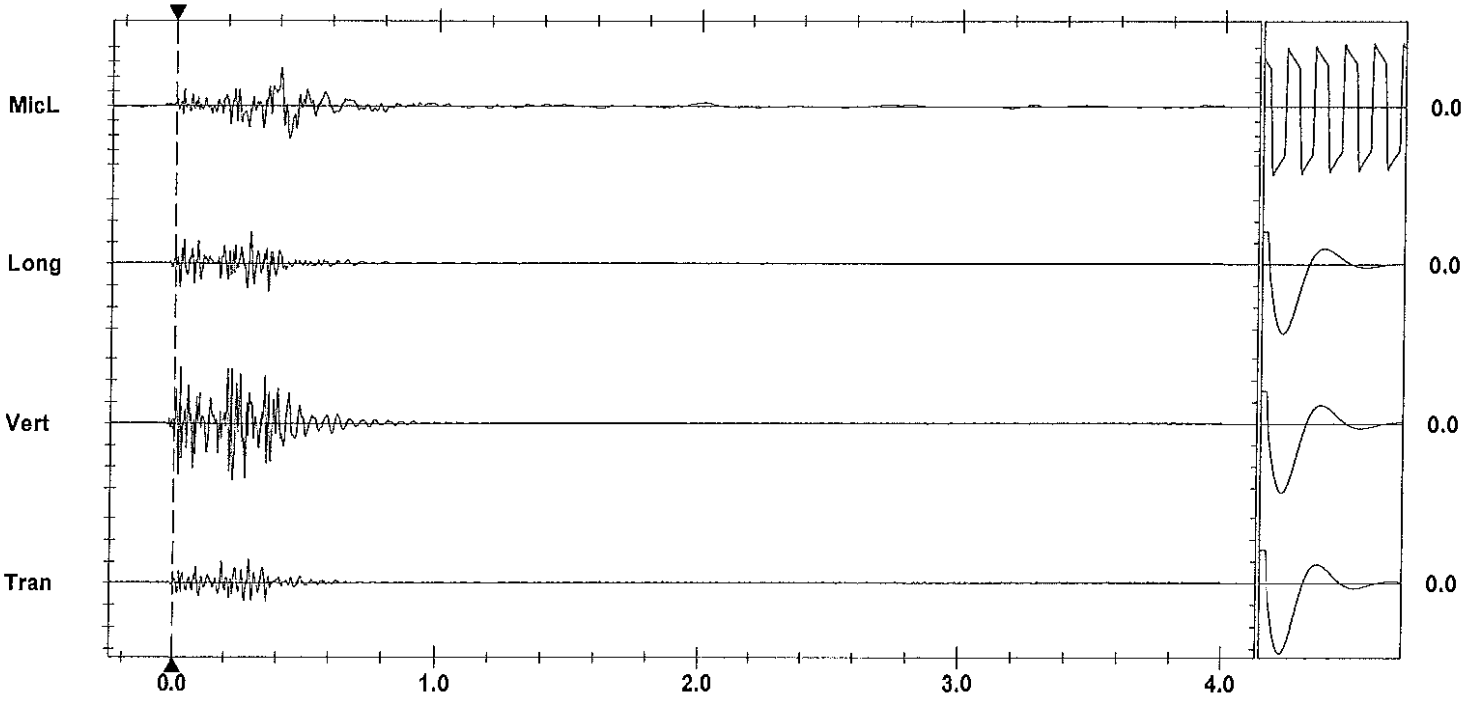
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00254 psi(L) at 0.404 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 693 mv)

	Tran	Vert	Long	
PPV	0.110	0.265	0.145	in/s
ZC Freq	43	43	39	Hz
Time (Rel. to Trig)	0.294	0.228	0.292	sec
Peak Acceleration	0.0795	0.371	0.146	g
Peak Displacement	0.00039	0.00107	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.281 in/s at 0.275 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Long at 12:55:57 December 16, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2GH.990
Job Number:	1		

Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

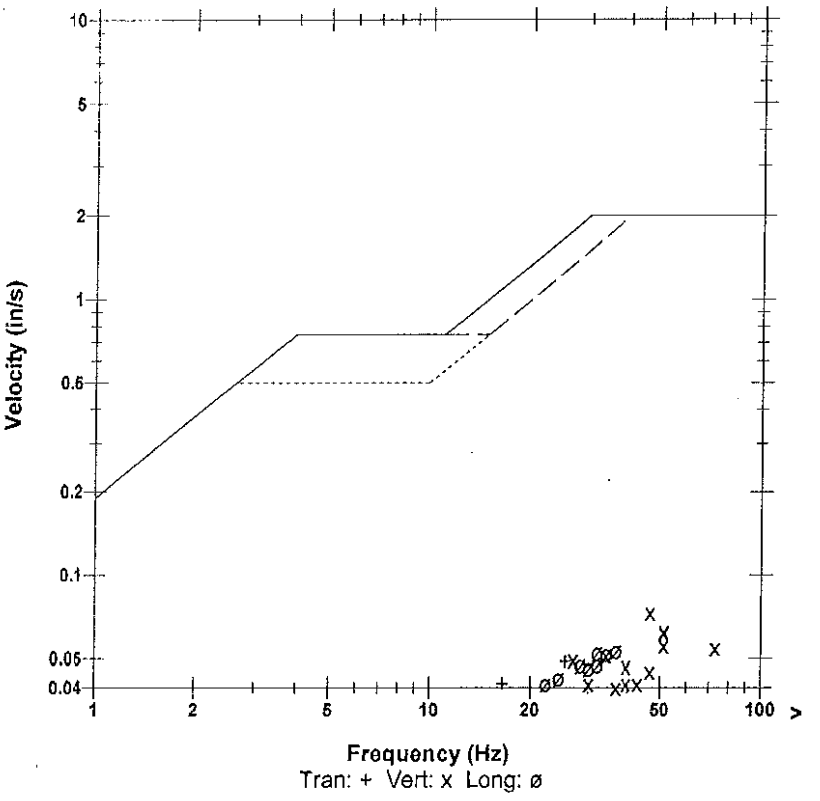
Post Event Notes

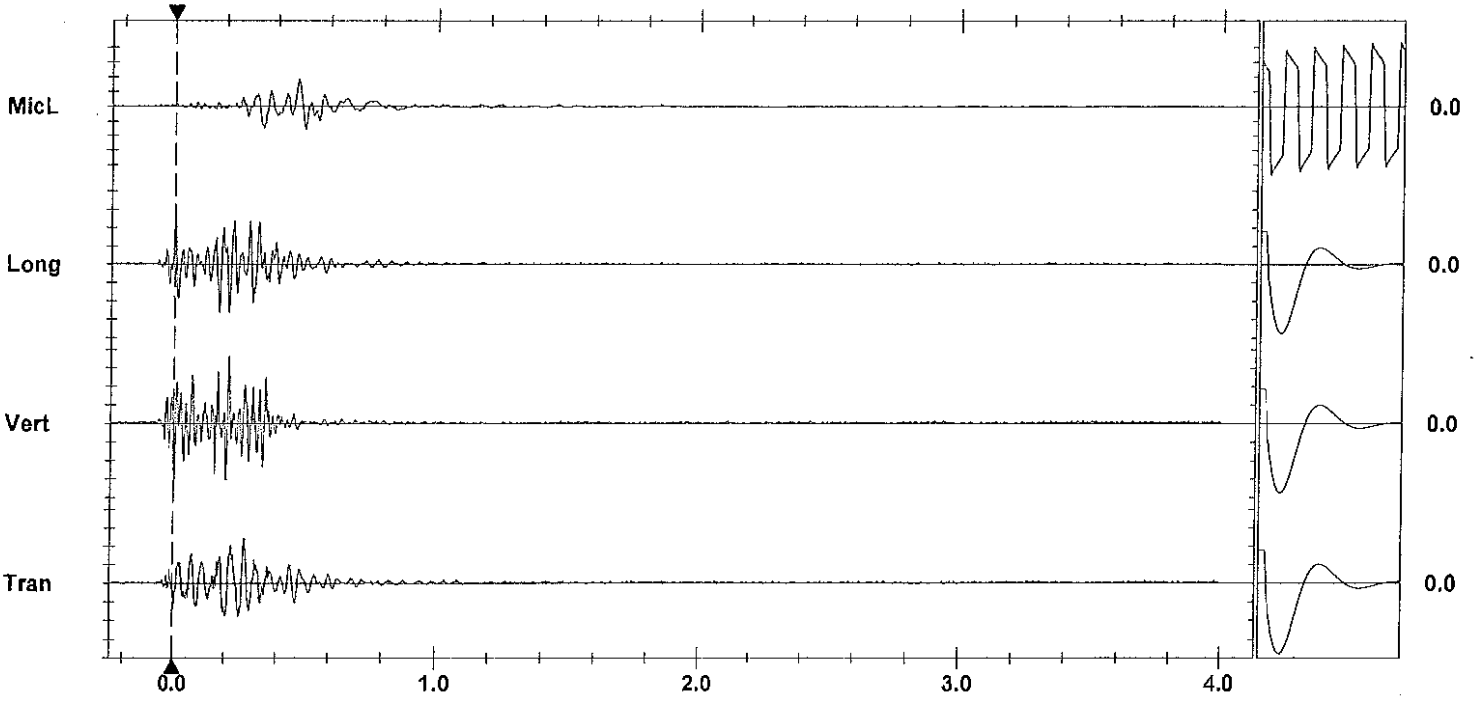
Microphone Linear Weighting
PSPL 0.00181 psi(L) at 0.476 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 723 mv)

	Tran	Vert	Long	
PPV	0.0487	0.0731	0.0531	in/s
ZC Freq	26	47	37	Hz
Time (Rel. to Trig)	0.277	0.213	0.212	sec
Peak Acceleration	0.0315	0.0630	0.0365	g
Peak Displacement	0.00033	0.00024	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0903 in/s at 0.213 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: December 17, 2011 0(8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

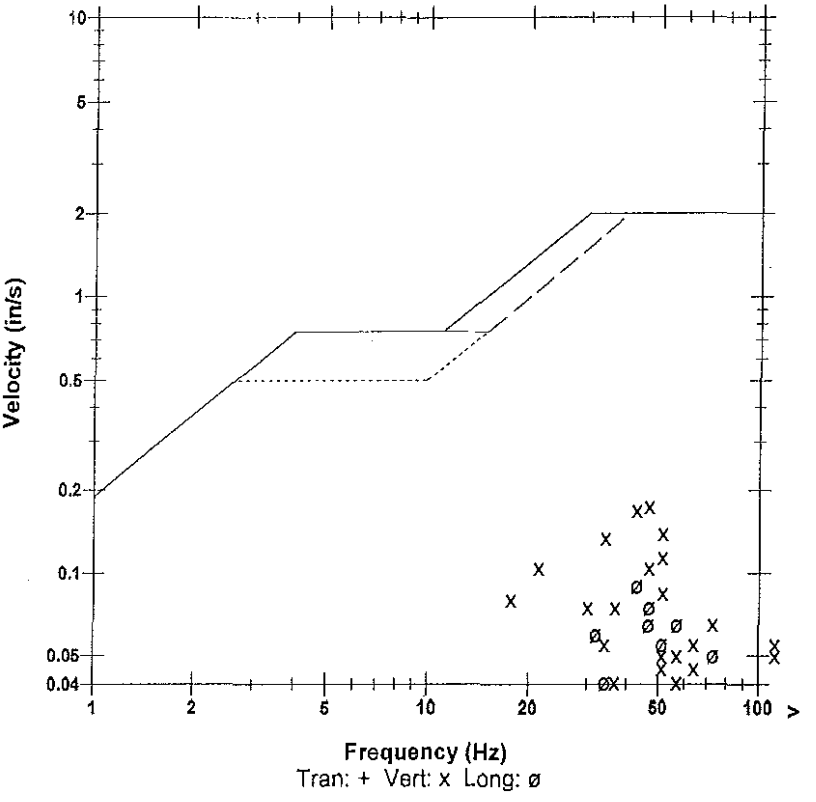
Date/Time	Vert at 12:05:47 December 14, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2CP.LN0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

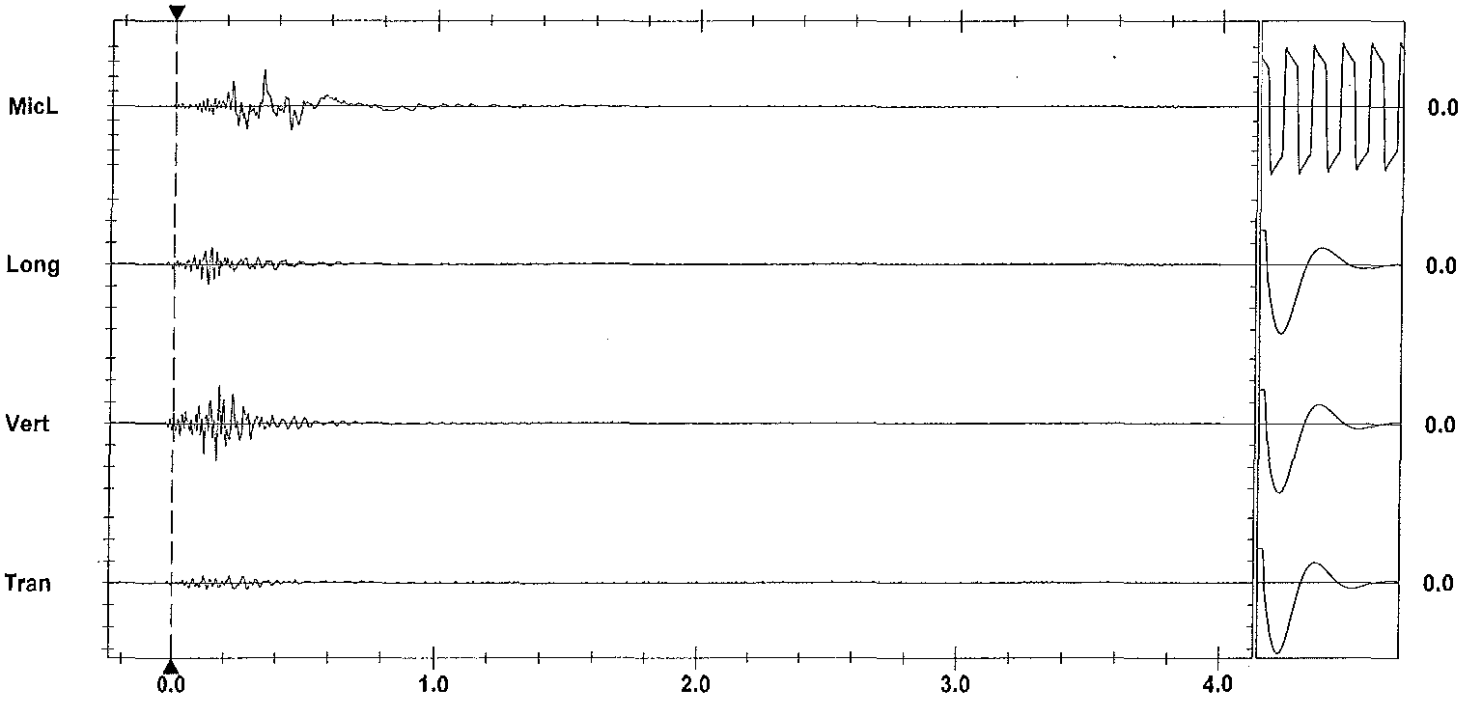
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00243 psi(L) at 0.344 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0350	0.175	0.0900	in/s
ZC Freq	32	47	43	Hz
Time (Rel. to Trig)	0.125	0.179	0.135	sec
Peak Acceleration	0.0265	0.133	0.0928	g
Peak Displacement	0.00018	0.00065	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.177 in/s at 0.167 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: December 29, 2011 (V 8.04 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 11/11
ACTUAL BLAST DATE Dec 11/11 12:40 PM
BLAST # MW-0037

HIGHWAY # 97
BLAST LOCATION AT: 129+85 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Chat noticed

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Greywacke
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

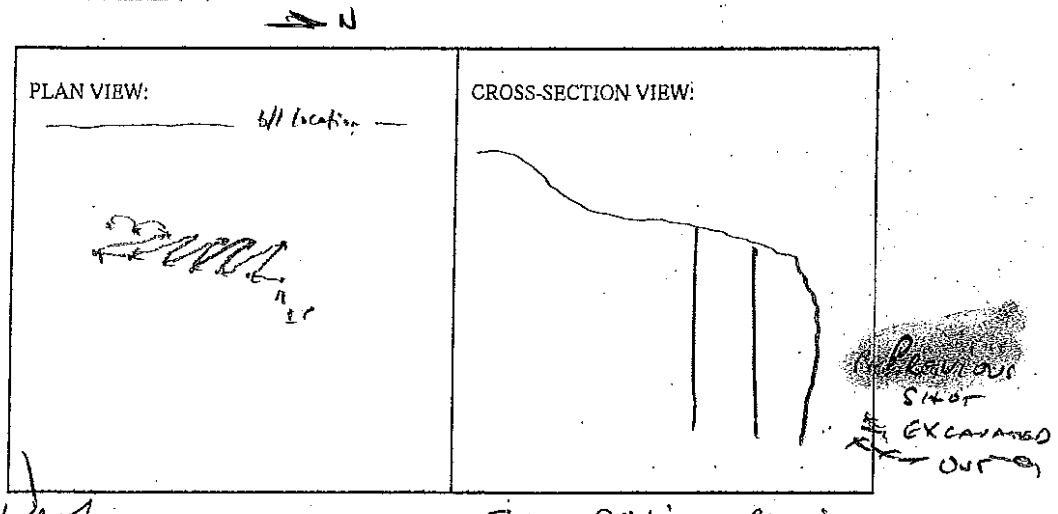
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Elec initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



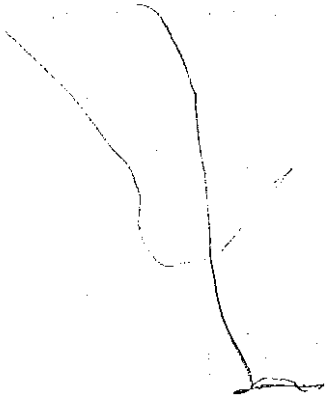
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph 13167 @ Cliffstone crest - 0.24 ips/30Hz
@ 13093 Cliffstone crest - 0.12 ips/28Hz

3' of [illegible] pipe [illegible] w/ 0.5 gal 1 1/4 x 16 dynamite



Instantel

Event Report

Date/Time	Vert at 12:40:31 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E291.VJ0
Job Number:	1		

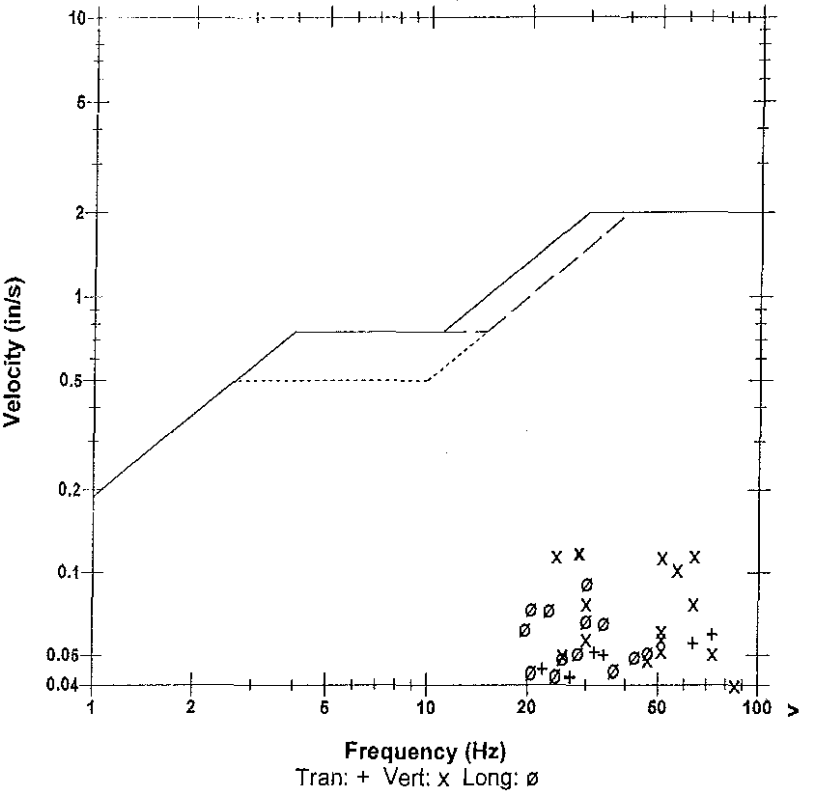
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

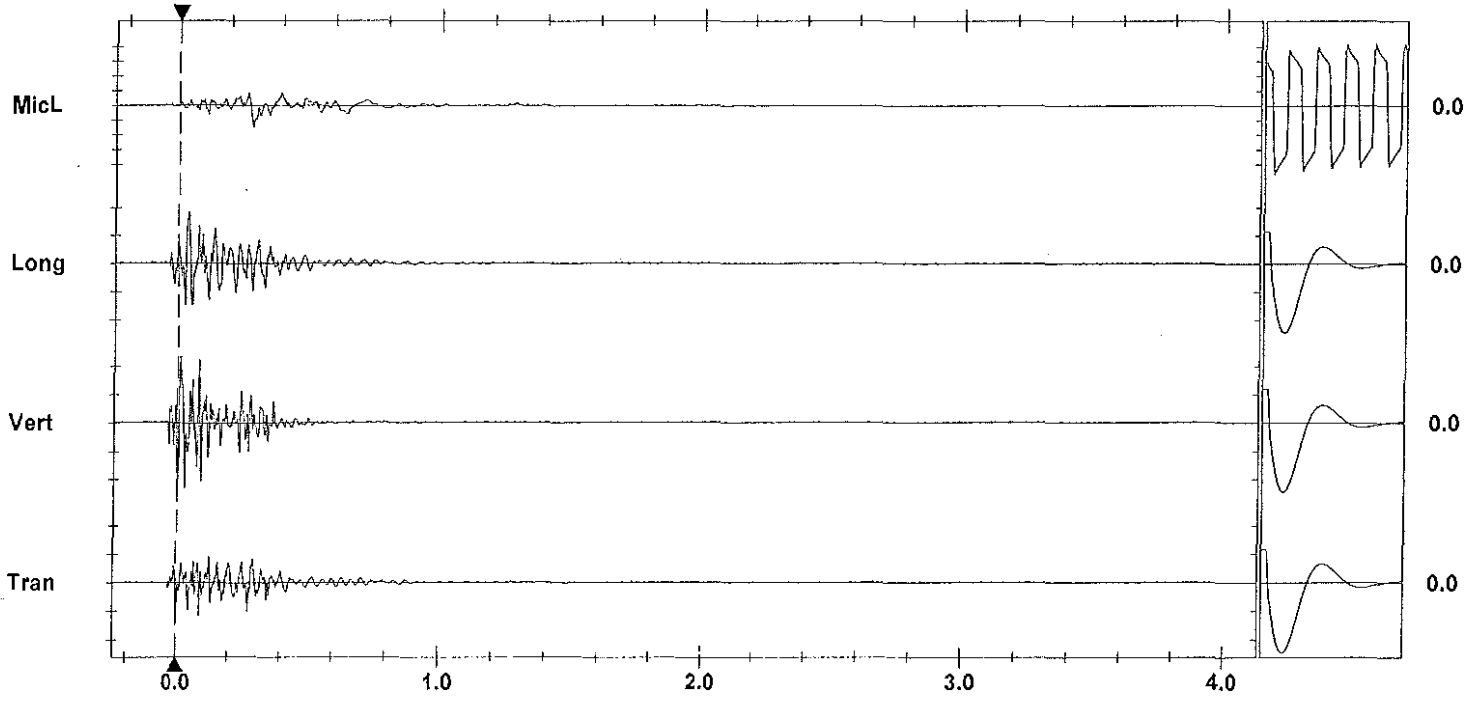
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.286 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	0.0594	0.119	0.0919	in/s
ZC Freq	73	28	30	Hz
Time (Rel. to Trig)	0.093	0.014	0.040	sec
Peak Acceleration	0.0679	0.133	0.0829	g
Peak Displacement	0.00024	0.00061	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.134 in/s at 0.003 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

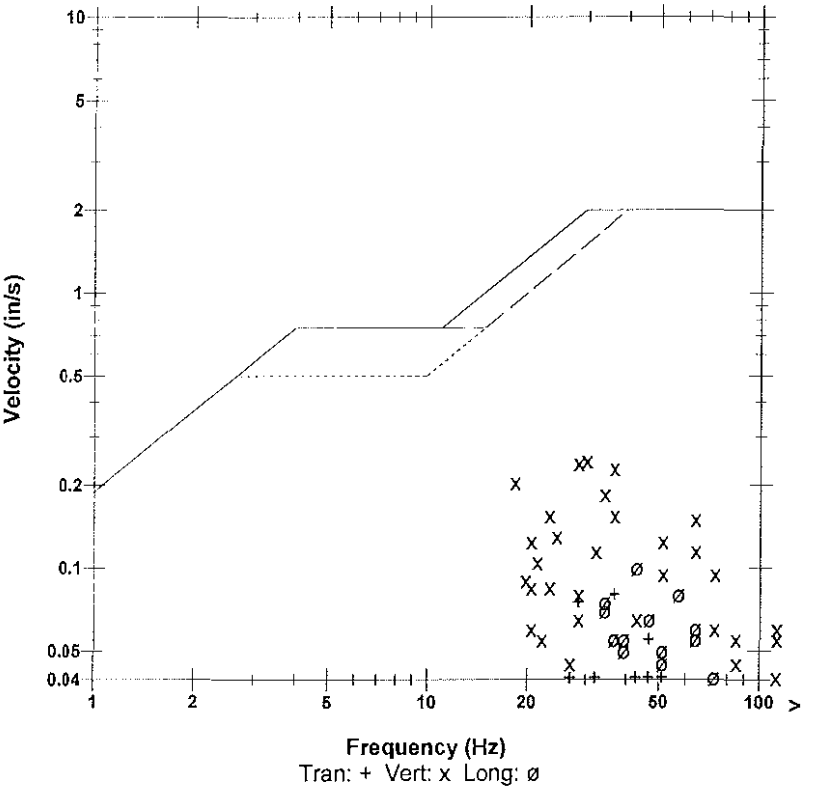
Date/Time	Vert at 12:40:25 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E291.VD0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

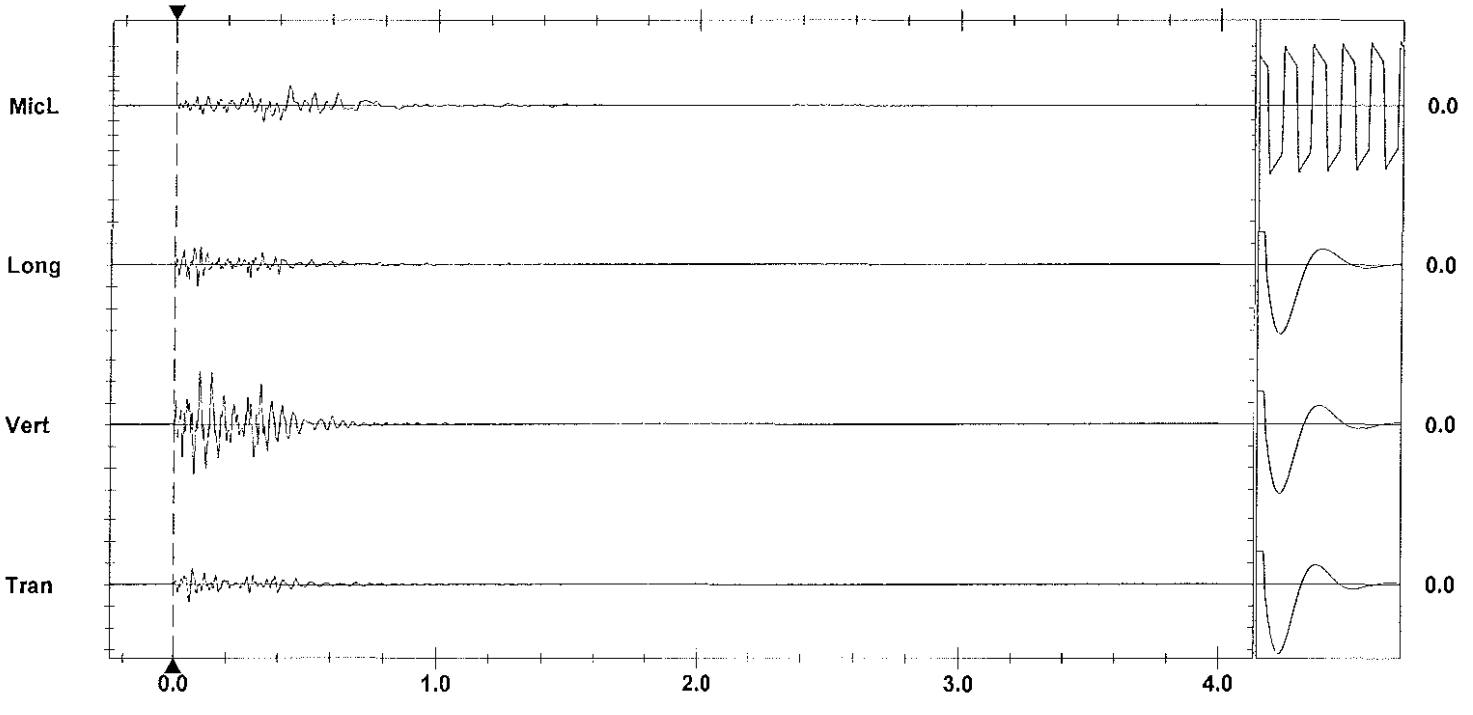
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0800	0.245	0.1000	in/s
ZC Freq	37	30	43	Hz
Time (Rel. to Trig)	0.060	0.100	0.088	sec
Peak Acceleration	0.0530	0.186	0.0795	g
Peak Displacement	0.00037	0.00113	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.436 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 744 mv)

Peak Vector Sum 0.258 in/s at 0.100 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/11
ACTUAL BLAST DATE Dec. 12/11 2:05 PM
BLAST # 134

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+65 – 127+85 RS (1ST Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 35 prod.
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING [redacted] 2.5 (m) BURDEN [redacted] 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 35

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 475 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

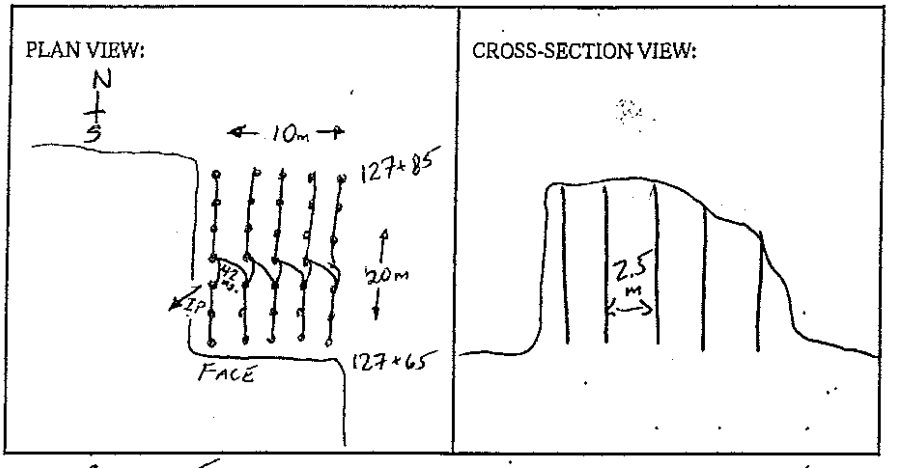
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

35 - 30' Ez dets.

8 - 42ms connectadet

1 - 17ms connectadet

18 bags Anfo.

17 sticks 1½ x 16.

Instantel

Event Report

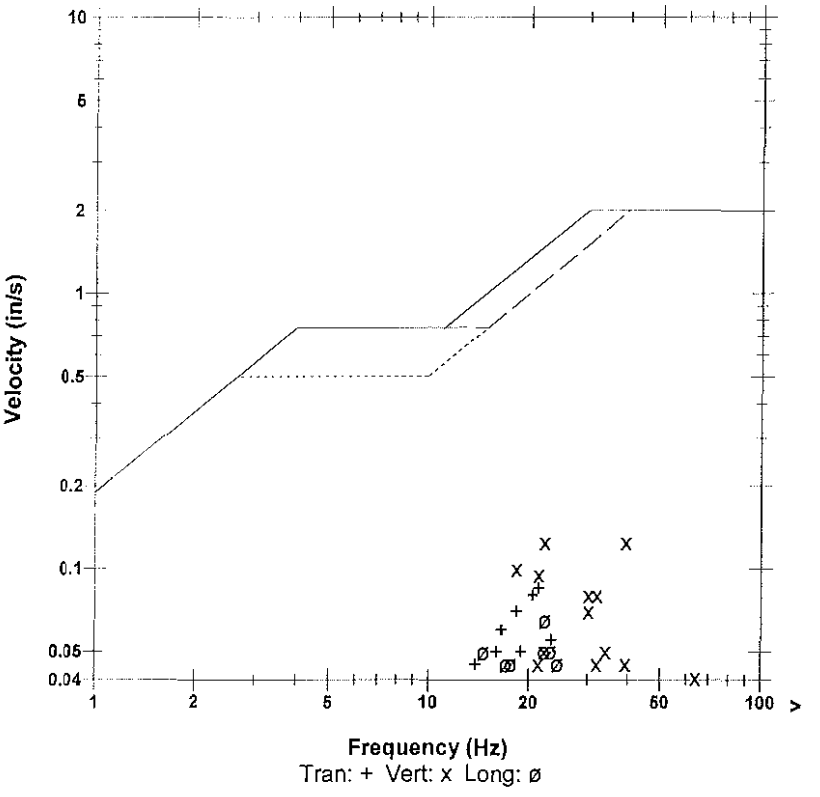
Date/Time	Tran at 14:05:35 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E295.TB0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

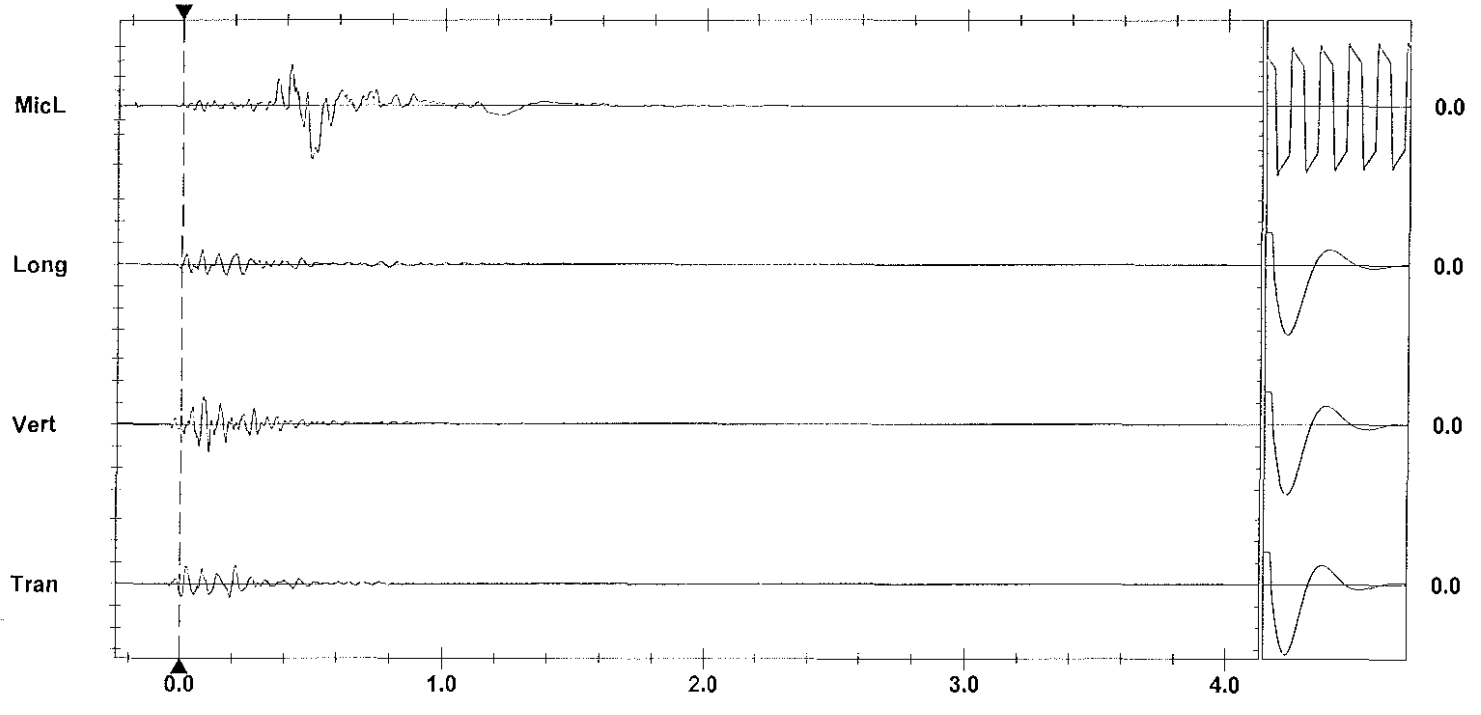
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0850	0.125	0.0650	in/s
ZC Freq	21	22	22	Hz
Time (Rel. to Trig)	0.213	0.086	0.078	sec
Peak Acceleration	0.0398	0.0795	0.0398	g
Peak Displacement	0.00062	0.00099	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Microphone Linear Weighting
PSPL 0.00363 psi(L) at 0.492 sec
ZC Freq 8.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 718 mv)

Peak Vector Sum 0.149 in/s at 0.086 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶ ◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 14:05:41 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E295.THO
Job Number:	1		

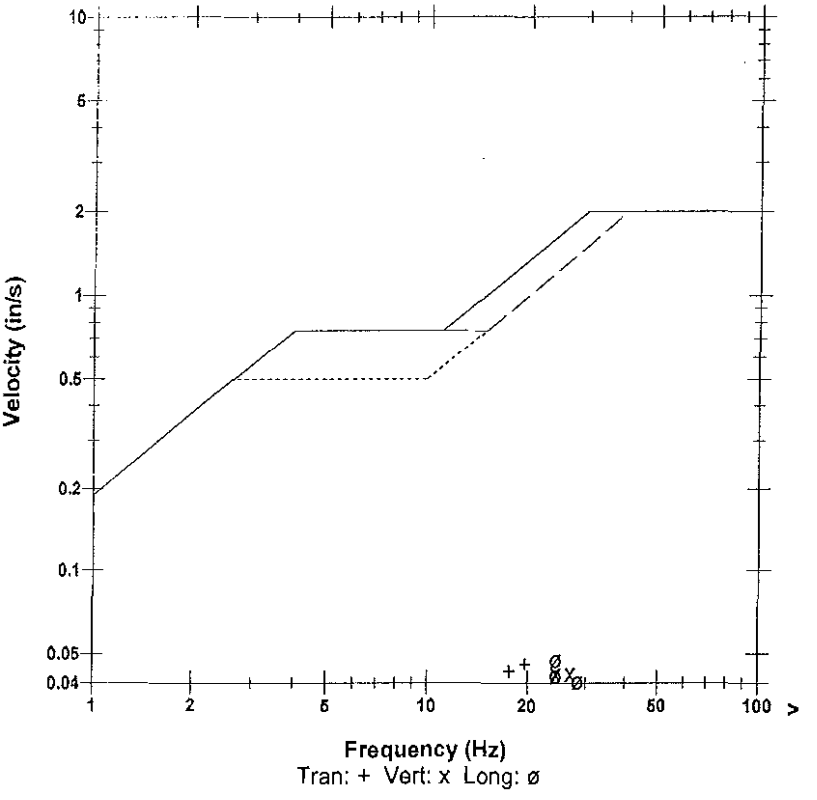
Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

Post Event Notes

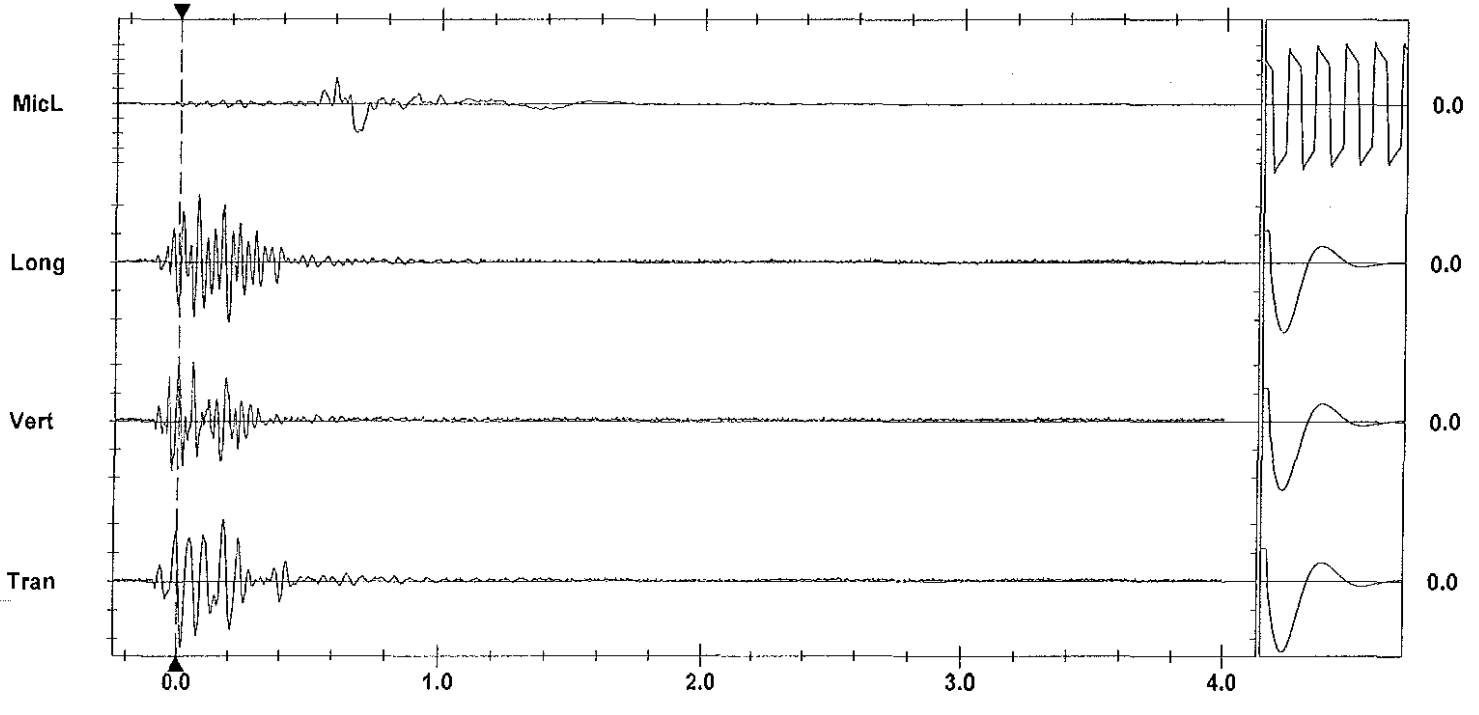
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.679 sec
ZC Freq	7.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 736 mv)

	Tran	Vert	Long	
PPV	0.0456	0.0425	0.0475	in/s
ZC Freq	20	24	24	Hz
Time (Rel. to Trig)	0.015	0.001	0.079	sec
Peak Acceleration	0.0215	0.0215	0.0215	g
Peak Displacement	0.00038	0.00027	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0661 in/s at 0.016 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 12/11
ACTUAL BLAST DATE Dec 12/11 2:24 PM
BLAST # MW-0038

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 - 129+50 US (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS: 12 6/11 holes loaded w/200 gr. det. cord

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 140 (m)

TOTAL NUMBER OF HOLES 18 6/11 + 6 BUFFER
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

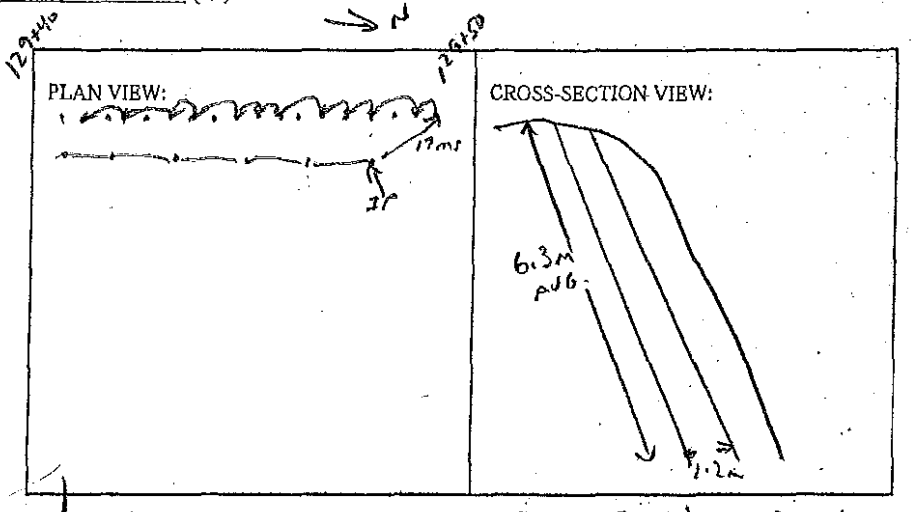
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 46 (kg)
DELAY TYPE AND LENGTH 17 + 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 CAPS

VOLUME OF ROCK BLASTED 260 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliff close out - 0.15 ips/ 34Hz
@ 13093 cliff/face out - 0.088 ips/ 47Hz

BUFFER HOLES - 4 CART 2"X16" BLASTROX / HOLE
PRIMED W/ 0.5 CART 1½" X 16" DYNAMITE

B/L HOLES - 1 CART 2"X16" DYNAMITE + 200 gr
DET CORD TO 4' COLLAR

Instantel

Event Report

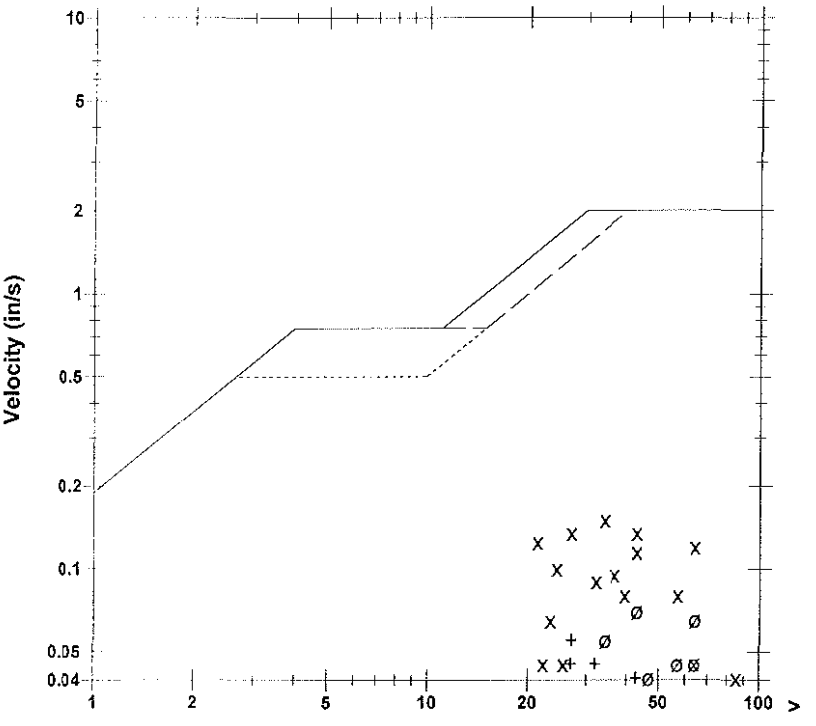
Date/Time	Vert at 14:28:03 December 12, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E296.UR0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

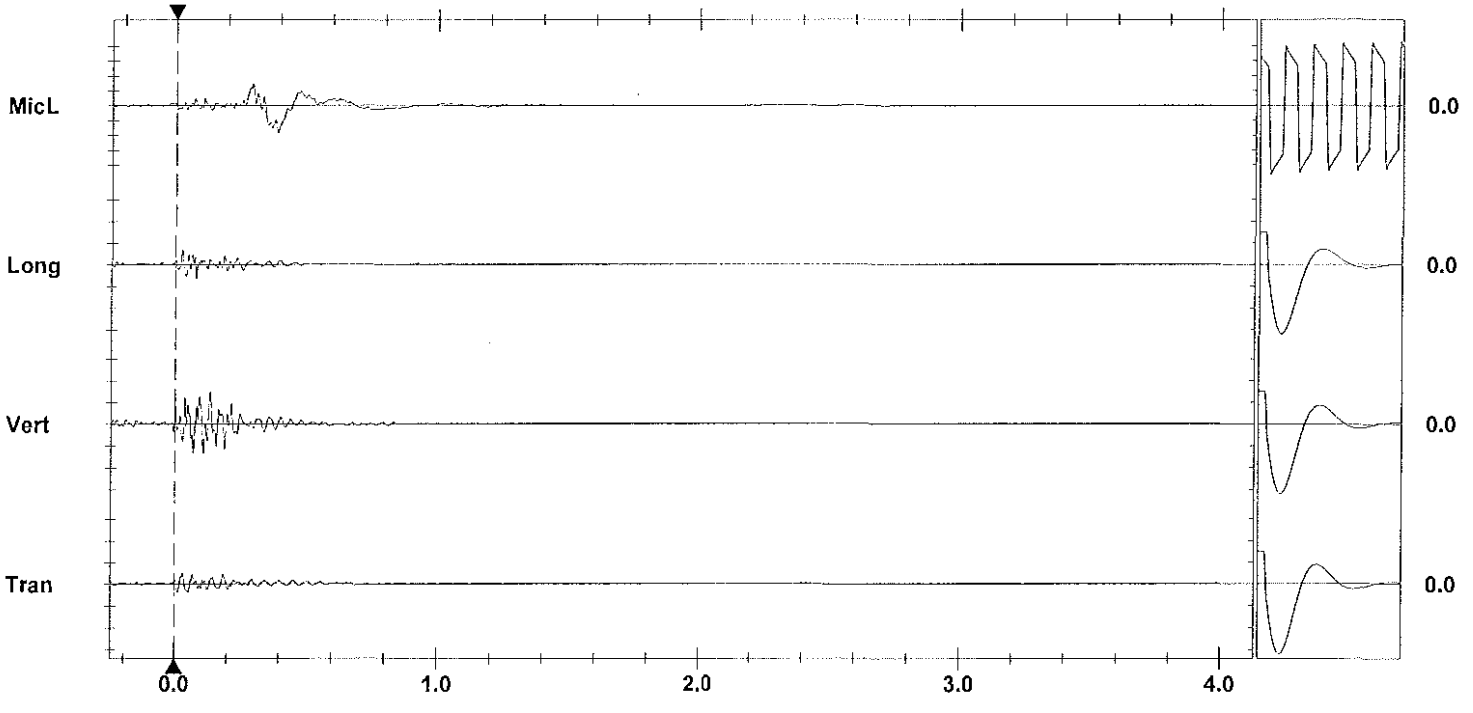
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0550	0.150	0.0700	in/s
ZC Freq	27	34	43	Hz
Time (Rel. to Trig)	0.032	0.136	0.028	sec
Peak Acceleration	0.0398	0.133	0.0663	g
Peak Displacement	0.00028	0.00078	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.389 sec
ZC Freq 4.9 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 766 mv)

Peak Vector Sum 0.151 in/s at 0.136 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:28:10 December 12, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E296.UY0
Job Number:	1		

Notes

location:on rear patio slab 13167
Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

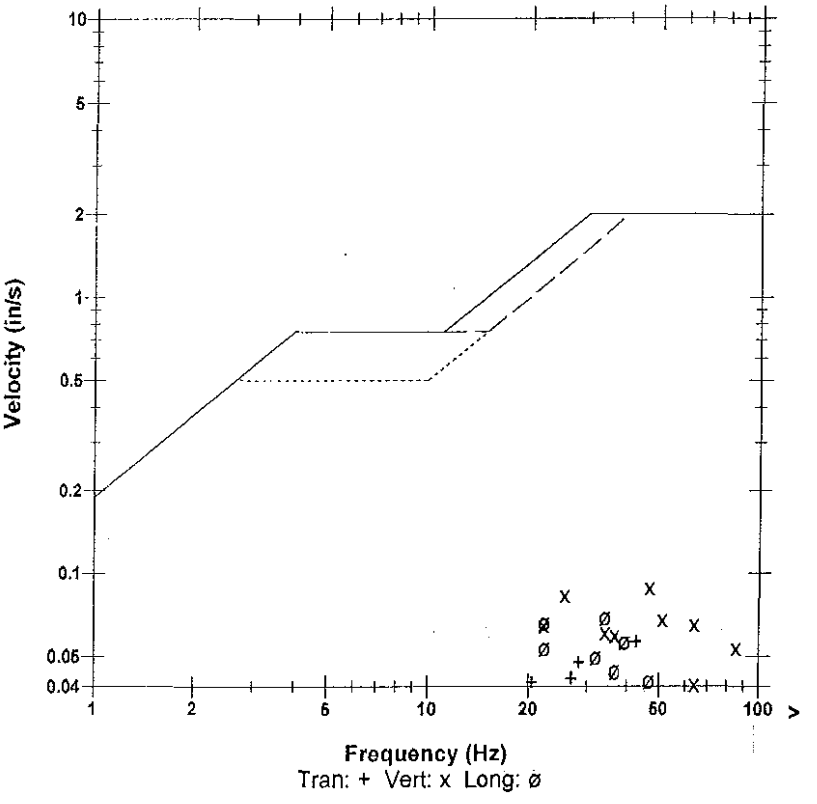
Post Event Notes

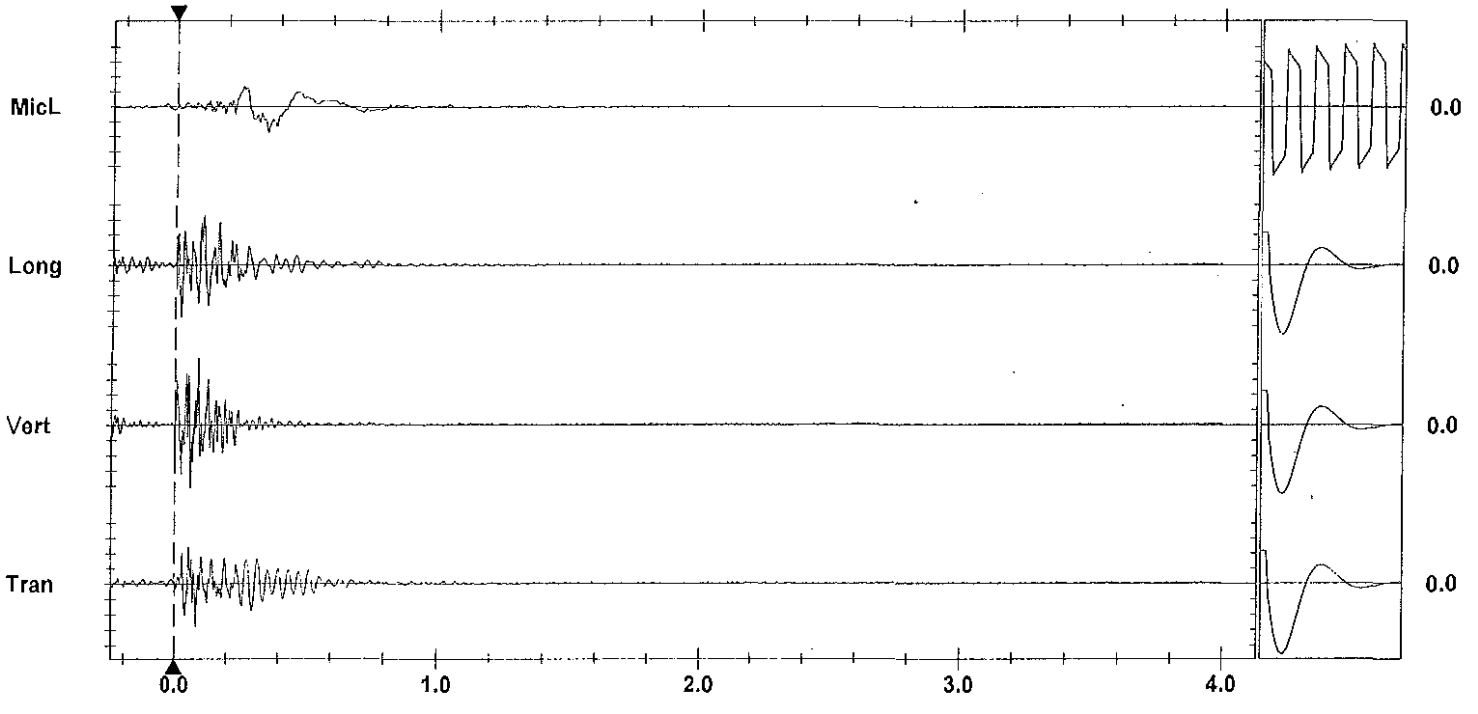
Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.351 sec
ZC Freq 3.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 749 mv)

	Tran	Vert	Long	
PPV	0.0562	0.0881	0.0687	in/s
ZC Freq	43	47	34	Hz
Time (Rel. to Trig)	0.086	0.093	0.020	sec
Peak Acceleration	0.0547	0.0878	0.0431	g
Peak Displacement	0.00024	0.00033	0.00047	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0965 in/s at 0.092 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: December 17, 2011 (V 8.04 - 8.04) Format Copyrighted 1995-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11
BLAST # mw-0099

11:17AM

HIGHWAY# 97
BLAST LOCATION AT: 129+30 - 129+40 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot matted.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

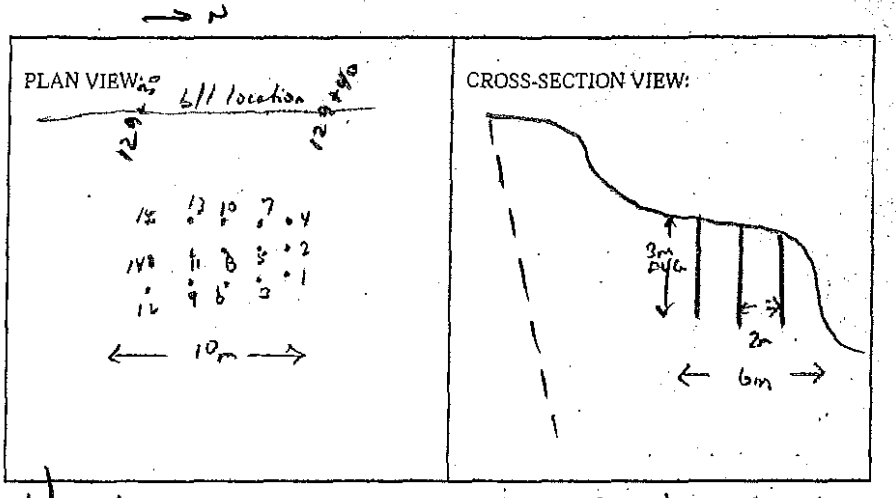
INITIATION DEVICE: (CIRCLE) (E.E. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HF 520 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13169 Cliffstone ent - 0.061 ips / 37 Hz
Seismograph @ 13093 Cliffstone ent - 0.151 ips / 21 Hz

3' ANFO / Hole primed w/ 0.5 amex 1 TNT/8 DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:19:46 December 13, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

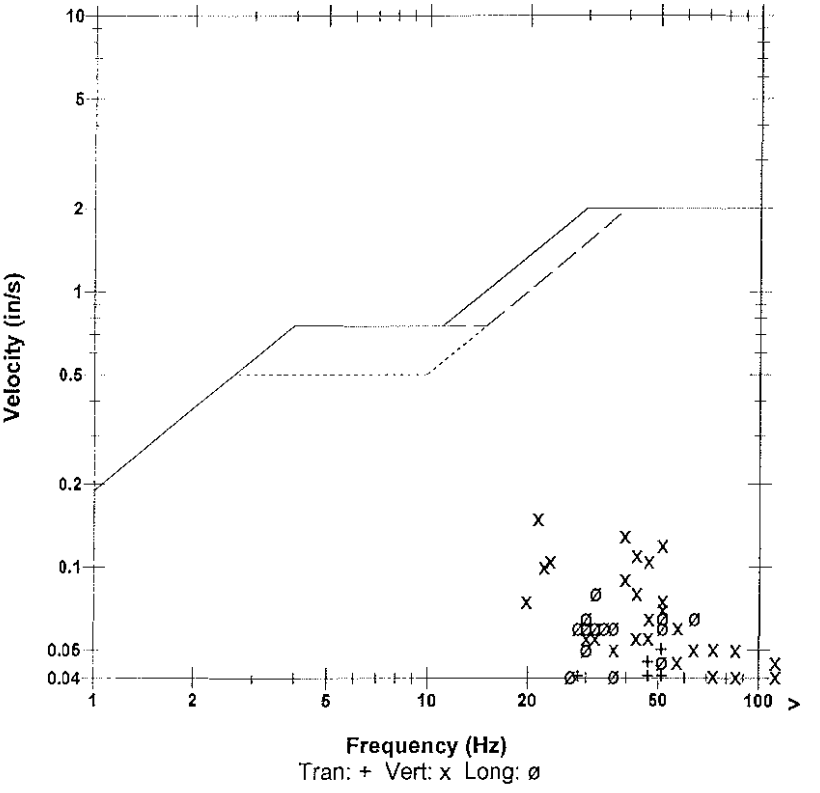
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2AS.SY0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

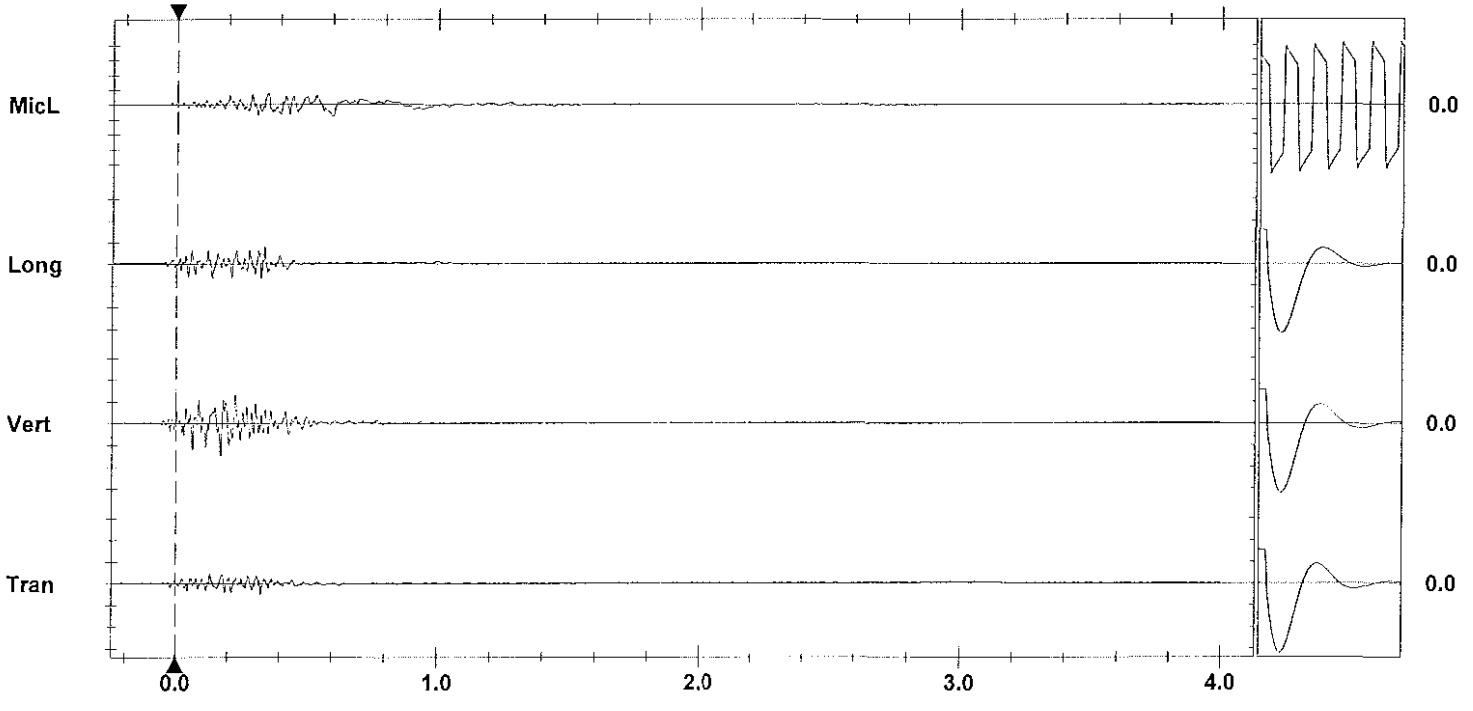
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00076 psi(L) at 0.350 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.0500	0.150	0.0800	in/s
ZC Freq	51	21	32	Hz
Time (Rel. to Trig)	0.330	0.172	0.342	sec
Peak Acceleration	0.0663	0.106	0.0928	g
Peak Displacement	0.00022	0.00078	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.5	

Peak Vector Sum 0.151 in/s at 0.172 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶ ◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:19:54 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2AS.T60
Job Number:	1		

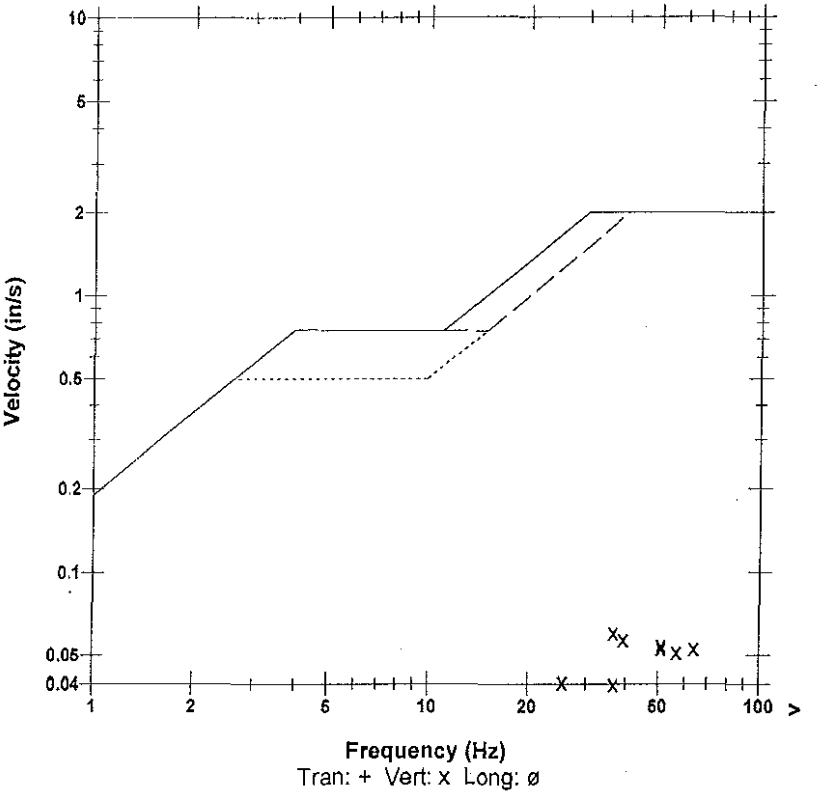
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

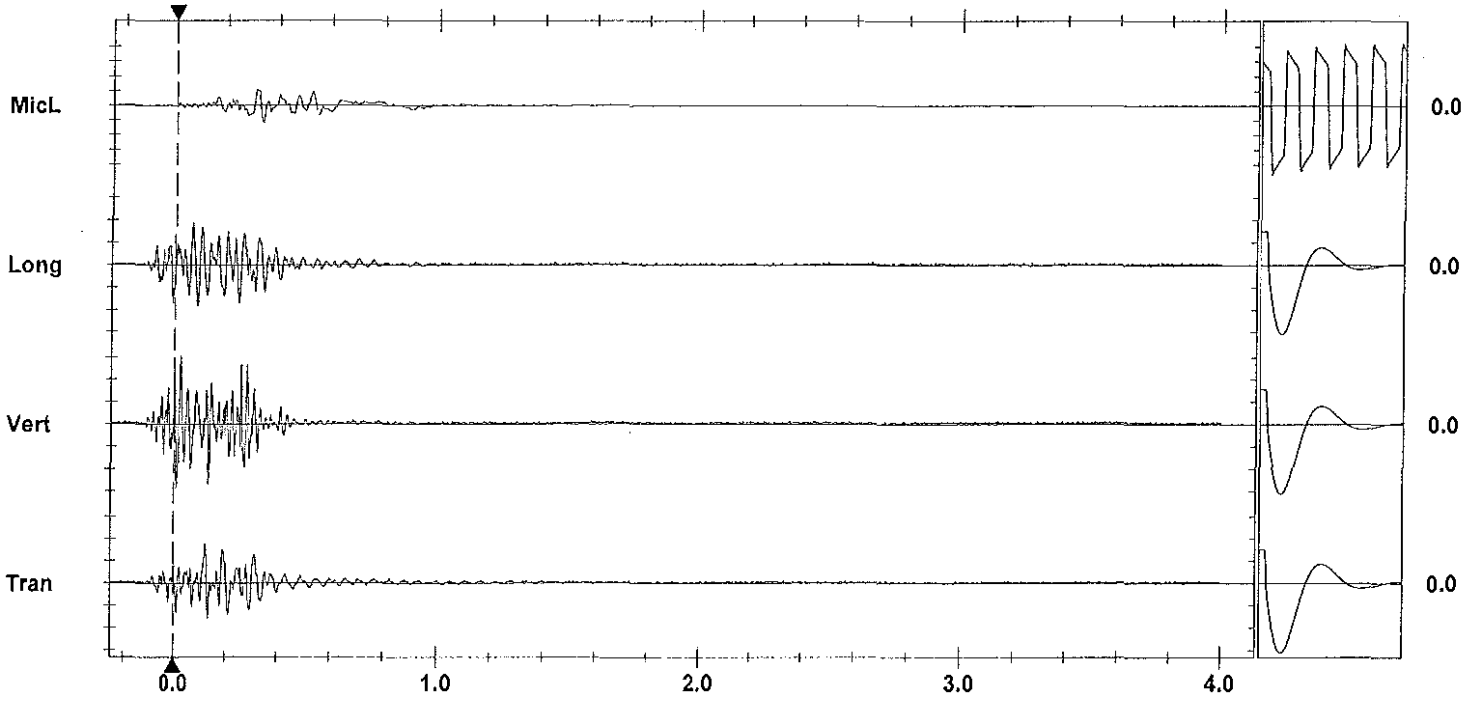
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.335 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0606	0.0369	in/s
ZC Freq	23	37	27	Hz
Time (Rel. to Trig)	0.127	0.025	0.069	sec
Peak Acceleration	0.0315	0.0746	0.0298	g
Peak Displacement	0.00020	0.00024	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.0648 in/s at 0.138 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶——————◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11 1:00 PM
BLAST # MW-0040

HIGHWAY# 97
BLAST LOCATION AT: STA 129+30 - 129+40 LS (TAPERED)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot muffled

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3.5
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 146/11 (10 loaded) / 7 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 1
TOTAL NUMBER OF DELAYS

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

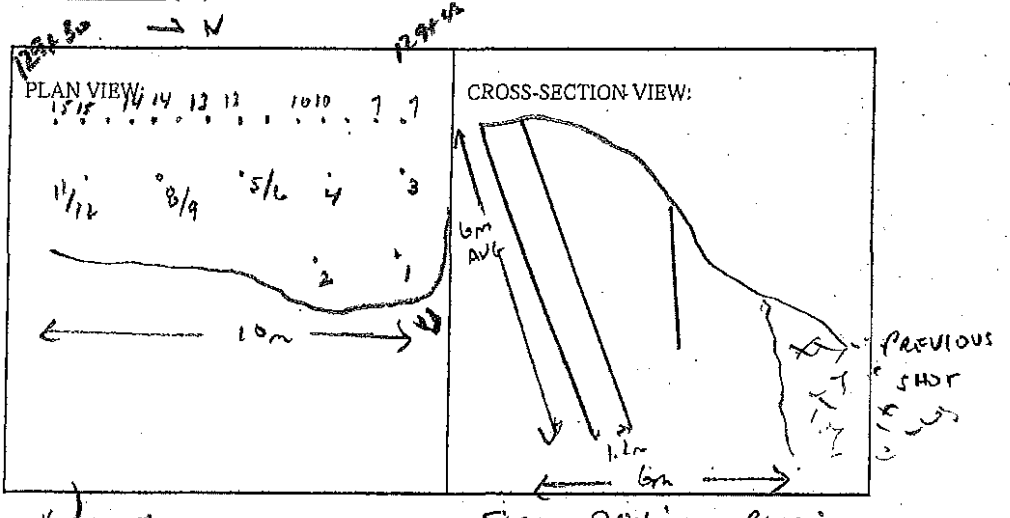
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HI 520 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13107 cliffstone ent – 0.061 ips / 43Hz
@ 13093 cliffstone ent – 0.18 ips / 57Hz

STAB Holes - 1.5' ANFO/Hole

Buffer Holes - Bottom Decks - 4 each 2½" Blasting

- Top Decks - 1-2 each 2"x16" Blasting

Primed w/ 0.5 each 1½"x16" Dynamite

B/L Holes - 1 each 2½"x16" Dynamite + 200 grain det cord to 4' collar.

Instantel

Event Report

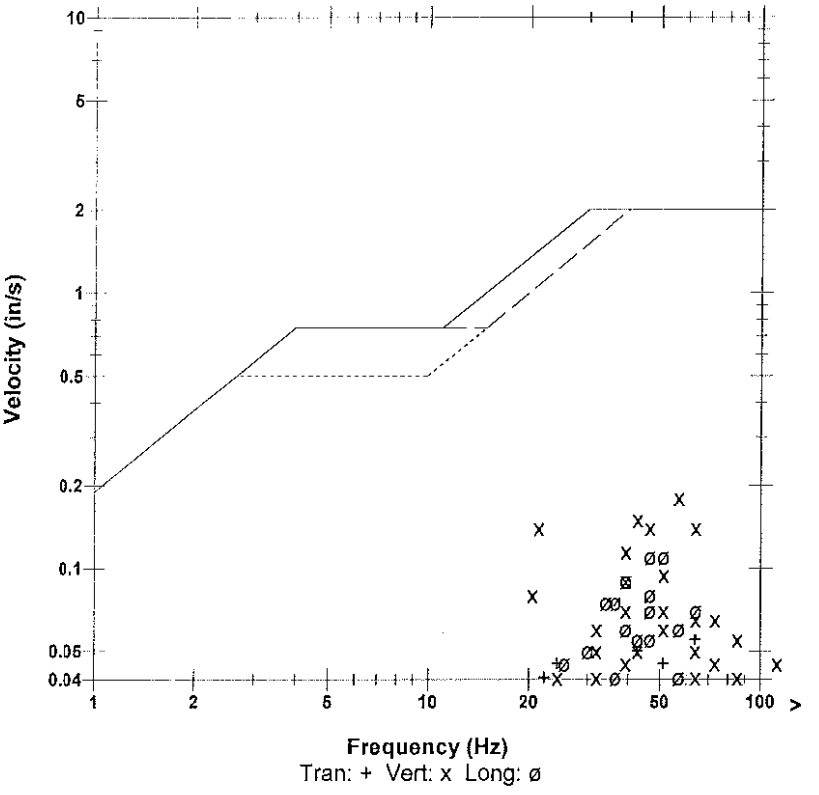
Date/Time	Vert at 13:00:29 December 13, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2AX.GT0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

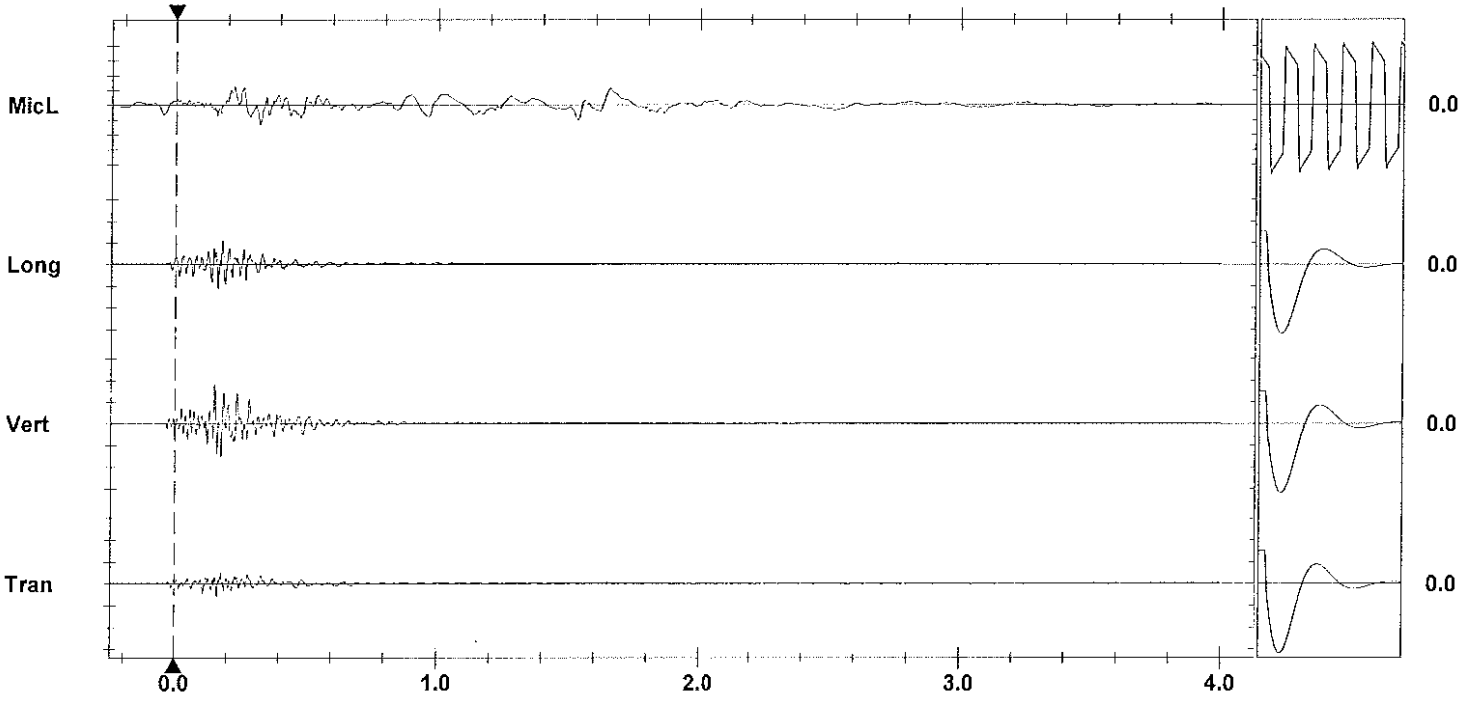
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0550	0.180	0.110	in/s
ZC Freq	64	57	51	Hz
Time (Rel. to Trig)	0.163	0.151	0.162	sec
Peak Acceleration	0.0663	0.239	0.106	g
Peak Displacement	0.00025	0.00066	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.321 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 714 mv)

Peak Vector Sum 0.184 in/s at 0.151 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01)
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Instantel

Event Report

Date/Time	Vert at 13:00:36 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2AX.H00
Job Number:	1		

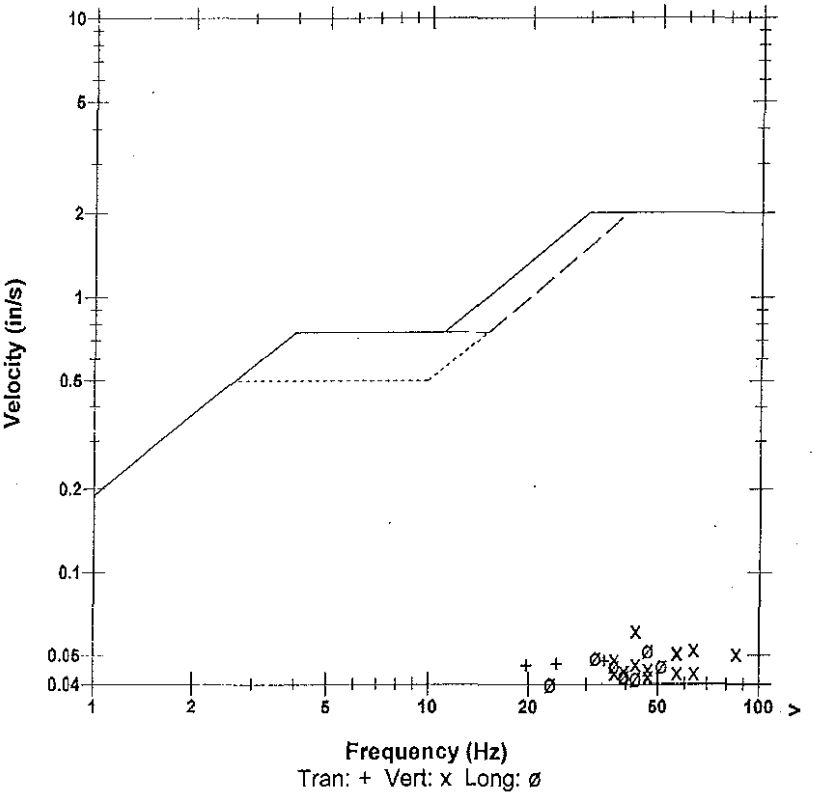
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

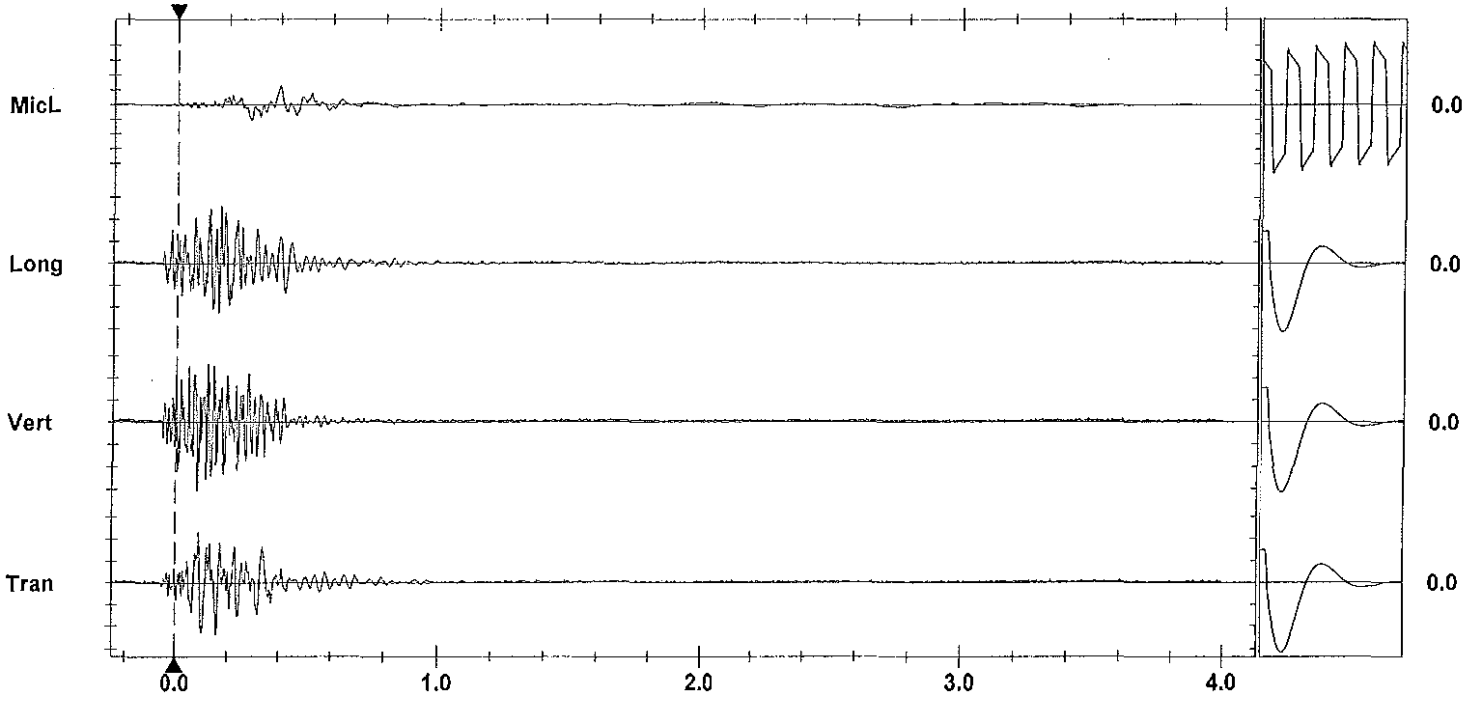
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.396 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 741 mv)

	Tran	Vert	Long	
PPV	0.0475	0.0612	0.0519	in/s
ZC Freq	34	43	47	Hz
Time (Rel. to Trig)	0.162	0.087	0.171	sec
Peak Acceleration	0.0514	0.118	0.0497	g
Peak Displacement	0.00031	0.00021	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.0732 in/s at 0.127 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶— — — —◀

Sensorcheck

Printed: December 17, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11 2221 PM
BLAST # MW-0041

HIGHWAY# 97
BLAST LOCATION AT: STN 1294+20 - 1294+70 (Hubberman)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Fanco
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

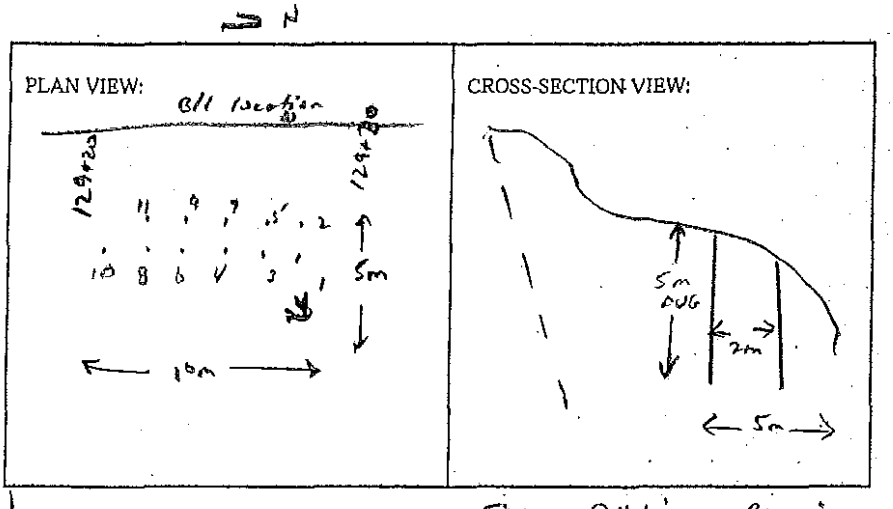
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 @ diffuser end - 0.092 ips / 39Hz
@ 13093 @ diffuser end - 0.241 ips / 43Hz

3'-4' ANFO/Hole primed w/ 0.5 case 1½"x16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 14:21:49 December 13, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

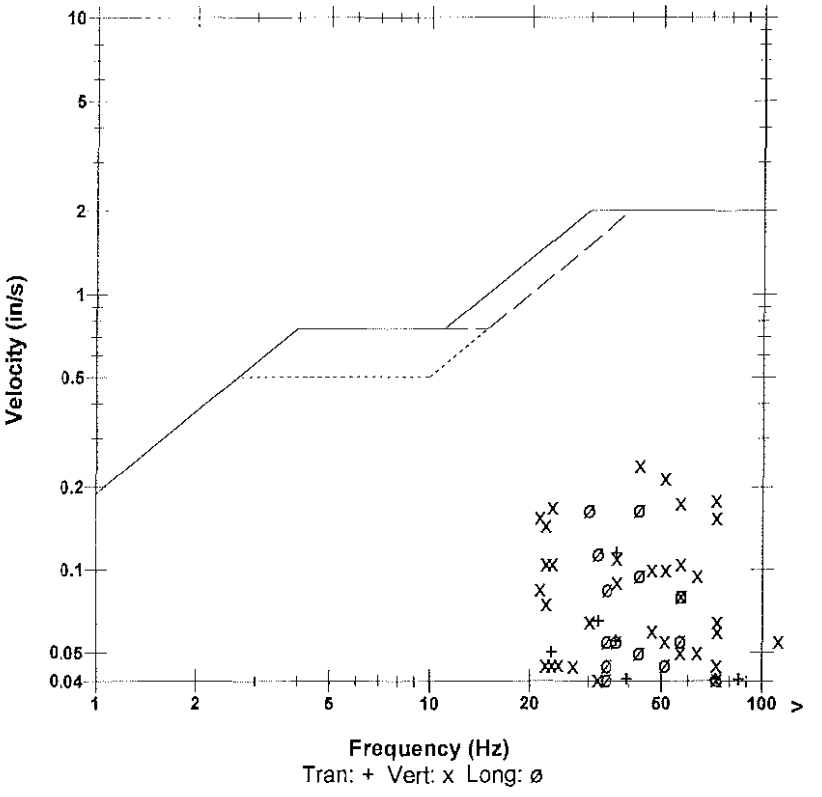
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2B1.8D0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

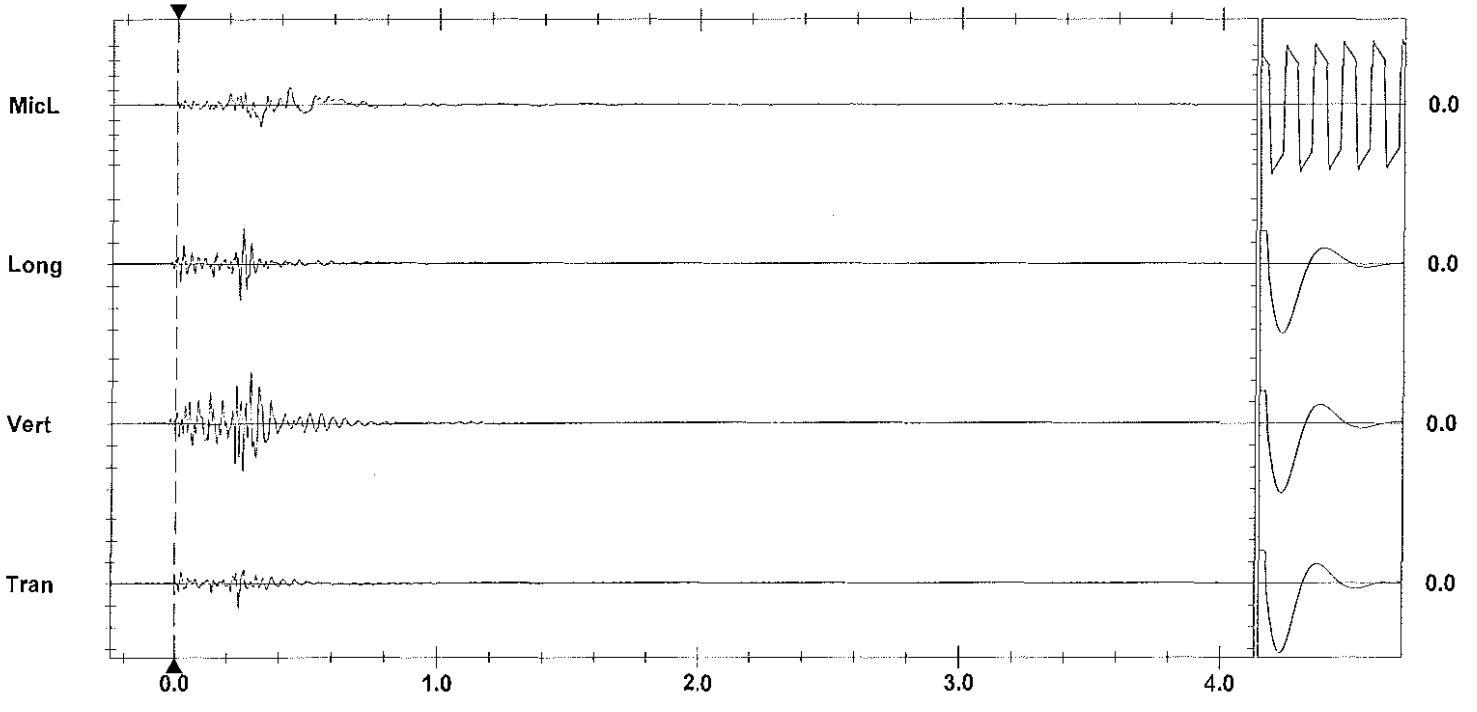
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.322 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 735 mv)

	Tran	Vert	Long	
PPV	0.115	0.240	0.165	in/s
ZC Freq	37	43	43	Hz
Time (Rel. to Trig)	0.248	0.288	0.246	sec
Peak Acceleration	0.0928	0.265	0.133	g
Peak Displacement	0.00037	0.00118	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.275 in/s at 0.261 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:21:56 December 13, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2B1.8K0
Job Number:	1		

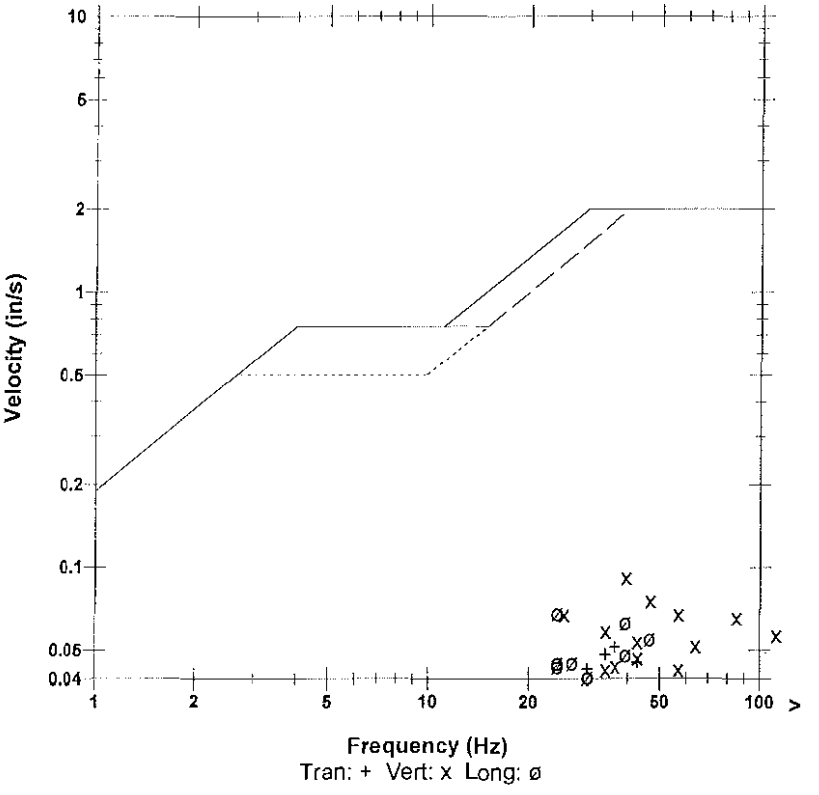
Notes

location:on rear	patio slab 13167
Cliffstone Crt	sandbagged
User Name:W Verwey	
General:Blast at Stn	129+80

Extended Notes

Post Event Notes

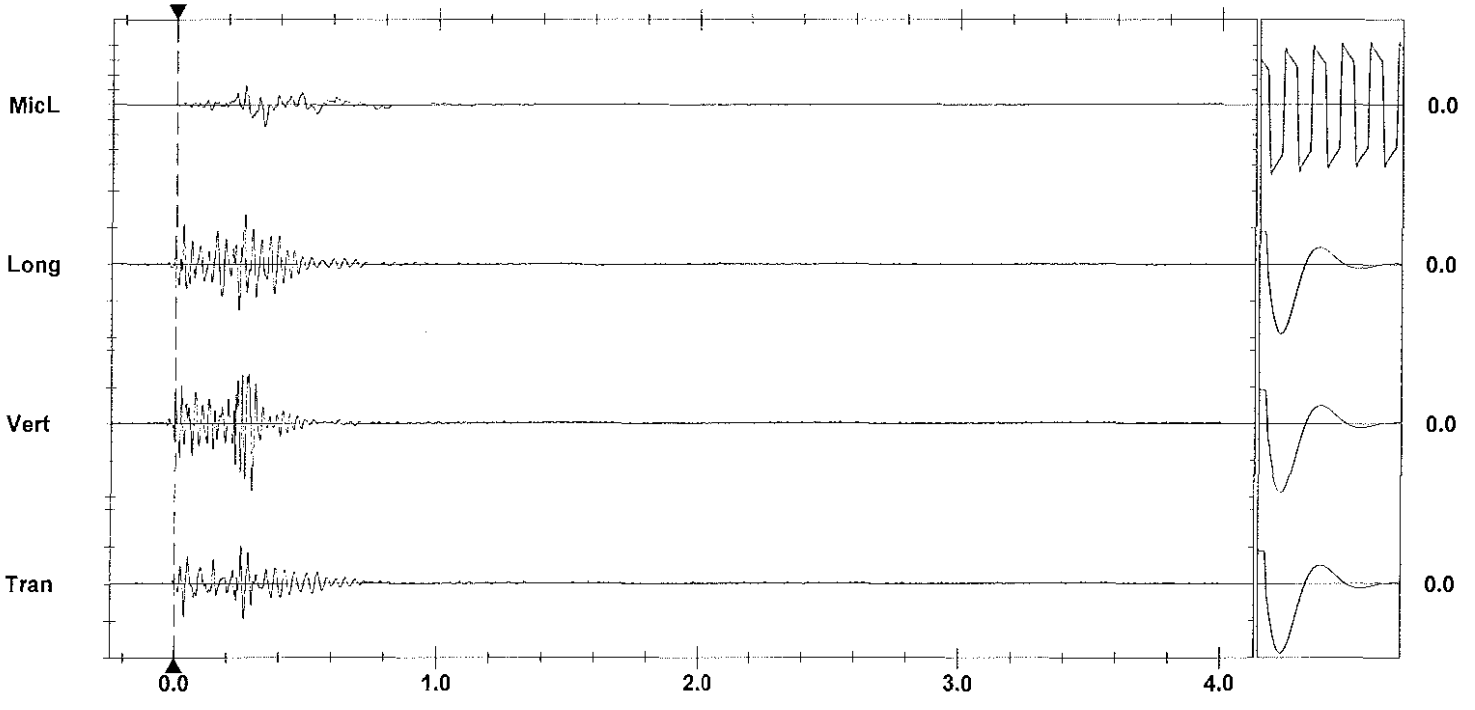
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.336 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 753 mv)

	Tran	Vert	Long	
PPV	0.0512	0.0919	0.0681	in/s
ZC Freq	37	39	24	Hz
Time (Rel. to Trig)	0.257	0.297	0.264	sec
Peak Acceleration	0.0414	0.116	0.0464	g
Peak Displacement	0.00021	0.00042	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.107 in/s at 0.297 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck

Trigger =

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 13/14
ACTUAL BLAST DATE Dec. 13/14
BLAST # 135 shot @ 16:00 pm 4:14 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+90 – 128+00 (1st Beach) RS.

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 12 (m) SLOPE ANGLE 80 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 0
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 160 (m)

TOTAL NUMBER OF HOLES 40 production
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 40

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

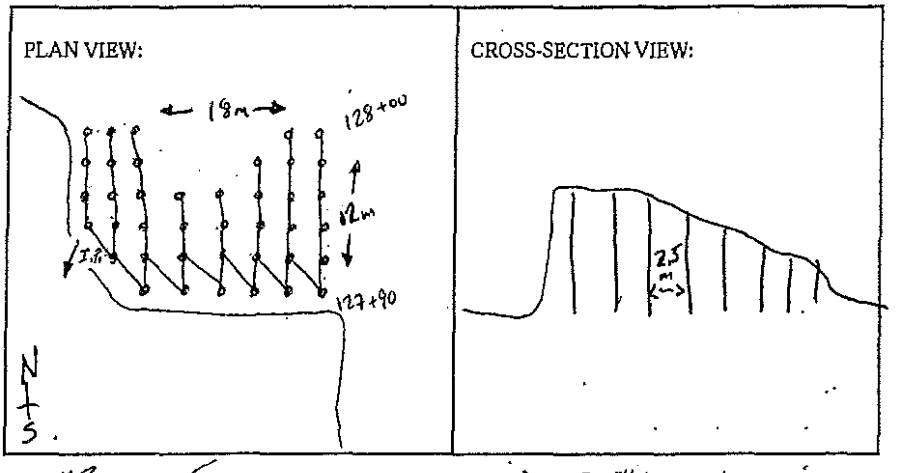
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 870 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

40 - 7m(24)' Ez dets.

7 - 42ms connectadel.

1 Elec del.

12 - BAgs Anfo.

20 - sticks 1½x16

Instantel

Event Report

Date/Time	Vert at 16:14:48 December 13, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

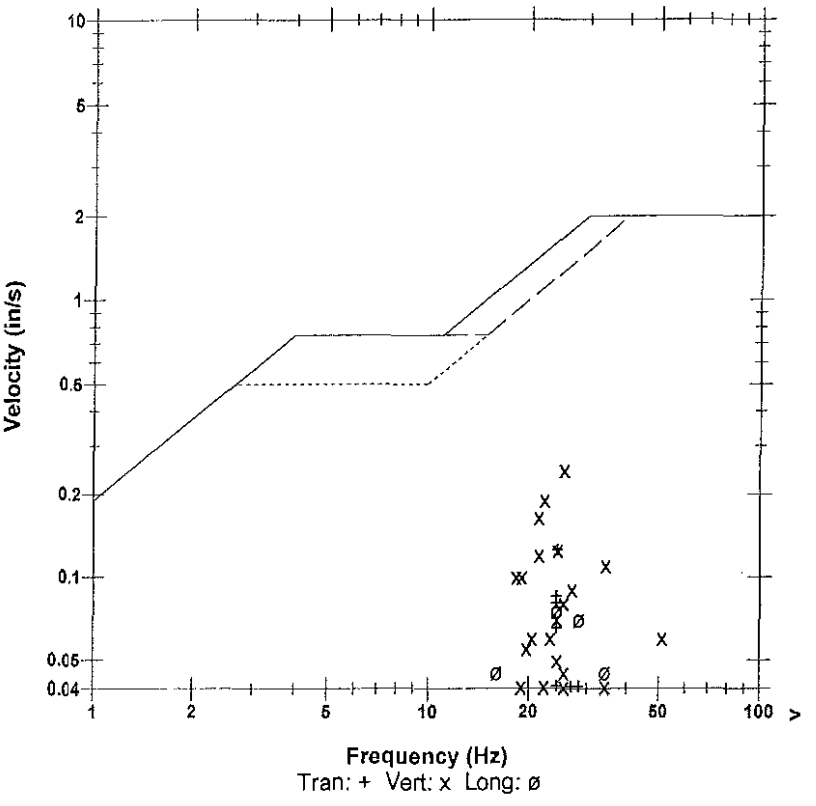
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2B6.GO0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

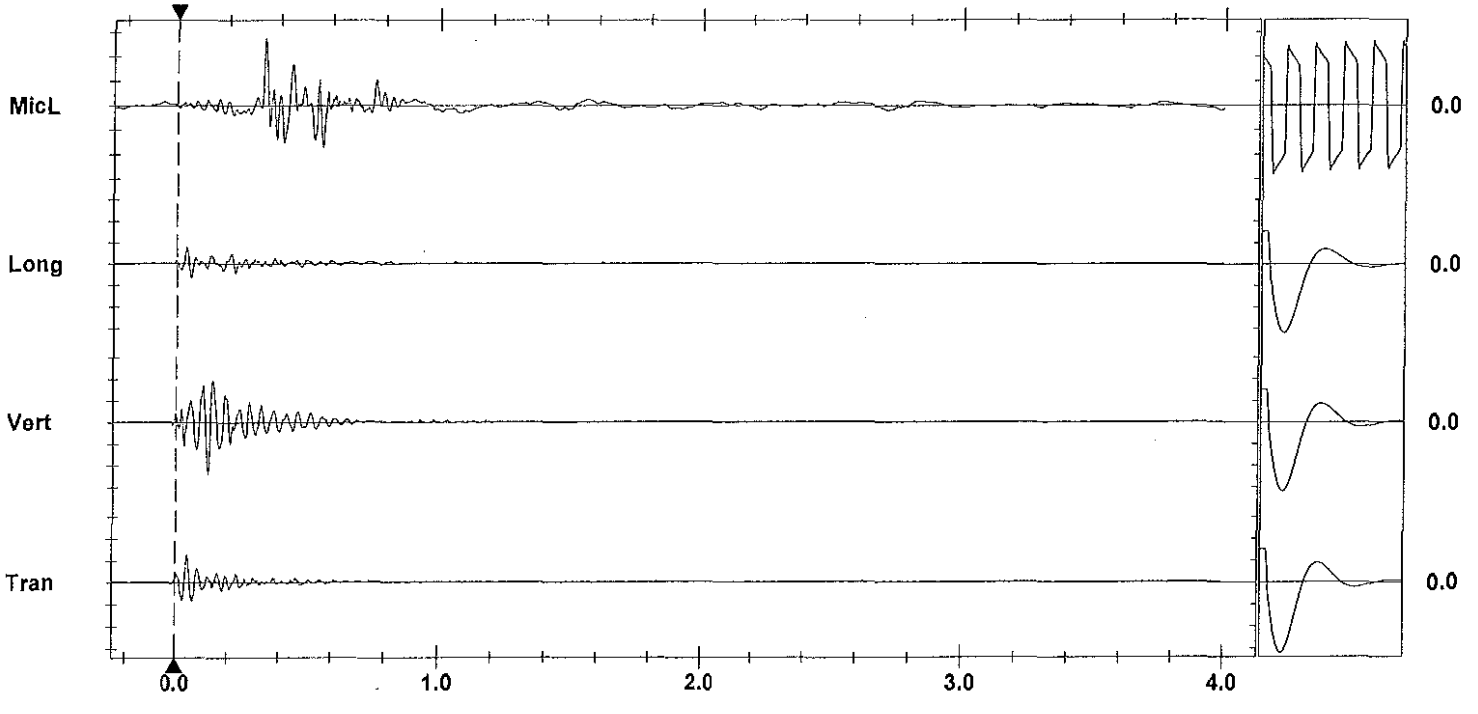
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00547 psi(L) at 0.342 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 742 mv)

	Tran	Vert	Long	
PPV	0.125	0.245	0.0750	in/s
ZC Freq	24	26	24	Hz
Time (Rel. to Trig)	0.047	0.126	0.039	sec
Peak Acceleration	0.0530	0.119	0.0398	g
Peak Displacement	0.00074	0.00151	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.246 in/s at 0.127 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

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Instantel

Event Report

Date/Time	Long at 16:14:56 December 13, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

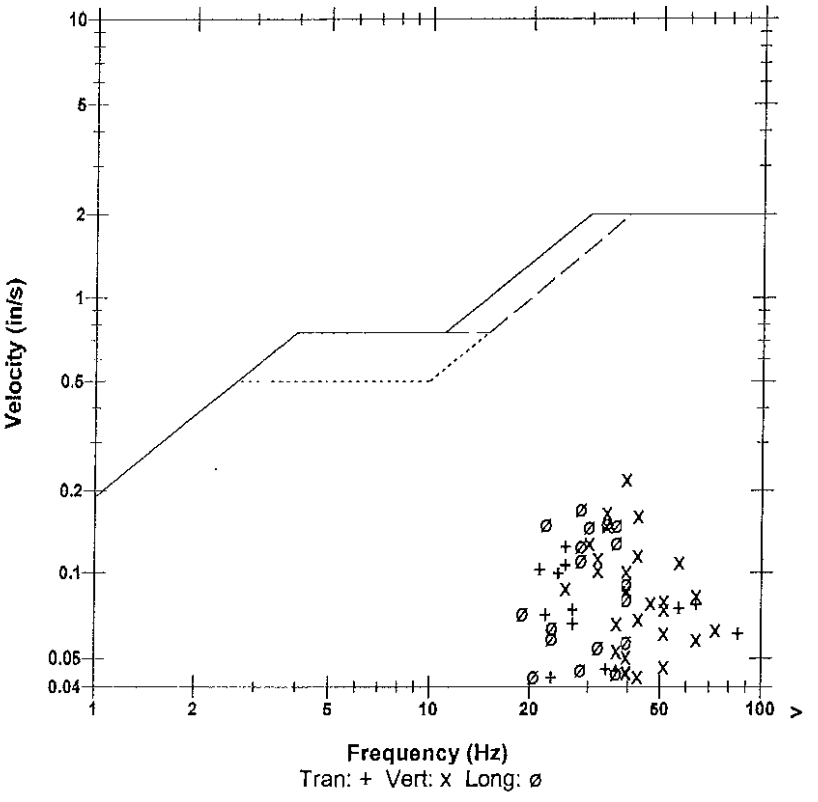
Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E2B6.GW0

Notes
location:on main entrance slab
13050 Old Mission Road sandbagged
User Name:W Verwey
General:Blast at Stn 129+80

Extended Notes

Post Event Notes

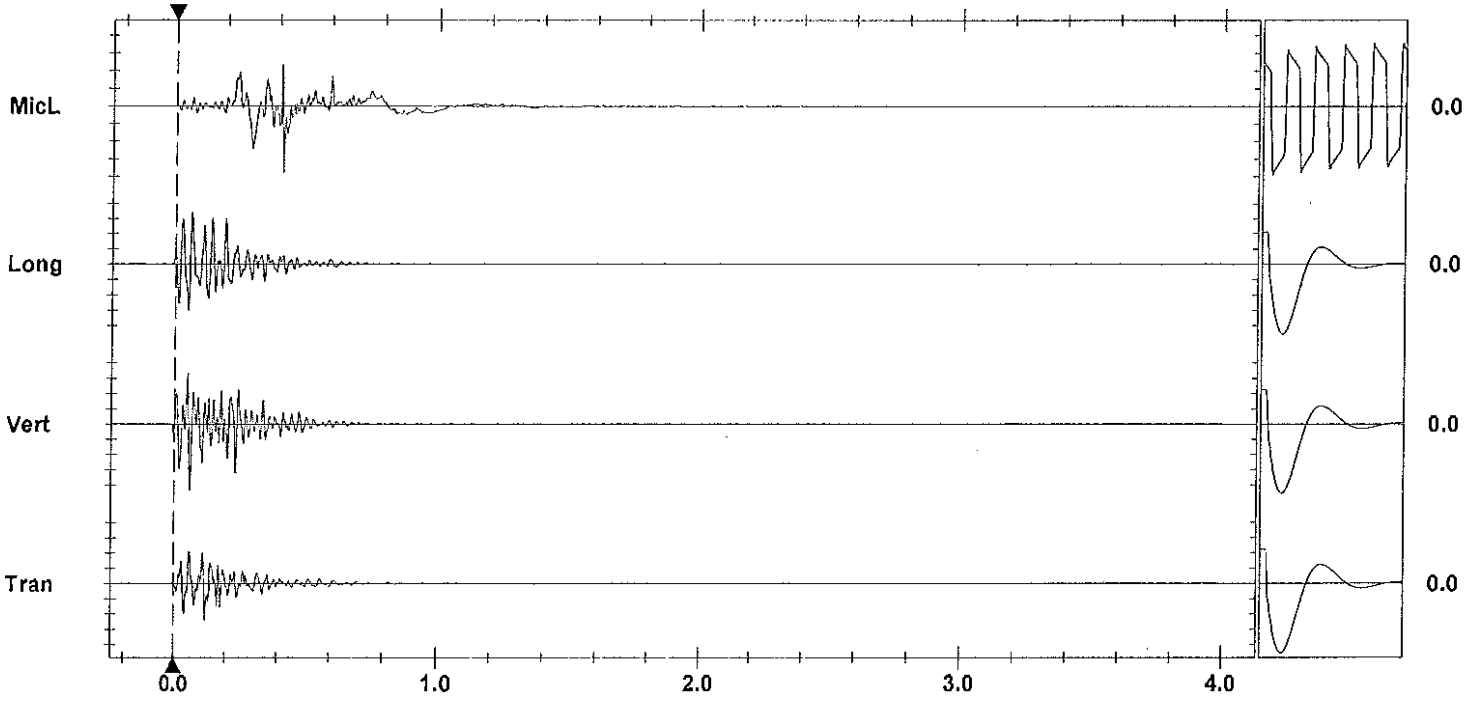
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00761 psi(L) at 0.414 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 688 mv)

	Tran	Vert	Long	
PPV	0.124	0.221	0.172	in/s
ZC Freq	26	39	28	Hz
Time (Rel. to Trig)	0.125	0.063	0.064	sec
Peak Acceleration	0.106	0.159	0.108	g
Peak Displacement	0.00059	0.00087	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.292 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 12:00 PM
BLAST # MW-0042

HIGHWAY# 97
BLAST LOCATION AT: 129+20 - 129+30 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14 (10 loaded)
AVERAGE DEPTH 10 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 130 (m)

TOTAL NUMBER OF HOLES 46/11 & P200.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

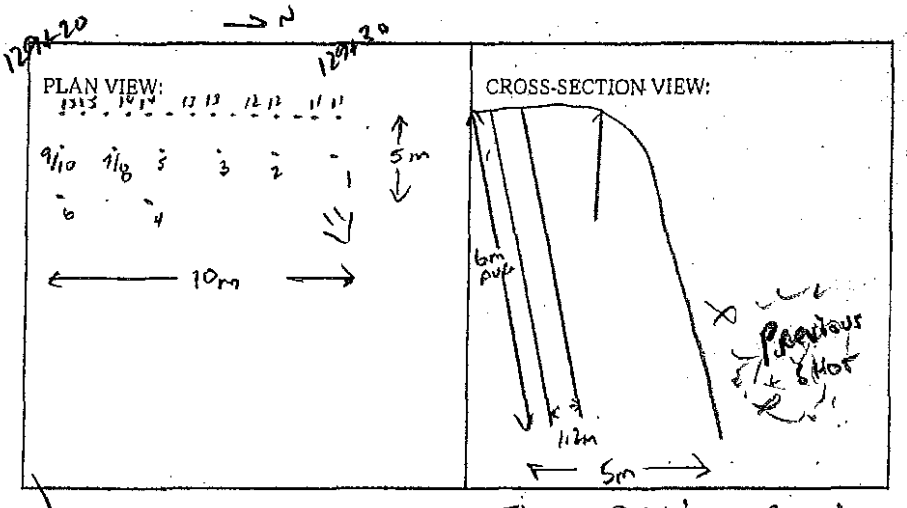
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.093 ips/ 47Hz
@ 13093 Cliffstone Cut - 0.173 ips/ 97Hz

STAB Holes - 1.5' ANFO/Hole

BUFFER Holes - Bottom Deck - 1/ each 2"x 16" Emulite

- TOP Deck - 2 each 2"x 16" Emulite

Primed w/ 1 each 1"x 8" DYNAMITE

B/L Holes - 1 each 2"x 16" DYNAMITE + 100gr det cord to 4' Collar

Instantel

Event Report

Date/Time	Vert at 12:05:55 December 14, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2CP.LV0
Job Number:	1		

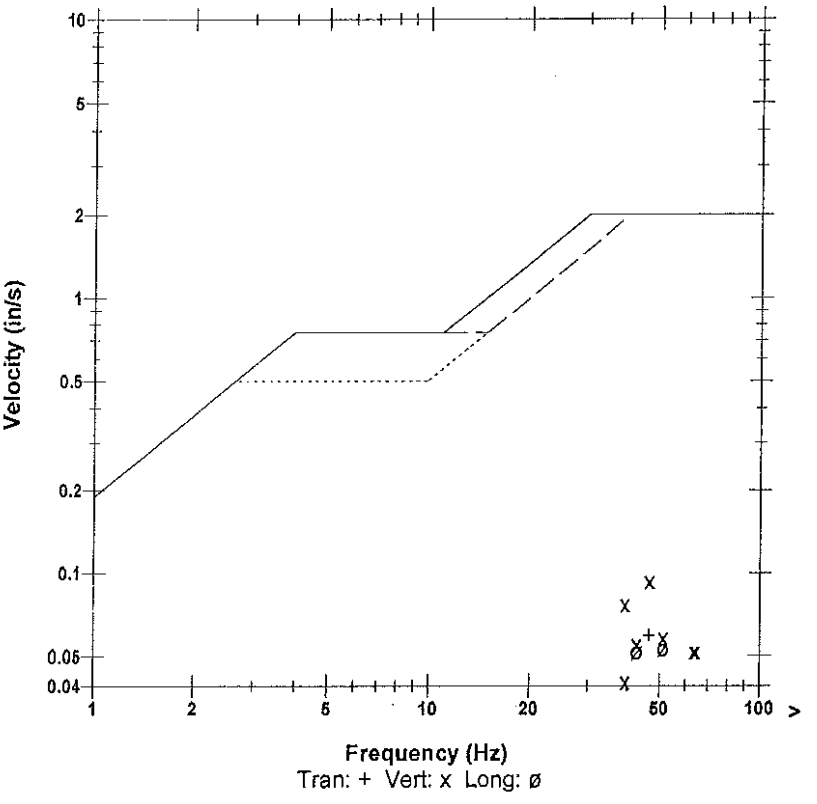
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

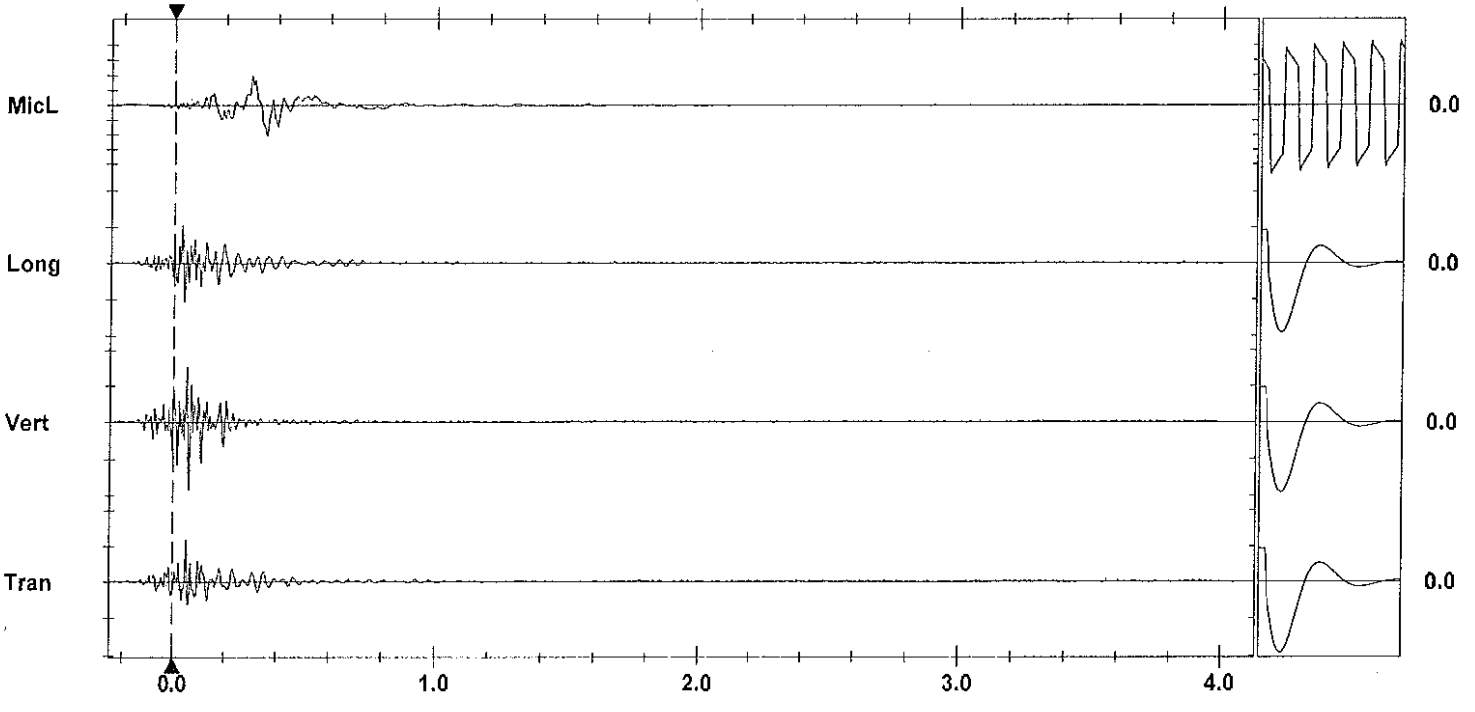
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00210 psi(L) at 0.355 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 731 mv)

	Tran	Vert	Long	
PPV	0.0594	0.0931	0.0531	in/s
ZC Freq	47	47	51	Hz
Time (Rel. to Trig)	0.054	0.062	0.040	sec
Peak Acceleration	0.0563	0.0945	0.0481	g
Peak Displacement	0.00017	0.00032	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.100 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD

FILE #:
PROJECT NO. 21377-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Dec. 16/11
ACTUAL BLAST DATE Dec. 16/11 2:32 PM
BLAST # 139

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 5544643

HIGHWAY # 97
BLAST LOCATION AT: STA # 126+23 - 126+60 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 39 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 39
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 17
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 936 (m)

TOTAL NUMBER OF HOLES 101 production / 39 B/L
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 140
TOTAL NUMBER OF DELAYS 101

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

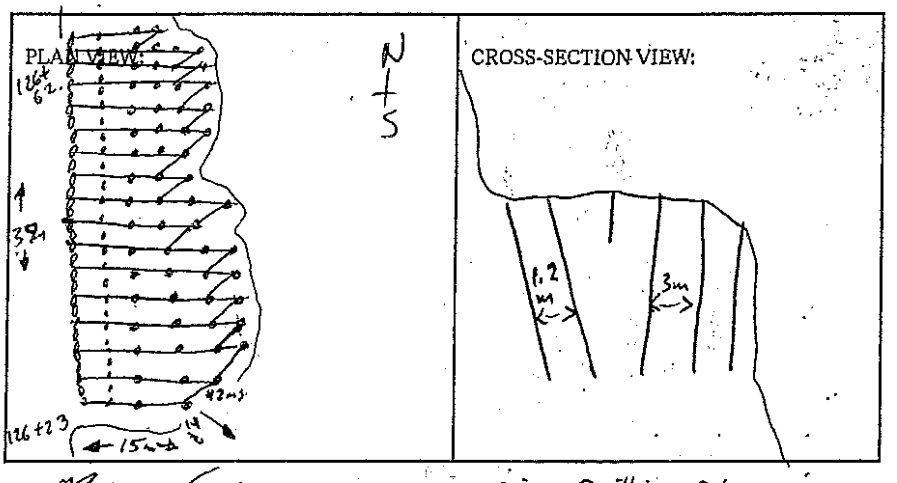
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 4600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

101 - 40' dets
15 - 24' dets
39 - 12' ms.
17 - 42 ms connecta det
1 - 17 ms connecta det

42 - Anfo.
13/4 - case 1½ x 16.

Instantel

Event Report

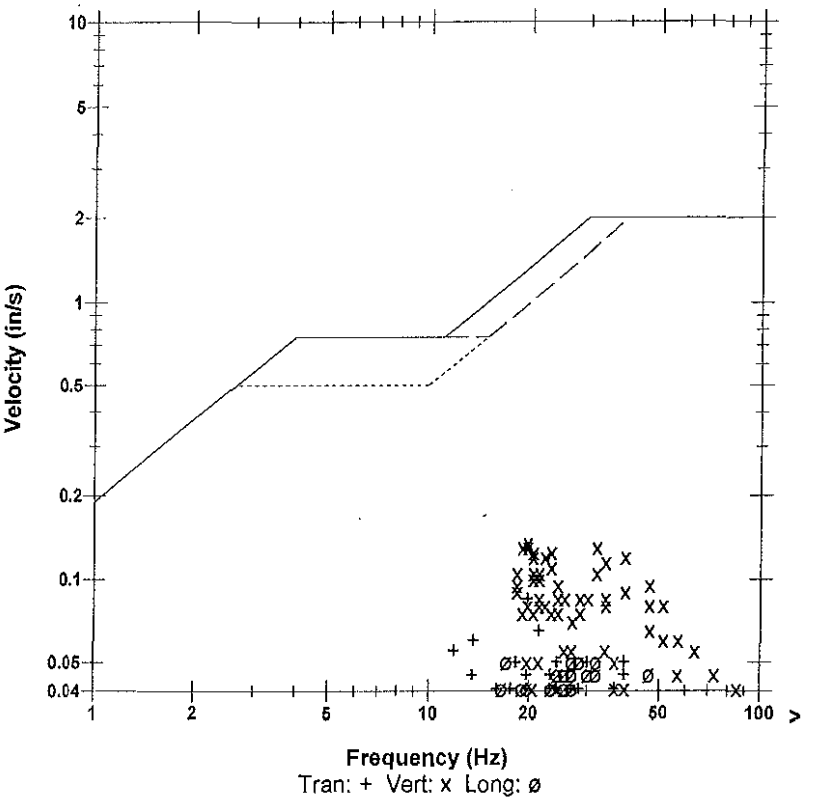
Date/Time	Vert at 14:32:31 December 16, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2GL.Q70

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

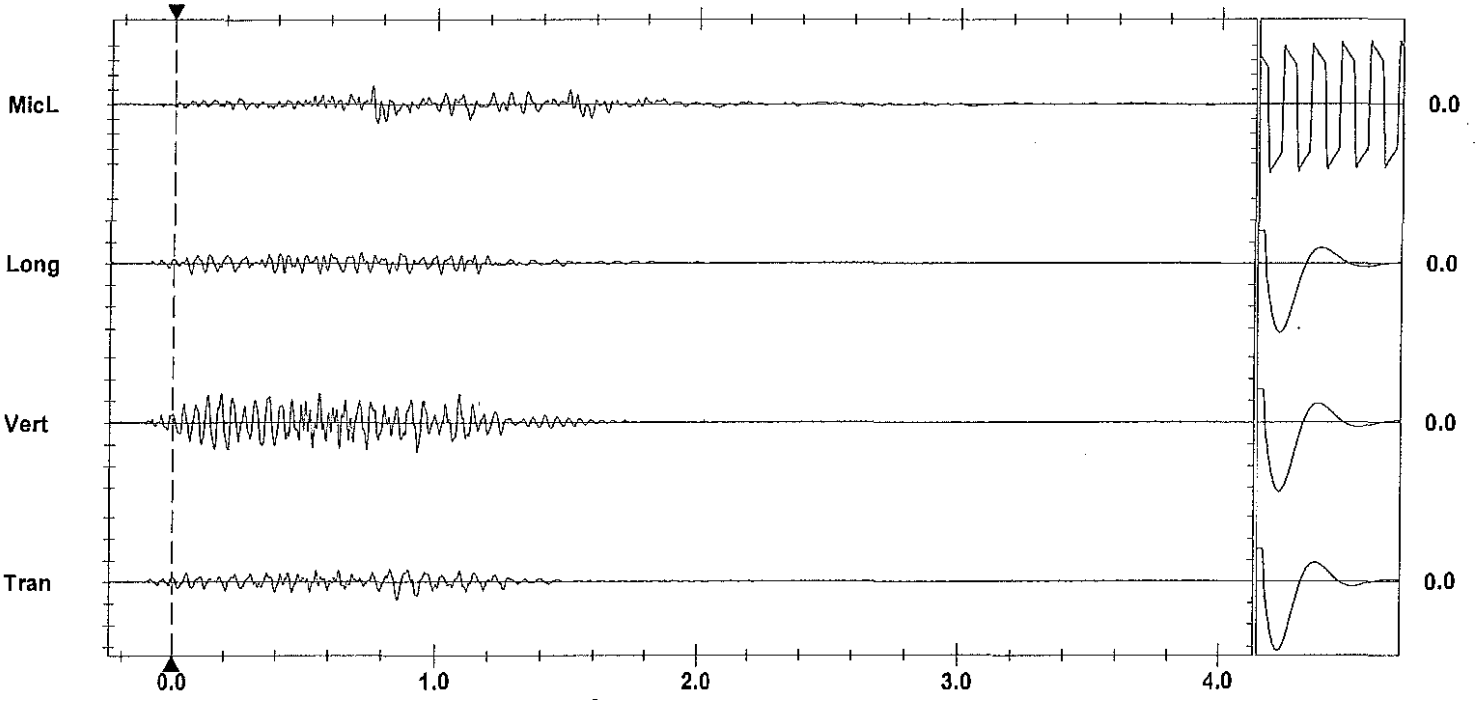
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.777 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.0850	0.135	0.0500	in/s
ZC Freq	20	20	27	Hz
Time (Rel. to Trig)	0.860	0.933	0.070	sec
Peak Acceleration	0.0398	0.0795	0.0398	g
Peak Displacement	0.00068	0.00103	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.148 in/s at 0.933 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 14:32:42 December 16, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2GL.QI0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

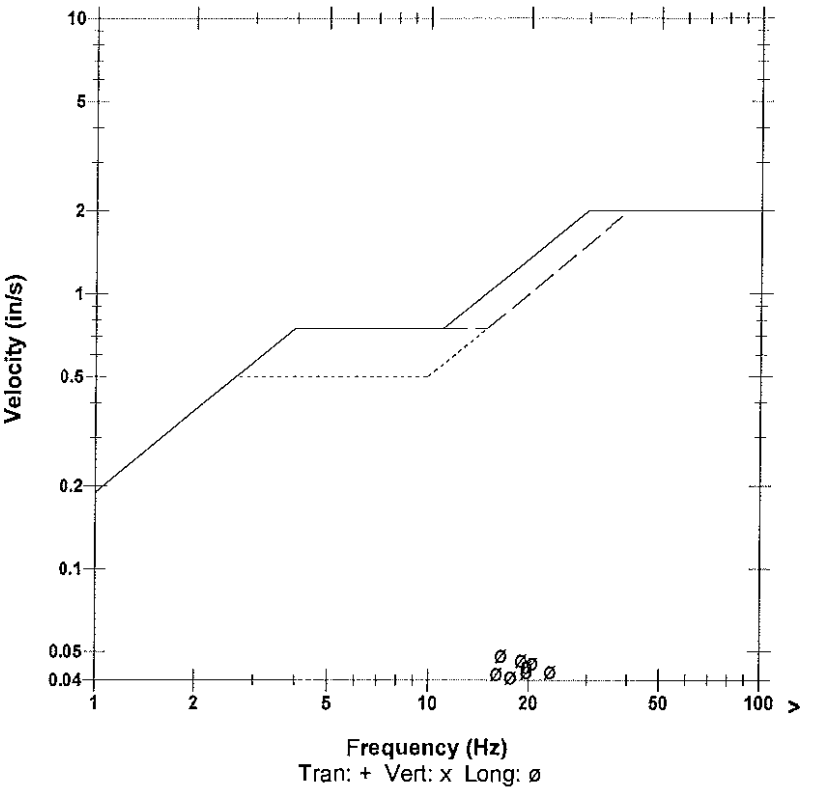
Post Event Notes

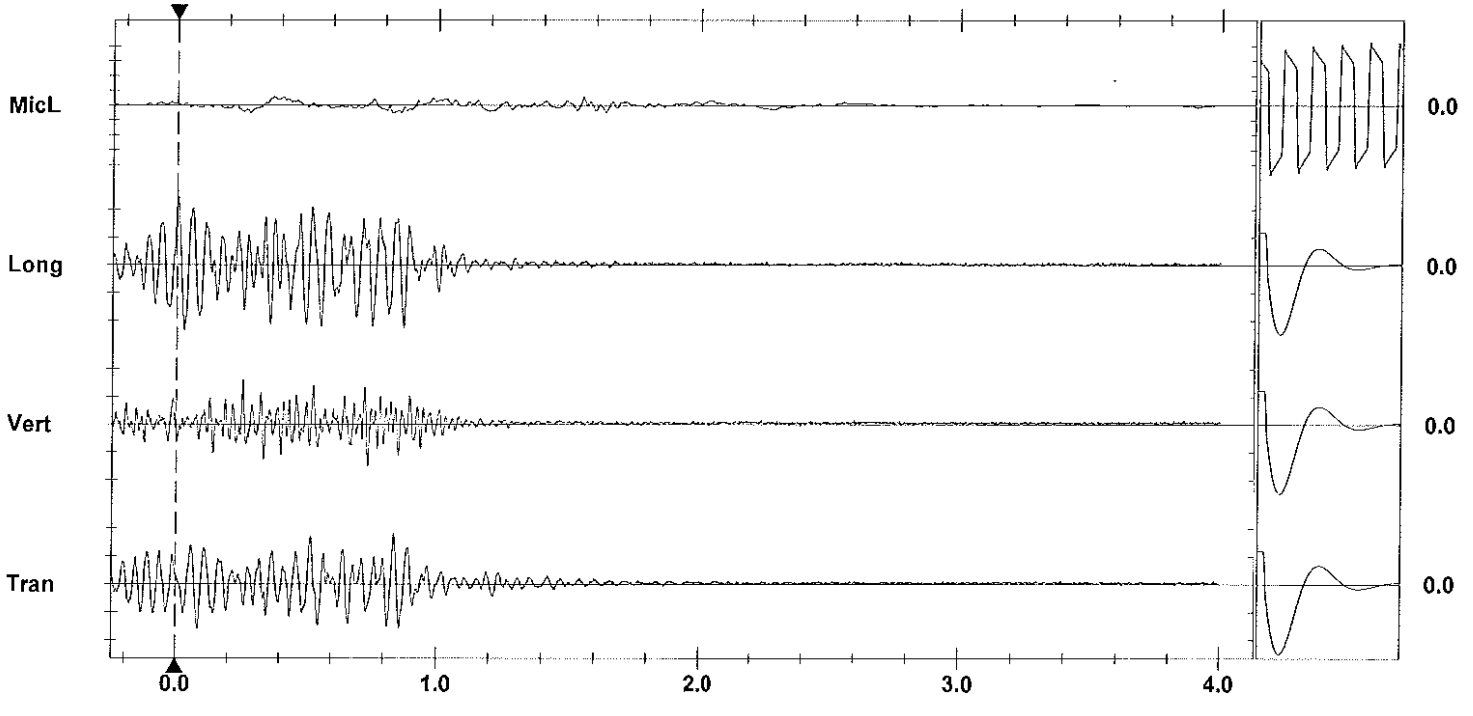
Microphone Linear Weighting
PSPL 0.00058 psi(L) at 0.369 sec
ZC Freq 3.3 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 733 mv)

	Tran	Vert	Long	
PPV	0.0362	0.0319	0.0487	in/s
ZC Freq	20	37	17	Hz
Time (Rel. to Trig)	0.840	0.258	0.003	sec
Peak Acceleration	0.0133	0.0249	0.0232	g
Peak Displacement	0.00026	0.00014	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0541 in/s at 0.521 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 16/11 2:55pm
BLAST # MW-0023

HIGHWAY# 97
BLAST LOCATION AT: 128+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

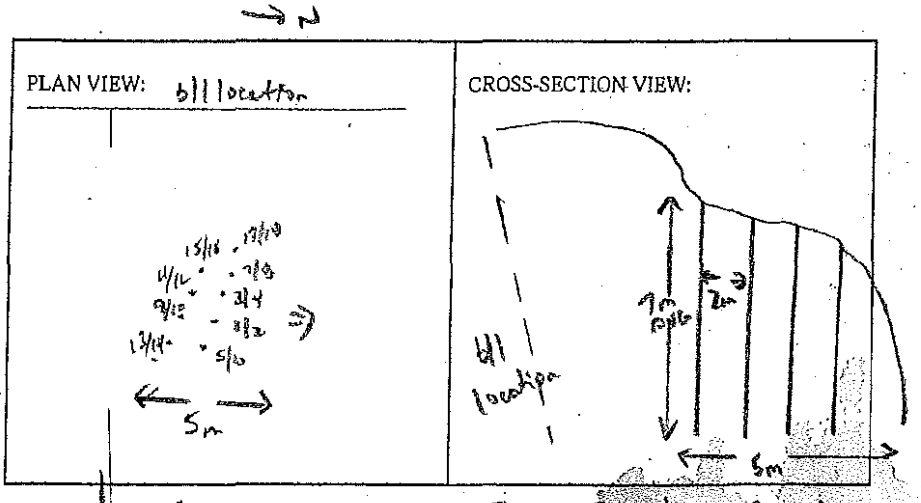
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crk = 0.096 ips / 43mm
@ 13093 cliffstone crk = 0.40 ips / 57mm

Bottom Decks 4'-5' ANFO

Top Decks - 2'-3' ANFO

1"x8" Dynamite Primers

Instantel®

Event Report

Date/Time	Vert at 14:54:48 December 16, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2GM.RC0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

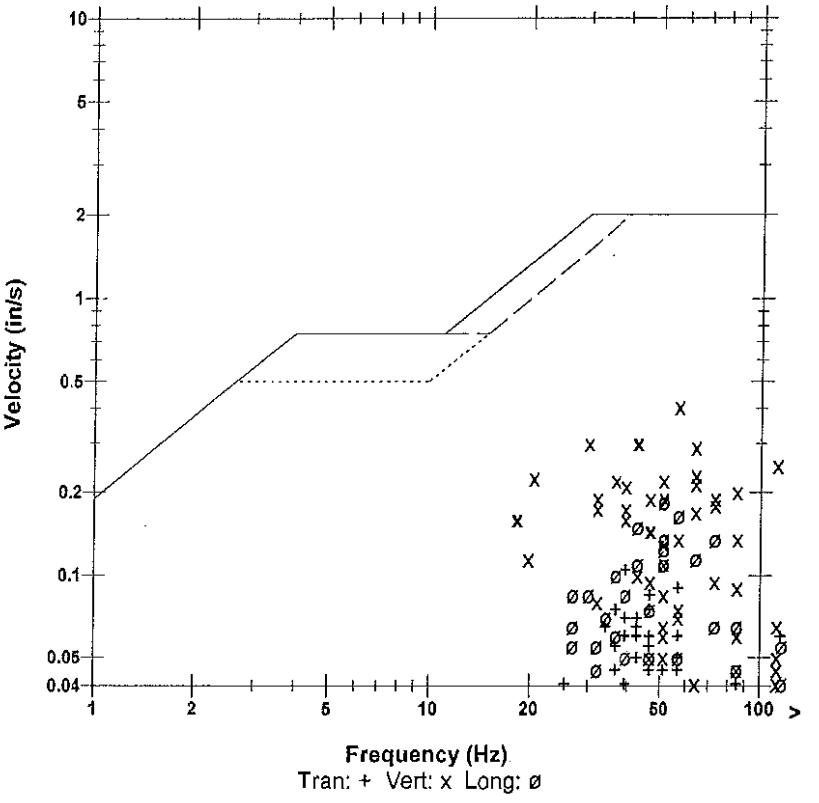
Post Event Notes

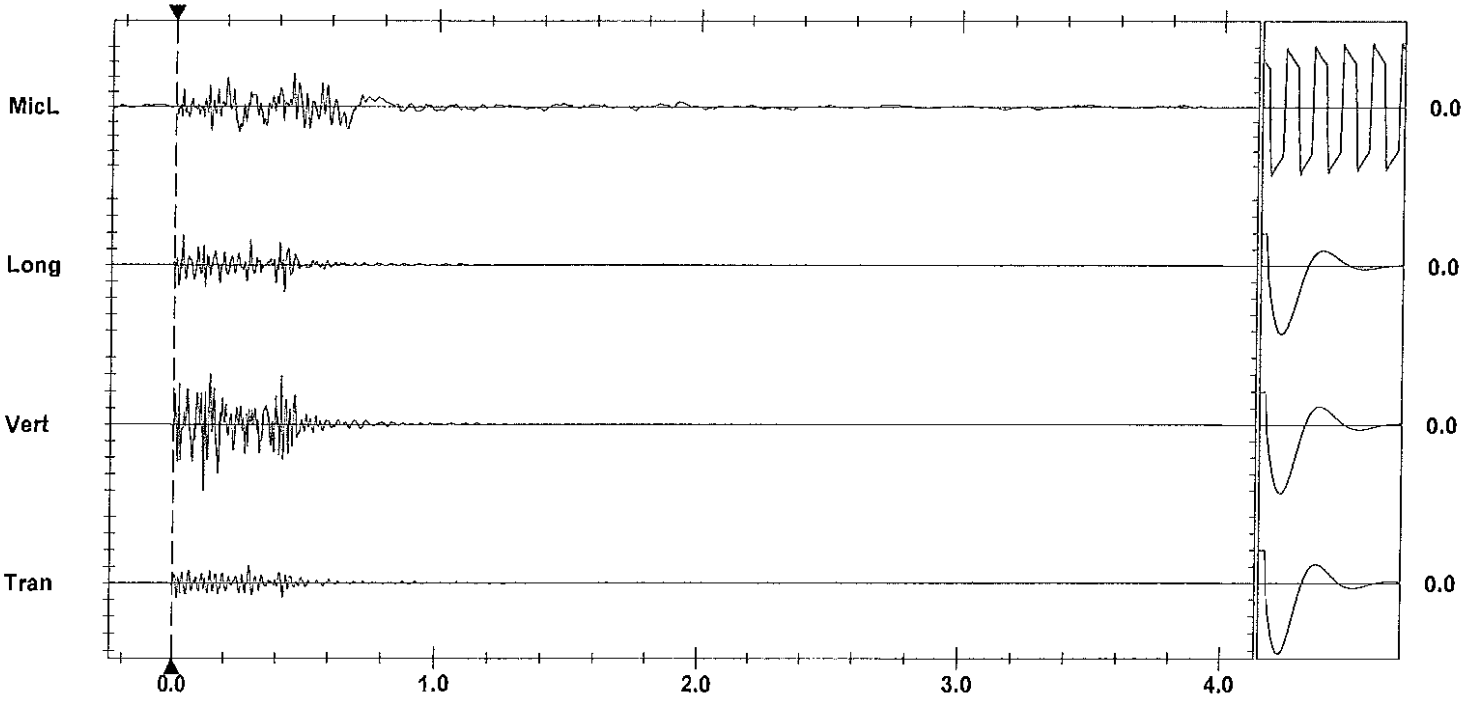
Microphone Linear Weighting
PSPL 0.00225 psi(L) at 0.455 sec
ZC Freq 32 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 674 mv)

	Tran	Vert	Long	
PPV	0.105	0.405	0.185	in/s
ZC Freq	39	57	51	Hz
Time (Rel. to Trig)	0.297	0.118	0.032	sec
Peak Acceleration	0.0928	0.398	0.159	g
Peak Displacement	0.00041	0.00142	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.408 in/s at 0.118 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 14:54:58 December 16, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2GM.RM0
Job Number:	1		

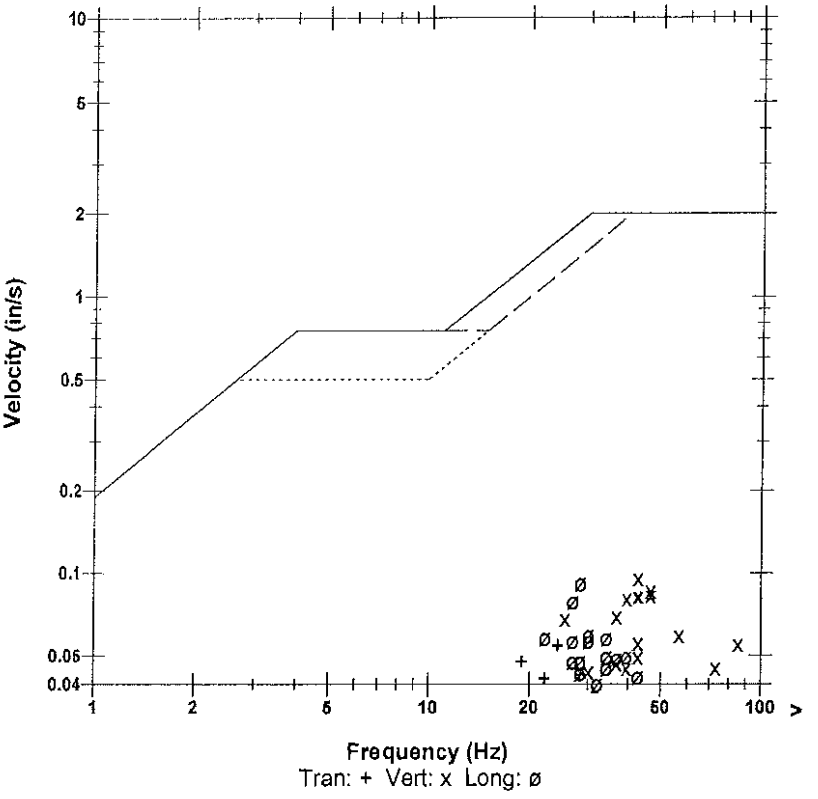
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

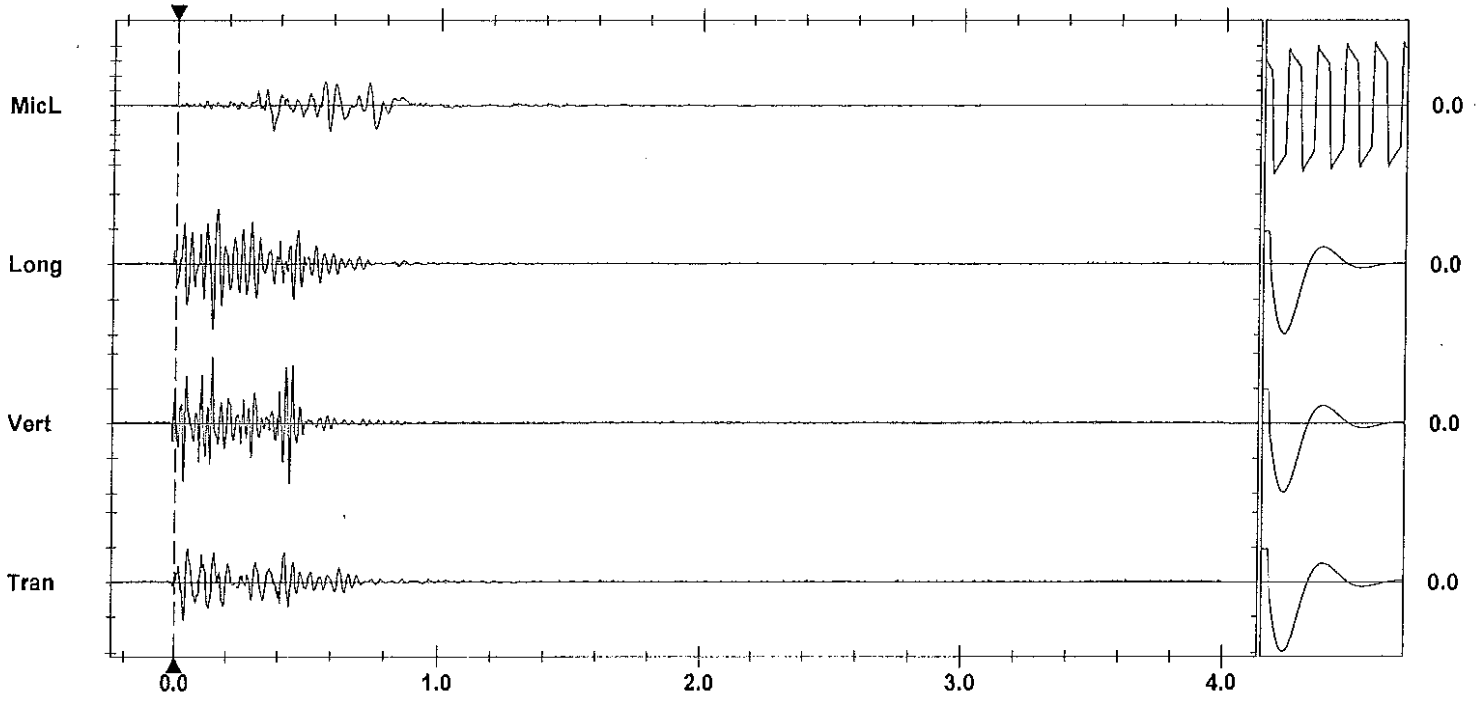


Tran: + Vert: x Long: ø

Microphone	Linear Weighting			
PSPL	0.00178 psi(L) at 0.586 sec			
ZC Freq	24 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 727 mv)			

	Tran	Vert	Long	
PPV	0.0544	0.0956	0.0919	in/s
ZC Freq	24	43	28	Hz
Time (Rel. to Trig)	0.036	0.146	0.145	sec
Peak Acceleration	0.0365	0.0862	0.0563	g
Peak Displacement	0.00037	0.00032	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.131 in/s at 0.146 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div

Trigger = ▶——————◀

Sensorcheck

Printed: December 17, 2011 0(8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11
BLAST # MW-0055 12:46 PM

HIGHWAY# 97
BLAST LOCATION AT: STN 128+85 - 128+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Granodiorite (quartz diorite)
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

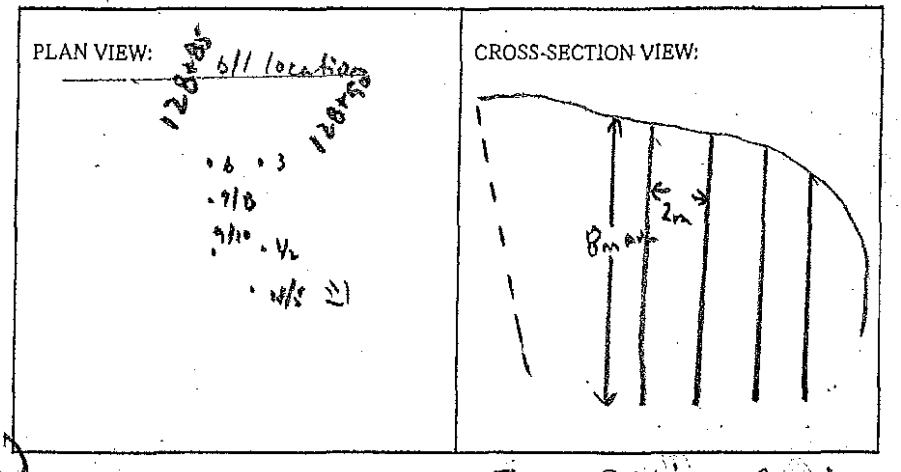
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismographs @ 13167 Cliffston Cct - 0.11 ips/43Hz
@ 13093 Cliffston Cct - 0.41 ips/51Hz

Bottom Decks - 4-6 ANFO
Top Decks - 1'-2' ANFO
} Primed by 1" x 8" dynamite

Instantel

Event Report

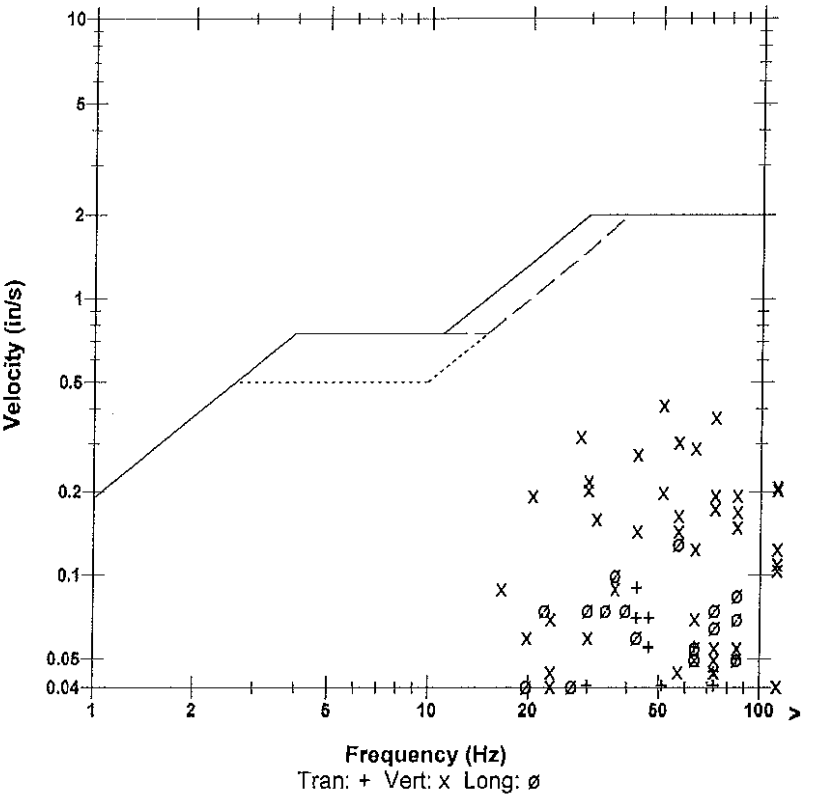
Date/Time	Vert at 12:46:16 December 19, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2M0.T40

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

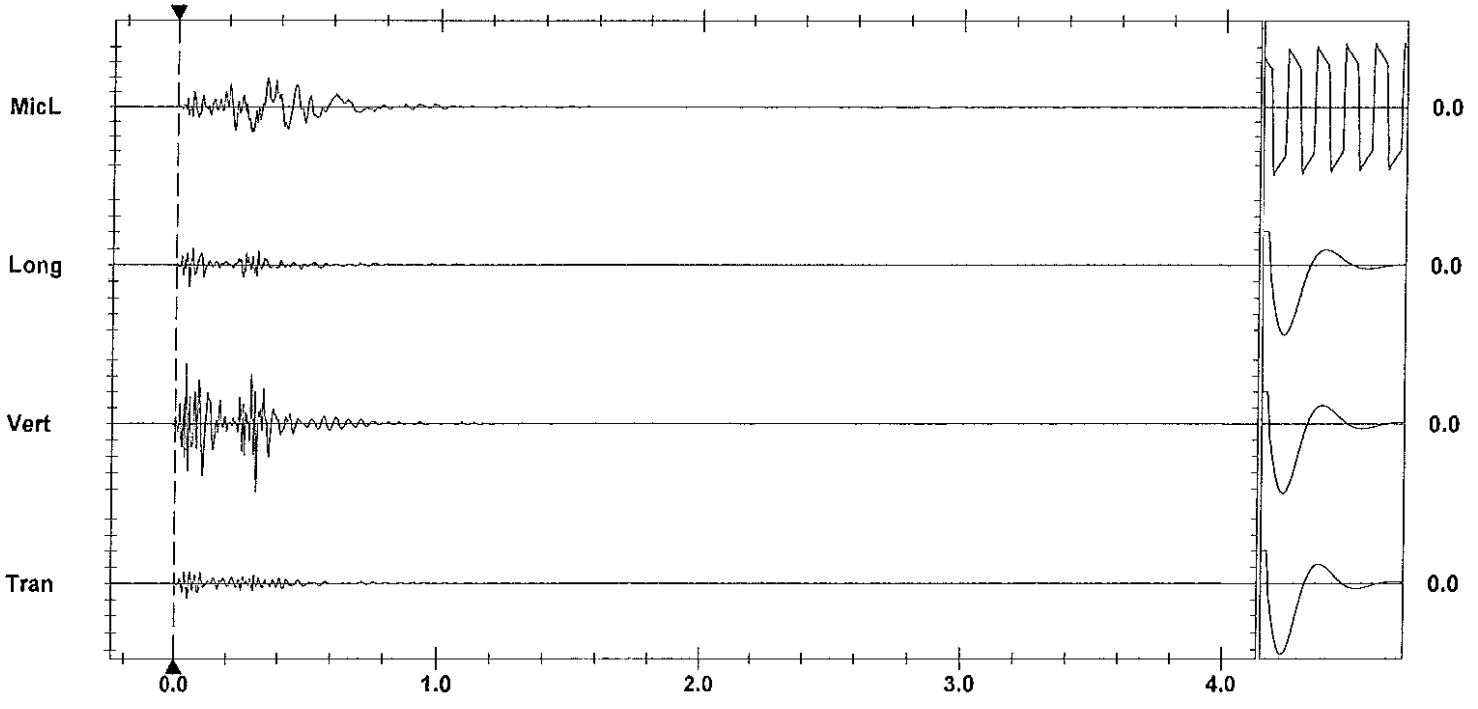
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.349 sec
ZC Freq	6.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.0900	0.415	0.130	in/s
ZC Freq	43	51	57	Hz
Time (Rel. to Trig)	0.051	0.314	0.051	sec
Peak Acceleration	0.0928	0.477	0.133	g
Peak Displacement	0.00031	0.00154	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.415 in/s at 0.314 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

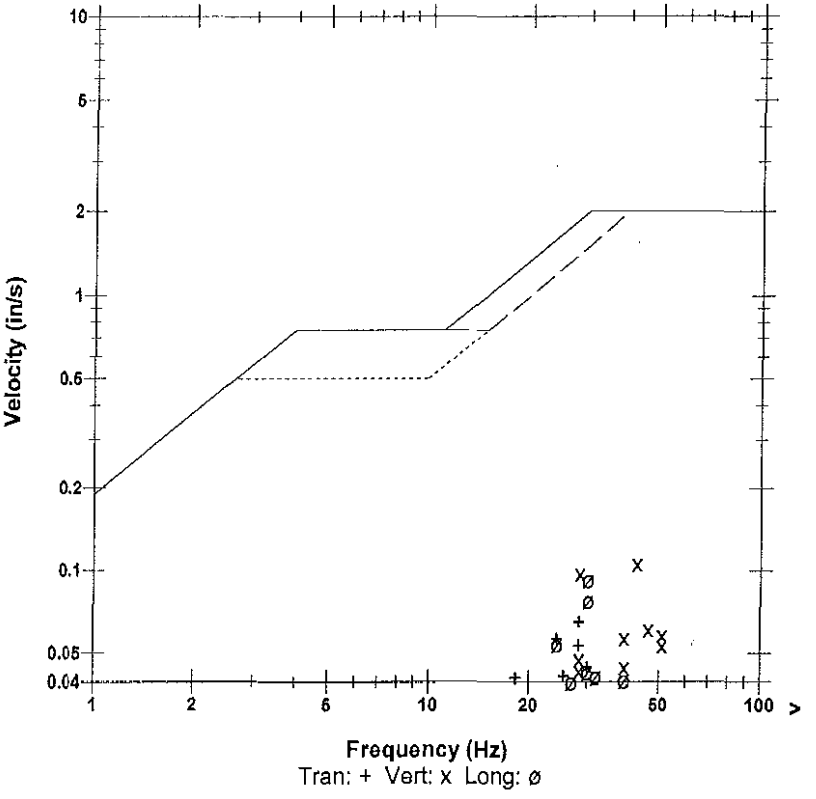
Date/Time	Vert at 12:46:16 December 19, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2M0.T40
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

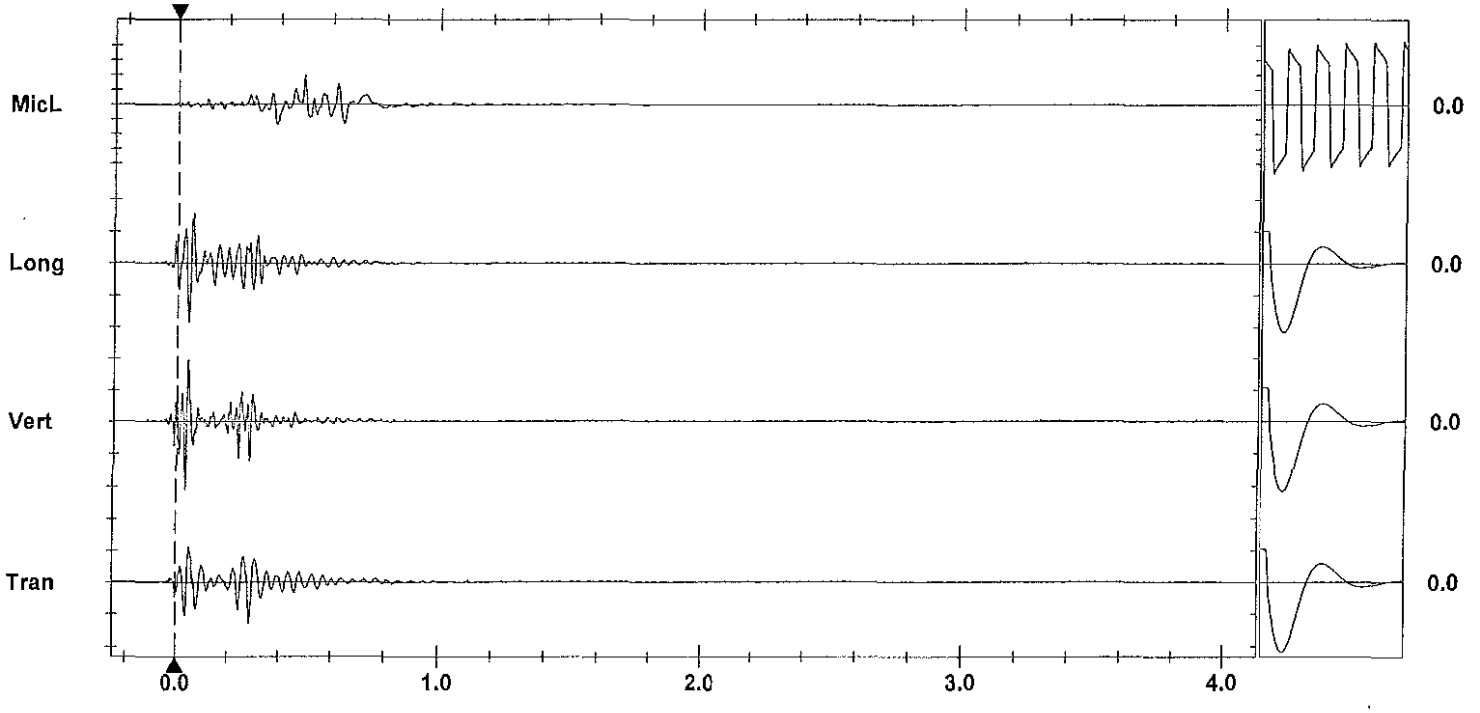
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.487 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 718 mv)

	Tran	Vert	Long	
PPV	0.0650	0.106	0.0925	in/s
ZC Freq	28	43	30	Hz
Time (Rel. to Trig)	0.288	0.033	0.046	sec
Peak Acceleration	0.0315	0.0878	0.0563	g
Peak Displacement	0.00038	0.00045	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.132 in/s at 0.044 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11
BLAST # MW-0054

11:37AM

HIGHWAY# 97
BLAST LOCATION AT: STN 128+90 - 128+95 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 6.1 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 6 6 11 / 26 after / 15 mab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE 60% ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 7

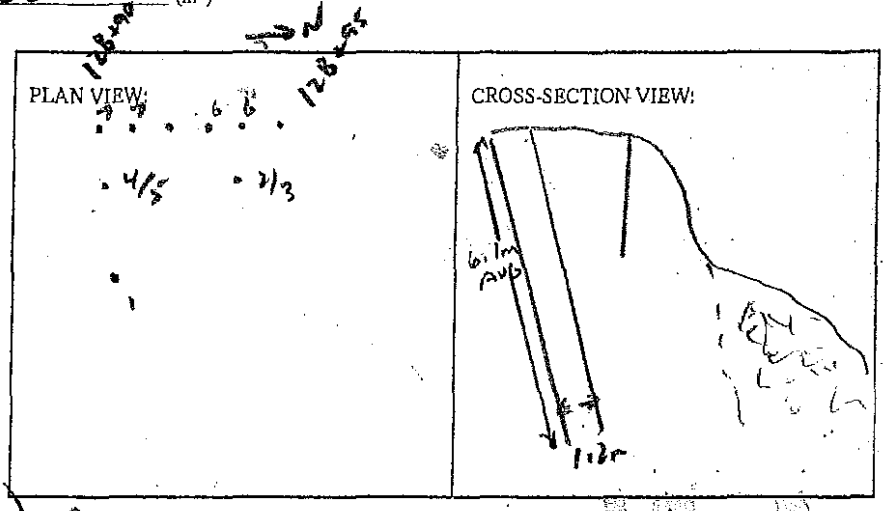
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HP5-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone Crt - 0.058 ips / 30Hz
@ 13093 cliffstone Crt - 0.35 ips / 47Hz

STAB Hole - 1.5' ANFO

Buffer Holes - Bottom deck - 4-5 each 2"x16" Blasting

Top deck - 1-2 each 2"x16" Blasting

Primed w/ 1"x8" dynamite

B/L Holes - 1 each 2"x16" DYNAMITE + 2 lbs gr. det cord to 4' collar

Instantel

Event Report

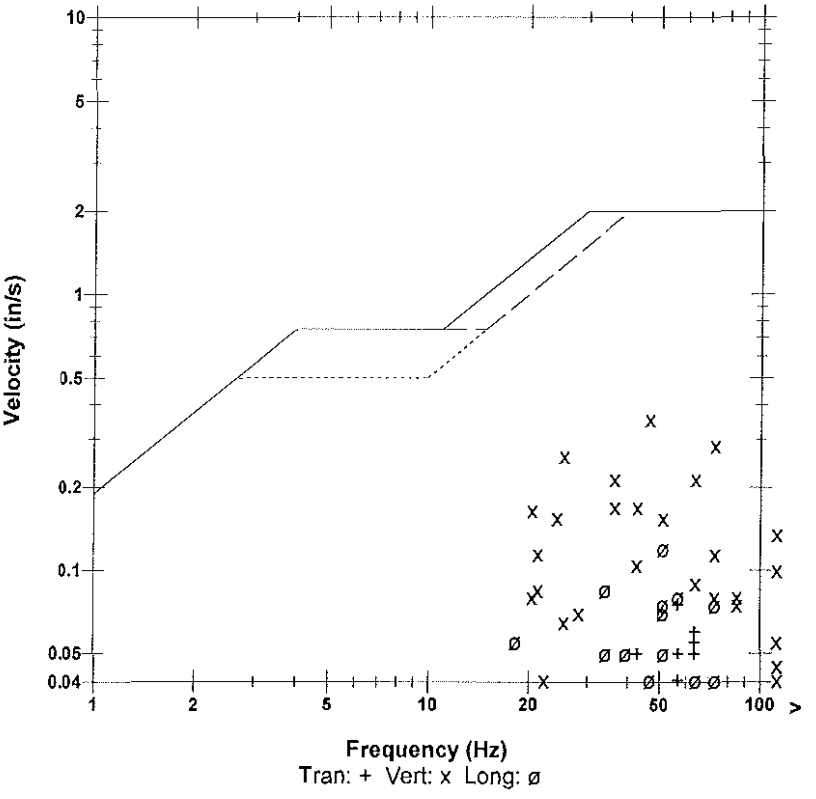
Date/Time	Vert at 11:37:00 December 19, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2LX.LO0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

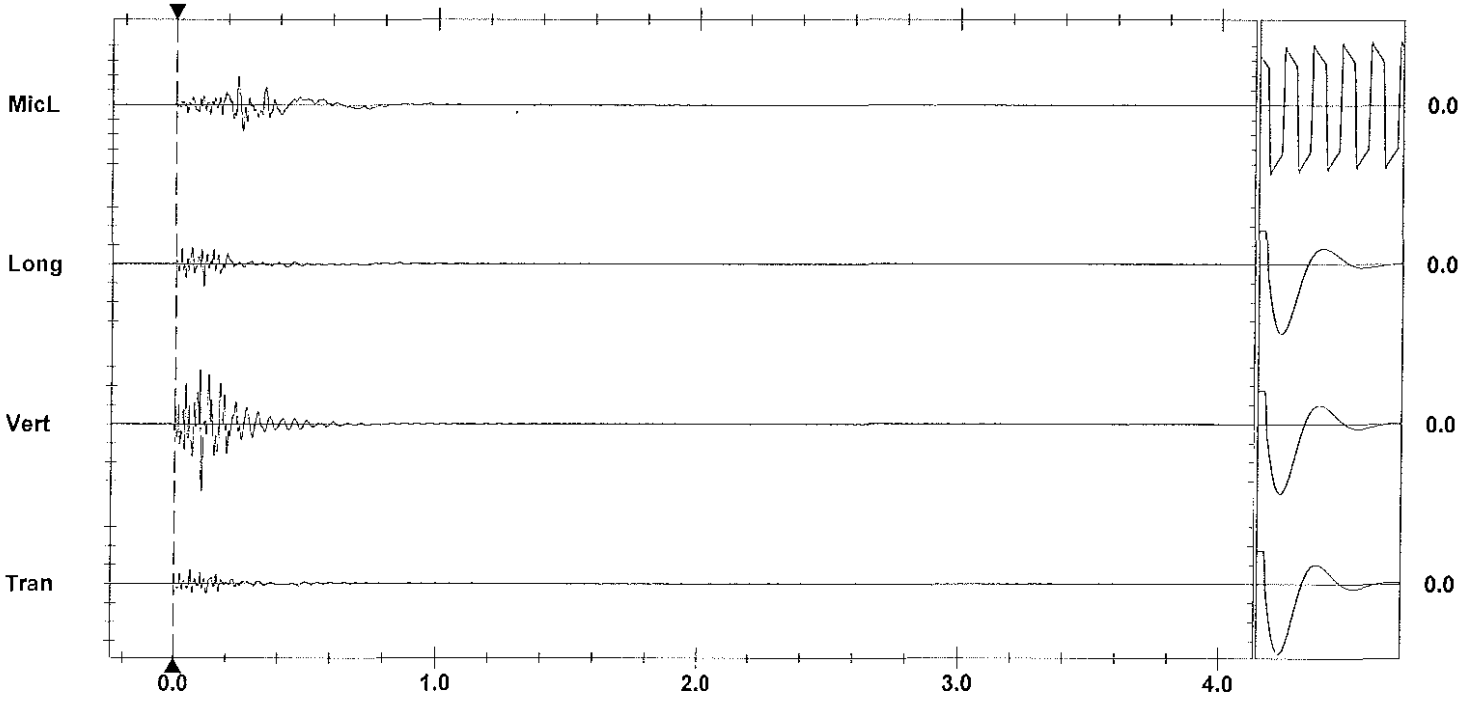
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0750	0.355	0.120	in/s
ZC Freq	57	47	51	Hz
Time (Rel. to Trig)	0.064	0.104	0.107	sec
Peak Acceleration	0.0663	0.437	0.0928	g
Peak Displacement	0.00020	0.00129	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00196 psi(L) at 0.239 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 710 mv)

Peak Vector Sum 0.362 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——— ———◀

Sensorcheck

Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

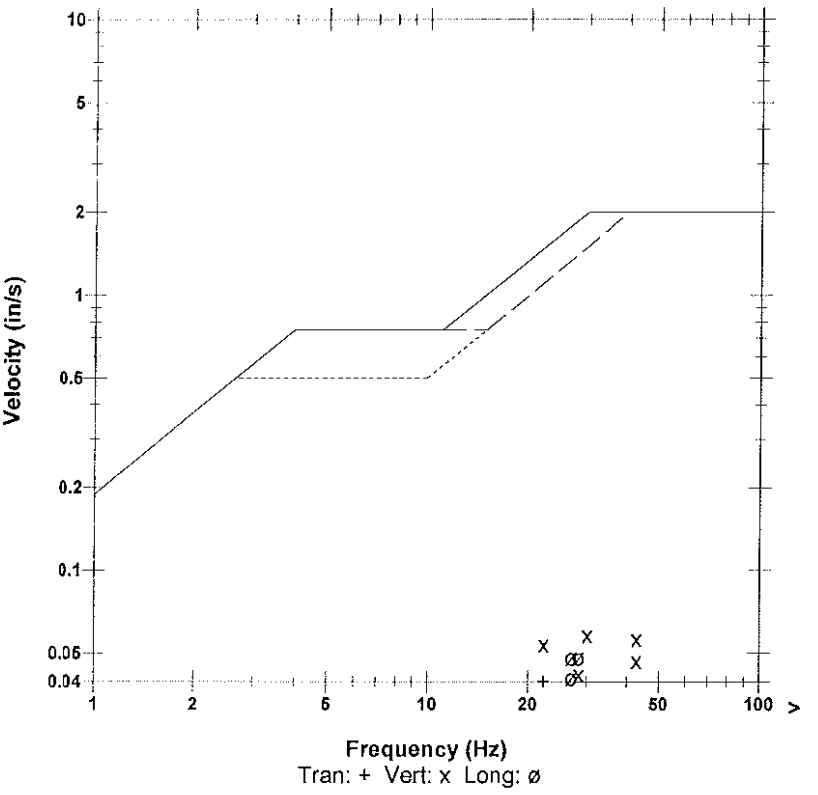
Date/Time	Vert at 11:37:00 December 19, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2LX.LO0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

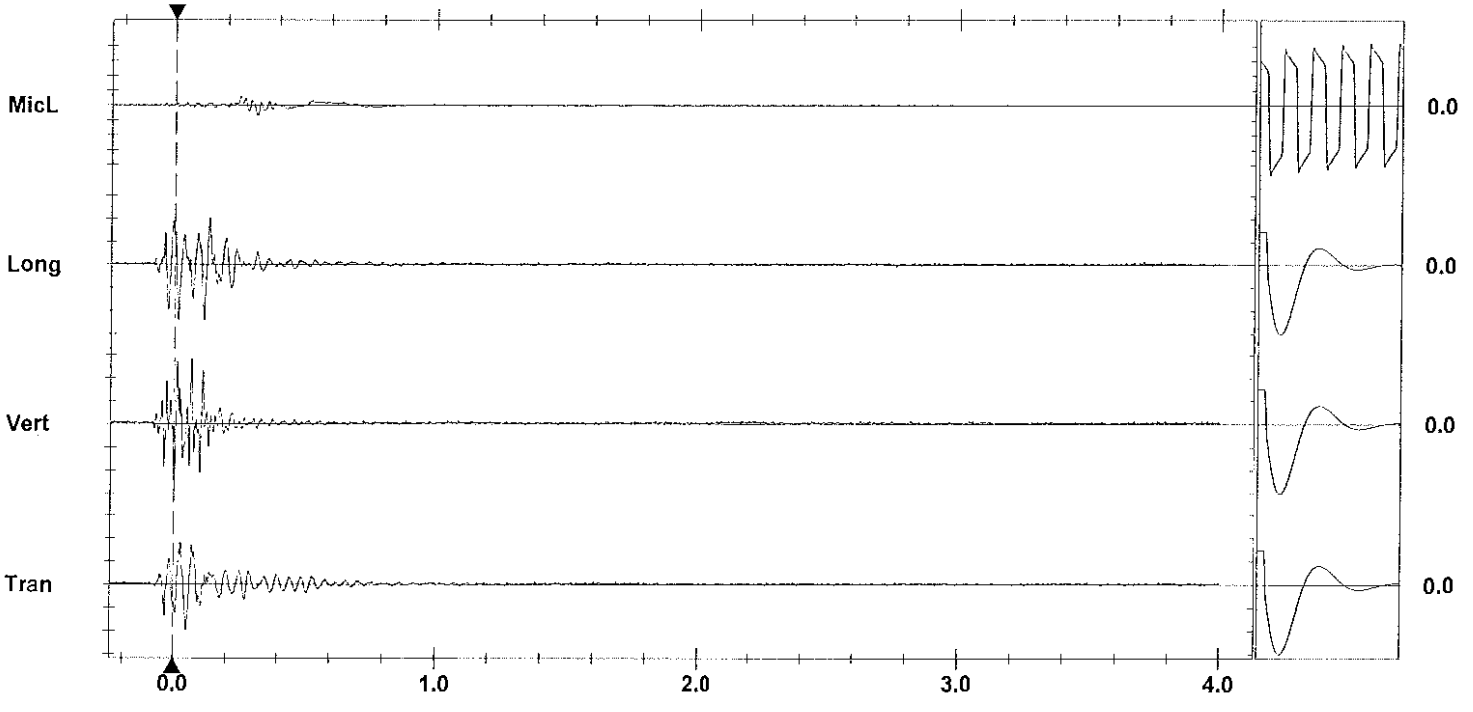
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0394	0.0581	0.0481	in/s
ZC Freq	22	30	28	Hz
Time (Rel. to Trig)	0.050	0.002	0.015	sec
Peak Acceleration	0.0232	0.0497	0.0282	g
Peak Displacement	0.00026	0.00027	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.7	3.9	4.0	

Microphone Linear Weighting
PSPL 0.00069 psi(L) at 0.313 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 698 mv)

Peak Vector Sum 0.0673 in/s at 0.013 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 20/11
ACTUAL BLAST DATE Dec. 19/11
BLAST # 145 (High spots) @ 4.20pm

HIGHWAY# 97
BLAST LOCATION AT: STN # 135

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ϕ (°) SLOPE LENGTH ϕ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) ϕ (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ϕ
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 12
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 260 (m)

TOTAL NUMBER OF HOLES 130 production
HOLE DIAMETER [redacted] (mm)
HOLE SPACING 7.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 130
TOTAL NUMBER OF DELAYS 130

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT _____ (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

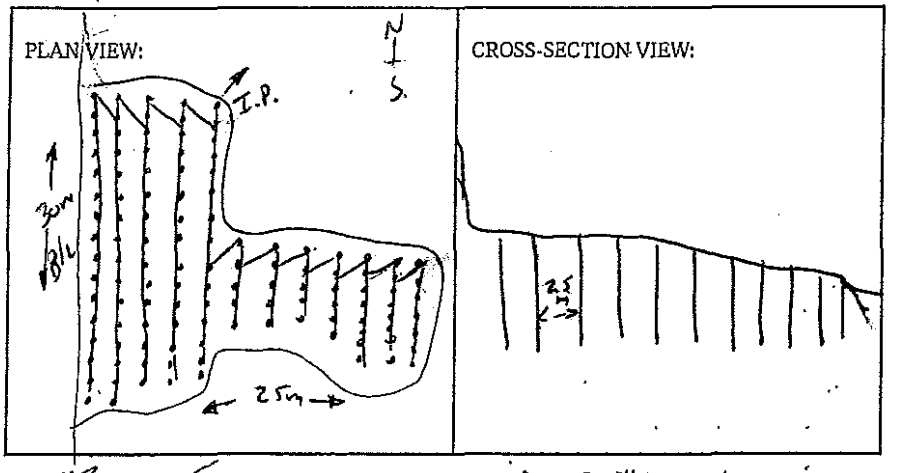
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismographs @ 13167 and 13093 CL: Alstone Contr
No trigger at either location (< 0.04 ips)

30 - ~~30~~ 24' dets Ez

100 - 16' Ez dets.

15 - 17ms connectadels

1 - Elec det.

20 - Anfo.

2 - wk.

2 - case 1½ x 66.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11 2:58 PM
BLAST # MW-0056

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+85 - 128+90 LS (Tree Removal)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9 (6 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 9 BLK / 10 Buffer / 15 LS / 1 Prop
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

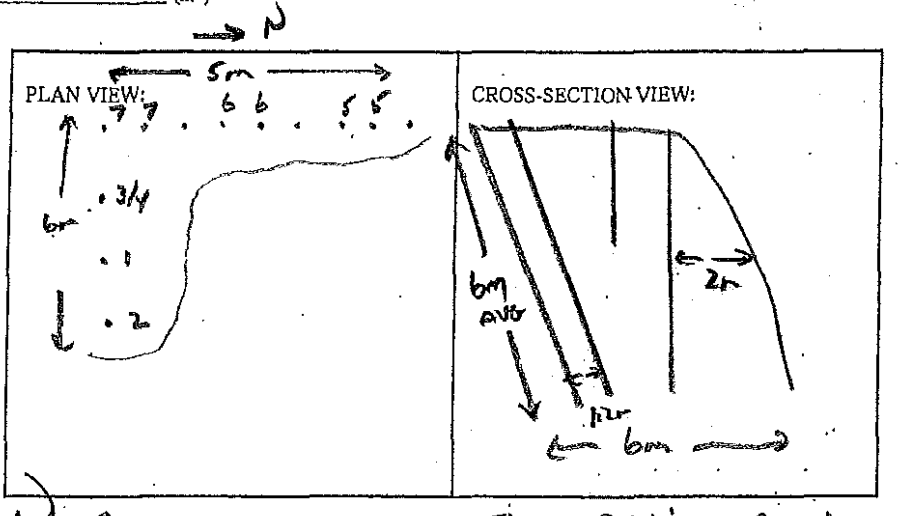
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSS20 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffside Ct. 0.061 ips / 47 Hz
@ 13093 cliffside ct. 0.39 ips / 51 Hz

Prod. Hole - 6' ANFO

Stem Hole - 1.5' ANFO

Buffer Hole - Bottom Deck 5 cans 2"x16" Blastrex
- Top Deck 1.5 cans 2"x16" Blastrex

B/L Holes - 1 cart. 2"x16" Dynamite + 200 grain det. cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 14:58:19 December 19, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2M6.X70

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

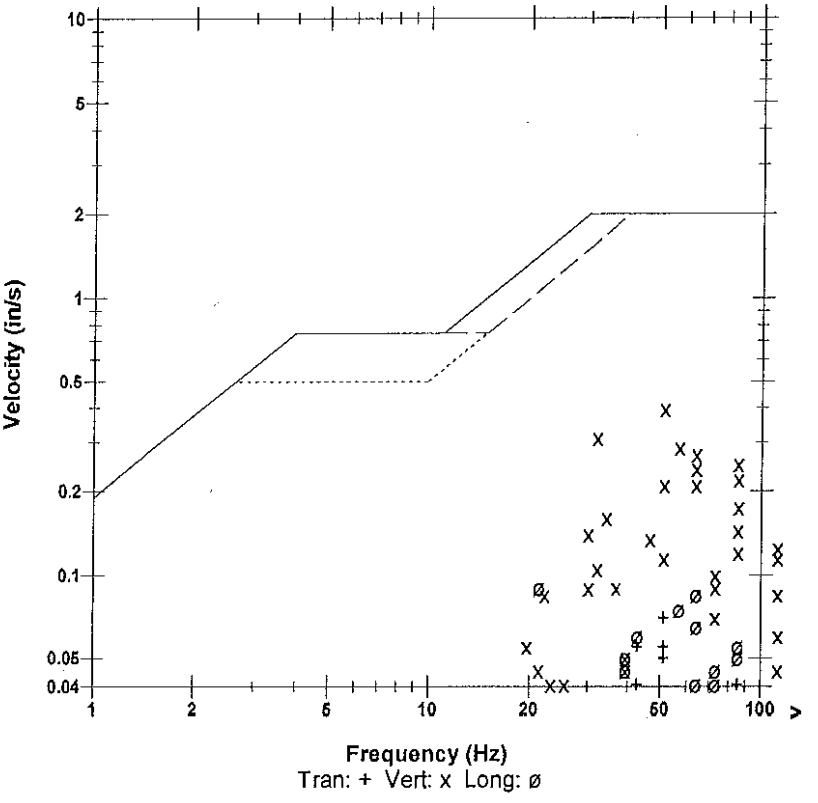
Extended Notes
Blast at stn 128

Post Event Notes

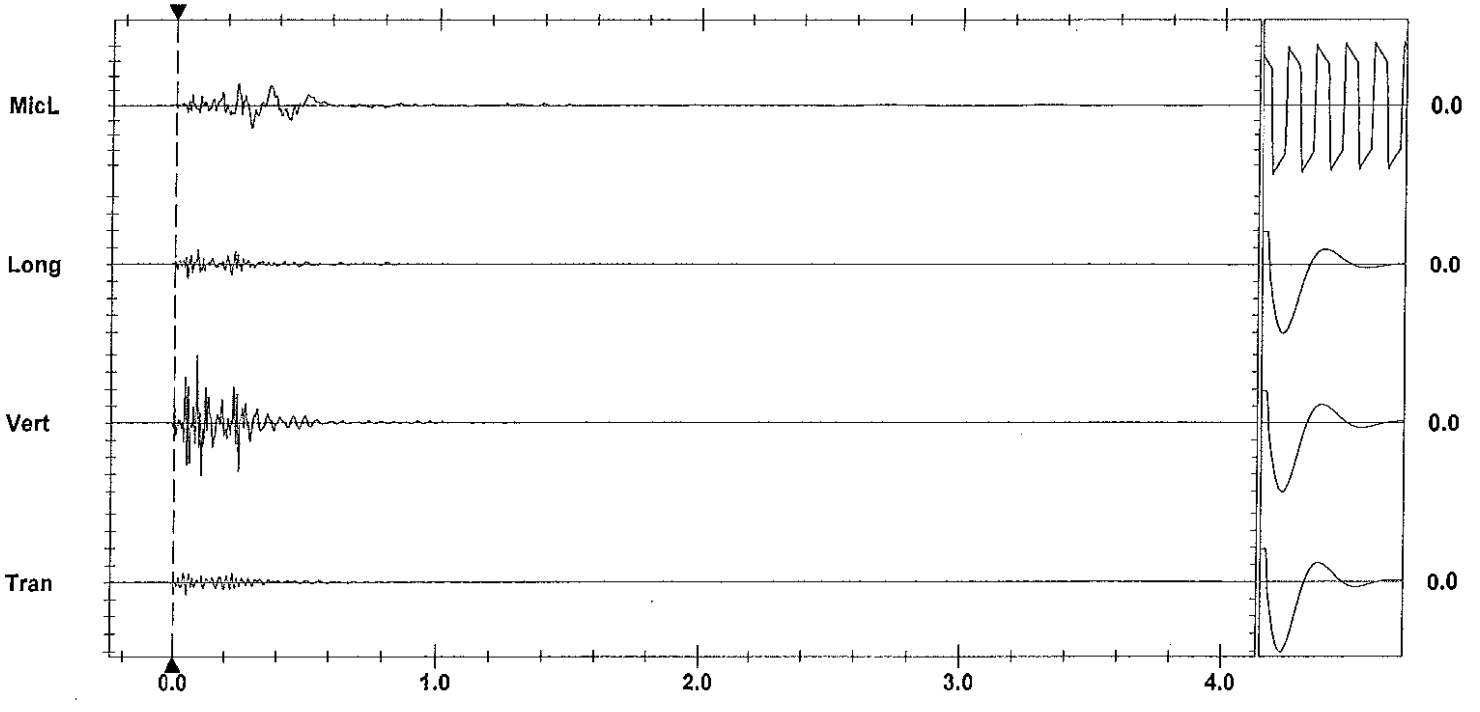
Microphone Linear Weighting
PSPL 0.00156 psi(L) at 0.294 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 707 mv)

	Tran	Vert	Long	
PPV	0.0700	0.395	0.0900	in/s
ZC Freq	51	51	21	Hz
Time (Rel. to Trig)	0.051	0.090	0.092	sec
Peak Acceleration	0.0663	0.371	0.0928	g
Peak Displacement	0.00021	0.00106	0.00035	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.400 in/s at 0.090 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 14:58:19 December 19, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E2M6.X70

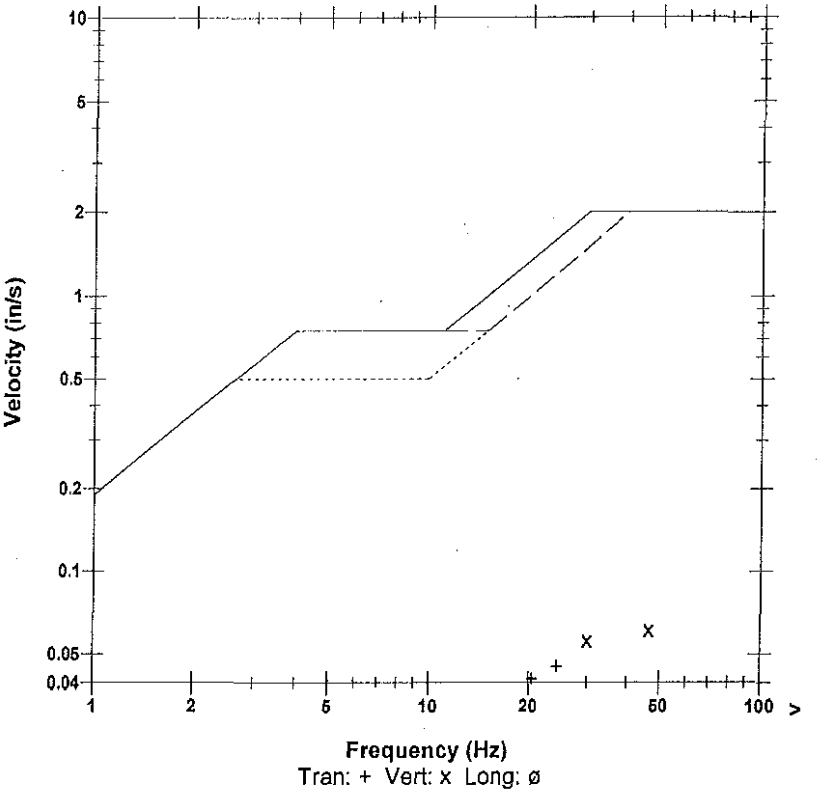
Notes

location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:Blast at Stn 129

Extended Notes

Post Event Notes

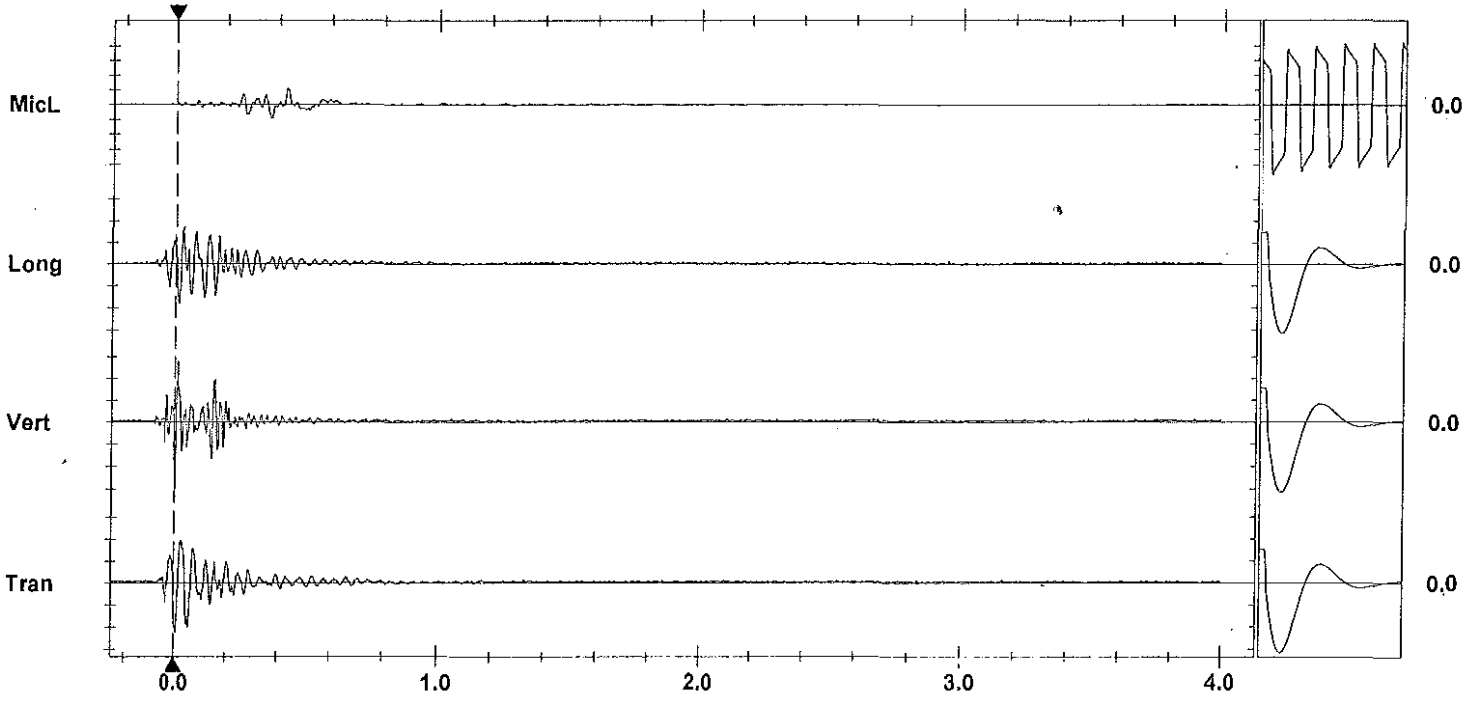
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.430 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 692 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0612	0.0362	in/s
ZC Freq	24	47	30	Hz
Time (Rel. to Trig)	0.008	0.002	0.015	sec
Peak Acceleration	0.0282	0.0497	0.0232	g
Peak Displacement	0.00035	0.00023	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0751 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 11:22 am
BLAST # MW-0057

HIGHWAY# 97
BLAST LOCATION AT: STN 128+80 - 129+85 (TCP Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shotcrete

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

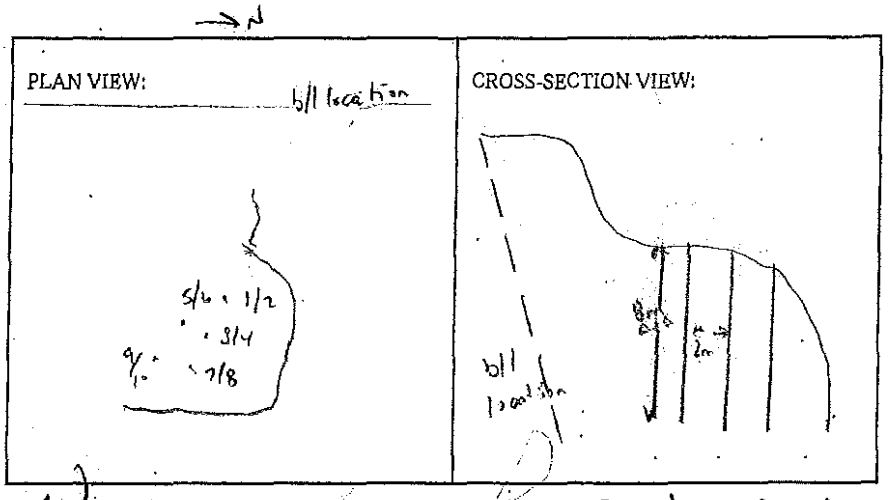
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffside ctr 0.041 ips / 39Hz
@ 13093 cliffside ctr - 0.301 ips / 34Hz

BOTTOM DECKS - 4 ANFO
TOP DECKS - 1 ANFO } PRIMED W/ 1½# DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:22:58 December 20, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2NR.MA0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

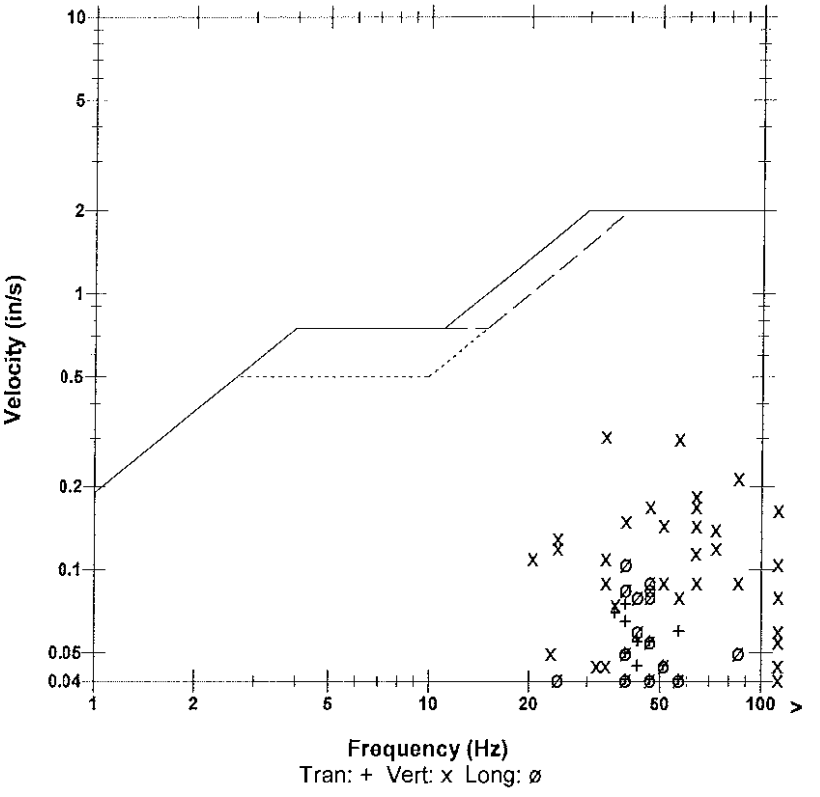
Post Event Notes

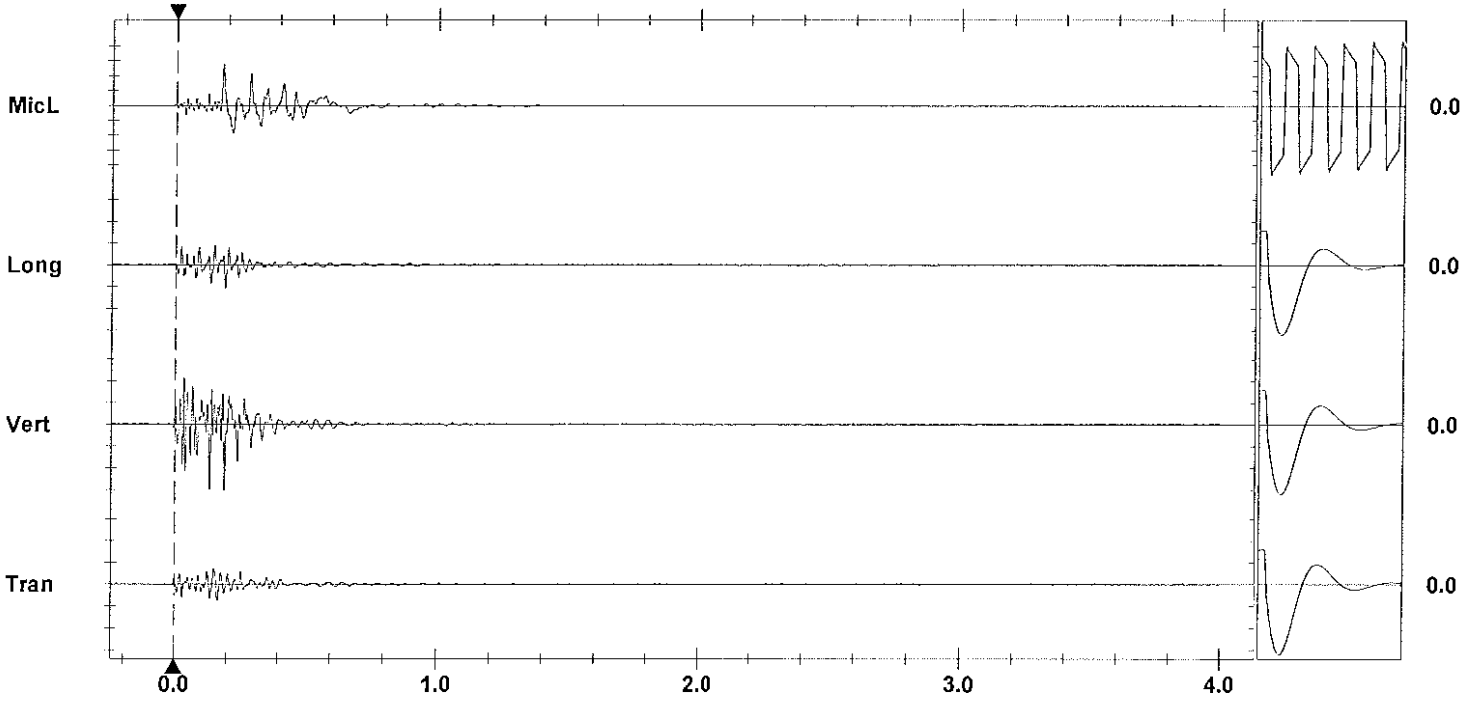
Microphone Linear Weighting
PSPL 0.00279 psi(L) at 0.179 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 640 mv)

	Tran	Vert	Long	
PPV	0.0750	0.305	0.105	in/s
ZC Freq	39	34	39	Hz
Time (Rel. to Trig)	0.165	0.190	0.190	sec
Peak Acceleration	0.0663	0.345	0.0795	g
Peak Displacement	0.00032	0.00091	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.325 in/s at 0.190 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

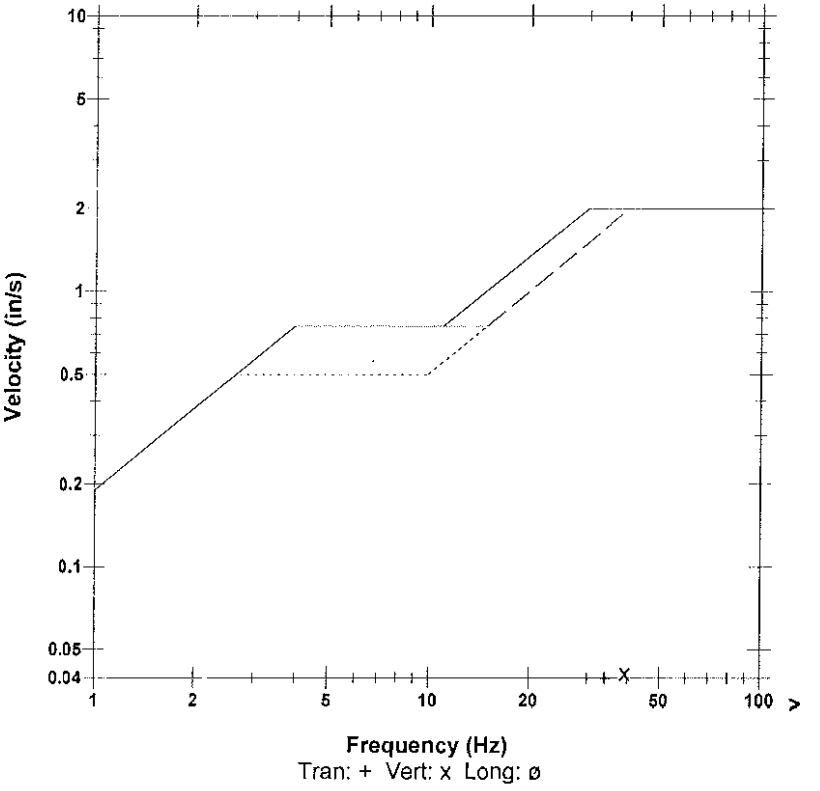
Date/Time	Vert at 11:22:59 December 20, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2NR.MB0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

Post Event Notes

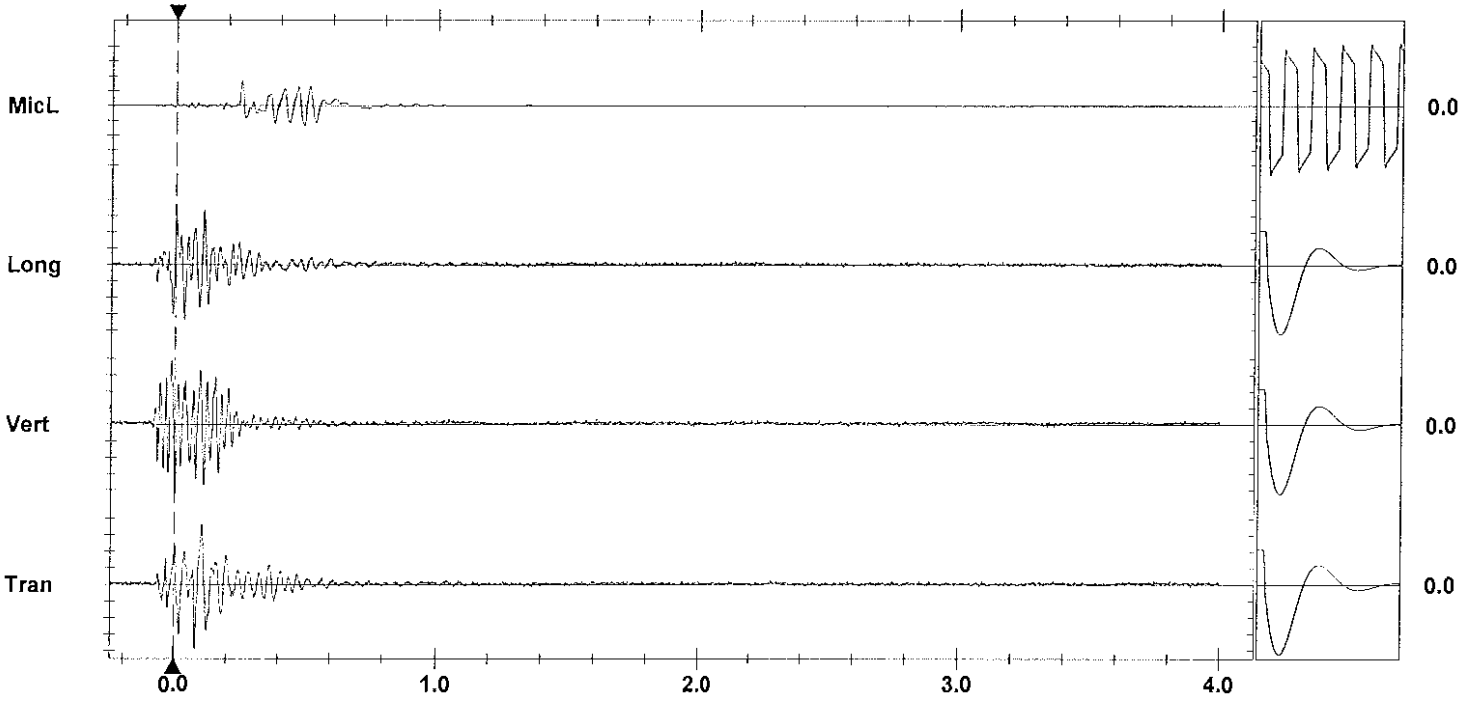
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.250 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 634 mv)

	Tran	Vert	Long	
PPV	0.0394	0.0412	0.0337	in/s
ZC Freq	34	39	32	Hz
Time (Rel. to Trig)	0.082	0.001	0.035	sec
Peak Acceleration	0.0265	0.0331	0.0215	g
Peak Displacement	0.00025	0.00020	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.0551 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 1:09 pm
BLAST # MWJ-0058

HIGHWAY# 97
BLAST LOCATION AT: 128+80

UTILITY PROTEGTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot muffled

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 415320 CAPACITY 80 Caps

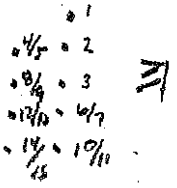
VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

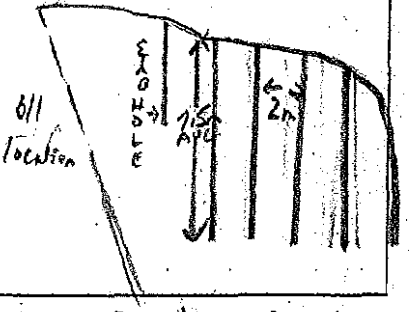
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: Hill location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13187 Cliffstone Cott = 0.066in/s/ 57Hz
@ 13093 Cliffstone Cott = 0.49in/s/ 57Hz

Bottom Decks - 4' ANFO
Top Decks - 1' ANFO } Paired w/ 1x8 wood

Instantel

Event Report

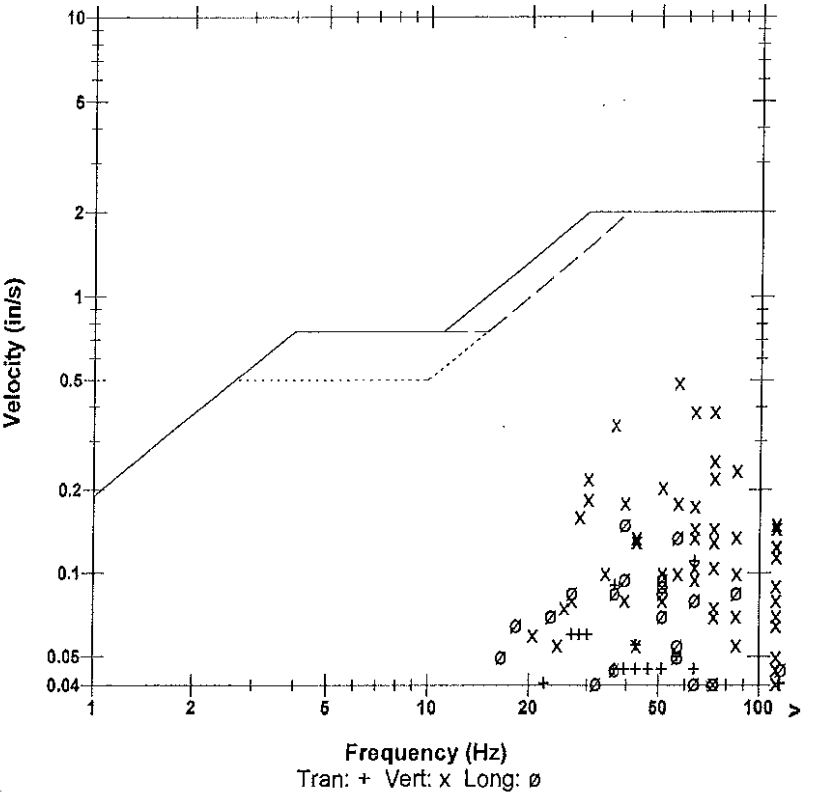
Date/Time	Vert at 13:09:51 December 20, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2NW.KF0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

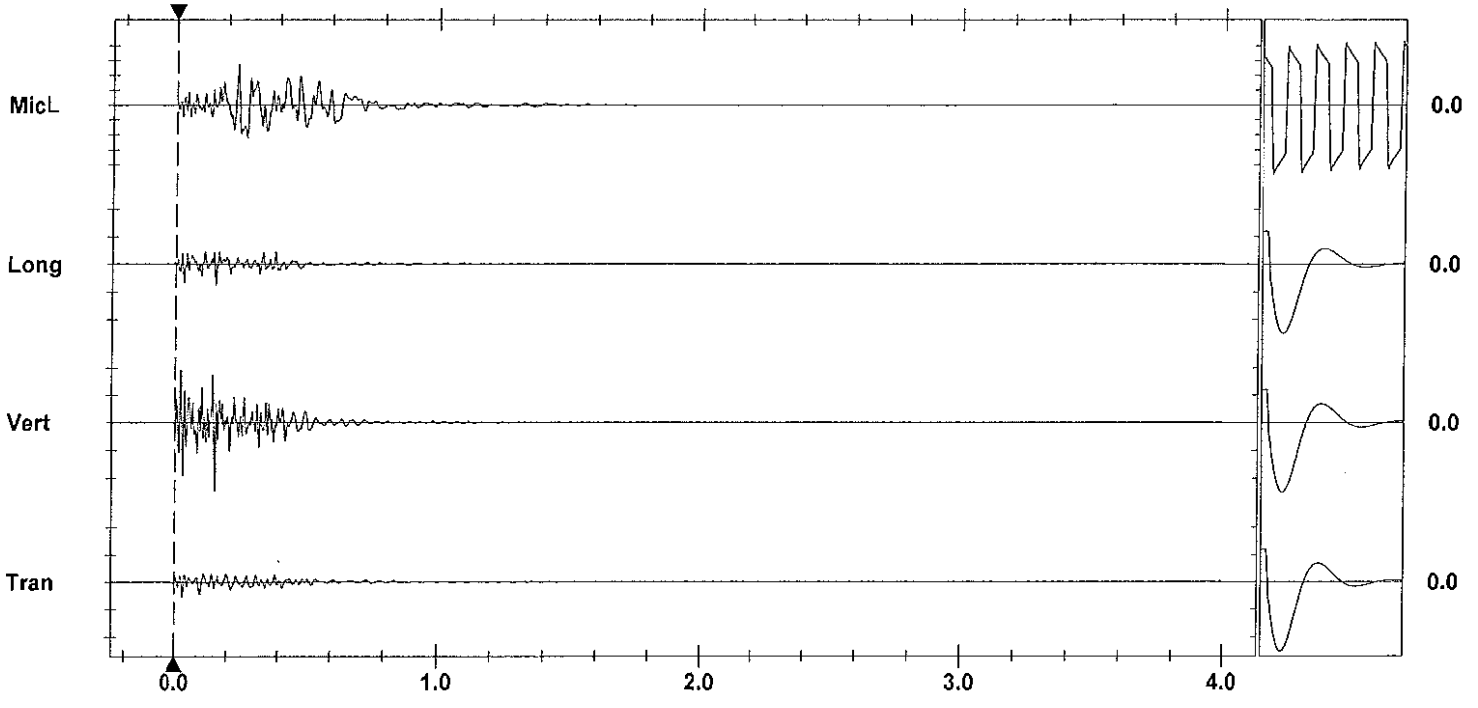
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00276 psi(L) at 0.237 sec
ZC Freq	32 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 690 mv)

	Tran	Vert	Long	
PPV	0.110	0.490	0.150	in/s
ZC Freq	64	57	39	Hz
Time (Rel. to Trig)	0.032	0.155	0.156	sec
Peak Acceleration	0.119	0.437	0.146	g
Peak Displacement	0.00039	0.00121	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.514 in/s at 0.156 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:09:52 December 20, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2NW.KG0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

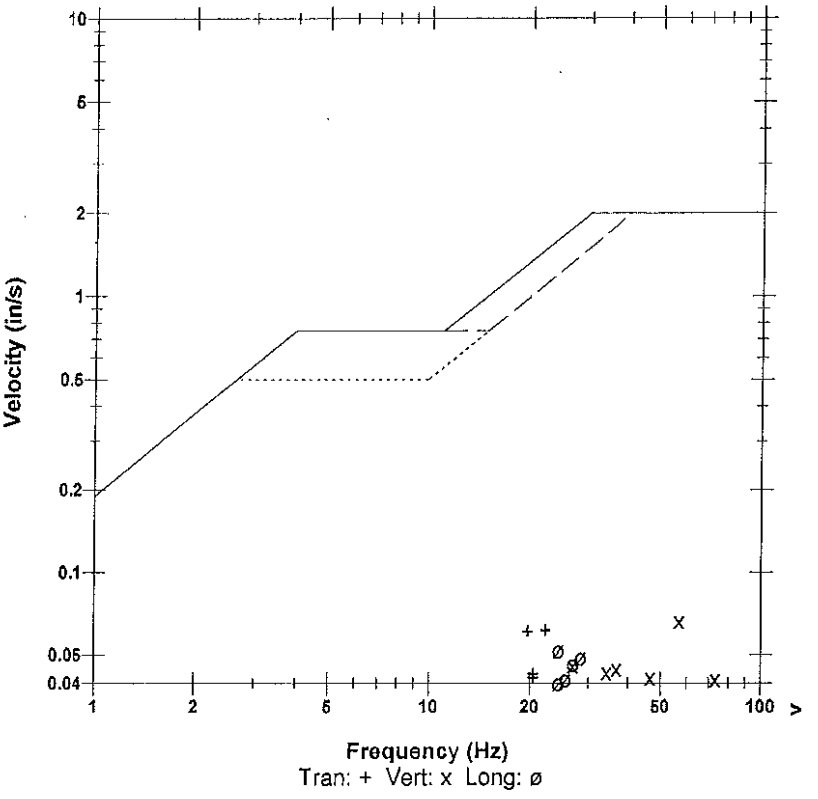
Post Event Notes

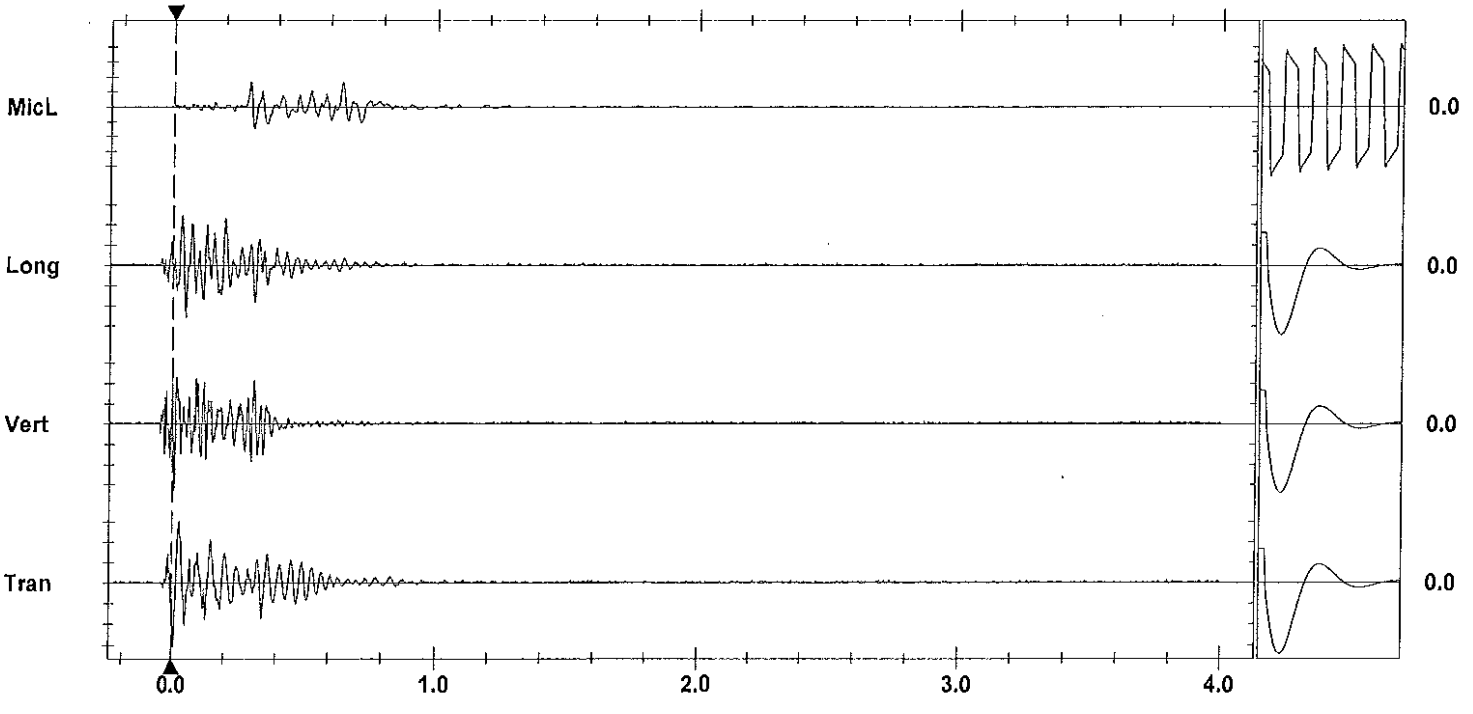
Microphone Linear Weighting
PSPL 0.00163 psi(L) at 0.294 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 718 mv)

	Tran	Vert	Long	
PPV	0.0612	0.0662	0.0519	in/s
ZC Freq	22	57	24	Hz
Time (Rel. to Trig)	0.008	0.008	0.051	sec
Peak Acceleration	0.0298	0.0713	0.0282	g
Peak Displacement	0.00045	0.00026	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0905 in/s at 0.008 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearncy
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 3:36 PM
BLAST # MW-0059

HIGHWAY# 97
BLAST LOCATION AT: STN 128+70 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN _____ (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

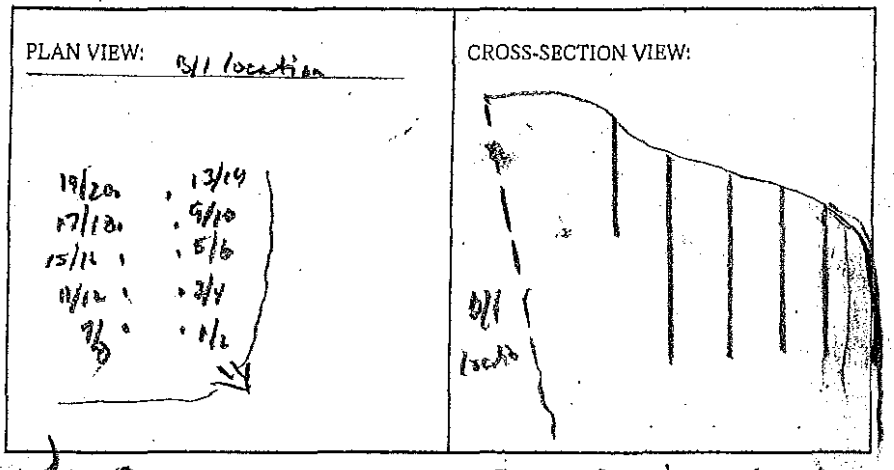
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m³)

BLAST SKETCH: → N

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vearncy COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crt - 0.055ips / 32Hz
@ 13093 cliffstone crt - 0.371ps / 23Hz

BOTTOM DECKS - 4'-5 ANFO
TOP DECKS - 1' ANFO } PRIMED W/ 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 15:36:26 December 20, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2O3.CQ0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

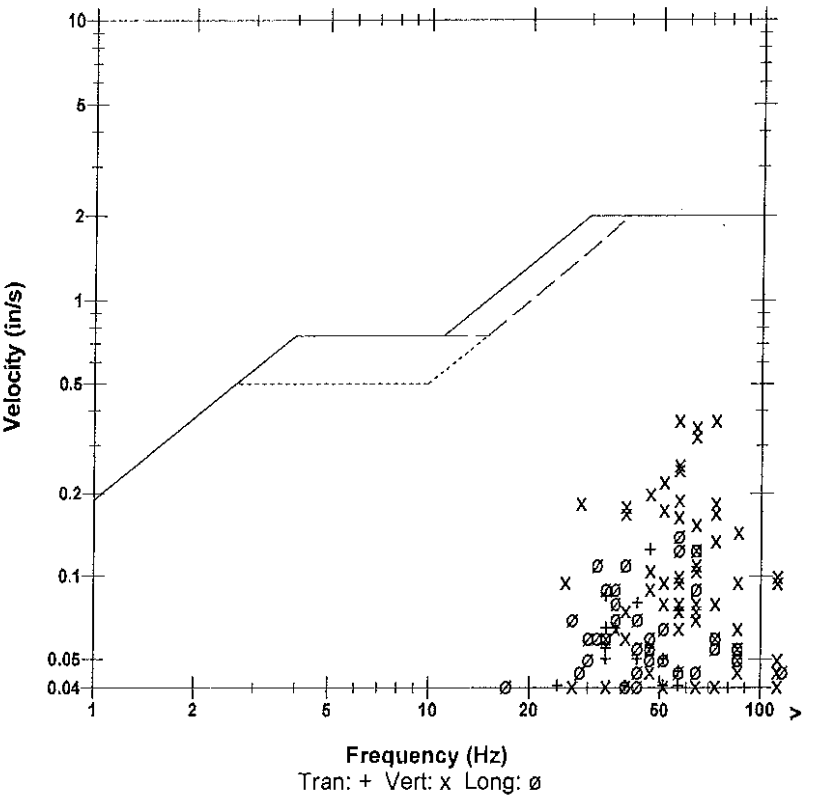
Post Event Notes

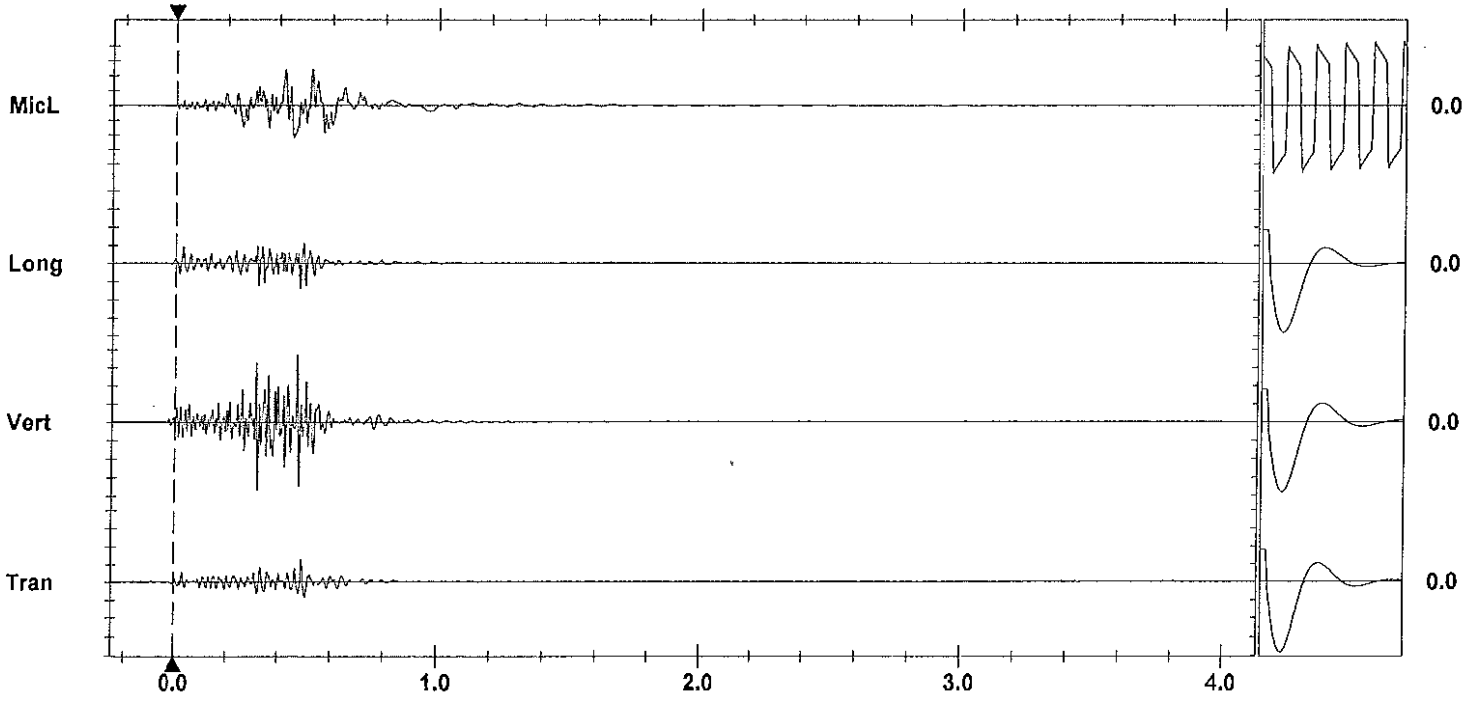
Microphone Linear Weighting
PSPL 0.00239 psi(L) at 0.522 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 706 mv)

	Tran	Vert	Long	
PPV	0.125	0.370	0.140	in/s
ZC Freq	47	73	57	Hz
Time (Rel. to Trig)	0.493	0.322	0.480	sec
Peak Acceleration	0.0795	0.411	0.146	g
Peak Displacement	0.00042	0.00105	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.394 in/s at 0.322 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 15:36:27 December 20, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2O3.CR0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

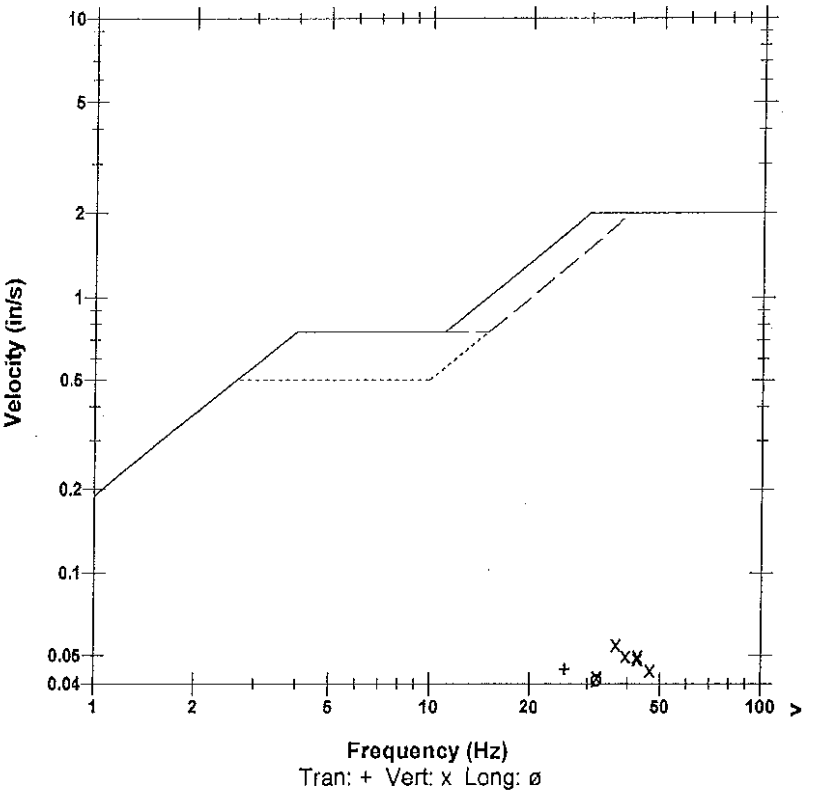
Post Event Notes

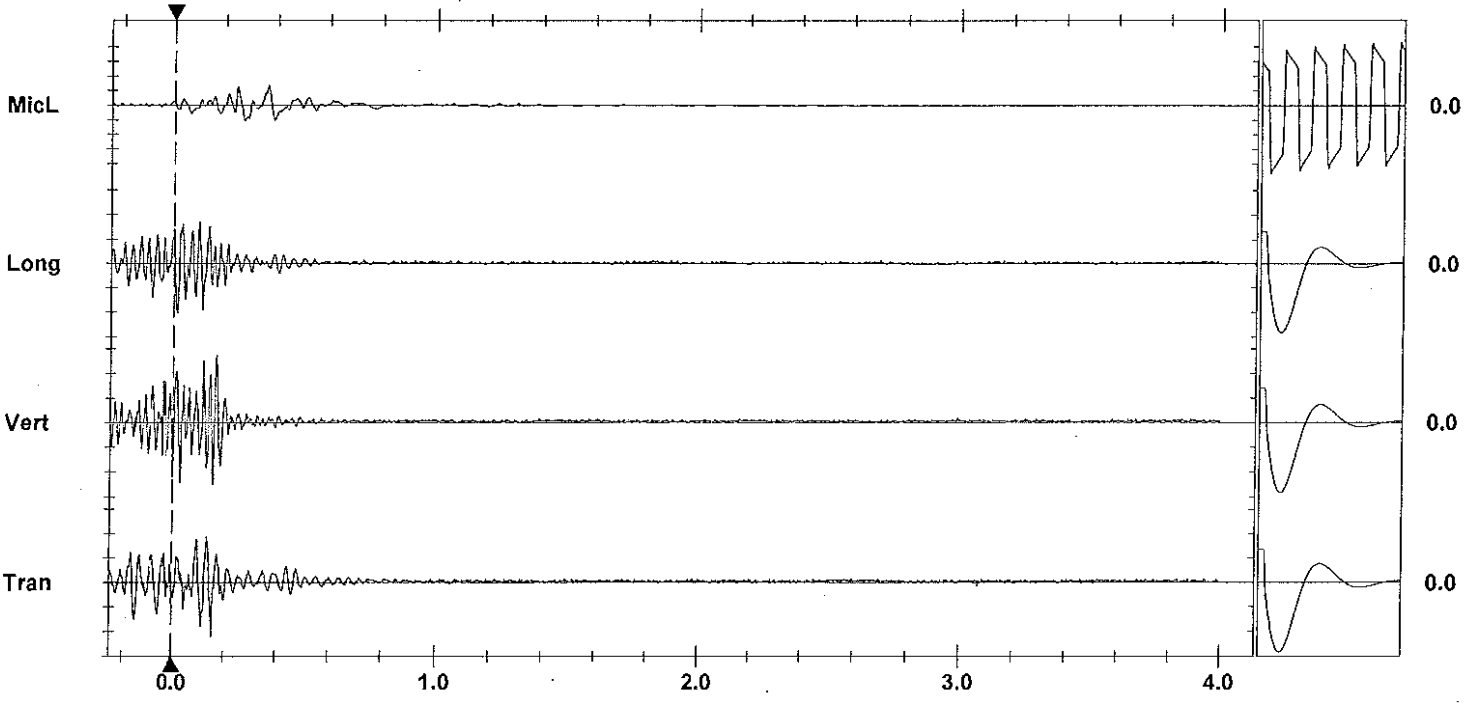
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.363 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 695 mv)

	Tran	Vert	Long	
PPV	0.0444	0.0550	0.0412	in/s
ZC Freq	26	37	32	Hz
Time (Rel. to Trig)	0.155	0.170	0.013	sec
Peak Acceleration	0.0282	0.0729	0.0282	g
Peak Displacement	0.00023	0.00024	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0602 in/s at 0.157 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Manchinery
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Dec. 20/11
ACTUAL BLAST DATE Dec. 20/11
BLAST # 142. @ ~~3:00pm~~ 3:18 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+25 – 126+90 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 35 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 29
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 730 (m)

TOTAL NUMBER OF HOLES 29 B/L / 117 production.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 146
TOTAL NUMBER OF DELAYS 117

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1450 (kg)
DELAY TYPE AND LENGTH 42 + 25 (ms)

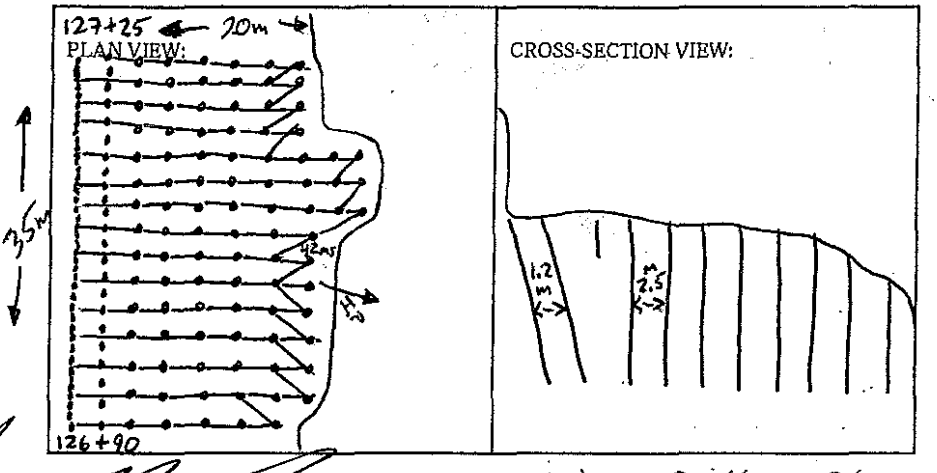
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 3500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

37 - Anfo

12 - WR.

3½ - CASES 2½ x 16

3 - CASES 2" x 16"

1/4 - CASE 1" x 8"

1 3/4 - CASE 1½" x 16"

29 - 12' ms dets.

90 - 24' EZ dets.

27 - 30' EZ dets.

15 - 42ms connectadets

1 - Elec det

Instantel

Event Report

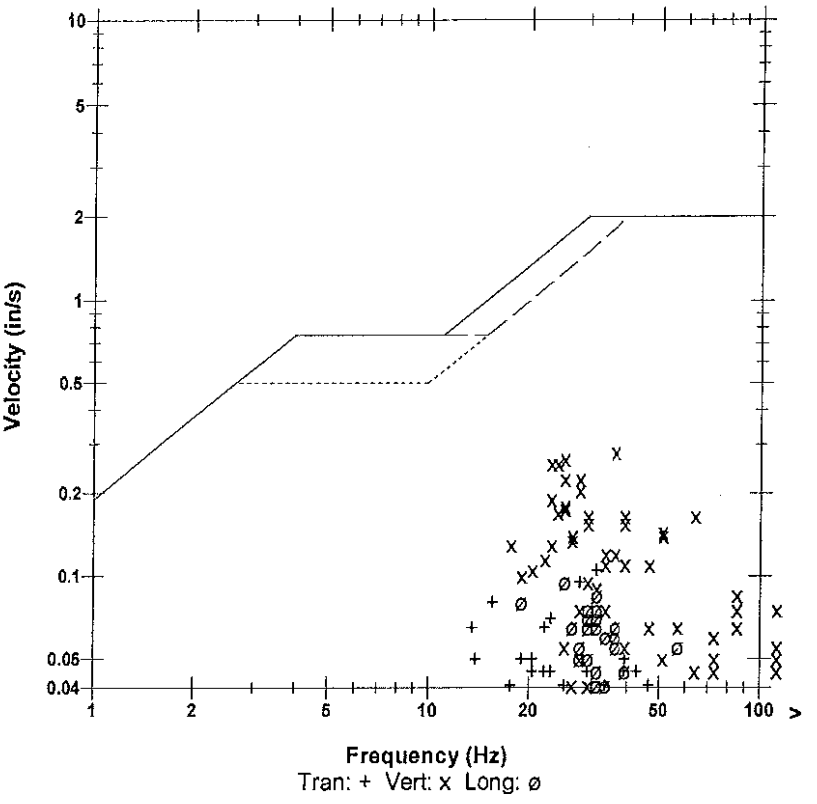
Date/Time	Vert at 15:18:55 December 20, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2O2.JJ0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

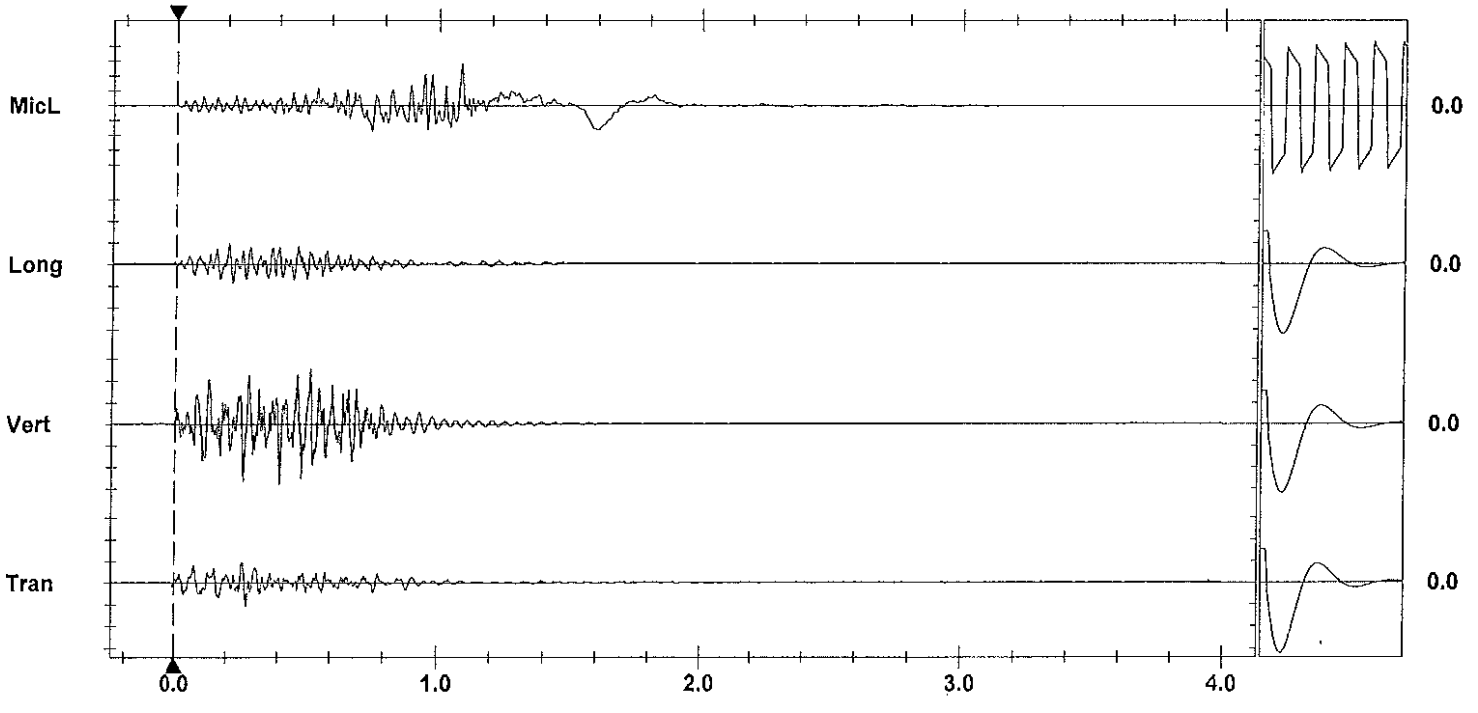
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.105	0.280	0.0950	in/s
ZC Freq	32	37	26	Hz
Time (Rel. to Trig)	0.279	0.407	0.205	sec
Peak Acceleration	0.0663	0.199	0.0663	g
Peak Displacement	0.00068	0.00141	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00279 psi(L) at 1.084 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 661 mv)

Peak Vector Sum 0.282 in/s at 0.407 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

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Event Report

Date/Time	Vert at 15:18:56 December 20, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2O2.JK0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

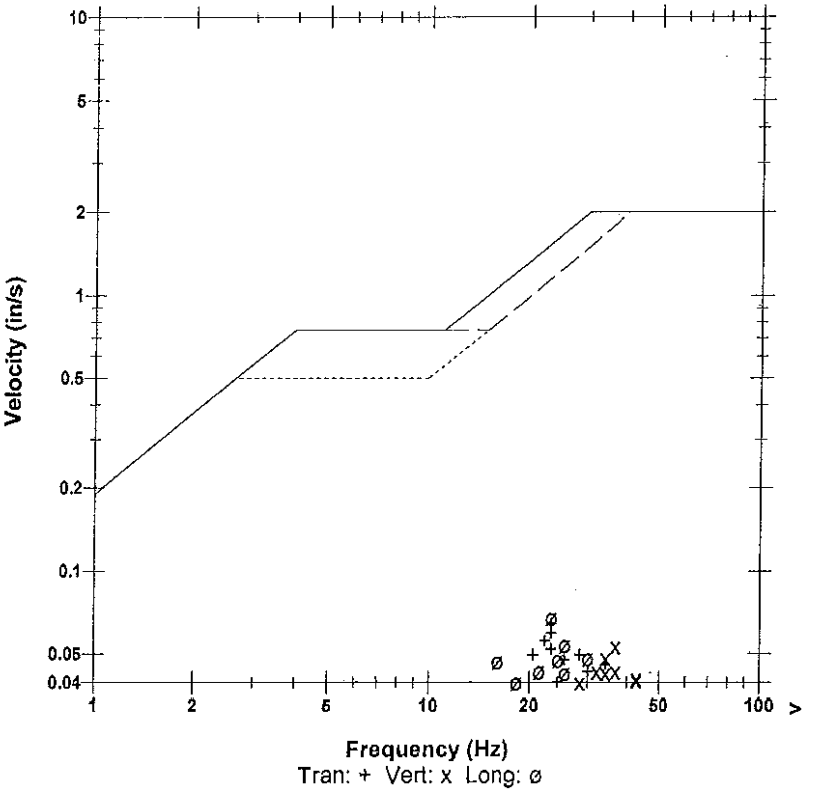
Post Event Notes

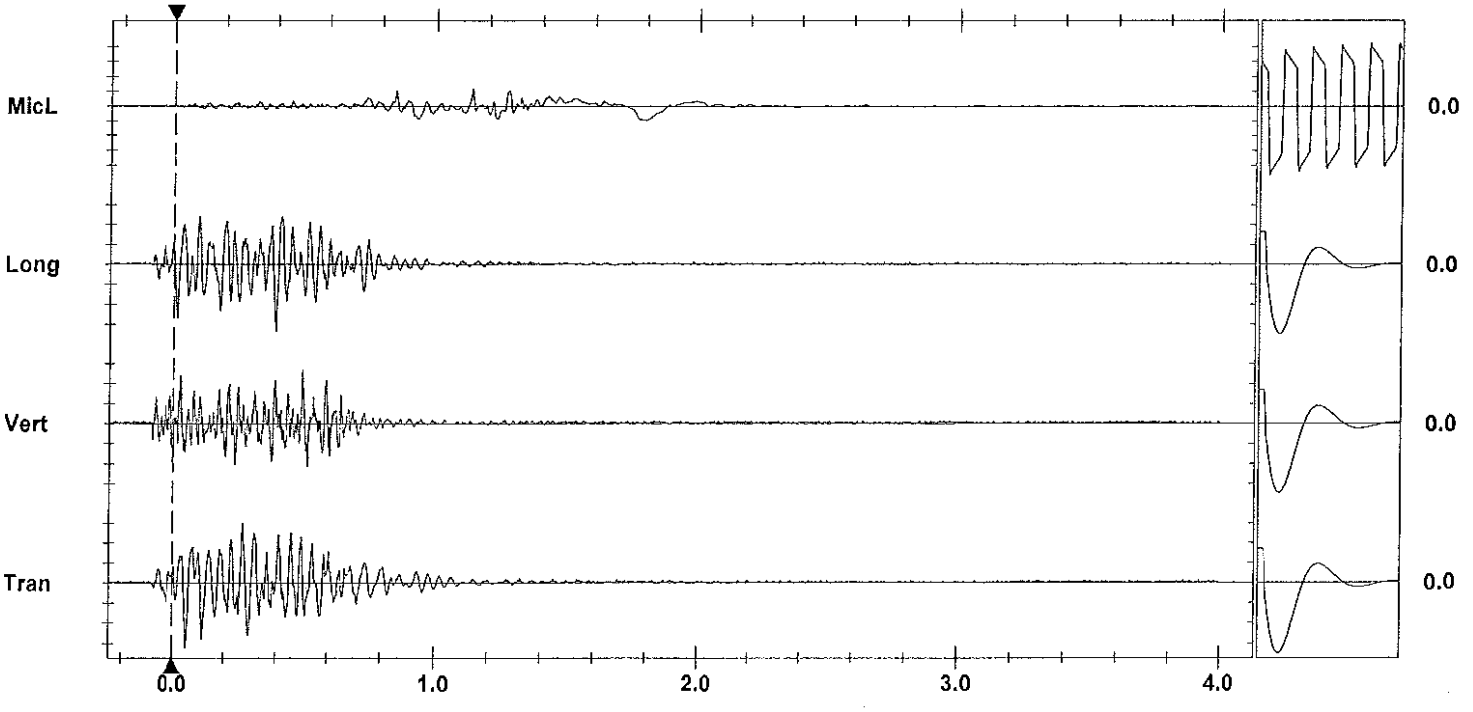
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 1.134 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 694 mv)

	Tran	Vert	Long	
PPV	0.0644	0.0531	0.0675	in/s
ZC Freq	23	37	23	Hz
Time (Rel. to Trig)	0.054	0.502	0.397	sec
Peak Acceleration	0.0265	0.0580	0.0315	g
Peak Displacement	0.00046	0.00020	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0772 in/s at 0.396 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 9:34 am
BLAST # MW-0060

HIGHWAY# 97
BLAST LOCATION AT: STN 128+73 - 128+80 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot moved

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Alaskan Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 9 of 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.75 (m) BURDEN — (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2 DYNAMITE 200grain det.cord
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 9
TOTAL WEIGHT 13 (kg)
TOTAL NUMBER OF DELAYS 9
DELAY TYPE AND LENGTH 25 (ms)

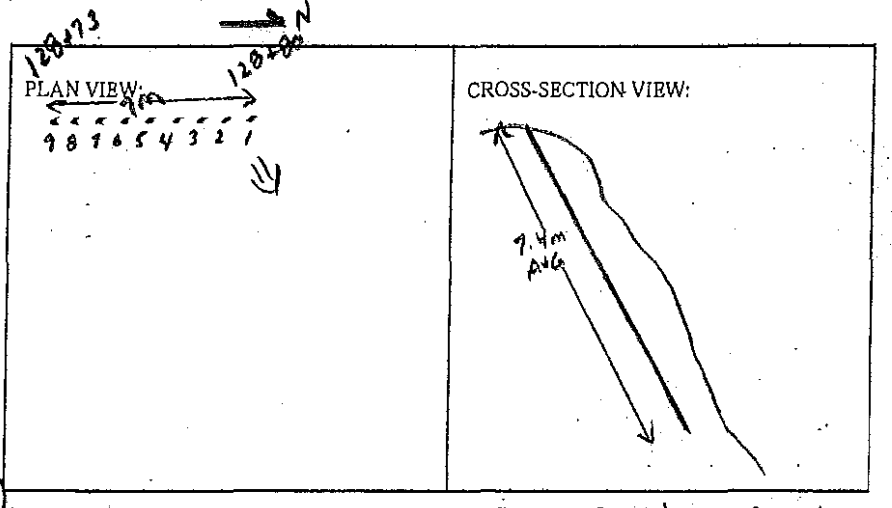
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 520 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone cut - No reid < 0.04 ips
@ 13093 cliffstone cut - 0.24 ips / 57Hz

/ CART. 2"x16" DYNAMITE + 200 gr. det cord to 4' collar

Instantel

Event Report

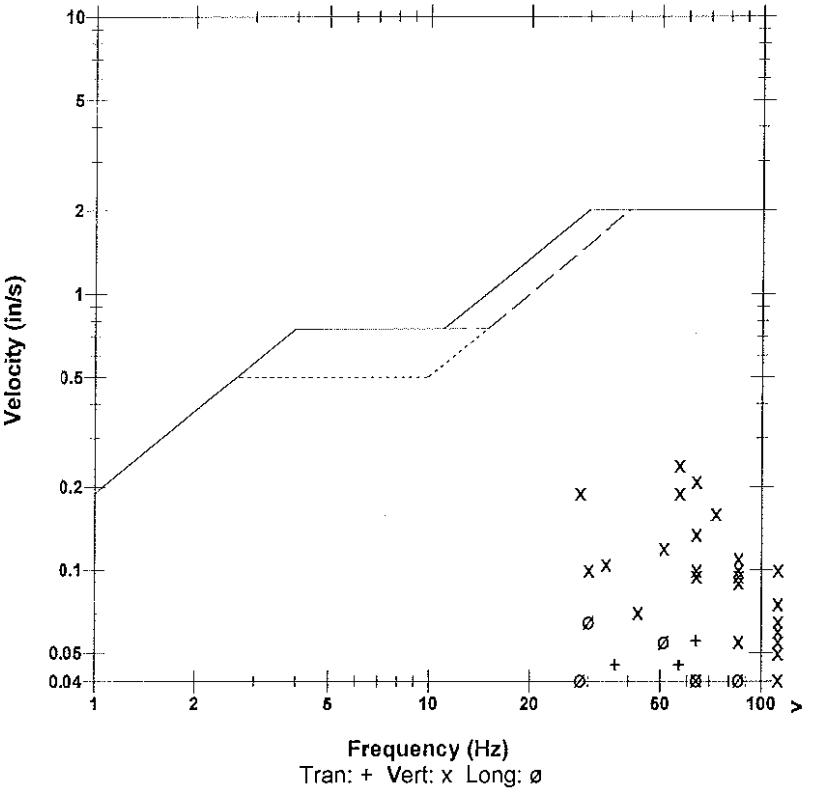
Date/Time	Vert at 09:34:32 December 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2PH.9K0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

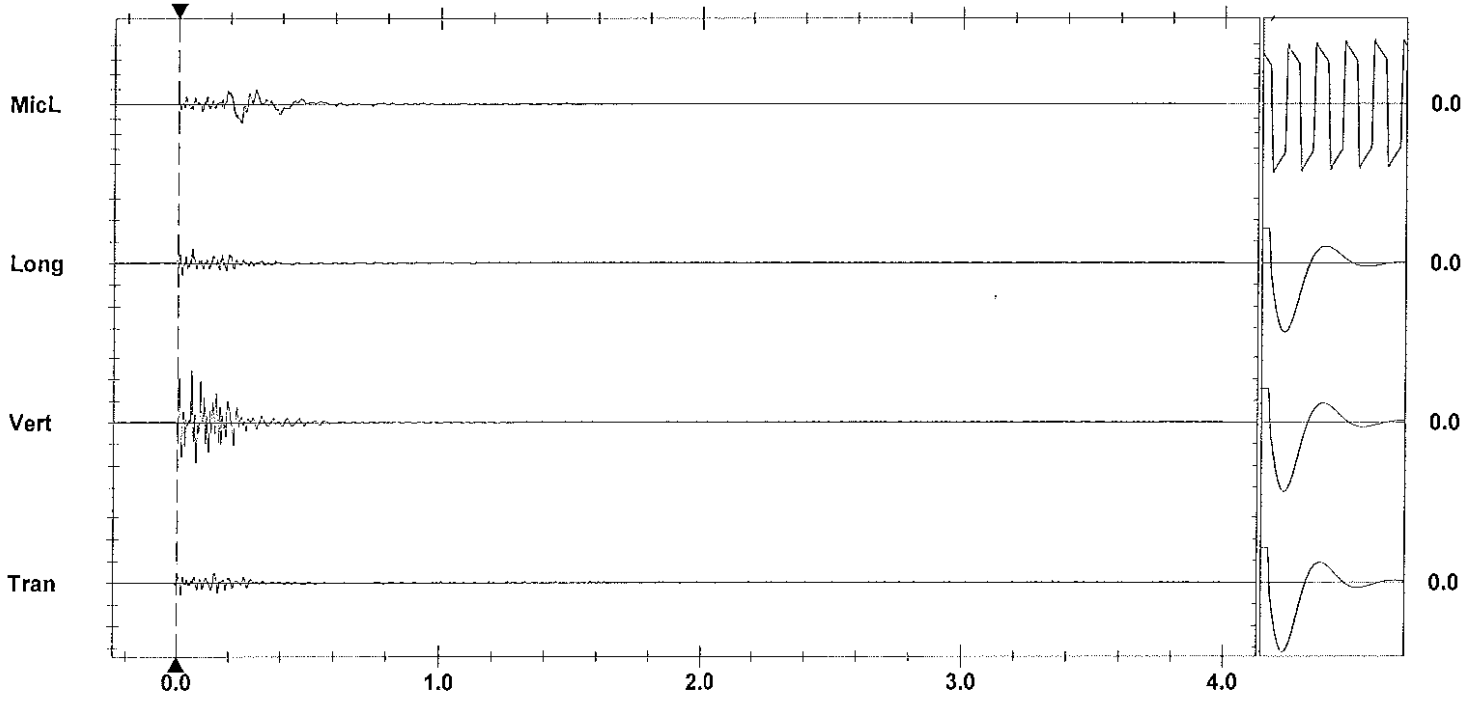
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00123 psi(L) at 0.241 sec			
ZC Freq	9.1 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 675 mv)			

	Tran	Vert	Long	
PPV	0.0550	0.240	0.0650	in/s
ZC Freq	64	57	30	Hz
Time (Rel. to Trig)	0.016	0.055	0.057	sec
Peak Acceleration	0.0530	0.239	0.0663	g
Peak Displacement	0.00021	0.00067	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.2	

Peak Vector Sum 0.247 in/s at 0.055 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 10:45 AM
BLAST # MW-0001

HIGHWAY# 97
BLAST LOCATION AT: 128+68-128+72 45 (TOP Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 4
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.E. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-325 CAPACITY 80 Caps

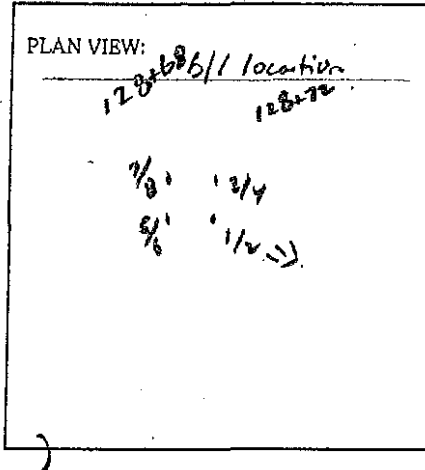
VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

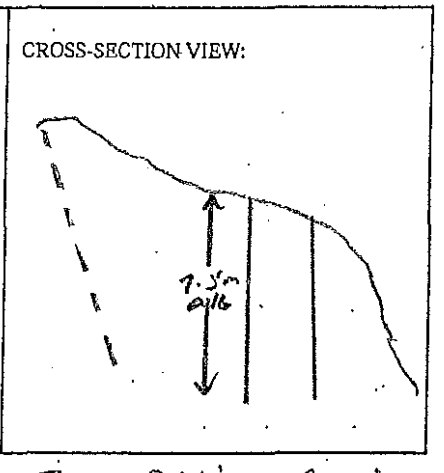
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Siesmograph @ 13167 c/l Blast ext - 0.12 ips / 37Hz
@ 13093 c/l Blast ext - 0.58 ips / 37Hz

Bottom Decks - 5' ANFO } 1" x 8" dynamite Primers
Top Decks - 1' ANFO

Instantel

Event Report

Date/Time	Vert at 10:44:30 December 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2PK.I60

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

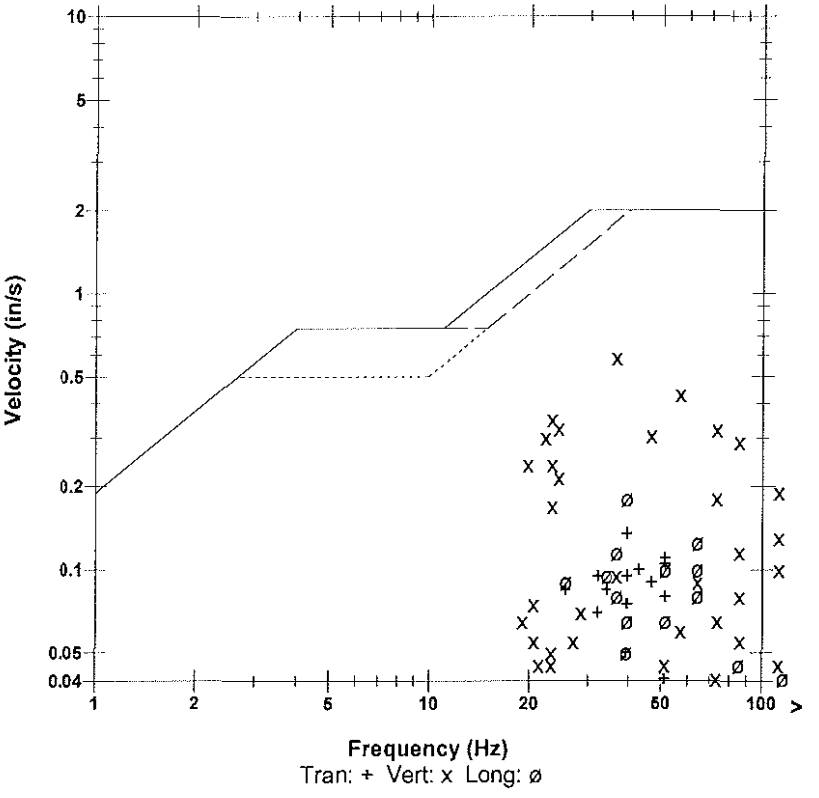
Extended Notes
Blast at stn 128

Post Event Notes

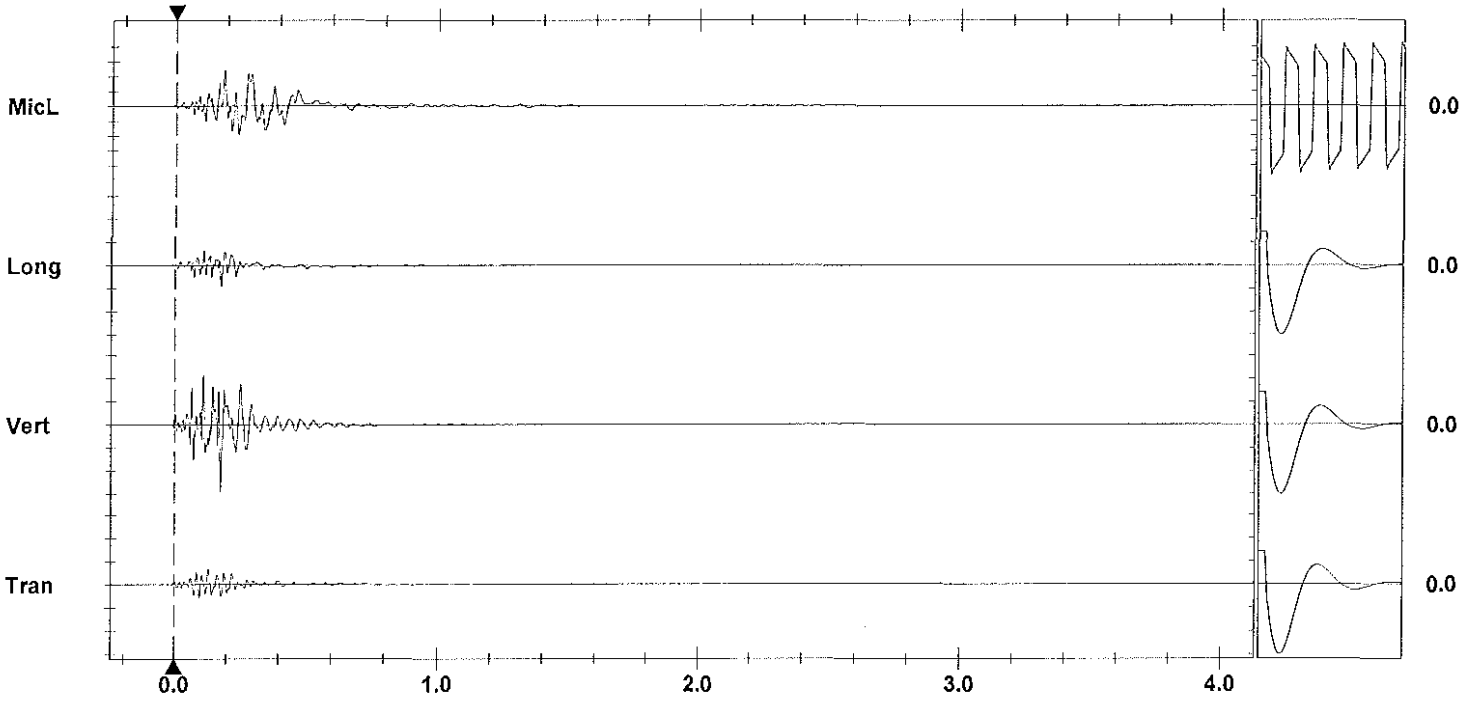
Microphone Linear Weighting
PSPL 0.00239 psi(L) at 0.186 sec
ZC Freq 24 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 707 mv)

	Tran	Vert	Long	
PPV	0.135	0.585	0.180	in/s
ZC Freq	39	37	39	Hz
Time (Rel. to Trig)	0.131	0.177	0.178	sec
Peak Acceleration	0.106	0.530	0.119	g
Peak Displacement	0.00052	0.00219	0.00064	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.610 in/s at 0.177 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 10:44:32 December 21, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

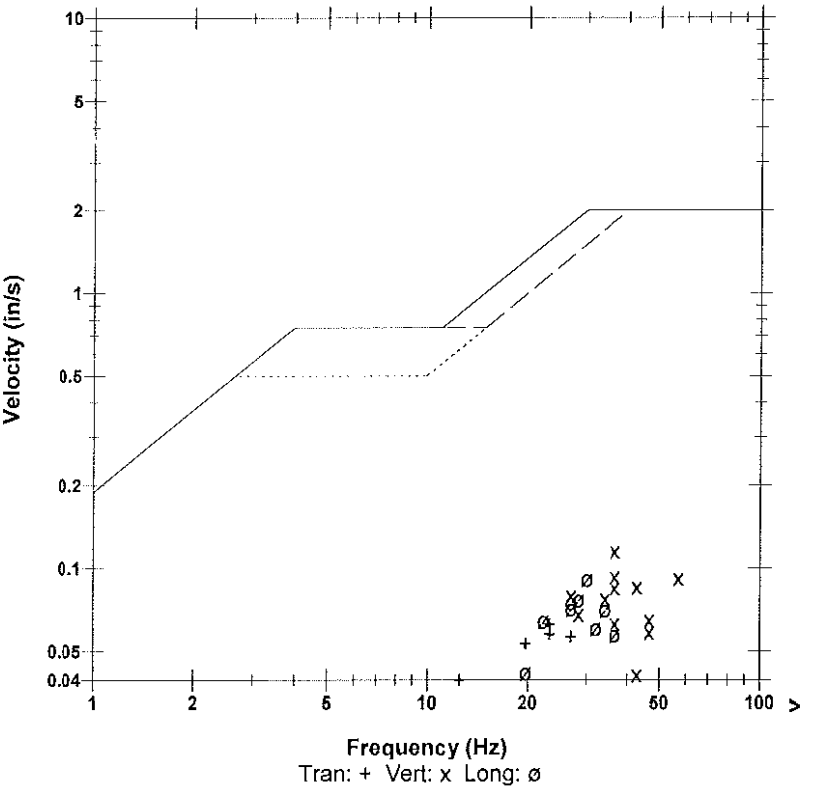
Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E2PK.I80

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

Post Event Notes

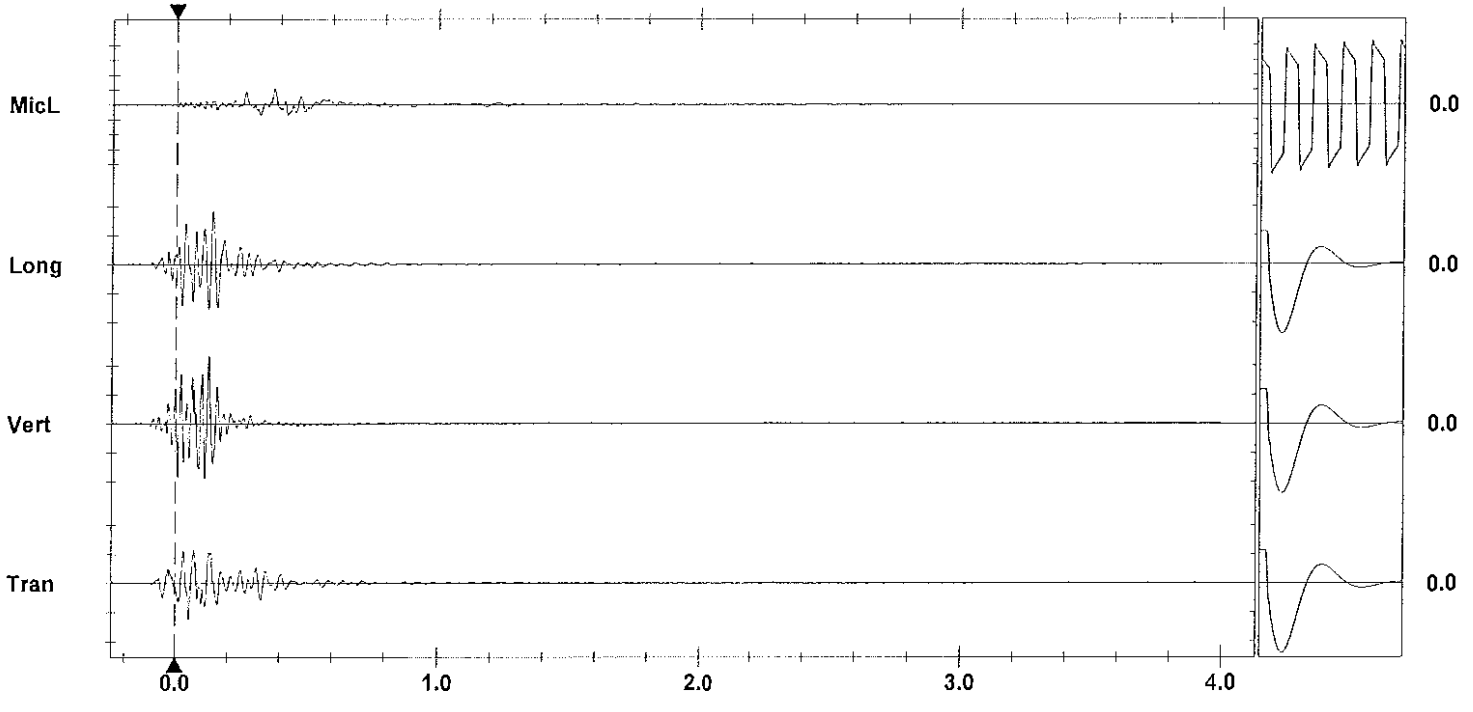
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at 0.376 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 738 mv)

	Tran	Vert	Long	
PPV	0.0625	0.116	0.0912	in/s
ZC Freq	23	37	30	Hz
Time (Rel. to Trig)	0.053	0.128	0.141	sec
Peak Acceleration	0.0481	0.0779	0.0563	g
Peak Displacement	0.00042	0.00049	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.143 in/s at 0.128 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 12:37 pm
BLAST # MW-0062

HIGHWAY# 97
BLAST LOCATION AT: STA 128+60 to 128+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot muffled

HEIGHT ABOVE HWY 11m (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 0.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

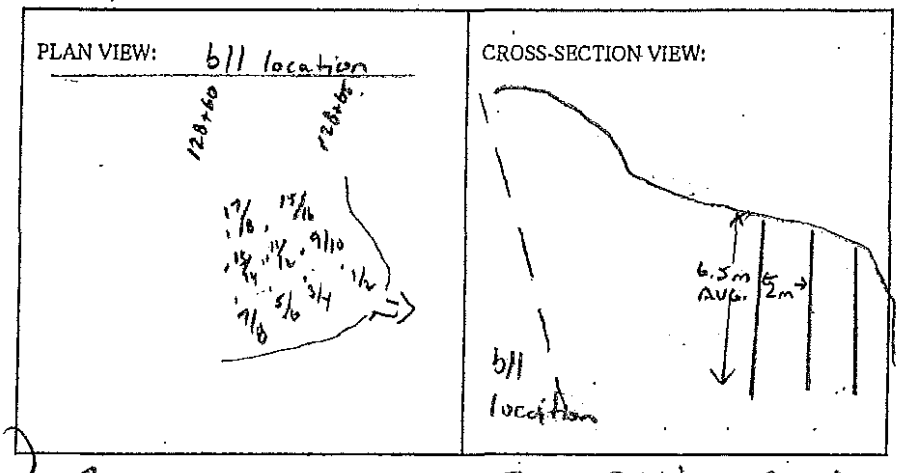
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ent. - 0.093 ips / 37 Hz
@ 13093 cliffstone ent. - 0.41 ips / 64 Hz

BOTTOM DECKS - 4 AND
TOP DECKS - 1' AND } 1¼" DYNAMITE PRIMER

Instantel

Event Report

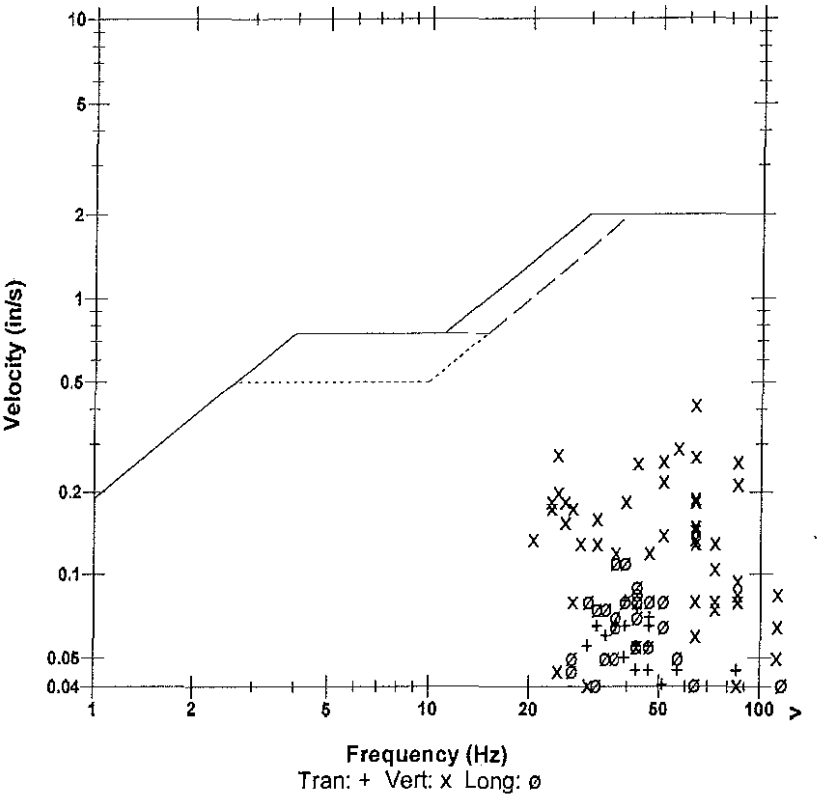
Date/Time	Vert at 12:37:22 December 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2PP.QA0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

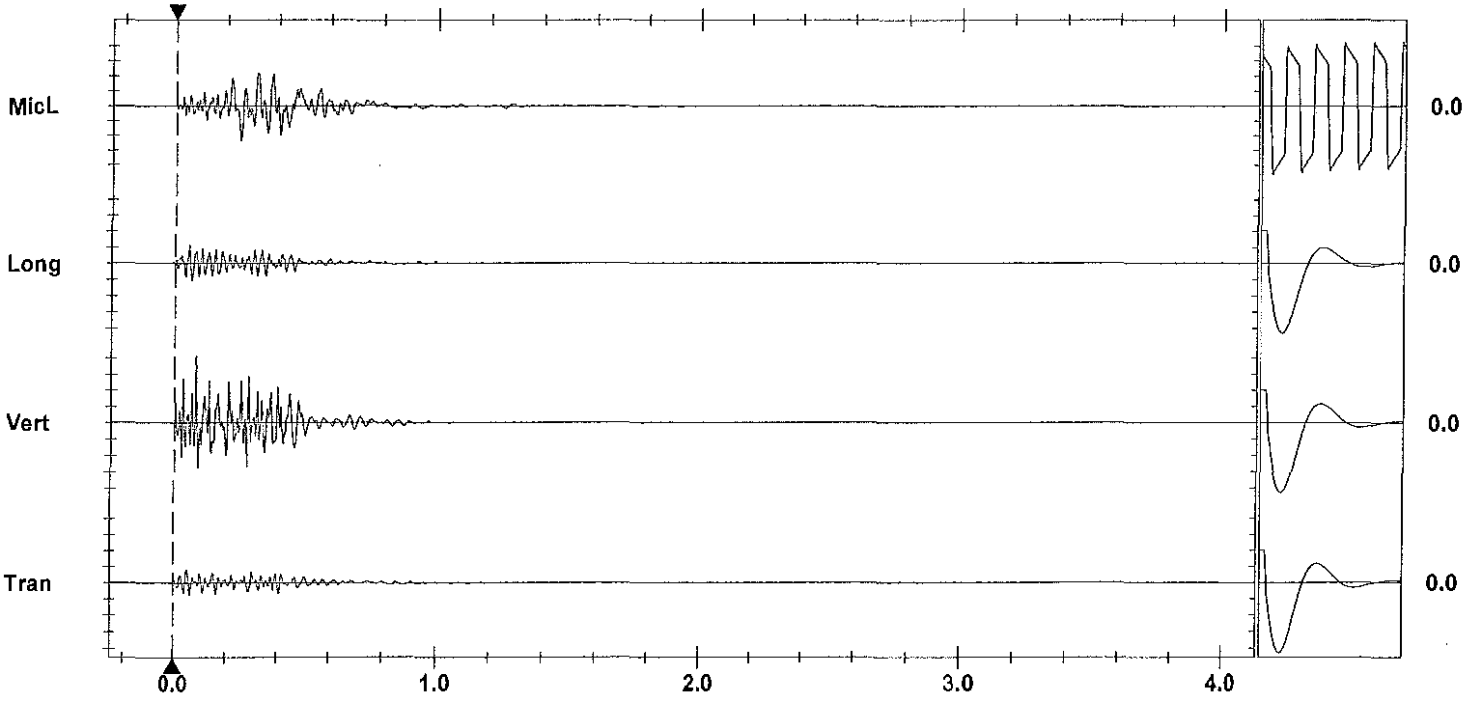
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00239 psi(L) at 0.250 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 684 mv)

	Tran	Vert	Long	
PPV	0.0800	0.415	0.110	in/s
ZC Freq	39	64	37	Hz
Time (Rel. to Trig)	0.053	0.085	0.056	sec
Peak Acceleration	0.0663	0.384	0.106	g
Peak Displacement	0.00036	0.00122	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.422 in/s at 0.085 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: December 09, 2011 07:48:04 AM
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Instantel

Event Report

Date/Time	Vert at 12:37:24 December 21, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2PP.QC0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

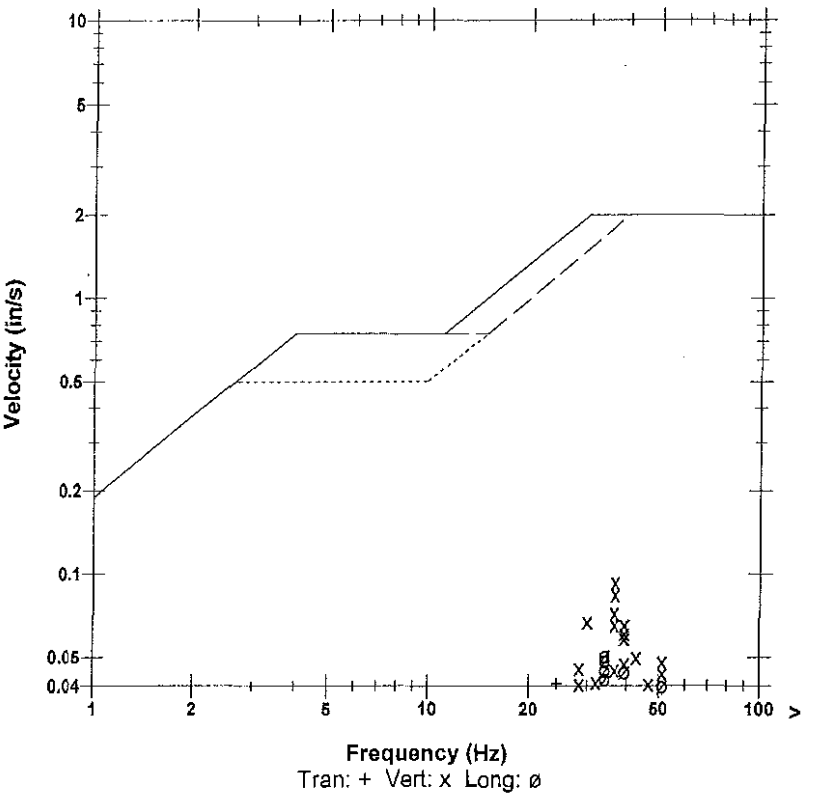
Post Event Notes

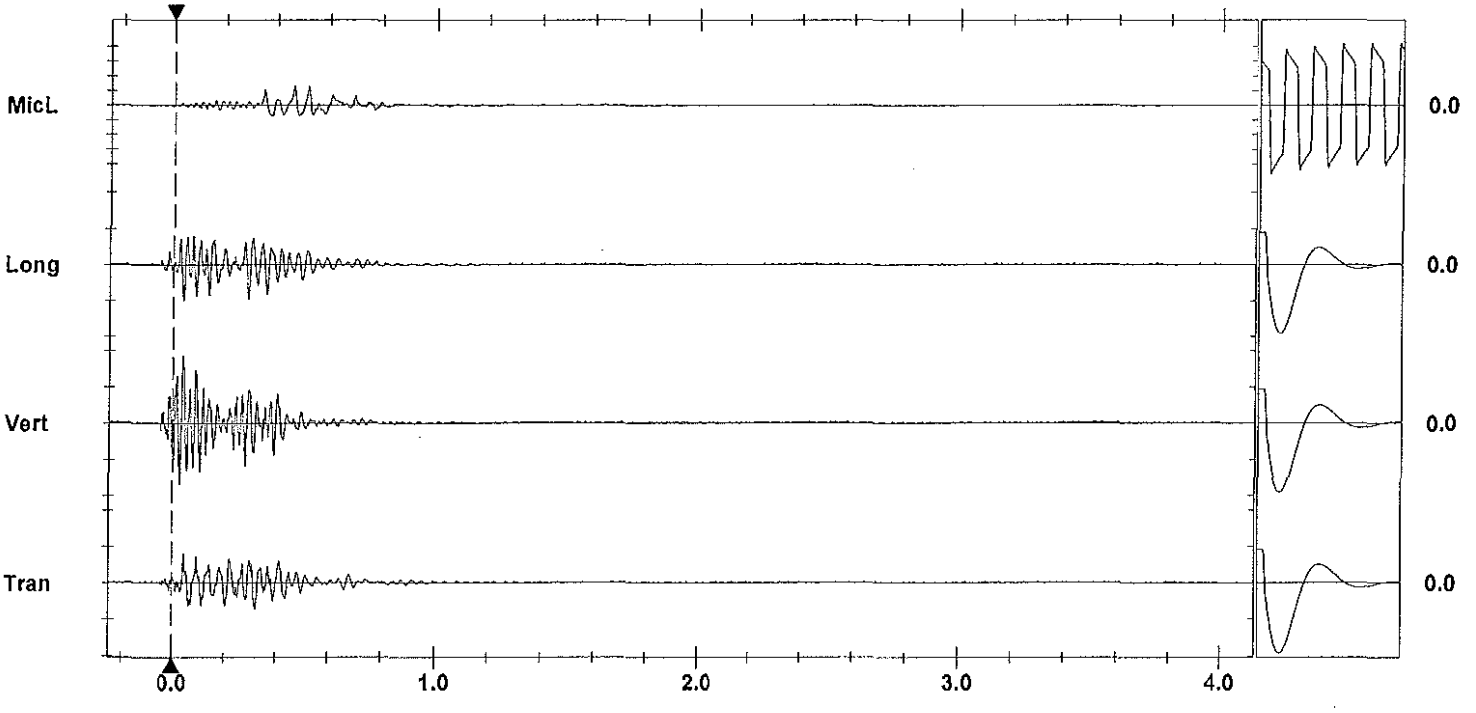
Microphone Linear Weighting
PSPL 0.00134 psi(L) at 0.460 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 714 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0931	0.0506	in/s
ZC Freq	24	37	34	Hz
Time (Rel. to Trig)	0.046	0.038	0.040	sec
Peak Acceleration	0.0298	0.0862	0.0315	g
Peak Displacement	0.00022	0.00043	0.00022	in
ensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.103 in/s at 0.038 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: December 28, 2011 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 2:02 pm
BLAST # MW-0063

HIGHWAY# 97
BLAST LOCATION AT: 128+60 - 128+67

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 50-01 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 46 (kg)
DELAY TYPE AND LENGTH 25 (ms)

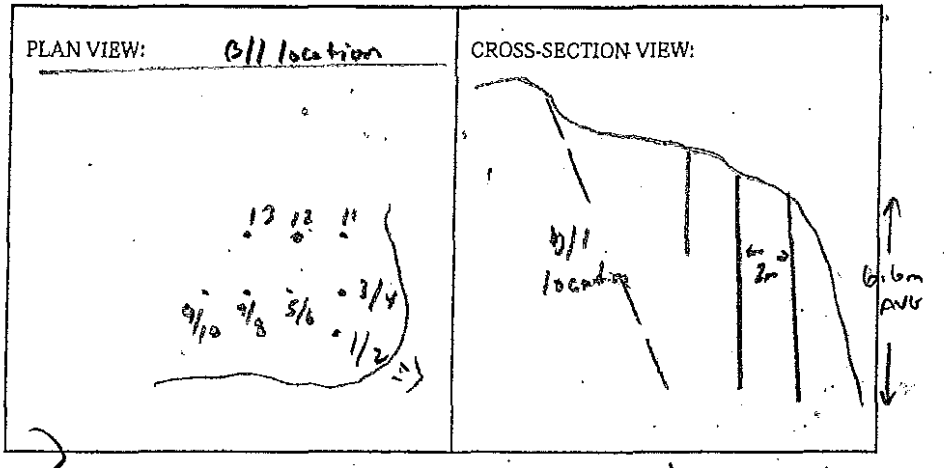
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSS20 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone ext. - 0.091 ips/ 34Hz
@ 13098 cliffstone ext. - 0.44 ips/ 93Hz

PRIM Holes - Bottom Decks - 5 ANFO
Top Decks - 1' ANFO } 1"x8" Dynamite Primers

STMB Holes - 1' ANFO

Instantel

Event Report

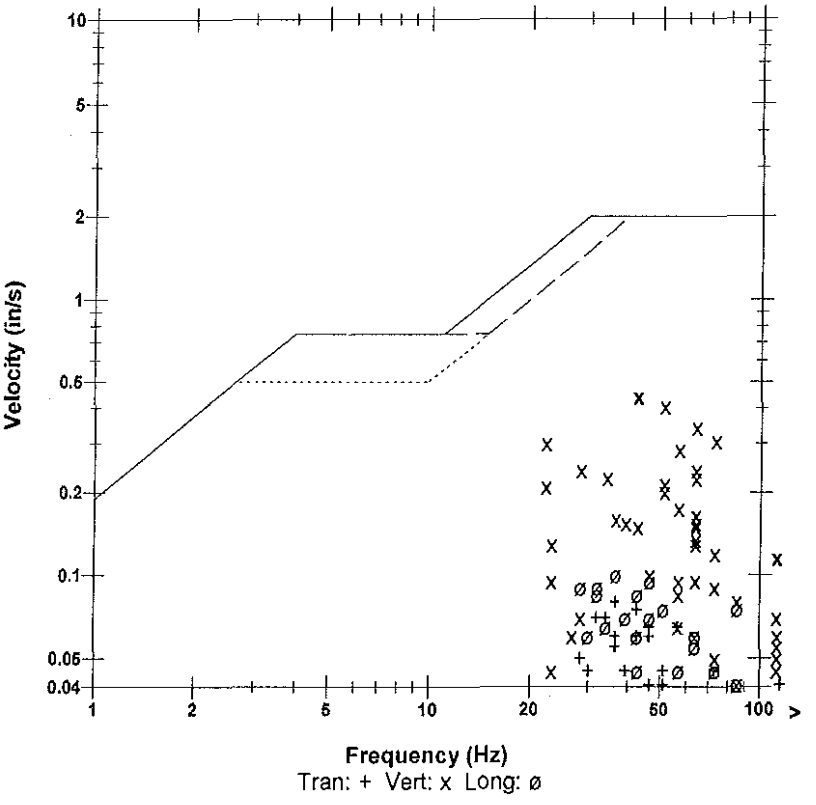
Date/Time	Vert at 14:02:05 December 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2PT.NH0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

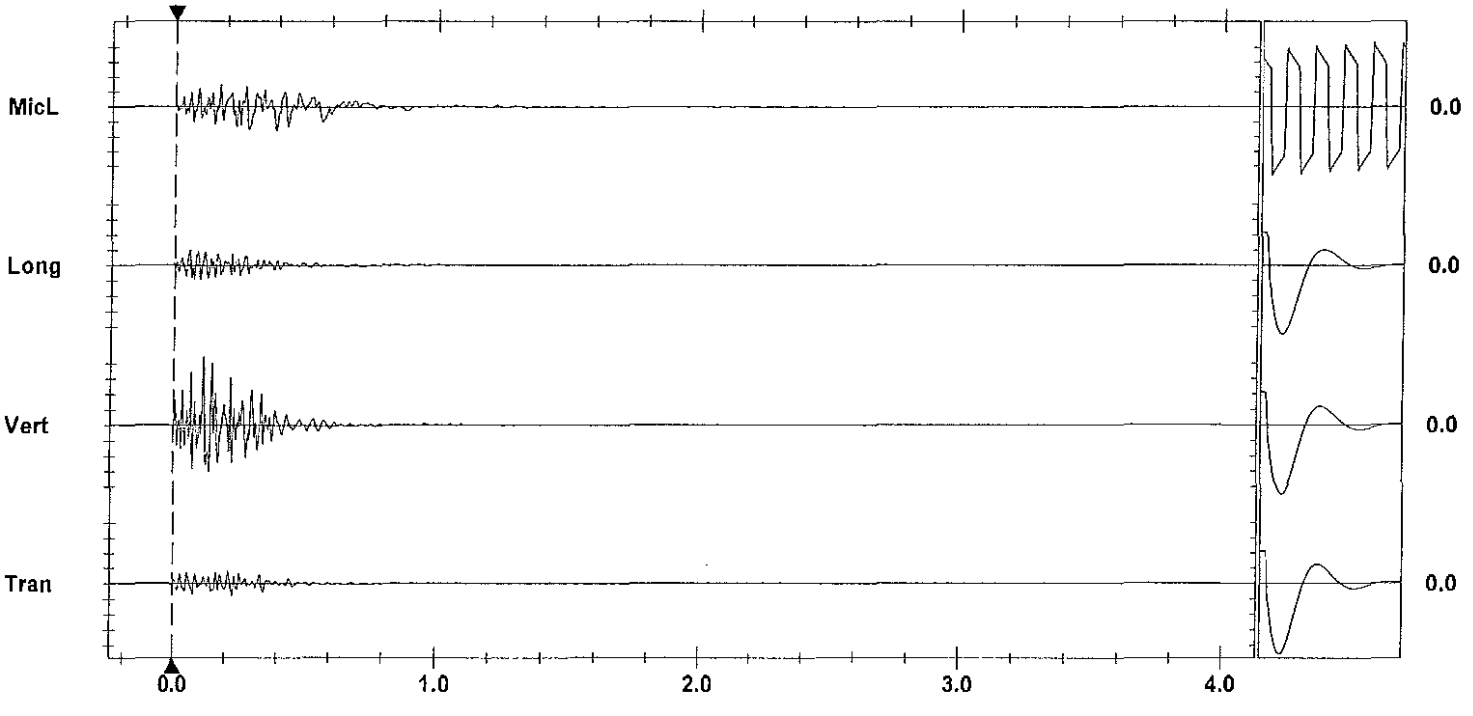
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.388 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 700 mv)

	Tran	Vert	Long	
PPV	0.0800	0.440	0.1000	in/s
ZC Freq	37	43	37	Hz
Time (Rel. to Trig)	0.214	0.118	0.058	sec
Peak Acceleration	0.0663	0.398	0.106	g
Peak Displacement	0.00032	0.00226	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.449 in/s at 0.118 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel®

Event Report

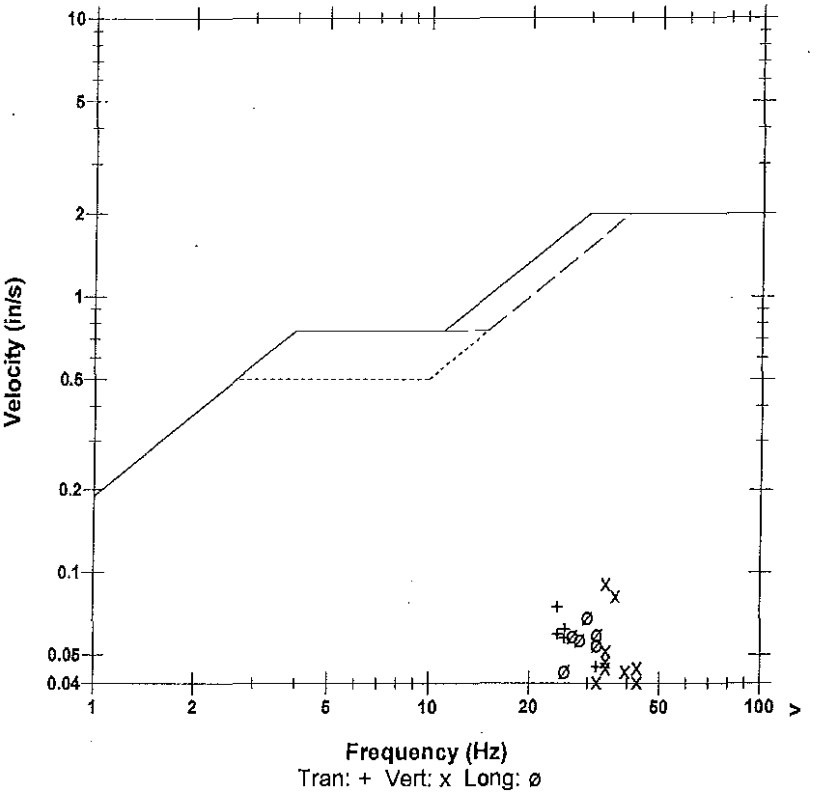
Date/Time	Vert at 14:02:07 December 21, 2011	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E2PT.NJ0
Job Number:	1		

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

Post Event Notes

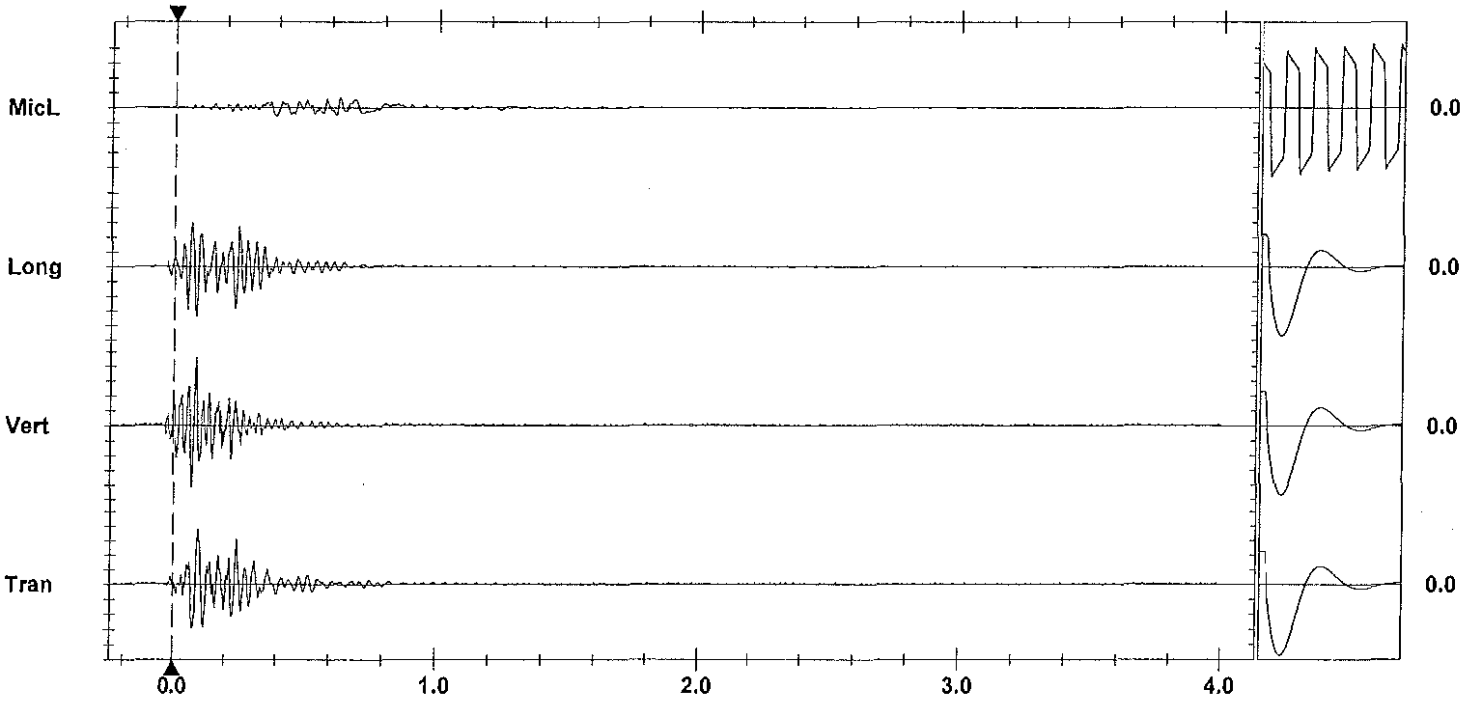
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00065 psi(L) at 0.631 sec			
ZC Freq	28 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 728 mv)			

	Tran	Vert	Long	
PPV	0.0744	0.0912	0.0687	in/s
ZC Freq	24	34	30	Hz
Time (Rel. to Trig)	0.099	0.089	0.087	sec
Peak Acceleration	0.0381	0.0597	0.0348	g
Peak Displacement	0.00050	0.00039	0.00035	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.112 in/s at 0.088 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 3:31 PM
BLAST # MW-0064

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+60 - 128+70 LS (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Chat matched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 14 6 11 / 3 Buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.75 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 20

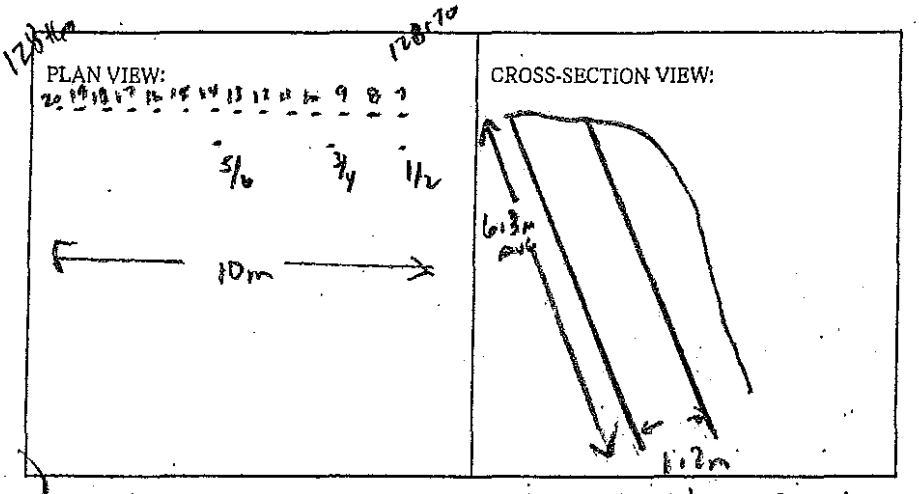
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cot. - Notes < 0.04 ips
@ 13093 Cliffstone Cot. - 0.33 ips / 75Hz

BUFFER HOLES - BOTTOM DECKS 3-4 CART 2"x16" BLASTEX
- TOP DECKS 1 CART 2"x16" BLASTEX

1½' DYNAMITE PRIMERS

B/L HOLES - 1 CART. 2"x16" DYNAMITE + 2LBS QR dust COAT to 4' COLLAR

Instantel

Event Report

Date/Time	Vert at 15:31:34 December 21, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2PX.SM0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

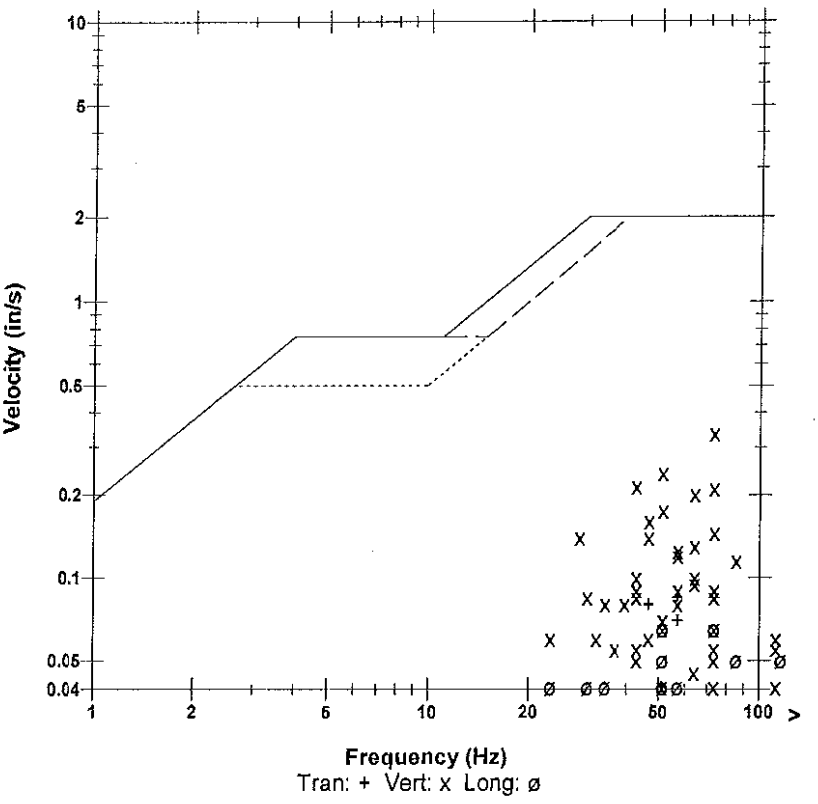
Post Event Notes

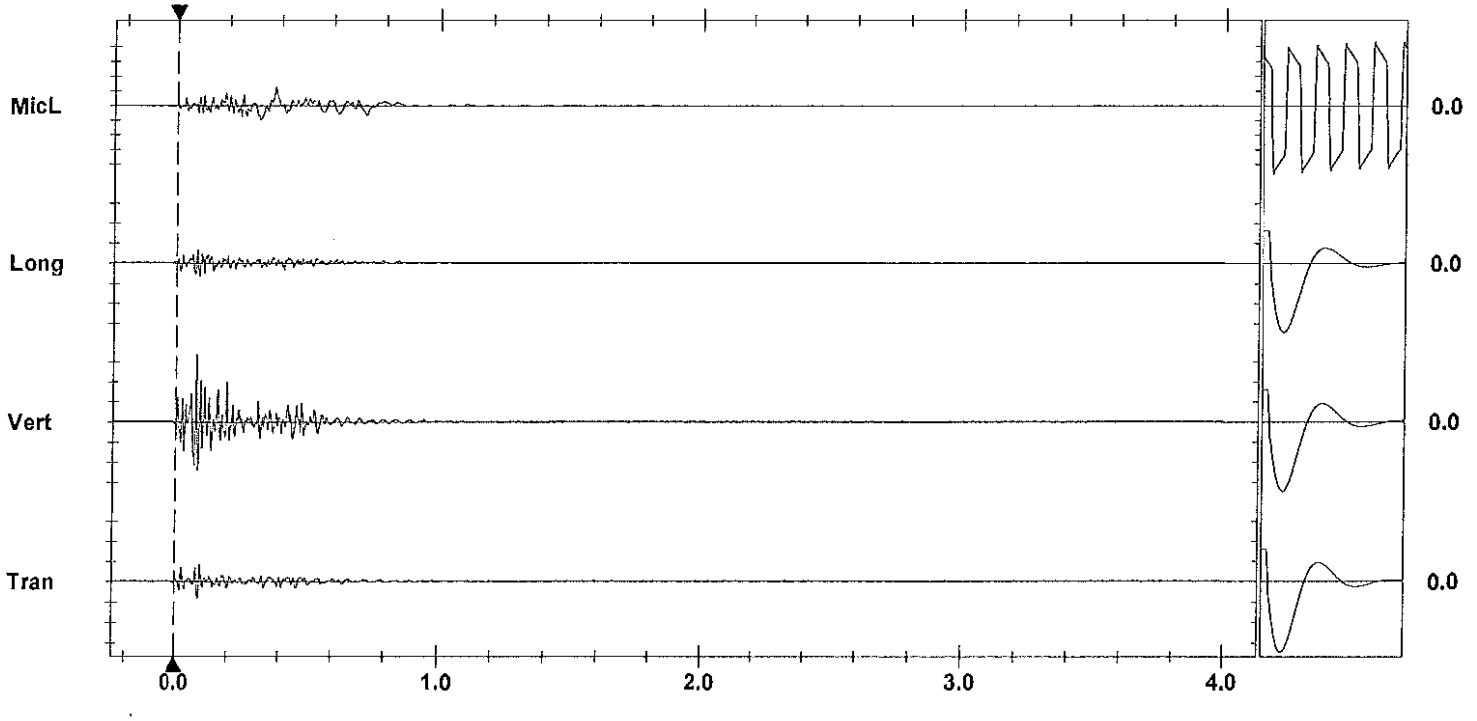
Microphone Linear Weighting
PSPL 0.00123 psi(L) at 0.376 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.0850	0.335	0.0650	in/s
ZC Freq	57	73	73	Hz
Time (Rel. to Trig)	0.099	0.080	0.080	sec
Peak Acceleration	0.106	0.345	0.0928	g
Peak Displacement	0.00029	0.00081	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.345 in/s at 0.080 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 22/11
ACTUAL BLAST DATE Dec 22/11 11:01 AM
BLAST # MW-0865

HIGHWAY# 97
BLAST LOCATION AT: SBN 128+60 - 128+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE N/a (°) SLOPE LENGTH N/a (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 9 @ 9000/1 stage
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

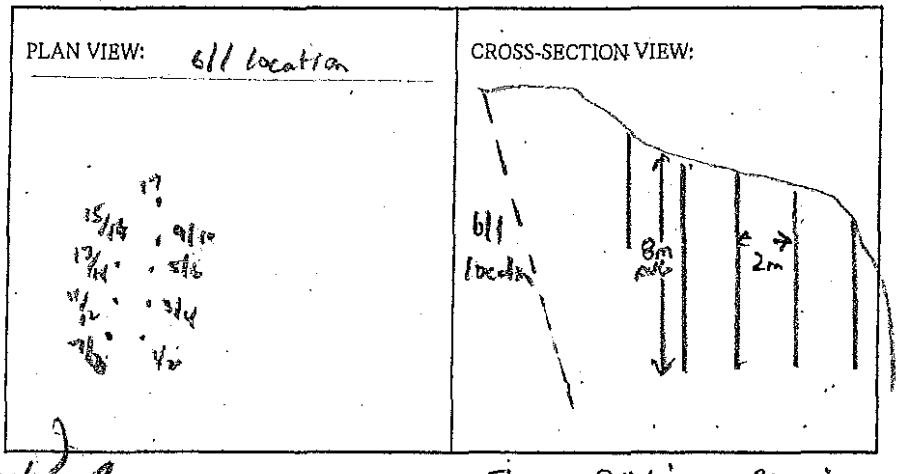
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Cut - 0.060 IPS / 27 Hz
@ 13097 Cliffstone Cut - 0.291 IPS / 51 Hz

PROD. HOLES - BOTTOM DECKS - ...

... TOP DECKS - 1' ANFO

STAB HOLE - 1' ANFO

1¼" DYNAMITE PRIMERS

Instantel

Event Report

Date/Time	Vert at 11:01:10 December 22, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

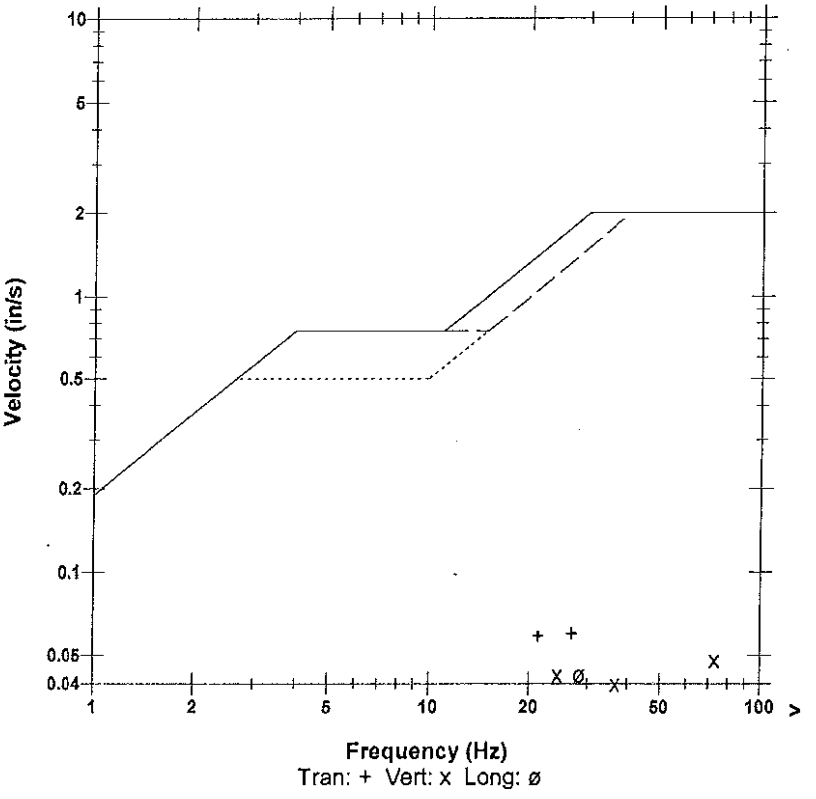
Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E2RF.XY0

Notes
location:on rear patio slab se crn
13167 Cliffstone Crt sandbagged
User Name:W Verwey
General:

Extended Notes

Post Event Notes

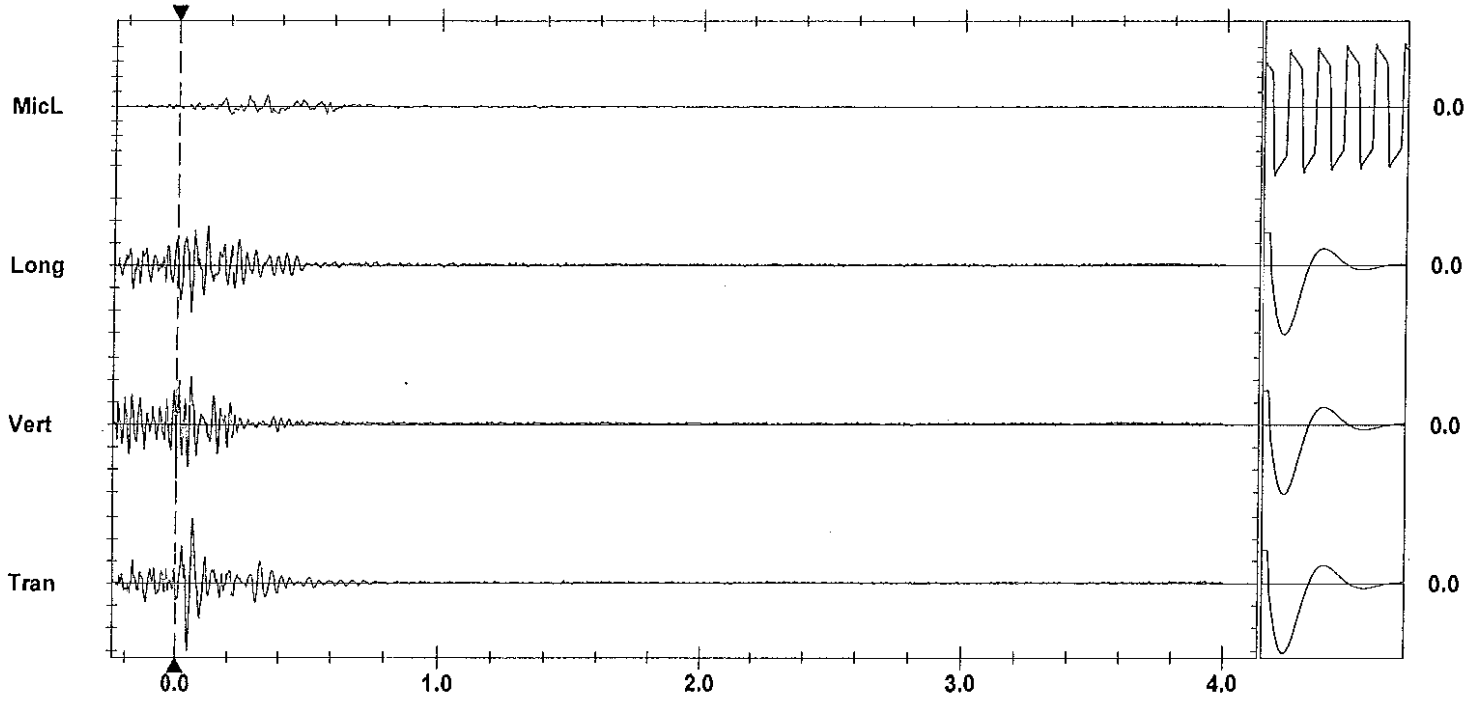
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00076 psi(L) at 0.343 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 692 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0481	0.0425	in/s
ZC Freq	27	73	28	Hz
Time (Rel. to Trig)	0.046	0.001	0.056	sec
Peak Acceleration	0.0365	0.0630	0.0249	g
Peak Displacement	0.00037	0.00023	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0712 in/s at 0.046 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

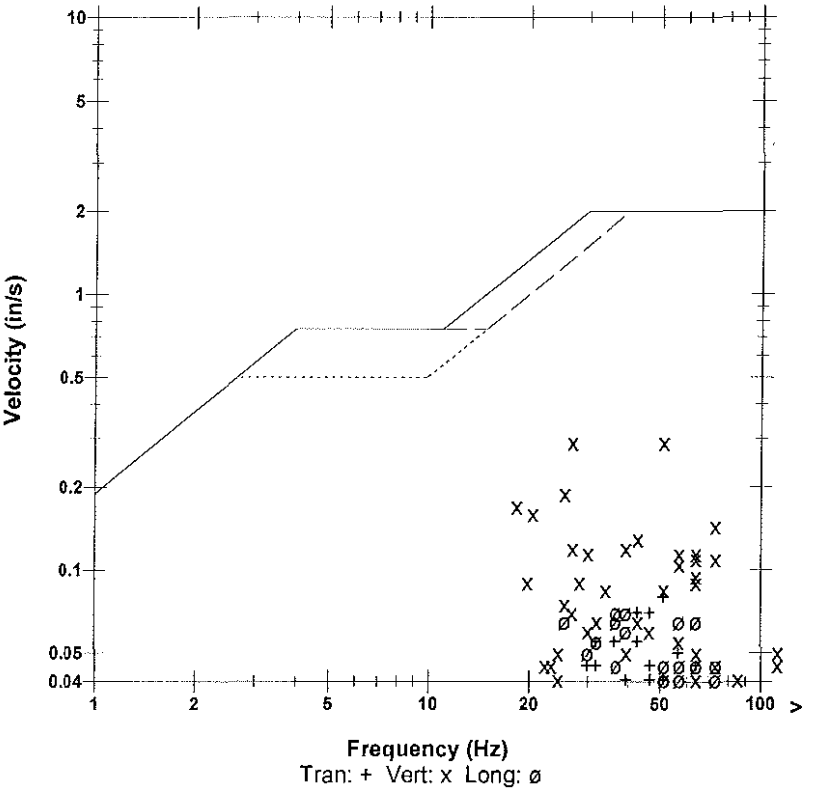
Date/Time	Vert at 11:01:07 December 22, 2011	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E2RF.XV0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

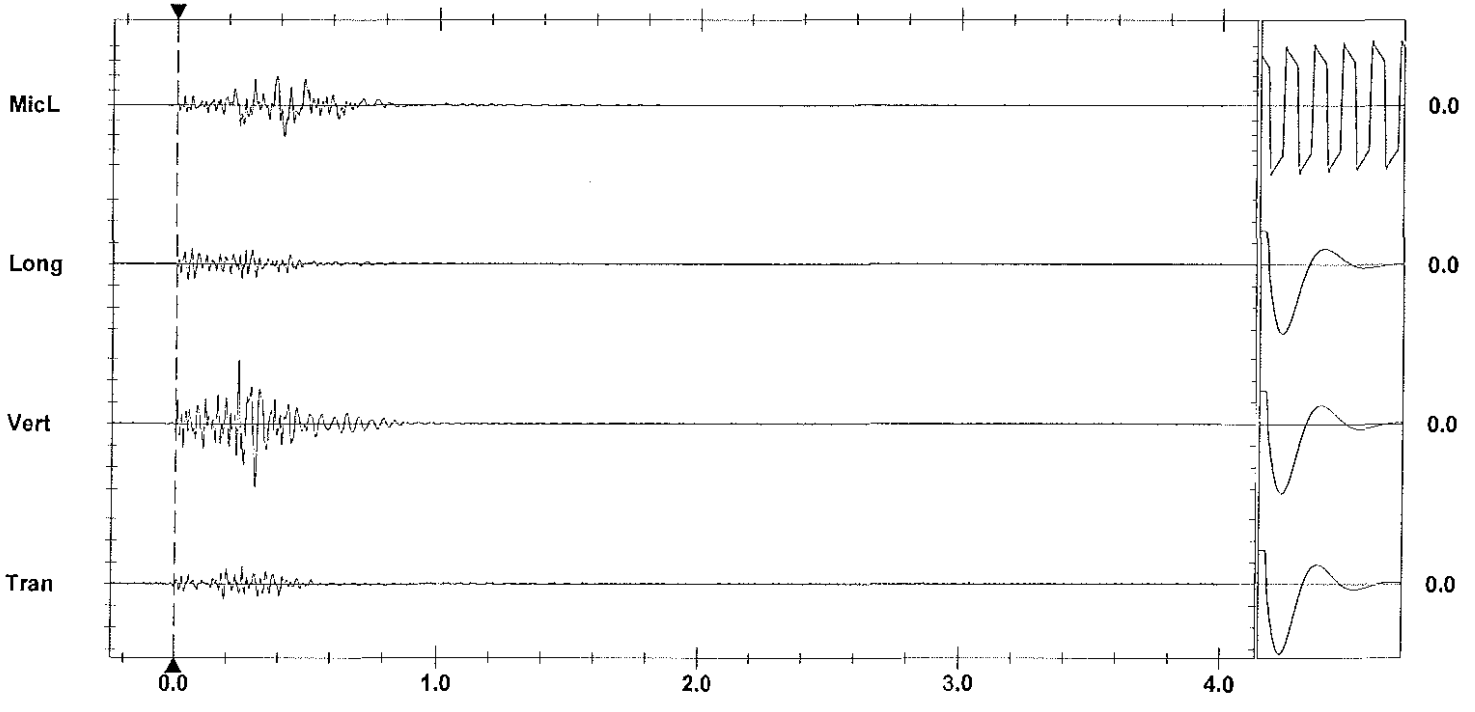
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00210 psi(L) at 0.415 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 657 mv)

	Tran	Vert	Long	
PPV	0.0800	0.290	0.0700	in/s
ZC Freq	51	51	39	Hz
Time (Rel. to Trig)	0.261	0.243	0.043	sec
Peak Acceleration	0.0795	0.292	0.0795	g
Peak Displacement	0.00025	0.00153	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.299 in/s at 0.308 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: December 28, 2011 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 22/11
ACTUAL BLAST DATE Dec 22/11 12:36pm
BLAST # MW-0066

HIGHWAY# 97
BLAST LOCATION AT: STA 128+70 - 128+75

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Augen Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8 (@ Lunch)
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 86 // / 36 Buffer / / 5 Shrub
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

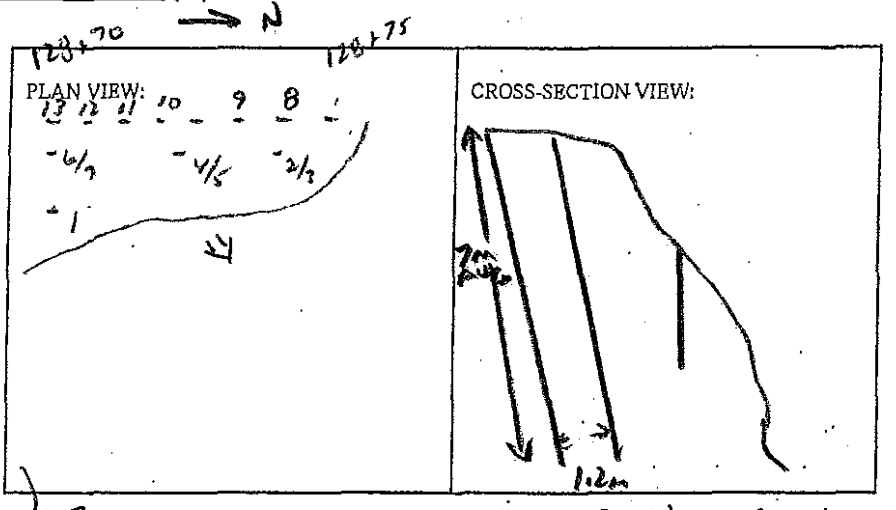
2½" x 16" Blaster Emulsion in Buffer Holes - 20 sticks/hole
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone ext - NO TRIGGER (< 0.04 ips)
@ 13093 Cliffstone ext - 0.26 ips / 43 Hz

STAB Holes - 1' ANFO

BUFFER Holes - BOTTOM DECKS 4 PART 2"x16" BLASTEX

- TOP DECKS 1 PART 2"x16" BLASTEX

1"x8" DYNAMITE Primers

B/L Holes - 2"x16" (1 PART) + 200 gr. det. cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 12:36:13 December 22, 2011
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

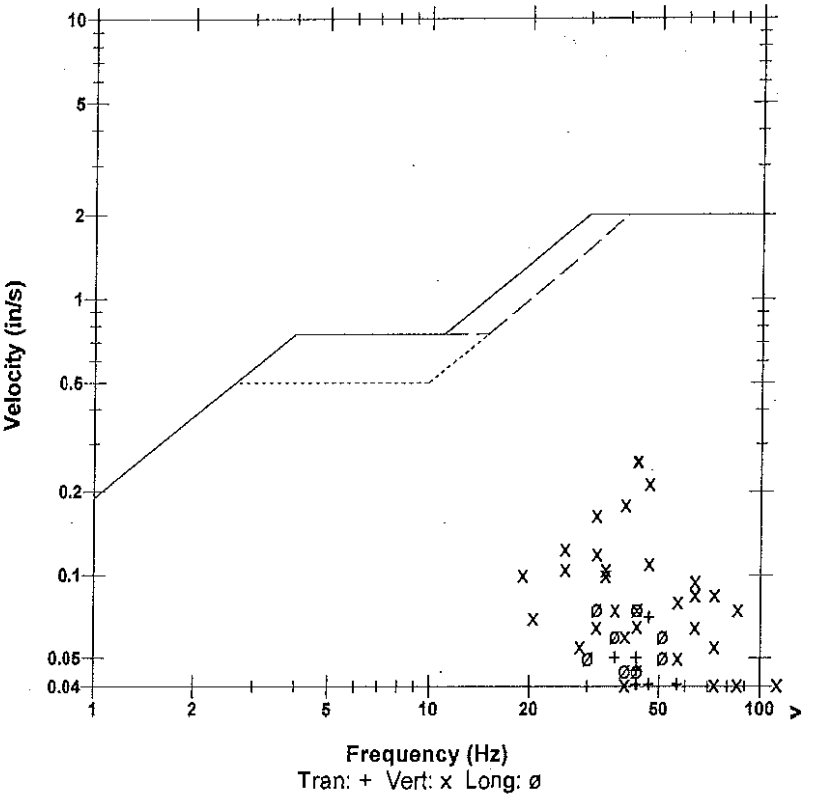
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E2RK.CD0

Notes
location:13093 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

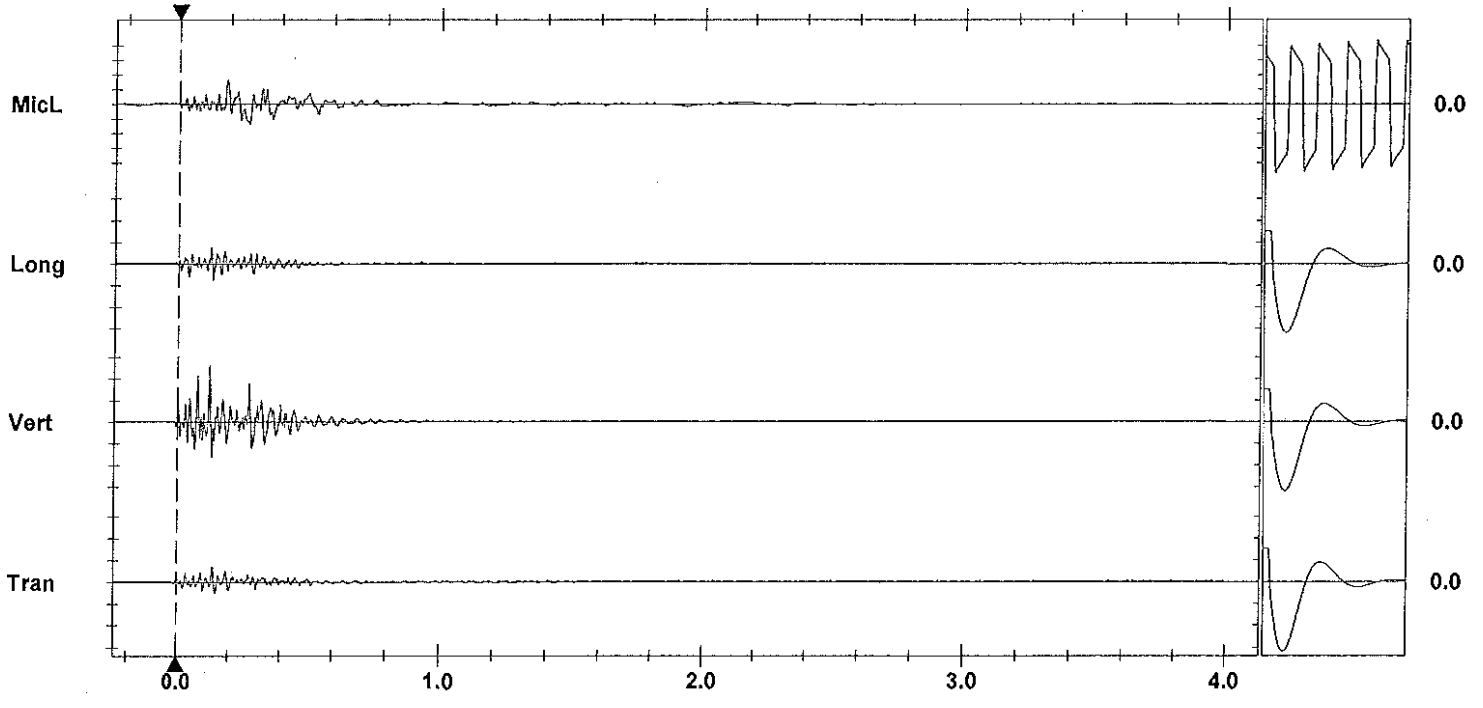
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.185 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 700 mv)

	Tran	Vert	Long	
PPV	0.0700	0.260	0.0750	in/s
ZC Freq	47	43	32	Hz
Time (Rel. to Trig)	0.142	0.127	0.129	sec
Peak Acceleration	0.0663	0.199	0.0795	g
Peak Displacement	0.00023	0.00079	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.9	4.6	

Peak Vector Sum 0.267 in/s at 0.127 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 3/12
ACTUAL BLAST DATE JAN. 3/12
BLAST # 146

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+35 - 127+45 (LS 2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 234 (m)

TOTAL NUMBER OF HOLES 10 B/L / 29 production
HOLE DIAMETER ~~127~~ (mm) 89
HOLE SPACING ~~3~~ 2.2 (m) BURDEN ~~3~~ 2.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
~~* Every 2nd B/L Hole Loaded with 200g/min Detcord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 39
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 815 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

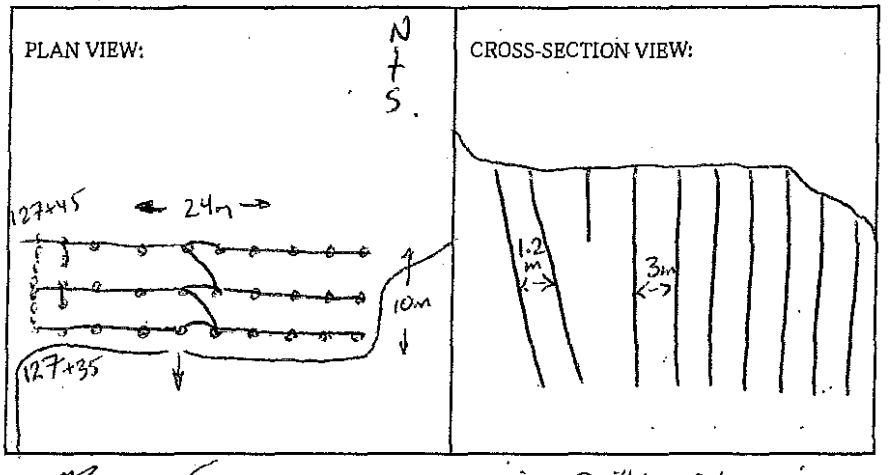
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 1500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

10 - 12' ms dets.
3 - 24' dets EZ.
26 - 40' EZ dets.
5 - 42ms connectadel.
1 - Elec det.

24 - Anfo
5 - WR.
1 - CASE 1 1/2 x 16.
2 - CASE 2 1/2 x 16.
1 1/2 - CASE 3" x 16.

Instantel

Event Report

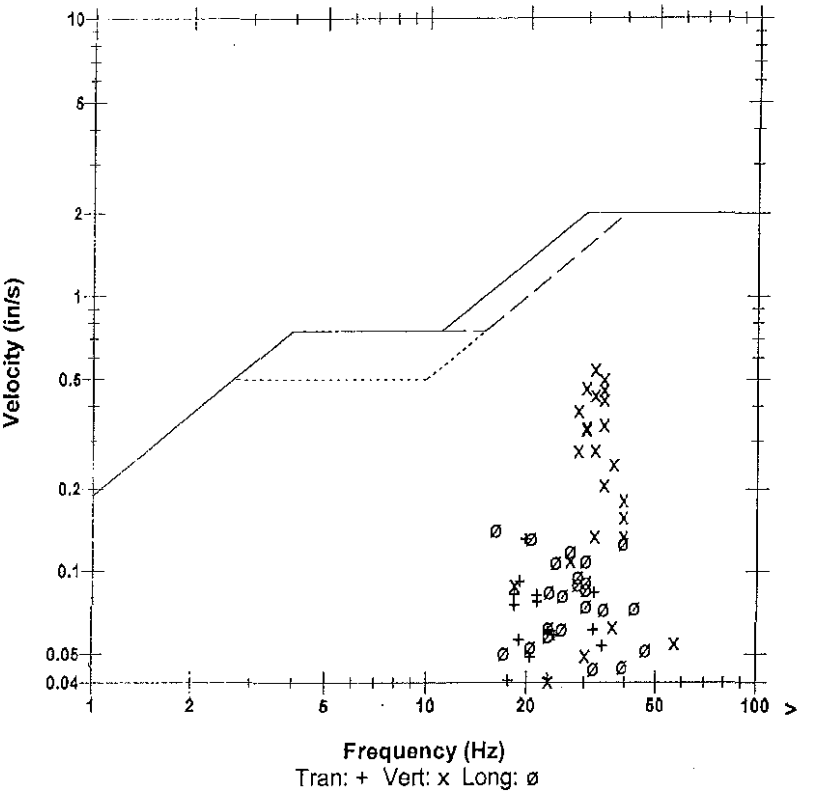
Date/Time	Vert at 16:08:10 January 3, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3E2.5M0
Job Number:	1		

Notes
location:on slab main entrance north
13050 Old Mission Rd
User Name:W Verwey
General:

Extended Notes

Post Event Notes

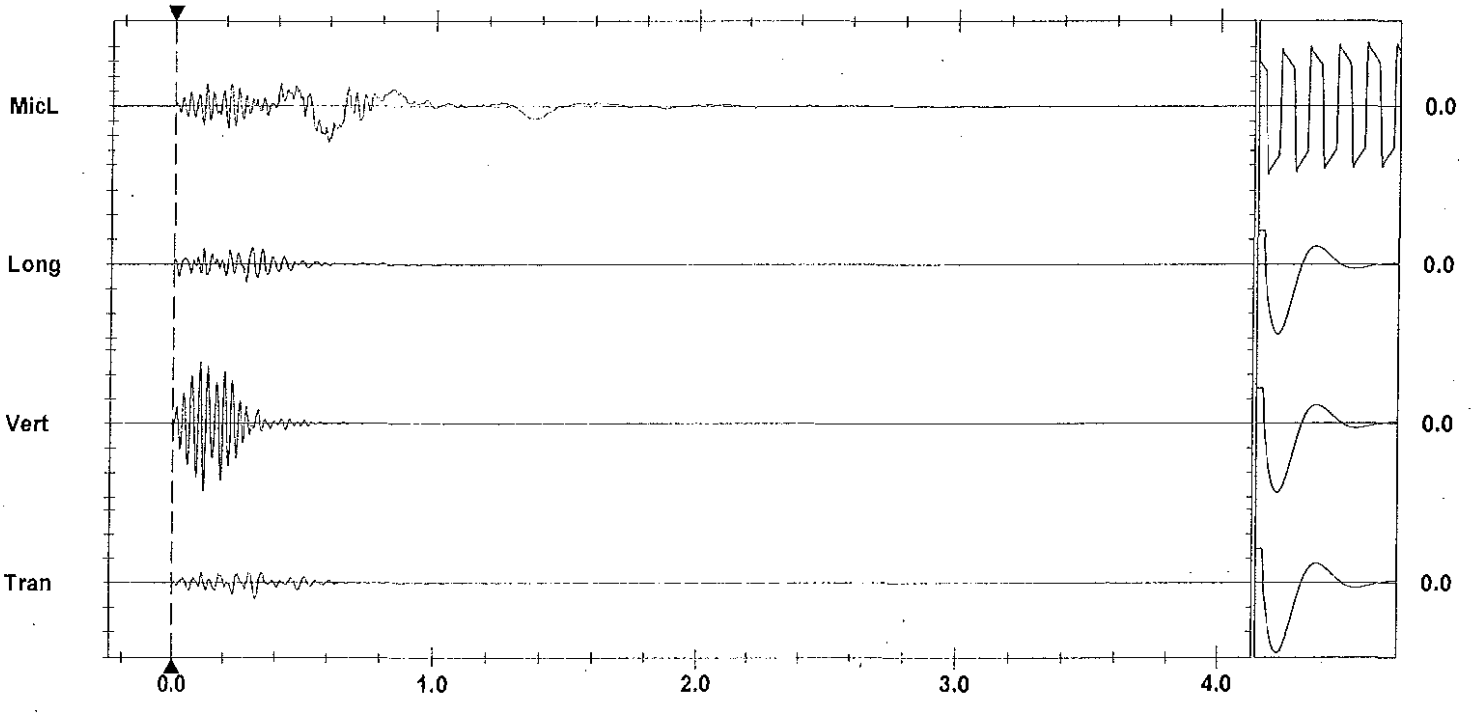
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00247 psi(L) at 0.592 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 688 mv)

	Tran	Vert	Long	
PPV	0.131	0.546	0.142	in/s
ZC Freq	20	32	16	Hz
Time (Rel. to Trig)	0.323	0.121	0.281	sec
Peak Acceleration	0.0530	0.298	0.0779	g
Peak Displacement	0.00097	0.00264	0.00101	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.555 in/s at 0.121 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

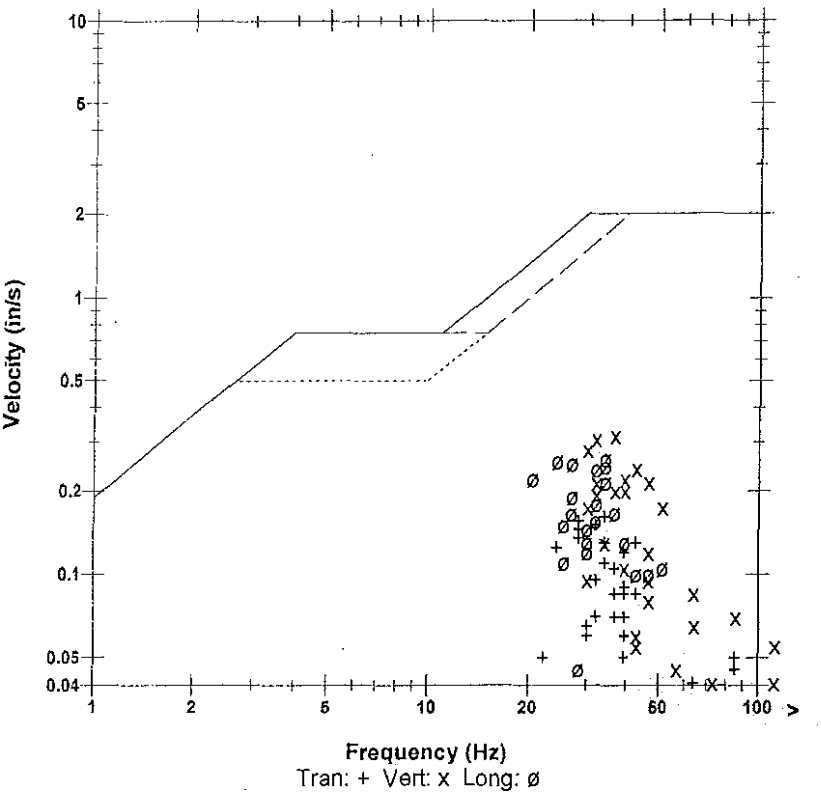
Date/Time	Vert at 16:07:56 January 3, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3E2.580

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

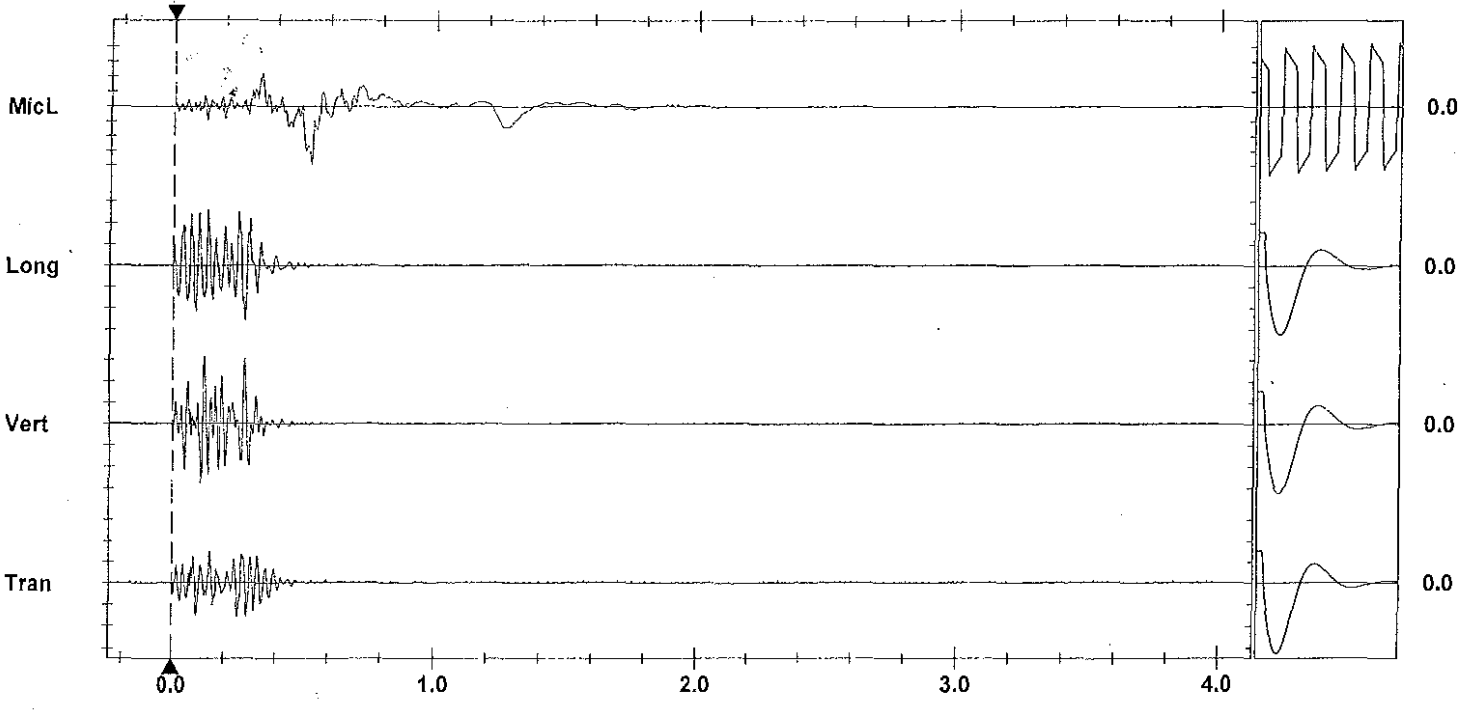
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00395 psi(L) at 0.528 sec
ZC Freq	7.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 689 mv)

	Tran	Vert	Long	
PPV	0.160	0.315	0.260	in/s
ZC Freq	34	37	34	Hz
Time (Rel. to Trig)	0.290	0.125	0.138	sec
Peak Acceleration	0.133	0.186	0.212	g
Peak Displacement	0.00085	0.00151	0.00170	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.396 in/s at 0.278 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: January 14 2013 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 4/12
ACTUAL BLAST DATE Jan. 4/12
BLAST # 148

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+45 - 127+50 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 210 (m)

TOTAL NUMBER OF HOLES 9 B/L / 21 production
HOLE DIAMETER ~~102~~ (mm) 89
HOLE SPACING ~~3~~ 2.5 (m) BURDEN ~~3~~ 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL ~~HORIZ.~~ VARIABLE
~~* Every 3rd B/L Hole Loaded with 300 grain Detacord~~

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 30
TOTAL NUMBER OF DELAYS 21

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 525 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

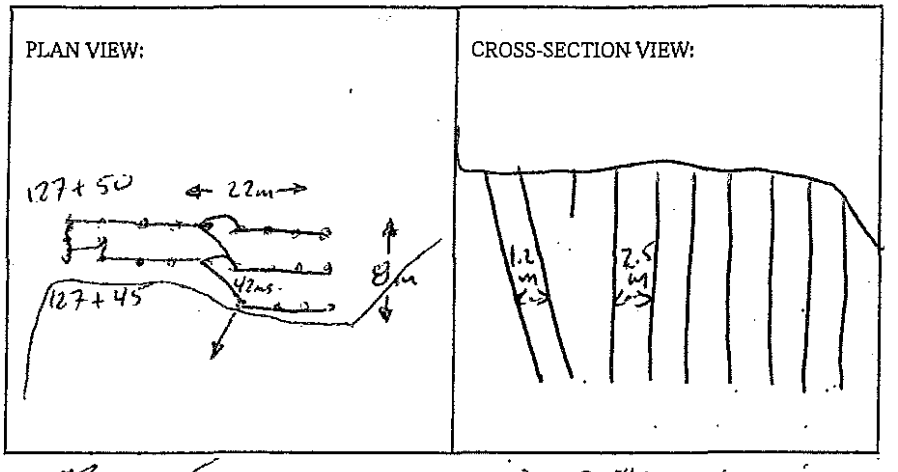
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 1240 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

9 - 12' ms dets.
2 - 24' Ez dets.
19 - 30' Ez dets.
2 - 42ms
3 - 17ms } connectadet
1 - Elec dets

10 Bags Anfo
5 Bags wet.
1 - 1½ x 16
4 - 3" x 16"
1 - 2½ x 16"

Instantel

Event Report

Date/Time	Vert at 12:02:30 January 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3FL.G60

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

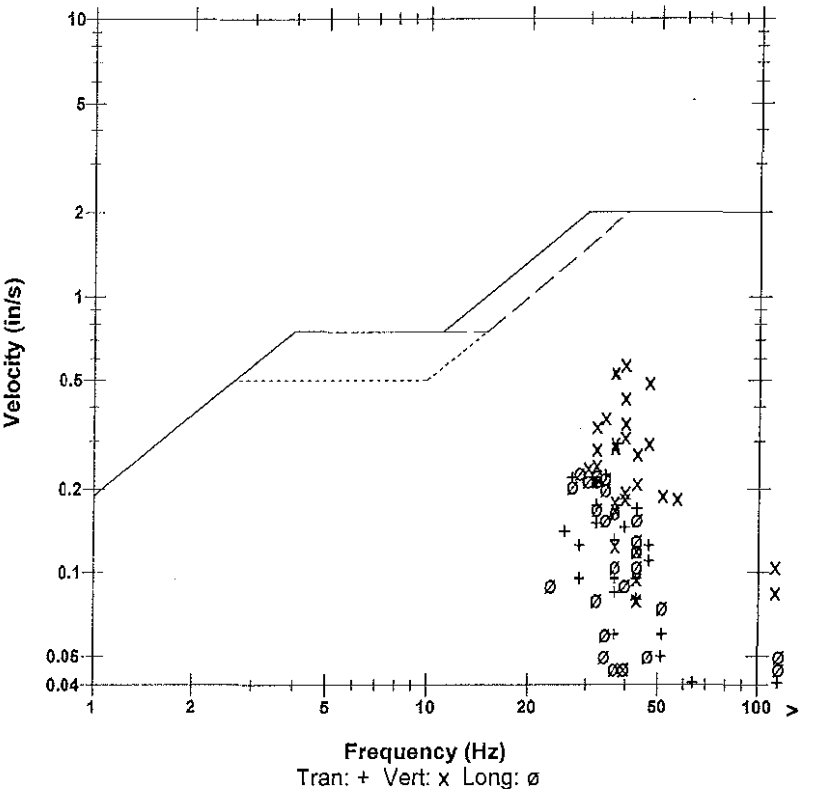
Post Event Notes

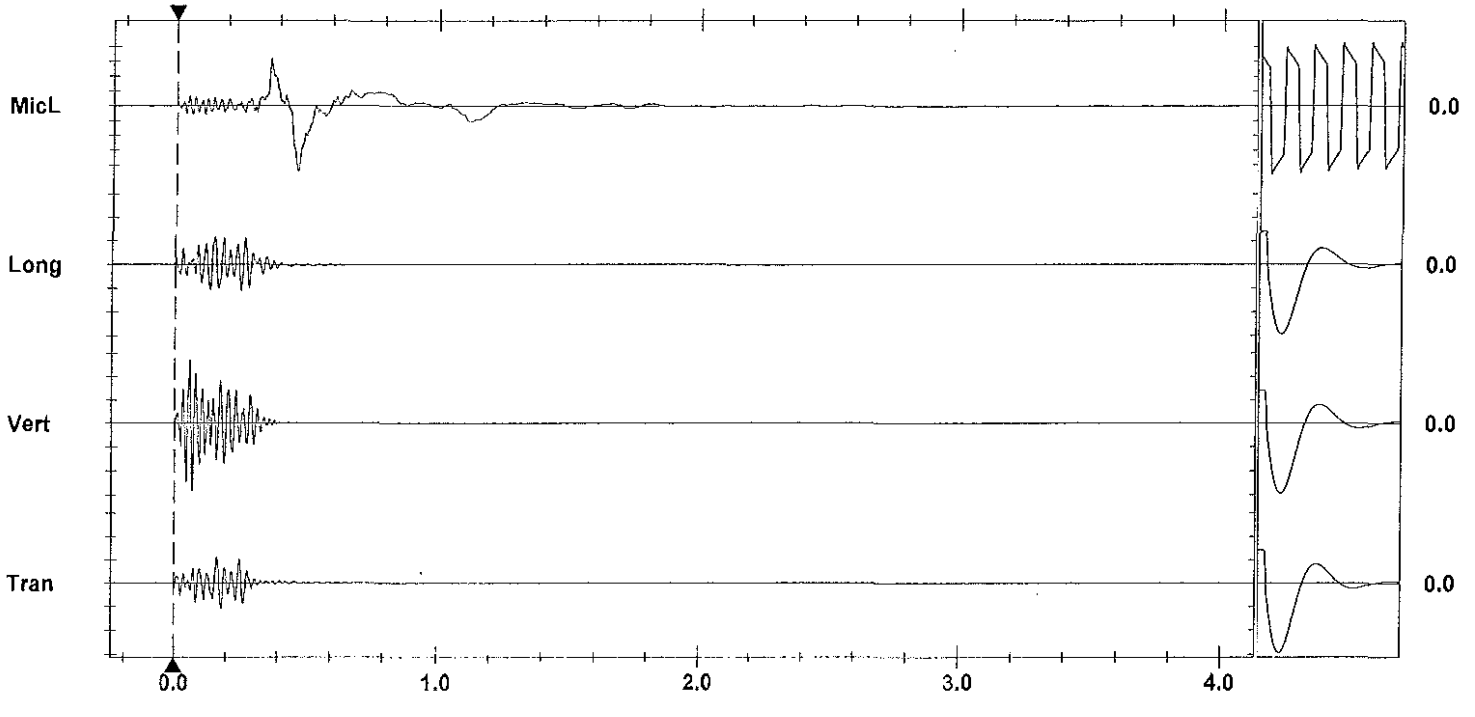
Microphone Linear Weighting
PSPL 0.00442 psi(L) at 0.469 sec
ZC Freq 3.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 663 mv)

	Tran	Vert	Long	
PPV	0.225	0.570	0.230	in/s
ZC Freq	34	39	28	Hz
Time (Rel. to Trig)	0.185	0.070	0.154	sec
Peak Acceleration	0.133	0.384	0.146	g
Peak Displacement	0.00119	0.00208	0.00142	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.572 in/s at 0.070 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

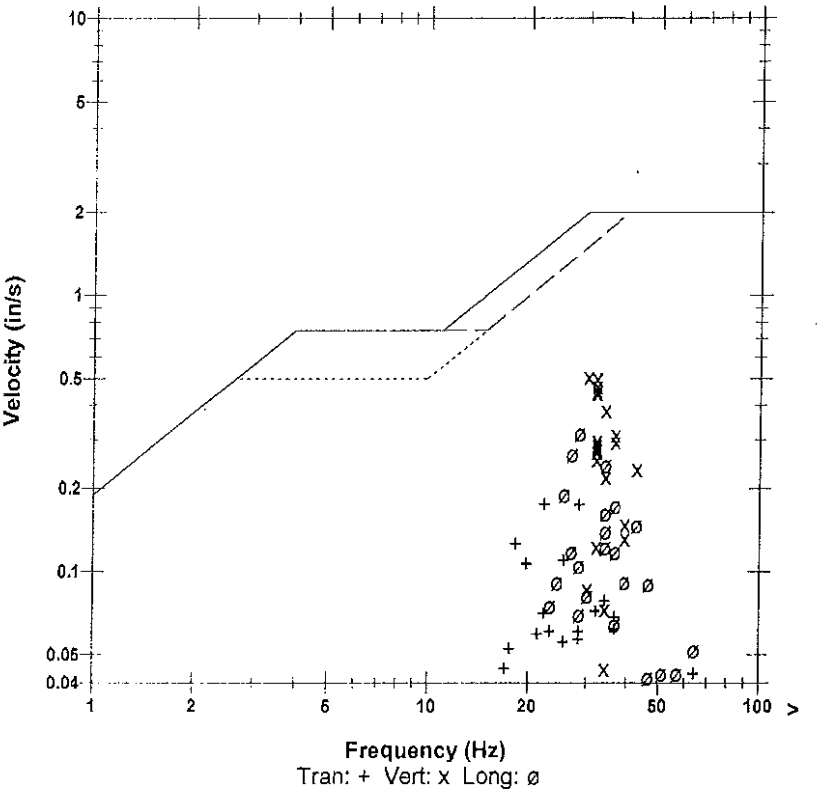
Date/Time	Vert at 12:02:45 January 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3FL.GL0
Job Number:	1		

Notes
location:on slab main entrance north
13050 Old Mission Rd
User Name:W Verwey
General:

Extended Notes

Post Event Notes

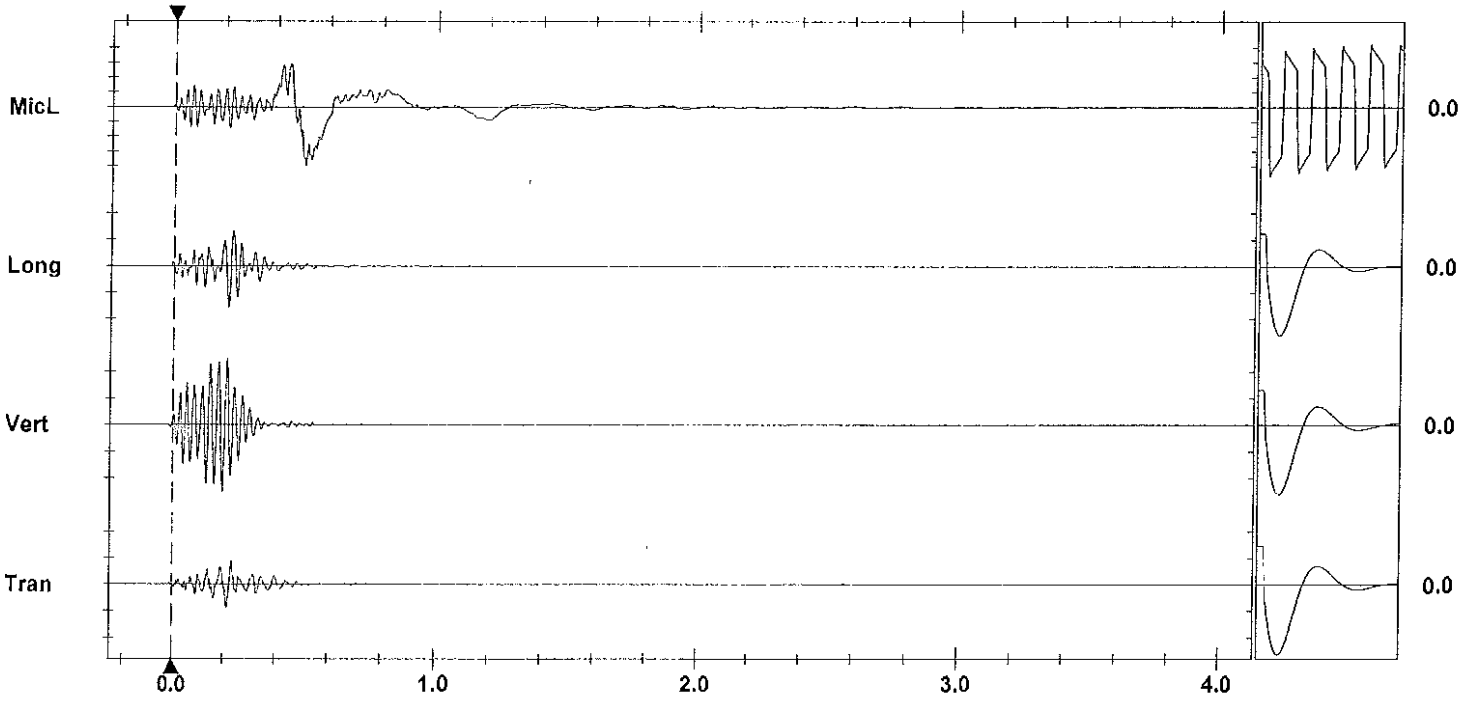
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00399 psi(L) at 0.506 sec		
ZC Freq	3.5 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)		

	Tran	Vert	Long	
PPV	0.176	0.507	0.316	in/s
ZC Freq	22	30	28	Hz
Time (Rel. to Trig)	0.215	0.196	0.215	sec
Peak Acceleration	0.0812	0.275	0.176	g
Peak Displacement	0.00105	0.00248	0.00168	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.598 in/s at 0.213 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 4/12
ACTUAL BLAST DATE JAN 4/12
BLAST # 149

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+50 - 127+55 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 189 (m)

TOTAL NUMBER OF HOLES 9 B/L / 18 production
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.5 (m) BURDEN 2.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 500 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

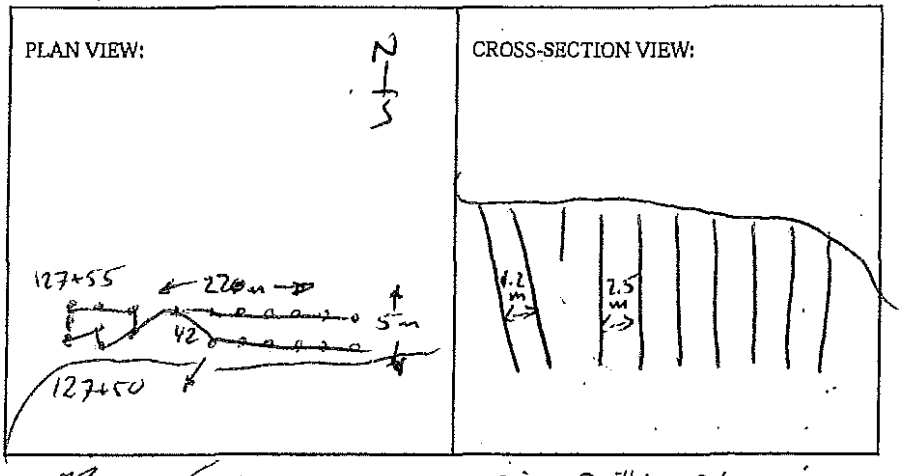
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 780 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

9 – 12' ms del
1 – 24' Ez del
17 – 30' Ez del.

1 – 42 ms connectadel
2 – 17 ms connectadel.
1 – Elec del

1 – 2½ x 16
1 – 2" x 16
1 – 1½ x 16
3 – 3" x 16

12 – Anfo
3 – WR.

Instantel

Event Report

Date/Time	Long at 15:02:32 January 4, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3FT.S80
Job Number:	1		

Notes
location:on slab main entrance north
13050 Old Mission Rd
User Name:W Verwey
General:

Extended Notes

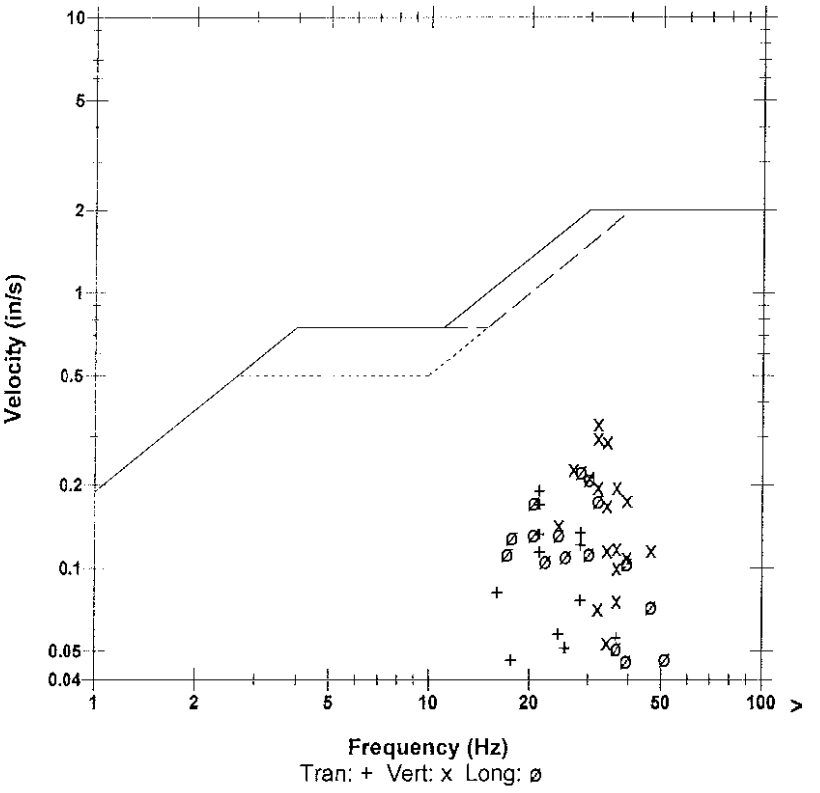
Post Event Notes

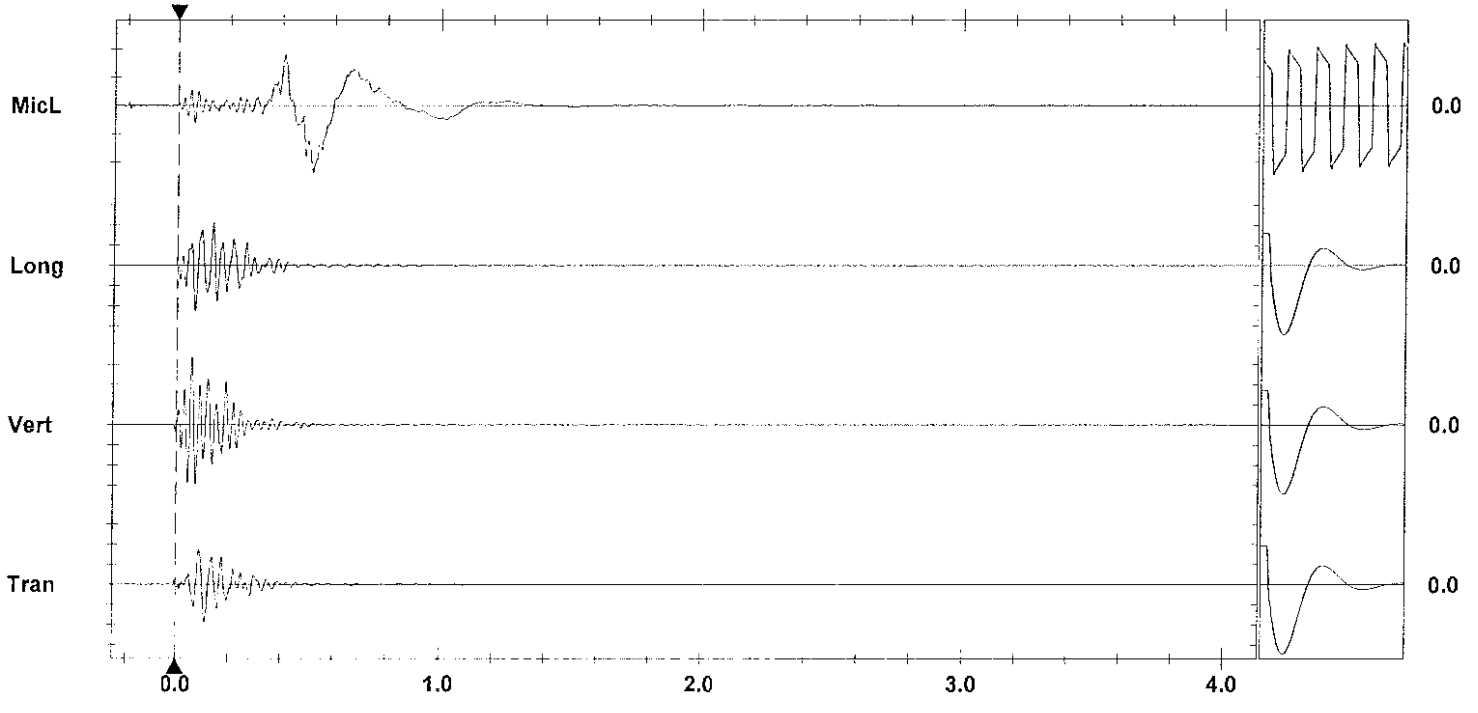
Microphone Linear Weighting
PSPL 0.00475 psi(L) at 0.516 sec
ZC Freq 3.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 683 mv)

	Tran	Vert	Long	
PPV	0.190	0.334	0.224	in/s
ZC Freq	21	32	28	Hz
Time (Rel. to Trig)	0.111	0.059	0.069	sec
Peak Acceleration	0.0795	0.184	0.118	g
Peak Displacement	0.00131	0.00170	0.00141	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.347 in/s at 0.059 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div Sensorcheck
Trigger = ▶ ◀

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Instantel

Event Report

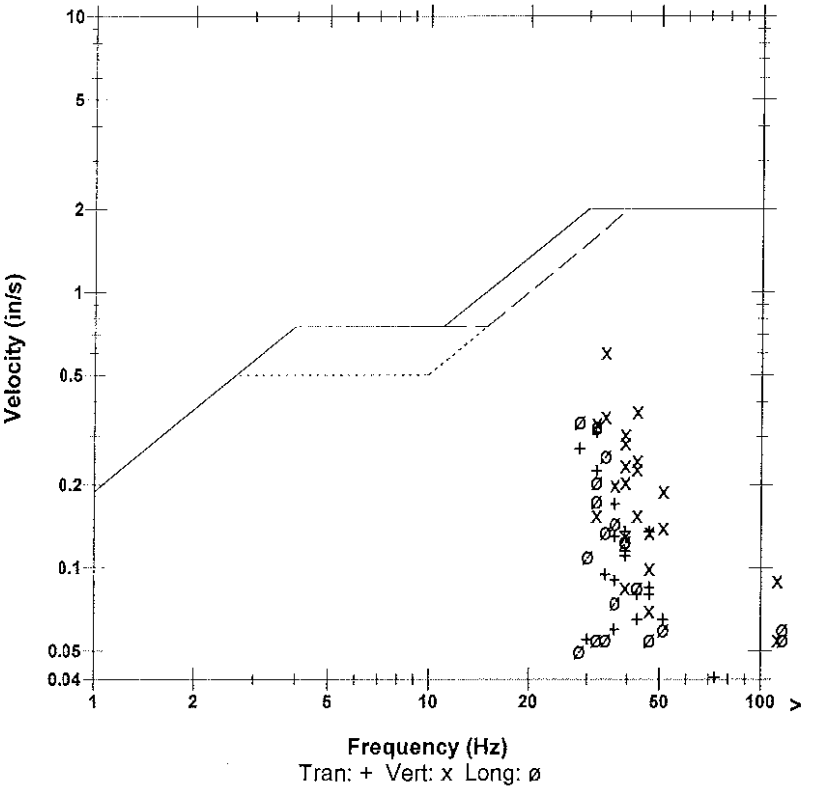
Date/Time	Vert at 15:02:17 January 4, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3FT.RT0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

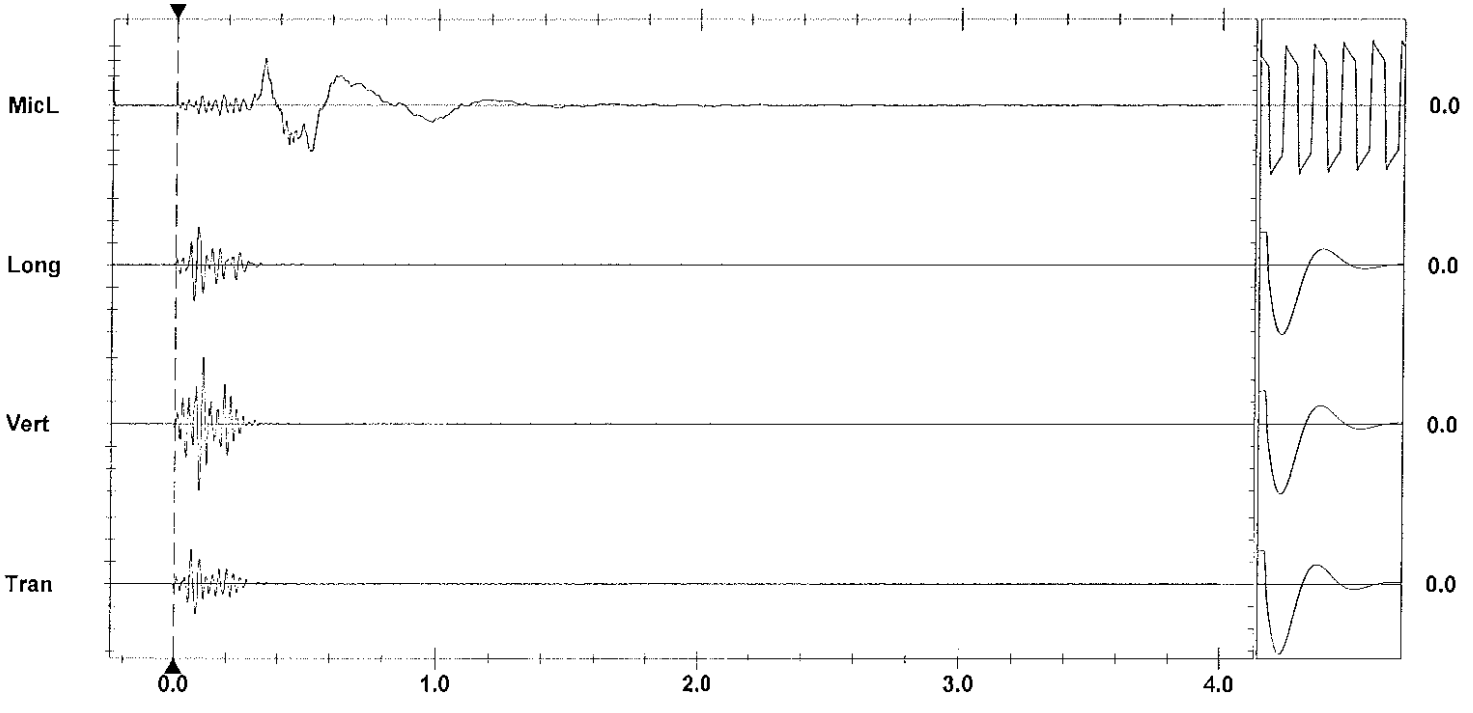
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00315 psi(L) at 0.343 sec
ZC Freq	5.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 658 mv)

	Tran	Vert	Long	
PPV	0.310	0.605	0.340	in/s
ZC Freq	32	34	28	Hz
Time (Rel. to Trig)	0.066	0.096	0.089	sec
Peak Acceleration	0.172	0.384	0.172	g
Peak Displacement	0.00154	0.00282	0.00199	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.659 in/s at 0.095 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶---------◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 5/12
ACTUAL BLAST DATE JAN 5/12 10:45 AM
BLAST # MW-0067

HIGHWAY# 97
BLAST LOCATION AT: 1284.55 - 1284.60 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: of shot marked

HEIGHT ABOVE HWY N/A (m) . SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 6.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 8 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

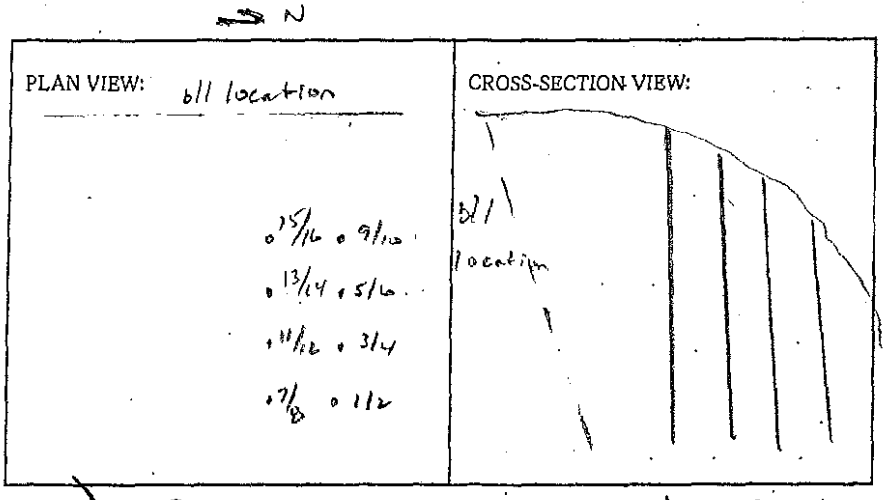
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone ent - 0.044 ips / 21Hz
@ 13073 cliffstone ent - 0.39 ips / 47Hz

Bottom Decks — 4' angle
Top Decks — 1.5' angle
} Primed w/ 1 each 1½" x 16" Dynamites

Instantel

Event Report

Date/Time	Long at 10:45:00 January 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3HC.J00

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

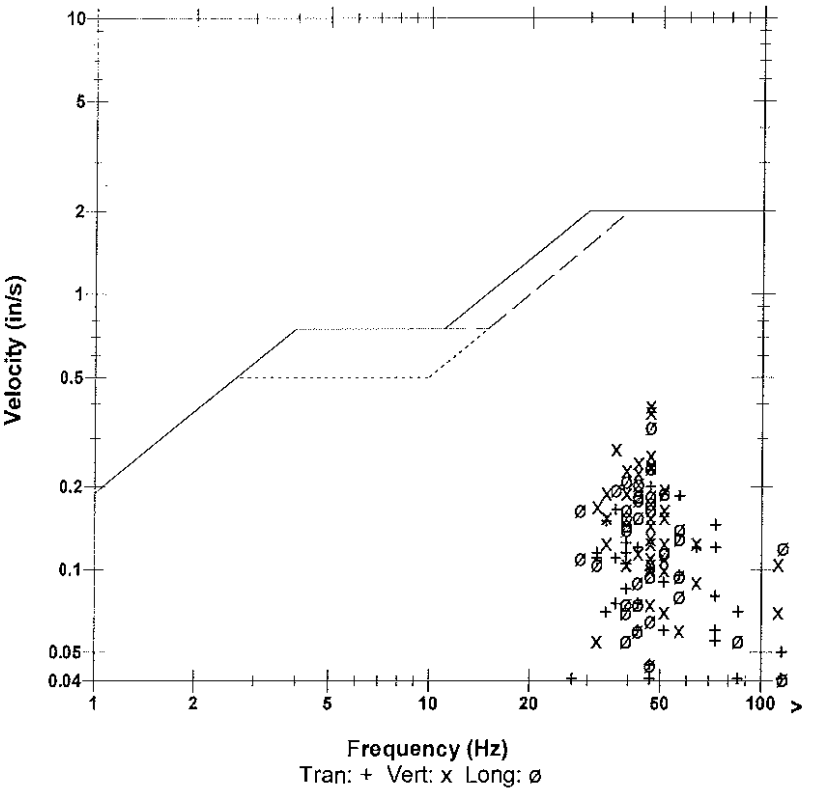
Post Event Notes

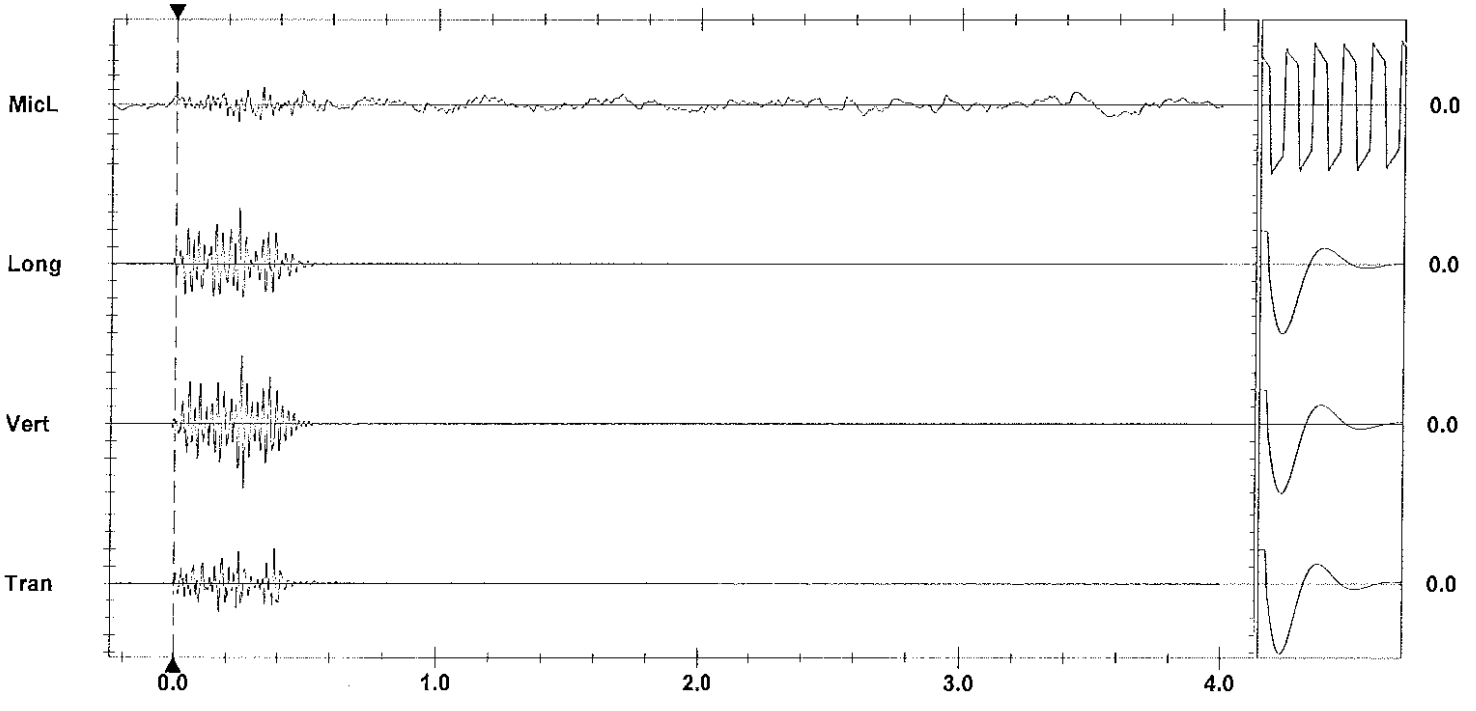
Microphone Linear Weighting
PSPL 0.00120 psi(L) at 0.335 sec
ZC Freq 47 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 670 mv)

	Tran	Vert	Long	
PPV	0.200	0.395	0.330	in/s
ZC Freq	47	47	47	Hz
Time (Rel. to Trig)	0.388	0.255	0.244	sec
Peak Acceleration	0.172	0.358	0.305	g
Peak Displacement	0.00065	0.00136	0.00103	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.5	3.7	4.3	

Peak Vector Sum 0.436 in/s at 0.256 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

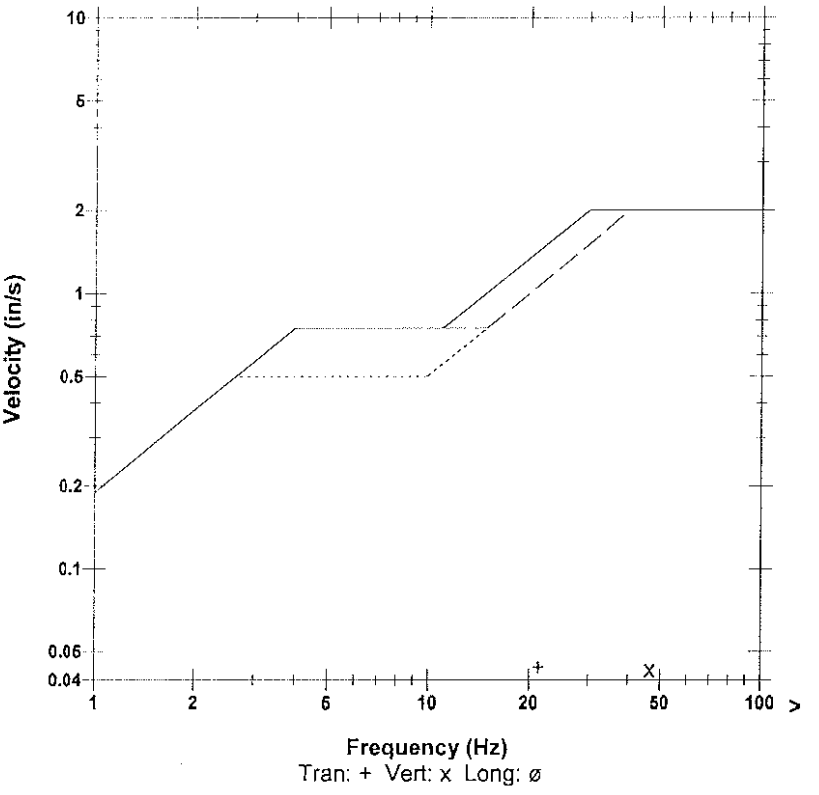
Date/Time	Tran at 10:45:16 January 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3HC.JG0
Job Number:	1		

Notes
location:on slab rear patio se
13167 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

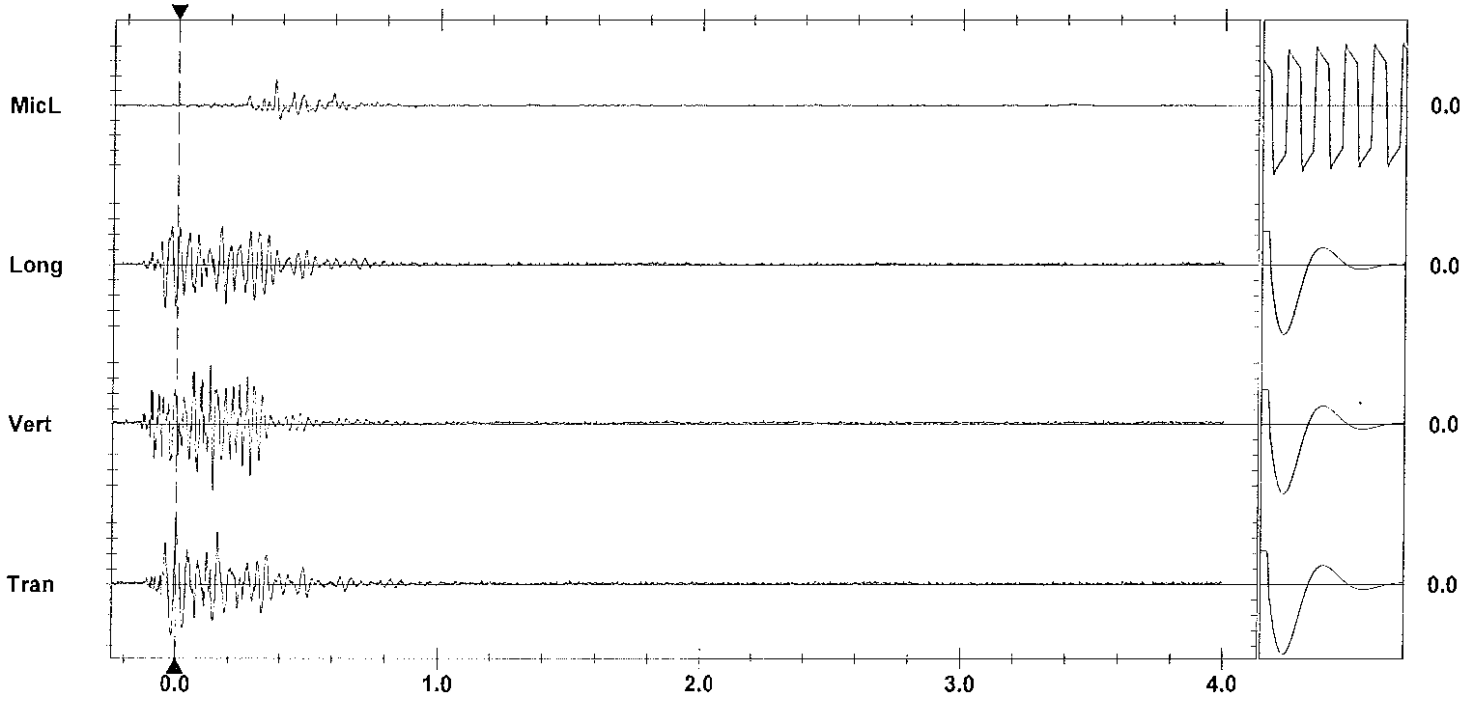
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00170 psi(L) at 0.374 sec
ZC Freq	30 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 682 mv)

	Tran	Vert	Long	
PPV	0.0437	0.0431	0.0281	in/s
ZC Freq	21	47	34	Hz
Time (Rel. to Trig)	0.001	0.140	-0.047	sec
Peak Acceleration	0.0199	0.0431	0.0215	g
Peak Displacement	0.00027	0.00016	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0486 in/s at 0.140 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 5/12
ACTUAL BLAST DATE Jan 5/12 12:33PM
BLAST # MW-0068

HIGHWAY# 97
BLAST LOCATION AT: SHP 128+50-128+55 Eastbound

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 30 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 37 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

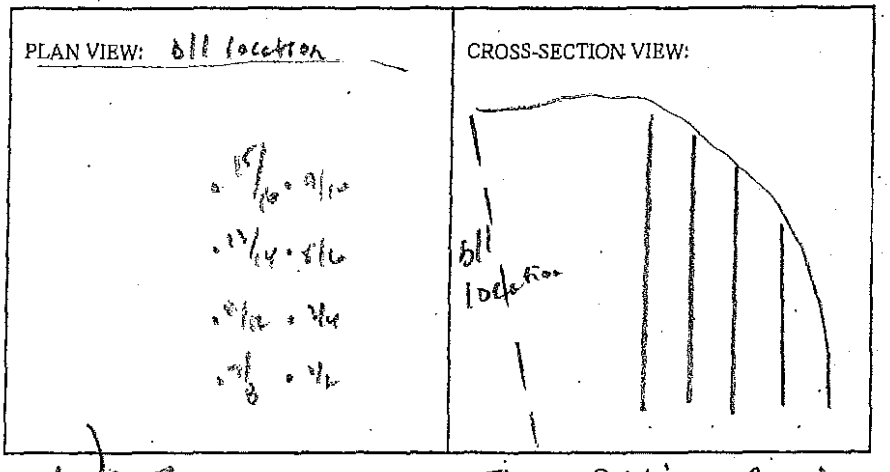
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1715 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: Bll location



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.042 ips/23Hz
@ 13073 Cliffstone Ct - 0.30 ips/43Hz

Bottom Holes - 4' ANFO
Top Holes - 1.5' ANFO
} Primed w/ 1 each 1½ x 16" DYNAMITE

Instantel

Event Report

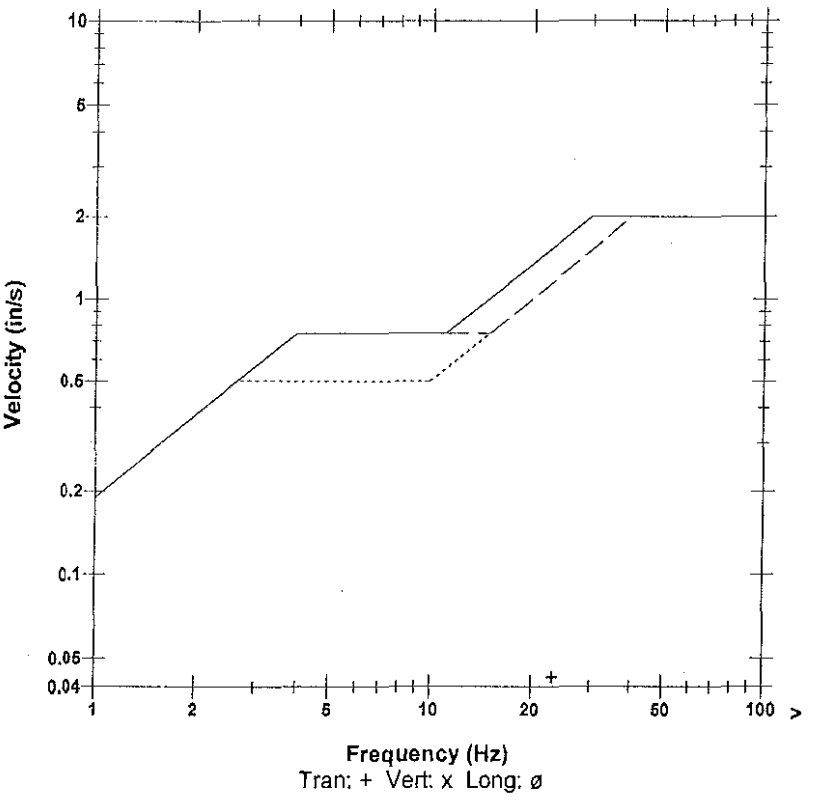
Date/Time	Tran at 12:33:35 January 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3HH.JZ0
Job Number:	1		

Notes
location:on slab rear patio se
13167 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

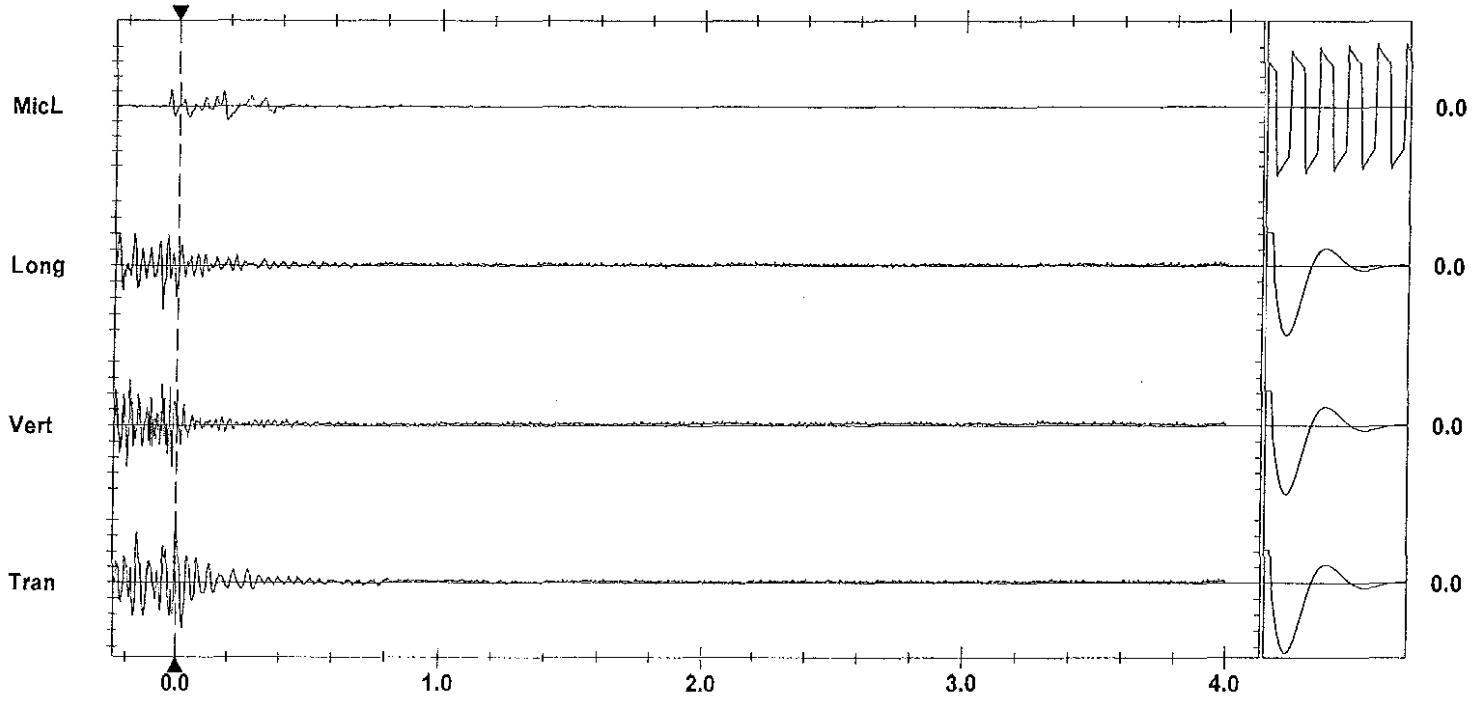
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at -0.034 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 670 mv)

	Tran	Vert	Long	
PPV	0.0425	0.0281	0.0275	in/s
ZC Freq	23	39	27	Hz
Time (Rel. to Trig)	0.002	-0.186	-0.062	sec
Peak Acceleration	0.0182	0.0331	0.0215	g
Peak Displacement	0.00025	0.00010	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.7	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.0436 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶---

Printed: January 14, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

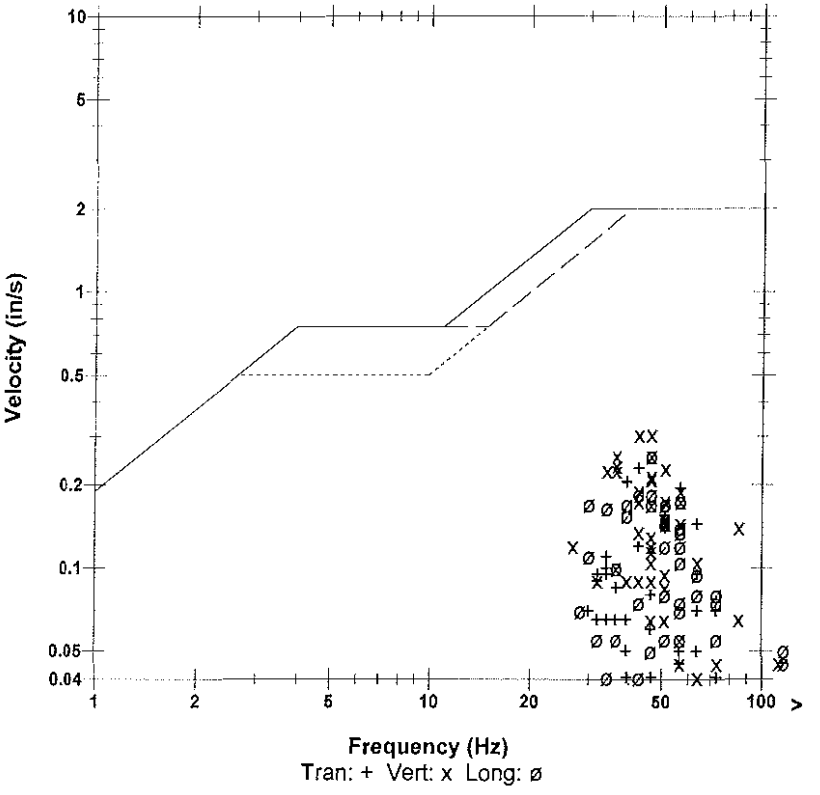
Date/Time	Long at 12:33:19 January 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3HH.JJ0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

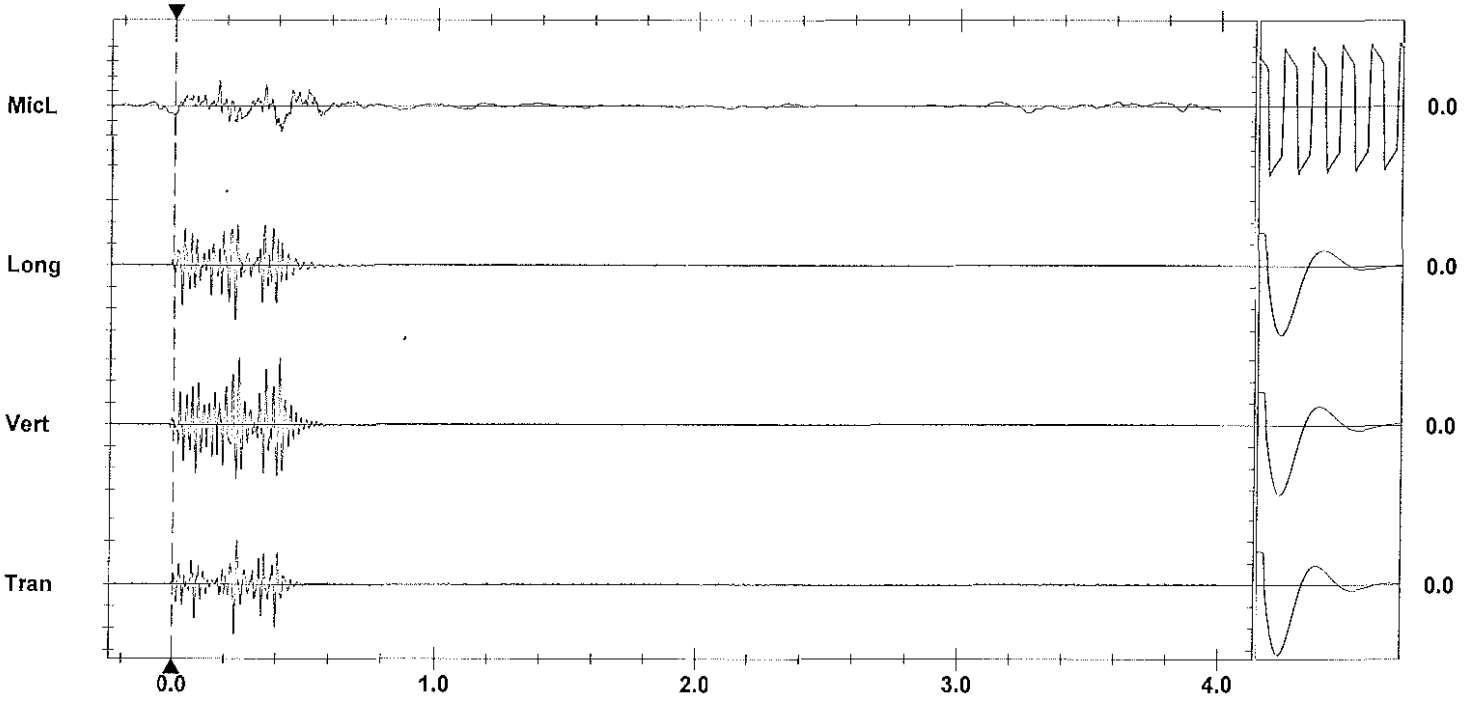
USBM RI8507 And OSMRE



	Tran	**Vert**	**Long**	
PPV	0.230	0.305	0.255	in/s
ZC Freq	43	43	47	Hz
Time (Rel. to Trig)	0.240	0.253	0.235	sec
Peak Acceleration	0.212	0.252	0.225	g
Peak Displacement	0.00072	0.00111	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.5	

Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.171 sec
ZC Freq 26 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 614 mv)

Peak Vector Sum 0.321 in/s at 0.253 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 5/12
ACTUAL BLAST DATE Jan 5/12 2:21 PM
BLAST # MW-0069

HIGHWAY# 97
BLAST LOCATION AT: 84+N 128+50 - 128+60 LS (TOP Bottom)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot metted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.0 (m)
TOTAL DEPTH 14.6 (m)

TOTAL NUMBER OF HOLES 12 / 11 / 5 bottom / 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 19

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

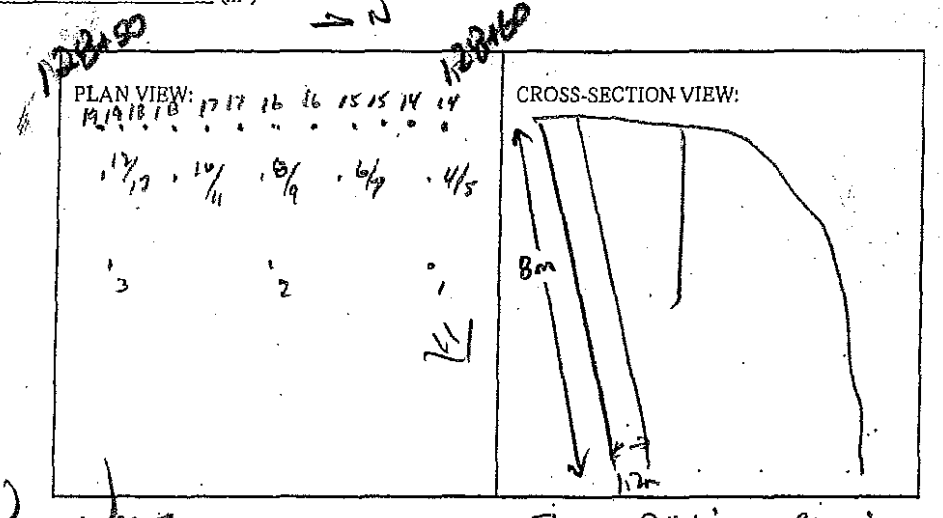
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 415320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 eli Offshore Cert. - 0.043 ips / 37Hz
@ 13273 eli Offshore Cert. - 0.316 ips / 47Hz

STAB HOLES - 1.5' - 2' APART/HOLE

BUFFER HOLES - BOTTOM DECKS - 3-4 CAPS 2½" BLASTEX

TOP DECKS - 1-2 CAPS 2½" BLASTEX

ALL ABOVE PRIMED W/ 1 CAP 1½" x 16' DYNAMITE

B/L HOLES - 1 CAP 2½" DYNAMITE + 2LBS QP. SHOT DOWN TO 4' COLLAR

Instantel

Event Report

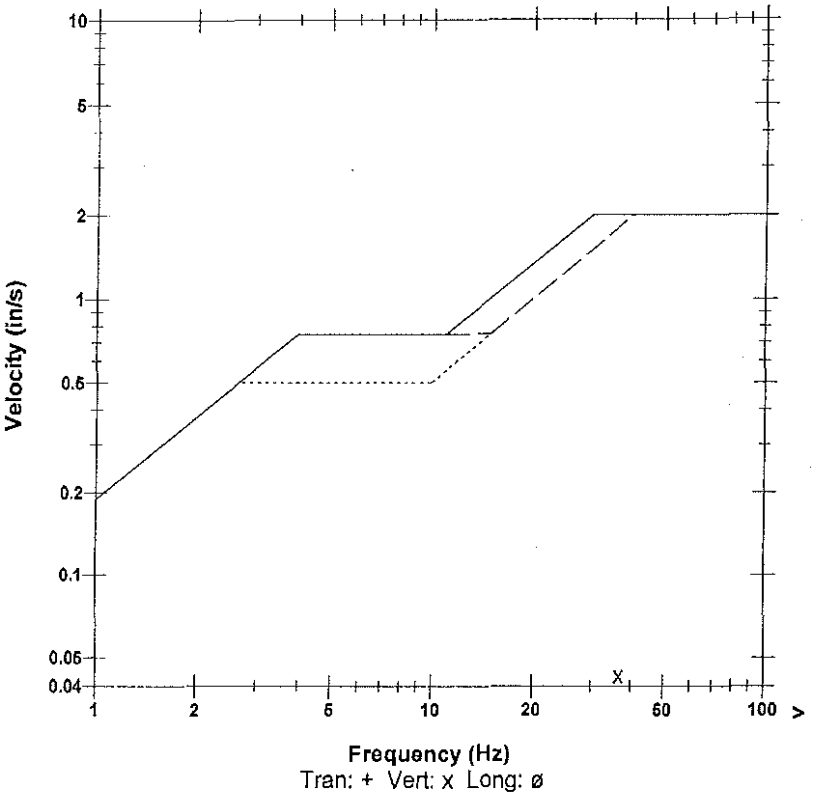
Date/Time	Vert at 14:20:57 January 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3HM.IX0
Job Number:	1		

Notes
location:on slab rear patio se
13167 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

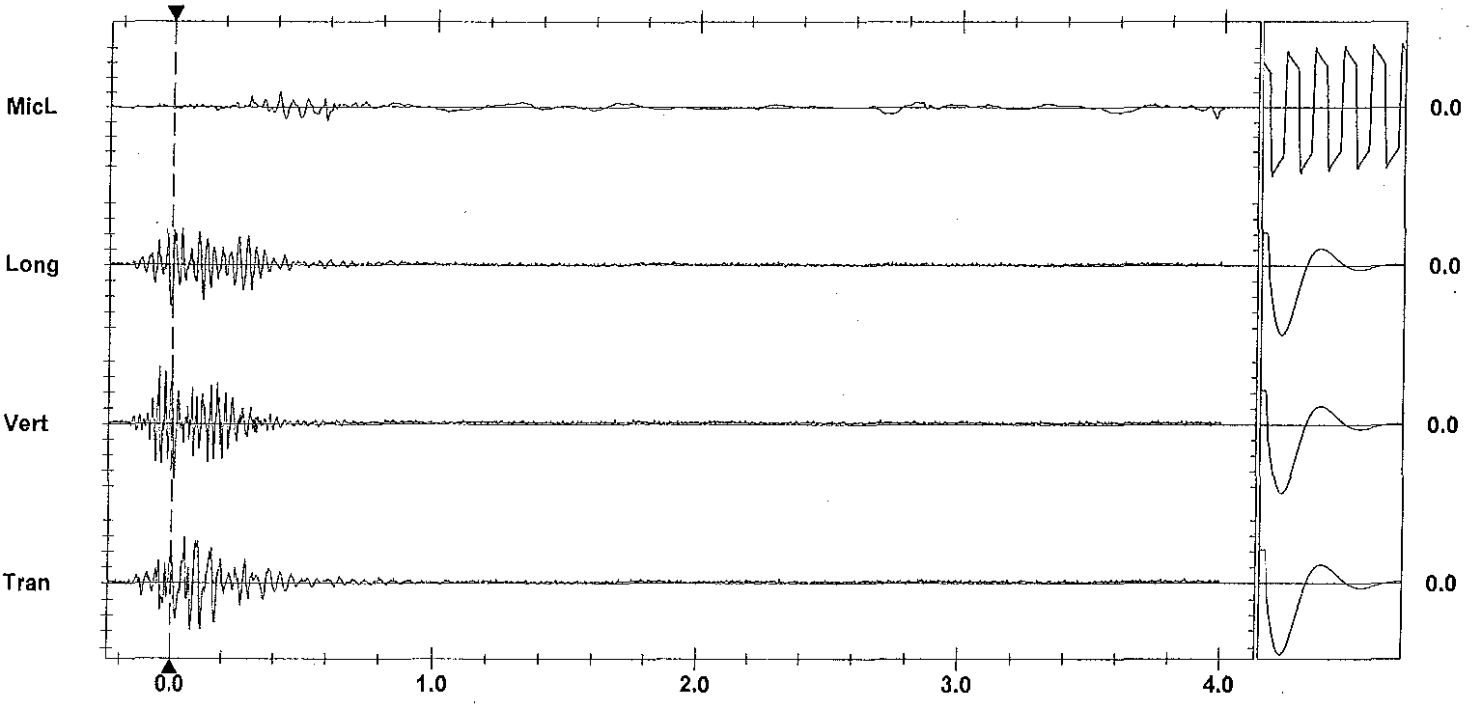


Frequency (Hz)
Tran: + Vert: x Long: ø

Microphone	Linear Weighting			
PSPL	0.00105 psi(L) at 0.409 sec			
ZC Freq	22 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 661 mv)			

	Tran	Vert	Long	
PPV	0.0294	0.0431	0.0262	in/s
ZC Freq	24	37	30	Hz
Time (Rel. to Trig)	0.053	0.001	-0.008	sec
Peak Acceleration	0.0215	0.0447	0.0215	g
Peak Displacement	0.00022	0.00017	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.7	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.0482 in/s at 0.001 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶—— — —◀

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Instantel

Event Report

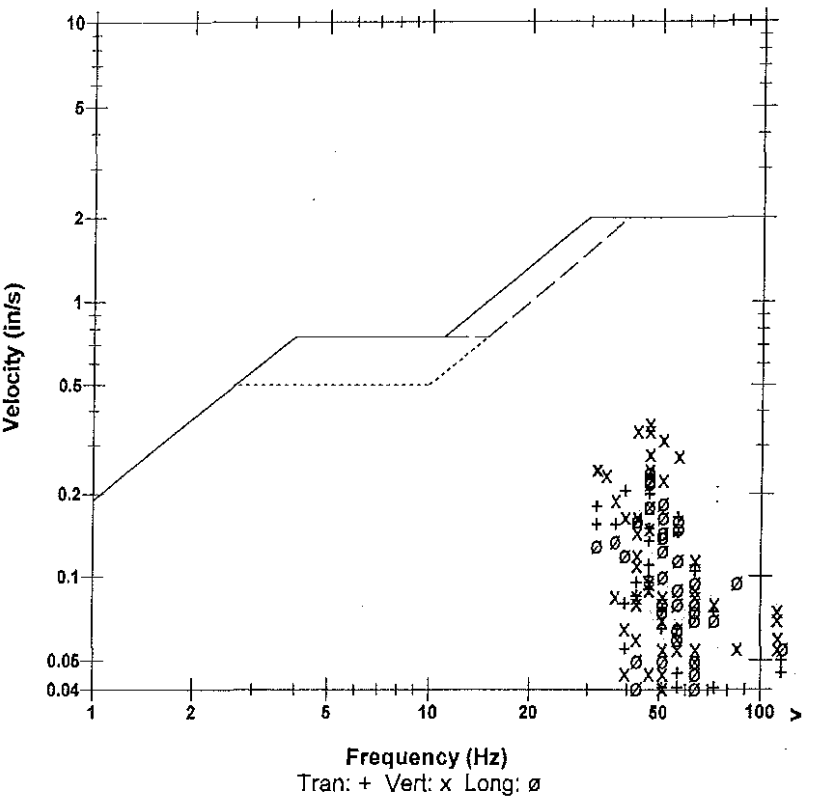
Date/Time	Long at 14:20:41 January 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3HM.IH0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

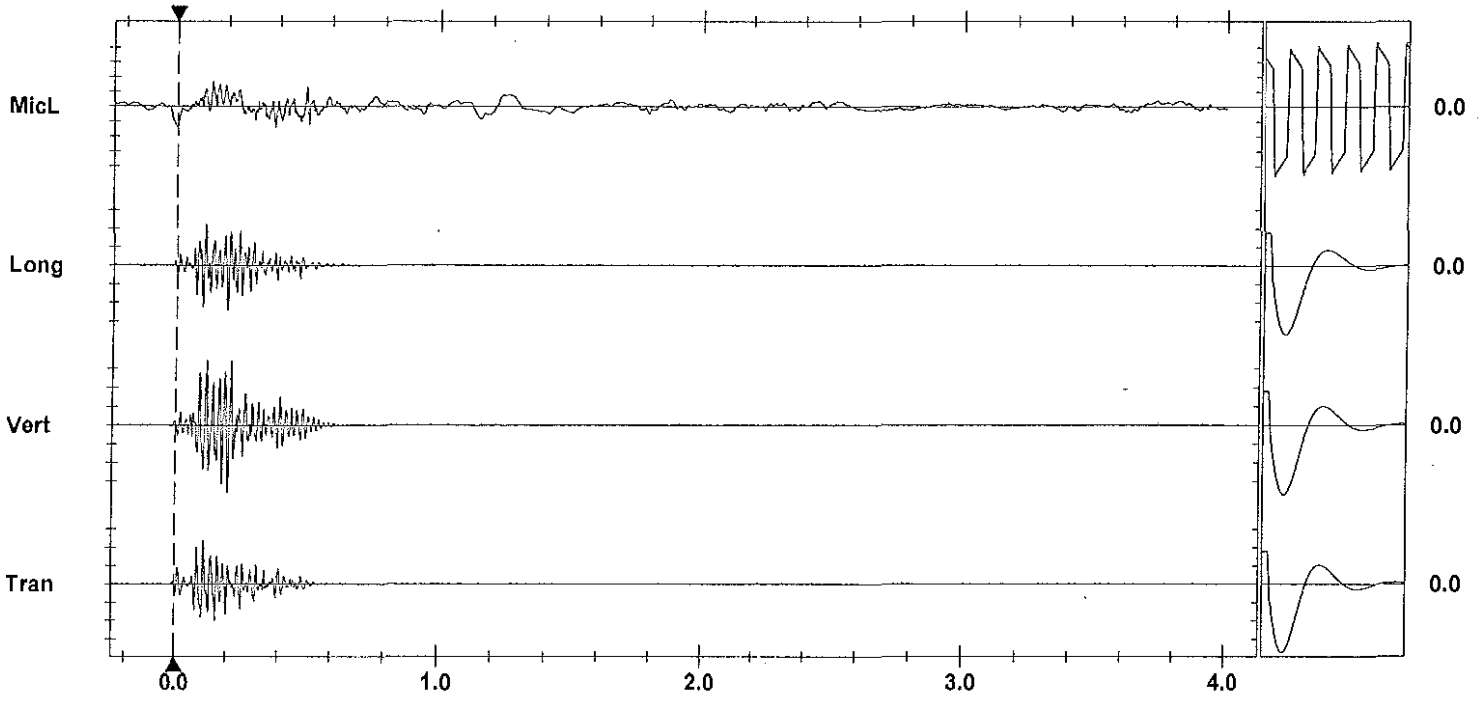
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00163 psi(L) at 0.139 sec			
ZC Freq	23 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 640 mv)			

	Tran	Vert	Long	
PPV	0.235	0.360	0.240	in/s
ZC Freq	47	47	47	Hz
Time (Rel. to Trig)	0.115	0.205	0.197	sec
Peak Acceleration	0.212	0.292	0.265	g
Peak Displacement	0.00081	0.00120	0.00080	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.398 in/s at 0.205 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED JAN 6/12
ACTUAL BLAST DATE JAN 6/12 10:52 AM
BLAST # MW-0070

HIGHWAY# 97
BLAST LOCATION AT: 128+45 - 128+80 (for bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite 60% ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

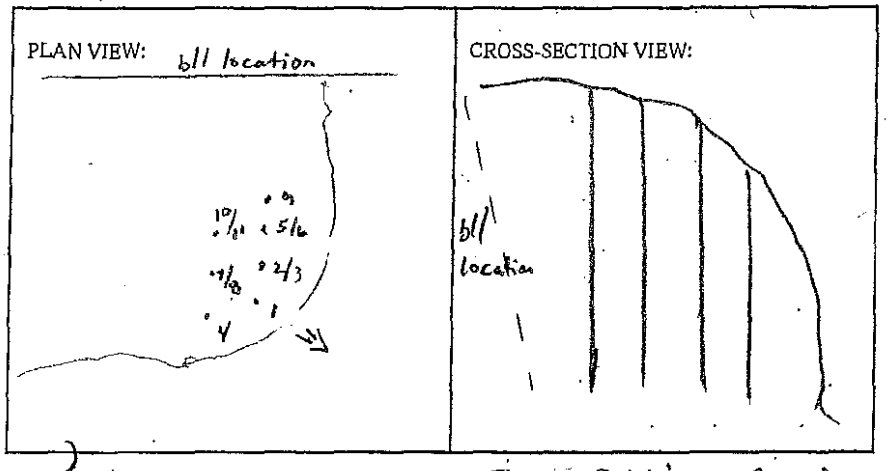
INITIATION DEVICE: (CIRCLE) DET CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 @ Cliffstone Ave. 0.051 ips/ 28 Hz
@ 13078 Cliffstone Ave. 0.491 ips/ 39 Hz

BOTTOM DECKS - 4'-5' ANFO / HOLE

TOP DECKS - 1'-2' ANFO/HOLE

PRIMED W/ 1 CAST 1¼"x16" DYNAMITE

Instantel

Event Report

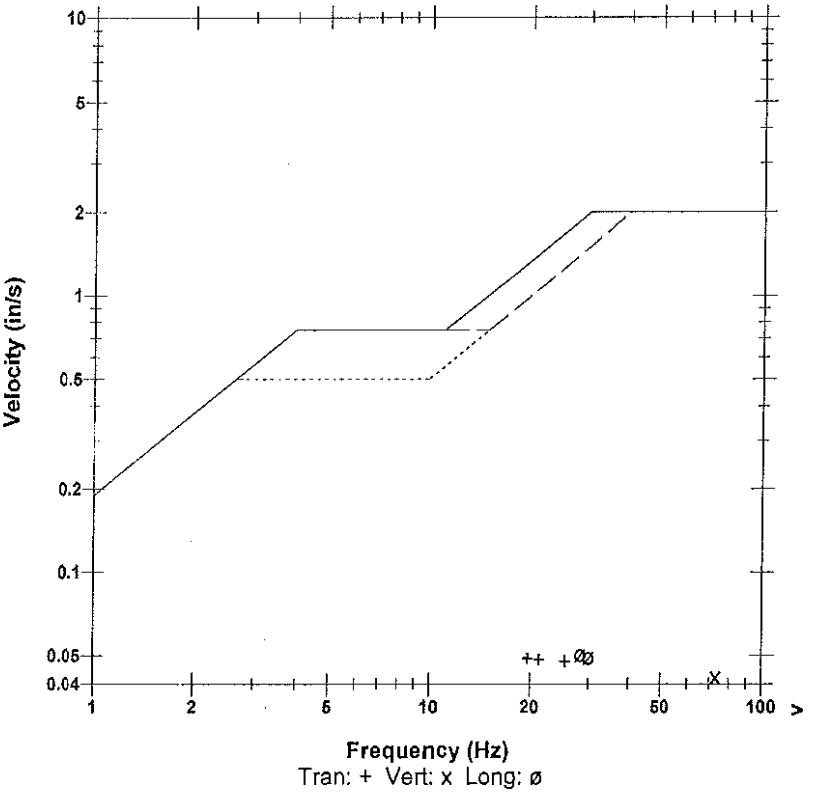
Date/Time	Vert at 10:52:42 January 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3J7.JU0
Job Number:	1		

Notes
location:on slab rear patio se
13167 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

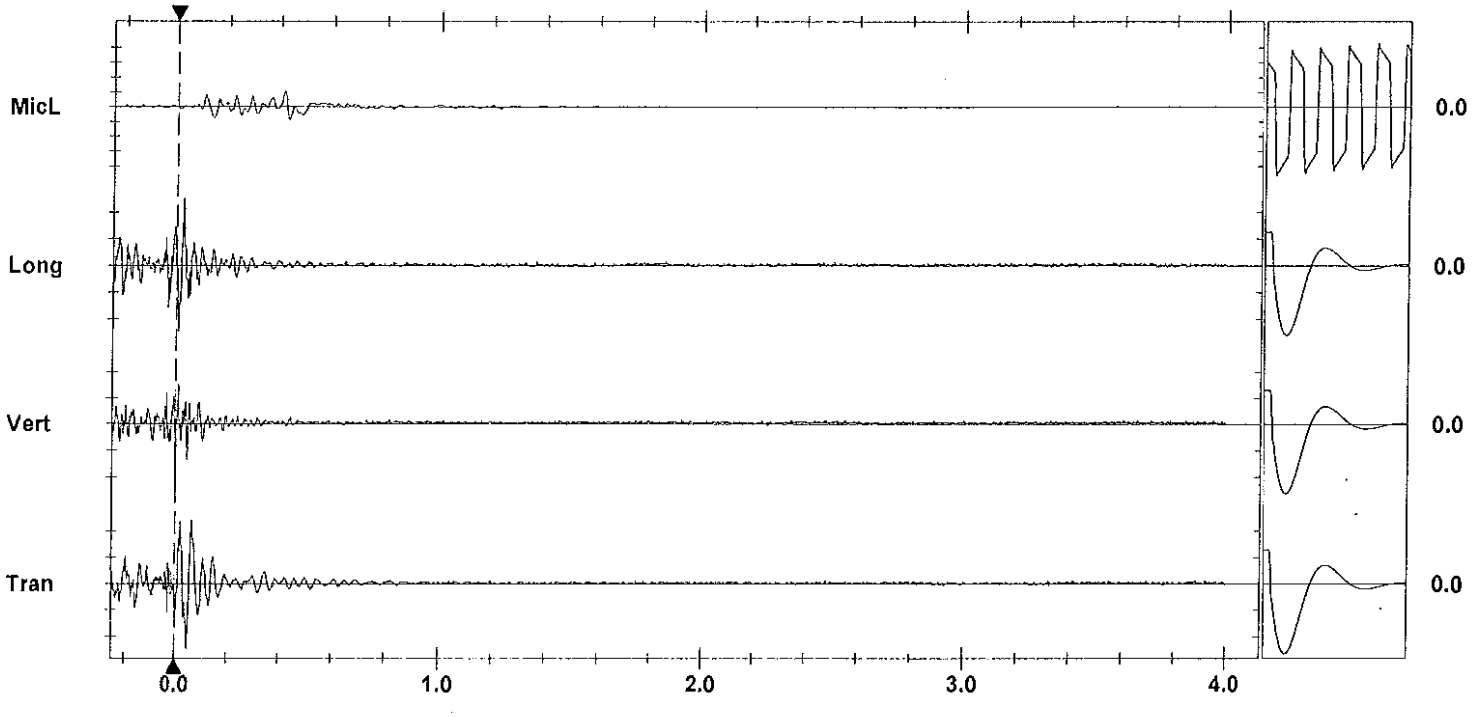
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00105 psi(L) at 0.412 sec		
ZC Freq	18 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 713 mv)		

	Tran	Vert	Long	
PPV	0.0487	0.0419	0.0506	in/s
ZC Freq	20	73	28	Hz
Time (Rel. to Trig)	0.048	0.000	0.027	sec
Peak Acceleration	0.0348	0.0431	0.0381	g
Peak Displacement	0.00034	0.00008	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0585 in/s at 0.026 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

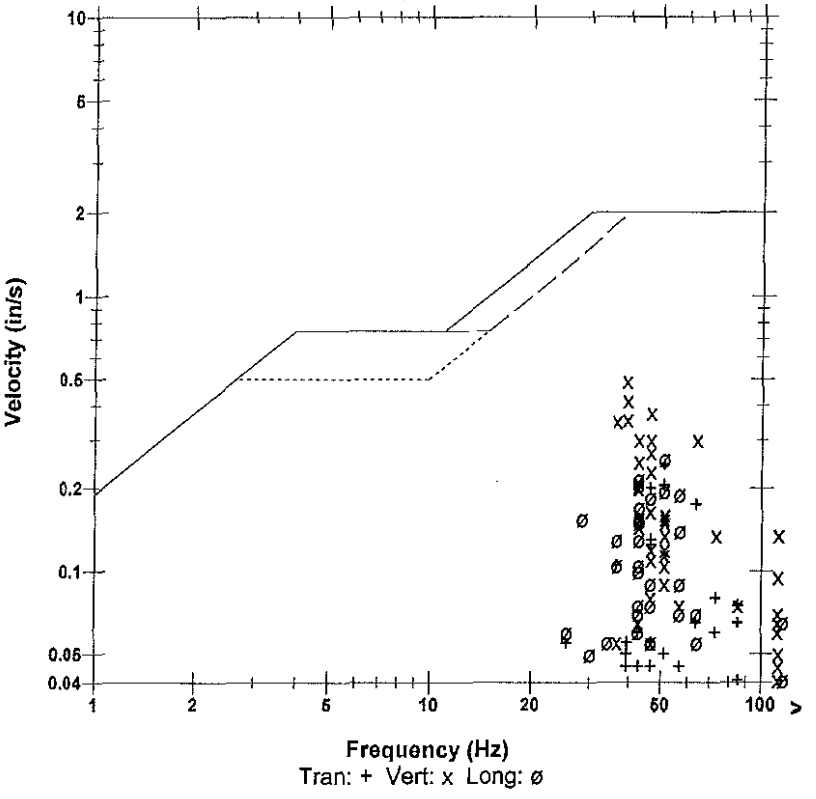
Date/Time	Vert at 10:52:24 January 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3J7.JC0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

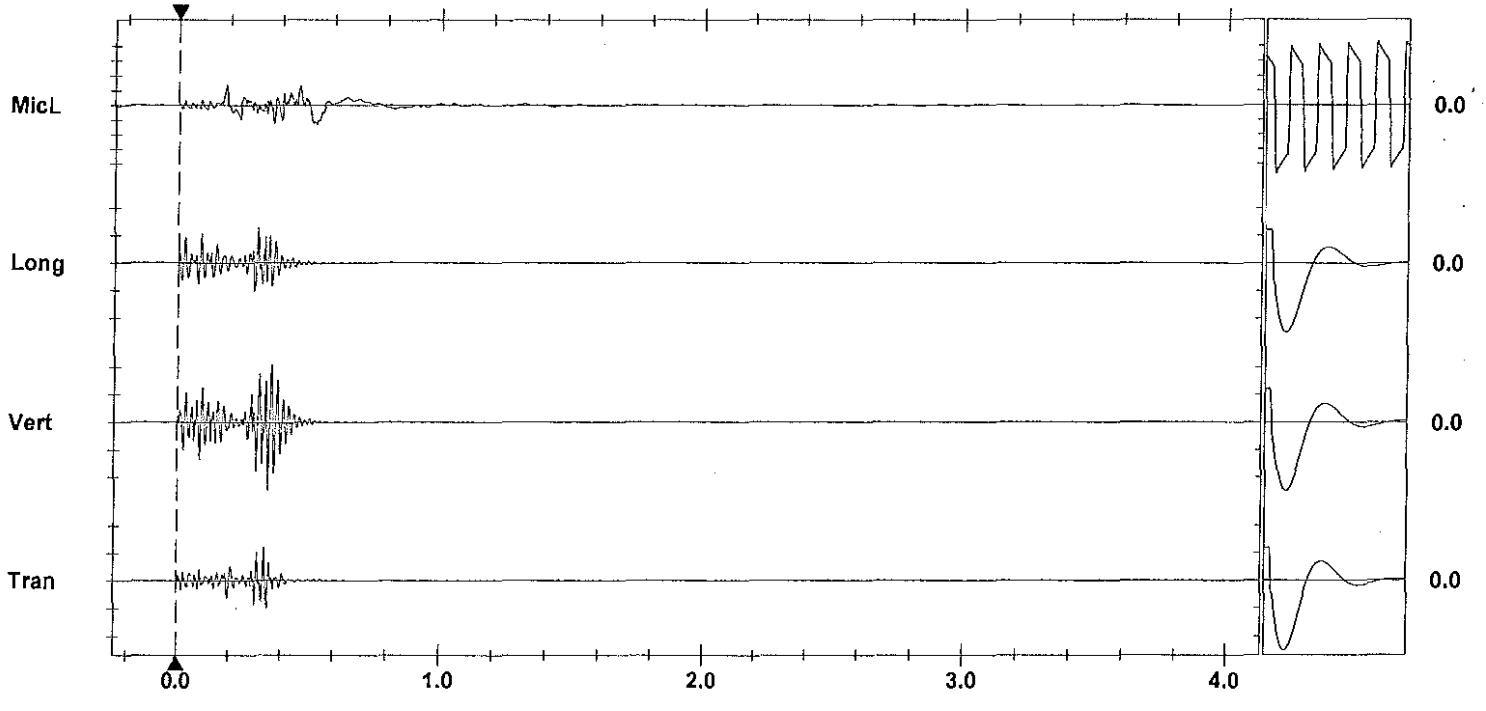
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.185 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 658 mv)

	Tran	Vert	Long	
PPV	0.245	0.490	0.255	in/s
ZC Freq	51	39	51	Hz
Time (Rel. to Trig)	0.339	0.354	0.309	sec
Peak Acceleration	0.199	0.384	0.212	g
Peak Displacement	0.00068	0.00164	0.00080	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.527 in/s at 0.354 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 6/12
ACTUAL BLAST DATE JAN 6/12 11:54 AM
BLAST # MW-0071

HIGHWAY# 97
BLAST LOCATION AT: 128+45 - 128+80 LS (TOP DOWN)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Submitted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 5 611 / 16 Offset / 1 Stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 6

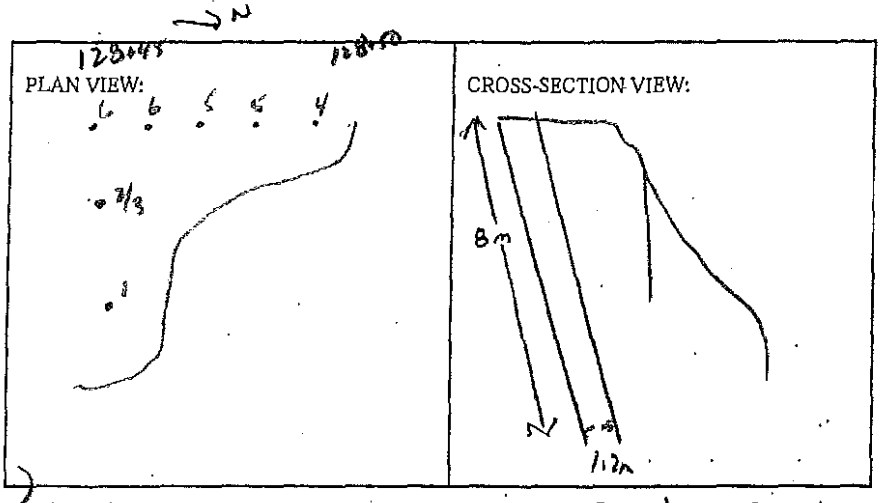
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 140 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Ci smoothwall @ 13167 c/c Perimeter c.t. - NoTrisacon (± 0.04 ips)
@ 13077 c/c Perimeter c.t. - 0.24 ips / 51 Hz

STAB HOLE - 1.5' ANFO

BUFFER HOLES - BOTTOM DECK - 4 CAST 2"x16" BLASTEX

TOP DECK - 3 CAST 2"x16" BLASTEX

B/L HOLES - 1 CAST 2"x16" DYNAMITE + 200 gr. DET. CORD to 4' collar

Instantel

Event Report

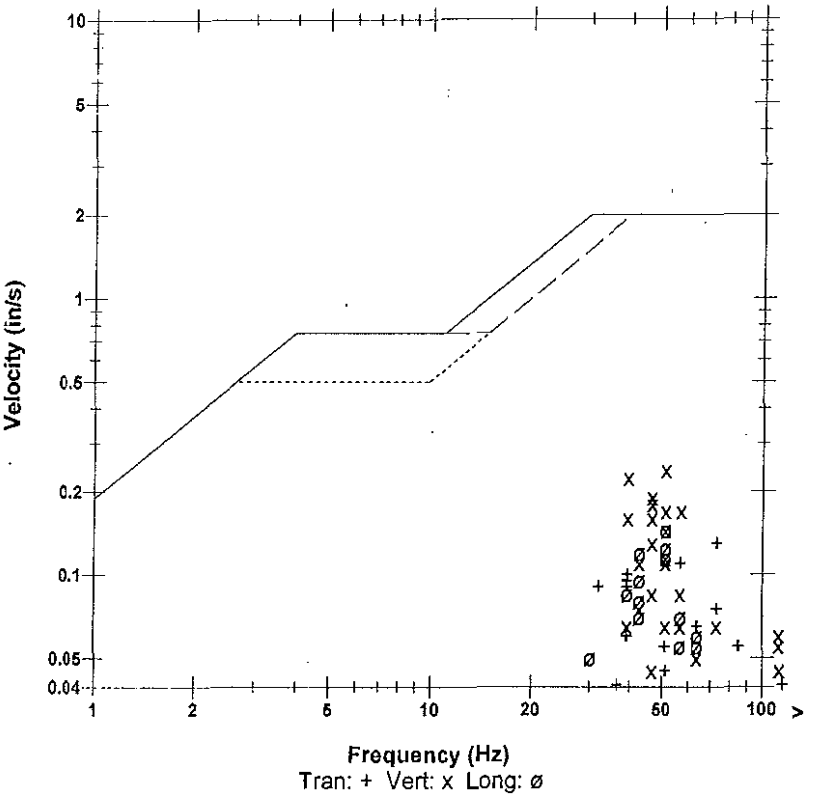
Date/Time	Vert at 11:54:16 January 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3JA.EG0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

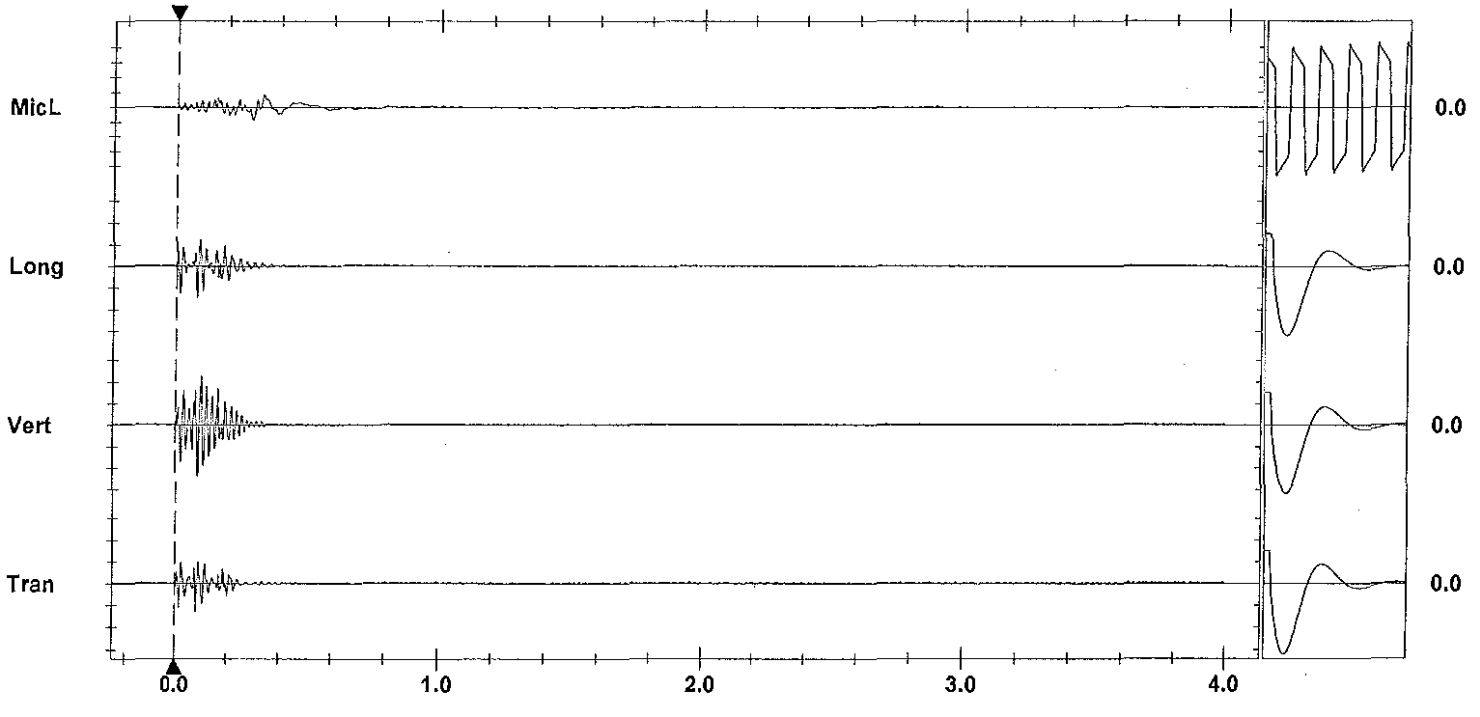
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00083 psi(L) at 0.290 sec			
ZC Freq	12 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 659 mv)			

	Tran	Vert	Long	
PPV	0.130	0.240	0.145	in/s
ZC Freq	73	51	51	Hz
Time (Rel. to Trig)	0.083	0.089	0.080	sec
Peak Acceleration	0.146	0.252	0.133	g
Peak Displacement	0.00033	0.00091	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.276 in/s at 0.090 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6th 1:15PM
BLAST # MW-0072

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+42 - 128+45 (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 4 Prod / 1 Shot
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

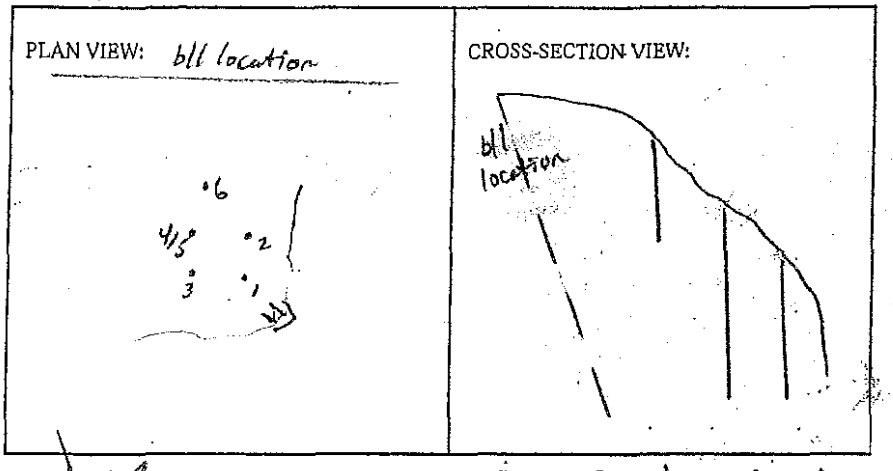
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE H15320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13113 Cliffstone Cres - No trigger (< 0.04 ips)
@ 13073 Cliffstone Cres - 0.401 ips / 43 Hz

Prod Holes. Bottom Rocks. 5'-6' apart / Mult
- Top Deck (1 hole) - 1' apart

Spud Hole - 2' apart

All Primed w/ 1 coat 1½" x 16" Dynamite

Instantel

Event Report

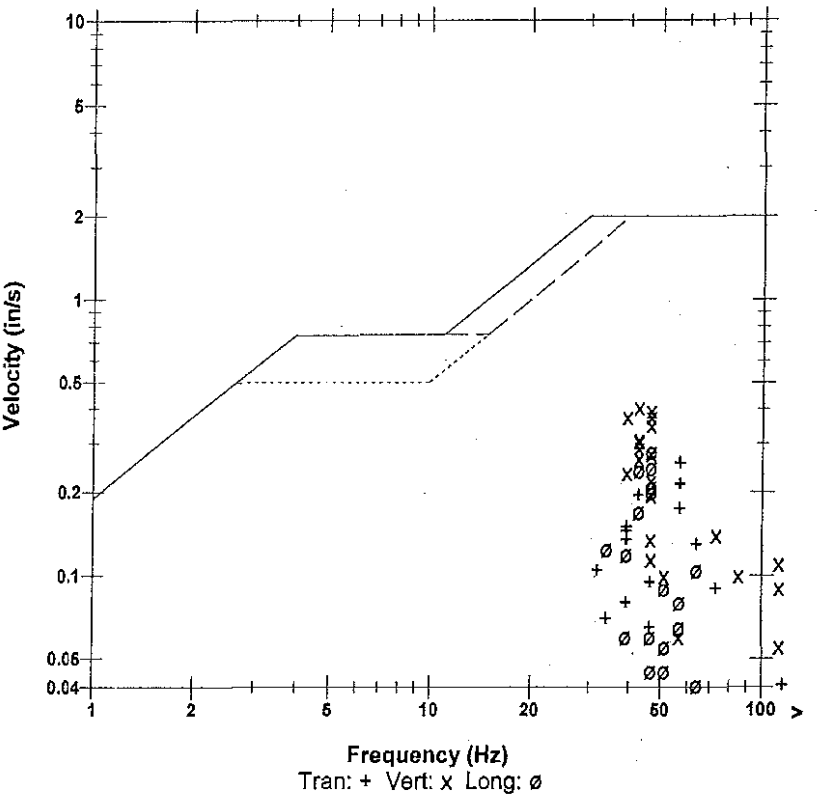
Date/Time	Vert at 13:15:42 January 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3JE.660

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

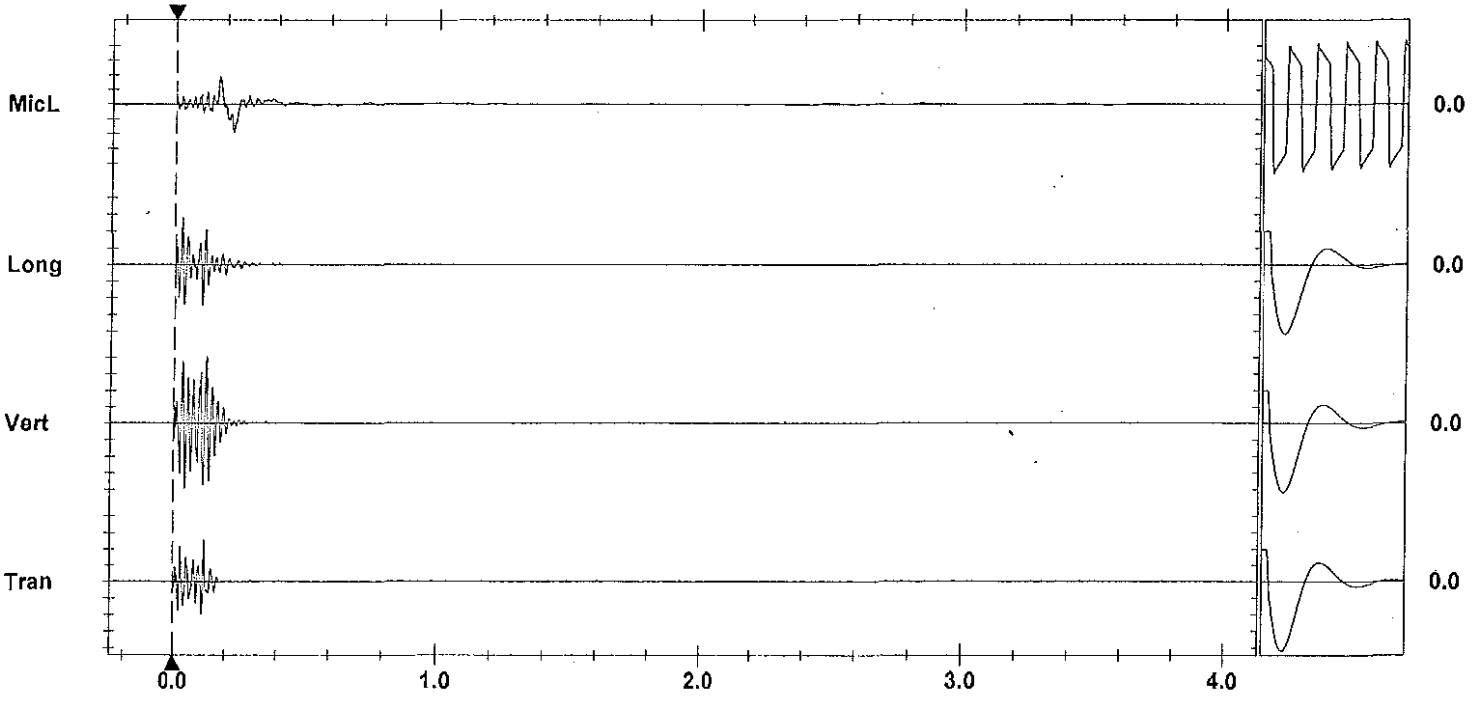
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00192 psi(L) at 0.224 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 628 mv)

	Tran	Vert	Long	
PPV	0.255	0.405	0.280	in/s
ZC Freq	57	43	47	Hz
Time (Rel. to Trig)	0.122	0.129	0.025	sec
Peak Acceleration	0.278	0.345	0.239	g
Peak Displacement	0.00067	0.00155	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.446 in/s at 0.117 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12 2:09 PM
BLAST # MW-0073

HIGHWAY# 97
BLAST LOCATION AT: SB 128+42 - 128+45 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 3.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.9 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 5611 / 160 after
HOLE DIAMETER 76 (mm)
HOLE SPACING _____ (m) BURDEN _____ (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

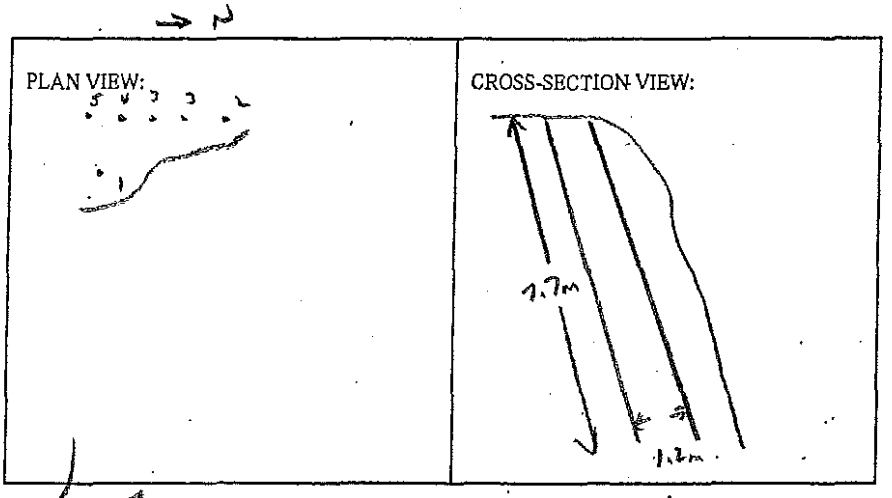
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone crt - No trigger (< 0.04 ips)
@ 13093 cliffstone crt - 0.21 ips / 39 Hz

Buffer Hole. Bottom Deck - 4 cart 2½" Blasrex

- TOP Deck - 2 cart 2½" Blasrex

Primed w/ 0.5 cart 2x16" Dynamite

B/L Holes - 1 cart 2½" Dynamite + 200gr. det. cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 14:07:25 January 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo:0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3JG.KD0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

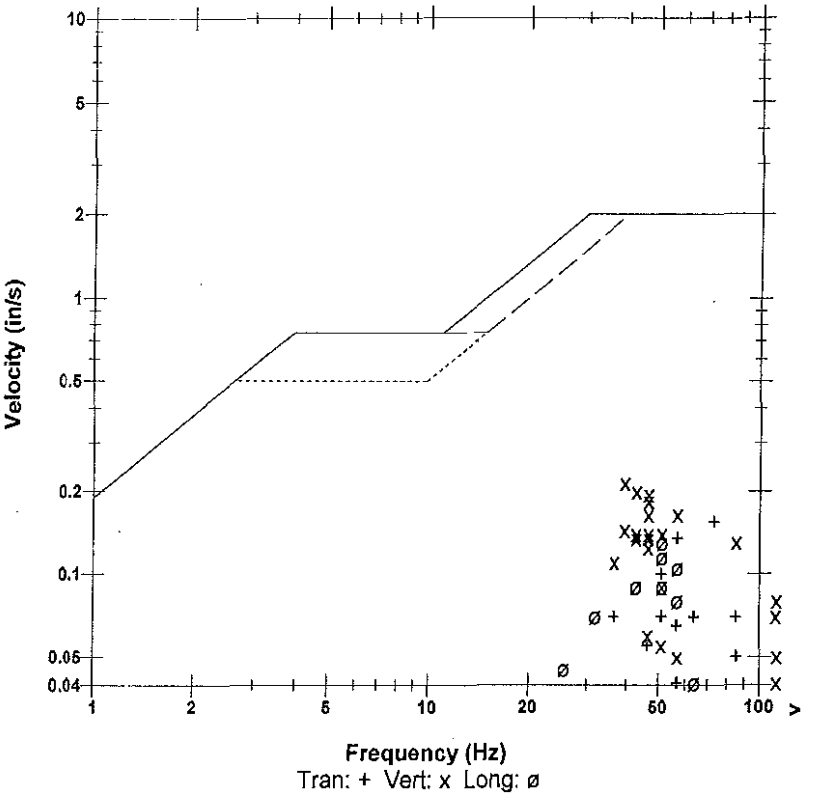
Post Event Notes

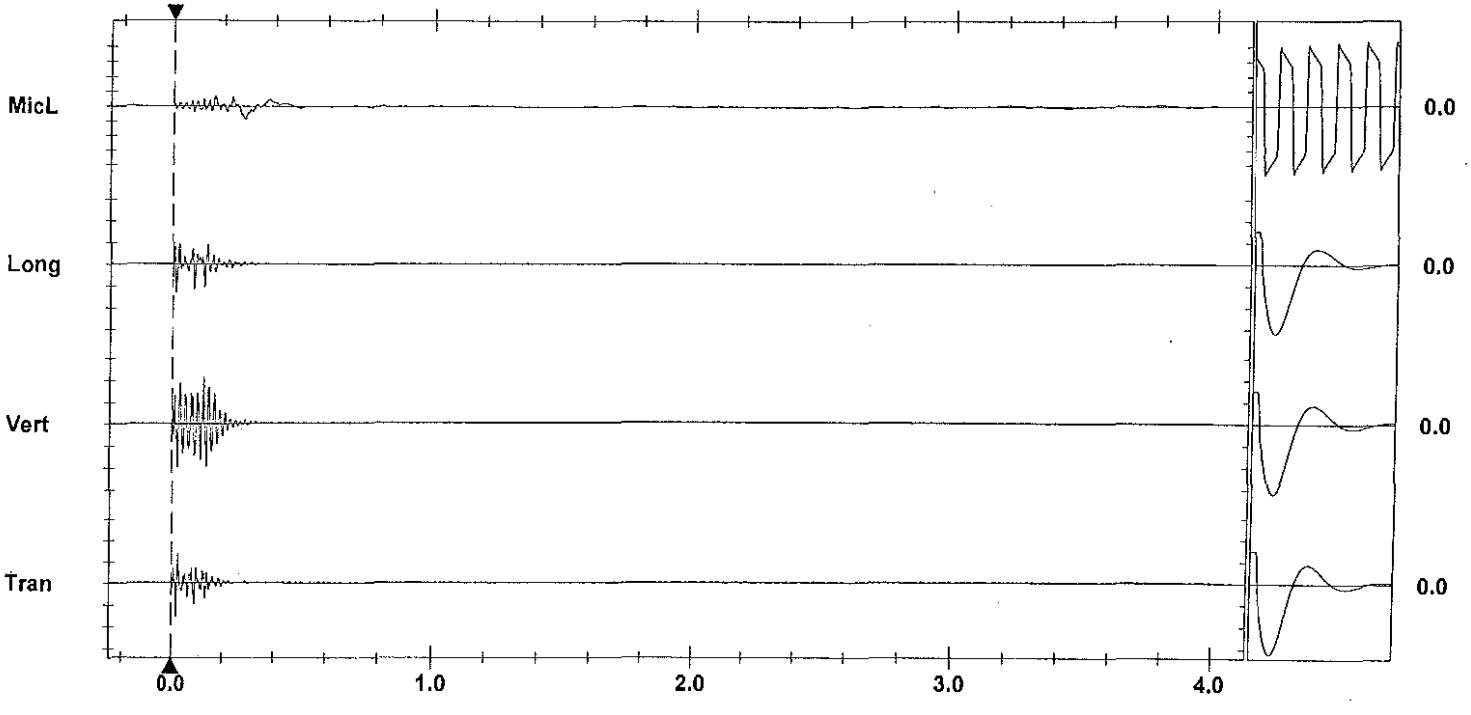
Microphone Linear Weighting
PSPL 0.00087 psi(L) at 0.283 sec
ZC Freq 7.5 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 687 mv)

	Tran	Vert	Long	
PPV	0.155	0.215	0.130	in/s
ZC Freq	73	39	51	Hz
Time (Rel. to Trig)	0.019	0.128	0.014	sec
Peak Acceleration	0.172	0.225	0.146	g
Peak Displacement	0.00032	0.00063	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.240 in/s at 0.128 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12 3:10 PM
BLAST # MW-0024

HIGHWAY# 97
BLAST LOCATION AT: STN 128+37 – 128+42 (Purcell)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Greenstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 5 Prod / 2 Strato
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

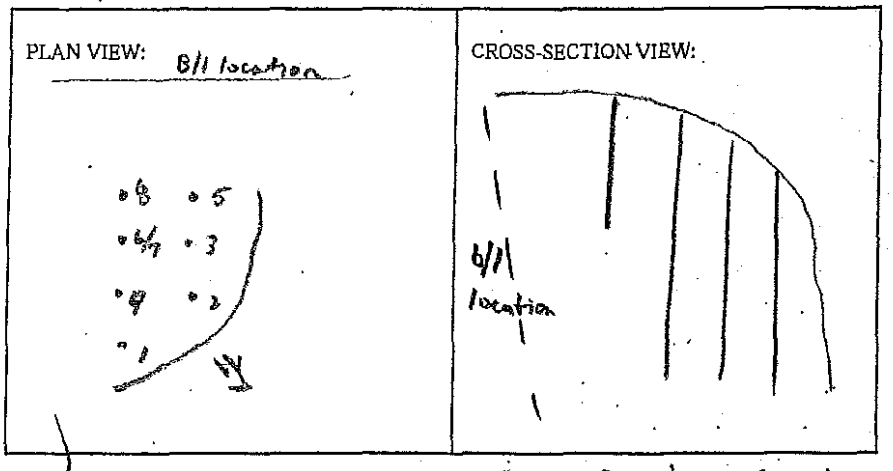
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone ext. Notebook (< 0.04 ips)
@ 13073 Cliffstone ext. 0.19 ips / 39 Hz

Perm Holes - Bottom Decks - 4' apart/Hole
- Top Deck (1 Hole) - 1' apart

Stab Holes - 2' apart/Hole

Primed w/ 1 part 1½"x16" Dynamite

Instantel

Event Report

Date/Time	Vert at 15:10:52 January 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3JJ.I40

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

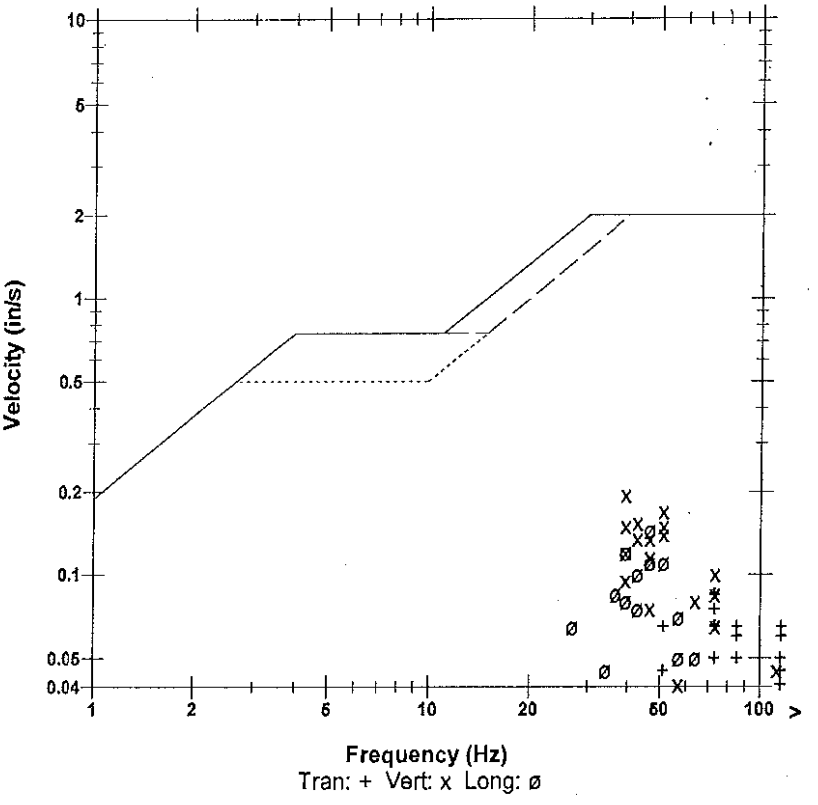
Extended Notes
Blast at stn 128

Post Event Notes

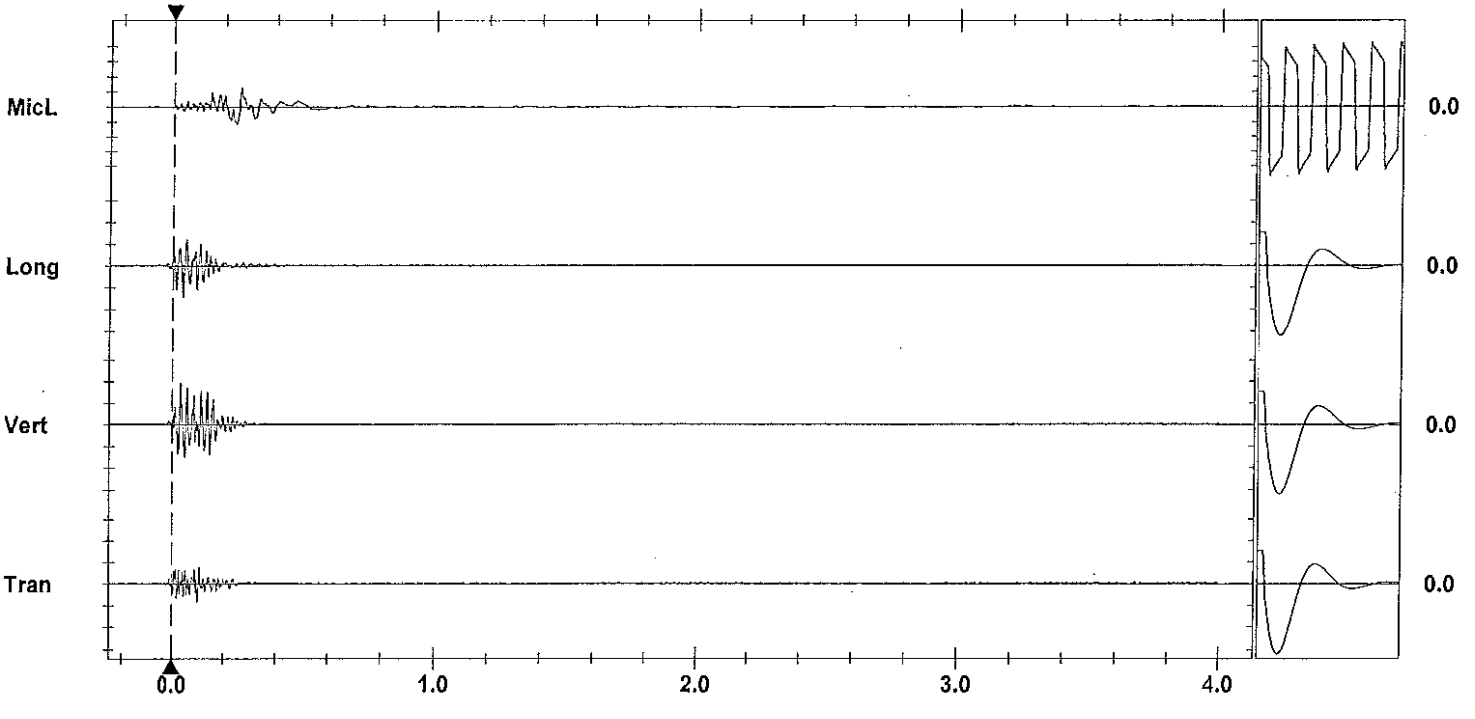
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.260 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 652 mv)

	Tran	Vert	Long	
PPV	0.0850	0.195	0.145	in/s
ZC Freq	73	39	47	Hz
Time (Rel. to Trig)	0.102	0.032	0.040	sec
Peak Acceleration	0.133	0.212	0.119	g
Peak Displacement	0.00021	0.00064	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.203 in/s at 0.032 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12 10:06 AM
BLAST # MW.0075

HIGHWAY# 97
BLAST LOCATION AT: SDN 128+34 - 128+39 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: de Shot metted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 (blocked)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 76/1 / 36 after
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

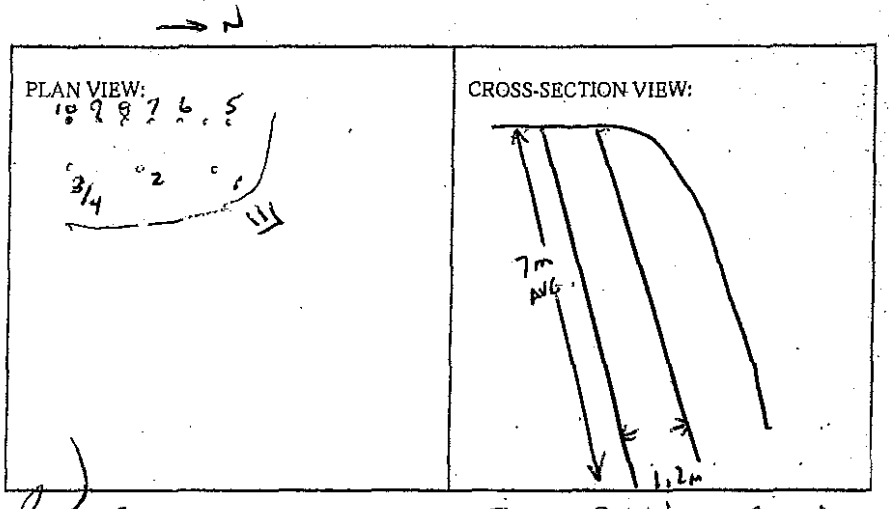
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 cliffstone ext - No Report (<0.04 ips)
@ 13093 cliffstone ext - 0.087 ips / 47 Hz

10'

Buffer Holes - Bottom Decks - 4-5 chgs 2"x16" Blastex

- Top Deck - (Alluvial) - 1.5 chgs 2"x16" Blastex

Primed w/ 1 each 1½" x16" Dynamite

B/L Holes - 1 each 2"x16" Dynamite + 200 gr. det. cord to 4' collar

Instantel

Event Report

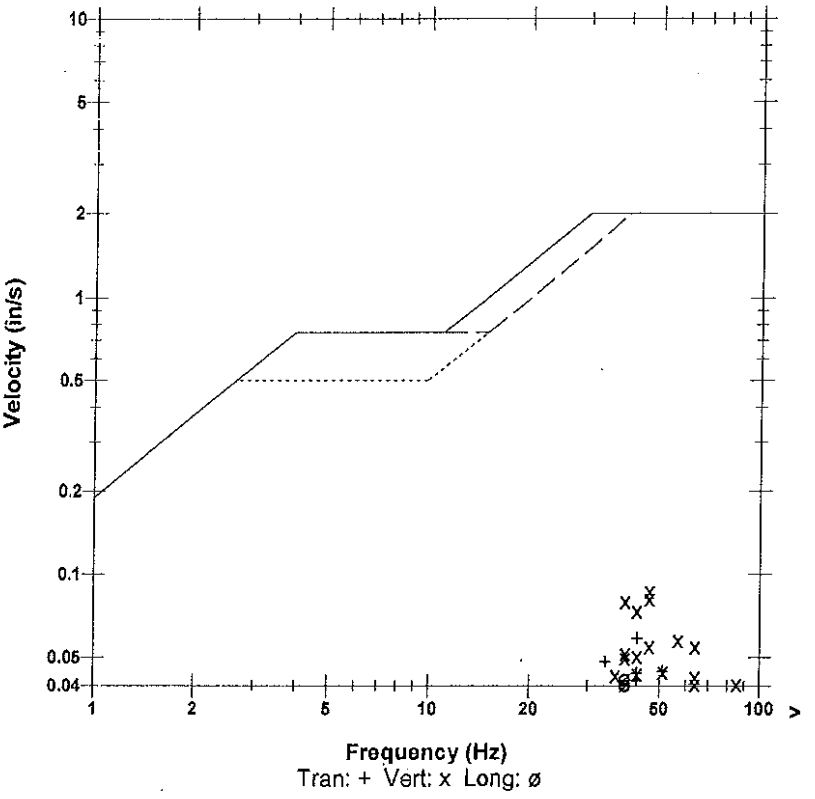
Date/Time	Vert at 10:06:29 January 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3OP.ET0
Job Number:	1		

Notes
location:on slab rear patio ne
13093 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

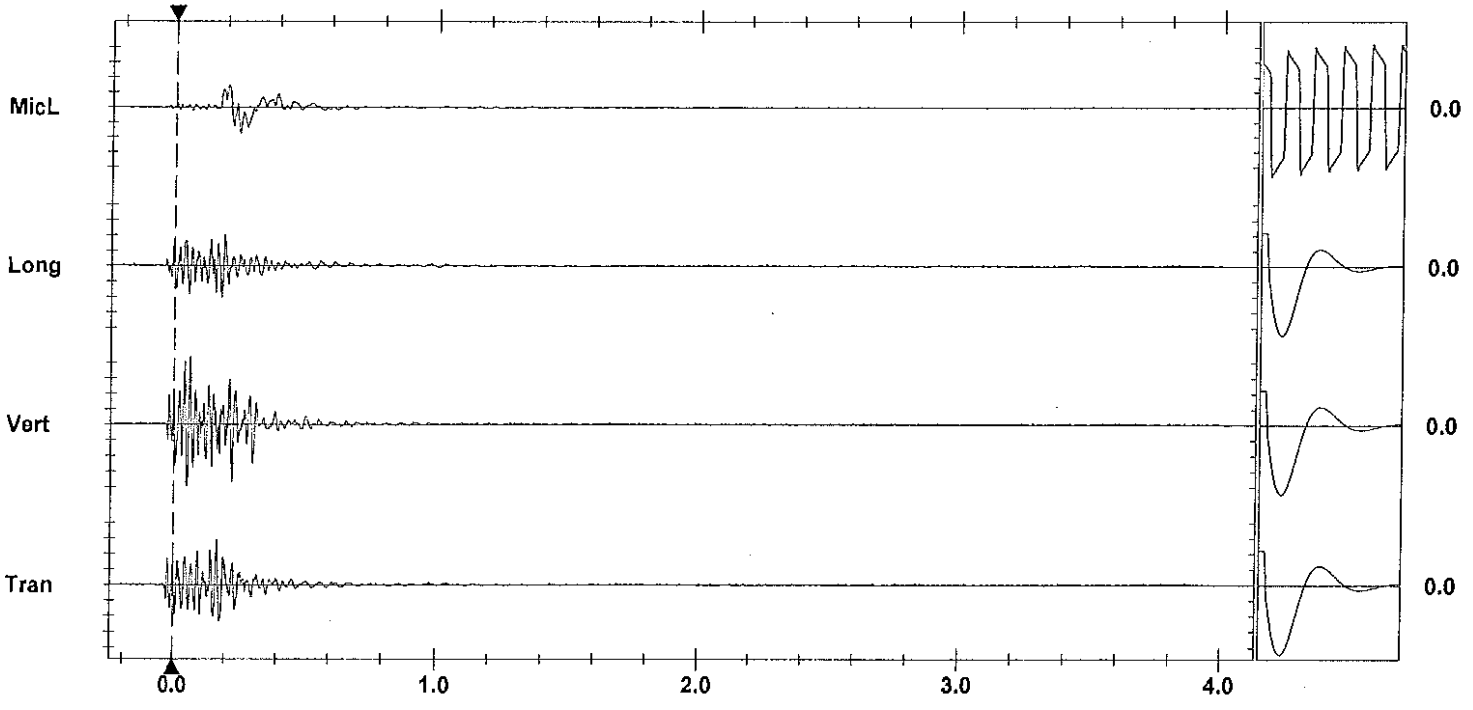
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00181 psi(L) at 0.248 sec		
ZC Freq	8.3 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 630 mv)		

	Tran	Vert	Long	
PPV	0.0587	0.0869	0.0419	in/s
ZC Freq	43	47	39	Hz
Time (Rel. to Trig)	0.173	0.064	0.183	sec
Peak Acceleration	0.0514	0.0961	0.0315	g
Peak Displacement	0.00025	0.00035	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0905 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12 11:23 am
BLAST # MW-0076

HIGHWAY# 97
BLAST LOCATION AT: SW 128+34 - 128+38 (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 4
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m). BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

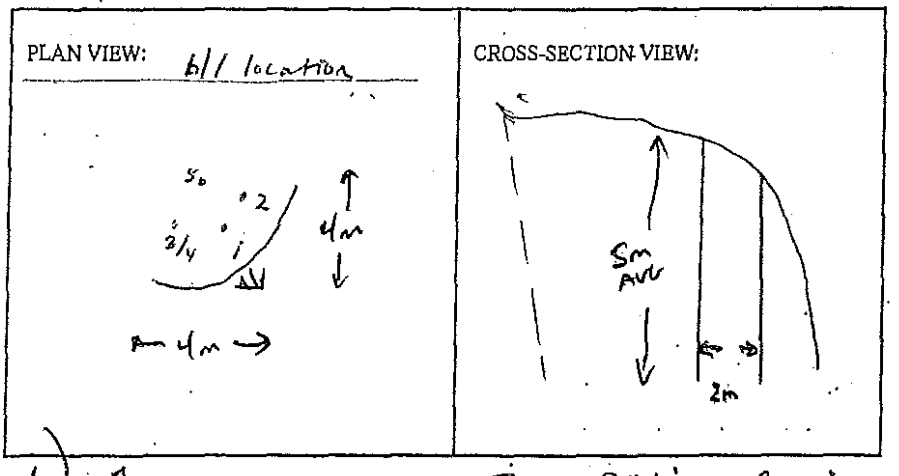
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HSM 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



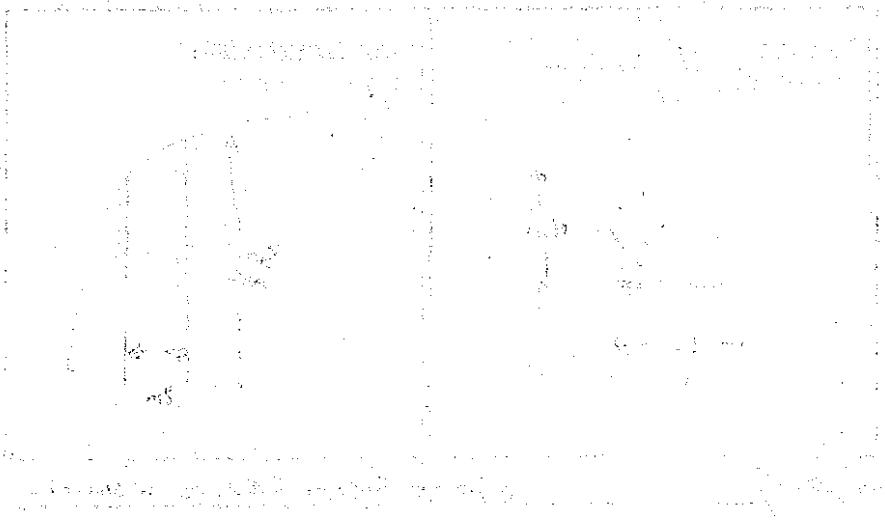
BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Rd - No trigger (< 0.04 ips)
@ 13093 Cliffstone Rd - 0.11 ips / 37 Hz

3'-4' ANFO/hole Primed w/ 1 each 1"x8" 40% Dynamite



Instantel

Event Report

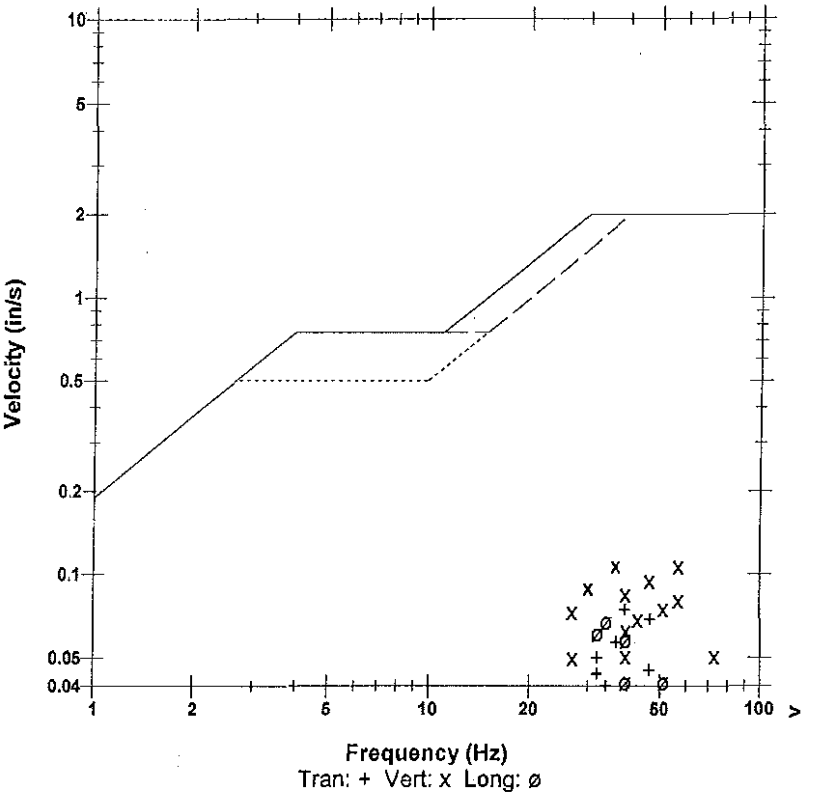
Date/Time	Vert at 11:23:39 January 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3OS.ZF0
Job Number:	1		

Notes
location:on slab rear patio ne
13093 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

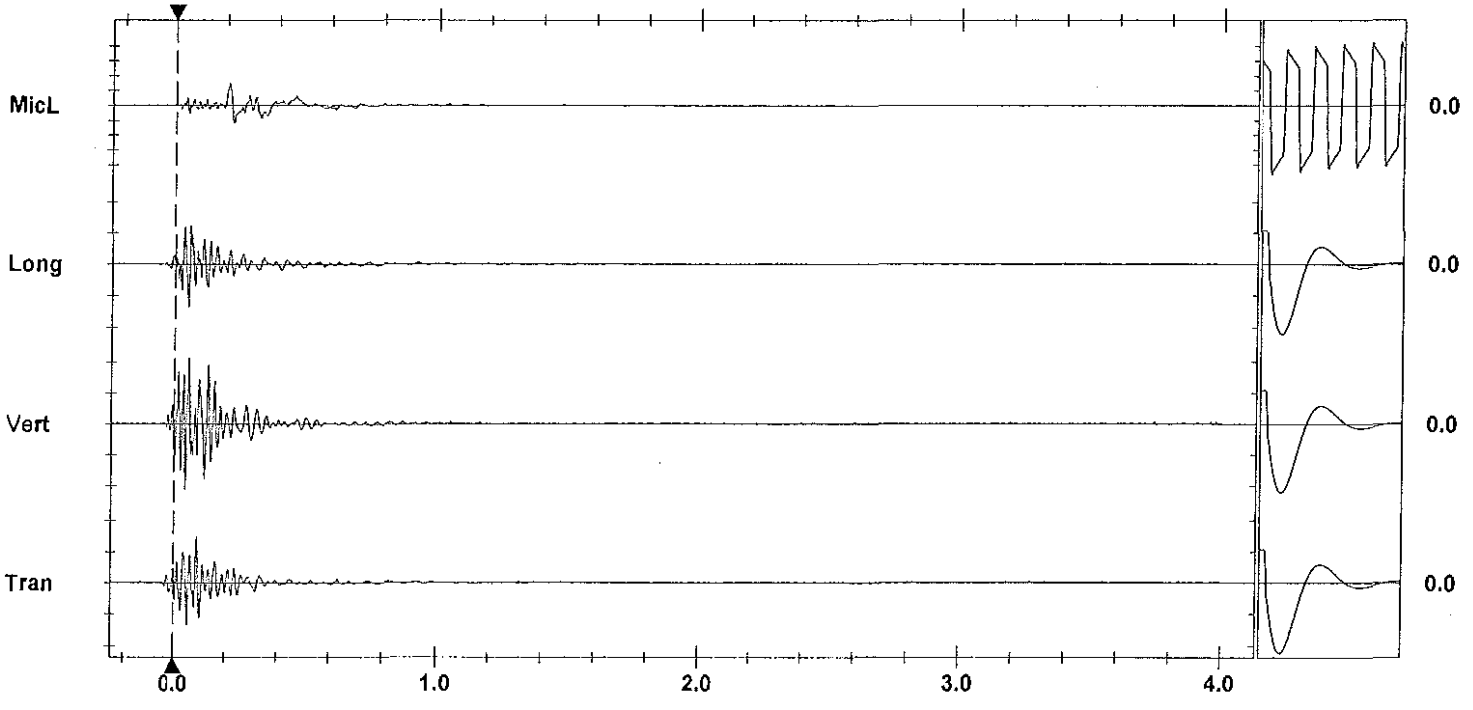
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00145 psi(L) at 0.206 sec		
ZC Freq	19 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 712 mv)		

	Tran	Vert	Long	
PPV	0.0744	0.107	0.0675	in/s
ZC Freq	39	37	34	Hz
Time (Rel. to Trig)	0.092	0.058	0.053	sec
Peak Acceleration	0.0481	0.136	0.0597	g
Peak Displacement	0.00026	0.00041	0.00028	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.116 in/s at 0.044 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — — —◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12
BLAST # MW-0077

12:52 PM

HIGHWAY# 97
BLAST LOCATION AT: SN 128+28 - 129+34 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 76/11/30 offset/7 Presp
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

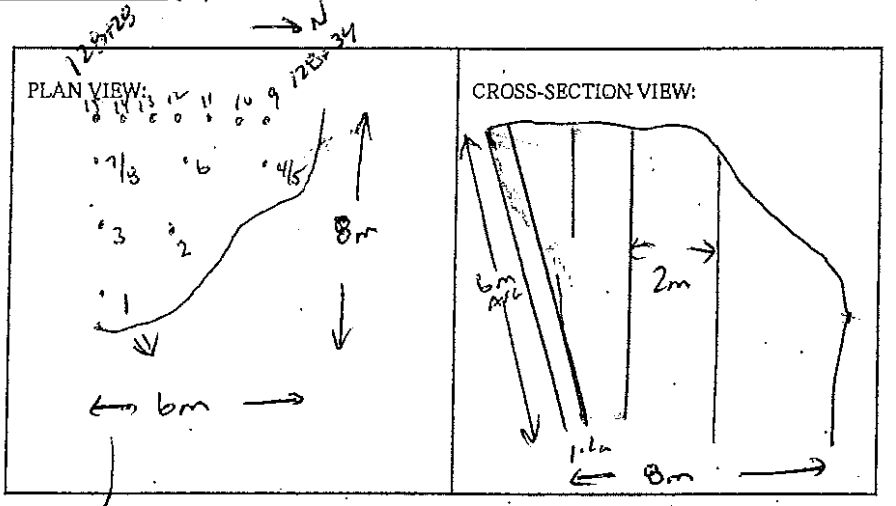
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Siesmograph @ 13073 C1: Offstreet - no trigger (0.04 ips)
@ 13093 C1: Offstreet - 0.18 ips / 34 HL

12-53

PROD. Holes - 5' ANFO/Hole

BOTTOM Holes - BOTTOM DECKS - 4 CART 2"x16" BLASTEX

- TOP DECKS - 1-2 CART 2"x16" BLASTEX

Primed w/ 1 CART 1"x8" DYNAMITE

B/L Holes - 1 CART 2"x16" DYNAMITE + 200 gr det. cord to 4' collar

Event Report

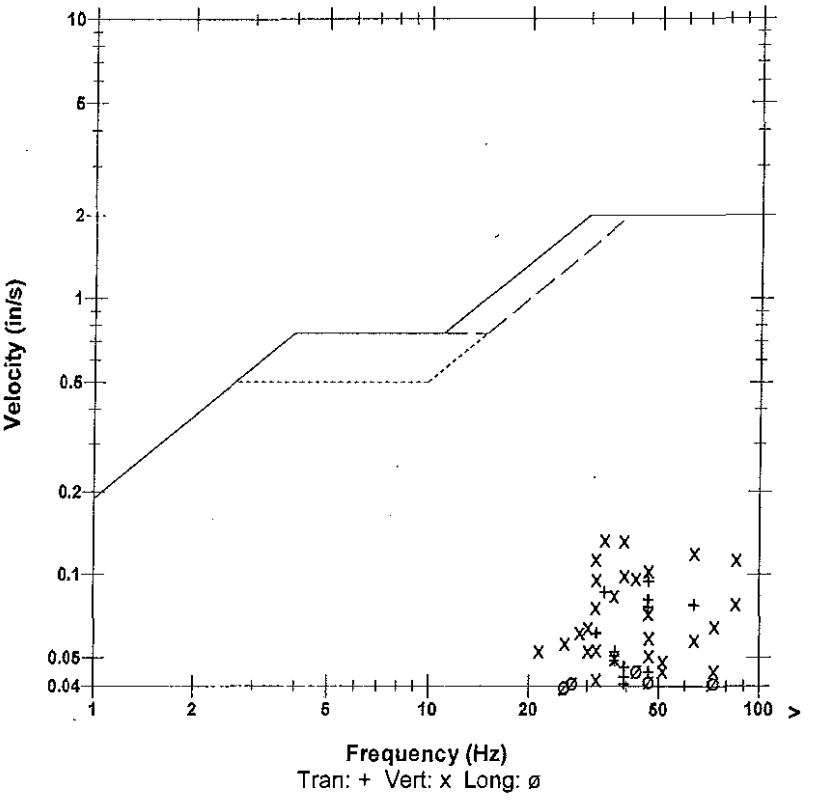
Date/Time	Tran at 12:52:33 January 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3OX.3L0
Job Number:	1		

Notes
location:on slab rear patio ne
13093 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

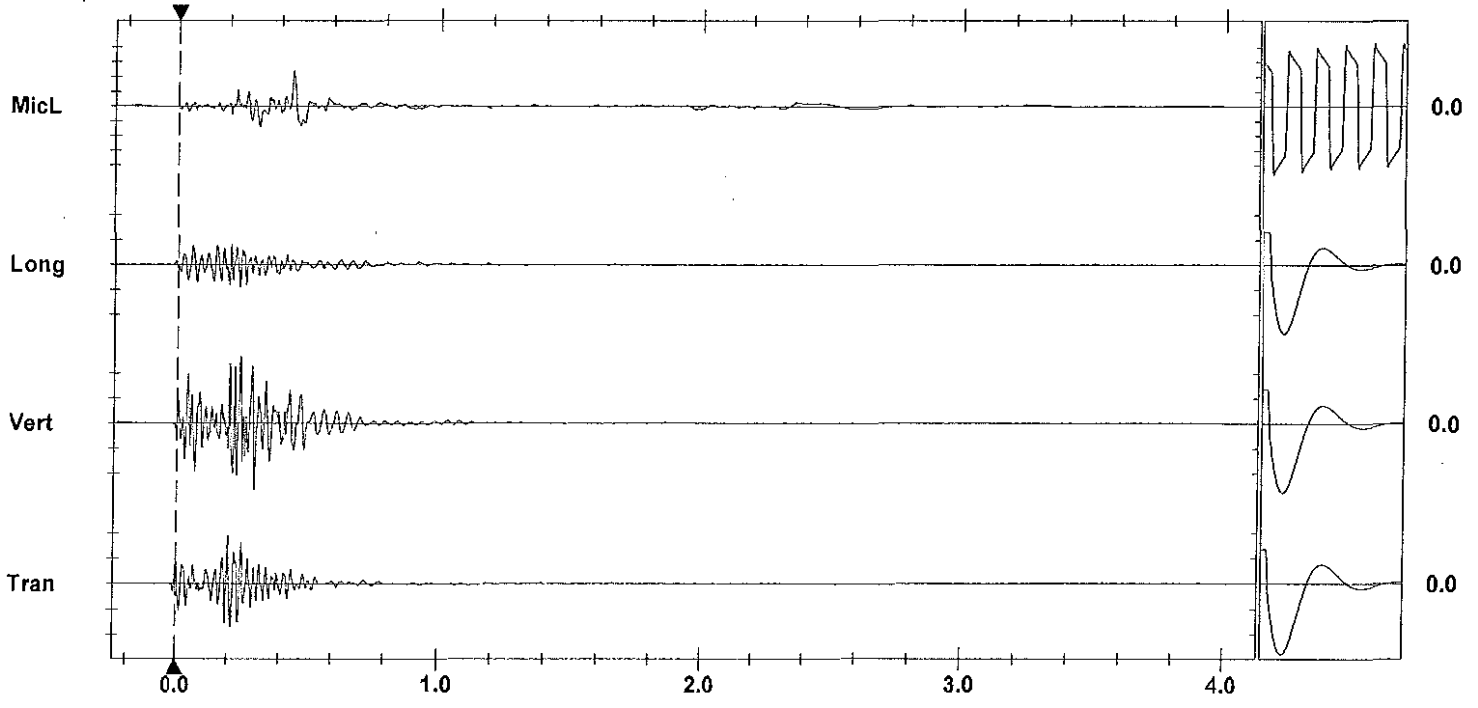
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00239 psi(L) at 0.445 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 665 mv)

	Tran	Vert	Long	
PPV	0.0944	0.134	0.0450	in/s
ZC Freq	47	34	43	Hz
Time (Rel. to Trig)	0.203	0.303	0.240	sec
Peak Acceleration	0.0845	0.154	0.0597	g
Peak Displacement	0.00037	0.00050	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.144 in/s at 0.204 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 9/12 2:23 PM
ACTUAL BLAST DATE JAN 9/12
BLAST # MW-0078

HIGHWAY # 97 * Shot method
BLAST LOCATION AT: 128+23 - 128+28.45 (Pine Ridge)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 7611 / 3 buffer / 1 Pond
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

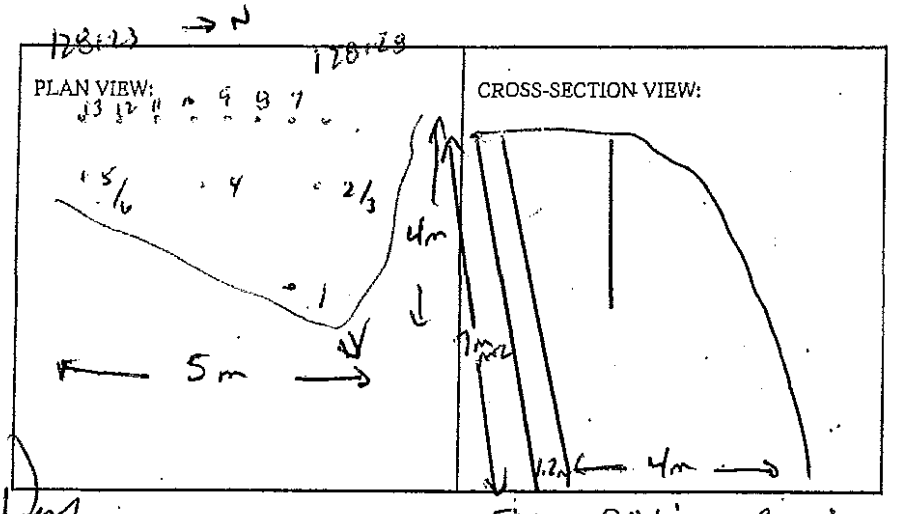
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crt - No Tremor (<0.04 ips)
@ 13093 Cliffstone Crt - ~~0.11 ips~~ 0.11 ips / 64 Hz

STAB Production Holes — 8' ANFO

224

BUFFER Holes - Bottom Deck - 4 Cart. 2"x16" Blastex

Top Deck - 1-2 Cart. 2"x16" Blastex

Primed w/ 1 Cart 1"x8" Dynamite

BL Holes - 1 Cart. 2"x16" Dynamite + 200 gr. det. cord to 4' collar.

Instantel®

Event Report

Date/Time	Long at 14:23:35 January 9, 2012
Trigger Source	Geo: 0.0400 in/s
Range	Geo :1.25 in/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

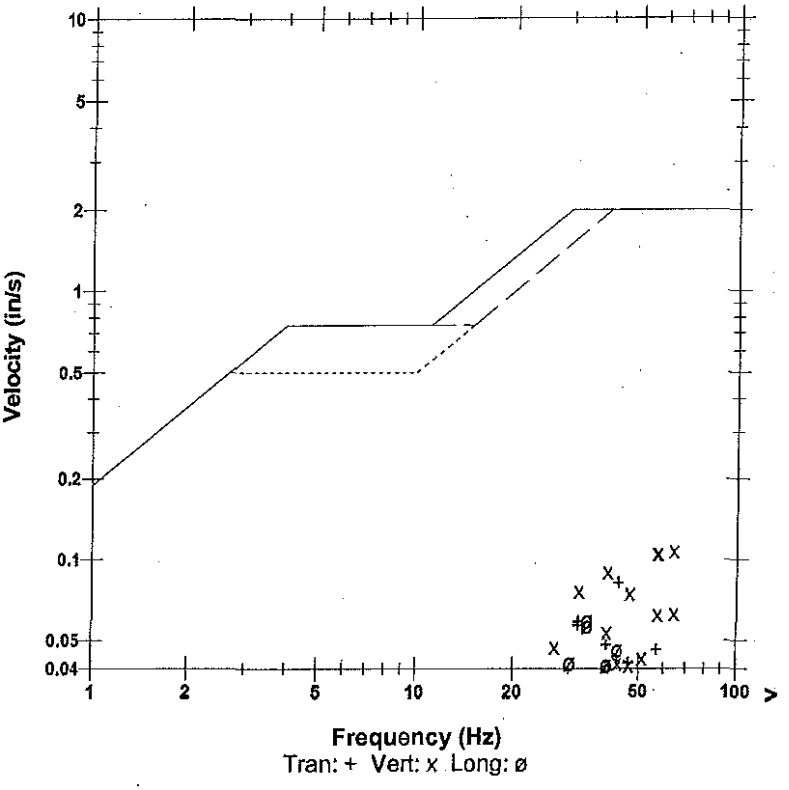
Serial Number	BA13960 V 10.10-8.17 BlastMate III
Battery Level	6.3 Volts
Calibration	December 22, 2010 by Instantel Inc.
File Name	O960E3P1.BB0

Notes
location:on slab rear patio ne
13093 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

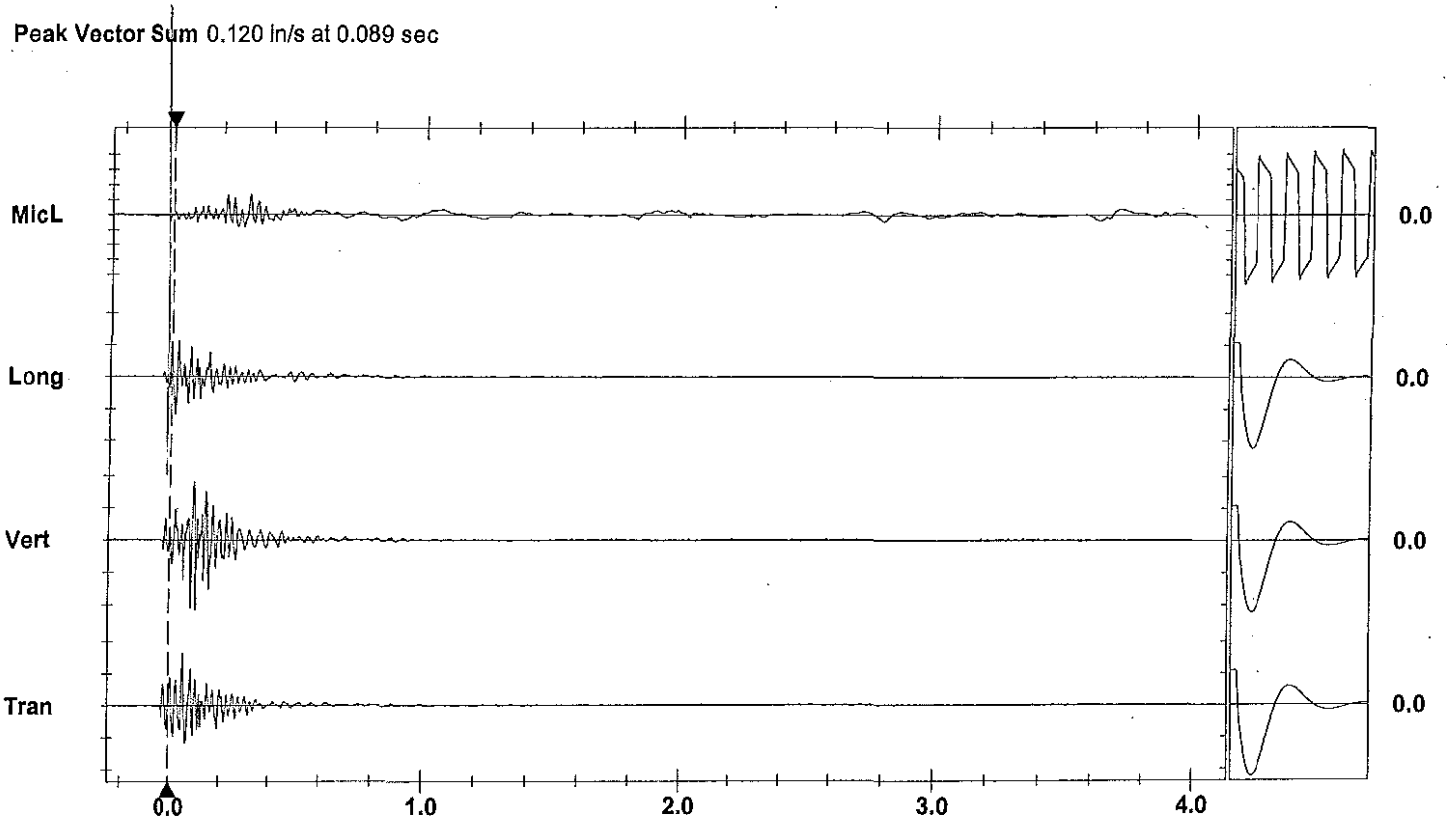
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.308 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 707 mv)

	Tran	Vert	Long	
PPV	0.0819	0.108	0.0594	in/s
ZC Freq	43	64	34	Hz
Time (Rel. to Trig)	0.059	0.107	0.016	sec
Peak Acceleration	0.0613	0.123	0.0398	g
Peak Displacement	0.00031	0.00038	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.120 in/s at 0.089 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12 3:24 PM
BLAST # NW-0079

HIGHWAY# 97
BLAST LOCATION AT: STN 128+20 - 128+23 LS (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: de shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 27.5 (m)

TOTAL NUMBER OF HOLES 56/11
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.77 (m) BURDEN 1.5m (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 200gr det. cord

EXPLOSIVE TYPE 1½" DYNAMITE + ~~ANFO~~
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

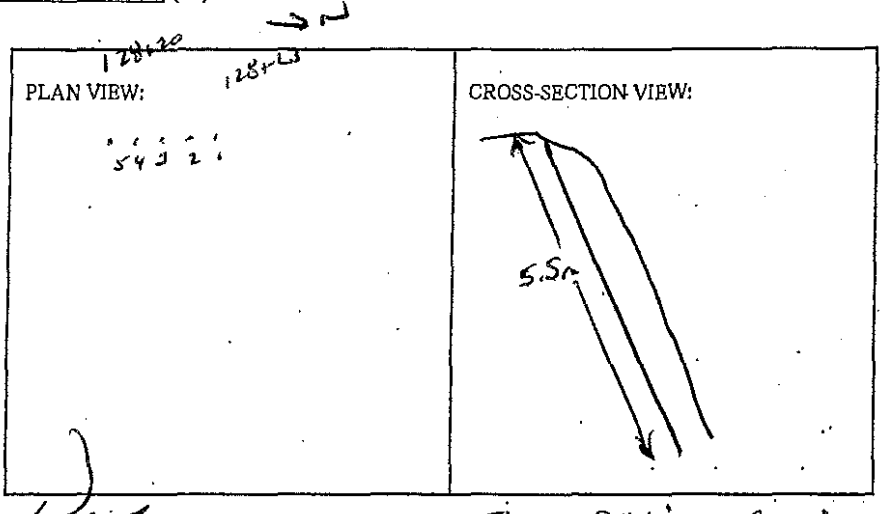
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 25 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Ct - No trigger (< 0.04 in/s)
@ 13093 Cliffstone Ct - 0.089 in/s / 43 Hz

1 CART 2"x16" DYNAMITE +200 grain det cord to 4' collar

Instantel

Event Report

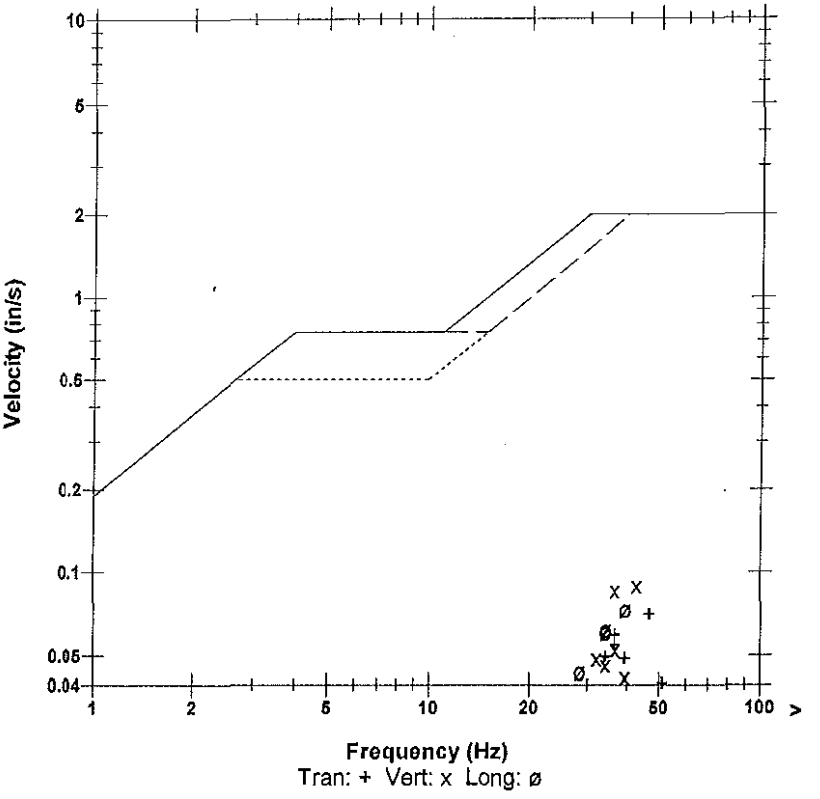
Date/Time	Tran at 15:24:06 January 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3P4.460
Job Number:	1		

Notes
location:on slab rear patio ne
13093 Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

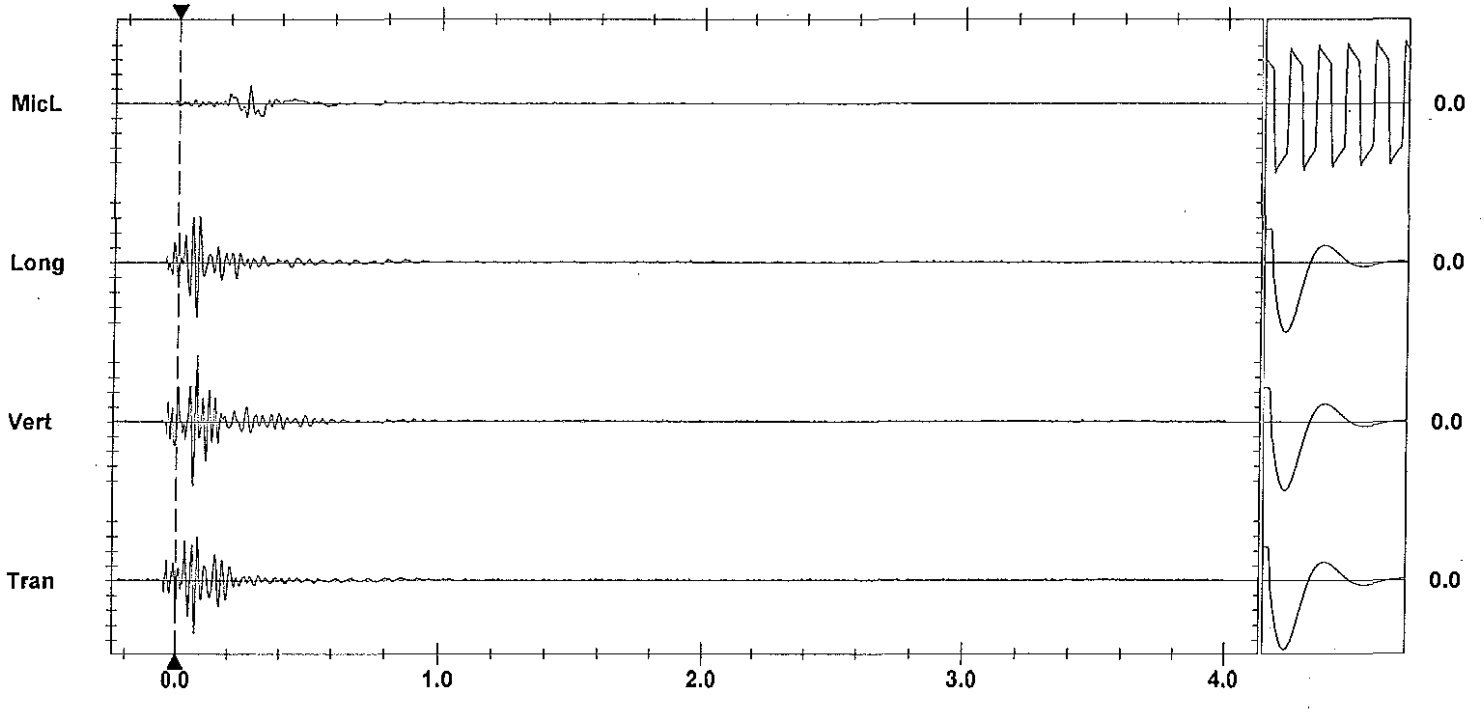
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.275 sec
ZC Freq	30 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 698 mv)

	Tran	Vert	Long	
PPV	0.0706	0.0894	0.0731	in/s
ZC Freq	47	43	39	Hz
Time (Rel. to Trig)	0.073	0.079	0.072	sec
Peak Acceleration	0.0514	0.0547	0.0530	g
Peak Displacement	0.00025	0.00036	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.102 in/s at 0.073 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 9/12
ACTUAL BLAST DATE Jan 9/12 3:51 PM
BLAST # MW-0080

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+18 - 128+20 Ls. (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Not metered

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4 (3 loaded)
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 46/1
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.77 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + 200gram det. cord
TOTAL NUMBER OF CARTRIDGES 3
TOTAL NUMBER OF DELAYS 3

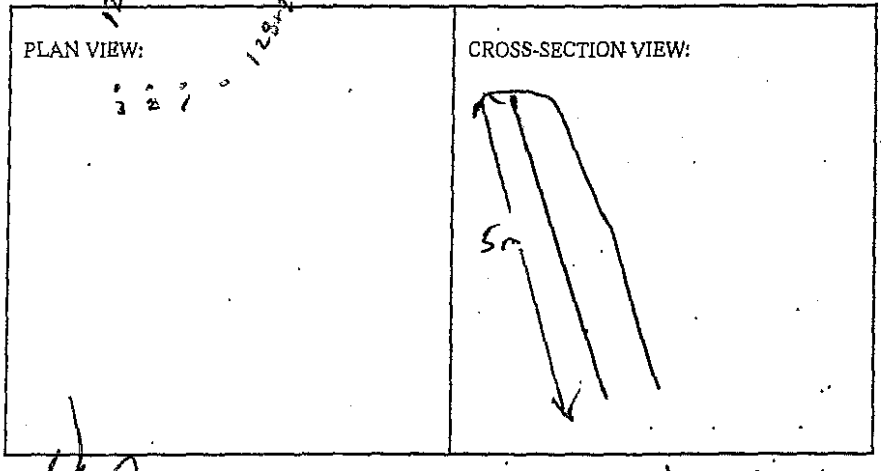
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 3.6kg (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 15 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



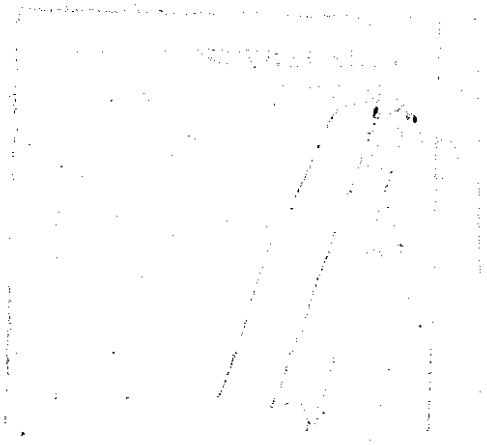
BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Cut - No trigger (< 0.04 ips)
@ 13093 Cliffstone Cut - No trigger (< 0.01 ips)

1 each 2"x16" Dynamite + 200 grain det. cord to 4' collar



AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 10/12
ACTUAL BLAST DATE JAN 10/12
BLAST # 154

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+90 - 126+65 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 25 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 8
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 438 (m)

TOTAL NUMBER OF HOLES 18 B/L / 12 Buffer / 43 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 73
TOTAL NUMBER OF DELAYS 55

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 1550 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

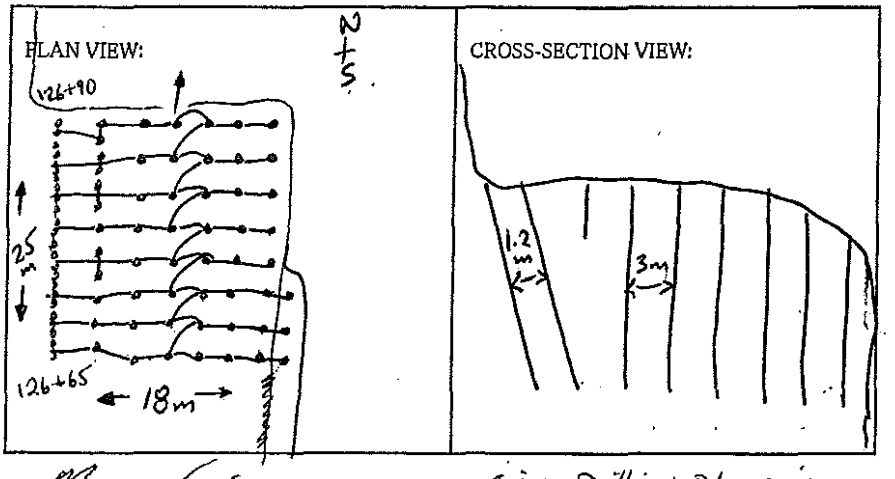
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2700 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

18 - 12' ms dets

8 - 24' EZ dets.

43 - 30' EZ dets.

15 - 42ms connector det

1 - Elec det.

60 Bags Anfo

1/2 bag WR.

1 CASE 2" x 16"

1 CASE 1 1/2 x 16.

Instantel

Event Report

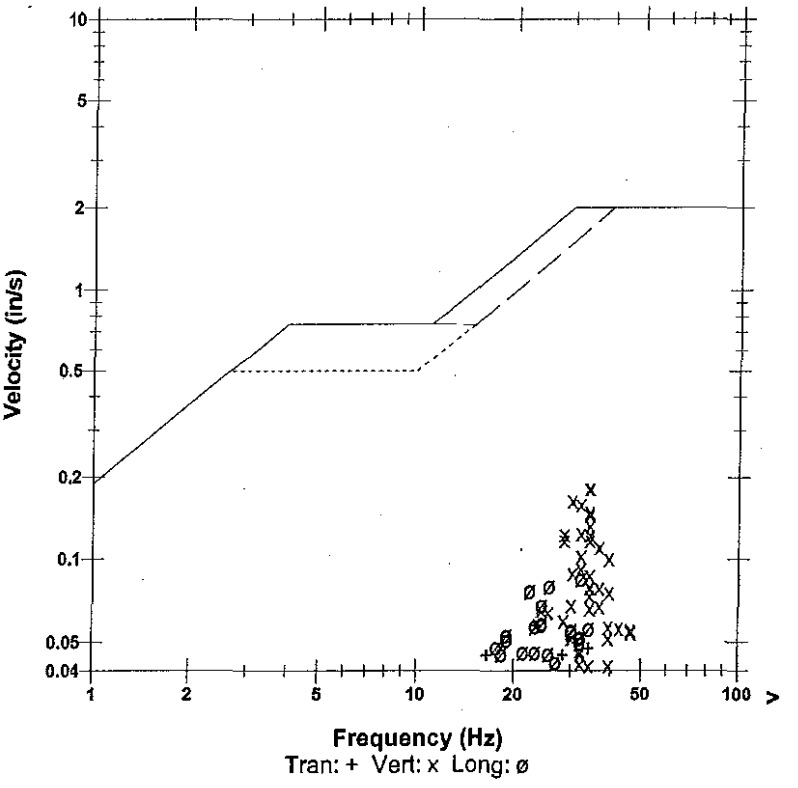
Date/Time	Vert at 14:55:17 January 10, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3QX.G50
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

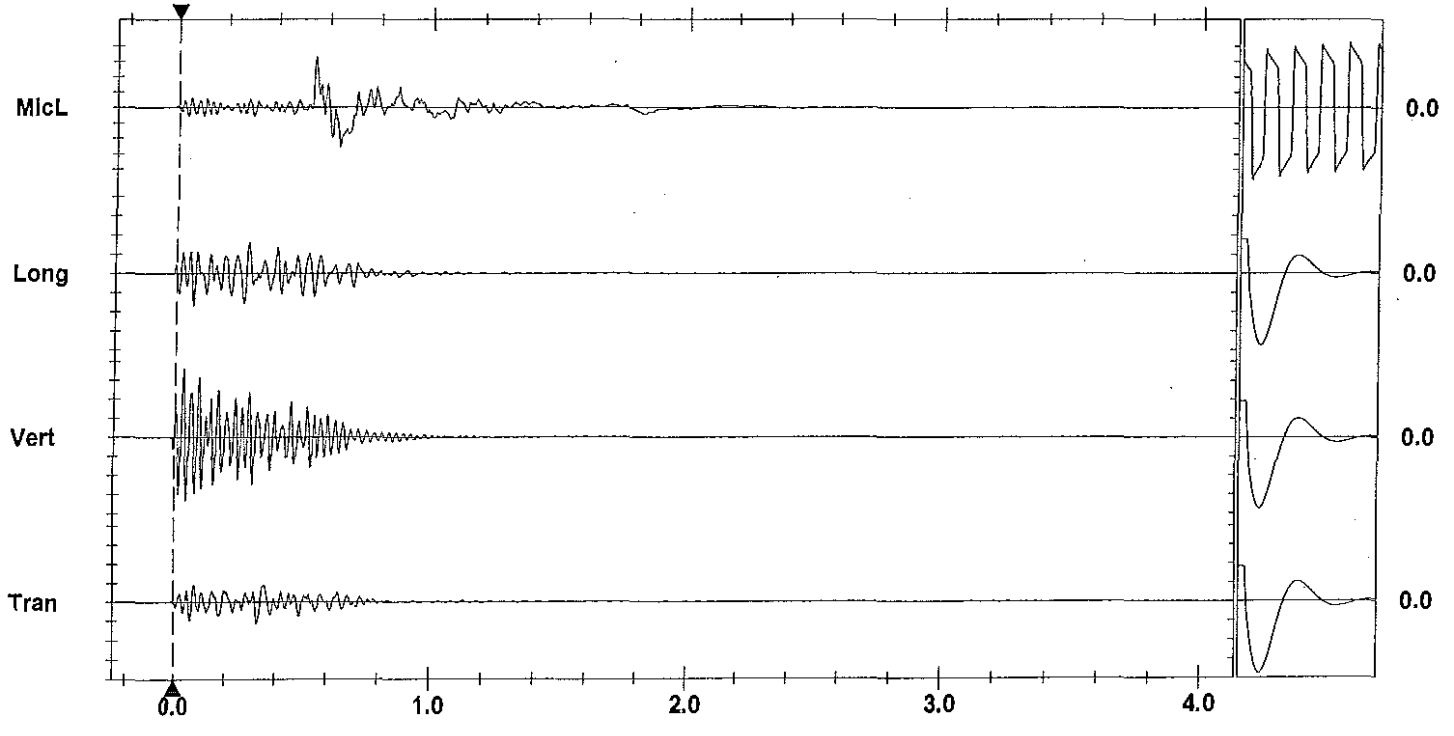
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00330 psi(L) at 0.541 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 690 mv)

	Tran	Vert	Long	
PPV	0.0575	0.182	0.0850	in/s
ZC Freq	23	34	32	Hz
Time (Rel. to Trig)	0.330	0.032	0.067	sec
Peak Acceleration	0.0298	0.108	0.0464	g
Peak Displacement	0.00044	0.00088	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.182 in/s at 0.032 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Instantel

Event Report

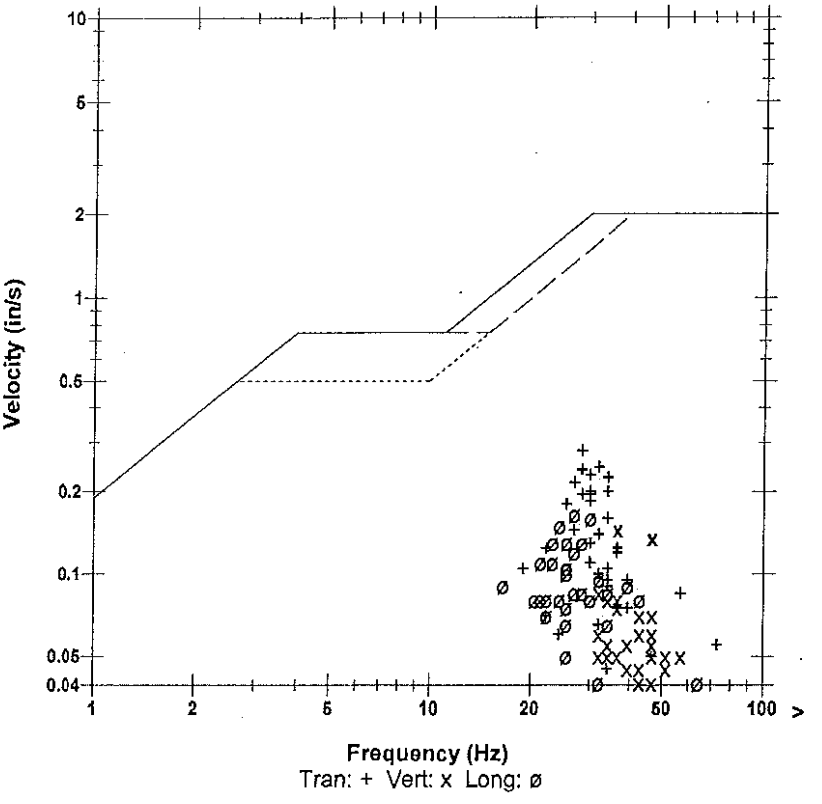
Date/Time	Tran at 14:55:17 January 10, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3QX.G50

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

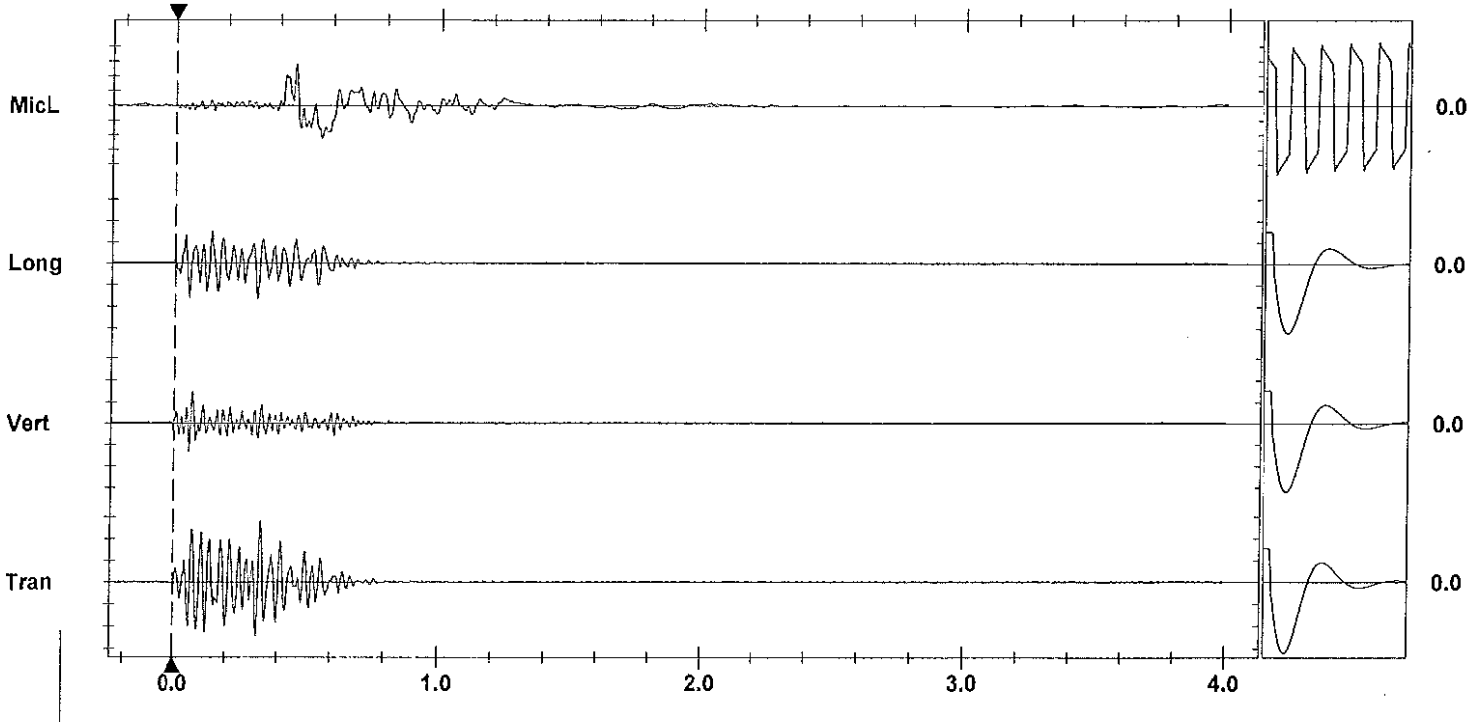
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00279 psi(L) at 0.460 sec			
ZC Freq	8.3 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 669 mv)			

	Tran	Vert	Long	
PPV	0.280	0.145	0.165	in/s
ZC Freq	28	37	27	Hz
Time (Rel. to Trig)	0.338	0.070	0.317	sec
Peak Acceleration	0.133	0.106	0.0795	g
Peak Displacement	0.00150	0.00062	0.00092	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.313 in/s at 0.338 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 693484

DATE PREPARED JAN 10/12
ACTUAL BLAST DATE JAN 10/12 2:58 PM
BLAST # MW-0081

HIGHWAY# 97
BLAST LOCATION AT: 127+50 ← 127+56 LS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 70 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 7.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 115 (m)

TOTAL NUMBER OF HOLES 8 backline / 3 buffer / 1 stab / 16 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 28
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 260 (kg)
DELAY TYPE AND LENGTH 17, 25 + 42 (ms)

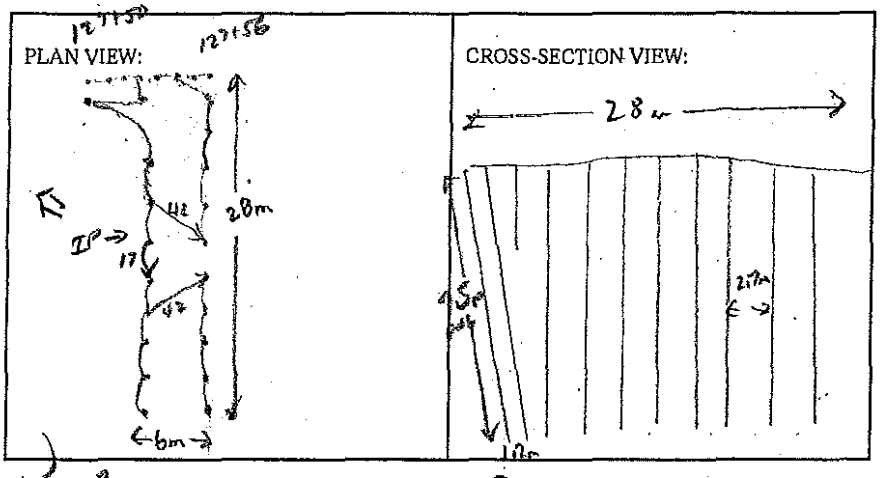
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of power systems
BLASTING MACHINE: TYPE MB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 1000 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffside Cut - 0.36 ips / 28 Hz

Seismograph @ 13030 Old Mission Road - 0.32 ips / 30 Hz

10'-14' ANFO in Prod Holes

2' ANFO in Stab Hole

Buffer Holes - B-9 cart 2"x16" Dynamite / Hole

Primed w/ 1 cart 1½"x16" Dynamite

272

192

B/L Holes - 1 cart 2"x16' Dynamite

+ 200 gr. det. cord to 4' collar

Instantel®

Event Report

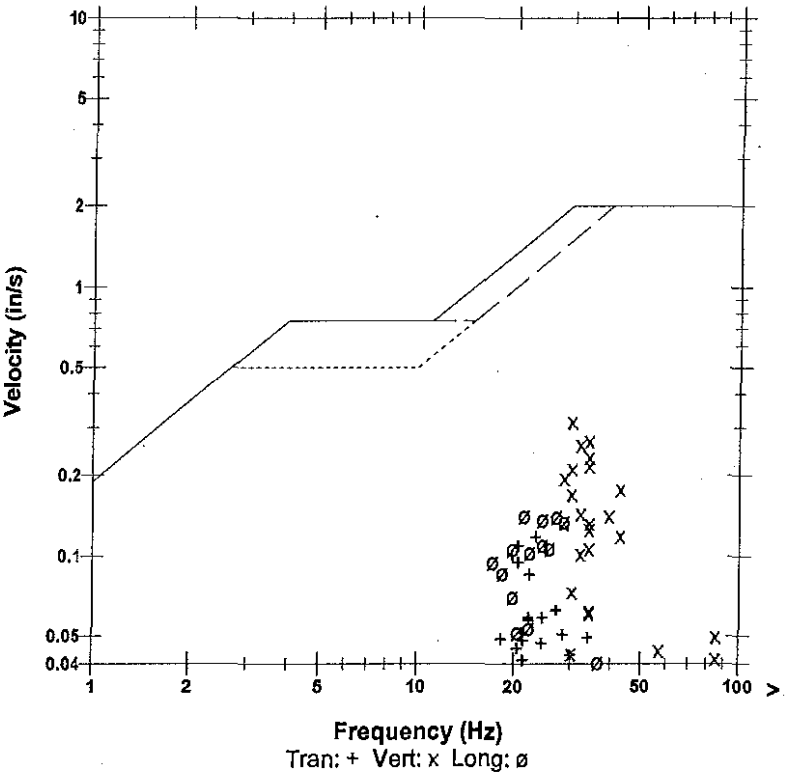
Date/Time	Vert at 14:58:05 January 10, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3QX.KT0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

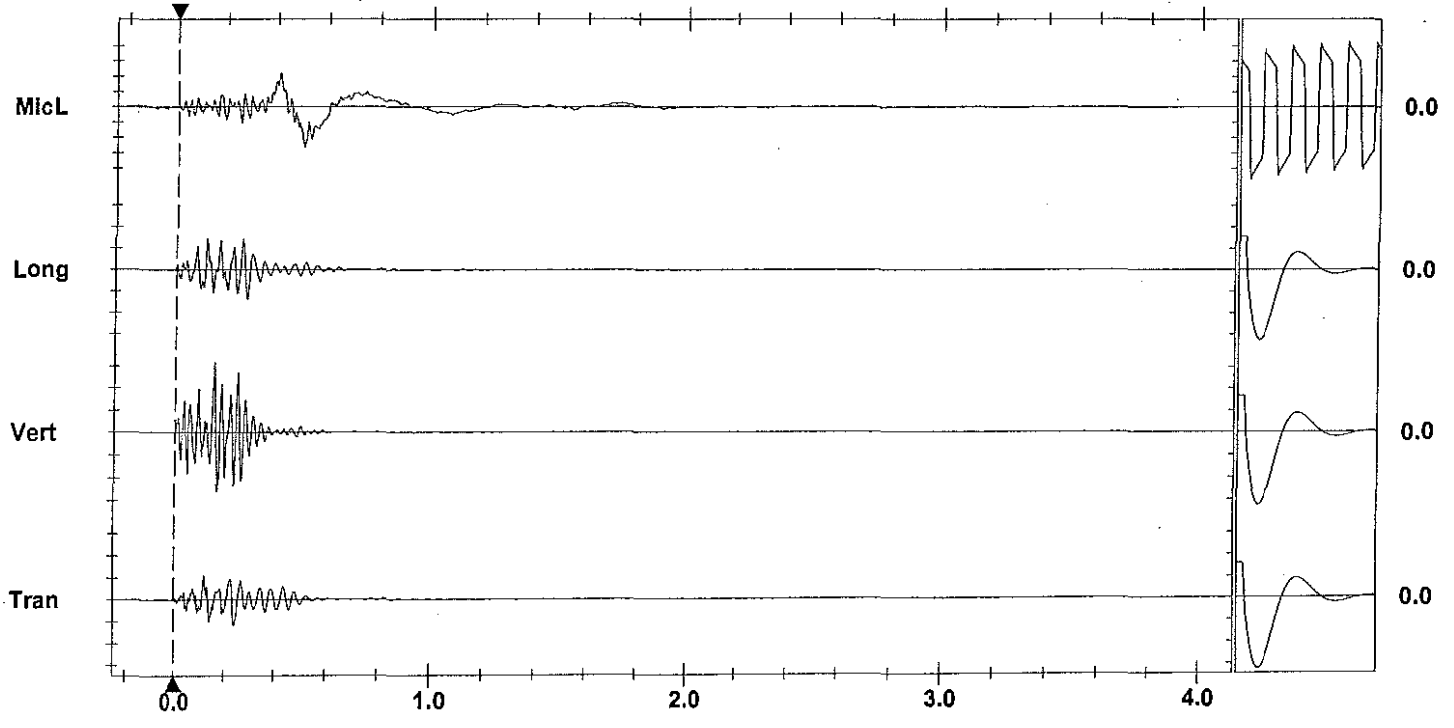
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00265 psi(L) at 0.501 sec
ZC Freq 3.4 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 721 mv)

	Tran	Vert	Long	
PPV	0.118	0.316	0.142	in/s
ZC Freq	23	30	21	Hz
Time (Rel. to Trig)	0.240	0.157	0.124	sec
Peak Acceleration	0.0762	0.189	0.0779	g
Peak Displacement	0.00083	0.00146	0.00089	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.319 in/s at 0.157 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Instantel

Event Report

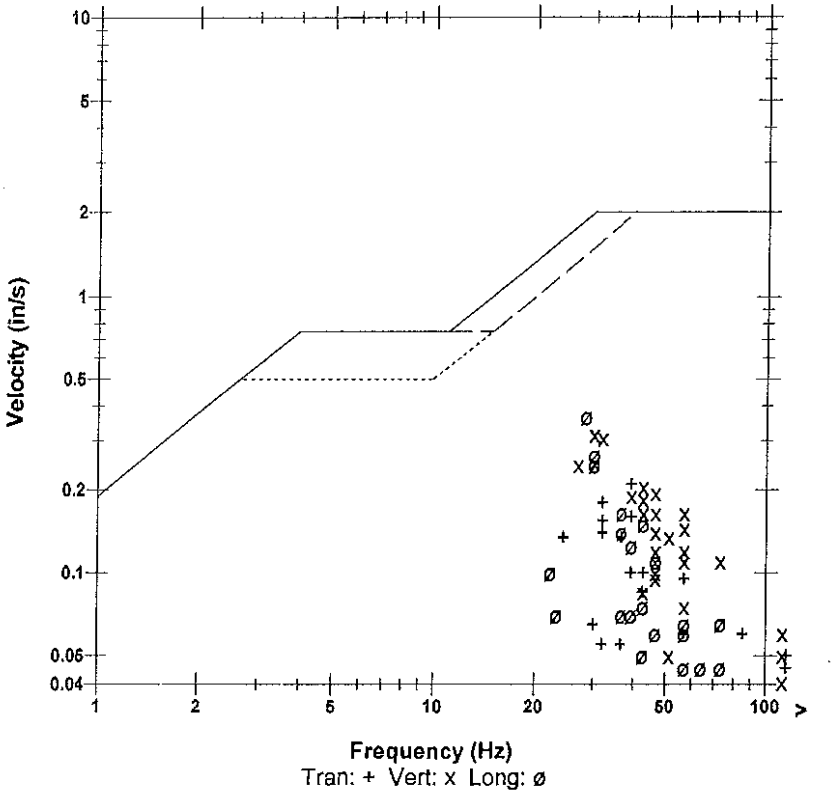
Date/Time	Vert at 14:58:04 January 10, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3QX.KS0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

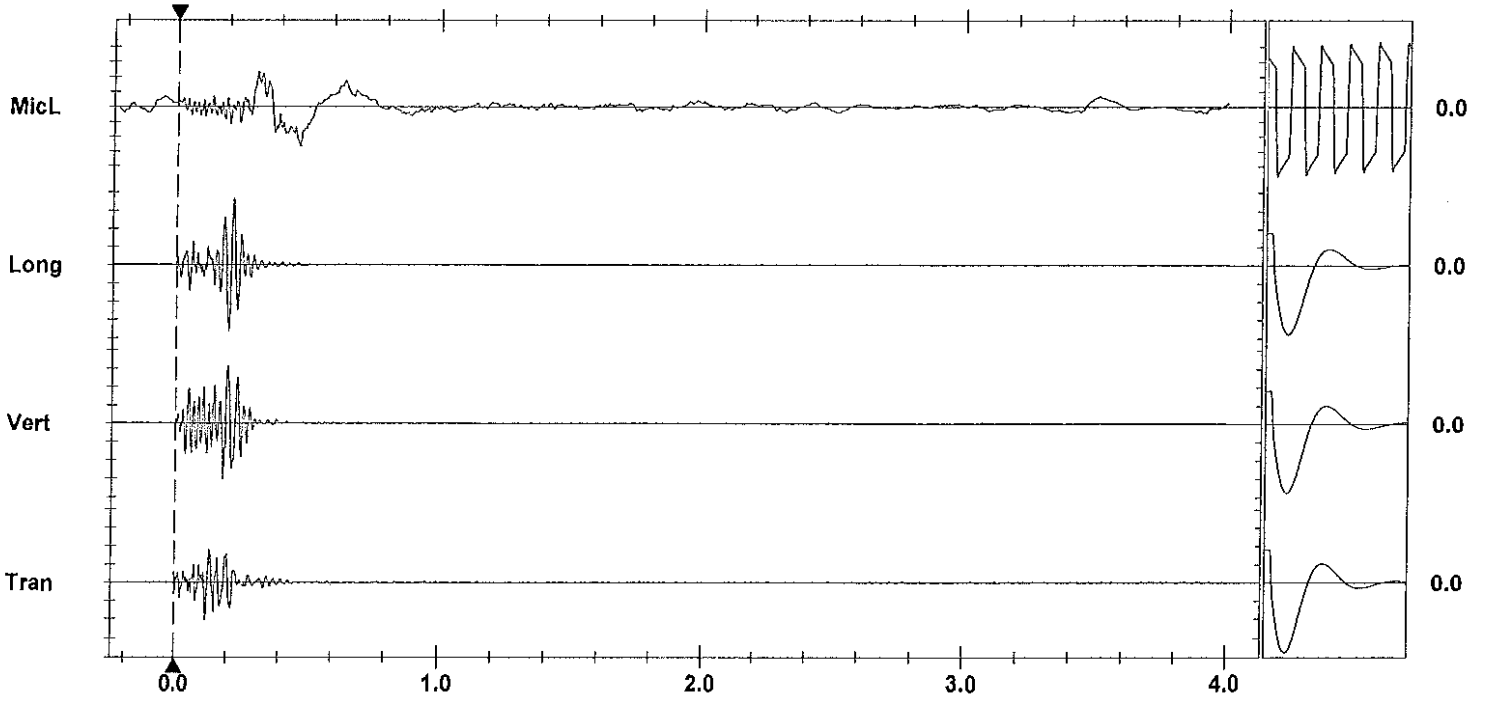
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00268 psi(L) at 0.472 sec
ZC Freq	3.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 694 mv)

	Tran	Vert	Long	
PPV	0.210	0.315	0.365	in/s
ZC Freq	39	30	28	Hz
Time (Rel. to Trig)	0.122	0.204	0.203	sec
Peak Acceleration	0.172	0.252	0.199	g
Peak Displacement	0.00088	0.00169	0.00202	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.503 in/s at 0.203 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: January 14, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

JAN 11/12

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacInnes
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED ~~Dec 11/12~~ Jan 11/12
ACTUAL BLAST DATE ~~Dec 11/12~~ Jan 11/12
BLAST # 157

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+65 - 126+45 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 20. (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 18
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 7
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 396 (m)

TOTAL NUMBER OF HOLES 18 B/L/11 Buffer/37 prod
HOLE DIAMETER ~~165~~ (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 66
TOTAL NUMBER OF DELAYS 48

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 875 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

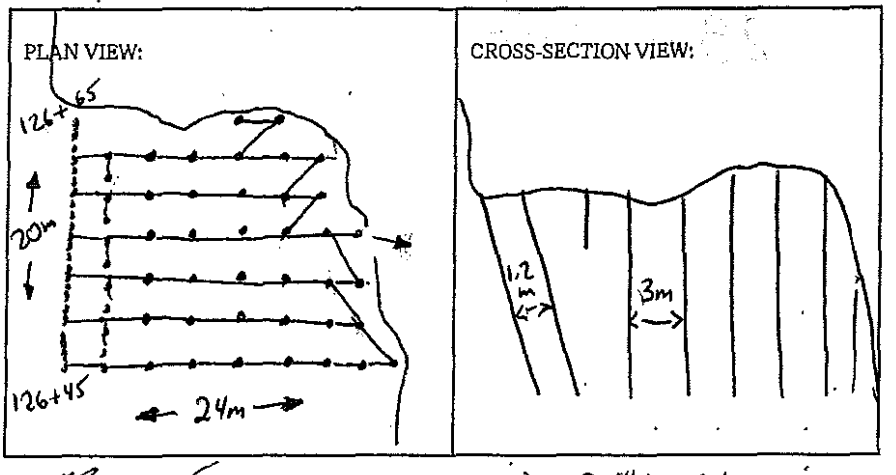
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 2900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacInnes COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

18 - 12' ms dets.

16 - 24' EZ dets.

10 - 40' Ez dets.

22 - 30' Ez dets.

8 - 42 ms connectadet.

1 - Elec det.

1 - 2" x 16"

1 - 1½ x 16"

1 - WR

4 - CASE 2½ x 16"

23 - Anfo.

Instantel

Event Report

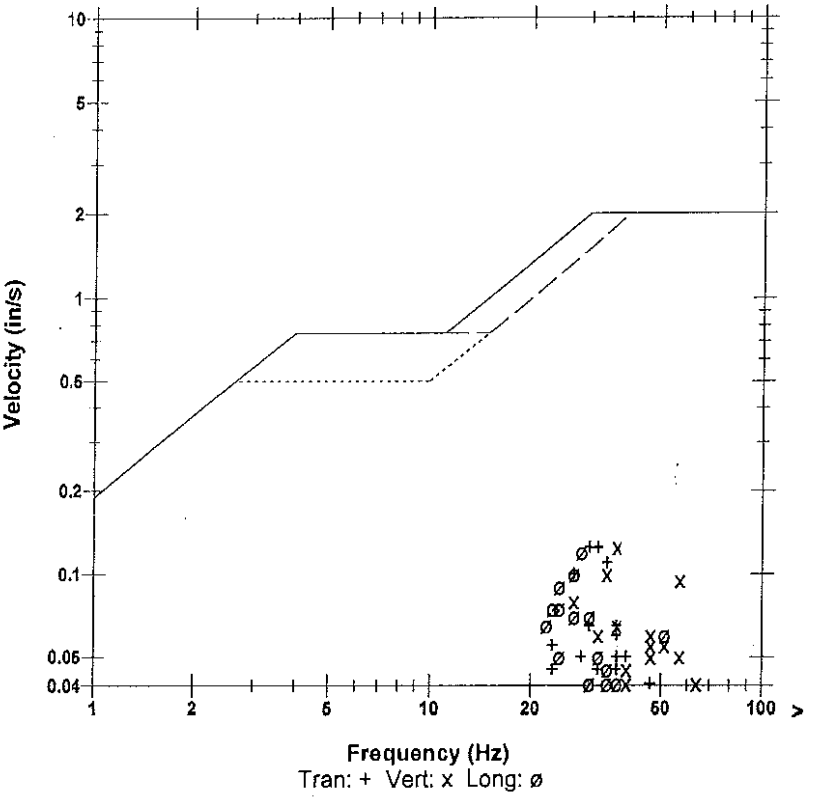
Date/Time	Long at 16:37:47 January 11, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3SW.UZ0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

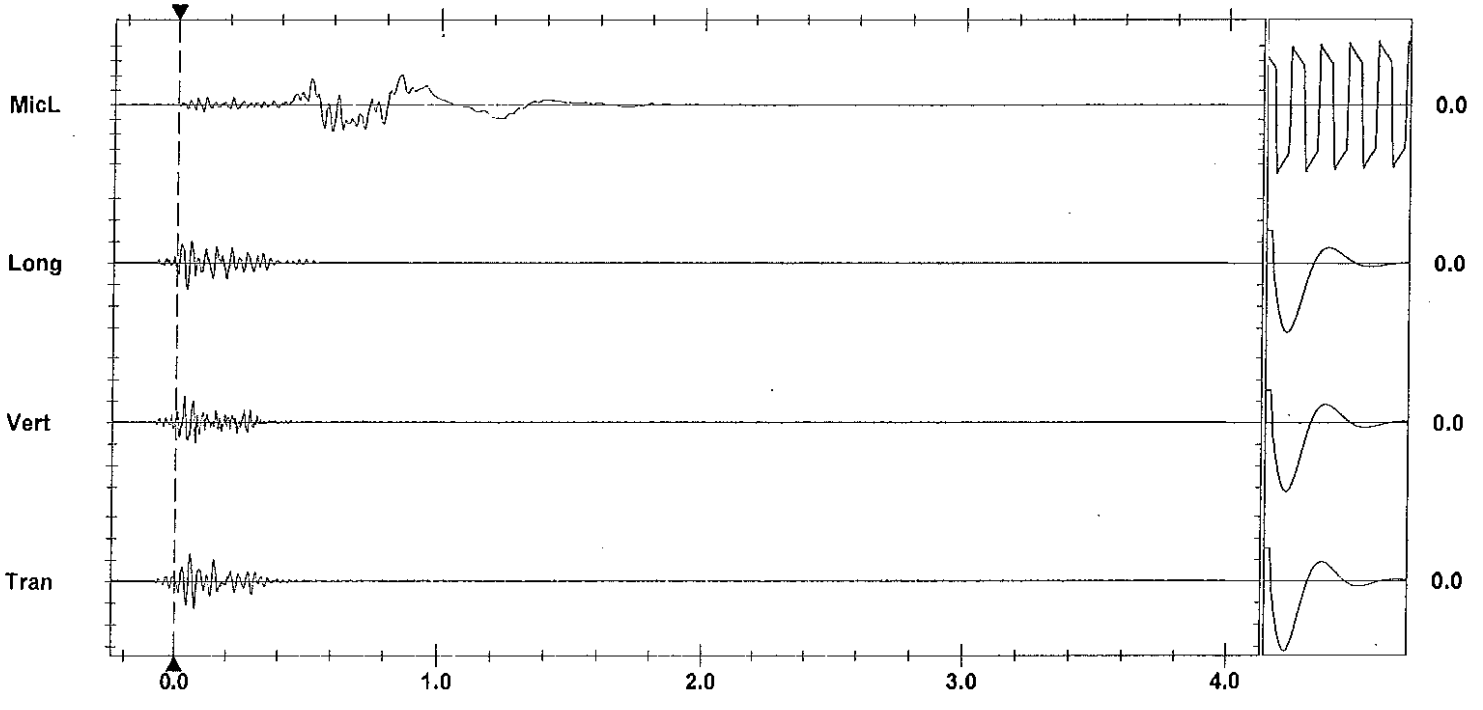
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00207 psi(L) at 0.852 sec
ZC Freq	2.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 678 mv)

	Tran	Vert	Long	
PPV	0.125	0.125	0.120	in/s
ZC Freq	30	37	28	Hz
Time (Rel. to Trig)	0.059	0.032	0.038	sec
Peak Acceleration	0.0795	0.106	0.0663	g
Peak Displacement	0.00067	0.00053	0.00069	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.5	

Peak Vector Sum 0.163 in/s at 0.042 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 12/12
ACTUAL BLAST DATE JAN. 12/12
BLAST # 158

HIGHWAY# 97
BLAST LOCATION AT: STN # 126+45 - 126+05 LS (3rd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 65 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 40 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 39
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 15
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 822 (m)

TOTAL NUMBER OF HOLES 39 B/L / 23 Buffer / 75 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 137
TOTAL NUMBER OF DELAYS 98

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 2100 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

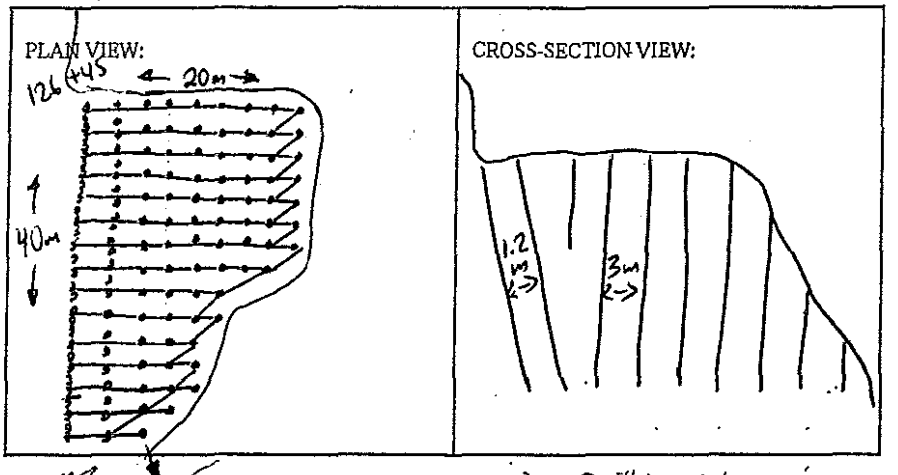
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS

VOLUME OF ROCK BLASTED 4800 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

39 - 12'ms dets.
23 - 24' Ez dets
75 - 30' Ez dets.

15 - 42ms connectadet
4 - 17ms connectadet
1 - Elec det.

76 - Anfo
5 - WR.
1 - 2" x 16"
1½ - 1½ x 16"
1 - 2½" x 16"

Instantel

Event Report

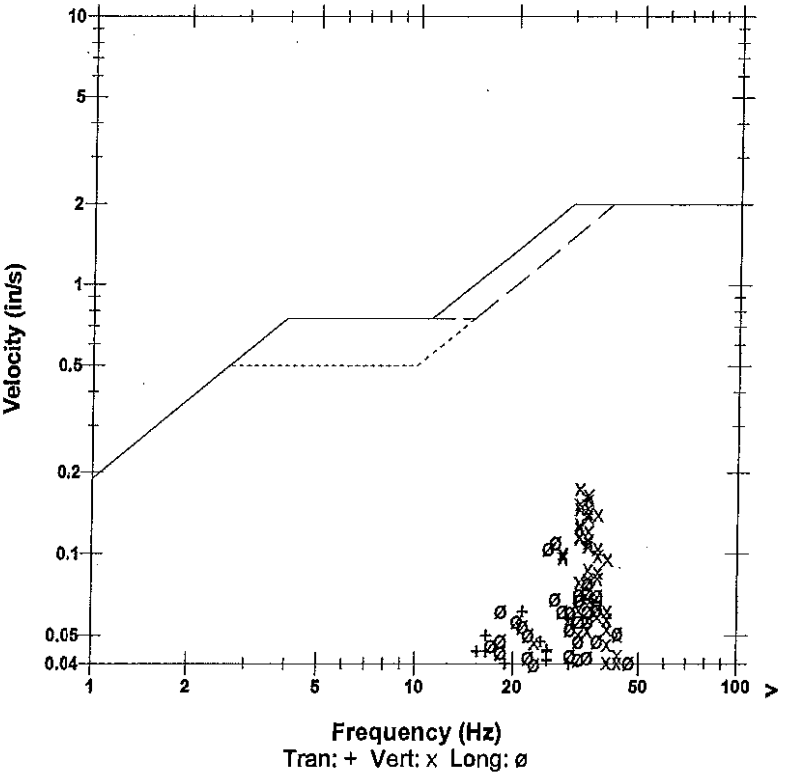
Date/Time	Vert at 15:47:53 January 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3UP.7T0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

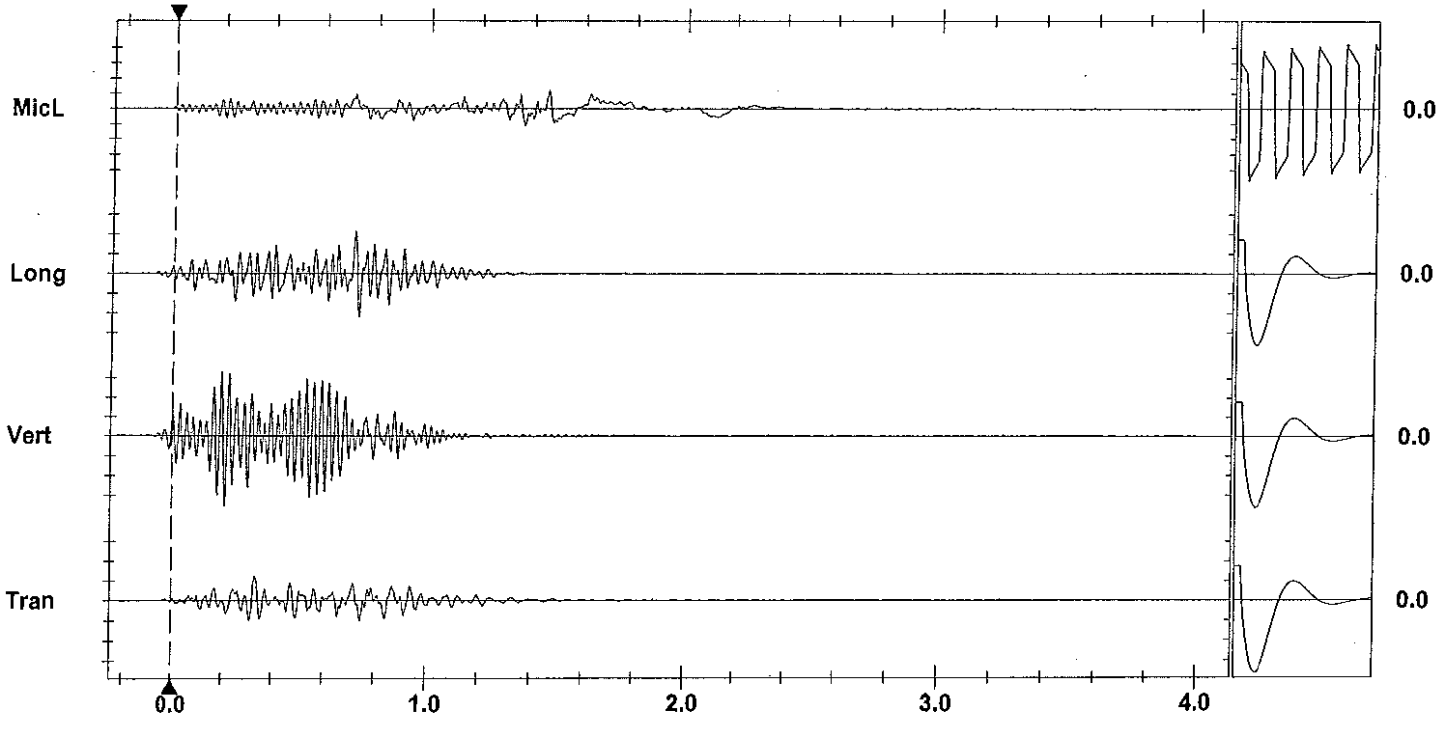
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00120 psi(L) at 1.456 sec			
ZC Freq	22 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 749 mv)			

	Tran	Vert	Long	
PPV	0.0612	0.176	0.111	in/s
ZC Freq	21	32	27	Hz
Time (Rel. to Trig)	0.334	0.211	0.734	sec
Peak Acceleration	0.0265	0.0978	0.0597	g
Peak Displacement	0.00047	0.00088	0.00063	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.179 in/s at 0.211 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Instantel

Event Report

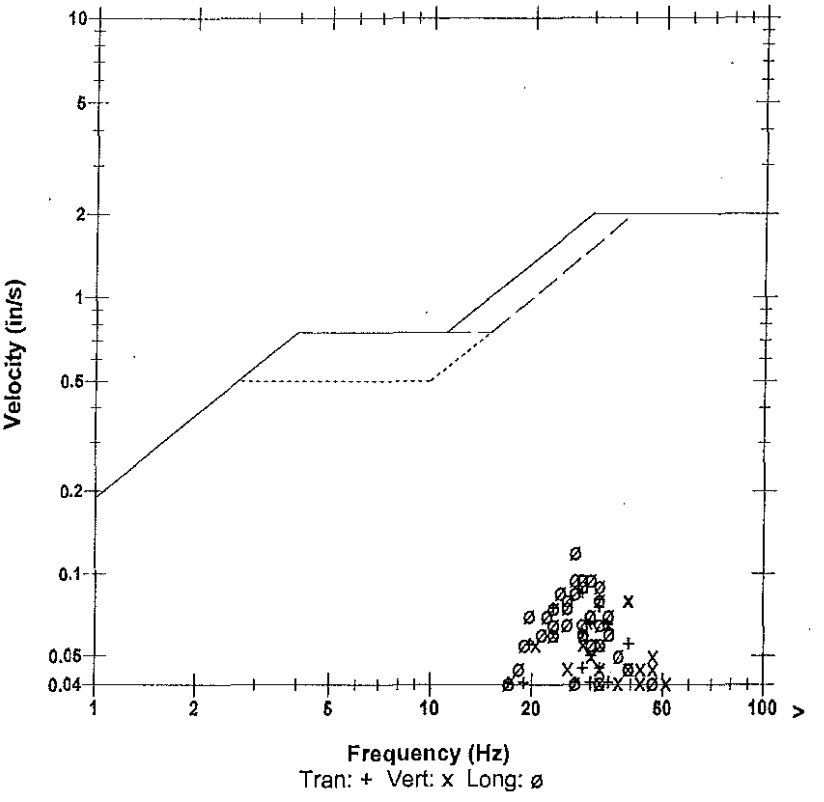
Date/Time	Long at 15:47:51 January 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E3UP.7R0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

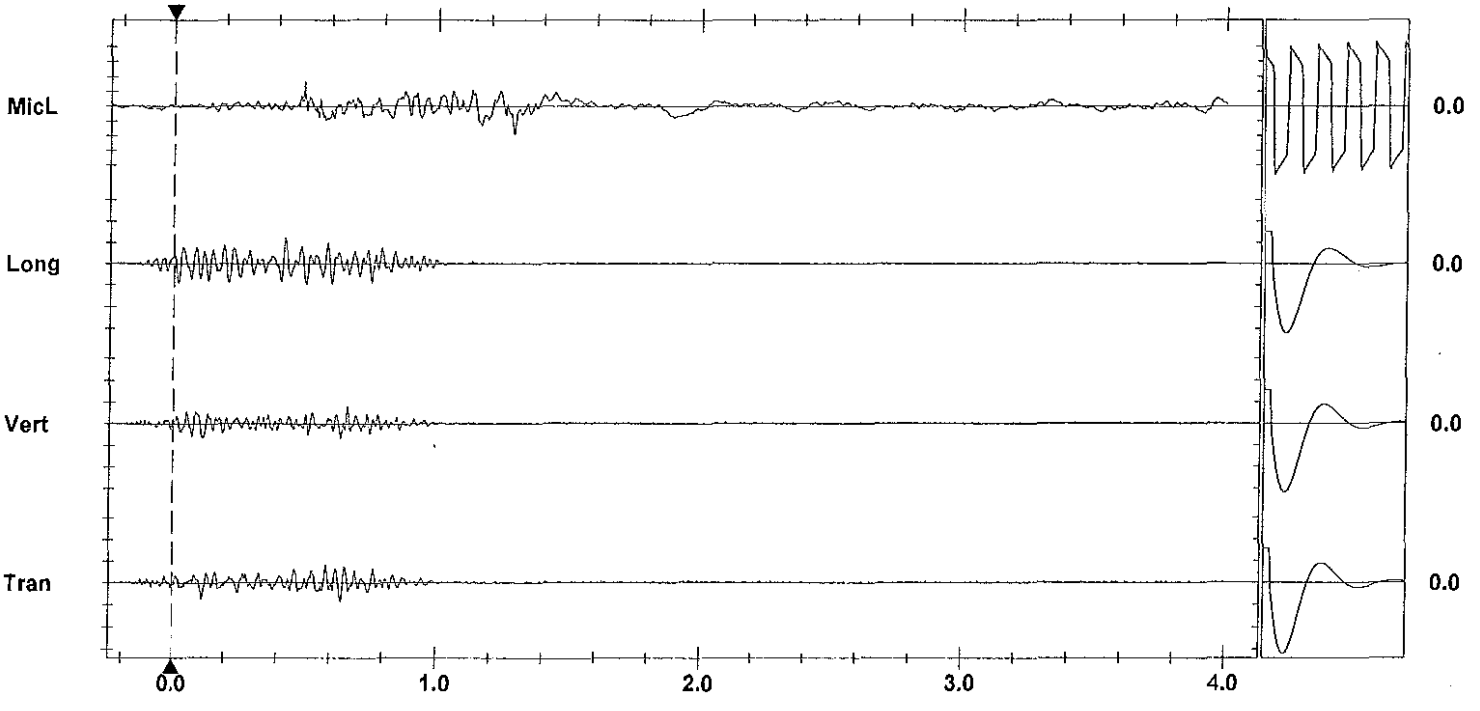
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 1.285 sec
ZC Freq	7.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 752 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0800	0.120	in/s
ZC Freq	28	39	27	Hz
Time (Rel. to Trig)	0.642	0.665	0.426	sec
Peak Acceleration	0.0530	0.0530	0.0530	g
Peak Displacement	0.00047	0.00048	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.7	3.7	4.5	

Peak Vector Sum 0.125 in/s at 0.587 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: January 14, 2012 07:8.01 - 8.01
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5034B9

DATE PREPARED JAN 13/12
ACTUAL BLAST DATE Jan 13/12 2:05 PM
BLAST # 160

HIGHWAY# 97
BLAST LOCATION AT: STN 127+56 - 127+62 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8 (7 loaded)
AVERAGE DEPTH 6.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.2 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 8 6 1/3 buffer / 2 stab / 20 Total
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 36
TOTAL NUMBER OF DELAYS 29

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 350 (kg)
DELAY TYPE AND LENGTH 17, 25 + 42 (ms)

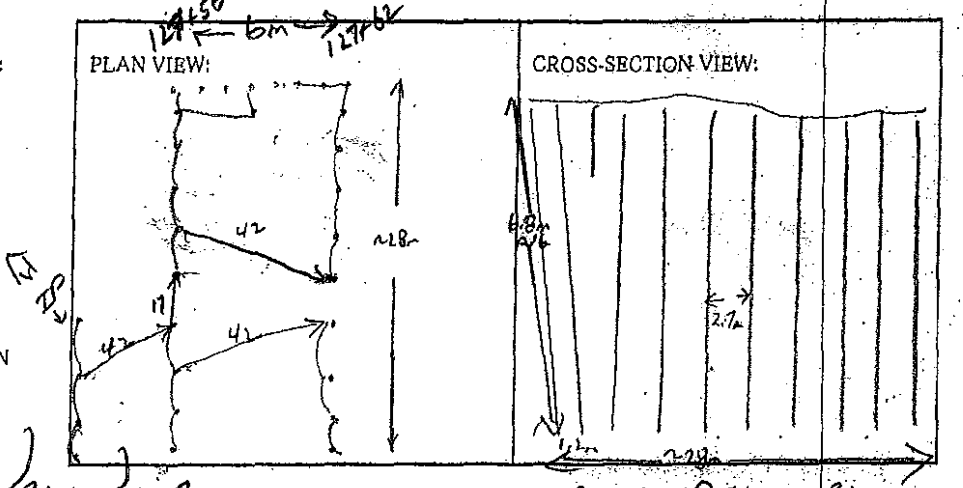
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBL INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 1100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

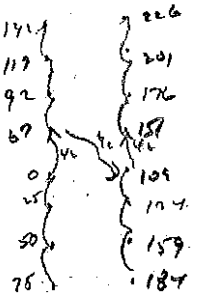
Seismograph @ 13073 Cliffstone Cst. - 0.360 ips 32Hz
@ 13050 OLD MISSION ROAD - 0.518 ips 37Hz

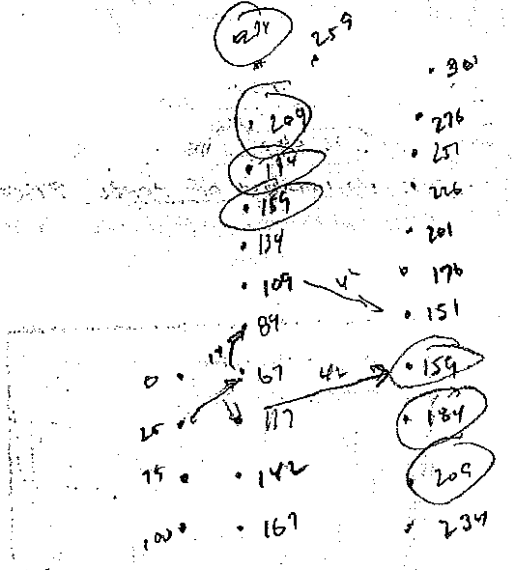
9 AWRO.

1 WATERBlock

1 1½ x 16 manway

2 3 x 16 Bladex





Instantel

Event Report

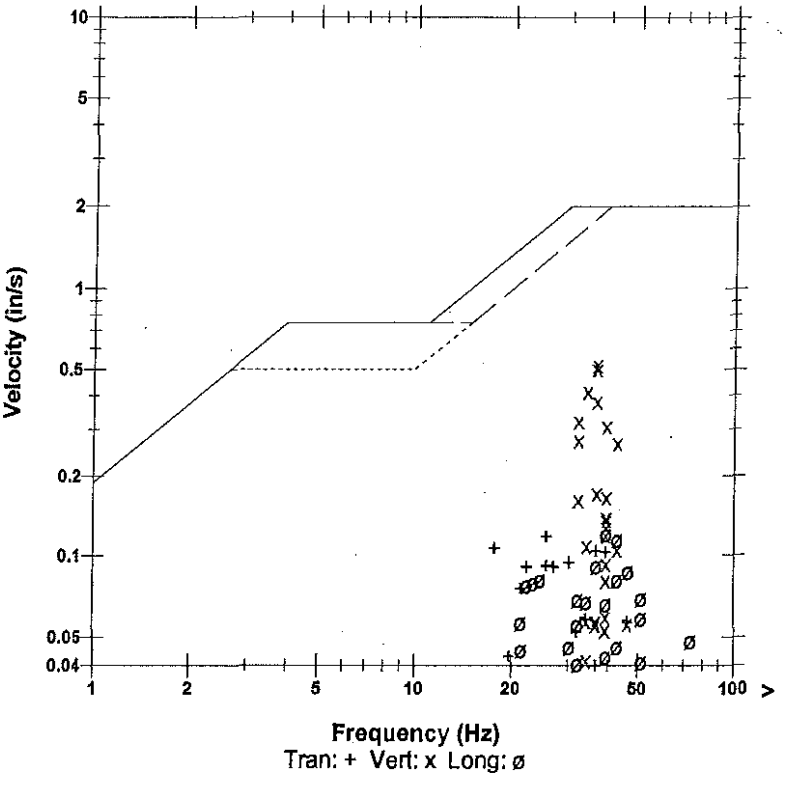
Date/Time	Vert at 14:05:03 January 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E3WF.4F0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

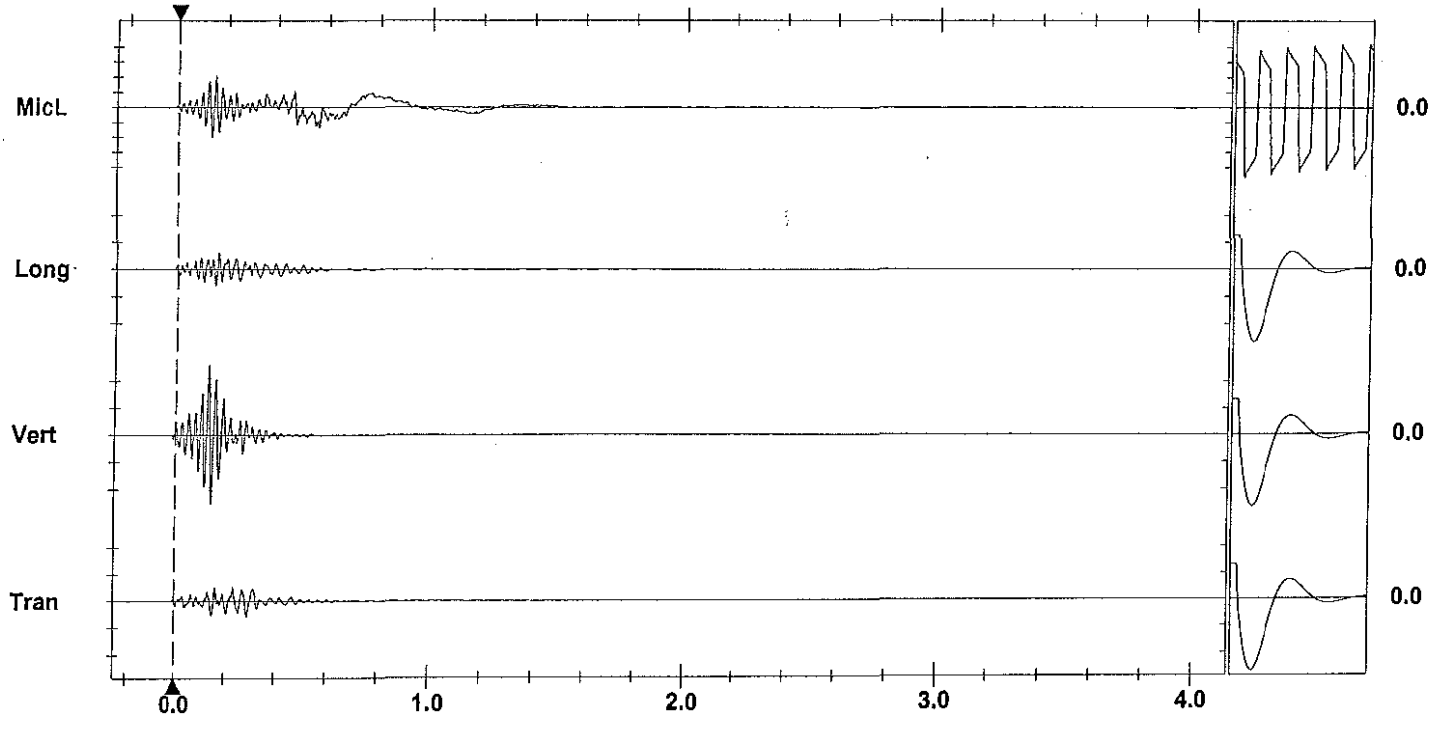
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00207 psi(L) at 0.149 sec			
ZC Freq	39 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 703 mv)			

	Tran	Vert	Long	
PPV	0.117	0.518	0.120	in/s
ZC Freq	26	37	39	Hz
Time (Rel. to Trig)	0.292	0.133	0.164	sec
Peak Acceleration	0.0829	0.365	0.0961	g
Peak Displacement	0.00067	0.00219	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.523 in/s at 0.133 sec



Time Scale:0.20 sec/div **Amplitude Scale:**Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Instantel

Event Report

Date/Time	Long at 14:05:00 January 13, 2012
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

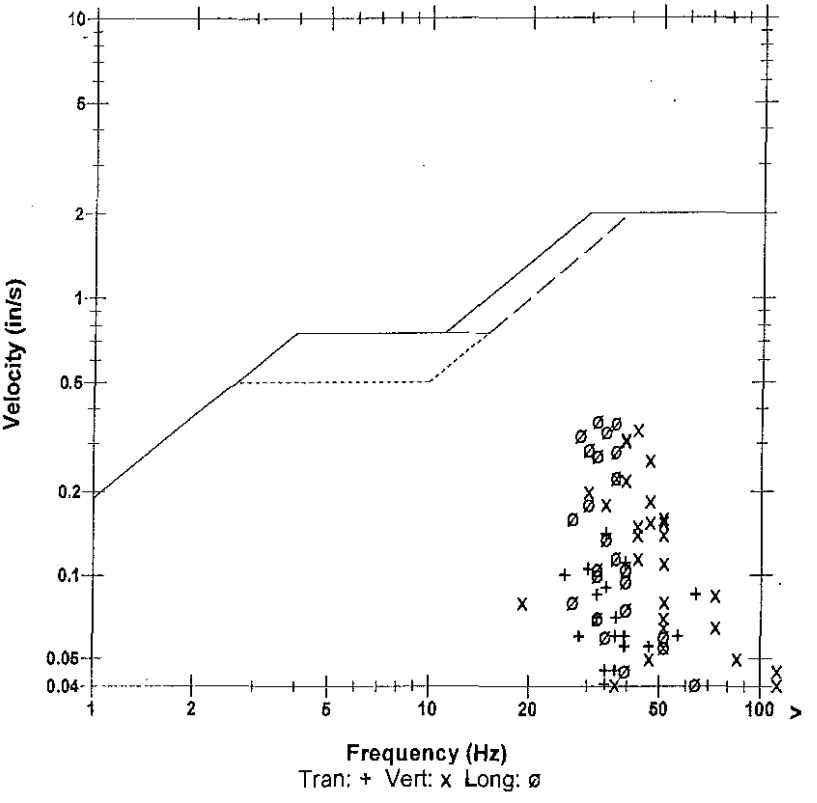
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.2 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E3WF.4C0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

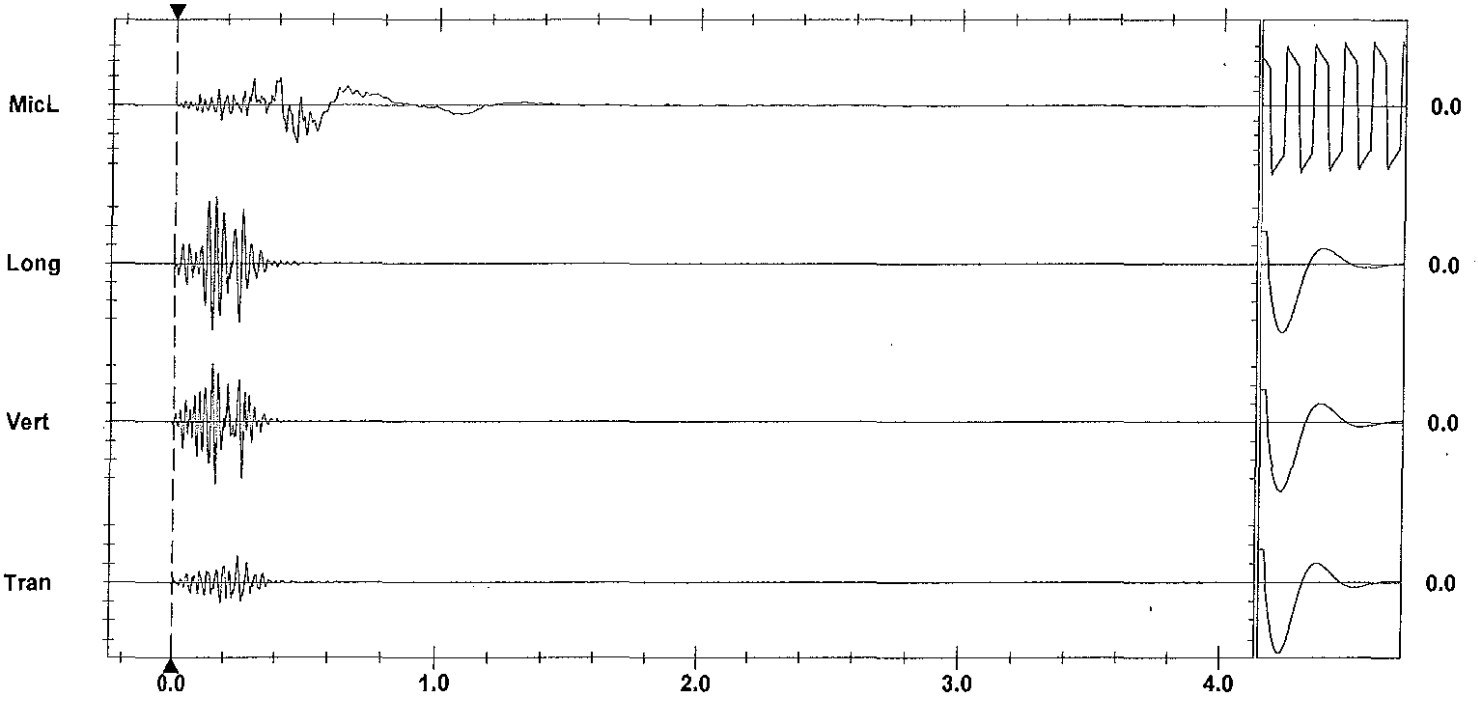
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00261 psi(L) at 0.468 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 718 mv)

	Tran	Vert	Long	
PPV	0.140	0.335	0.360	in/s
ZC Freq	34	43	32	Hz
Time (Rel. to Trig)	0.255	0.164	0.150	sec
Peak Acceleration	0.106	0.265	0.212	g
Peak Displacement	0.00060	0.00124	0.00164	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.489 in/s at 0.164 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— —— ——◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 16/12
ACTUAL BLAST DATE JAN. 16/12
BLAST # 161 @ ~~1:30~~ 1:07 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+62 - 127+68 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 216 (m)

TOTAL NUMBER OF HOLES 10 B/L/3 Buffer/14 production
HOLE DIAMETER [illegible] (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 27
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 300 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

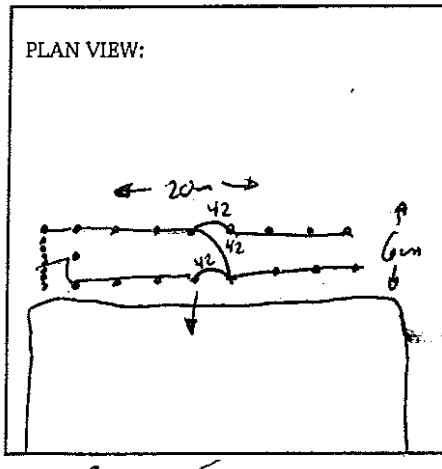
VOLUME OF ROCK BLASTED 960 (m^3)

BLAST SKETCH:

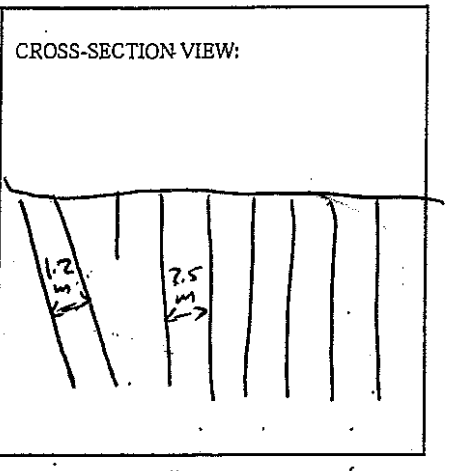
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

10 - 12'ms dets
2 - 24' Ez dets
15 - 30' Ez dets
3 - 42ms connected
1 - Elec det.

10 - Anfo
1 - 3"x16"
1 - WR
1/2 cast 1½x16

Instantel

Event Report

Date/Time	Vert at 13:07:39 January 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E41W.GR0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

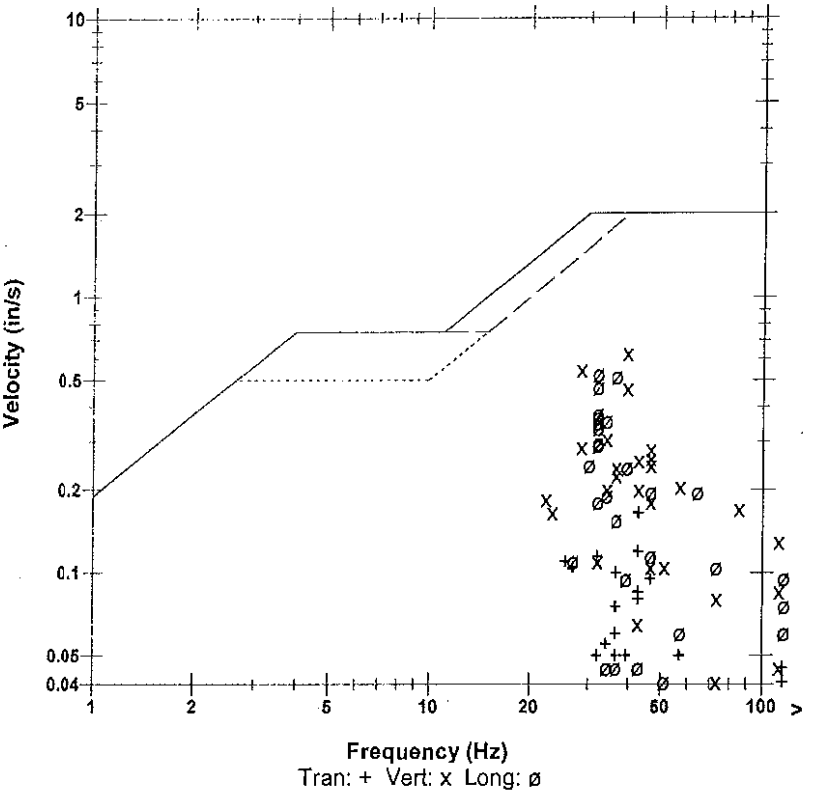
Post Event Notes

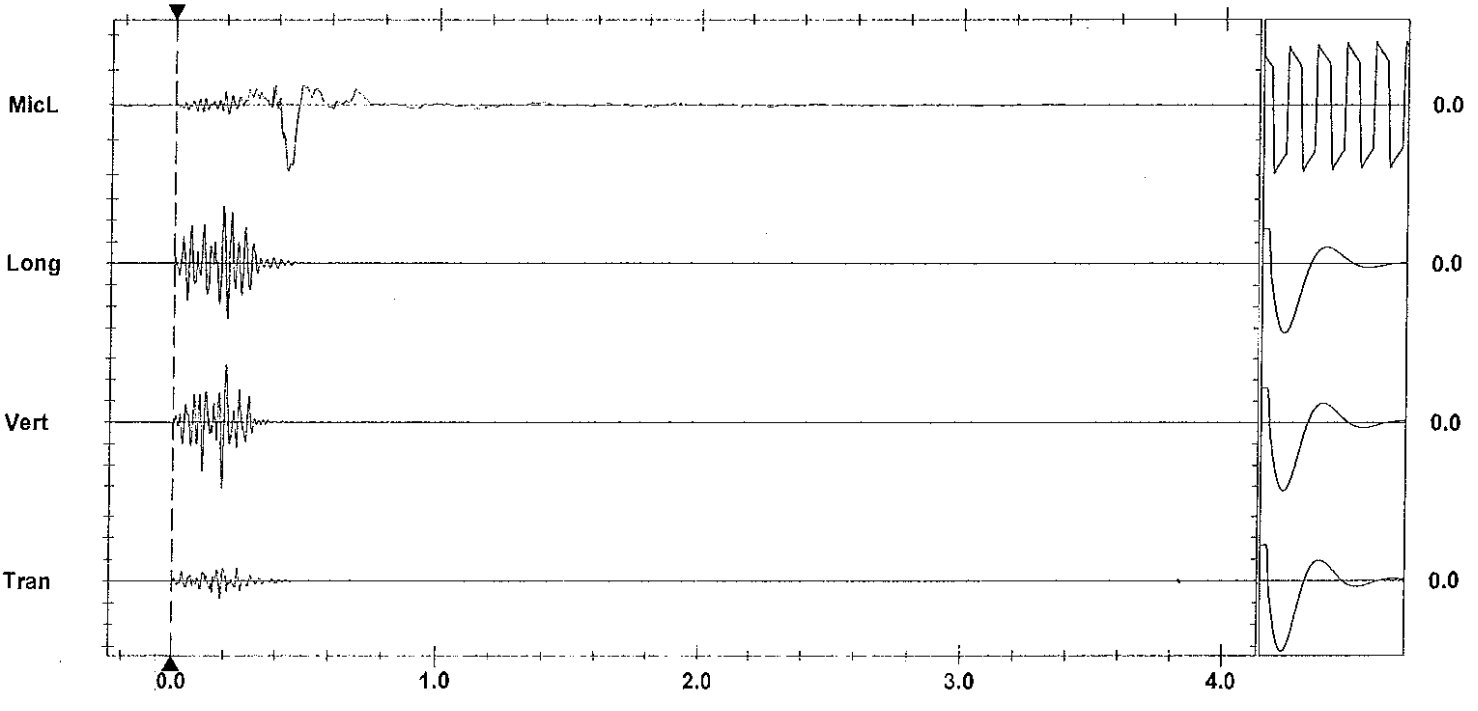
Microphone Linear Weighting
PSPL 0.00950 psi(L) at 0.435 sec
ZC Freq 7.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 686 mv)

	Tran	Vert	Long	
PPV	0.165	0.625	0.525	in/s
ZC Freq	43	39	32	Hz
Time (Rel. to Trig)	0.188	0.190	0.190	sec
Peak Acceleration	0.119	0.358	0.331	g
Peak Displacement	0.00058	0.00258	0.00251	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.5	3.6	4.2	

Peak Vector Sum 0.820 in/s at 0.190 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00500 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

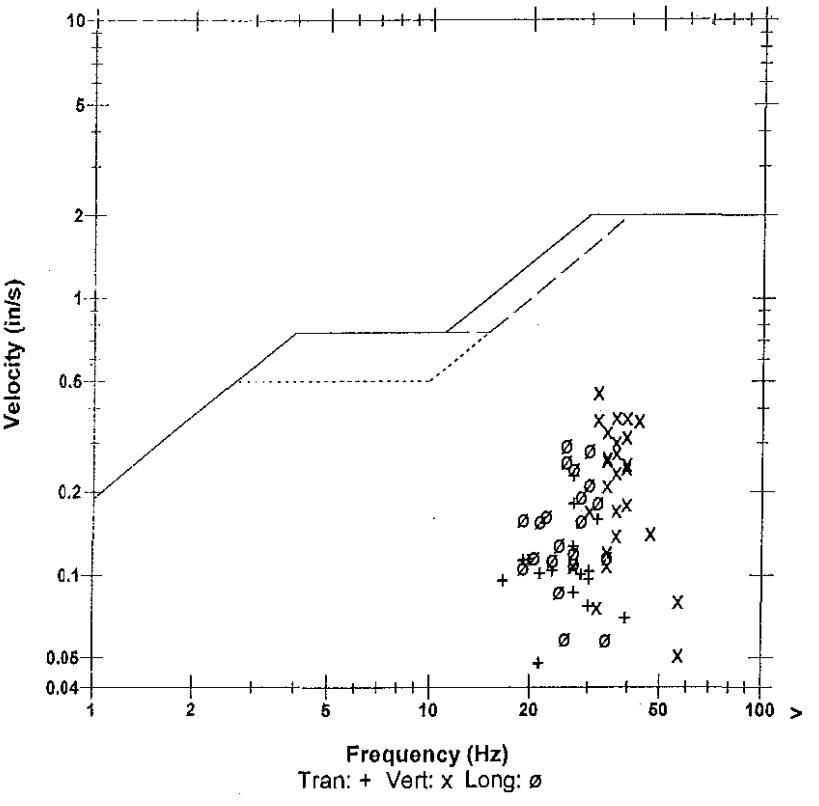
Date/Time	Vert at 13:07:45 January 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E41W.GX0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

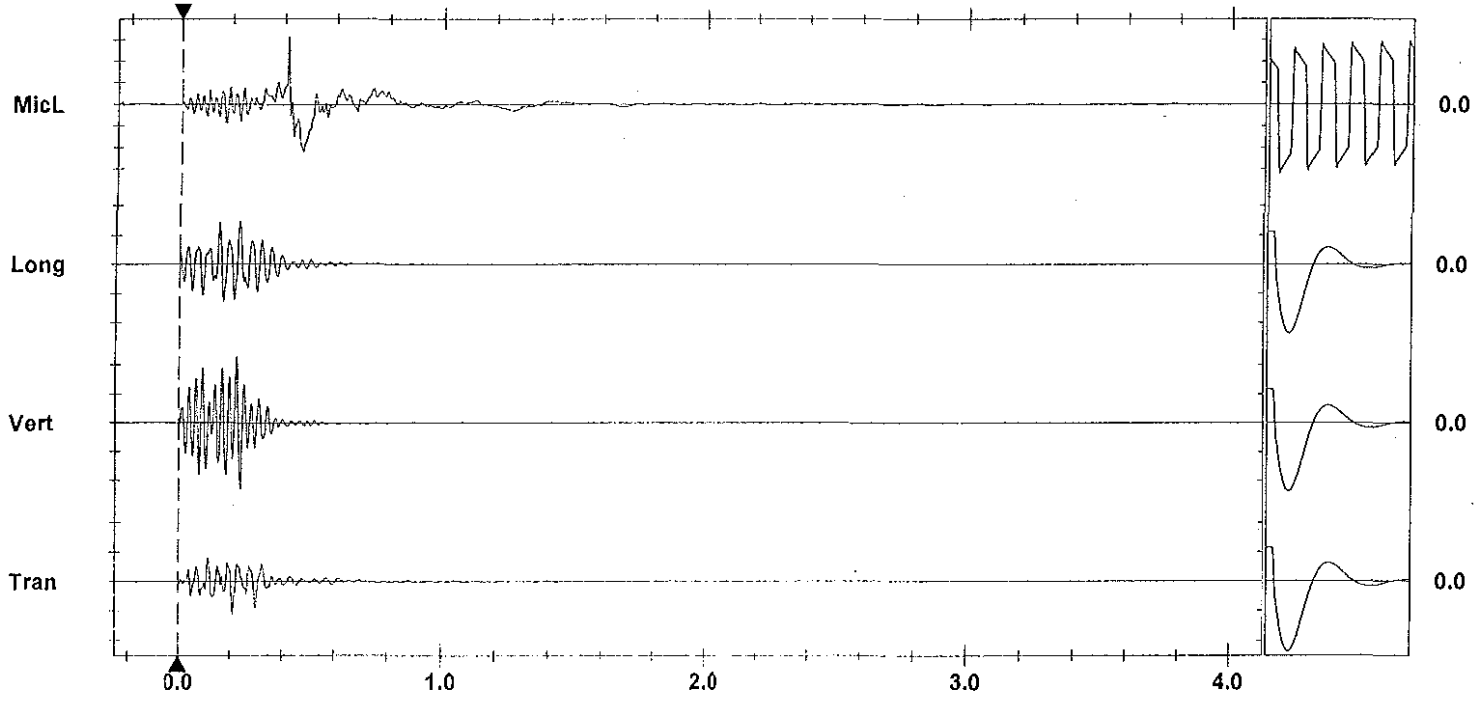
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00624 psi(L) at 0.413 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 766 mv)

	Tran	Vert	Long	
PPV	0.227	0.457	0.293	in/s
ZC Freq	27	32	26	Hz
Time (Rel. to Trig)	0.212	0.240	0.234	sec
Peak Acceleration	0.103	0.267	0.157	g
Peak Displacement	0.00115	0.00217	0.00171	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.499 in/s at 0.239 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00200 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN 16/12
ACTUAL BLAST DATE JAN 16/12
BLAST # 162 @ ~~2:30~~ 4:08 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+74 – 127+68 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 85 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 165 (m)

TOTAL NUMBER OF HOLES 8 BL/3 Buffer/12 production
HOLE DIAMETER (mm) 89
HOLE SPACING @ 2.2 (m) BURDEN @ 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 23
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 225 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

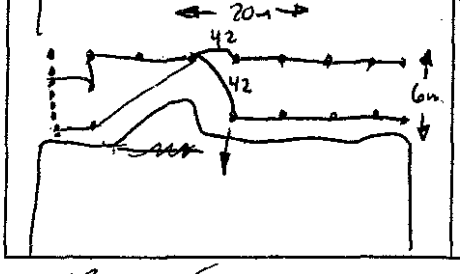
VOLUME OF ROCK BLASTED 900 (m^3)

BLAST SKETCH:

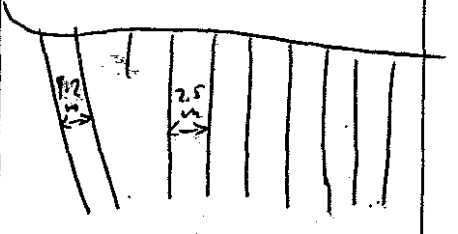
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

8- 12' ms dets
1 - 24' EZ dets
11 - 30' EZ dets
2 - 42 ms connectadel.
1 - Elec del.

6- bags Anfo
1 - bag ANR
1 - CASE 3" x 16"
1/2 CASE 1 1/2 x 16.

Instantel®

Event Report

Date/Time	Vert at 16:08:29 January 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E424.U50
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

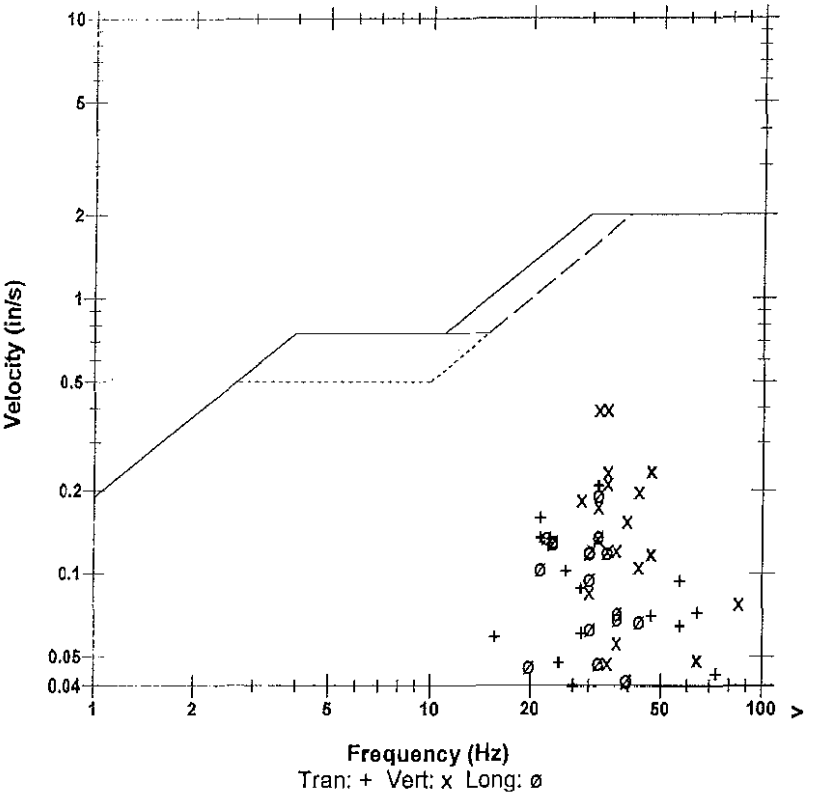
Post Event Notes

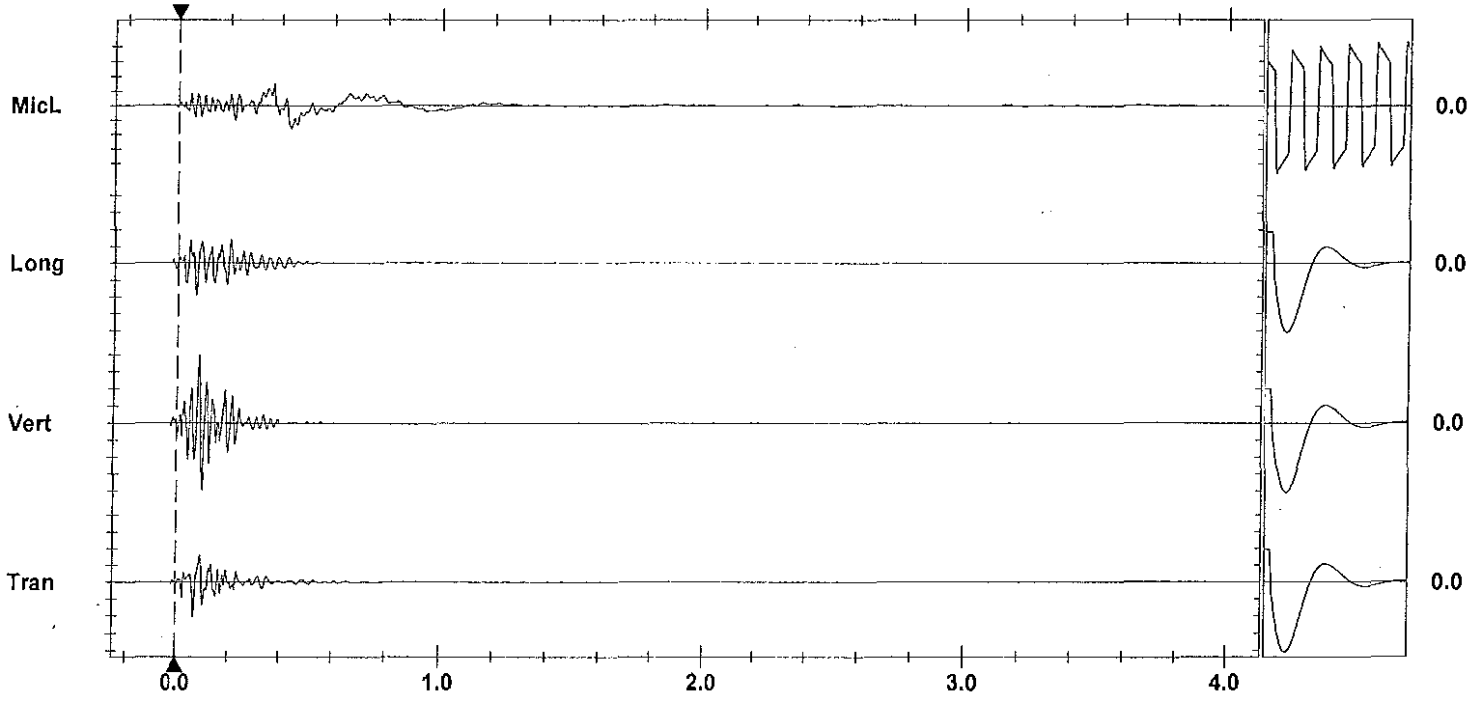
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.434 sec
ZC Freq 5.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 762 mv)

	Tran	Vert	Long	
PPV	0.209	0.396	0.193	in/s
ZC Freq	32	34	32	Hz
Time (Rel. to Trig)	0.071	0.102	0.071	sec
Peak Acceleration	0.133	0.204	0.103	g
Peak Displacement	0.00105	0.00185	0.00087	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.9	4.0	4.2	

Peak Vector Sum 0.415 in/s at 0.087 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Event Report

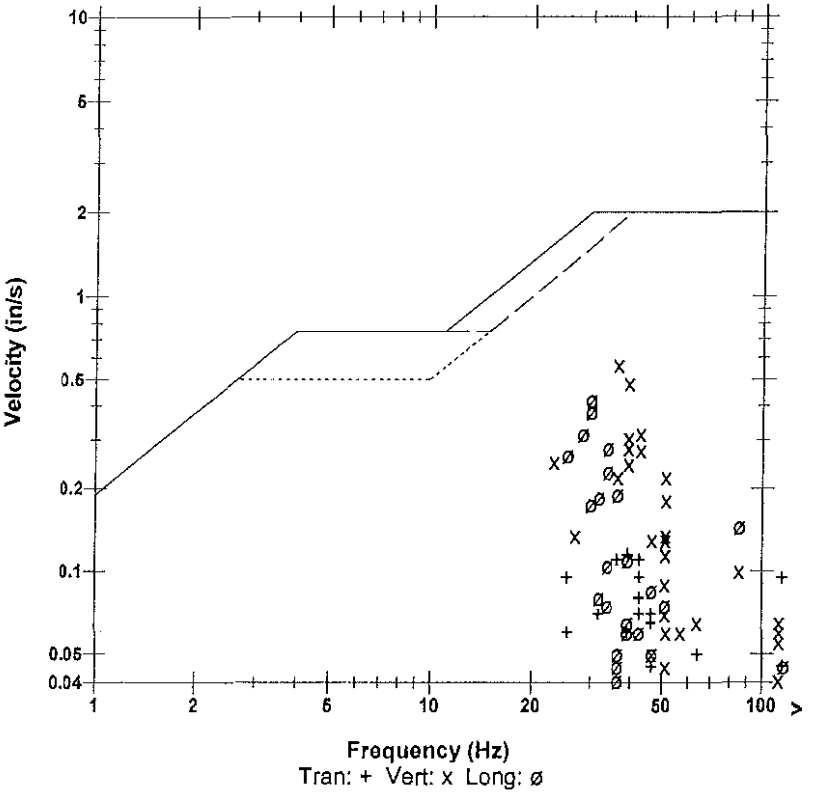
Date/Time	Vert at 16:08:24 January 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E424.U00

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

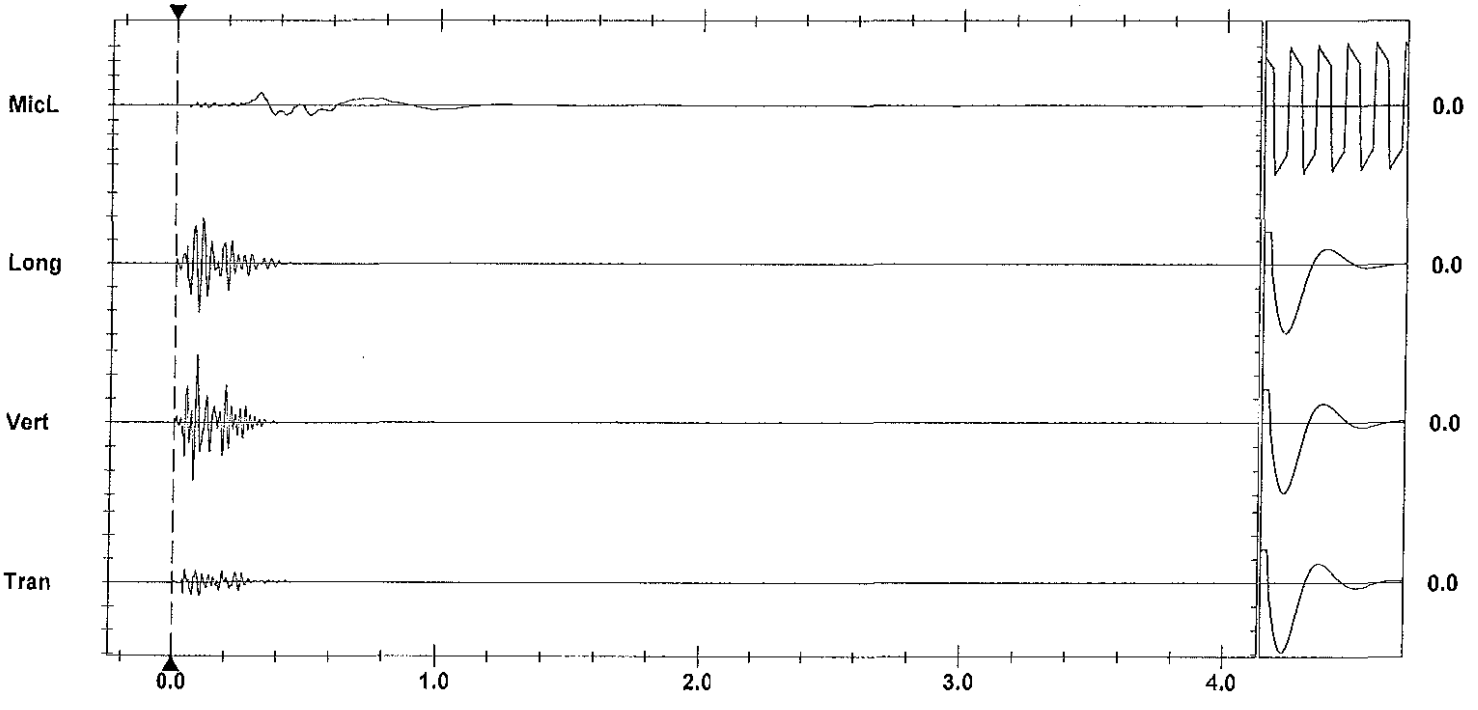
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00080 psi(L) at 0.321 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 794 mv)

	Tran	Vert	Long	
PPV	0.115	0.565	0.420	in/s
ZC Freq	39	37	30	Hz
Time (Rel. to Trig)	0.105	0.090	0.093	sec
Peak Acceleration	0.133	0.504	0.225	g
Peak Displacement	0.00056	0.00232	0.00201	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.656 in/s at 0.090 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 17/12
ACTUAL BLAST DATE JAN 17/12.
BLAST # 163 @ 12:45

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+74 - 127+80 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 180 (m)

TOTAL NUMBER OF HOLES 7 B/L / 3 Buffer / 14 production
HOLE DIAMETER 89 (mm)
HOLE SPACING @ 2.2 (m) BURDEN @ 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 250 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

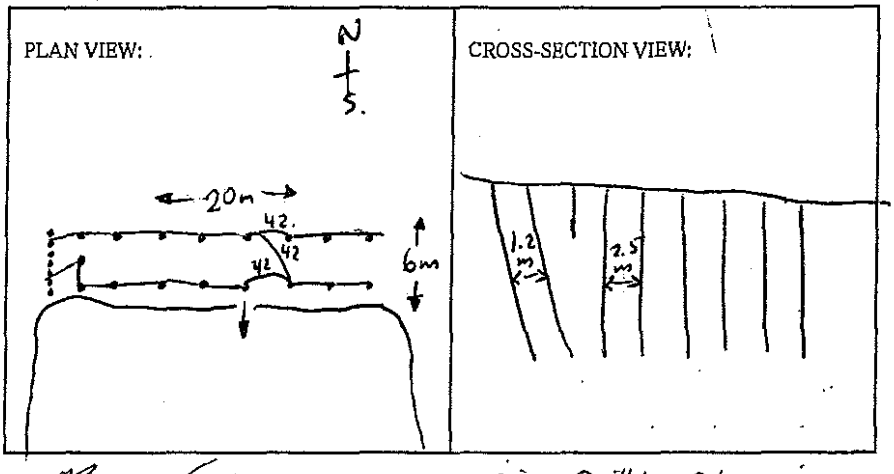
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 900 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

7 - 12'ms dets

2 - 24' EZ dets.

15 - 30' EZ dets.

3 - 42ms connecto. det

1 - Elec det.

7 bags Anfo

2 - bags WR.

1/2 - CASE 1½x16.

Instantel

Event Report

Date/Time	Long at 12:47:24 January 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E43Q.700
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

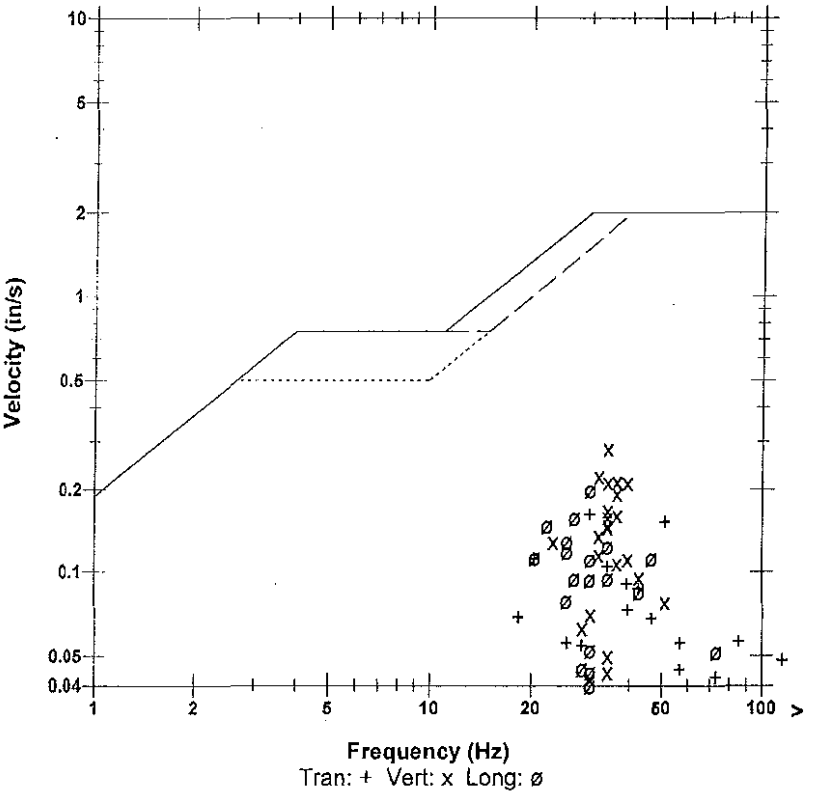
Post Event Notes

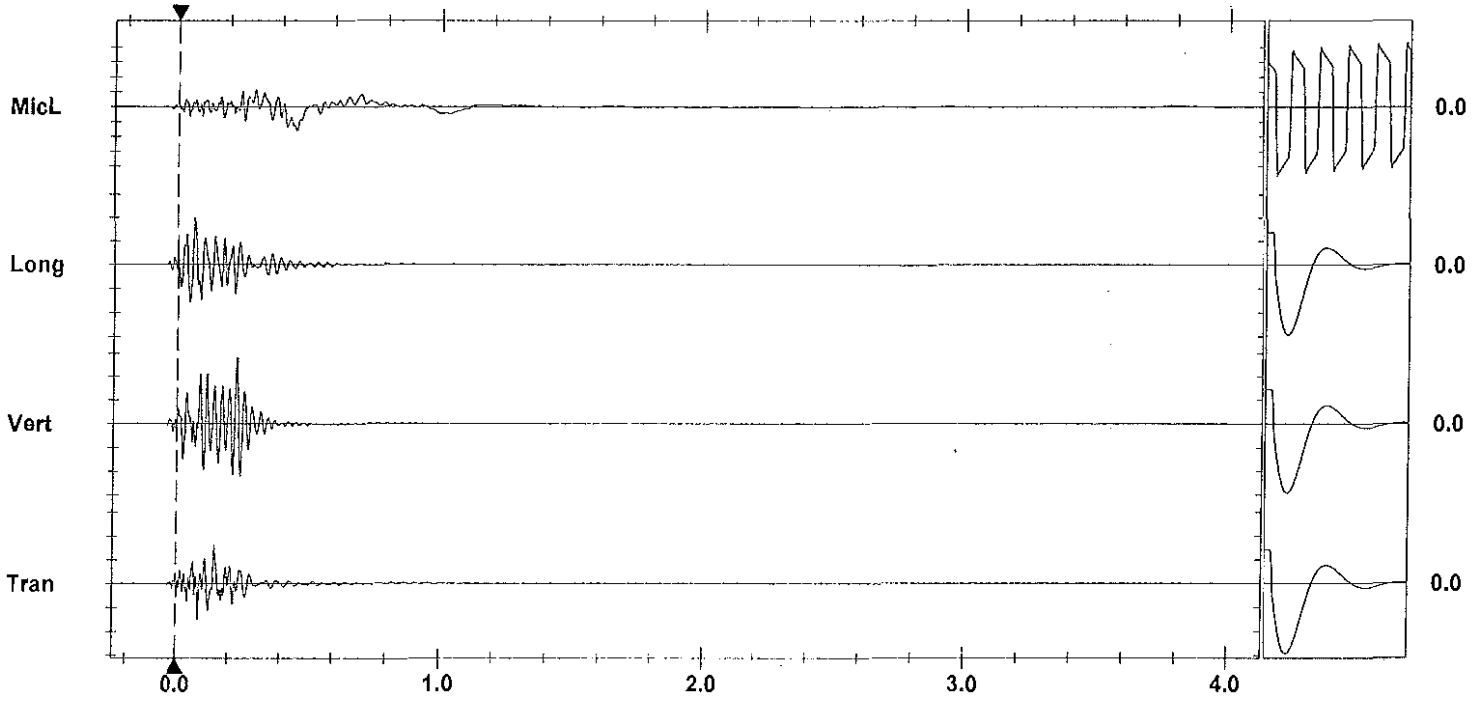
Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.453 sec
ZC Freq 6.3 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 793 mv)

	Tran	Vert	Long	
PPV	0.162	0.282	0.199	in/s
ZC Freq	30	34	30	Hz
Time (Rel. to Trig)	0.150	0.232	0.065	sec
Peak Acceleration	0.116	0.156	0.123	g
Peak Displacement	0.00075	0.00132	0.00106	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.286 in/s at 0.232 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 12:47:18 January 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E43Q.6U0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

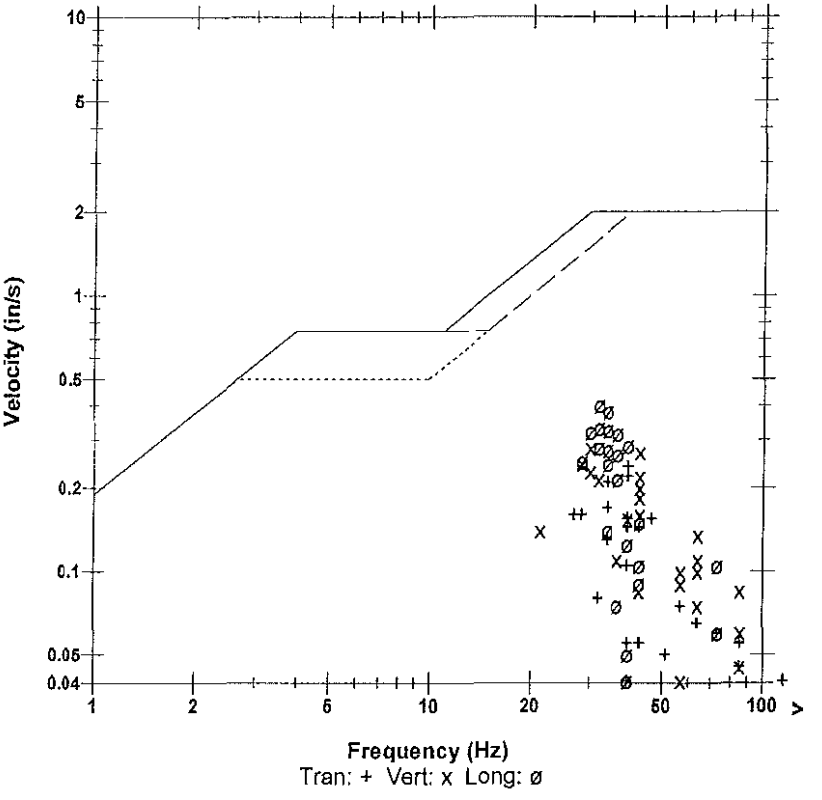
Post Event Notes

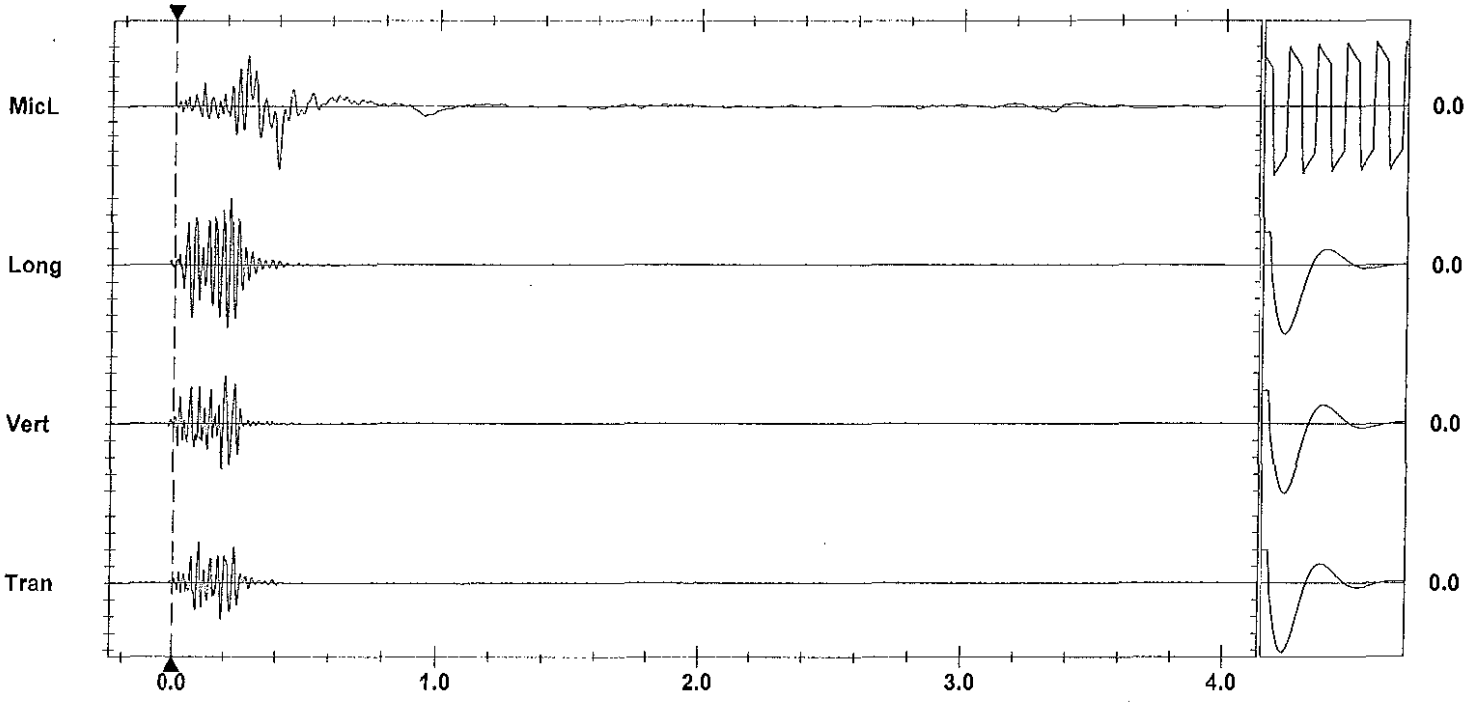
Microphone Linear Weighting
PSPL 0.00428 psi(L) at 0.400 sec
ZC Freq 5.8 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 768 mv)

	Tran	Vert	Long	
PPV	0.240	0.280	0.400	in/s
ZC Freq	39	30	32	Hz
Time (Rel. to Trig)	0.104	0.200	0.219	sec
Peak Acceleration	0.172	0.212	0.278	g
Peak Displacement	0.00103	0.00144	0.00194	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.486 in/s at 0.219 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 17/12
ACTUAL BLAST DATE JAN 17/12
BLAST # 164 @ ~~1530~~ 3:01 PM

HIGHWAY# 97
BLAST LOCATION AT: STN # 127 + 80 - 127 + 86 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY. Ø (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 98 (m)

TOTAL NUMBER OF HOLES 14 production
HOLE DIAMETER ~~115~~ (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 425 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

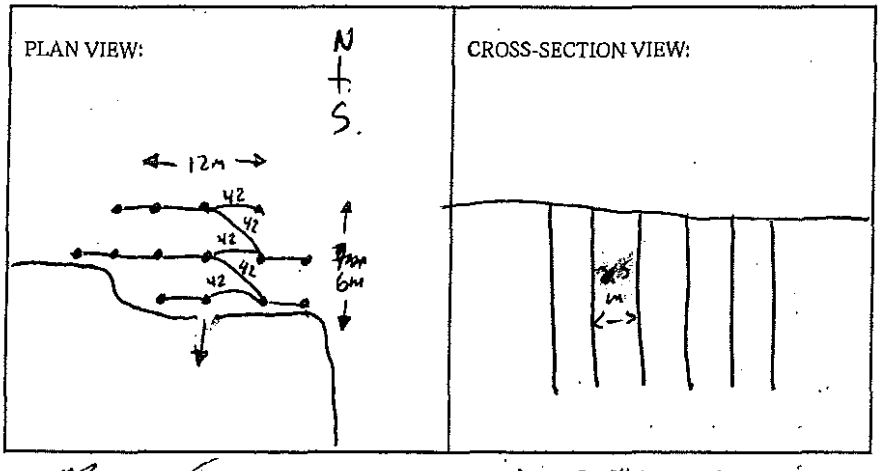
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 504 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

14 - 30' Ez dets.
8 - 12' ms dets.
5 - 42 ms connectadets
1 - Elec dets
1½ bAg WR
6 - bAg Anfo
10 sticks 1½ x 16"

Instantel®

Event Report

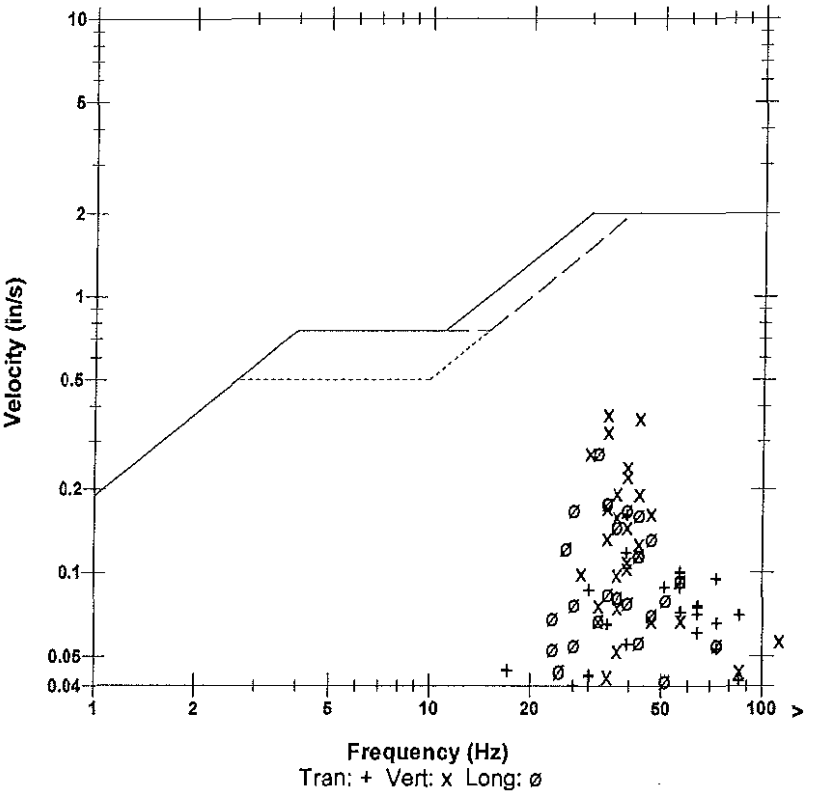
Date/Time	Vert at 15:01:27 January 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E43W.EF0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

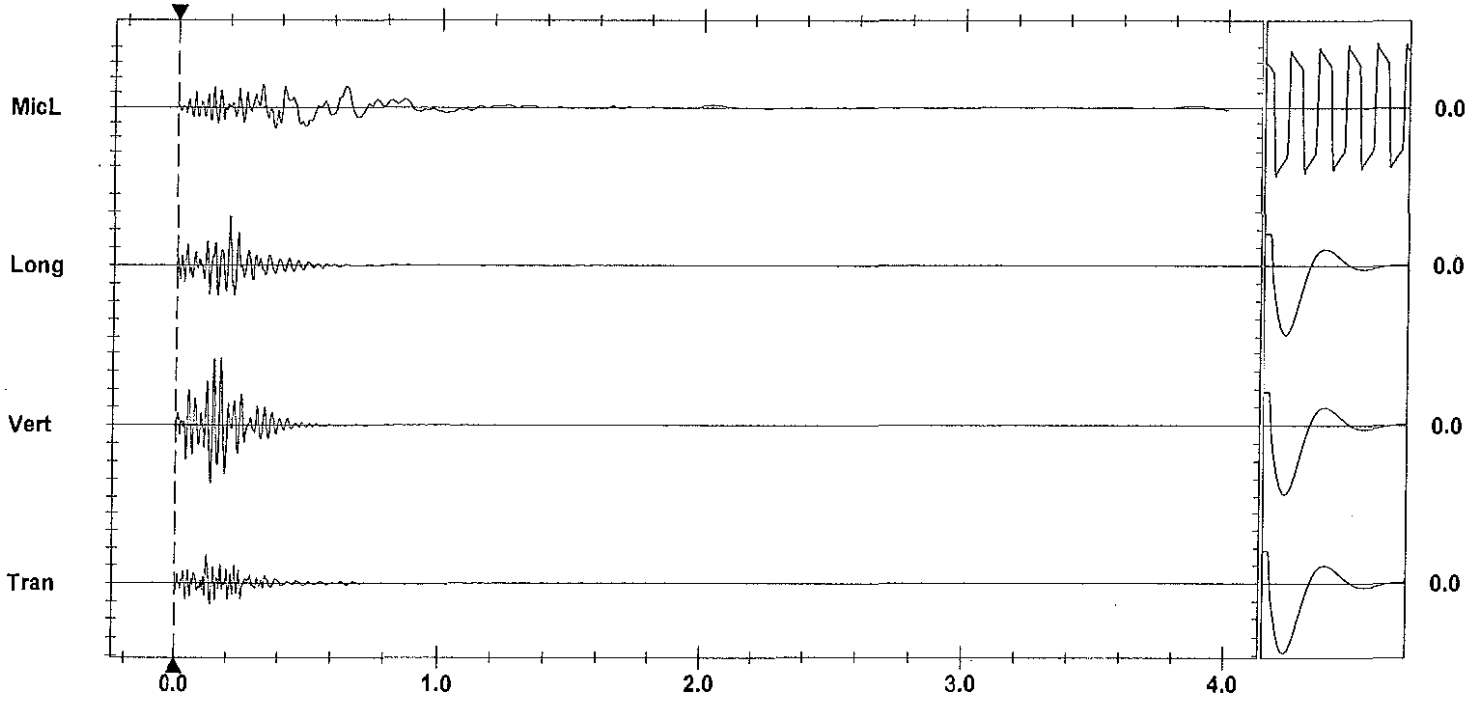
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00152 psi(L) at 0.327 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 780 mv)

	Tran	Vert	Long	
PPV	0.161	0.374	0.271	in/s
ZC Freq	39	34	32	Hz
Time (Rel. to Trig)	0.125	0.176	0.202	sec
Peak Acceleration	0.141	0.270	0.139	g
Peak Displacement	0.00059	0.00152	0.00111	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.9	4.0	4.3	

Peak Vector Sum 0.391 in/s at 0.176 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Instantel

Event Report

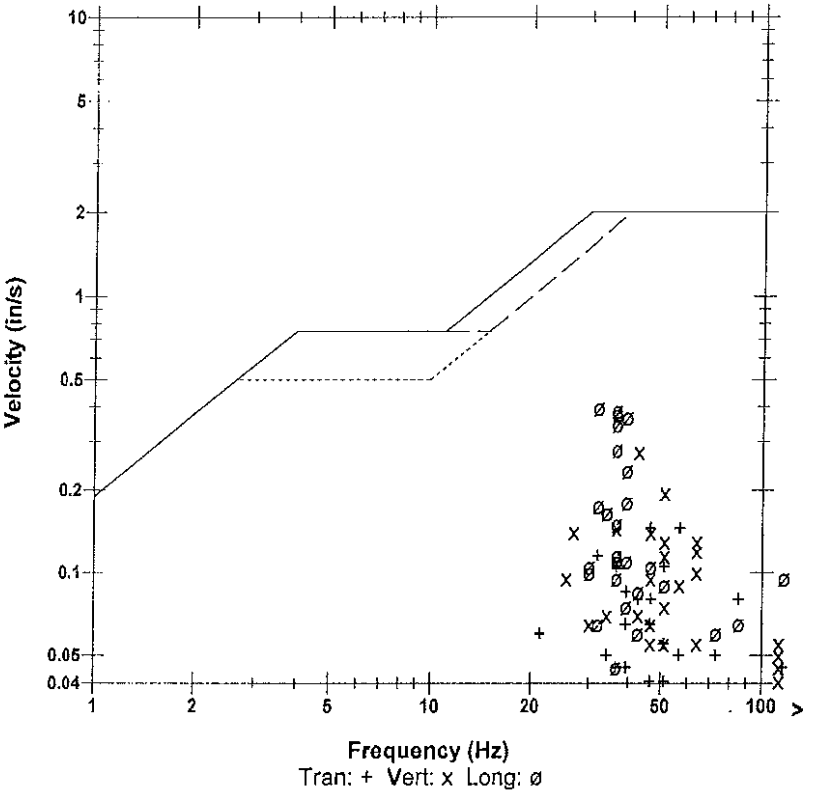
Date/Time	Vert at 15:01:21 January 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E43W.E90

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

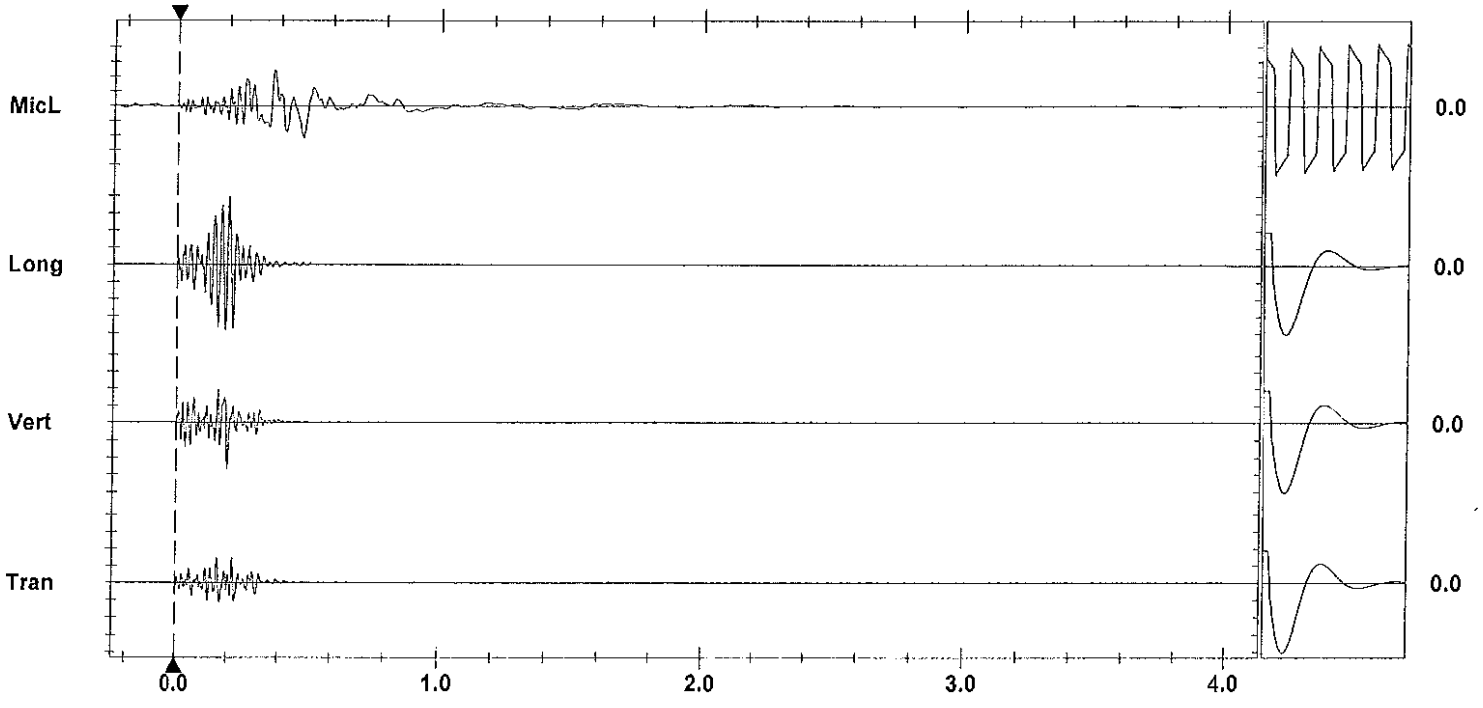
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00243 psi(L) at 0.374 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 769 mv)

	Tran	Vert	Long	
PPV	0.145	0.275	0.395	in/s
ZC Freq	47	43	32	Hz
Time (Rel. to Trig)	0.165	0.199	0.201	sec
Peak Acceleration	0.119	0.239	0.252	g
Peak Displacement	0.00051	0.00101	0.00183	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.464 in/s at 0.201 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

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AS-Built

~~PROPOSED~~ BLAST DESIGN

File #:

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING + BLASTING
BLASTER'S NAME JAMES MAWHINNEY
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
PROPOSED BLAST DATE JAN 18/12 12:05 PM
BLAST # 166

HIGHWAY # 97
BLAST LOCATION AT: STN # 127+86 - 128+02 (Toe Side) LS

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

ANTICIPATED DRILLING DETAILS:

~~PROPOSED~~ NO. OF BACKLINE HOLES 10
~~PROPOSED~~ AVG. DEPTH 7 (m)
~~PROPOSED~~ NO. OF ROWS 3
~~PROPOSED~~ MAXIMUM DEPTH 8 (m)
~~PROPOSED~~ TOTAL DEPTH 33/147 (m)

~~PROPOSED~~ APPROX. NO. OF HOLES 5 Buffer / 6 prod. / 10 Bf
HOLE DIA. [redacted] (mm) 89
APPROX. HOLE SPACING [redacted] 2.2 (m) BURDEN [redacted] 2.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded w/200 grain Det cord

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
~~APPROX.~~ NUMBER OF CARTRIDGES 21
~~PROPOSED~~ NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

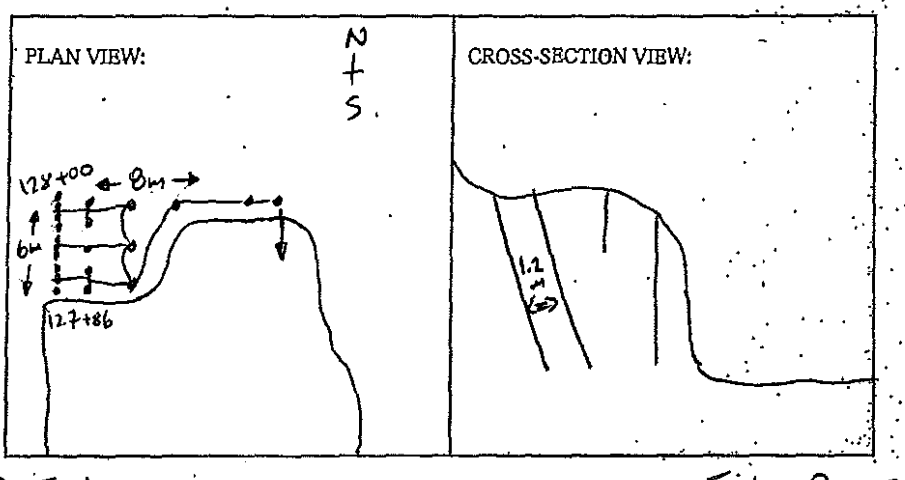
INITIATION DEVICE: (CIRCLE) E.B. CAPS · SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel system
BLASTING MACHINE: TYPE HB 320 CAPACITY 85 caps

~~APPROX.~~ VOLUME OF ROCK TO BE BLASTED 350 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE James Mawhinney COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

10 - 12'ms dests.

5 - 40' EZ dets.

6 - 24' EZ dets.

3 - 42ms connecta det.

1 - 17ms connecta det.

1 Elec det.

5 - Anfo

18 sticks 1½"x16"

Instantel

Event Report

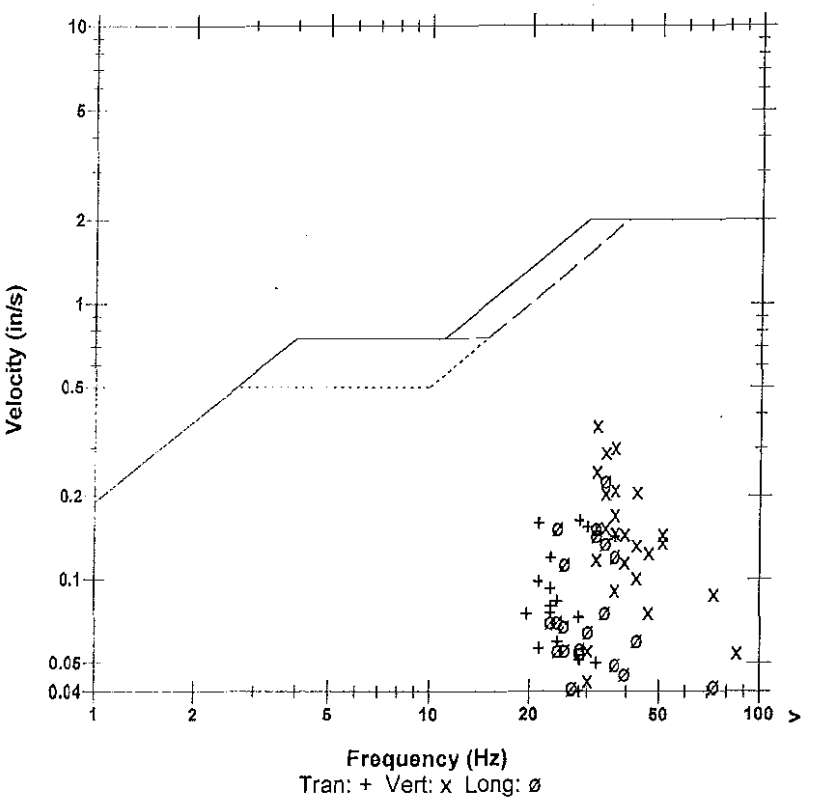
Date/Time	Long at 12:05:55 January 18, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E45I.XV0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

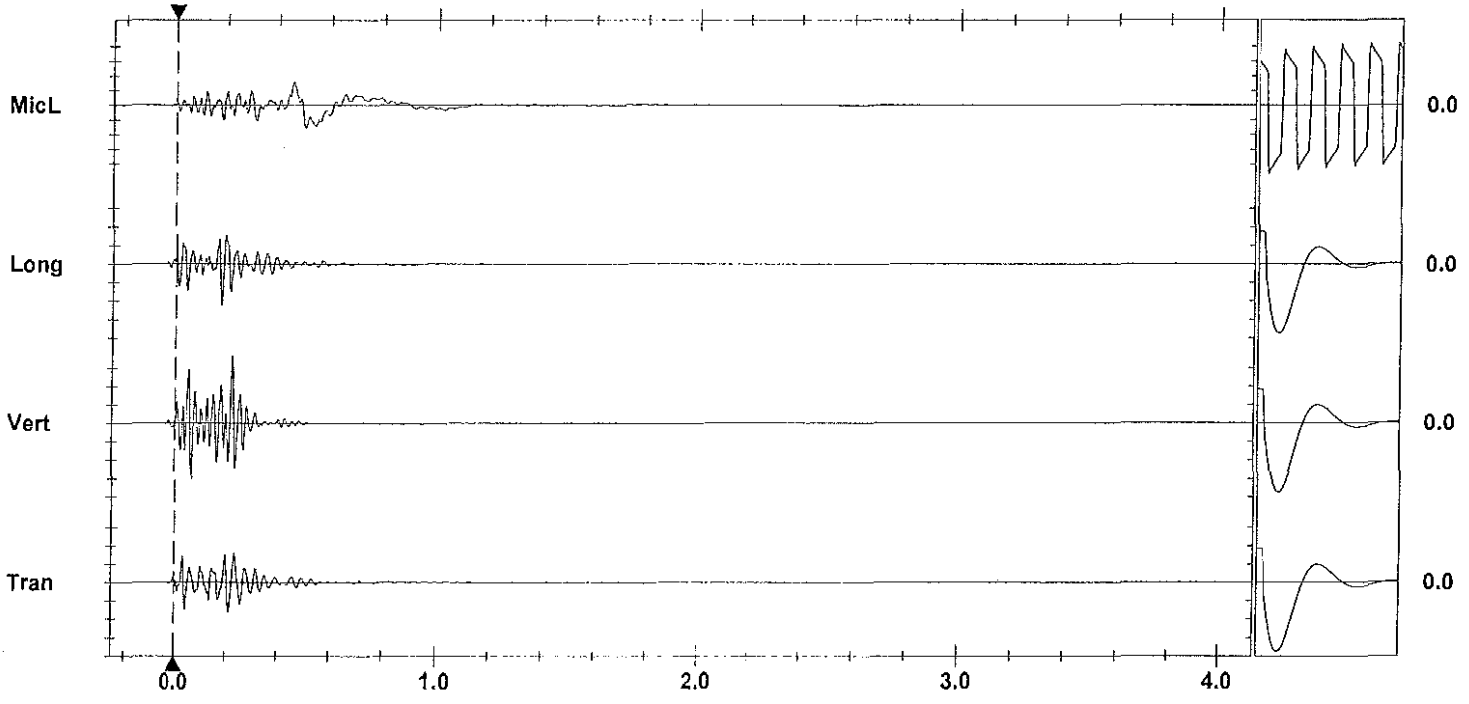
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00156 psi(L) at 0.452 sec			
ZC Freq	8.5 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 805 mv)			

	Tran	Vert	Long	
PPV	0.162	0.362	0.227	in/s
ZC Freq	28	32	34	Hz
Time (Rel. to Trig)	0.215	0.225	0.180	sec
Peak Acceleration	0.118	0.202	0.149	g
Peak Displacement	0.00097	0.00171	0.00102	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.363 in/s at 0.225 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 12:05:48 January 18, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E45I.XO0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

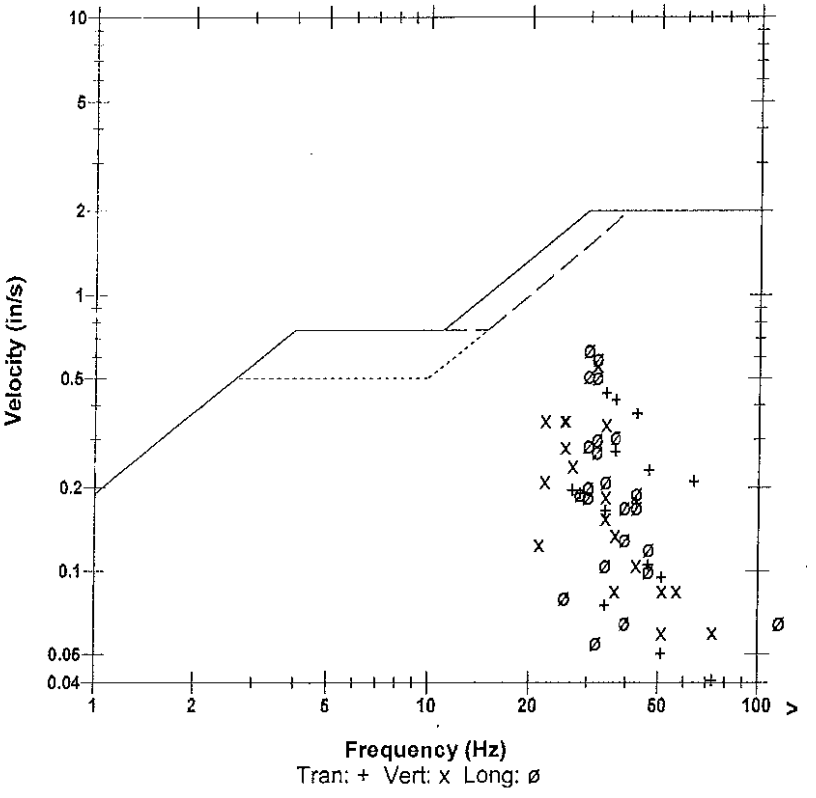
Post Event Notes

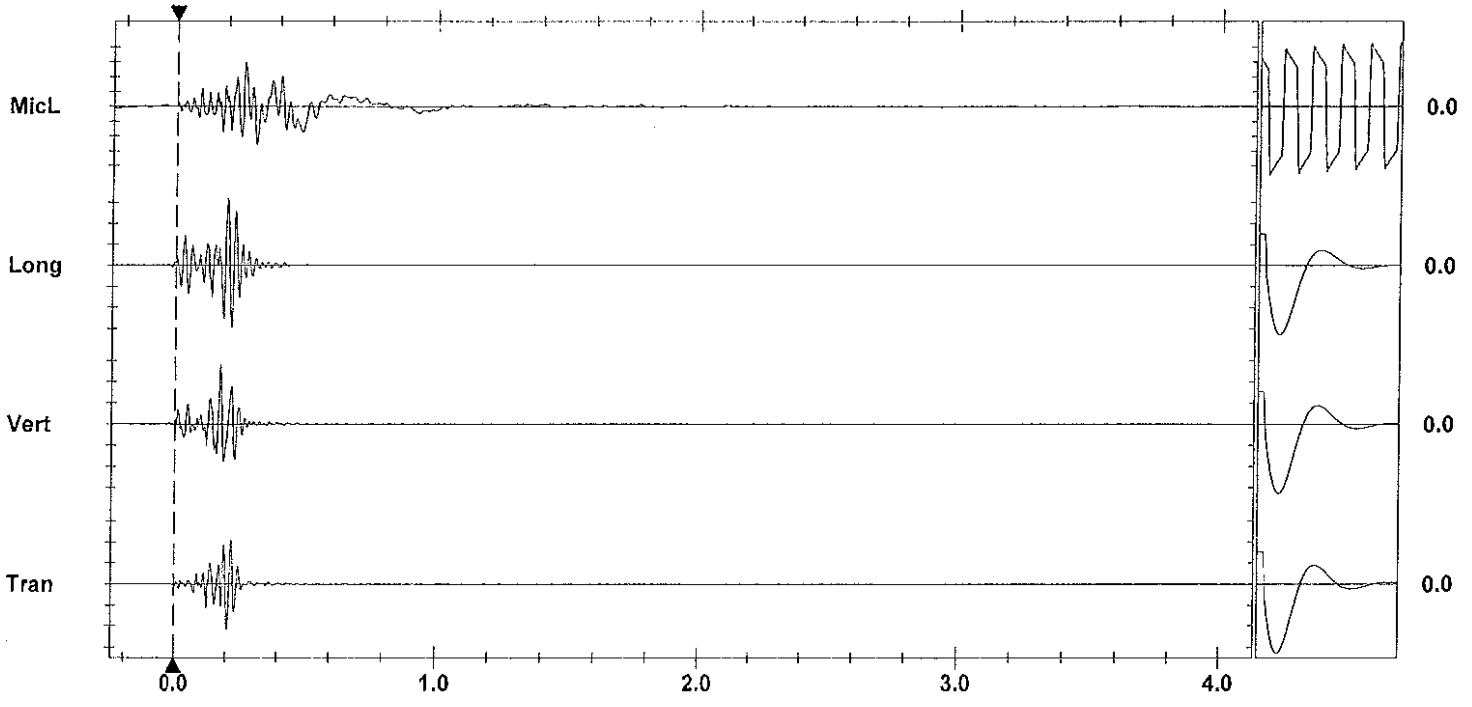
Microphone Linear Weighting
PSPL 0.00294 psi(L) at 0.265 sec
ZC Freq 26 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 782 mv)

	Tran	Vert	Long	
PPV	0.440	0.560	0.635	in/s
ZC Freq	34	32	30	Hz
Time (Rel. to Trig)	0.208	0.178	0.200	sec
Peak Acceleration	0.278	0.318	0.411	g
Peak Displacement	0.00208	0.00254	0.00346	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.6	

Peak Vector Sum 0.743 in/s at 0.220 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 18/12
ACTUAL BLAST DATE JAN 18/12 2:35PM
BLAST # 167

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+70 – 127+60 RS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH ∅ (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ∅
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 production
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

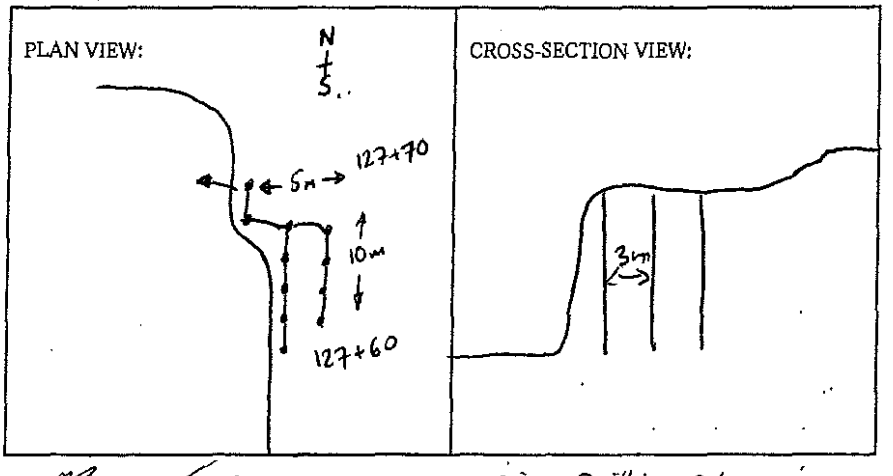
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

11 - 30' EZ dets.

1 bag wR.

3# bags Anfo

1 CASE 2½ x 16

Instantel®

Event Report

Date/Time	Vert at 14:35:16 January 18, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E45P.US0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

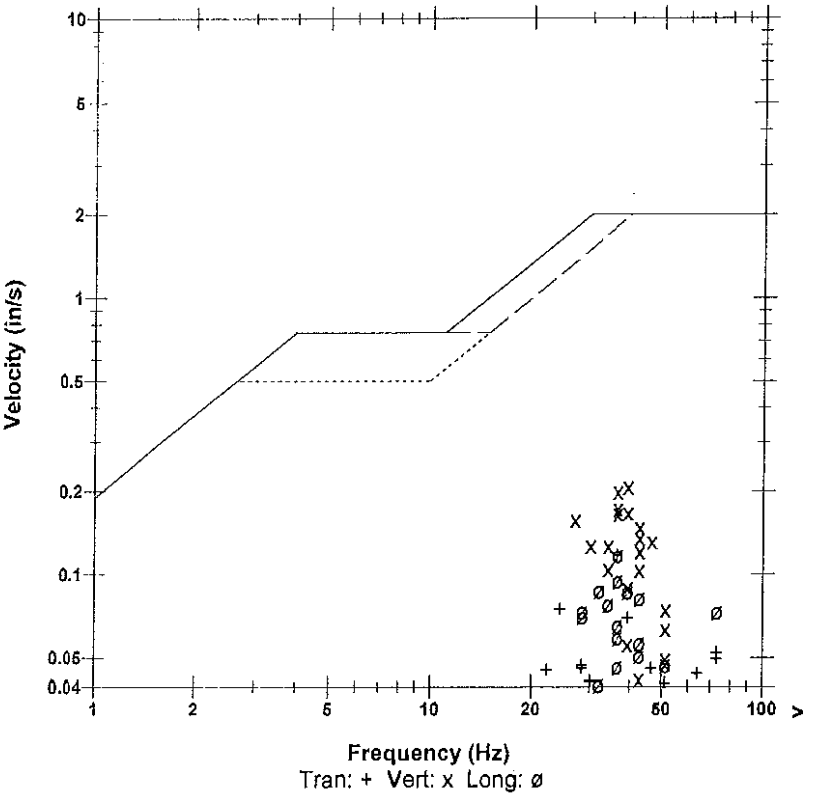
Post Event Notes

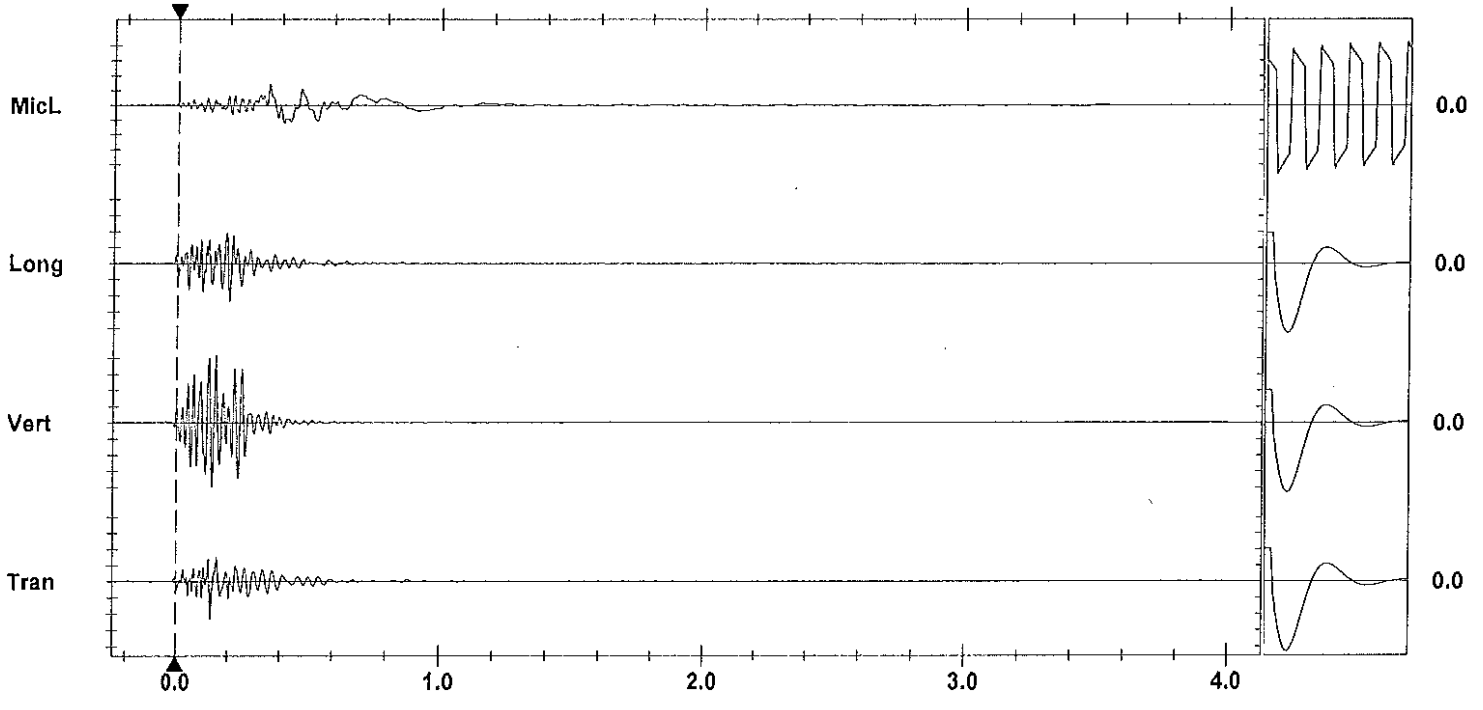
Microphone Linear Weighting
PSPL 0.00141 psi(L) at 0.352 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 842 mv)

	Tran	Vert	Long	
PPV	0.117	0.207	0.117	in/s
ZC Freq	37	39	37	Hz
Time (Rel. to Trig)	0.136	0.154	0.201	sec
Peak Acceleration	0.104	0.146	0.0945	g
Peak Displacement	0.00039	0.00092	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.0	4.1	4.3	

Peak Vector Sum 0.213 in/s at 0.128 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

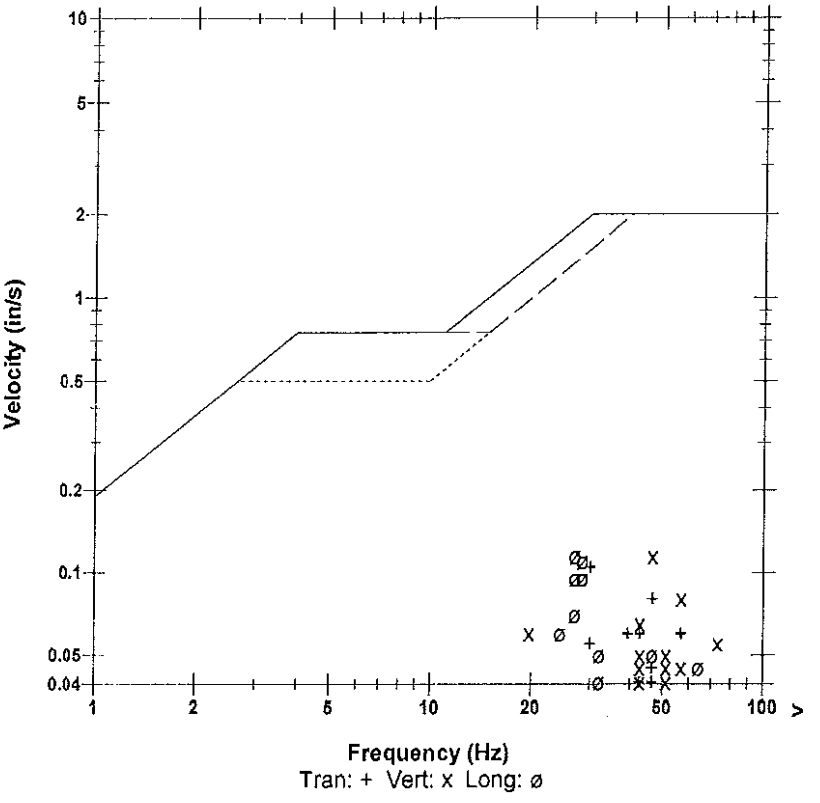
Date/Time	Long at 14:35:09 January 18, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E45P.UL0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

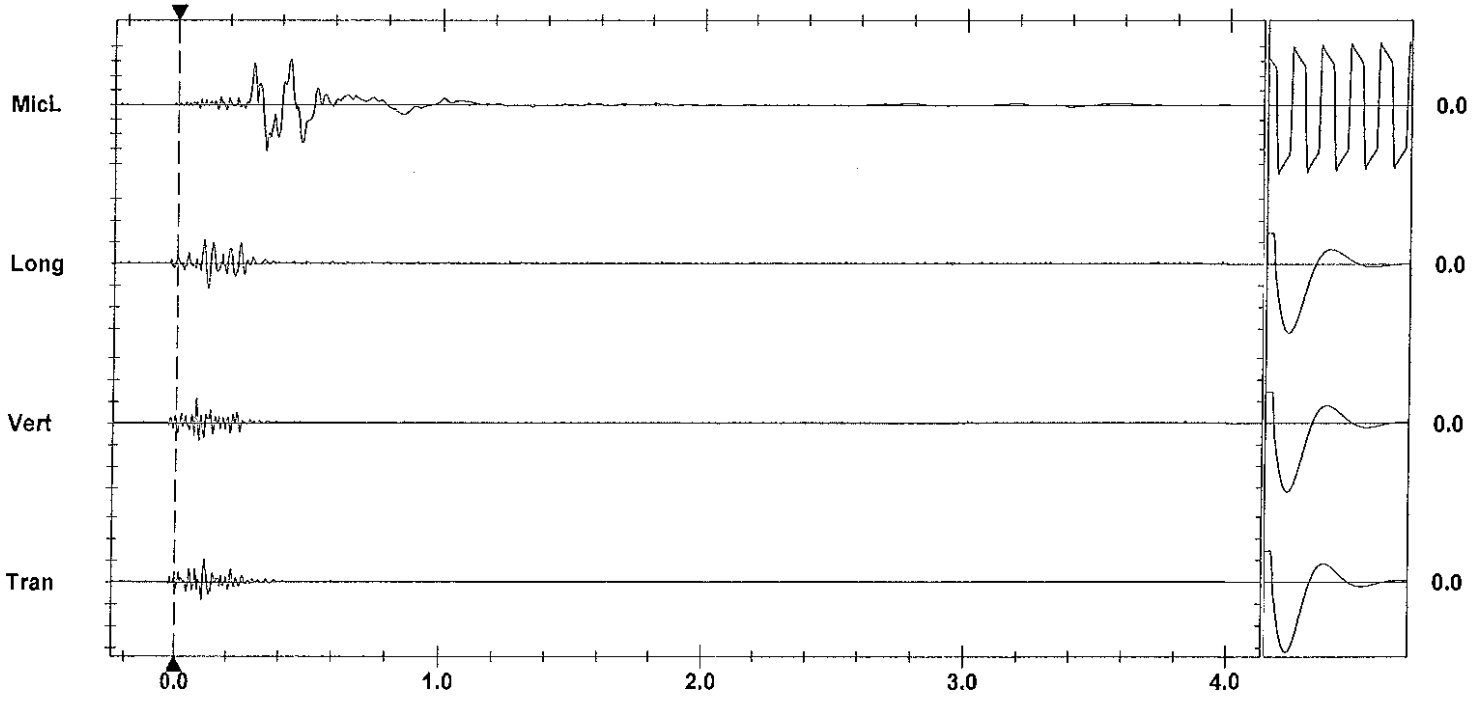
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00315 psi(L) at 0.341 sec
ZC Freq	7.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 835 mv)

	Tran	Vert	Long	
PPV	0.105	0.115	0.115	in/s
ZC Freq	30	47	27	Hz
Time (Rel. to Trig)	0.117	0.080	0.120	sec
Peak Acceleration	0.0795	0.0928	0.0795	g
Peak Displacement	0.00051	0.00040	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.0	Hz
Overswing Ratio	3.9	4.0	4.8	

Peak Vector Sum 0.154 in/s at 0.120 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: February 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacKinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Jan. 19/12
ACTUAL BLAST DATE Jan 19/12 11:20AM
BLAST # 168

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+60 - 127+52 RS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE ∅ (°) SLOPE LENGTH ∅ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ∅
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 66 (m)

TOTAL NUMBER OF HOLES 11 prod.
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING ~~2.5~~ (m) BURDEN ~~2.5~~ (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

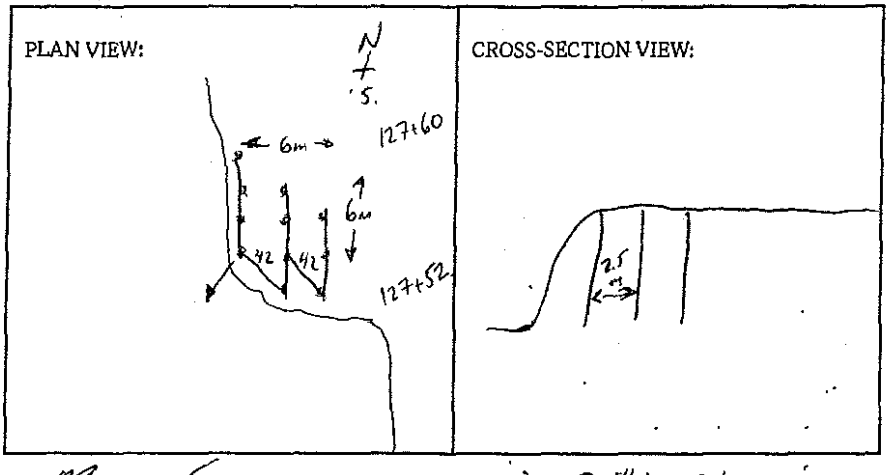
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 216 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James MacKinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

11 - 30' Ez dets.

2 - 42ms connectadel.

1 - Elec det

2 - wr.

4 - Anfo.

5 - 1 1/2" x 16"

Instantel

Event Report

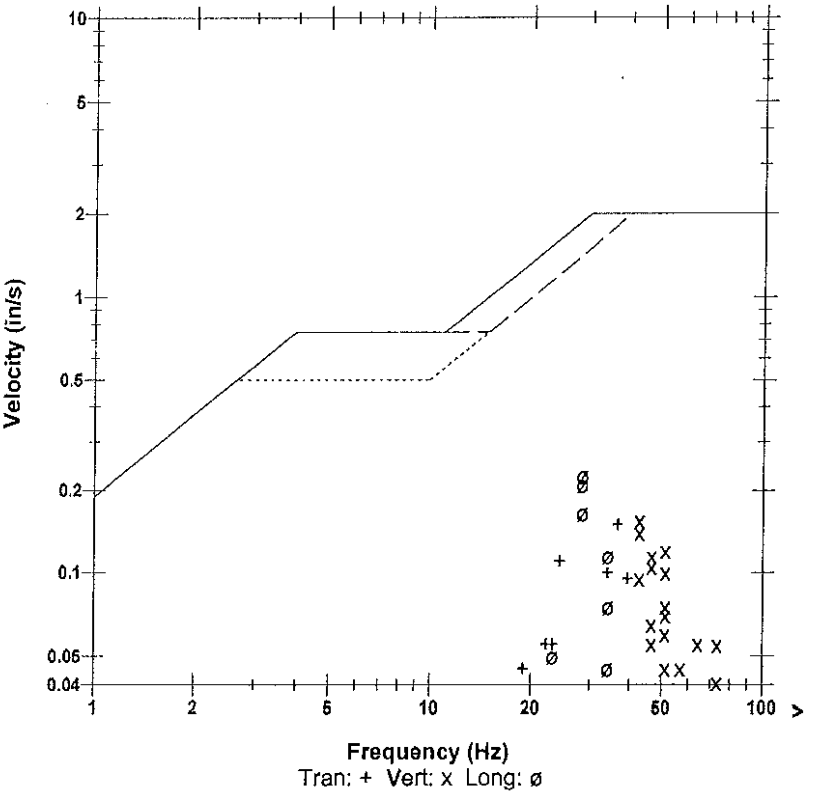
Date/Time	Vert at 11:20:43 January 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E47B.IJ0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

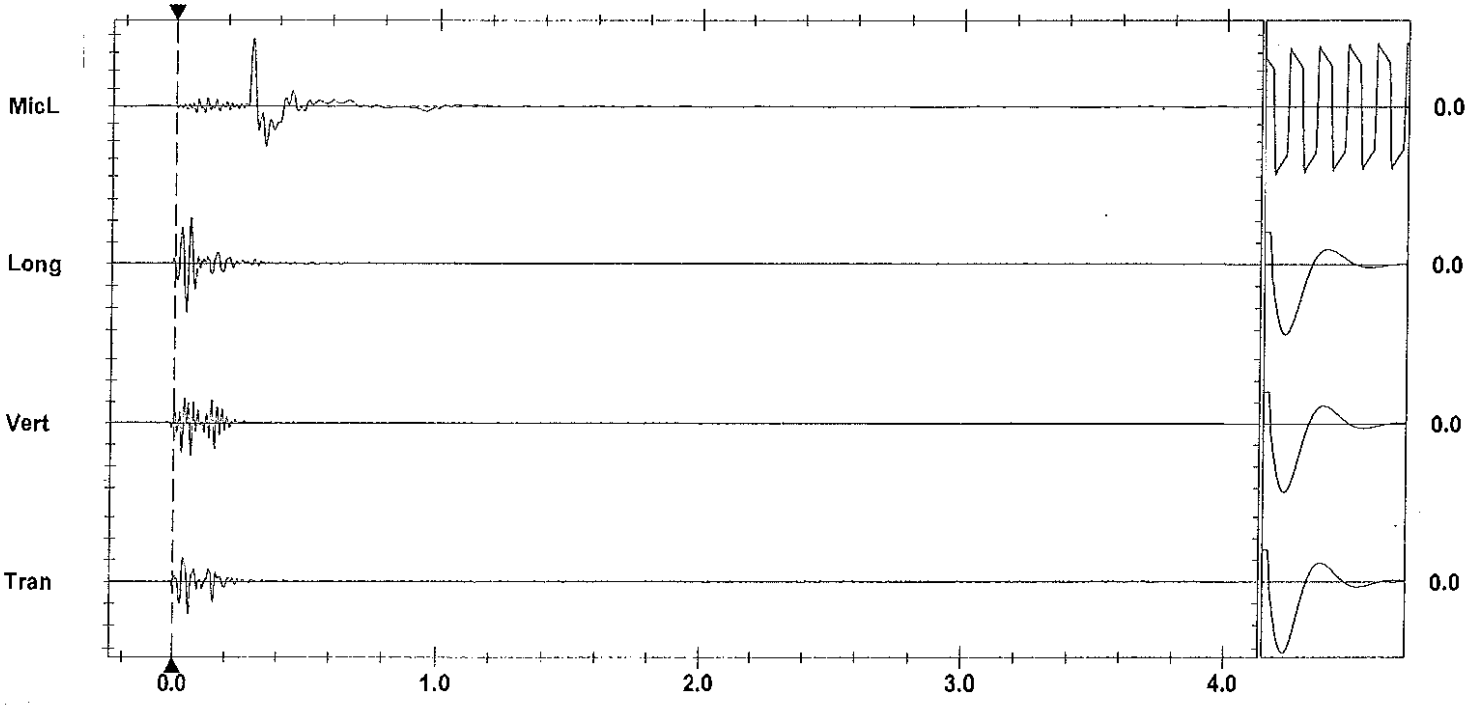
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.150	0.155	0.225	in/s
ZC Freq	37	43	28	Hz
Time (Rel. to Trig)	0.062	0.067	0.046	sec
Peak Acceleration	0.0795	0.0928	0.106	g
Peak Displacement	0.00076	0.00054	0.00121	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.9	4.7	

Microphone Linear Weighting
PSPL 0.00758 psi(L) at 0.298 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 755 mv)

Peak Vector Sum 0.258 in/s at 0.062 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 11:20:51 January 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E47B.IR0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

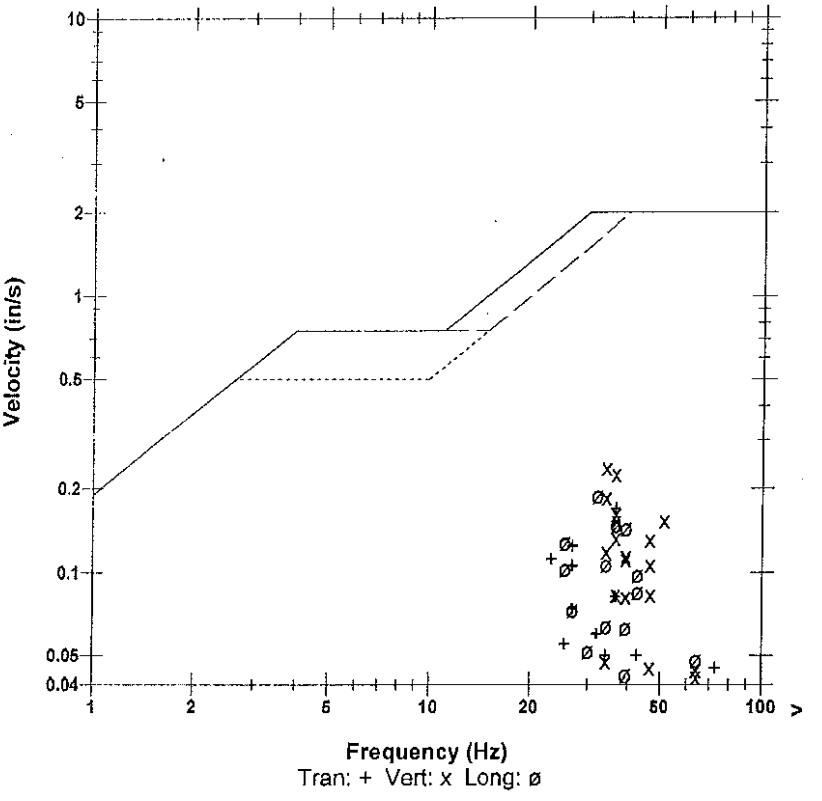
Post Event Notes

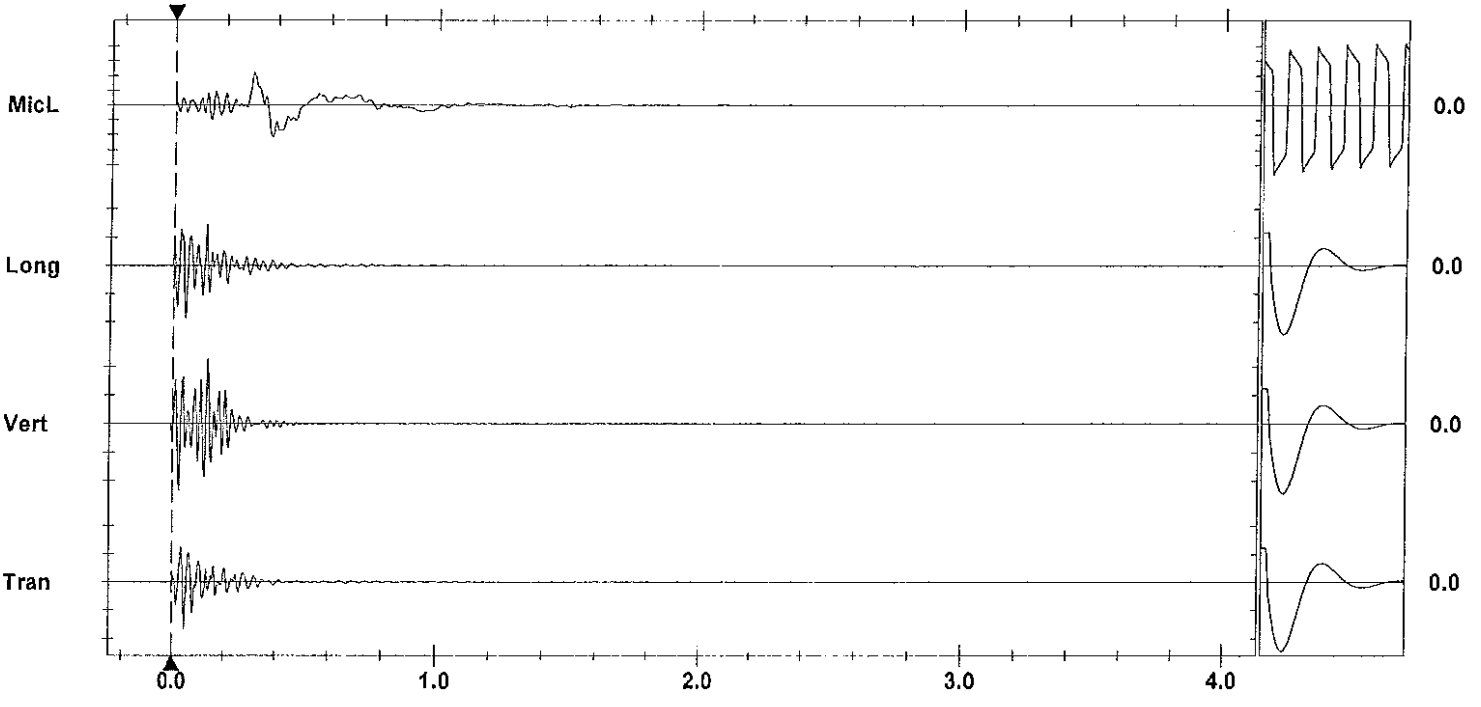
Microphone Linear Weighting
PSPL 0.00221 psi(L) at 0.305 sec
ZC Freq 8.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 735 mv)

	Tran	Vert	Long	
PPV	0.169	0.237	0.188	in/s
ZC Freq	37	34	32	Hz
Time (Rel. to Trig)	0.050	0.025	0.049	sec
Peak Acceleration	0.0961	0.161	0.109	g
Peak Displacement	0.00066	0.00104	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.263 in/s at 0.050 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED JAN. 19/12
ACTUAL BLAST DATE JAN. 19/12 12:49PM
BLAST # 169

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+50 - 127+40 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 9 (m)
TOTAL DEPTH 147 (m)

TOTAL NUMBER OF HOLES 5 STAB / 6 Buffer / 10 B/L
HOLE DIAMETER [redacted] (mm) 89
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 21
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

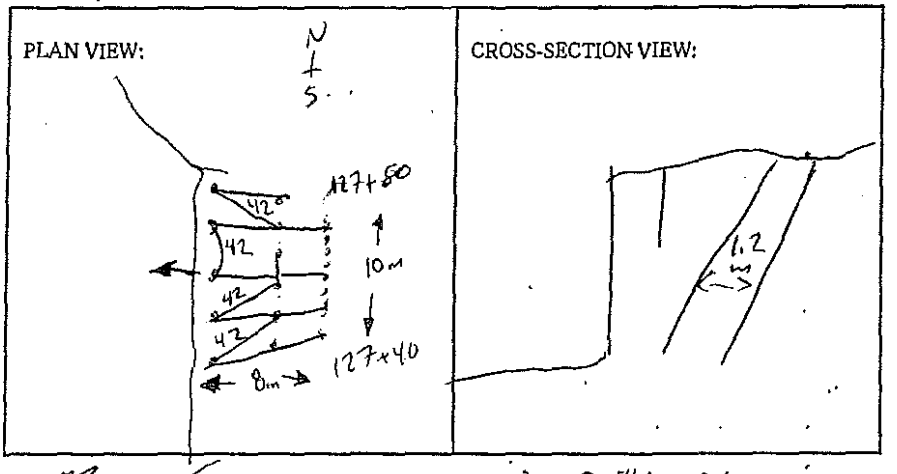
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 560 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

10 - 12' ms dets

5 - 24' Ez dets.

6 - 30' Ez dets.

4 - 42 ms connectadel.

1 - Elec det

2 - WR.

1 - 2 1/2" x 16"

3 - Anfo.

15 sticks 1 1/2 x 16 -

Instantel

Event Report

Date/Time	Long at 12:49:40 January 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E47F.MS0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

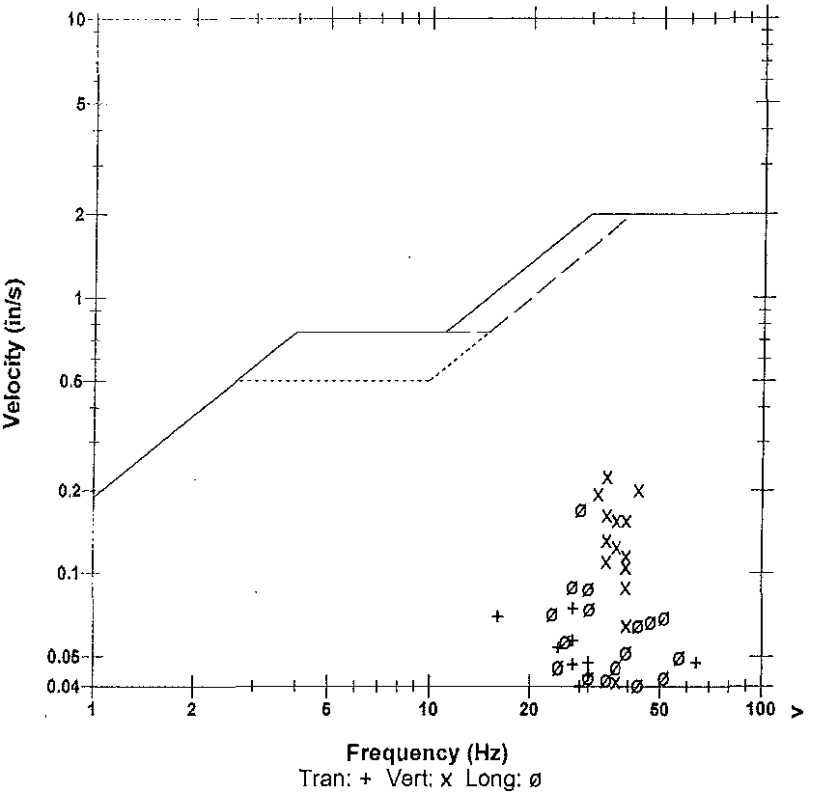
Post Event Notes

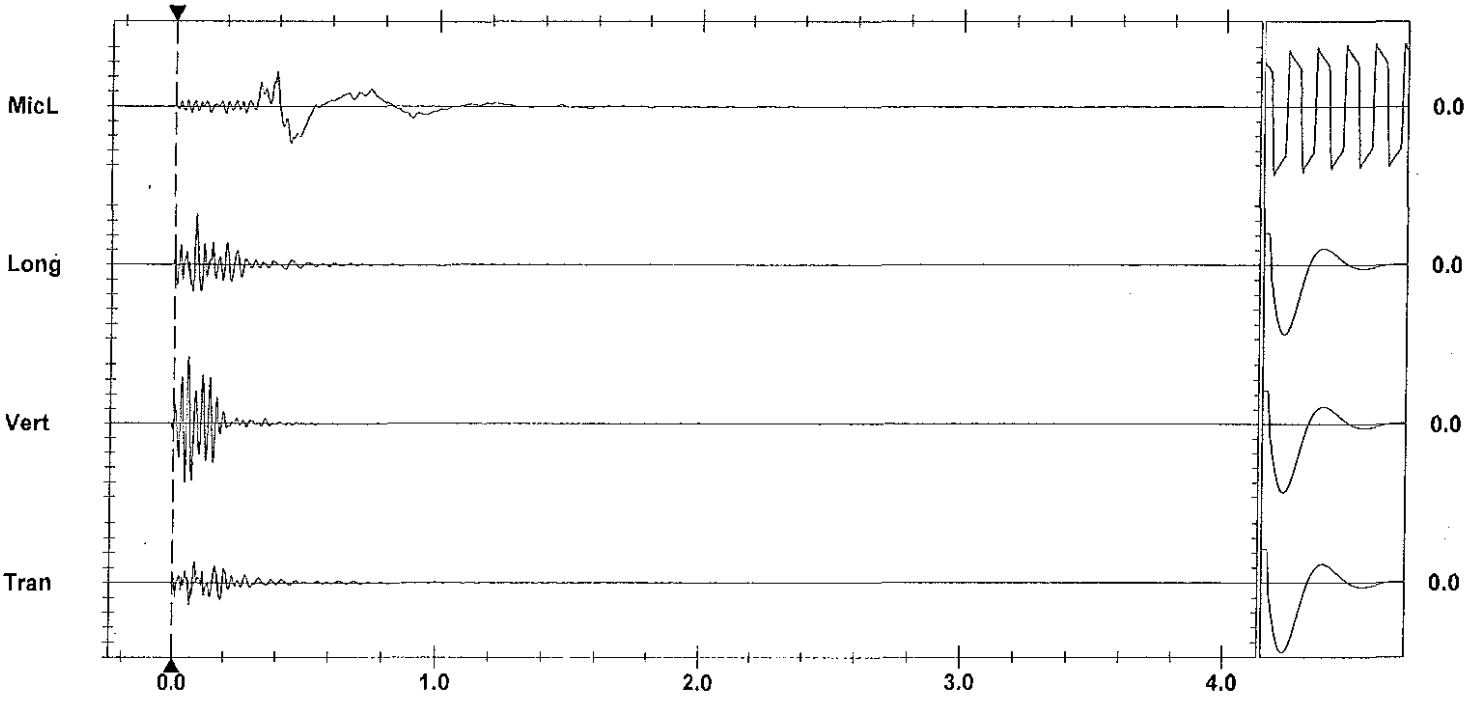
Microphone Linear Weighting
PSPL 0.00250 psi(L) at 0.444 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 840 mv)

	Tran	Vert	Long	
PPV	0.0744	0.226	0.171	in/s
ZC Freq	27	34	28	Hz
Time (Rel. to Trig)	0.068	0.058	0.086	sec
Peak Acceleration	0.0547	0.156	0.0829	g
Peak Displacement	0.00042	0.00102	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.9	4.0	4.3	

Peak Vector Sum 0.227 in/s at 0.058 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 12:49:32 January 19, 2012
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

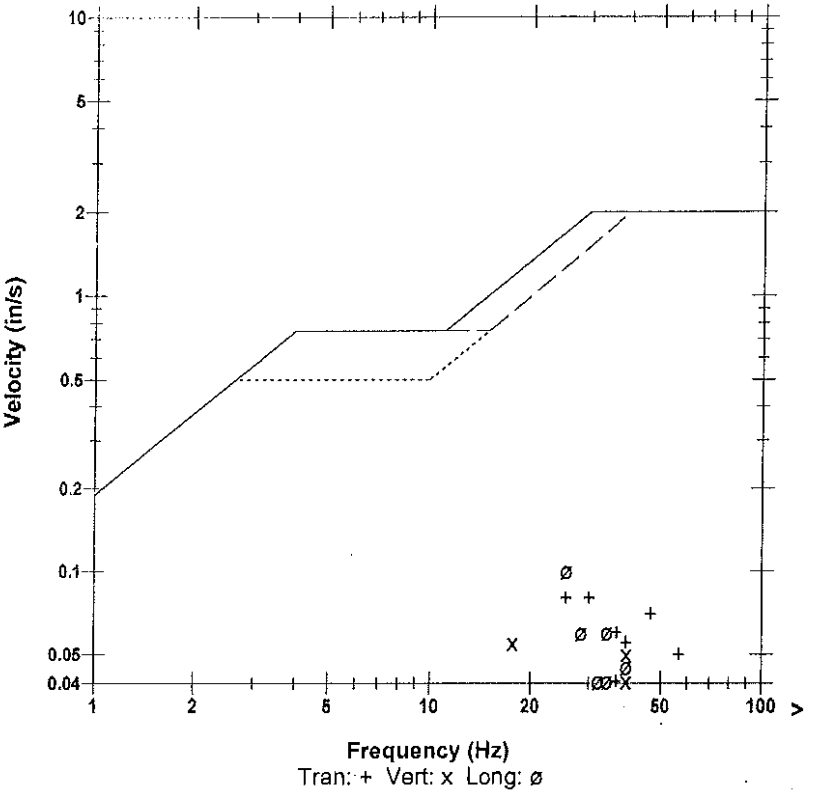
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E47F.MK0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

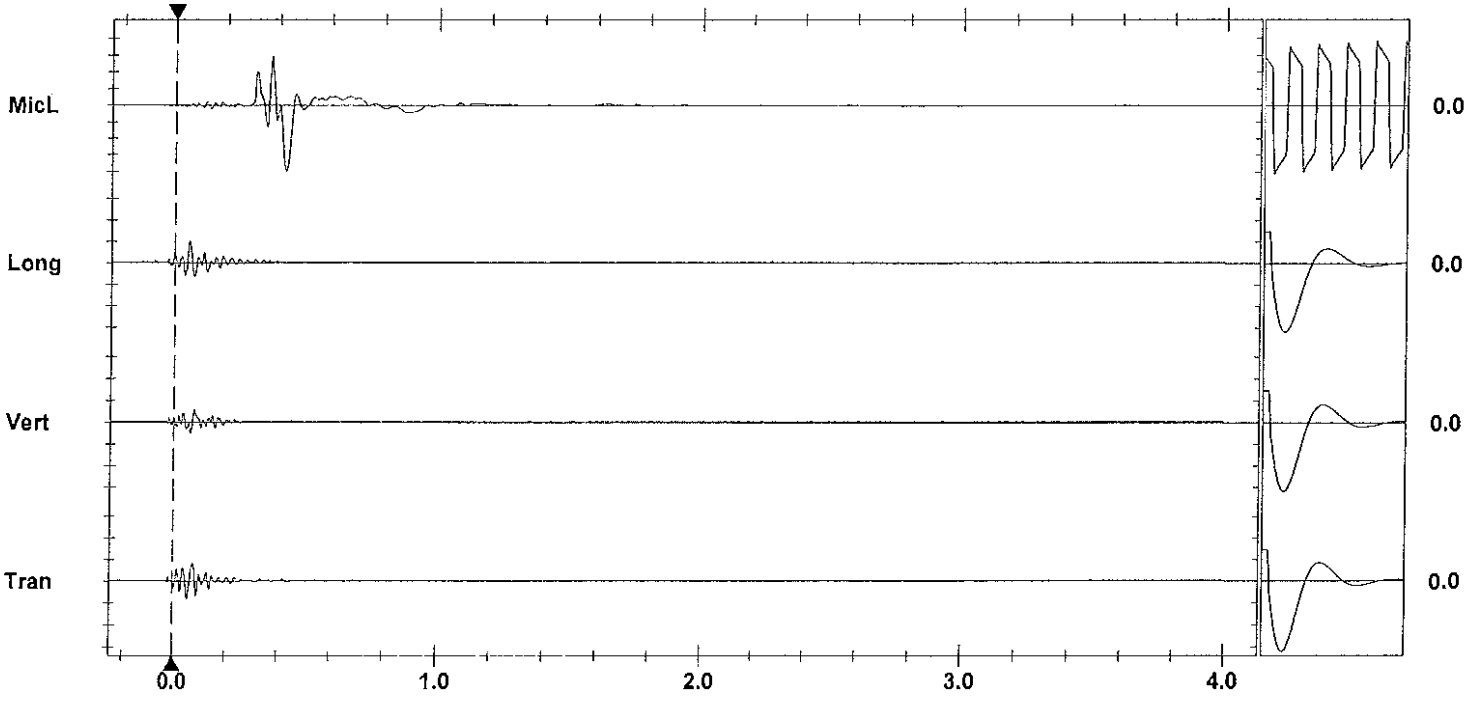
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00798 psi(L) at 0.425 sec
ZC Freq	7.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 818 mv)

	Tran	Vert	Long	
PPV	0.0800	0.0550	0.1000	in/s
ZC Freq	30	18	26	Hz
Time (Rel. to Trig)	0.055	0.079	0.057	sec
Peak Acceleration	0.0530	0.0398	0.0530	g
Peak Displacement	0.00055	0.00042	0.00062	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.8	3.9	4.8	

Peak Vector Sum 0.128 in/s at 0.057 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED JAN. 19/12
CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554643
ACTUAL BLAST DATE JAN. 19/12
BLAST # 170

HIGHWAY# 97
BLAST LOCATION AT: STN # 127+40 - 127+35 RS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5M (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 119 (m)

TOTAL NUMBER OF HOLES 10 B/L / 3 Buffer / 4 prod.
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.2 (m) BURDEN 2.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

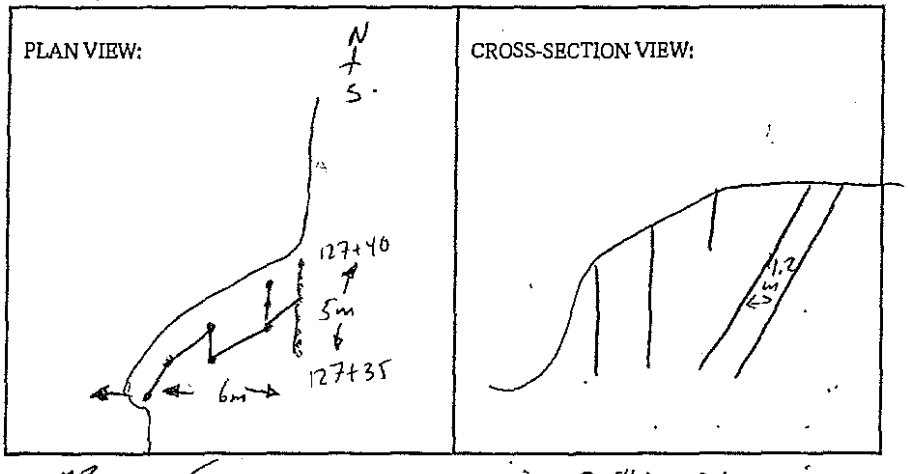
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 210 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE James Mawhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

10 - 12' ms dets.

7 - 30' Ez dets.

2 - 42ms connectadels

1 - Elec det.

14 sticks 1 1/2 x 16"

1 - WR.

3 - Anfo.

Instantel

Event Report

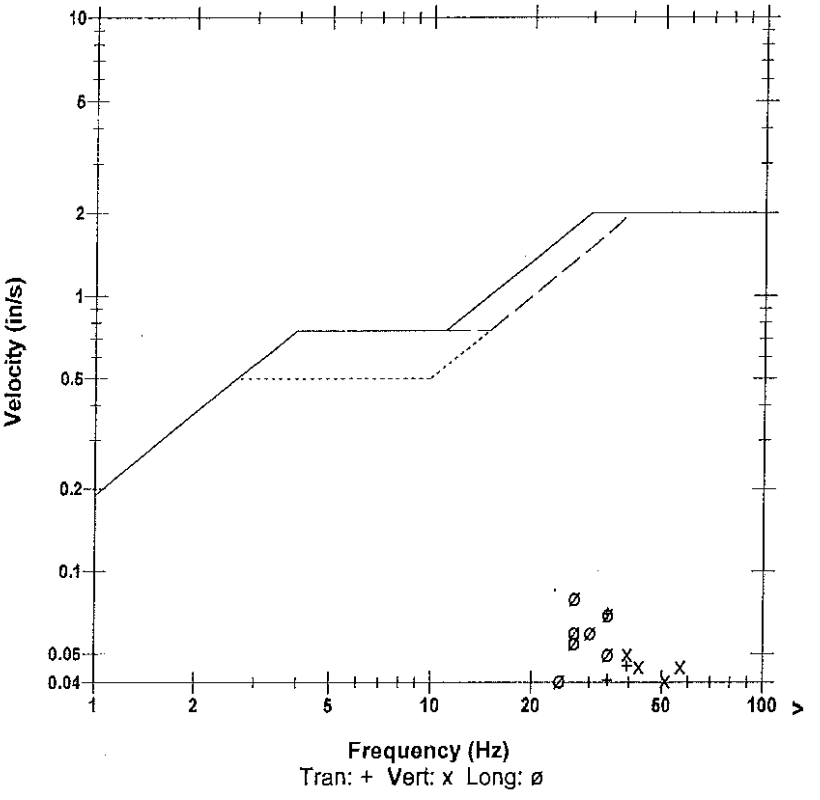
Date/Time	Vert at 15:03:27 January 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E47L.TR0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

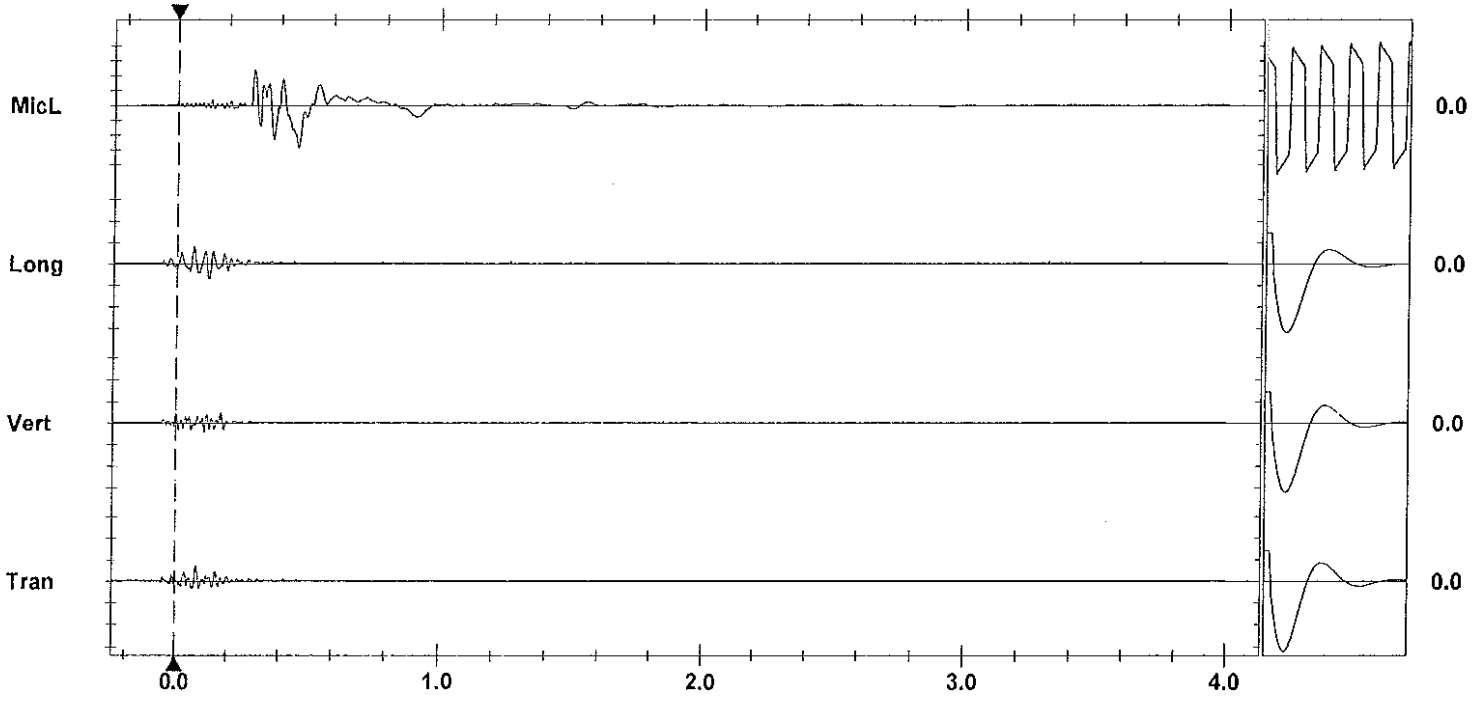
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00286 psi(L) at 0.464 sec		
ZC Freq	5.5 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 761 mv)		

	Tran	Vert	Long	
PPV	0.0700	0.0500	0.0800	in/s
ZC Freq	34	39	27	Hz
Time (Rel. to Trig)	0.081	0.175	0.064	sec
Peak Acceleration	0.0530	0.0530	0.0663	g
Peak Displacement	0.00032	0.00020	0.00045	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.9	4.8	

Peak Vector Sum 0.0867 in/s at 0.064 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

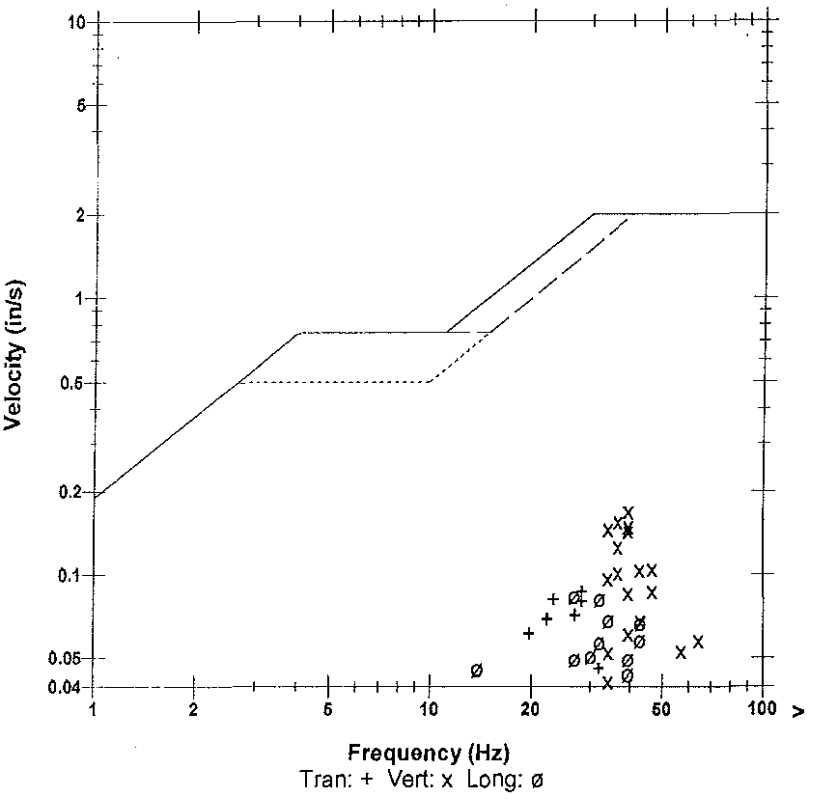
Date/Time	Vert at 15:03:35 January 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E47L.TZ0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

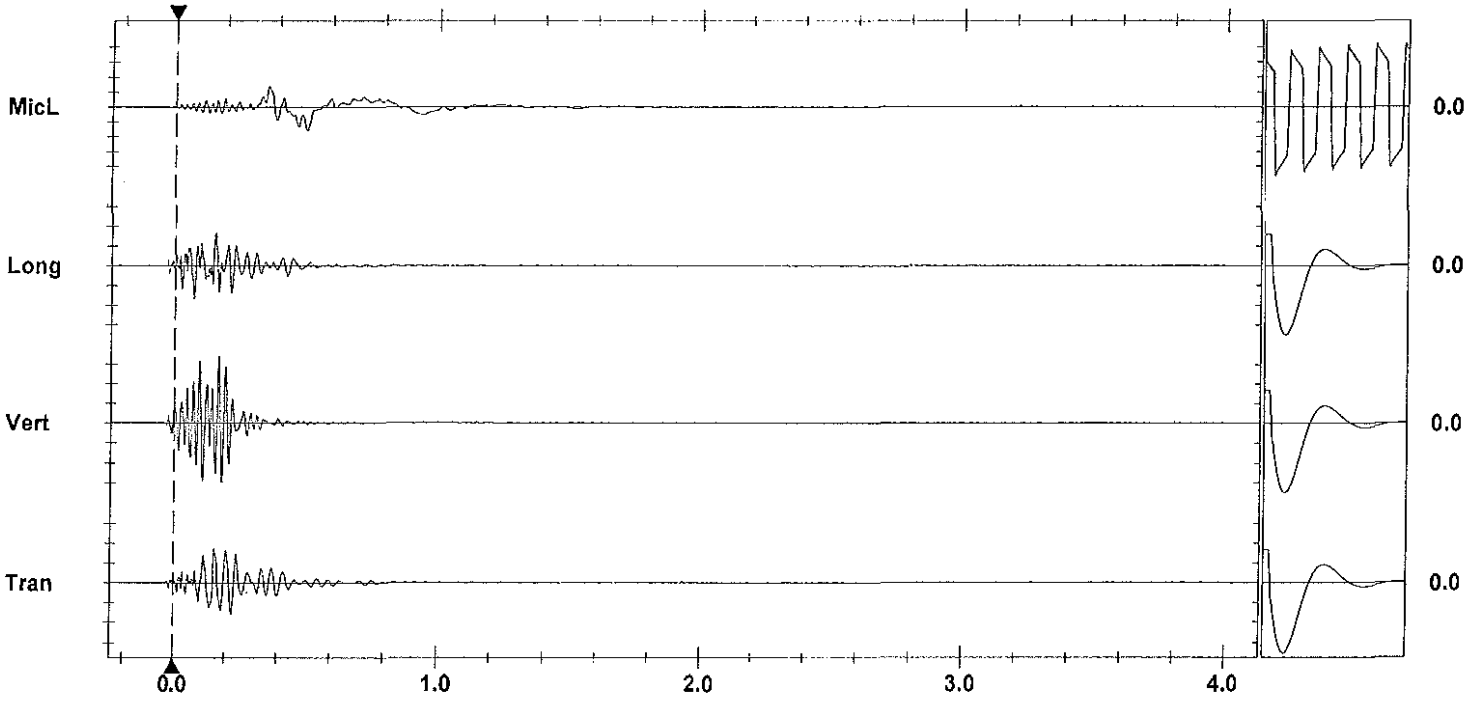
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00160 psi(L) at 0.504 sec
ZC Freq	3.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 821 mv)

	Tran	Vert	Long	
PPV	0.0869	0.169	0.0837	in/s
ZC Freq	28	39	27	Hz
Time (Rel. to Trig)	0.159	0.173	0.075	sec
Peak Acceleration	0.0696	0.113	0.0597	g
Peak Displacement	0.00053	0.00067	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.9	4.0	4.3	

Peak Vector Sum 0.179 in/s at 0.173 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 24/11
ACTUAL BLAST DATE Jan 24/11 10:46 AM
BLAST # MW-0049

HIGHWAY# 97
BLAST LOCATION AT: STN 127+36 - 127+50 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 14 (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 150 (m)

DRILLING DETAILS: * 2 rows of 4 inch in W/I holes

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 128 (m)

TOTAL NUMBER OF HOLES 15611 5 buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 1.5" Dynamite + 2.5" Blasek Emulsion

EXPLOSIVE TYPE [redacted]
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS 16

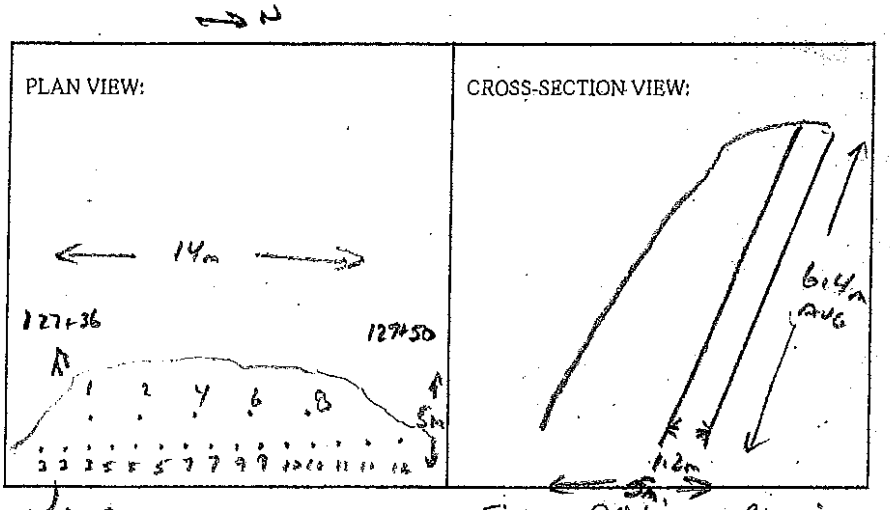
EXPLOSIVE SIZE 65 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13073 Cliffstone Cnt - 0.080 ips/ 32 Hz

@ 13050 Old Mission Rd - 0.25 ips/ 39 Hz

Buffer Holes - 6 - 8 Cart. 2½x16 Binaflex
primed w/ 0.5 Cart 1½ x 16" Dynamite

B/L Holes - 1 Cart 2"x16" Dynamite + 200 gr.
det cord to 4' collar

Instantel

Event Report

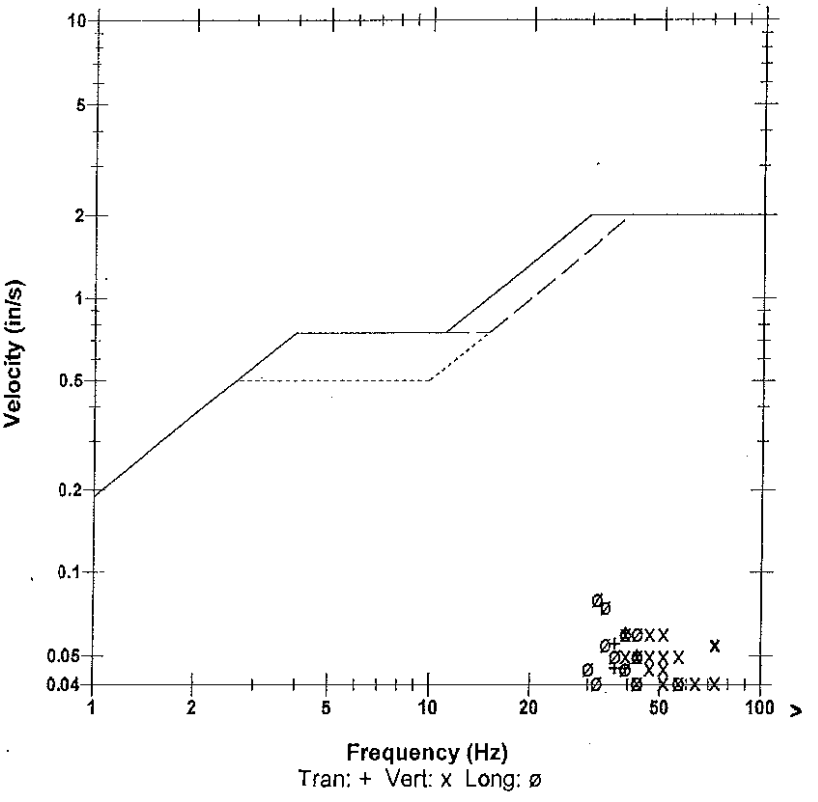
Date/Time	Vert at 10:46:30 January 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4GJ.9I0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

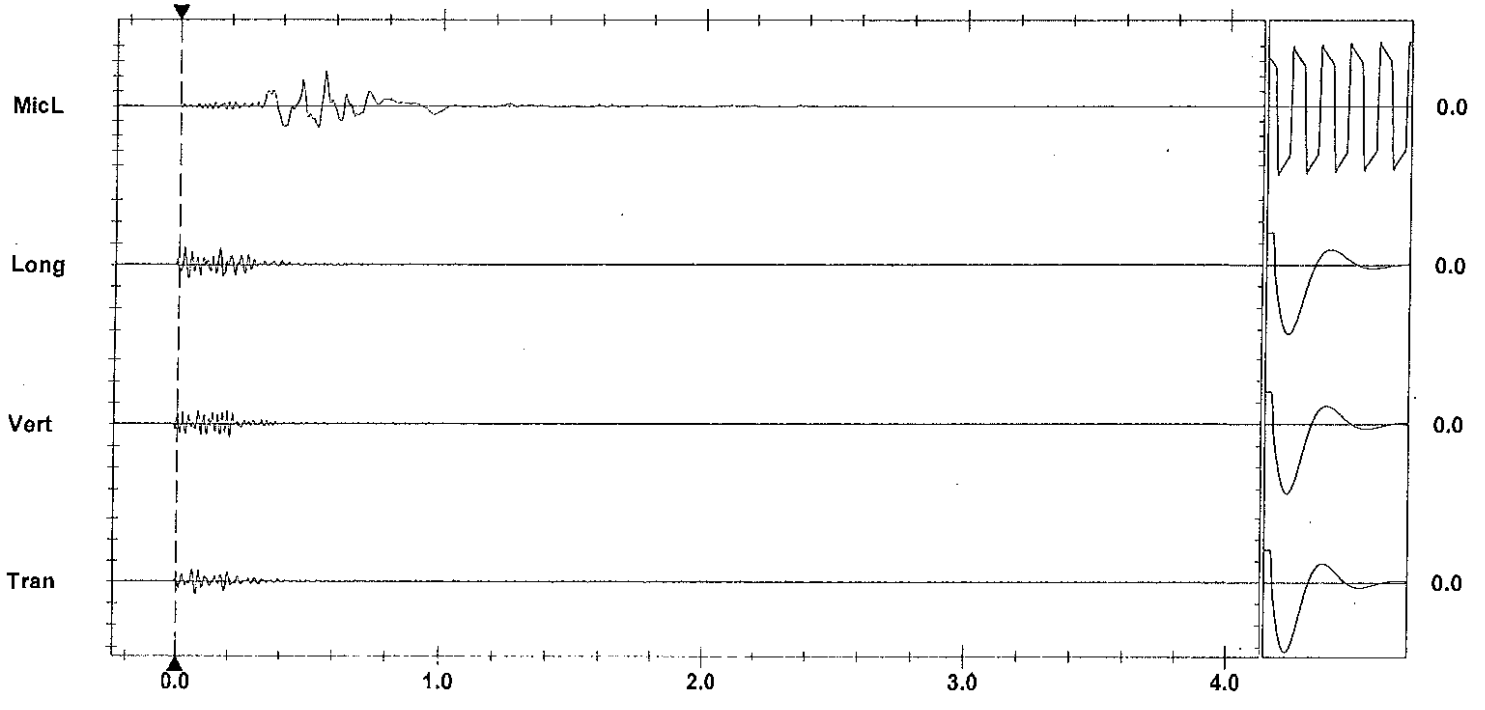
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00225 psi(L) at 0.559 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 725 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0600	0.0800	in/s
ZC Freq	39	39	32	Hz
Time (Rel. to Trig)	0.075	0.081	0.021	sec
Peak Acceleration	0.0398	0.0663	0.0530	g
Peak Displacement	0.00026	0.00023	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.102 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: February 6, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Long at 10:46:44 January 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4GJ.9W0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

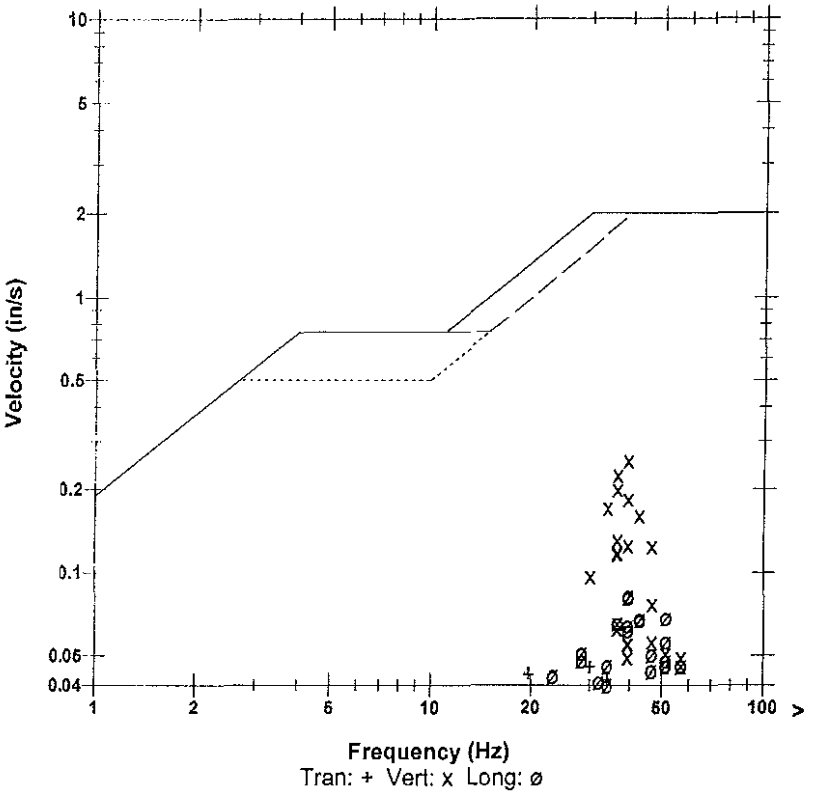
Post Event Notes

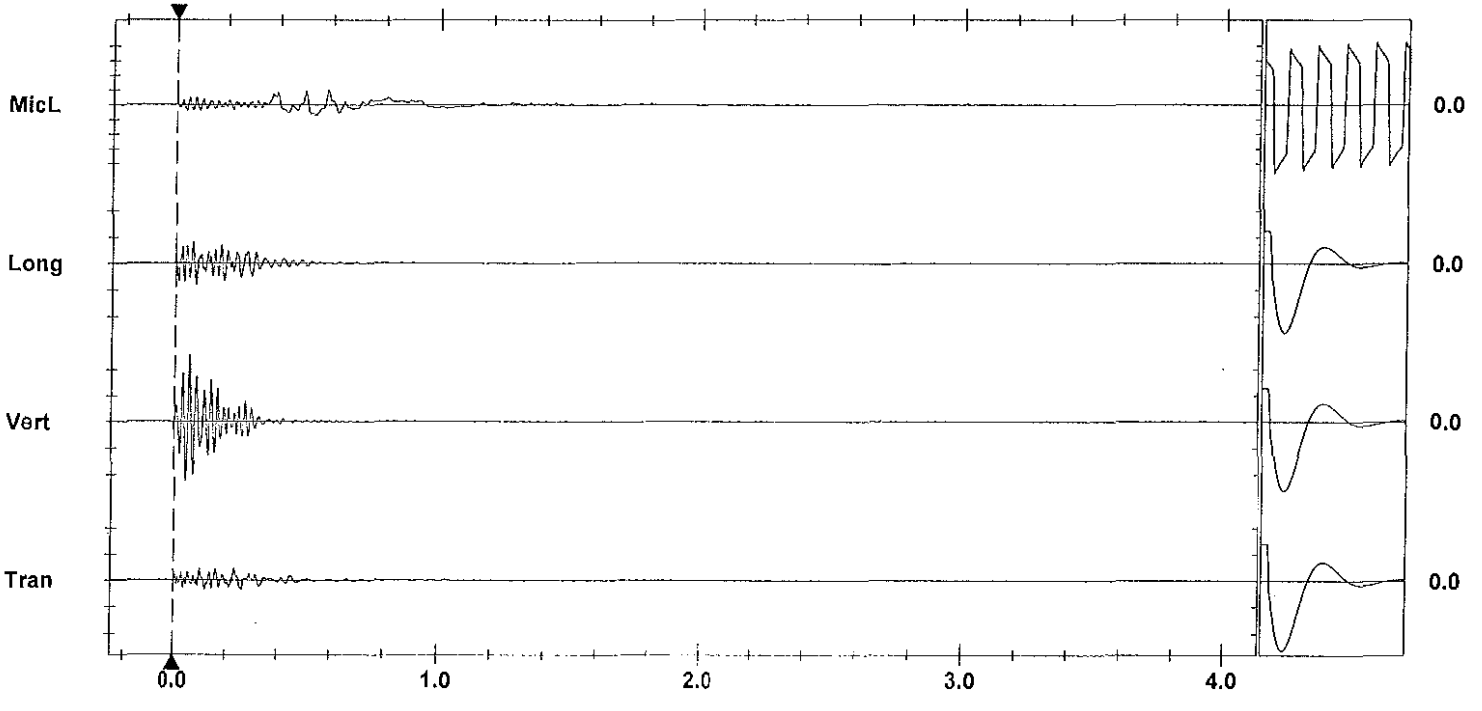
Microphone Linear Weighting
PSPL 0.00098 psi(L) at 0.582 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 737 mv)

	Tran	Vert	Long	
PPV	0.0456	0.254	0.0825	in/s
ZC Freq	30	39	39	Hz
Time (Rel. to Trig)	0.103	0.060	0.081	sec
Peak Acceleration	0.0381	0.172	0.0746	g
Peak Displacement	0.00028	0.00104	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.256 in/s at 0.059 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: February 5, 2013 (V 9.01 - 9.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME: Sierra Drilling & Blasting
BLASTER'S NAME: Wayne Verney
BLASTER'S CERTIFICATE NUMBER: SB3489

DATE PREPARED: JAN 24/12
ACTUAL BLAST DATE: JAN 24/12 12:22 PM
BLAST #: MW-0090

HIGHWAY#: 97
BLAST LOCATION AT: STN 127+60 - 127+65 RS (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION: _____

SITE DETAILS:

HEIGHT ABOVE HWY: N/A (m) SLOPE ANGLE: 63 (°) SLOPE LENGTH: 5 (m)
ROCK TYPE: Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY): 135 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES: 9 (6 loaded)
AVERAGE DEPTH: 6 (m)
NUMBER OF ROWS: 3
MAXIMUM DEPTH: 6.3 (m)
TOTAL DEPTH: 90 (m)

TOTAL NUMBER OF HOLES: 96 11/ 36 RFa / 3 PRod
HOLE DIAMETER: 89 (mm)
HOLE SPACING: 2.7 (m) BURDEN: 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE: 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES: 15
TOTAL NUMBER OF DELAYS: 10

EXPLOSIVE SIZE: 40 mm by 400 mm
TOTAL WEIGHT: 50 (kg)
DELAY TYPE AND LENGTH: 25 (ms)

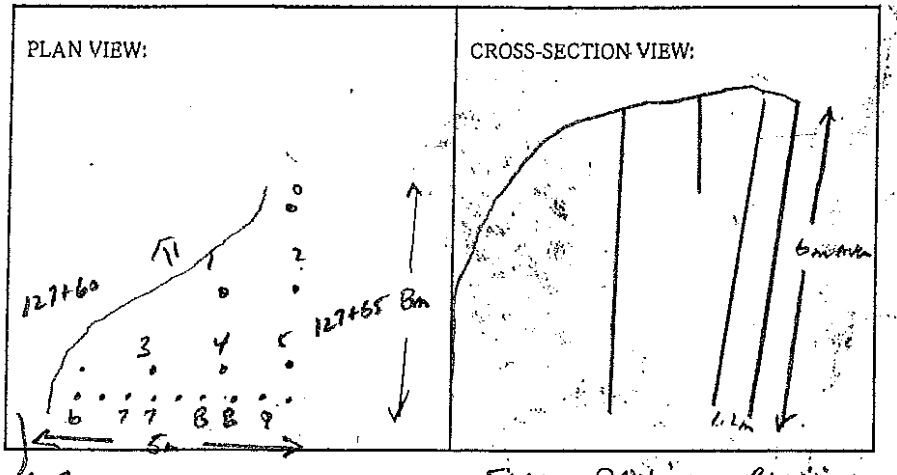
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY): _____
BLASTING MACHINE: TYPE 415320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED: 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE: _____ COMPANY: Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE): _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffhanger Ct - 0.060 ips / 34 Hz
@ 13080 Old Mission Rd - 0.12 ips / 51 Hz

PROD. HOLE (1) - 5' ANFO

PROD. HOLES (STAB) (2) - 2' ANFO/HOLE

BUFFER HOLES - 5 CART 2½" x 16" BLASTEX

PRIMED W/ 0.5 CART 1½" x 16" DYNAMITE

BL HOLES - 1 CART 2" x 16" DYNAMITE + $100 gr. det. cord to 4' collar.

Instantel

Event Report

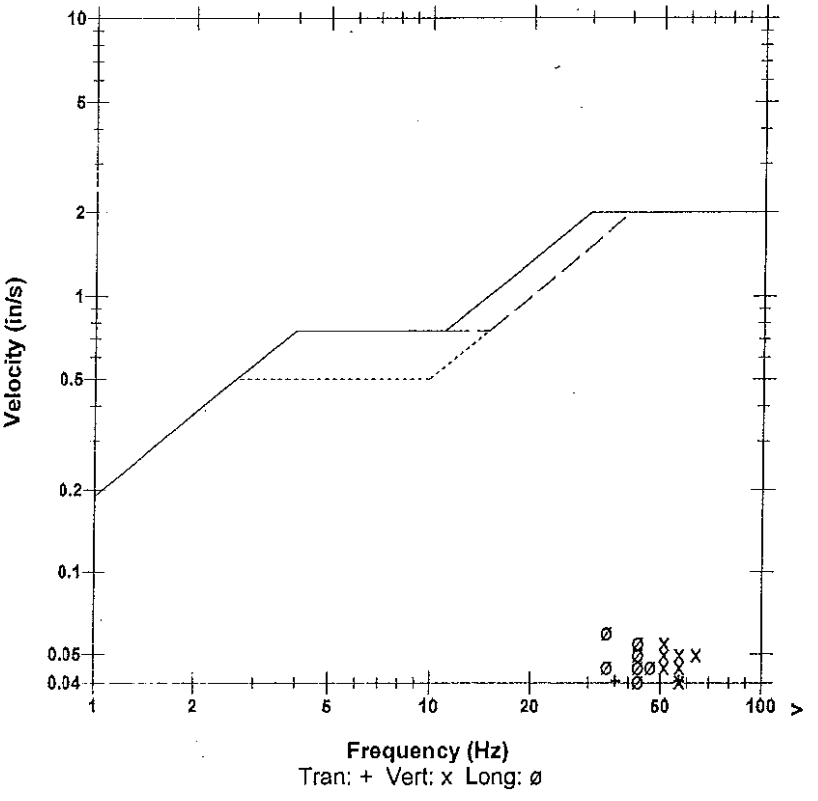
Date/Time	Long at 12:22:28 January 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4GN.PG0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

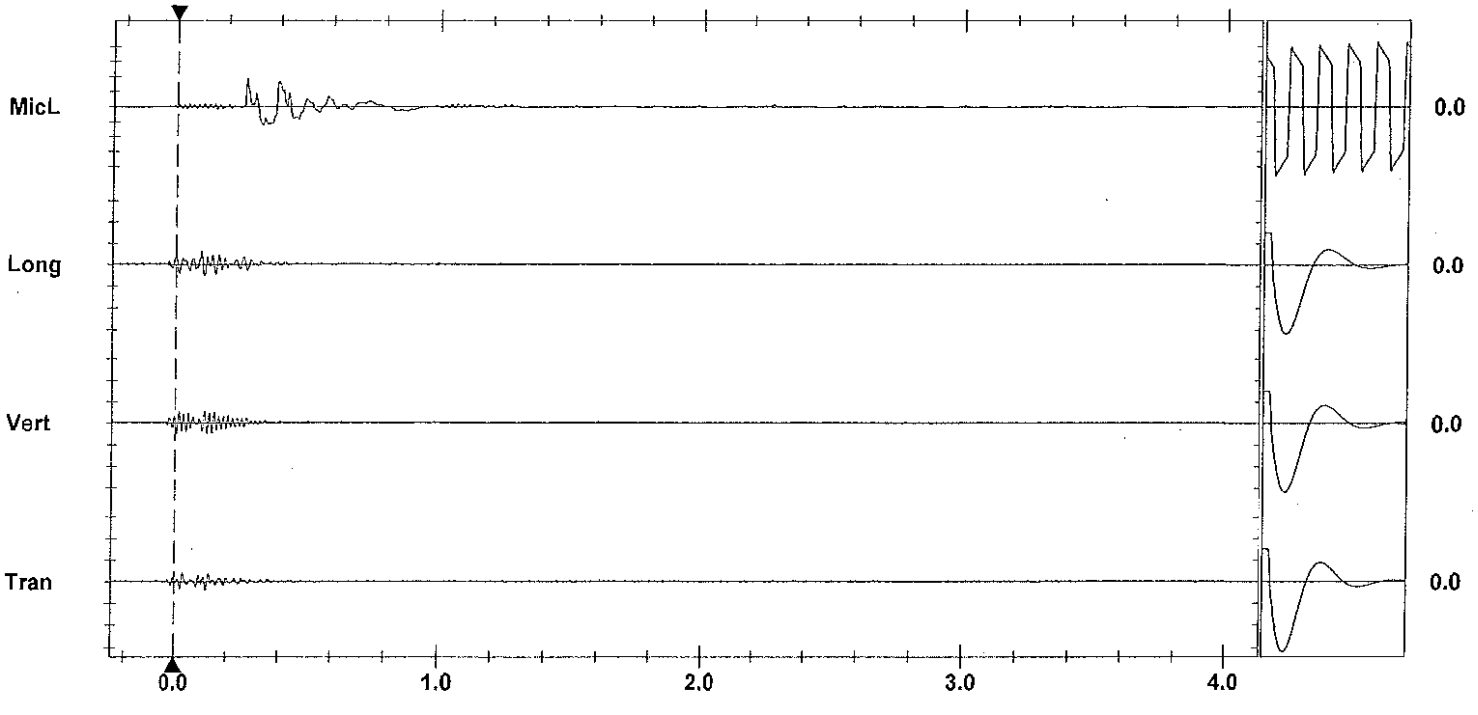
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00189 psi(L) at 0.269 sec
ZC Freq 9.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 696 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0550	0.0600	in/s
ZC Freq	37	51	34	Hz
Time (Rel. to Trig)	0.032	0.016	0.101	sec
Peak Acceleration	0.0398	0.0530	0.0530	g
Peak Displacement	0.00017	0.00018	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.0	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0709 in/s at 0.153 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 12:22:42 January 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4GN.PU0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

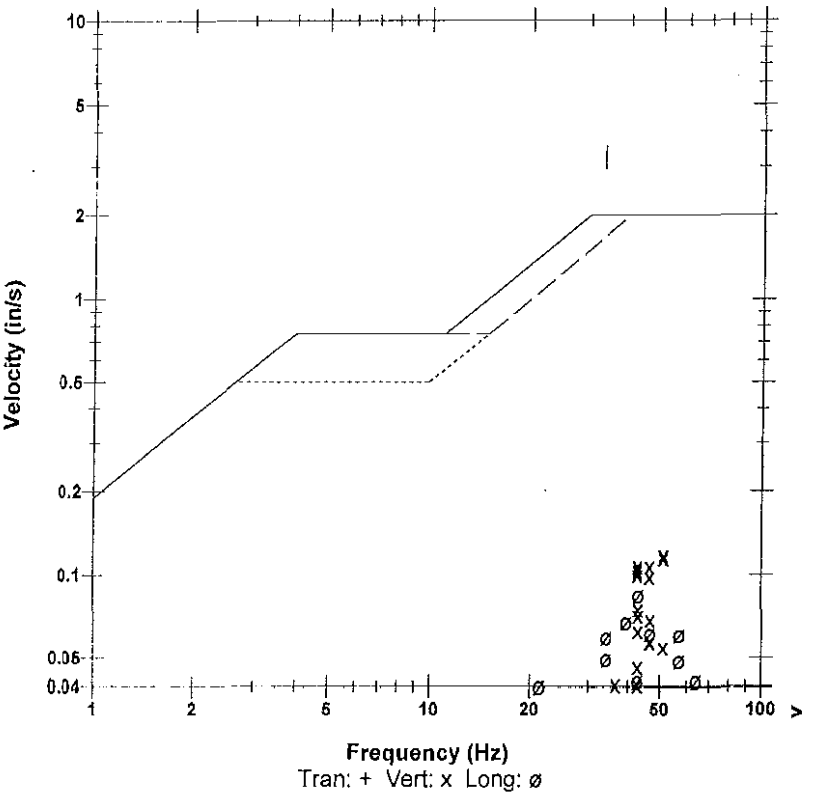
Post Event Notes

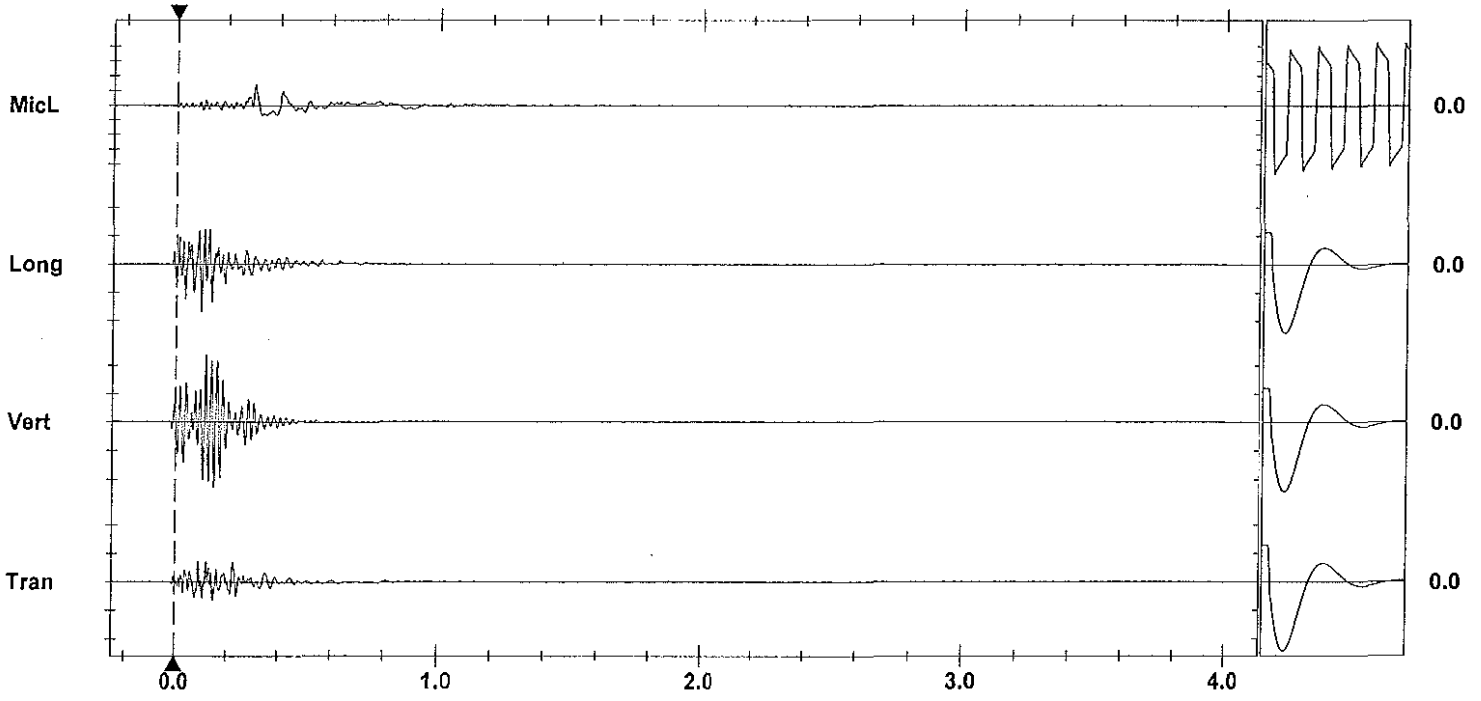
Microphone Linear Weighting
PSPL 0.00141 psi(L) at 0.304 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 693 mv)

	Tran	Vert	Long	
PPV	0.0362	0.118	0.0844	in/s
ZC Freq	73	51	43	Hz
Time (Rel. to Trig)	0.094	0.120	0.100	sec
Peak Acceleration	0.0398	0.0978	0.0580	g
Peak Displacement	0.00015	0.00041	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.120 in/s at 0.152 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 24/12
ACTUAL BLAST DATE Jan 24/12 1:39 PM
BLAST # MW-13091

HIGHWAY# 97
BLAST LOCATION AT: Stn 127+65 - 127+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE N/a (°) SLOPE LENGTH N/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 130 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 12 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES
TOTAL NUMBER OF DELAYS

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

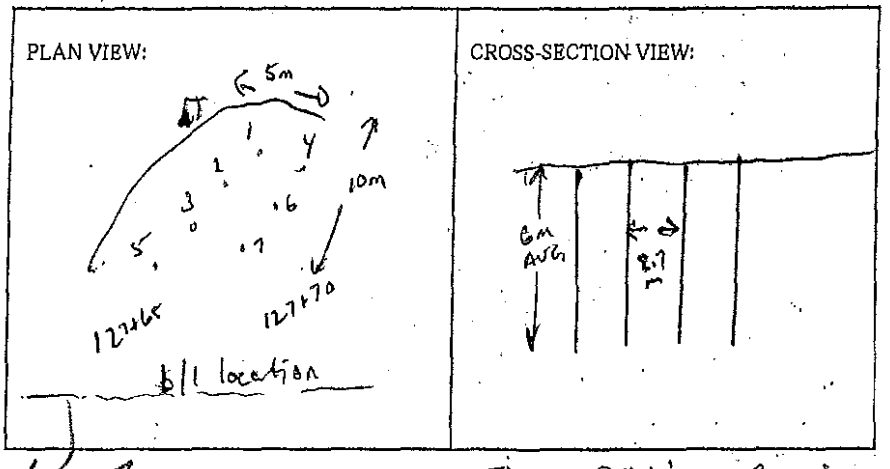
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



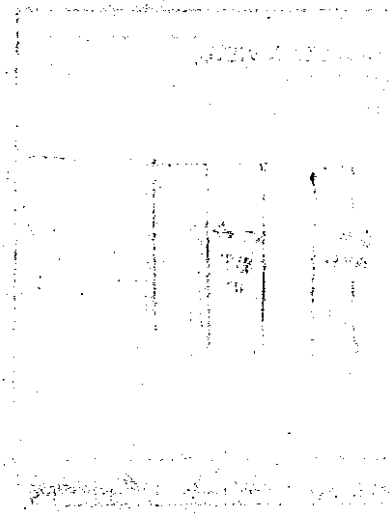
BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.13 ips/ 37 Hz
@ 13050 Old Mission Rd - 0.15 ips/ 24 Hz

4'-6' ANFO / HOLE Primed w/ 1 each 1½" x 16" DYNAMITE



Instantel

Event Report

Date/Time	Long at 13:39:33 January 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4GR.9X0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

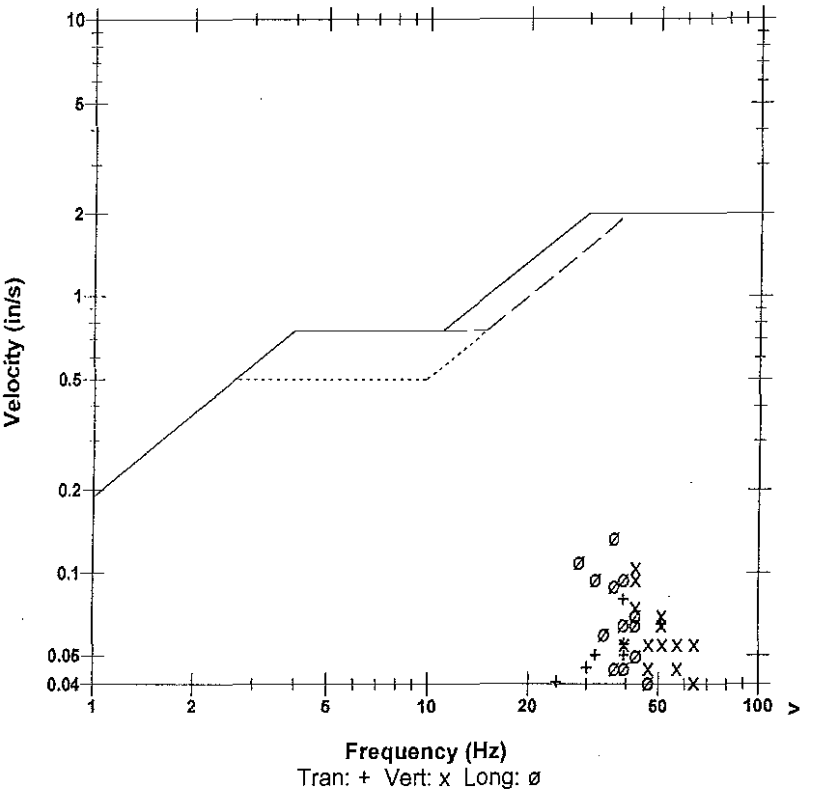
Extended Notes
Blast at stn 128

Post Event Notes

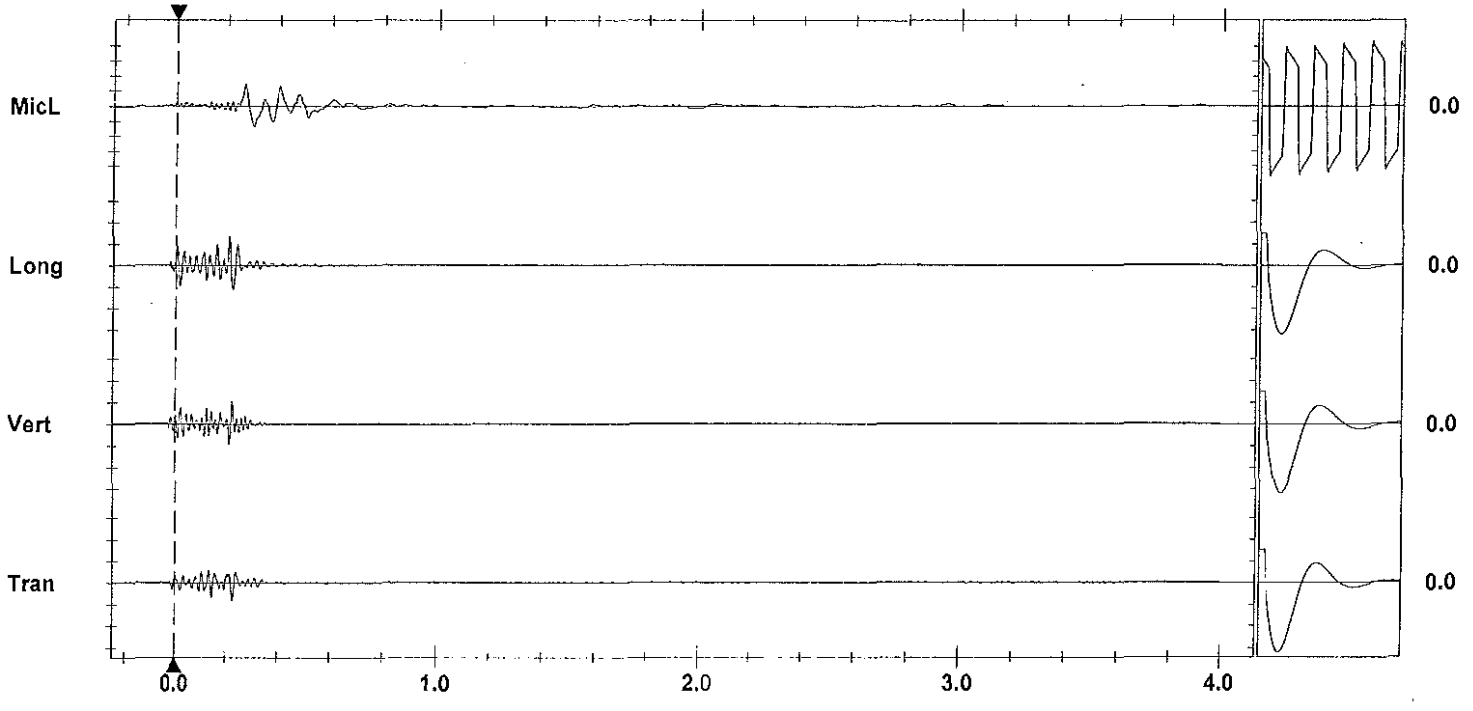
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.266 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 680 mv)

	Tran	Vert	Long	
PPV	0.0800	0.105	0.135	in/s
ZC Freq	39	43	37	Hz
Time (Rel. to Trig)	0.227	0.224	0.208	sec
Peak Acceleration	0.0530	0.0795	0.0795	g
Peak Displacement	0.00034	0.00038	0.00067	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

USBM RI8507 And OSMRE



Peak Vector Sum 0.164 in/s at 0.225 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

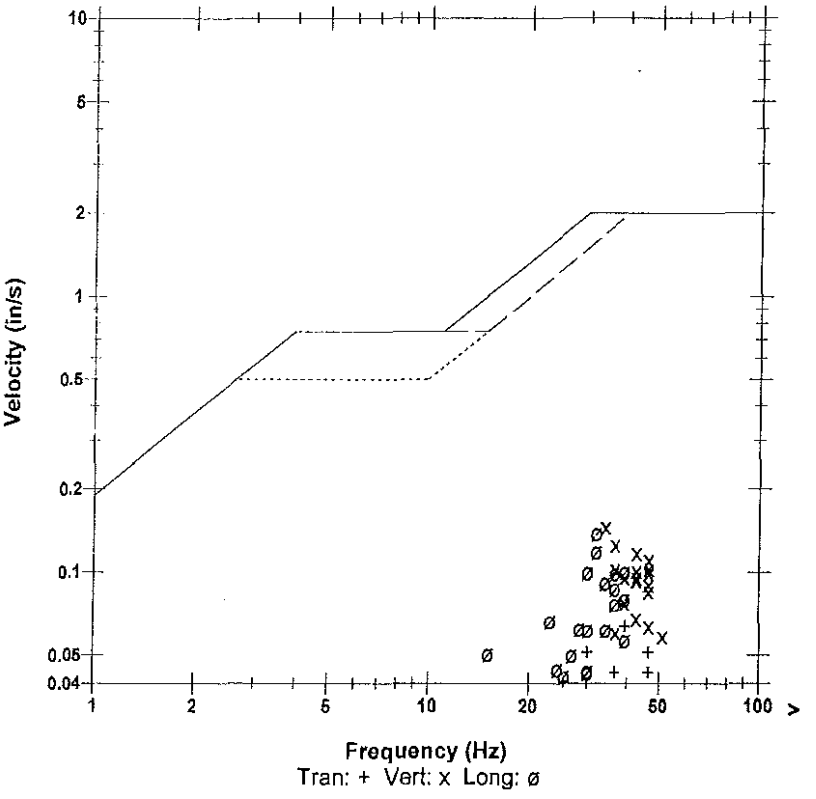
Date/Time	Vert at 13:39:47 January 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4GR.ABO
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

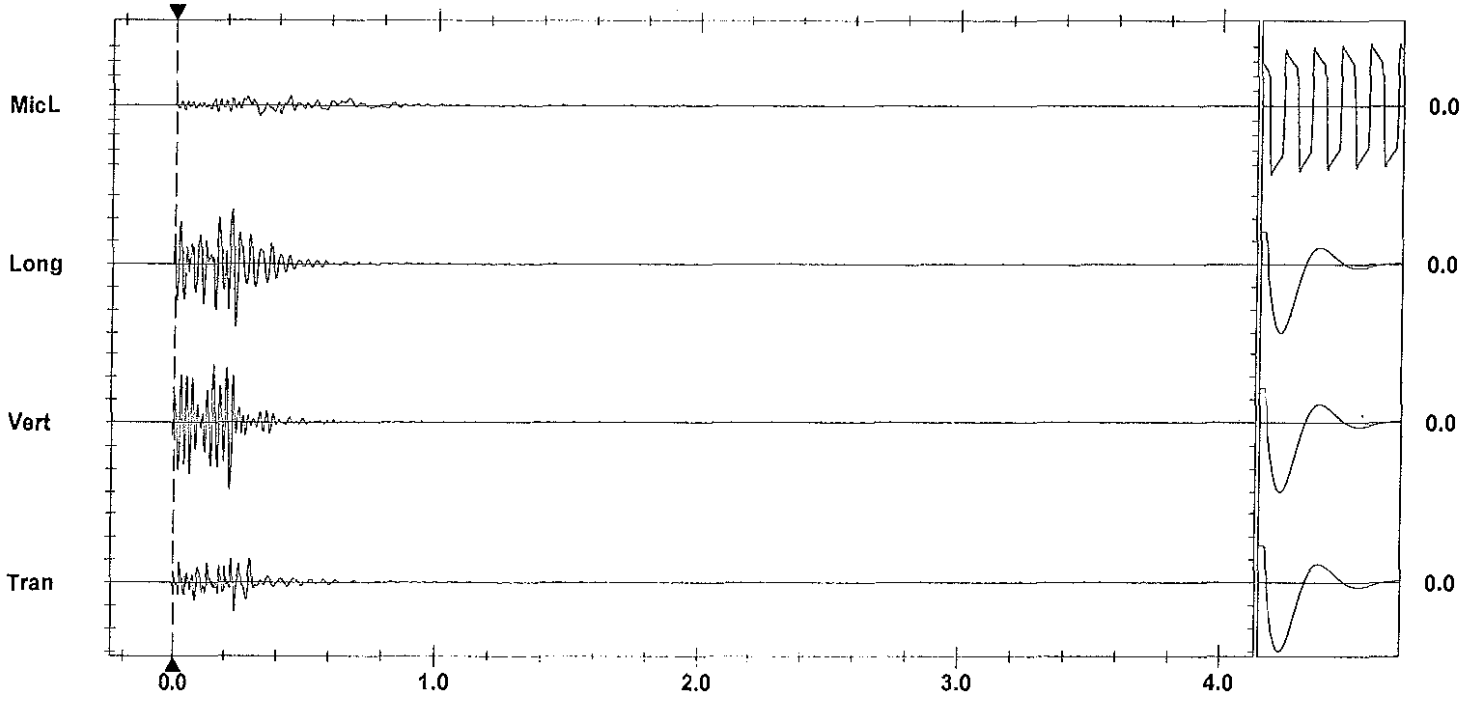
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00073 psi(L) at 0.324 sec			
ZC Freq	15 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 693 mv)			

	Tran	Vert	Long	
PPV	0.0637	0.146	0.139	in/s
ZC Freq	39	34	32	Hz
Time (Rel. to Trig)	0.237	0.217	0.235	sec
Peak Acceleration	0.0547	0.108	0.0812	g
Peak Displacement	0.00026	0.00068	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.180 in/s at 0.218 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Young
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Jan 26/12
ACTUAL BLAST DATE Jan 26/12 11:34 AM
BLAST # MW-0092

HIGHWAY# 97
BLAST LOCATION AT: 127+65 - 127+79 RS (to Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 68 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 125 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 11611 / 46 Aft / 3 Stab
HOLE DIAMETER 89 (mm) + 76 mm
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 410 mm by 1400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

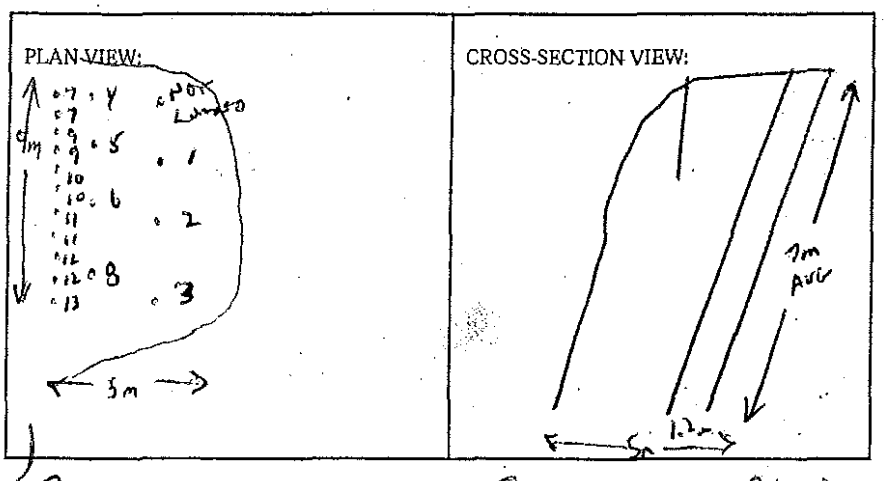
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE _____ CAPACITY _____

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Young COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.100 ips / 30Hz
@ 13050 Old Mission Rd - 0.22 ips / 34Hz

STAB HOLES - 2' ANFO/HOLE

BUFFER HOLES - 5-6 EACH 2½"x16" BLASTEX

PRIMED W/ 0.5 EACH 1½" x 16" DYNAMITE

B/L HOLES - 1 EACH 2x16 DYNAMITE + 200gr det cord to 4' collar

Instantel

Event Report

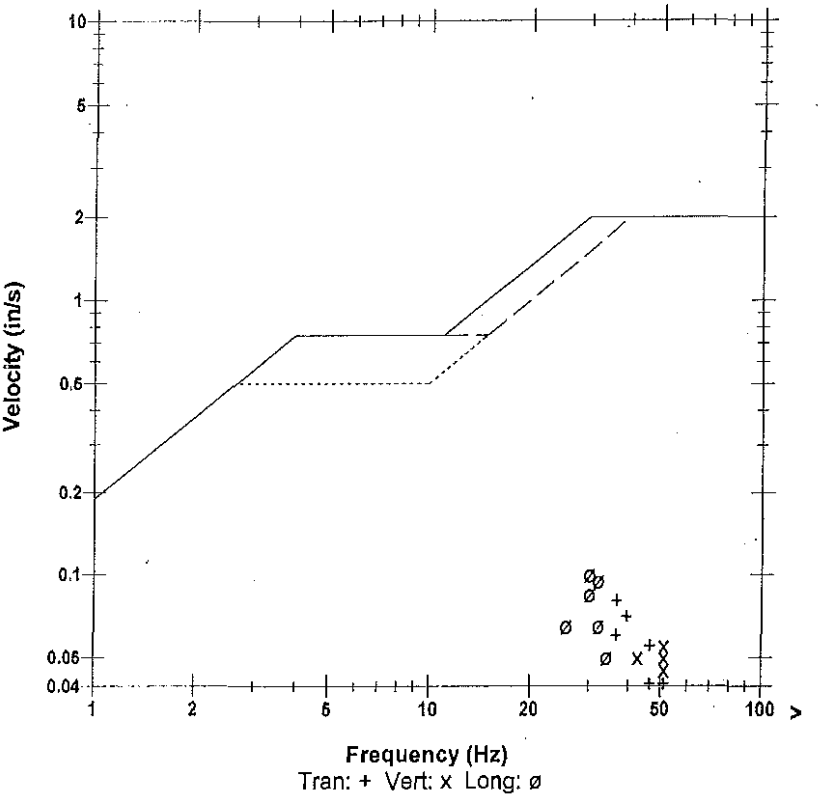
Date/Time	Long at 11:33:59 January 26, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4KA.SN0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

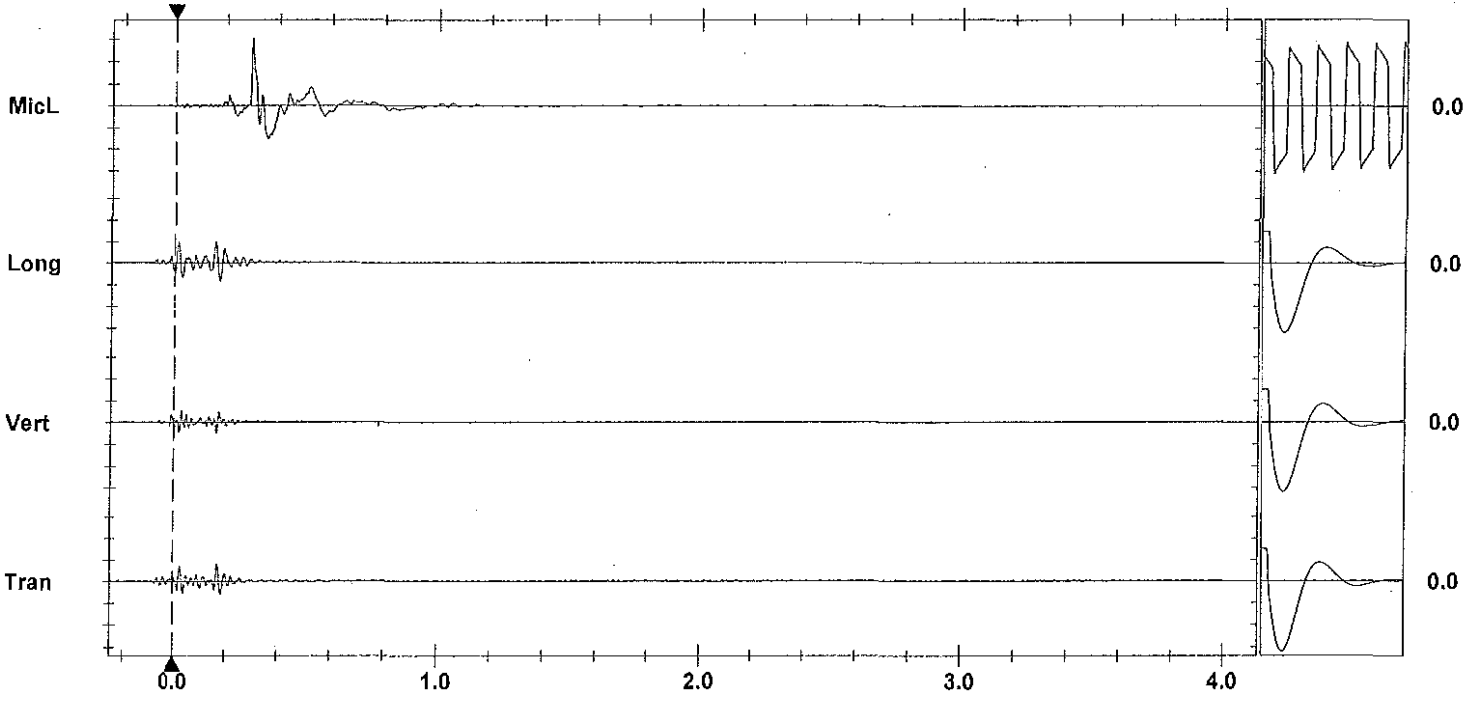
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00609 psi(L) at 0.297 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 685 mv)

	Tran	Vert	Long	
PPV	0.0800	0.0550	0.1000	in/s
ZC Freq	37	51	30	Hz
Time (Rel. to Trig)	0.173	0.030	0.161	sec
Peak Acceleration	0.0530	0.0530	0.0530	g
Peak Displacement	0.00035	0.00018	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.122 in/s at 0.176 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 11:34:15 January 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4KA.T30
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

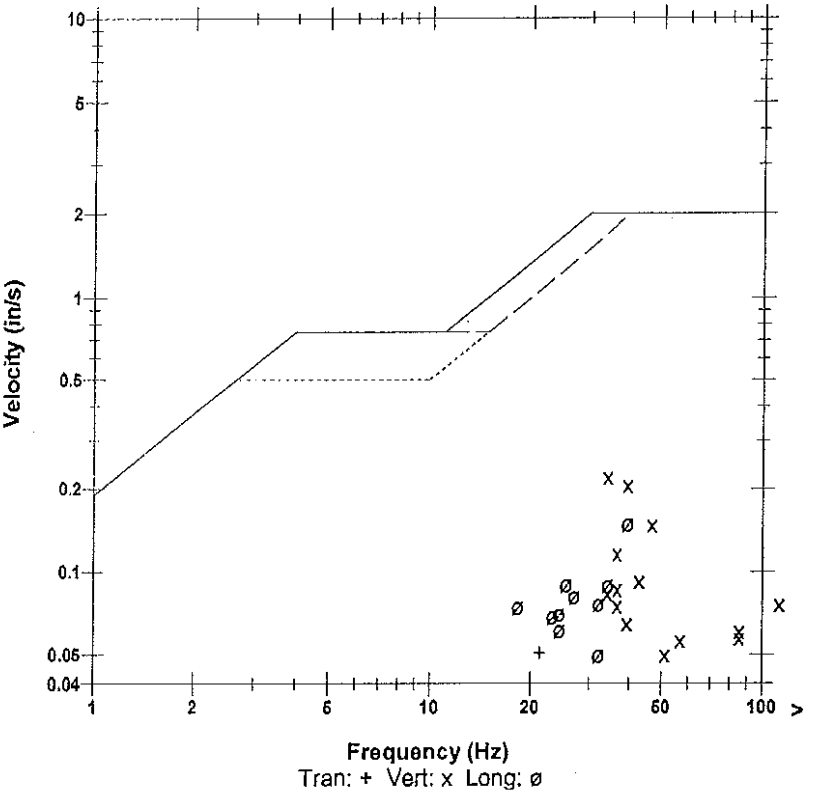
Post Event Notes

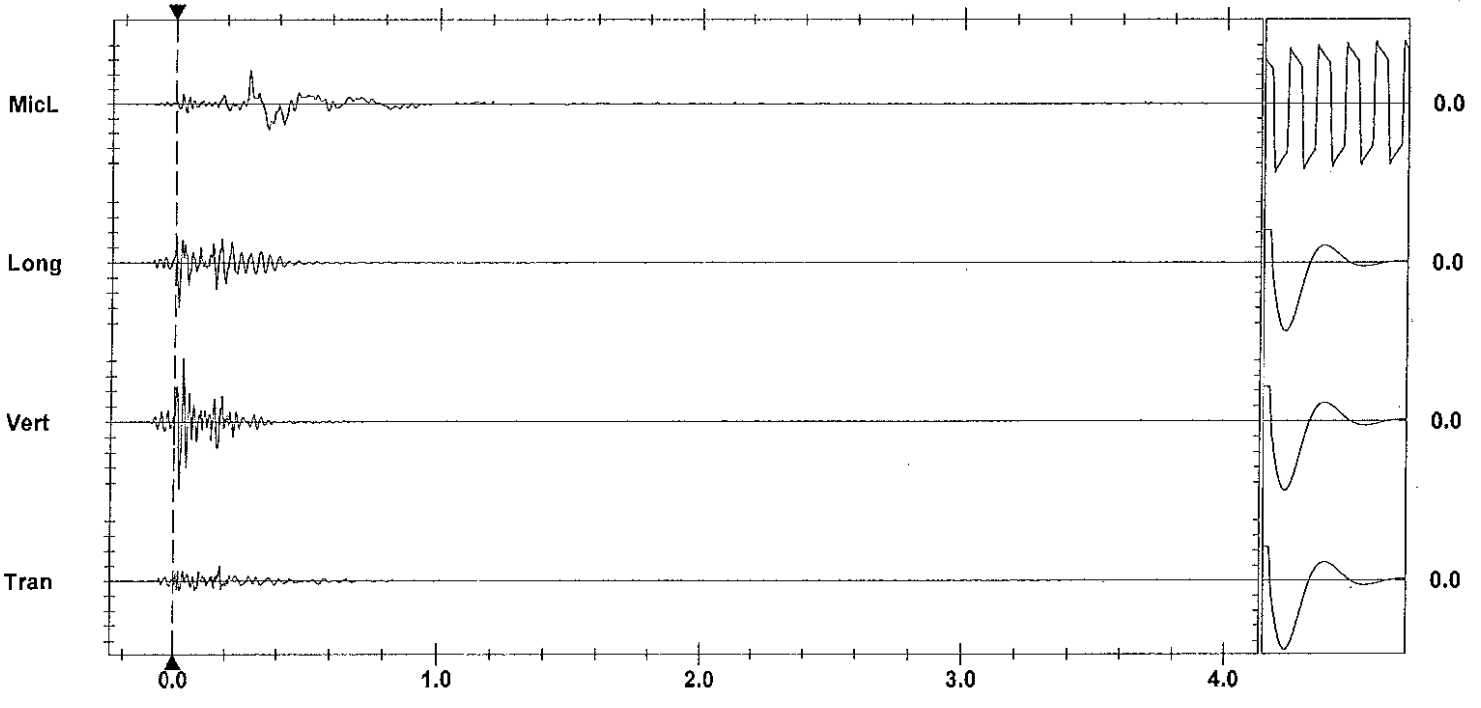
Microphone Linear Weighting
PSPL 0.00225 psi(L) at 0.287 sec
ZC Freq 8.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 696 mv)

	Tran	Vert	Long	
PPV	0.0506	0.221	0.149	in/s
ZC Freq	21	34	39	Hz
Time (Rel. to Trig)	0.182	0.021	0.014	sec
Peak Acceleration	0.0563	0.162	0.0945	g
Peak Displacement	0.00025	0.00087	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.224 in/s at 0.021 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 26/12
ACTUAL BLAST DATE JAN 26/12 1:16PM
BLAST # MW-0093

HIGHWAY# 97
BLAST LOCATION AT: 127+80 - 127+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 120 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½ Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

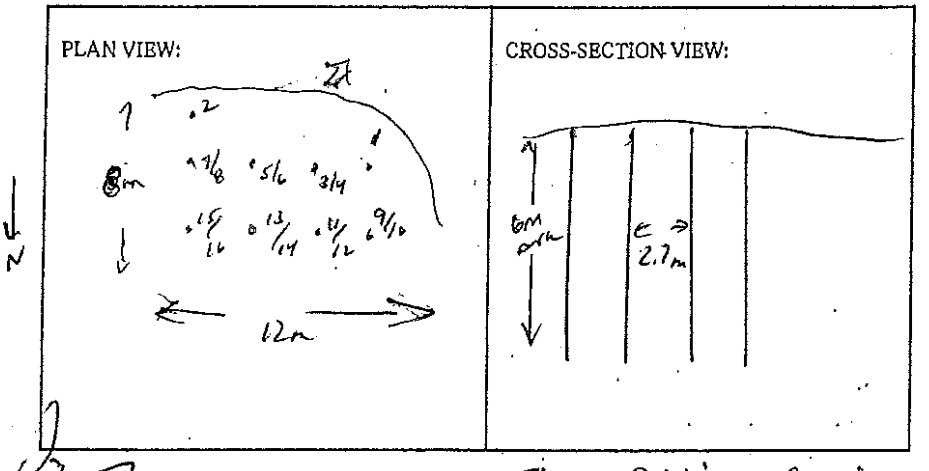
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 550 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13+73 Cliffstone cut - 0.16 ips/ 32Hz
" @ 13+050 Old Mission Rd - 0.18 ips/ 32Hz

Bottom Decks - 3'-3.5' ANFO

Top Decks - 1' ANFO

Primed w/ 1 each 1½"x16" Dynamite

Instantel

Event Report

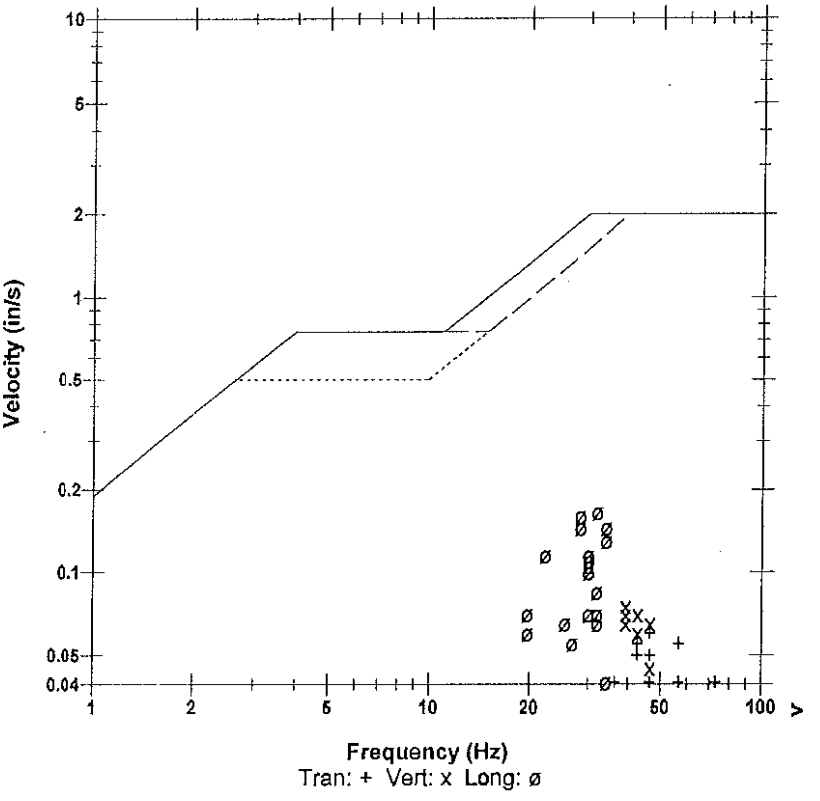
Date/Time	Long at 13:15:57 January 26, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4KF.IL0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

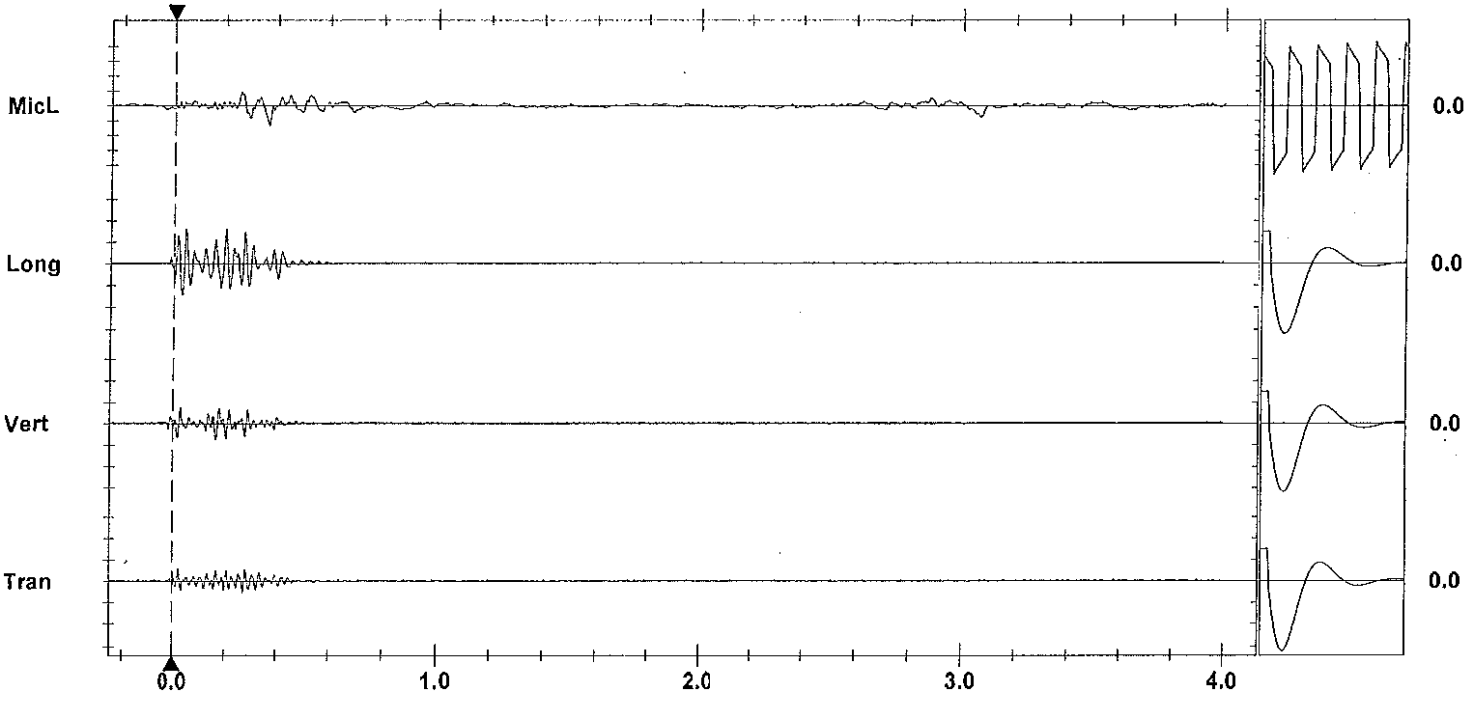
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.364 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 614 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0750	0.165	in/s
ZC Freq	47	39	32	Hz
Time (Rel. to Trig)	0.023	0.030	0.047	sec
Peak Acceleration	0.0398	0.0795	0.0928	g
Peak Displacement	0.00020	0.00032	0.00081	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.8	3.8	4.6	

Peak Vector Sum 0.166 in/s at 0.202 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

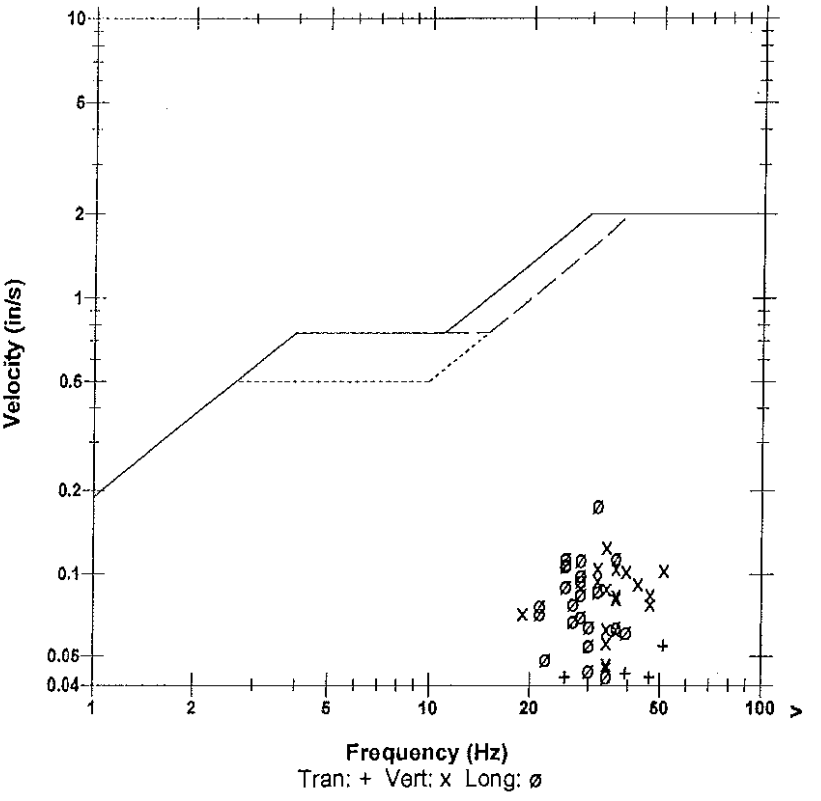
Date/Time	Vert at 13:16:13 January 26, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4KF.J10
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

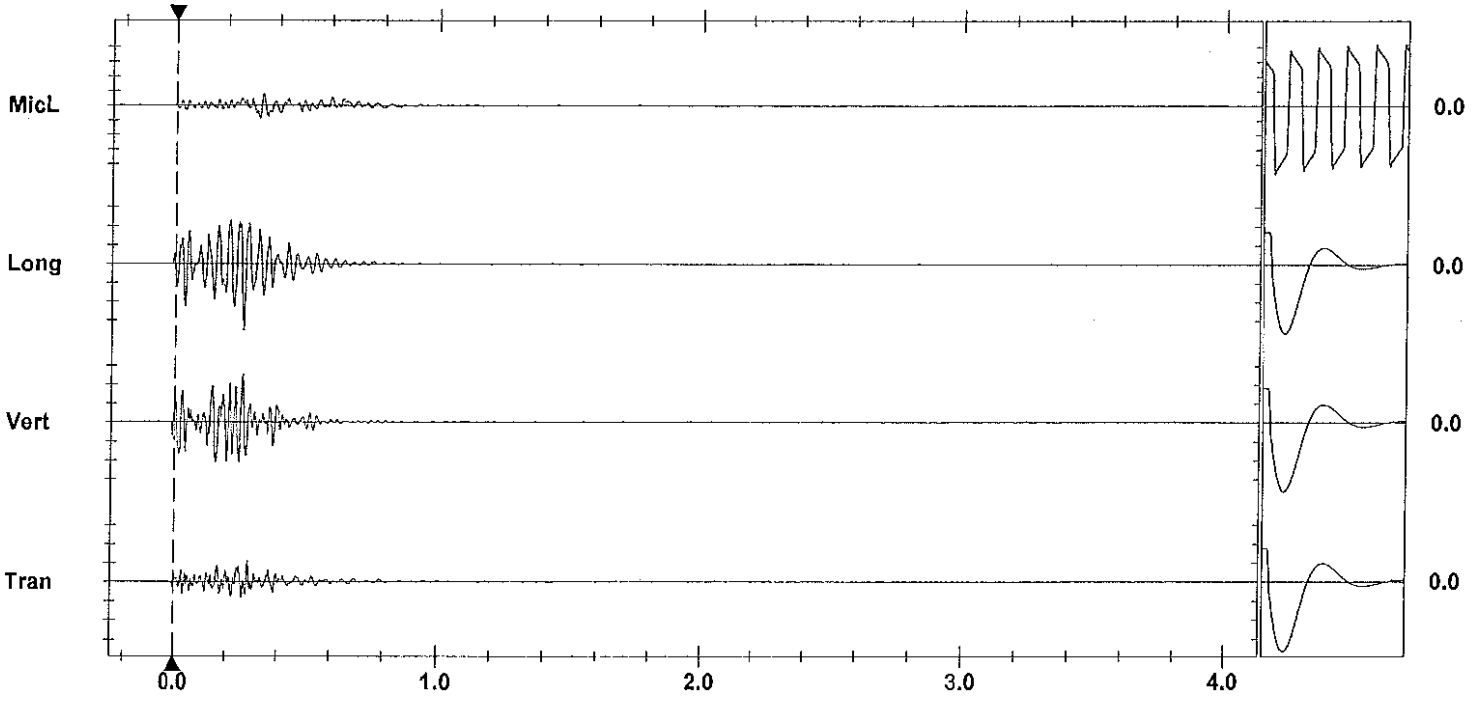
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00083 psi(L) at 0.321 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 640 mv)

	Tran	Vert	Long	
PPV	0.0544	0.126	0.177	in/s
ZC Freq	51	34	32	Hz
Time (Rel. to Trig)	0.288	0.264	0.266	sec
Peak Acceleration	0.0481	0.129	0.0978	g
Peak Displacement	0.00026	0.00058	0.00084	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.219 in/s at 0.265 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 30/12
ACTUAL BLAST DATE JAN 30/12 11:57 AM
BLAST # MW-0094

HIGHWAY# 97
BLAST LOCATION AT: 127+64 - 127+74 Rs (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Metasedimentary
DISTANCE TO NEAREST STRUCTURE (UTILITY) 115 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 105/11 / 360 Aff / 2 Stab
HOLE DIAMETER 89 (mm) & 76mm
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + Blastex Emulsion (Cart.) 85mm x 400mm
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

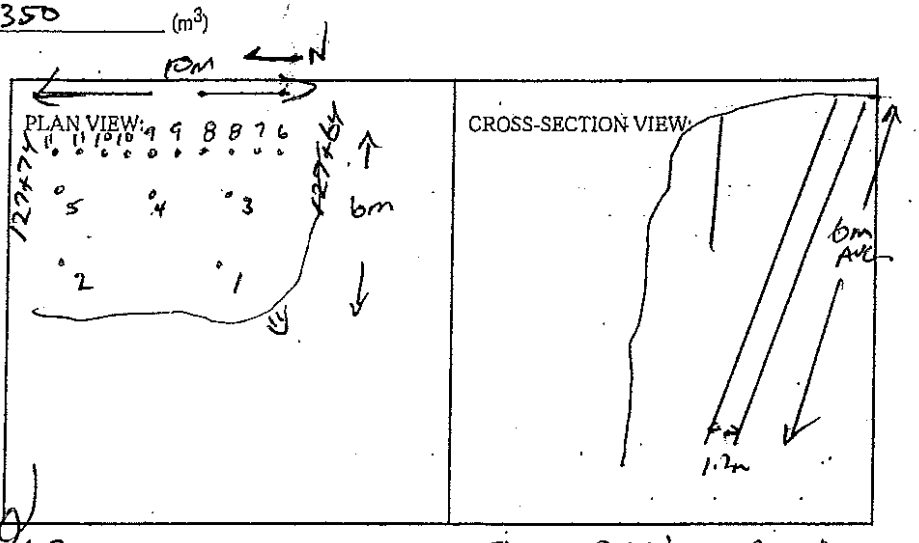
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffside Crt - 0.11 ips/ 51 Hz
" @ 13050 Old Mission Rd - 0.131 ips/ 32 Hz

STAB Holes - 1.5' Anfo/hole

Buffer Holes - 4 count 2½"x16' Blastex

Primed w/ 0.5 each 1½"x16' Dynamite

B/L Holes - 1 count 2"x16' Blastex + 200gm det. cord to 4' collar

Instantel

Event Report

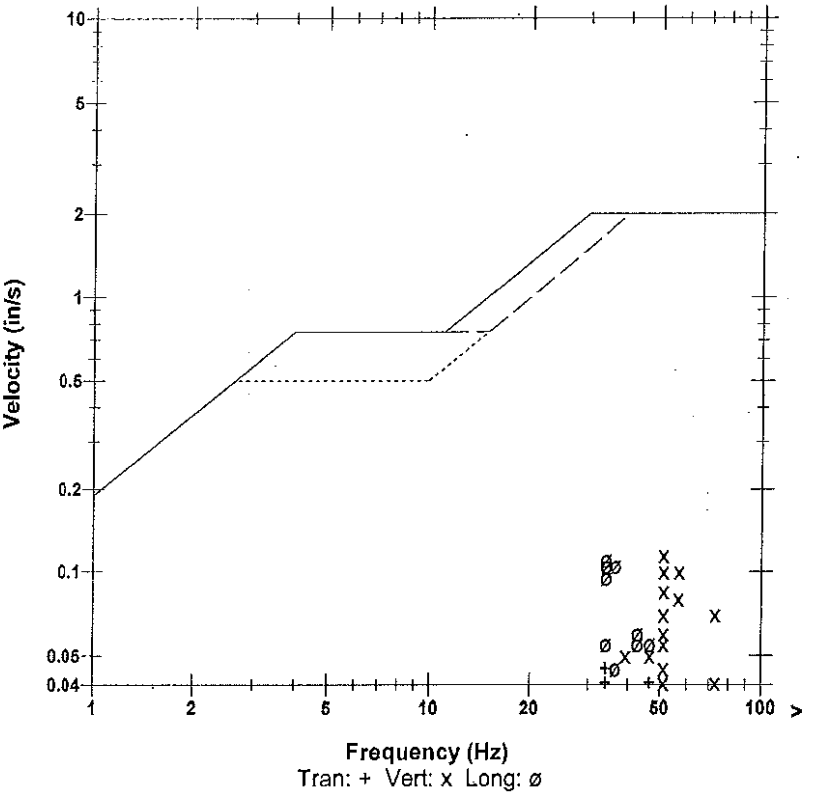
Date/Time	Vert at 11:57:21 January 30, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4RQ.JL0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

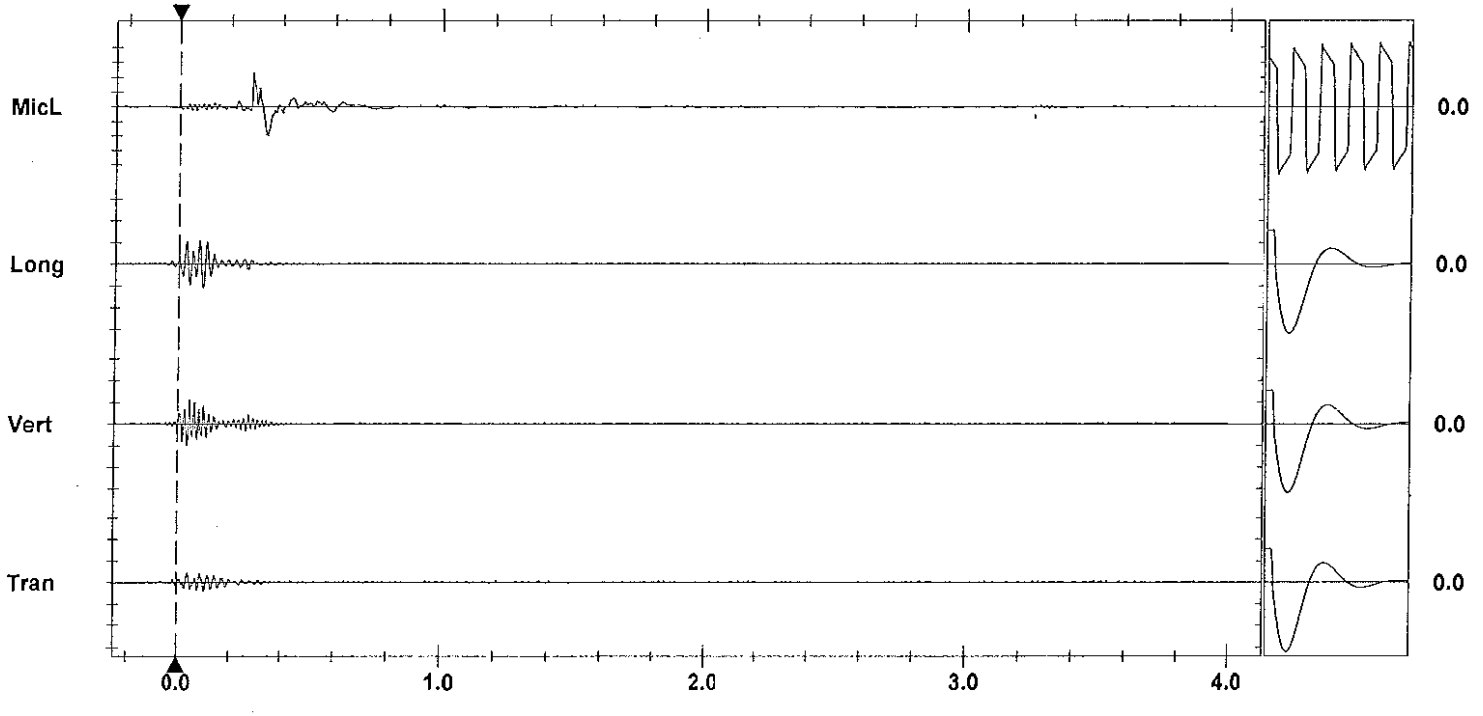
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00232 psi(L) at 0.284 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 609 mv)

	Tran	Vert	Long	
PPV	0.0450	0.115	0.110	in/s
ZC Freq	34	51	34	Hz
Time (Rel. to Trig)	0.042	0.048	0.096	sec
Peak Acceleration	0.0398	0.106	0.0663	g
Peak Displacement	0.00021	0.00035	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.135 in/s at 0.047 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

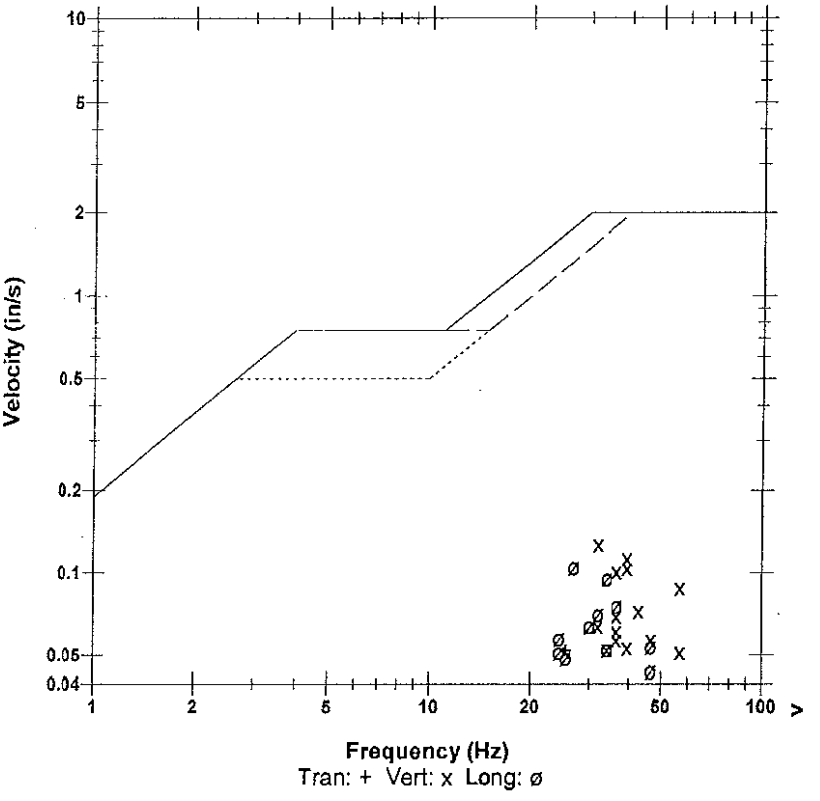
Date/Time	Vert at 11:57:41 January 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4RQ.K50
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

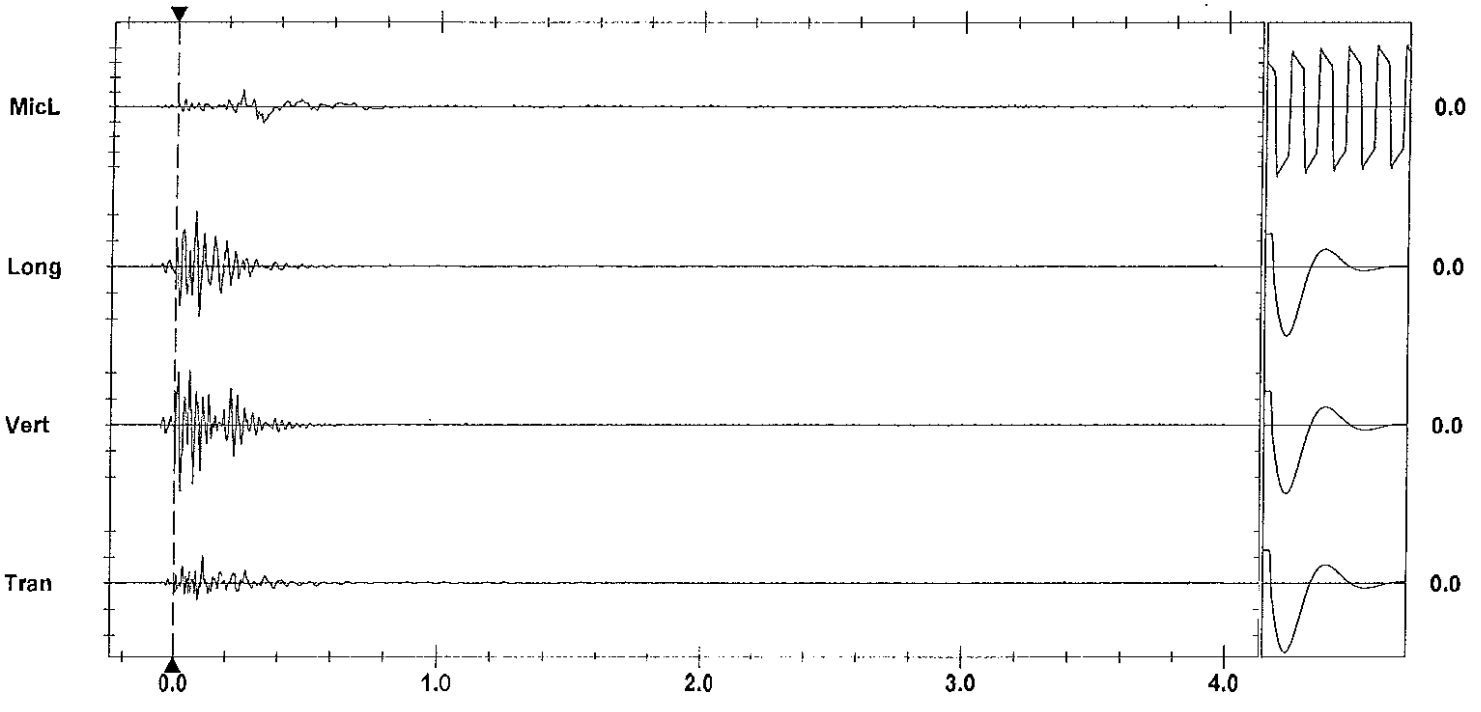
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.255 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 659 mv)

	Tran	Vert	Long	
PPV	0.0519	0.127	0.105	in/s
ZC Freq	26	32	27	Hz
Time (Rel. to Trig)	0.114	0.023	0.078	sec
Peak Acceleration	0.0497	0.144	0.0696	g
Peak Displacement	0.00020	0.00053	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.129 in/s at 0.023 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 30/12
ACTUAL BLAST DATE Jan 30/12 1:30 PM
BLAST # MW-0095

HIGHWAY# 97
BLAST LOCATION AT: STN 127+64 - 127+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 105 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 67 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

*Blaster Cert. Emulsion - 75mm x 400mm

EXPLOSIVE TYPE 1½" Dynamite ~~Powder~~
TOTAL NUMBER OF CARTRIDGES 55
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

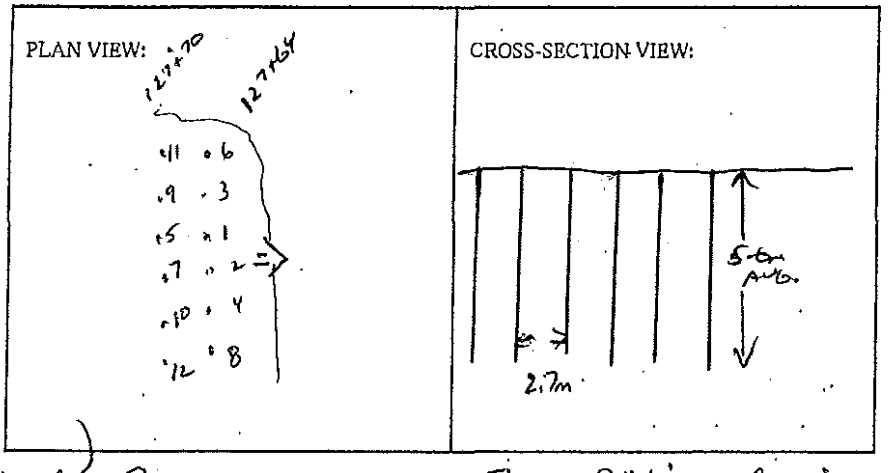
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 540 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt. - 0.26 ips/ 32Hz
" @ 13050 Old Mission Rd. - 0.21 ips/ 39Hz

2-3 CAST 3"x16" BAGTEX/HOLE
Primed w/ 0.5 CAST 1½"x16" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 13:30:27 January 30, 2012
Trigger Source	Geo: 0.0400 in/s
Range	Geo :10.00 in/s
Record Time	4.0 sec at 1024 sps

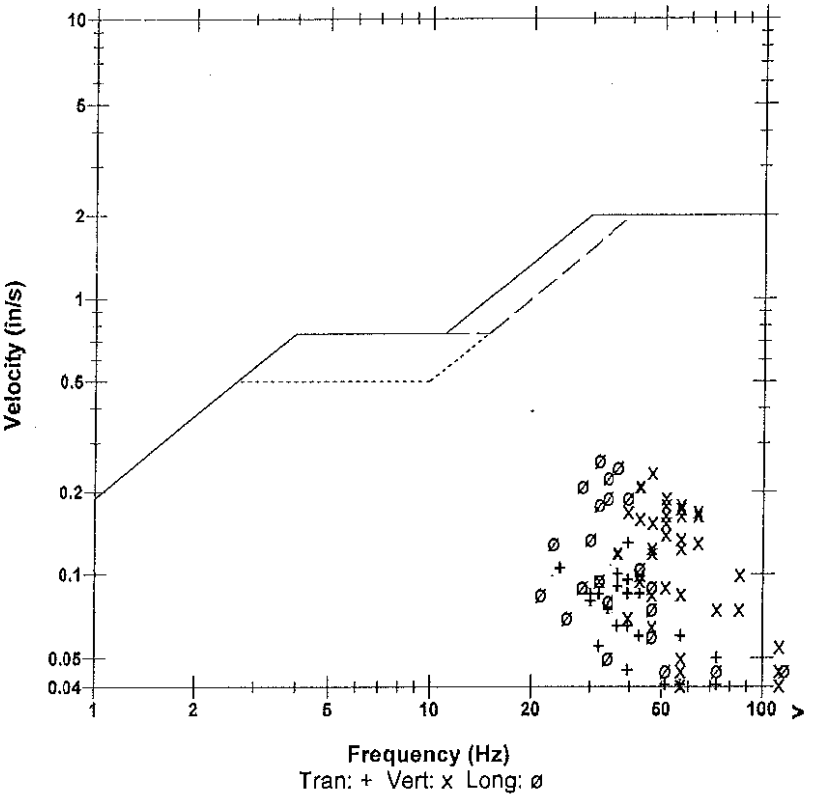
Serial Number	BA11866 V 10.10-8.17 BlastMate III
Battery Level	6.1 Volts
Calibration	January 26, 2011 by Instantel Inc.
File Name	M866E4RU.UR0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

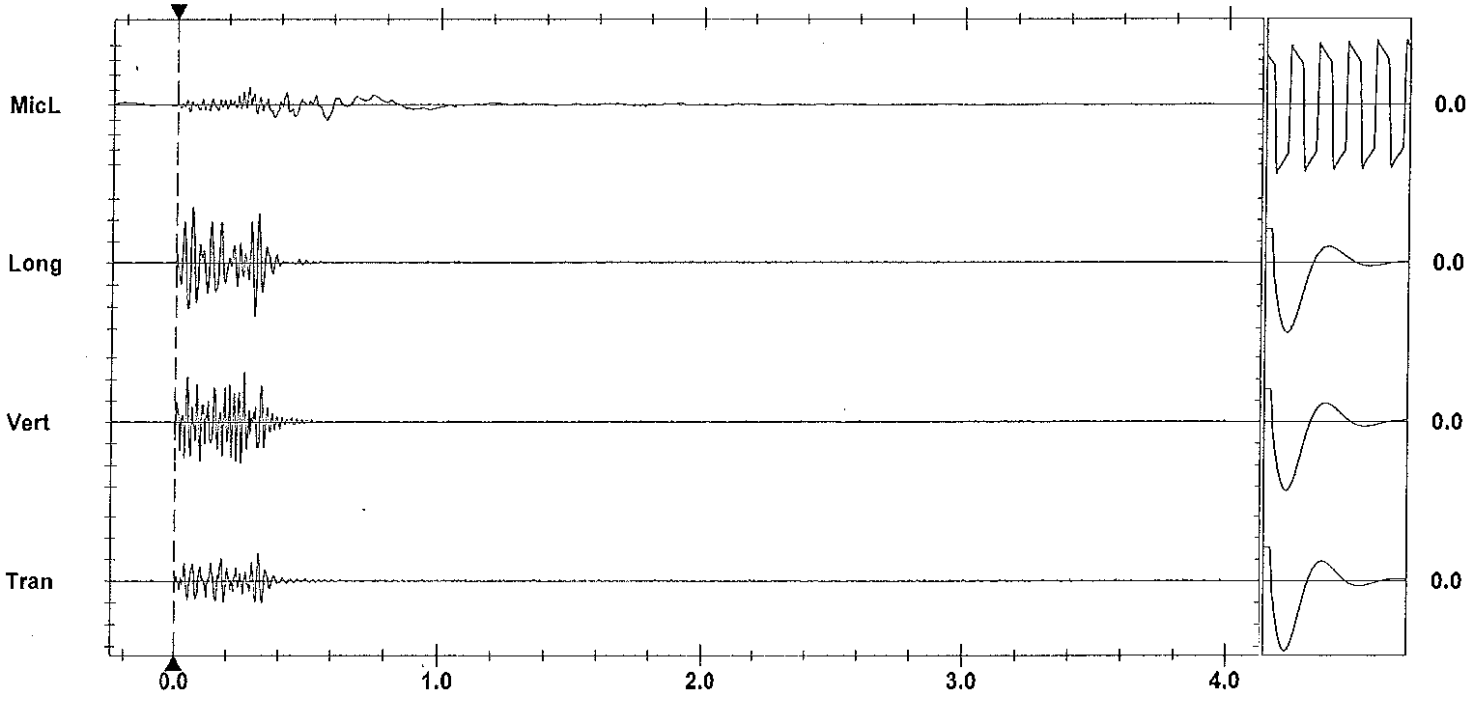
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.277 sec
ZC Freq	30 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 649 mv)

	Tran	Vert	Long	
PPV	0.130	0.235	0.260	in/s
ZC Freq	39	47	32	Hz
Time (Rel. to Trig)	0.326	0.268	0.064	sec
Peak Acceleration	0.0928	0.199	0.159	g
Peak Displacement	0.00052	0.00079	0.00126	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.301 in/s at 0.049 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 6, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

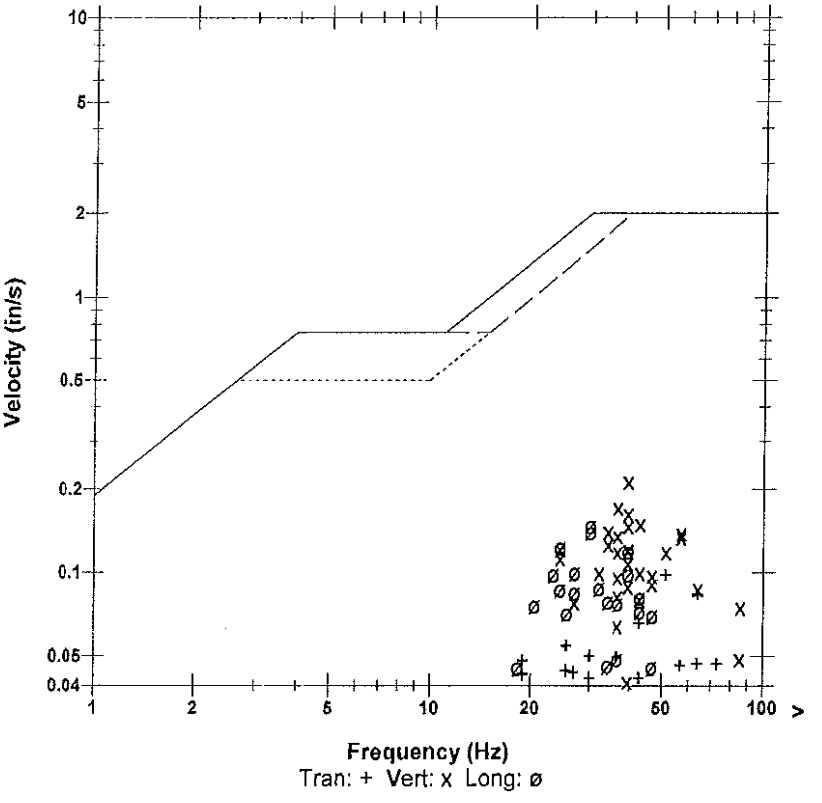
Date/Time	Vert at 13:30:46 January 30, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4RU.VA0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

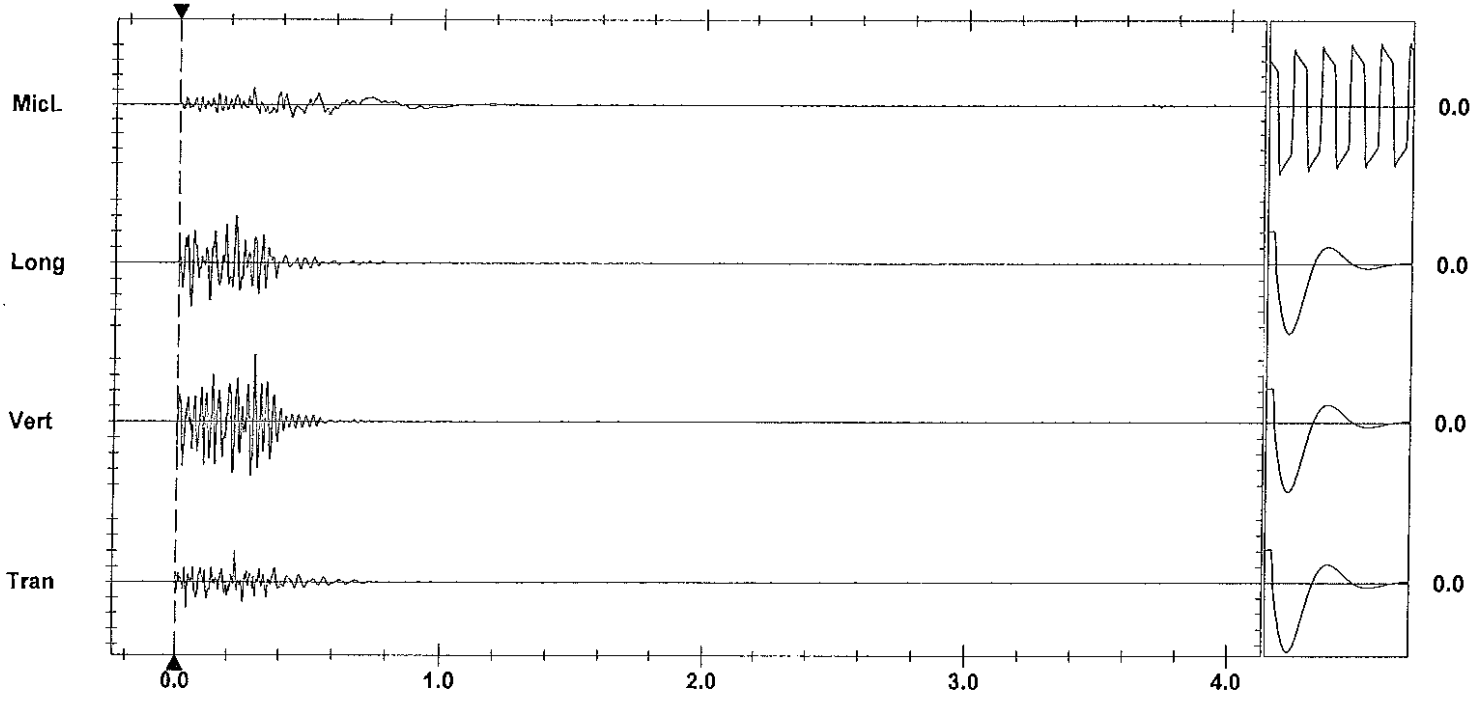
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at 0.286 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 652 mv)

	Tran	Vert	Long	
PPV	0.0981	0.213	0.147	in/s
ZC Freq	51	39	30	Hz
Time (Rel. to Trig)	0.229	0.300	0.223	sec
Peak Acceleration	0.0845	0.161	0.101	g
Peak Displacement	0.00032	0.00074	0.00072	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.226 in/s at 0.300 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 31/12
ACTUAL BLAST DATE Jan 31/12 11:23 am
BLAST # MW-0096

HIGHWAY# 97
BLAST LOCATION AT: STN 127+74 - 127+84 RS (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 110 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 86 11 / 3 by After
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

65mm x 400mm Bmax

EXPLOSIVE TYPE 1½" Dynamite + ~~ANFO~~ EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 10 TOTAL WEIGHT 25 (kg)
TOTAL NUMBER OF DELAYS 8 DELAY TYPE AND LENGTH 25 (ms)

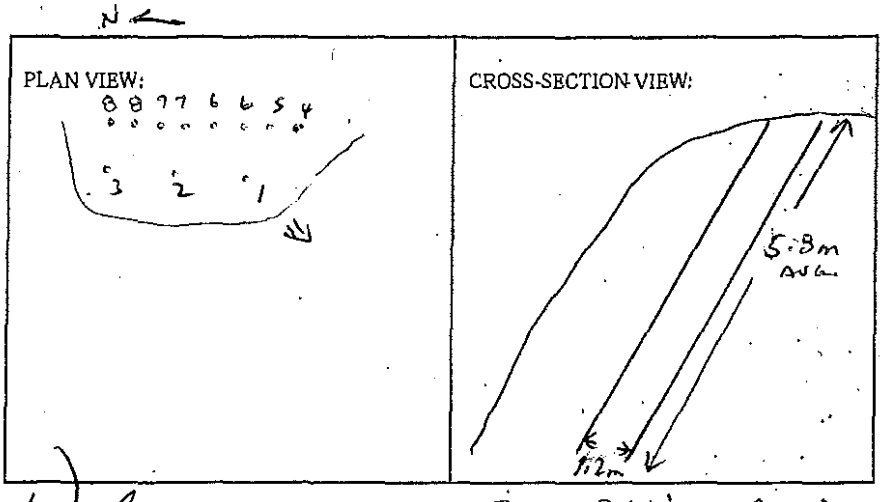
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.080 ips / 39 Hz
" @ 13050 Old Mission Rd - 0.14 ips / 51 Hz

Buffer Holes. 3-4 each 2½" x 16" Blasting
Primed w/ 0.5 each 1½" x 16" Dynamite

Bell Holes – 1 each 2" x 16" Dynamite + 200 grain
det. cord to 4' collar

Instantel

Event Report

Date/Time	Long at 11:23:57 January 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4TJ.NX0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

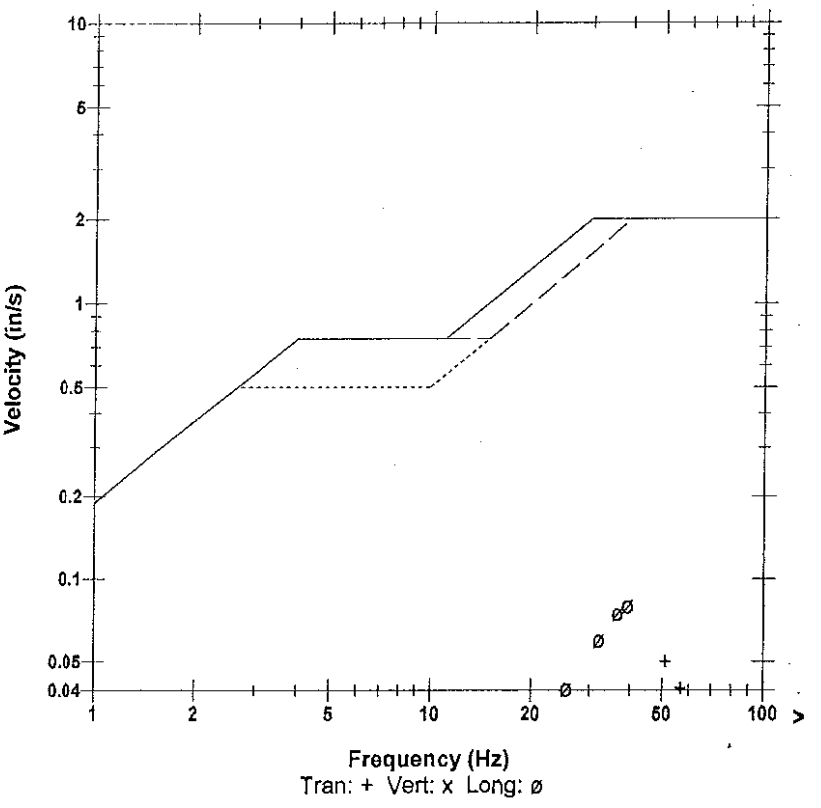
Extended Notes
Blast at stn 128

Post Event Notes

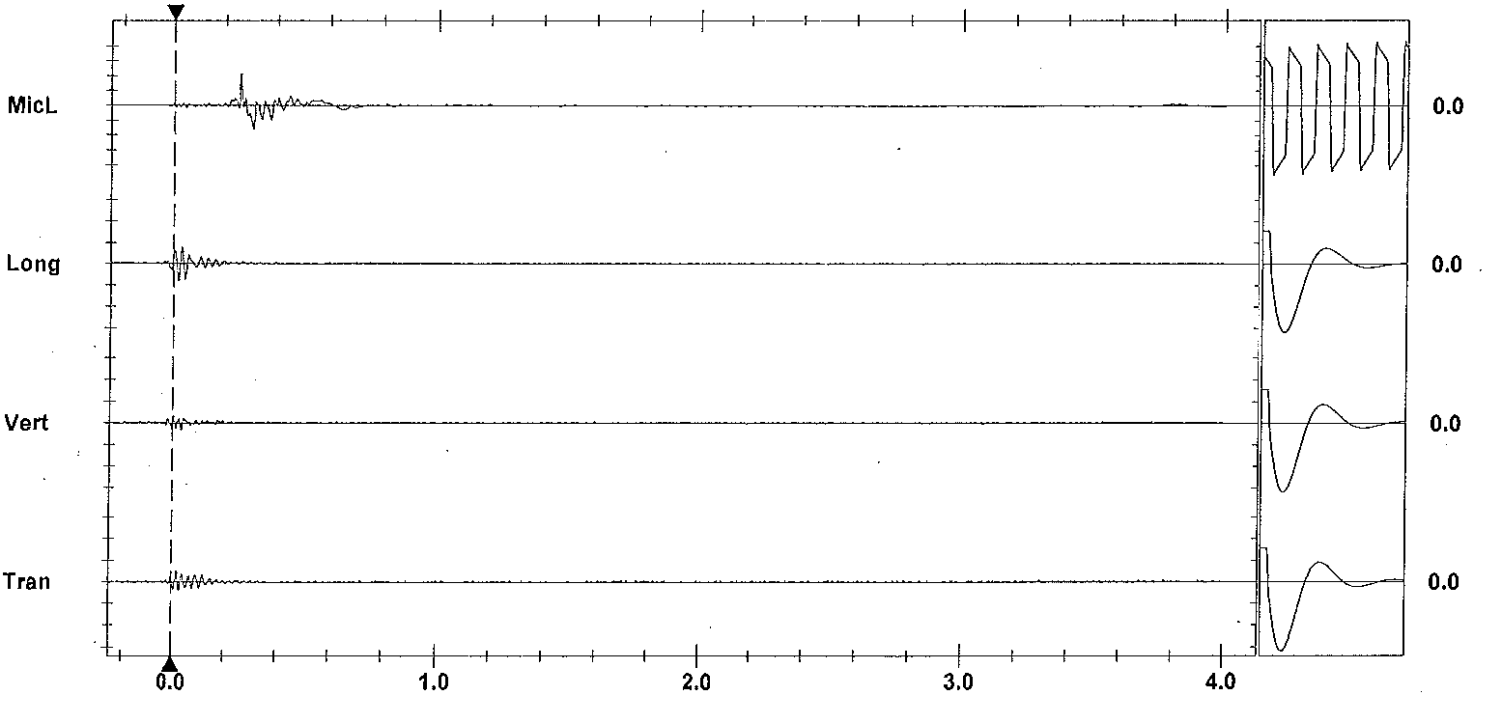
Microphone Linear Weighting
PSPL 0.00214 psi(L) at 0.257 sec
ZC Freq 39 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 636 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0300	0.0800	in/s
ZC Freq	51	64	39	Hz
Time (Rel. to Trig)	0.021	0.003	0.019	sec
Peak Acceleration	0.0530	0.0398	0.0530	g
Peak Displacement	0.00015	0.00011	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0919 in/s at 0.020 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 5, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

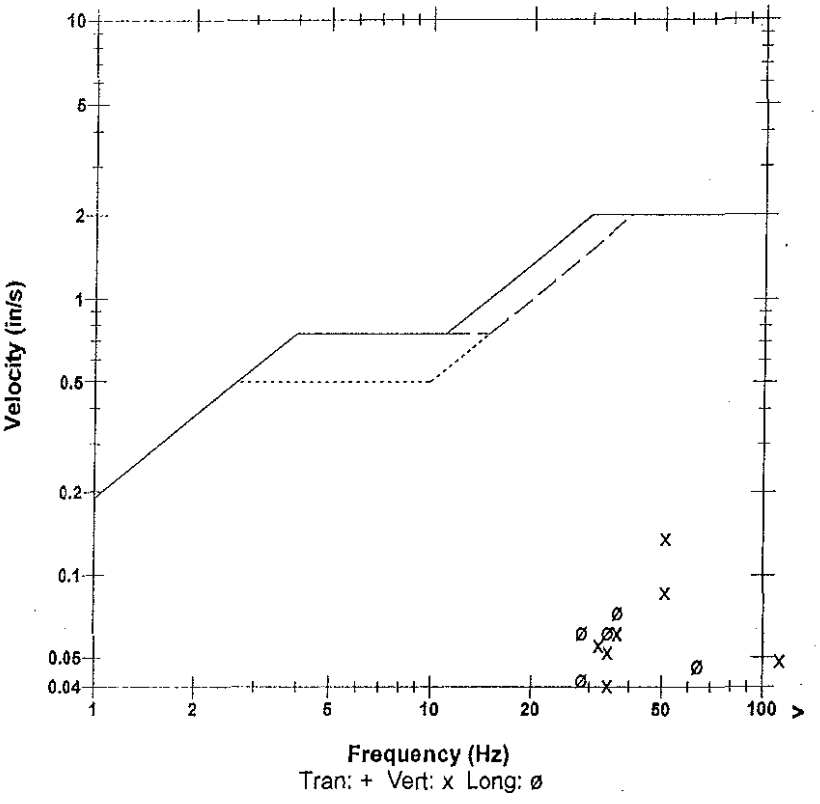
Date/Time	Vert at 11:24:17 January 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4TJ.OH0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

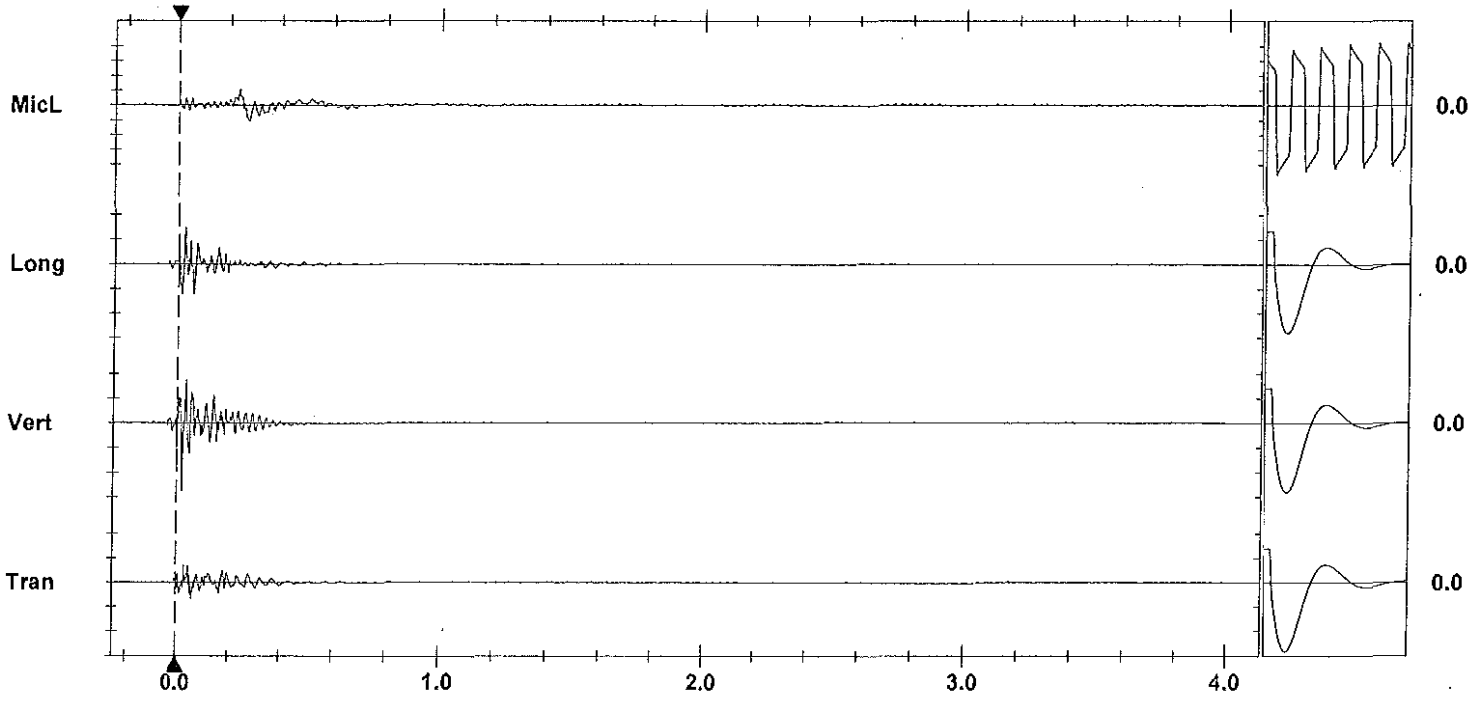
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00102 psi(L) at 0.233 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 680 mv)

	Tran	Vert	Long	
PPV	0.0369	0.136	0.0731	in/s
ZC Freq	73	51	37	Hz
Time (Rel. to Trig)	0.032	0.021	0.025	sec
Peak Acceleration	0.0497	0.131	0.0713	g
Peak Displacement	0.00015	0.00033	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.137 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 5, 2013 (V 9.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 31/12
ACTUAL BLAST DATE Jan 31/12 1:09 PM
BLAST # MW-0097

HIGHWAY# 97
BLAST LOCATION AT: STN 127+70 - 127+76

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 105 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 67 (m)

TOTAL NUMBER OF HOLES 12 Plus
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ~~AMEX~~ 75mm x 400mm Bhasses
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 50
TOTAL WEIGHT 100 (kg)
TOTAL NUMBER OF DELAYS 12
DELAY TYPE AND LENGTH 25 (ms)

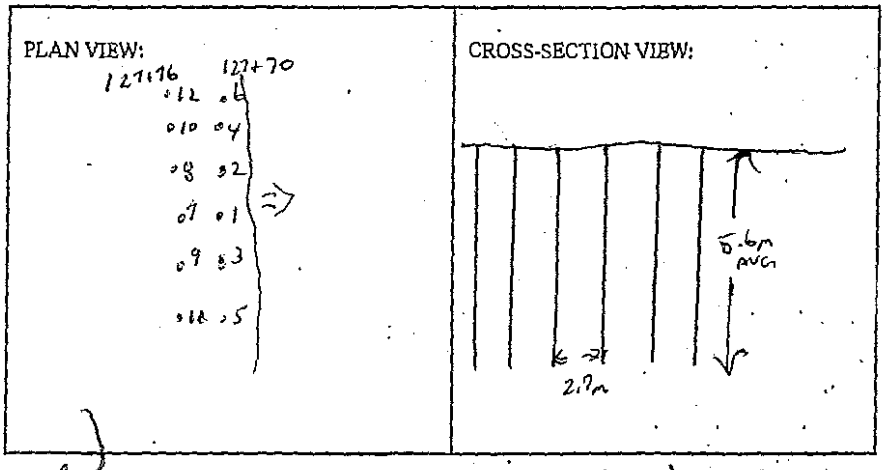
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HF 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 600 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph 13073 Cliffsborough - 0.24 ips/ 37Hz
@ 13050 Old Mission Rd - 0.26 ips/ 37Hz

6-9 CART 3"x16" BLASTEX / HOLE

Primed w/ 0.5 CART 1½"x16" DYNAMITE

Instantel

Event Report

Date/Time	Long at 13:09:51 January 31, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4TO.KF0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

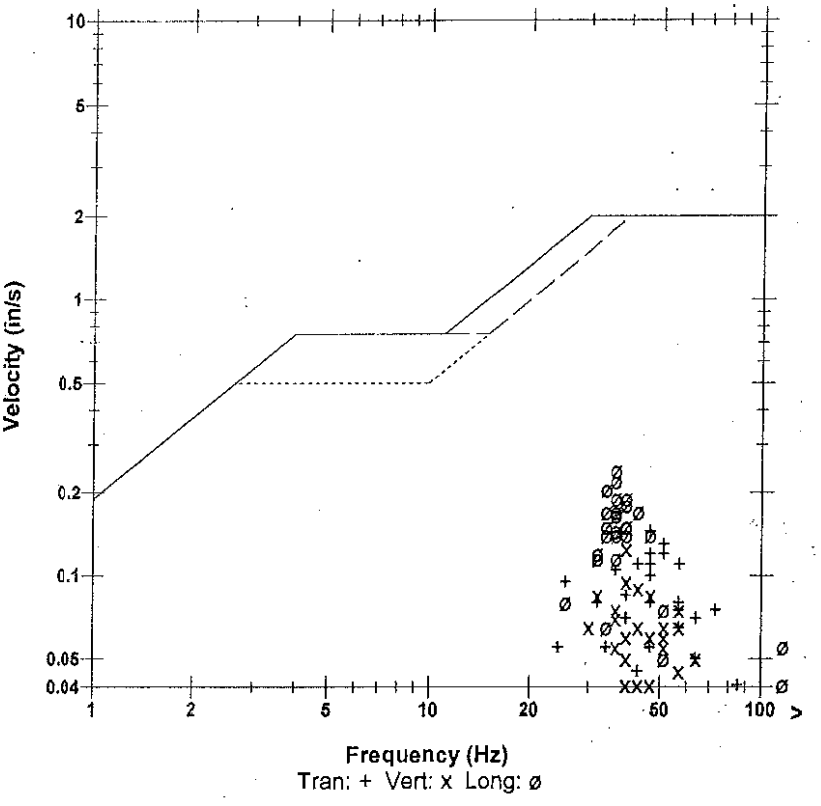
Post Event Notes

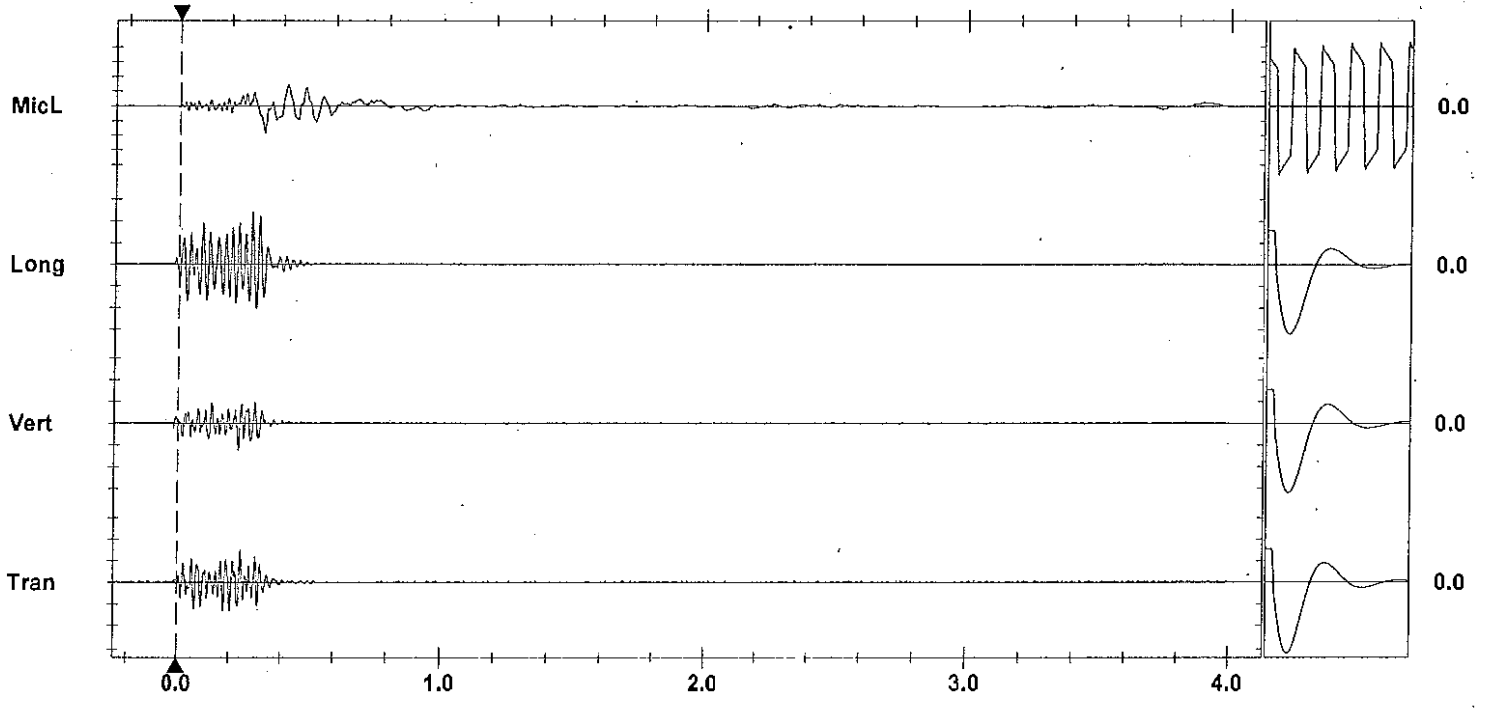
Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.329 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 652 mv)

	Tran	Vert	Long	
PPV	0.145	0.125	0.240	in/s
ZC Freq	47	39	37	Hz
Time (Rel. to Trig)	0.246	0.235	0.285	sec
Peak Acceleration	0.146	0.119	0.212	g
Peak Displacement	0.00049	0.00044	0.00100	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.7	4.3	

Peak Vector Sum 0.253 in/s at 0.285 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

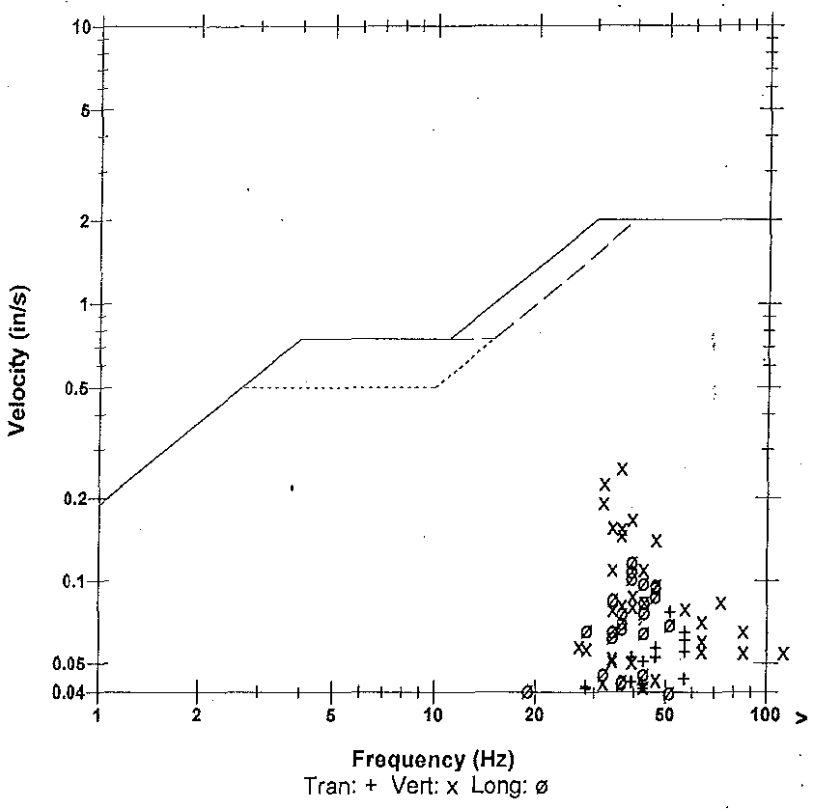
Date/Time	Vert at 13:10:12 January 31, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4TO.L00
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

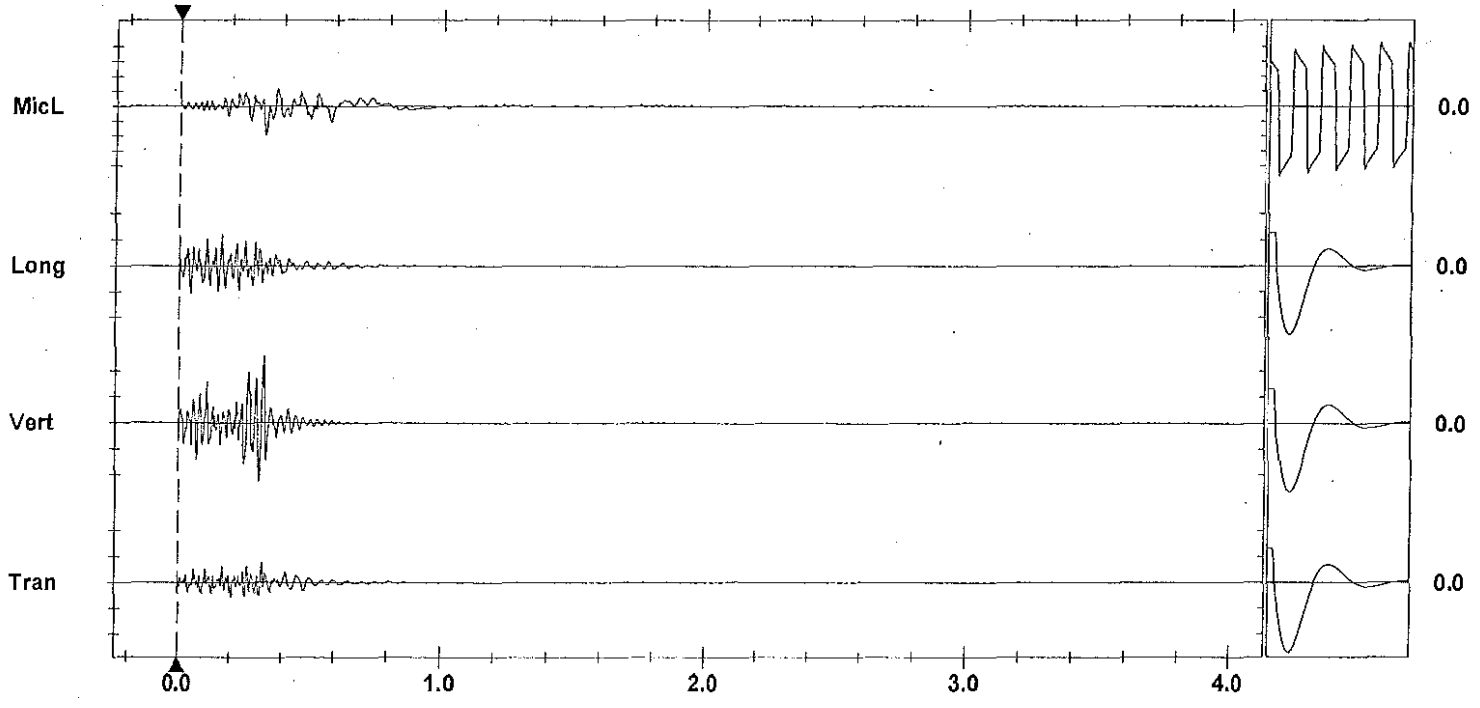
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00199 psi(L) at 0.331 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 681 mv)

	Tran	Vert	Long	
PPV	0.0769	0.257	0.117	in/s
ZC Freq	51	37	39	Hz
Time (Rel. to Trig)	0.326	0.329	0.164	sec
Peak Acceleration	0.0679	0.156	0.0928	g
Peak Displacement	0.00023	0.00111	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 0.261 in/s at 0.329 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 6, 2012 IV 8.01 - 8.01 Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489
DATE PREPARED Feb 1/12
ACTUAL BLAST DATE Feb 1/12 11:20AM
BLAST # MW-0098

HIGHWAY# 97
BLAST LOCATION AT: 127+76 – 127+82

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 95 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

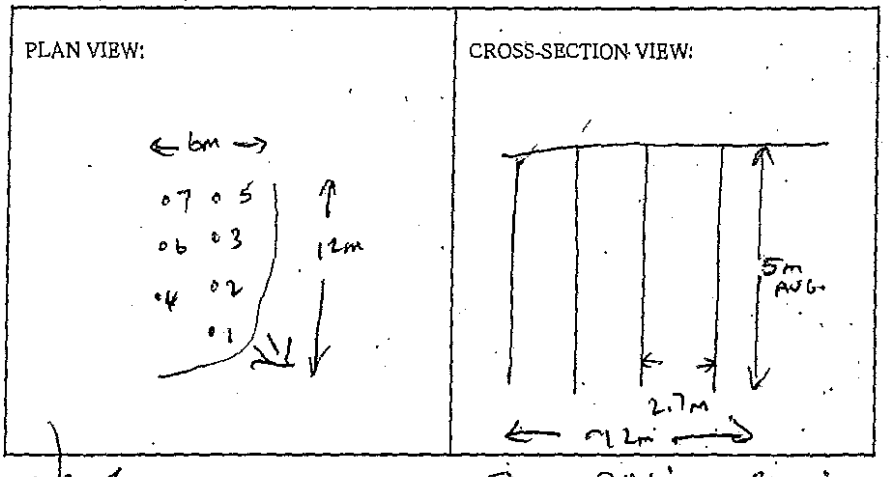
EXPLOSIVE TYPE 1½" DYNAMITE + 75mm×400mm Blastex
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 25
TOTAL WEIGHT 57 (kg)
TOTAL NUMBER OF DELAYS 7
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Siesmograph @ 13073 Chilliwack Cr. – 0.24 ips / 37 Hz
@ 13050 Old Mission Rd – 0.32 ips / 34 Hz

3-4 CART 3"x16" BLASTEX PER HOLE

+ 0.5 CART 1½"x16" DYNAMITE PRIMER

Instantel

Event Report

Date/Time	Long at 11:20:12 February 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4VE.5O0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

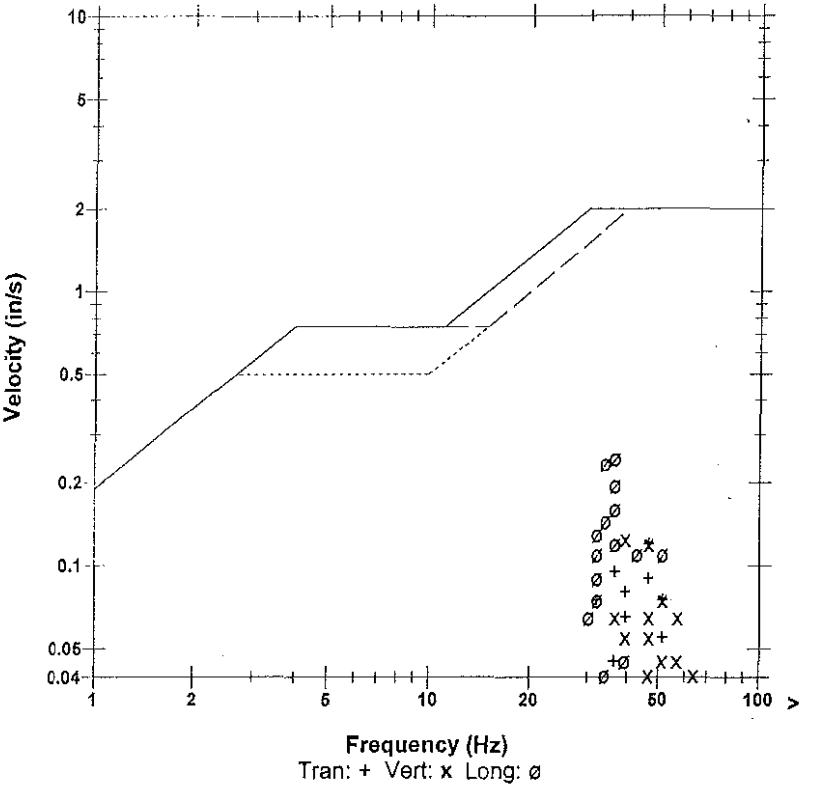
Extended Notes
Blast at stn 128

Post Event Notes

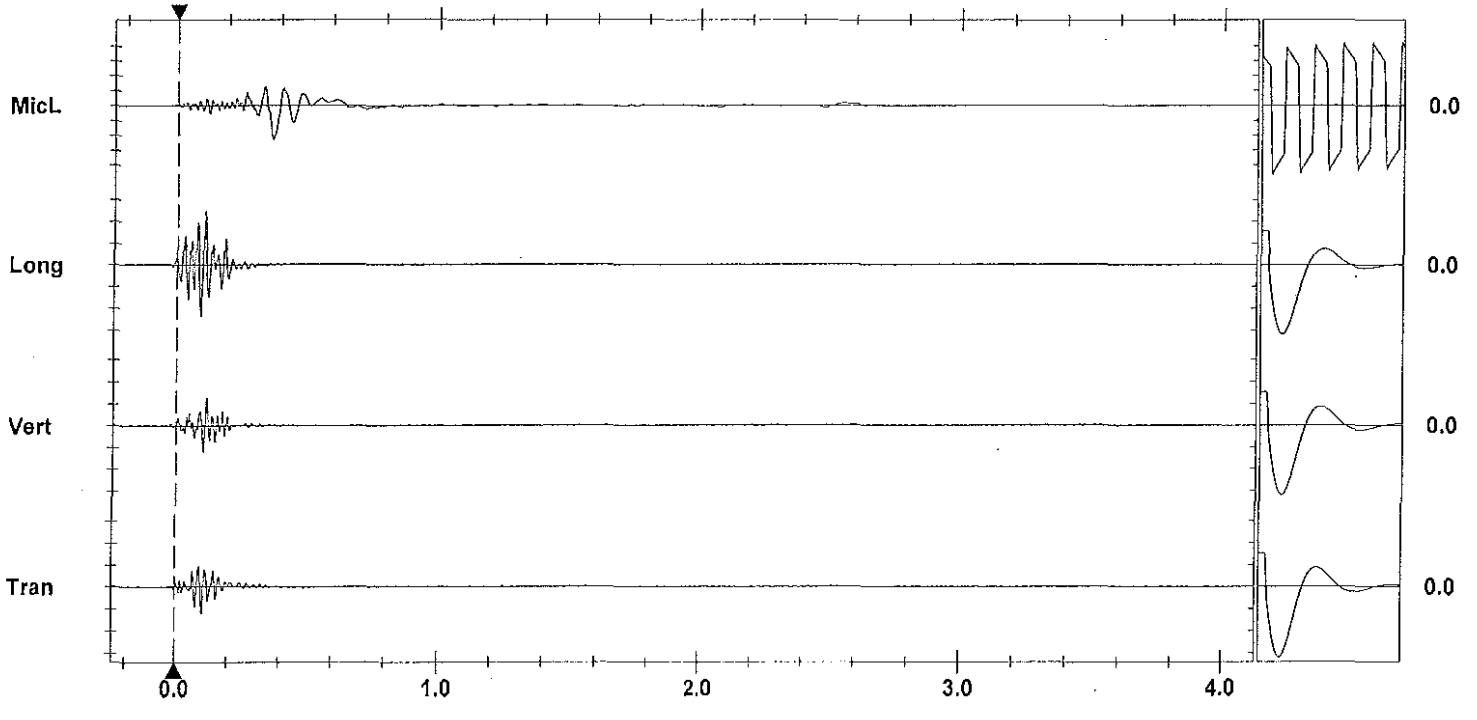
Microphone Linear Weighting
PSPL 0.00228 psi(L) at 0.366 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.120	0.125	0.245	in/s
ZC Freq	47	39	37	Hz
Time (Rel. to Trig)	0.107	0.118	0.107	sec
Peak Acceleration	0.0795	0.0795	0.146	g
Peak Displacement	0.00042	0.00050	0.00107	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.291 in/s at 0.107 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

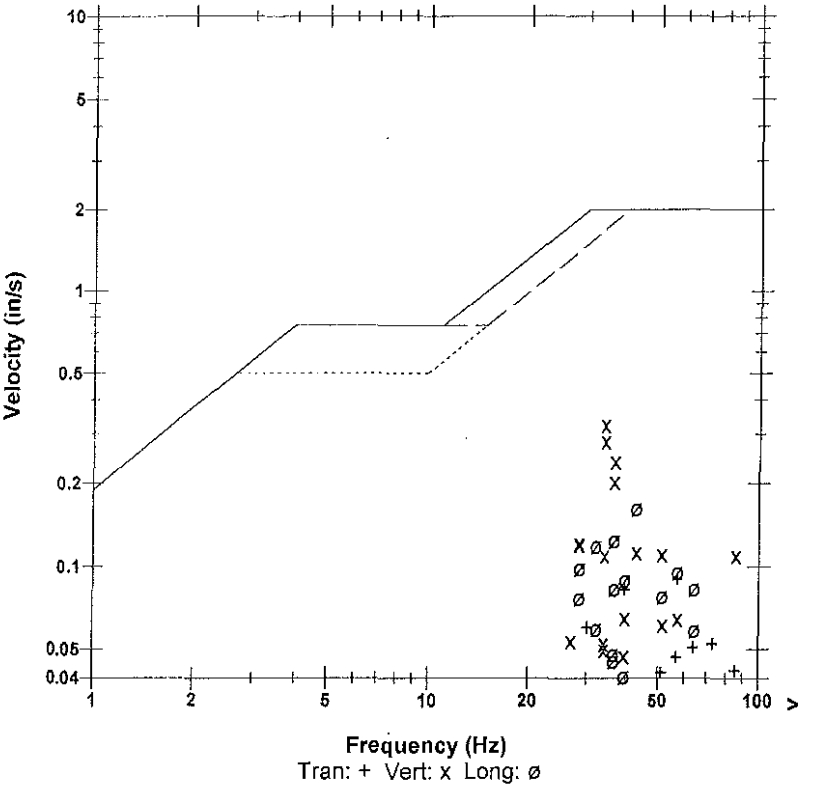
Date/Time	Vert at 11:20:14 February 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4VE.5Q0
Job Number:	1		

Notes
location:on slab main entrance north
side 13060 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

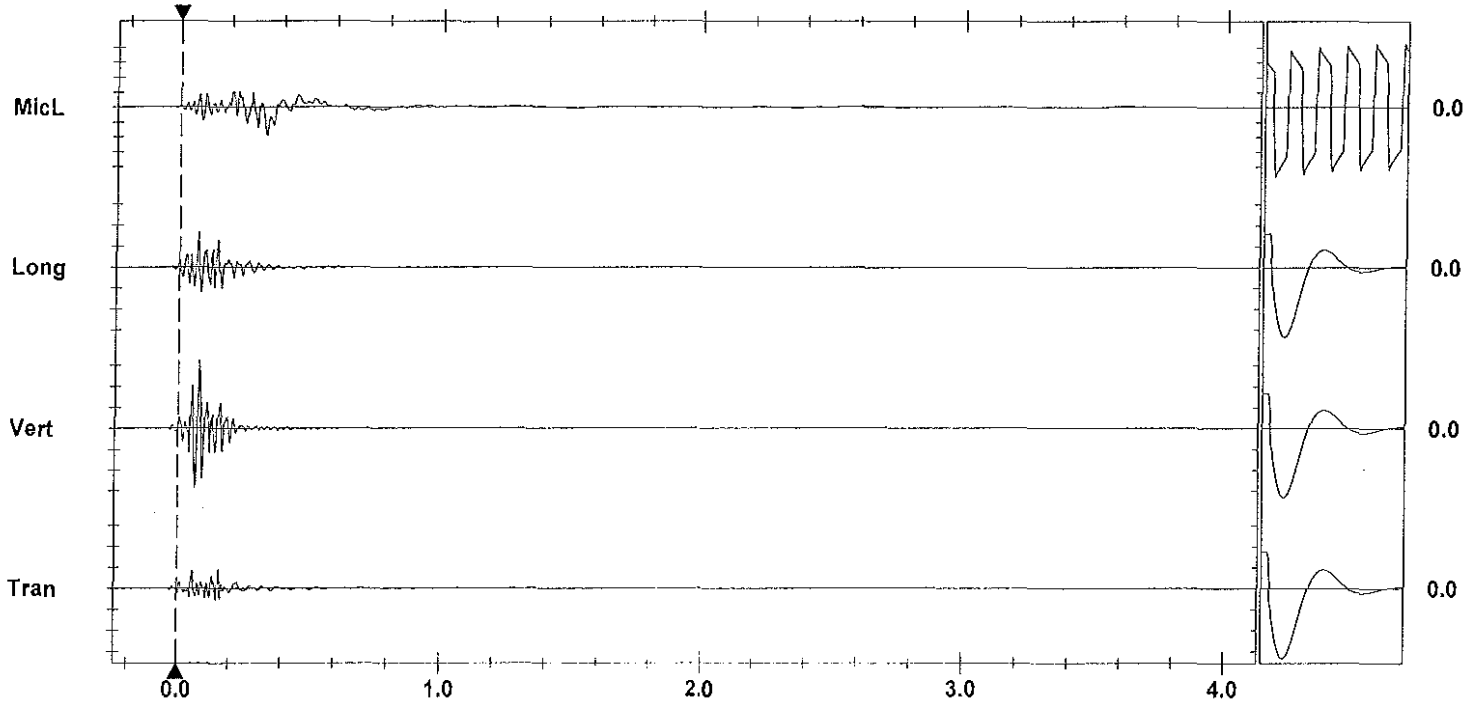
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.333 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 708 mv)

	Tran	Vert	Long	
PPV	0.0900	0.323	0.164	in/s
ZC Freq	57	34	43	Hz
Time (Rel. to Trig)	0.160	0.083	0.073	sec
Peak Acceleration	0.0829	0.189	0.114	g
Peak Displacement	0.00032	0.00141	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.327 in/s at 0.083 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 6/12
ACTUAL BLAST DATE Feb 1/12 1:58 PM
BLAST # MW-0099

HIGHWAY# 97
BLAST LOCATION AT: 127+86 - 128+02 RS (no offset noted)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 15 (m)
ROCK TYPE _____
DISTANCE TO NEAREST STRUCTURE (UTILITY) _____ (m)

DRILLING DETAILS: * All holes loaded w/ 1 main det cord

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.7 (m)
TOTAL DEPTH 130 (m)

TOTAL NUMBER OF HOLES 116/11 / 6 Bo Aft / 5 Row
HOLE DIAMETER 76/89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 65mm x 400m Blastrex

EXPLOSIVE TYPE 1½" Dynamite + ~~Ammo~~
EXPLOSIVE SIZE 140 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 33
TOTAL WEIGHT 50 (kg)
TOTAL NUMBER OF DELAYS 20
DELAY TYPE AND LENGTH 25 (ms)

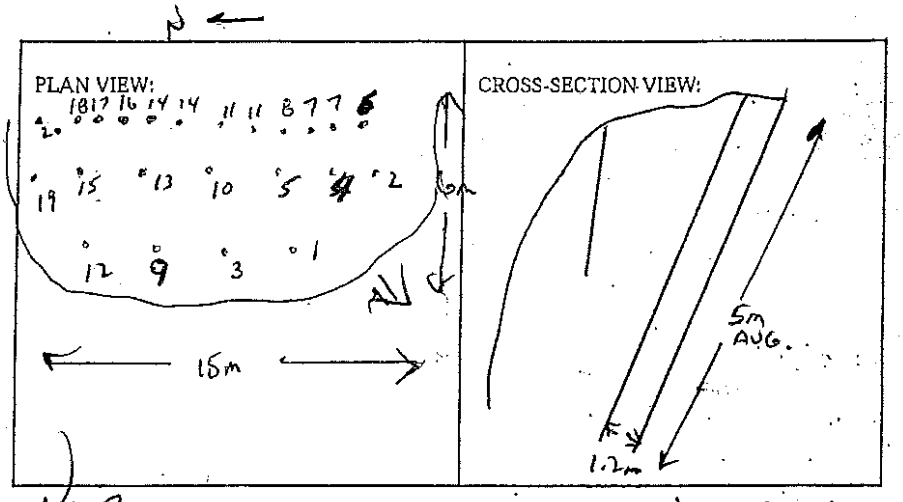
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 350 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Clifton Crt. - 0.14 ips / 34 Hz
" @ 13050 Old Mission Rd - 0.13 ips / 34 Hz

B/L Holes - 1 case 2"x16" Dynamite + 200gr det. cord to 4' collar

Buffer Holes - 3-4 case 2½"x16" Blastex + 0.5 case 1½"x16" Dynamite Primer

Stab Holes - 1 case 2½"x16" Blastex + 0.5 case 1½"x16" Dynamite Primer

Instantel

Event Report

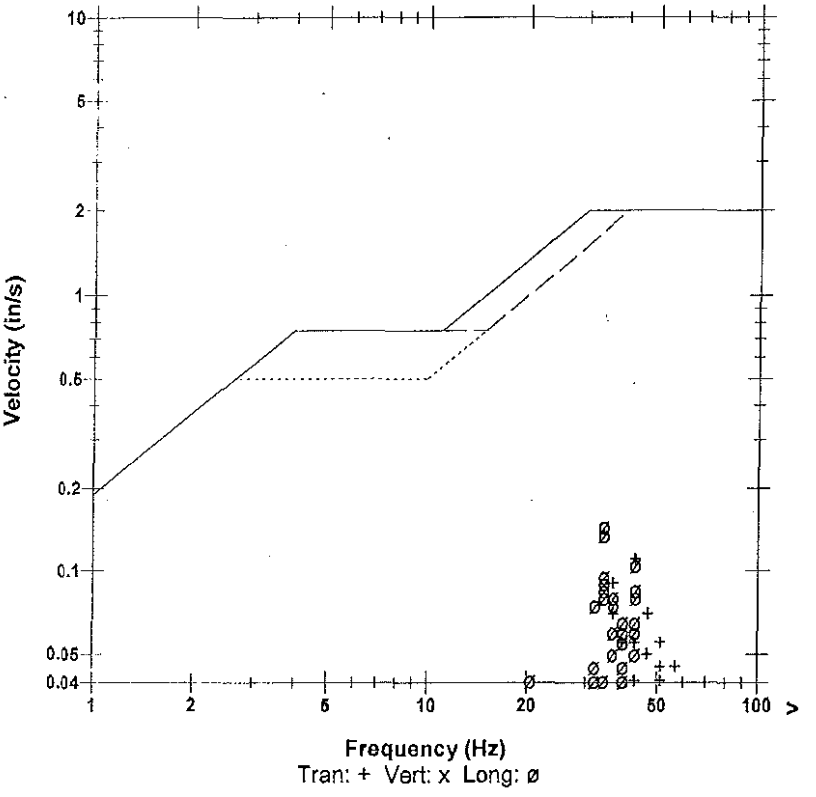
Date/Time	Long at 13:58:45 February 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E4VL.HX0

Notes
location:13073 Cliffstone Crt on
rear patio slab se corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

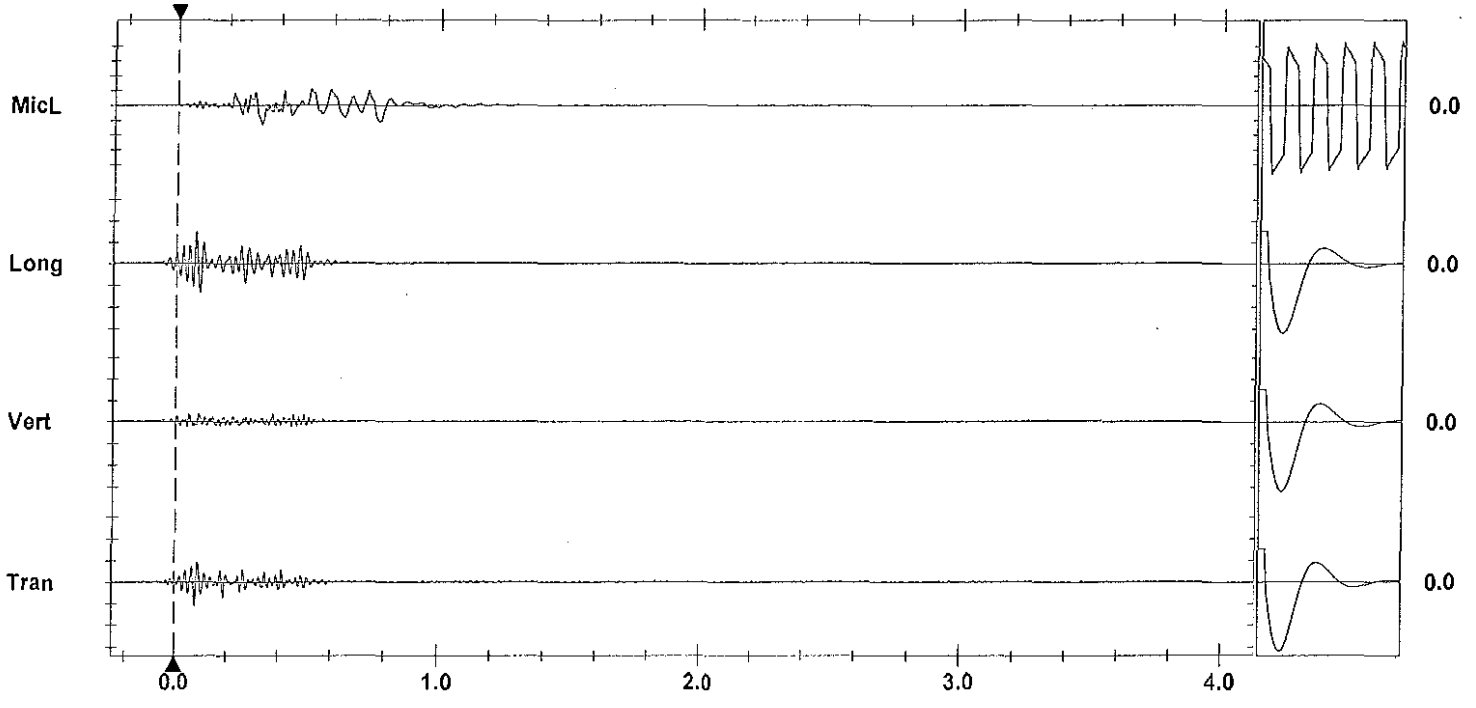
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.326 sec
ZC Freq	7.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 693 mv)

	Tran	Vert	Long	
PPV	0.110	0.0350	0.145	in/s
ZC Freq	43	47	34	Hz
Time (Rel. to Trig)	0.081	0.053	0.079	sec
Peak Acceleration	0.0663	0.0398	0.0795	g
Peak Displacement	0.00039	0.00016	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.176 in/s at 0.080 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Instantel

Event Report

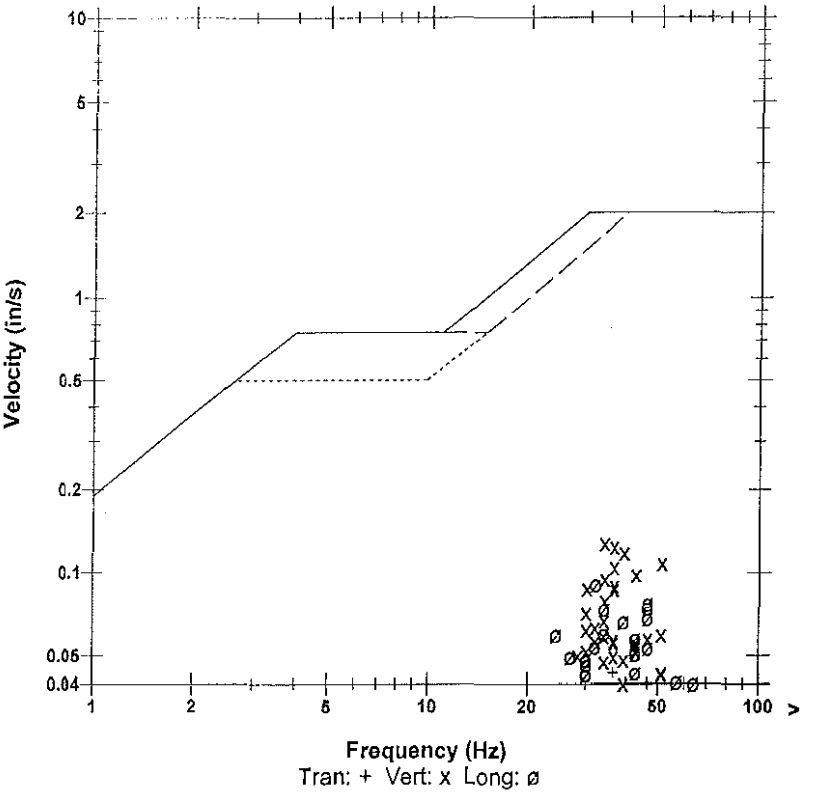
Date/Time	Vert at 13:58:46 February 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E4VL.HY0
Job Number:	1		

Notes
location:on slab main entrance north
side 13050 Old Mission Road
User Name:W Verwey
General:

Extended Notes

Post Event Notes

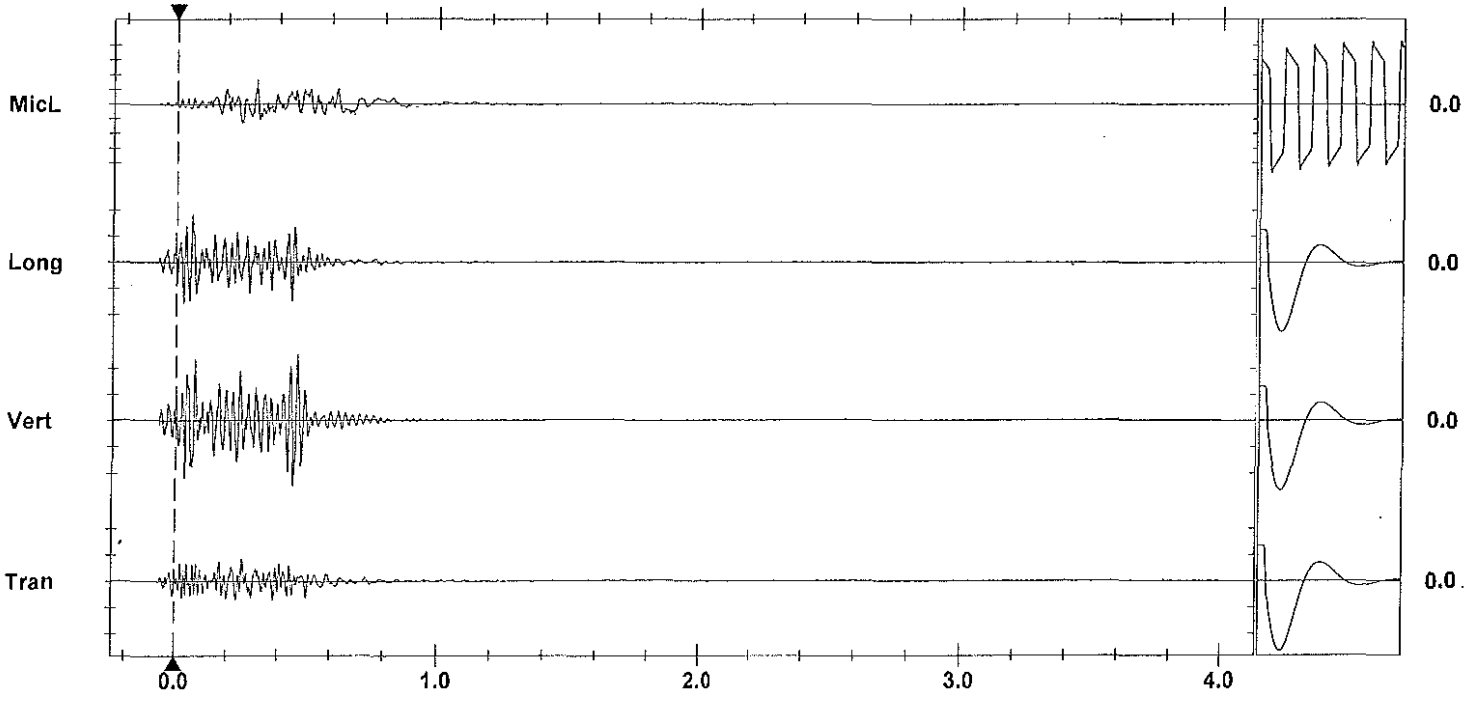
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.313 sec
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 659 mv)

	Tran	Vert	Long	
PPV	0.0431	0.127	0.0906	in/s
ZC Freq	37	34	32	Hz
Time (Rel. to Trig)	0.265	0.472	0.065	sec
Peak Acceleration	0.0514	0.174	0.0679	g
Peak Displacement	0.00020	0.00053	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.136 in/s at 0.459 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 8/16
ACTUAL BLAST DATE Feb 8/16 10:41 AM
BLAST # MW-0100

HIGHWAY# 97
BLAST LOCATION AT: 129+90 - 129+95 (approximate)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * slot machine

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Arkosic Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60m (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.1 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 2.3 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

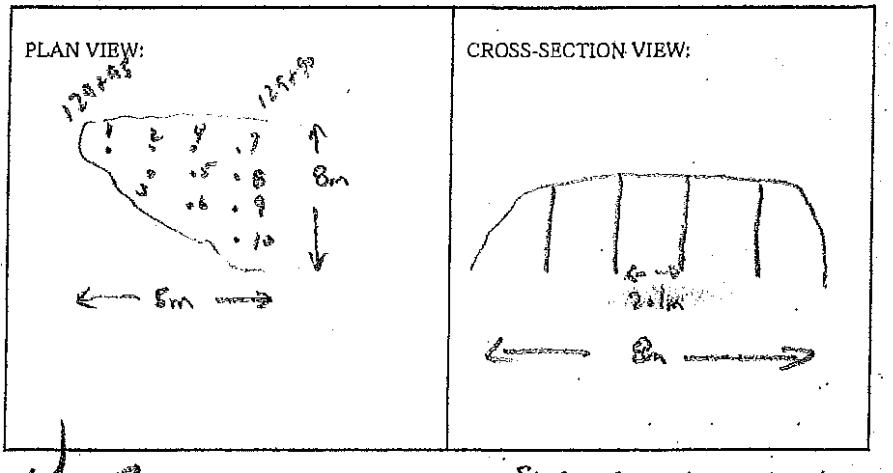
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffside est - 0.054 ips @ 47Hz
" @ 13117 Cliffside est. 0.055 ips @ 47Hz

1" ANGLE / HOLE + 1 COVER 11"x8" DYNAMIC PRIMER

Instantel

Event Report

Date/Time	Vert at 10:41:03 February 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E58B.0F0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

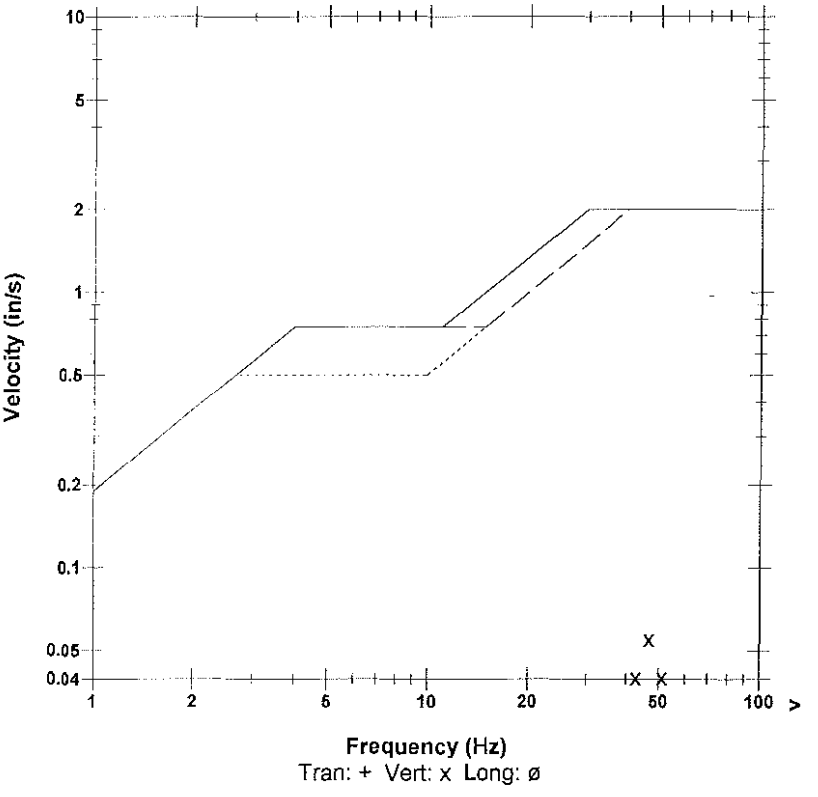
Extended Notes
Blast at stn 128

Post Event Notes

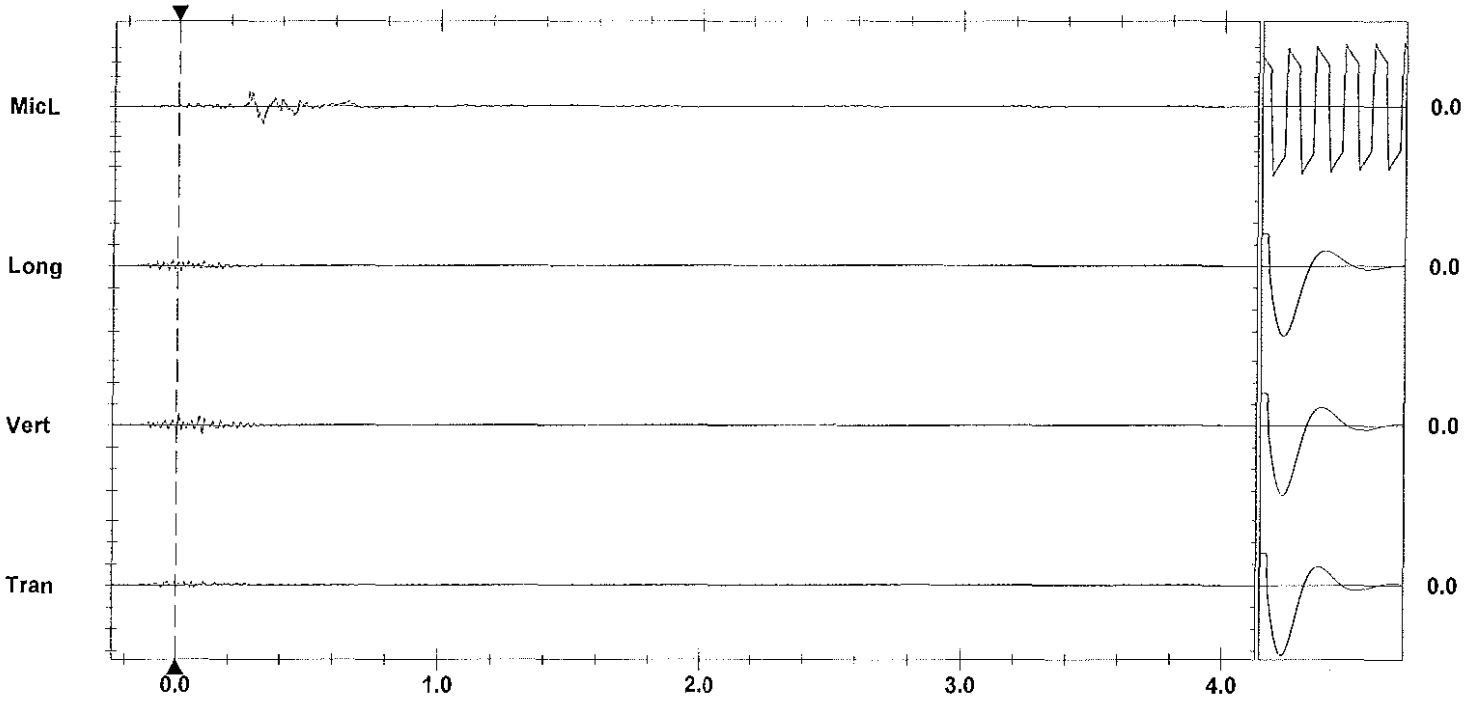
Microphone Linear Weighting
PSPL 0.00116 psi(L) at 0.325 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 733 mv)

	Tran	Vert	Long	
PPV	0.0150	0.0550	0.0250	in/s
ZC Freq	85	47	57	Hz
Time (Rel. to Trig)	-0.044	0.011	-0.079	sec
Peak Acceleration	0.0265	0.0530	0.0265	g
Peak Displacement	0.00004	0.00018	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0568 in/s at 0.011 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

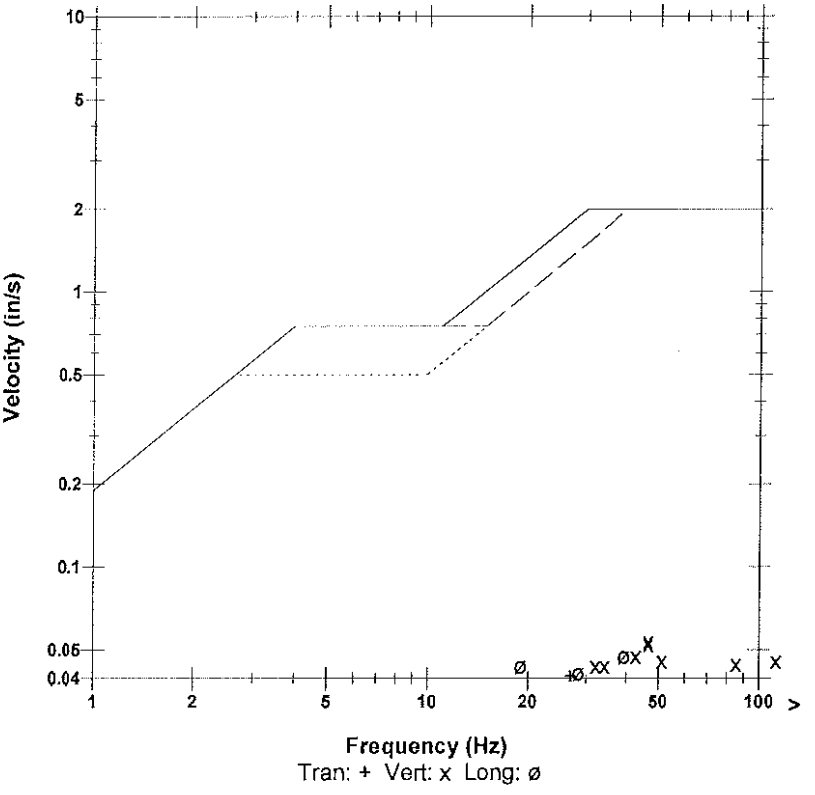
Date/Time	Vert at 10:41:11 February 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E58B.0N0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

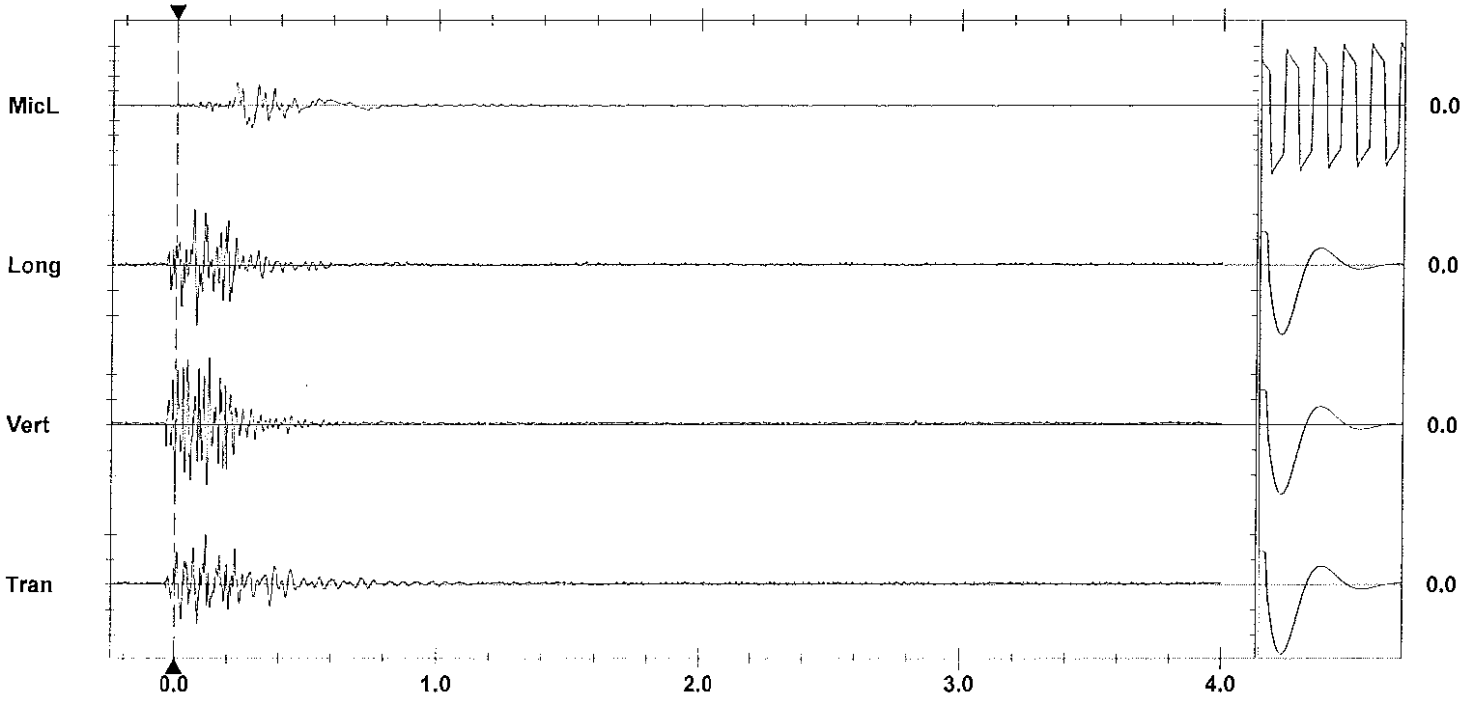
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00156 psi(L) at 0.229 sec		
ZC Freq	11 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 722 mv)		

	Tran	Vert	Long	
PPV	0.0400	0.0537	0.0475	in/s
ZC Freq	27	47	39	Hz
Time (Rel. to Trig)	0.119	0.130	0.079	sec
Peak Acceleration	0.0381	0.0746	0.0398	g
Peak Displacement	0.00015	0.00018	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0577 in/s at 0.120 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 8/12
ACTUAL BLAST DATE Feb 8/12 11:29 AM
BLAST # MW-0101

HIGHWAY# 97
BLAST LOCATION AT: 129+99 - 130+04 (90 Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot mapped

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 65 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Greenstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.3 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + Ammo
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

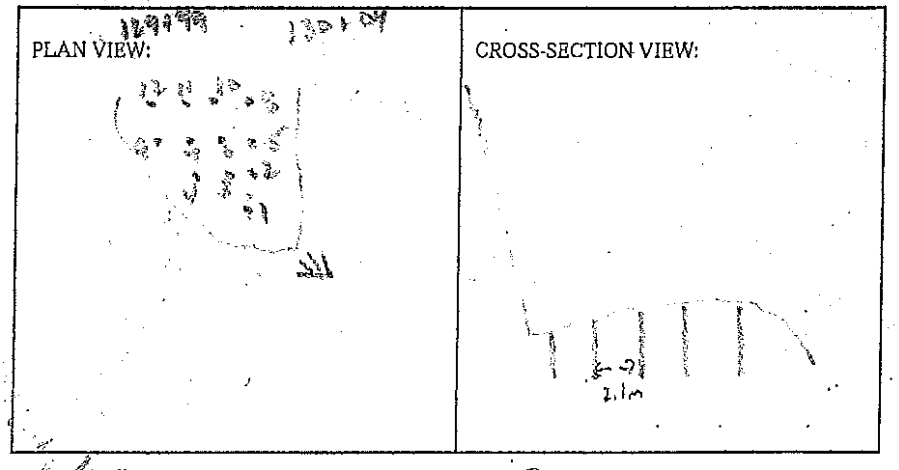
VOLUME OF ROCK BLASTED 850 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone cut. 0.096 ips/32Hz
" @ 13117 cliffstone cut. 0.095 ips/39Hz

Typical plate arrangement of 1 and 1½" dynamite

Event Report

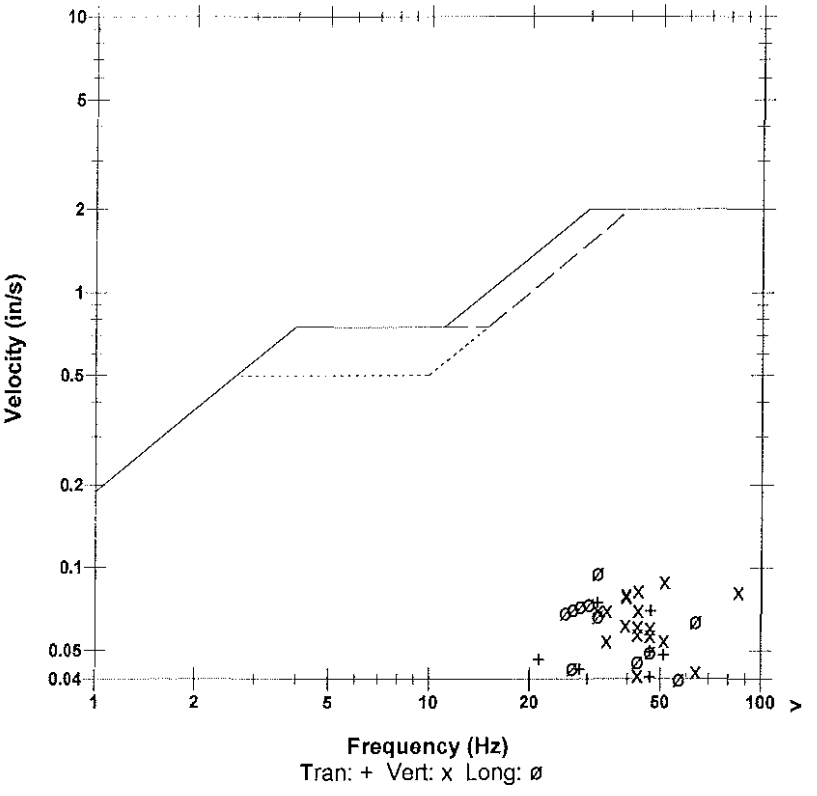
Date/Time	Vert at 11:29:00 February 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E58D.8C0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

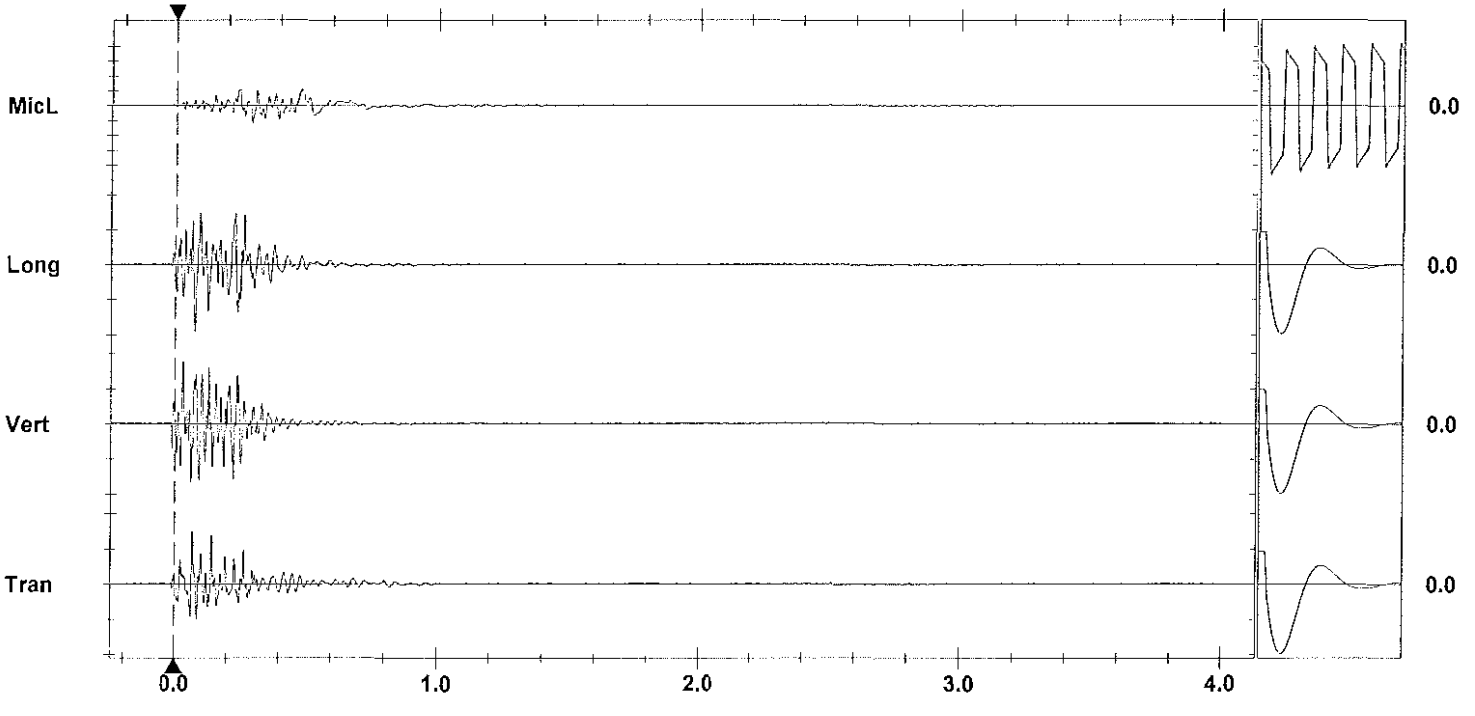
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00120 psi(L) at 0.291 sec			
ZC Freq	27 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 754 mv)			

	Tran	Vert	Long	
PPV	0.0744	0.0887	0.0956	in/s
ZC Freq	32	51	32	Hz
Time (Rel. to Trig)	0.069	0.031	0.077	sec
Peak Acceleration	0.0746	0.104	0.0679	g
Peak Displacement	0.00026	0.00038	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.112 in/s at 0.076 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

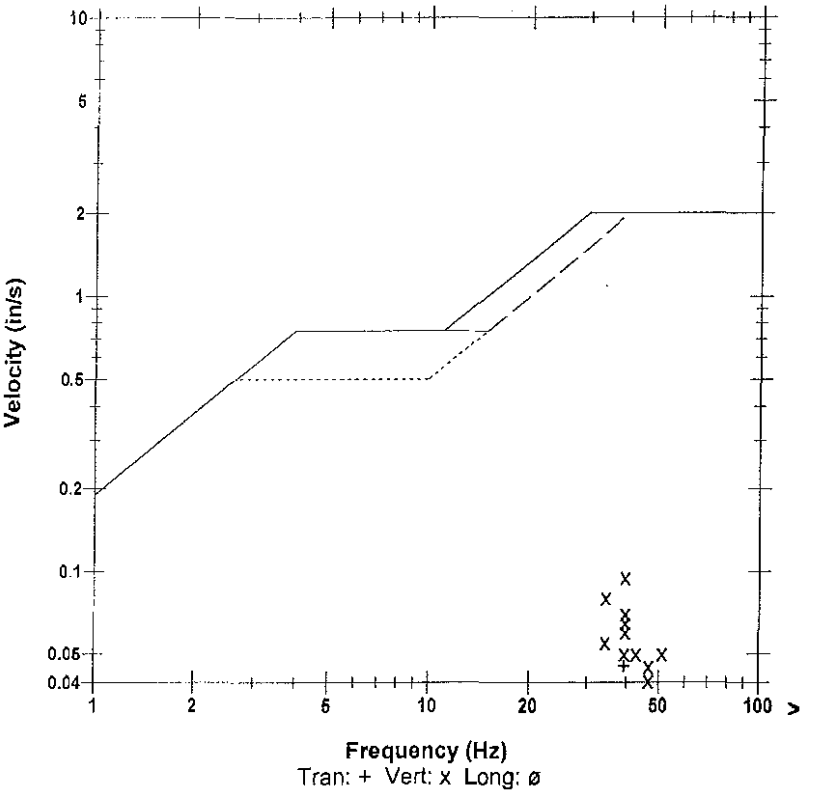
Date/Time	Vert at 11:28:51 February 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E58D.830

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

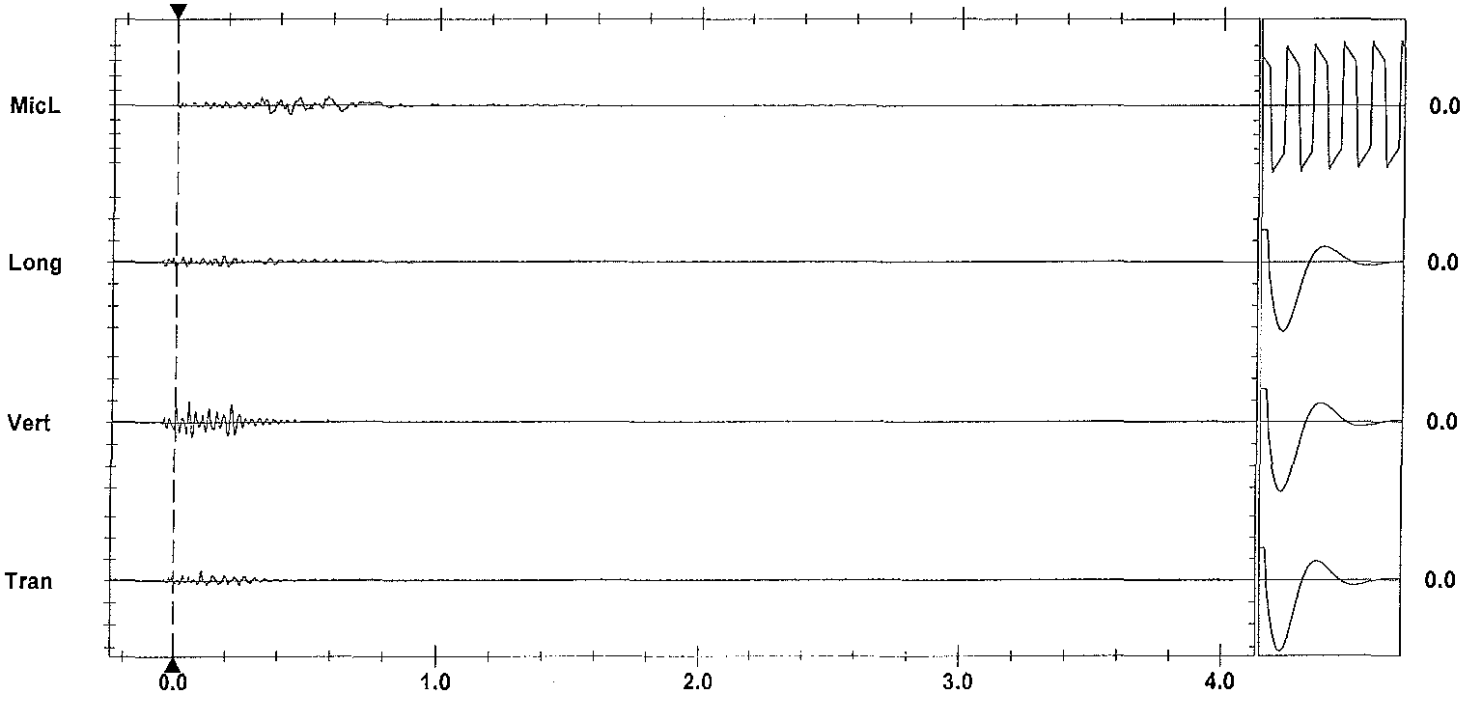
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00062 psi(L) at 0.436 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 693 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0950	0.0300	in/s
ZC Freq	39	39	39	Hz
Time (Rel. to Trig)	0.110	0.055	0.183	sec
Peak Acceleration	0.0265	0.0663	0.0265	g
Peak Displacement	0.00016	0.00037	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0951 in/s at 0.055 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: February 11, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearsy
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 8/12
ACTUAL BLAST DATE Feb 8/12 1:03 PM
BLAST # NW-0102

HIGHWAY# 97
BLAST LOCATION AT: STN 129+90 - 129+99 LS (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES all
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 17
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

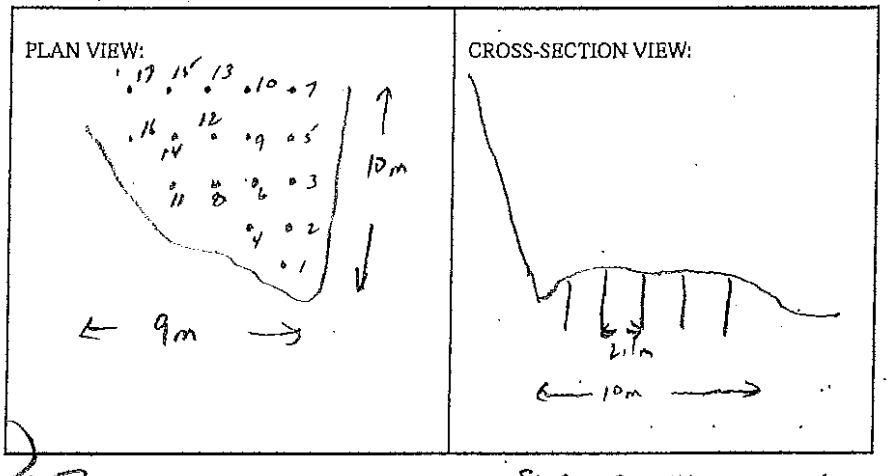
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HOBBO CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vearsy COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Client Ref. - 0.094 ips / 32 Hz
" 13117 Client Ref. - 0.088 ips / 57 Hz

1.5' - 2' ANGLE / HALE PRIMED W/ 1 COAT 1½" DIAMETER

Instantel

Event Report

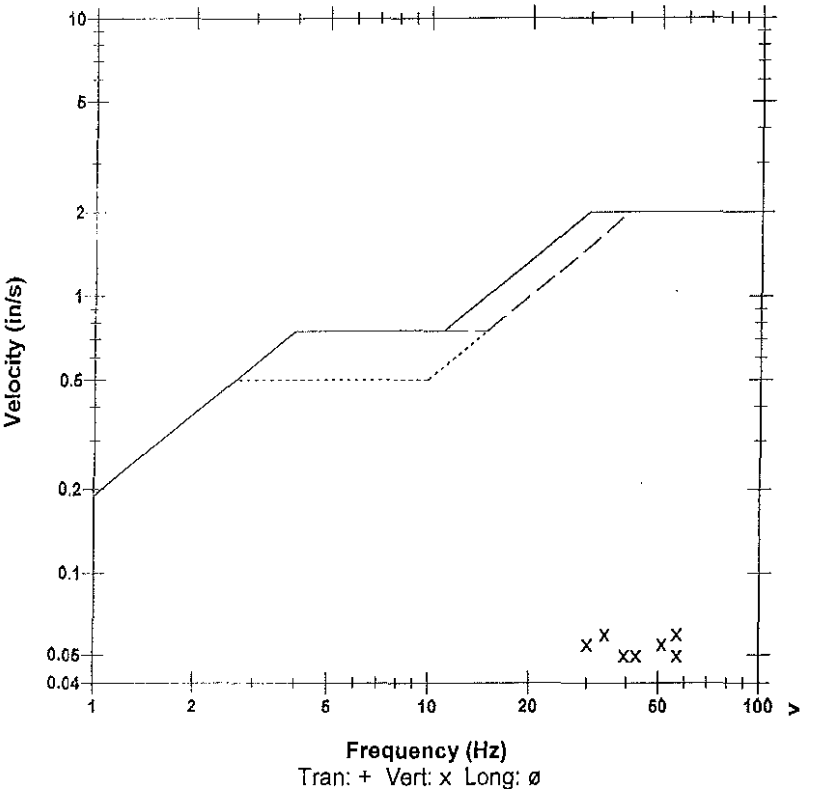
Date/Time	Vert at 13:03:17 February 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E58H.LH0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

USBM RI8507 And OSMRE

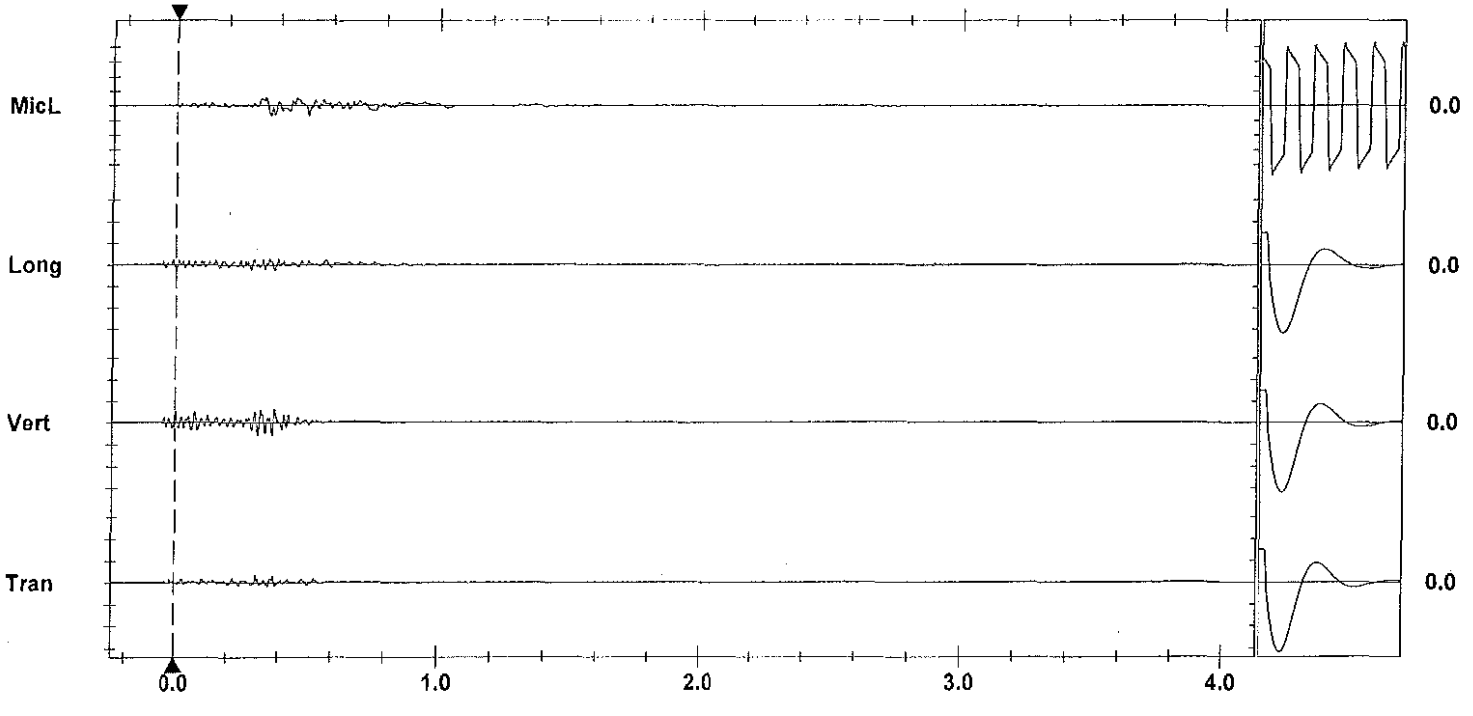


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00069 psi(L) at 0.363 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 678 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0600	0.0250	in/s
ZC Freq	64	57	51	Hz
Time (Rel. to Trig)	0.316	0.375	-0.011	sec
Peak Acceleration	0.0398	0.0663	0.0265	g
Peak Displacement	0.00016	0.00028	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0696 in/s at 0.384 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 11, 2012 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 13:03:26 February 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E58H.LQ0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

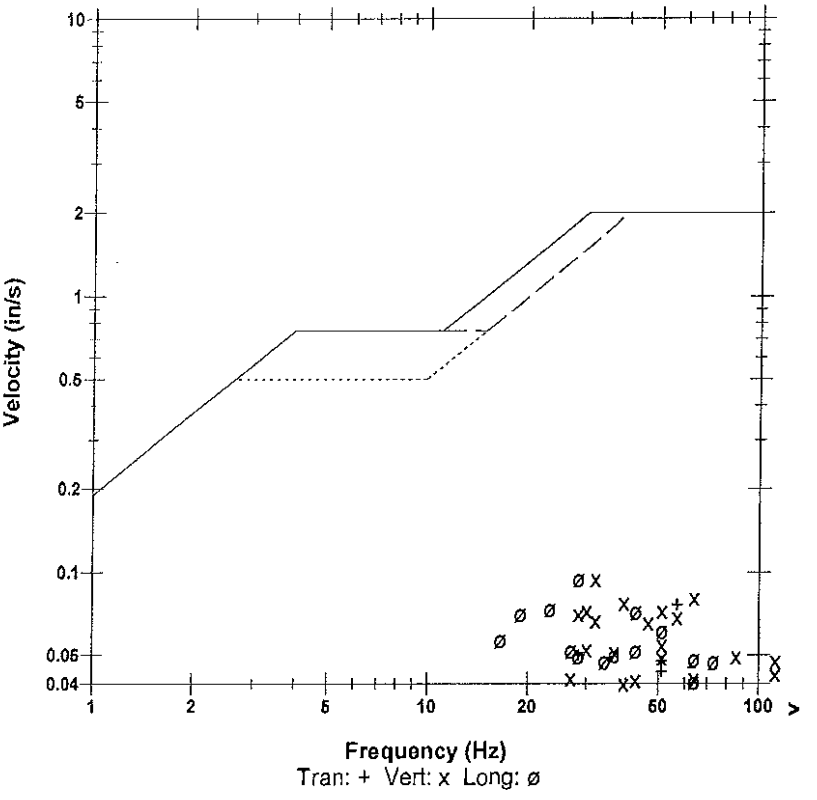
Post Event Notes

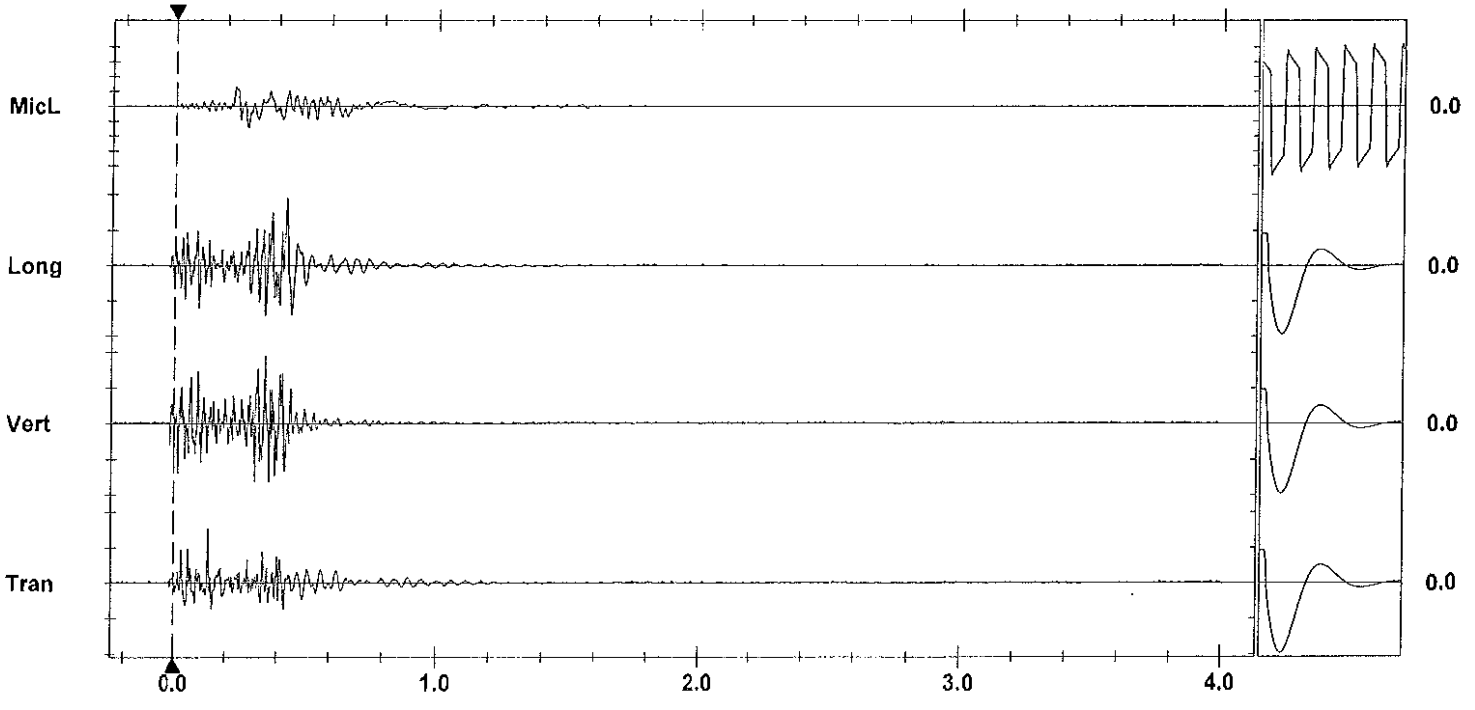
Microphone Linear Weighting
PSPL 0.00141 psi(L) at 0.280 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 691 mv)

	Tran	Vert	Long	
PPV	0.0762	0.0944	0.0944	in/s
ZC Freq	57	32	28	Hz
Time (Rel. to Trig)	0.137	0.354	0.434	sec
Peak Acceleration	0.0613	0.157	0.0713	g
Peak Displacement	0.00019	0.00039	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.119 in/s at 0.354 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: February 11, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VOEWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 13/12
ACTUAL BLAST DATE FEB 8/12 1157 PM
BLAST # MW-0103

HIGHWAY# 97
BLAST LOCATION AT: 129+86 - 129+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Blast matting

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m), SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE GNEISS GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.9 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 29 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

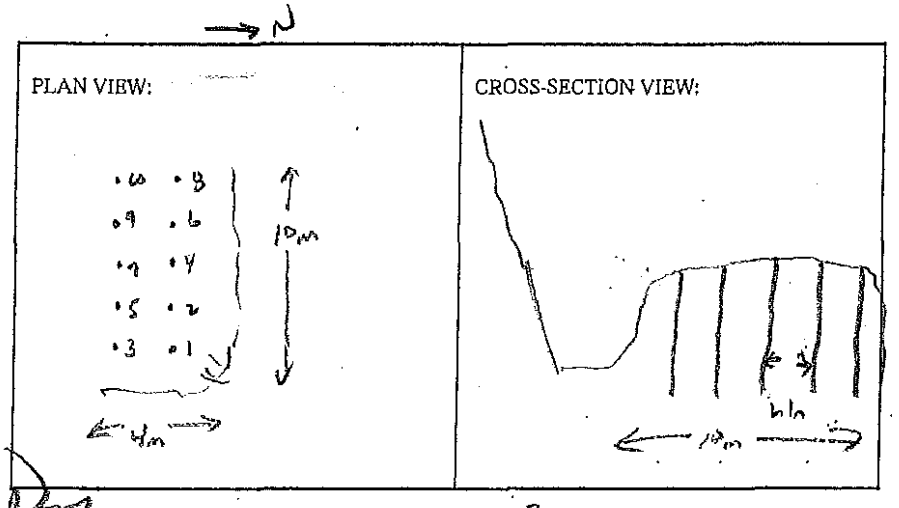
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB820 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 0.055 ips / 34Hz
" 13117 0.050 / 43Hz

1' ANGLE HOLE + 1 COAT 1"x8" DYNAMITE PRIMER

Instantel

Event Report

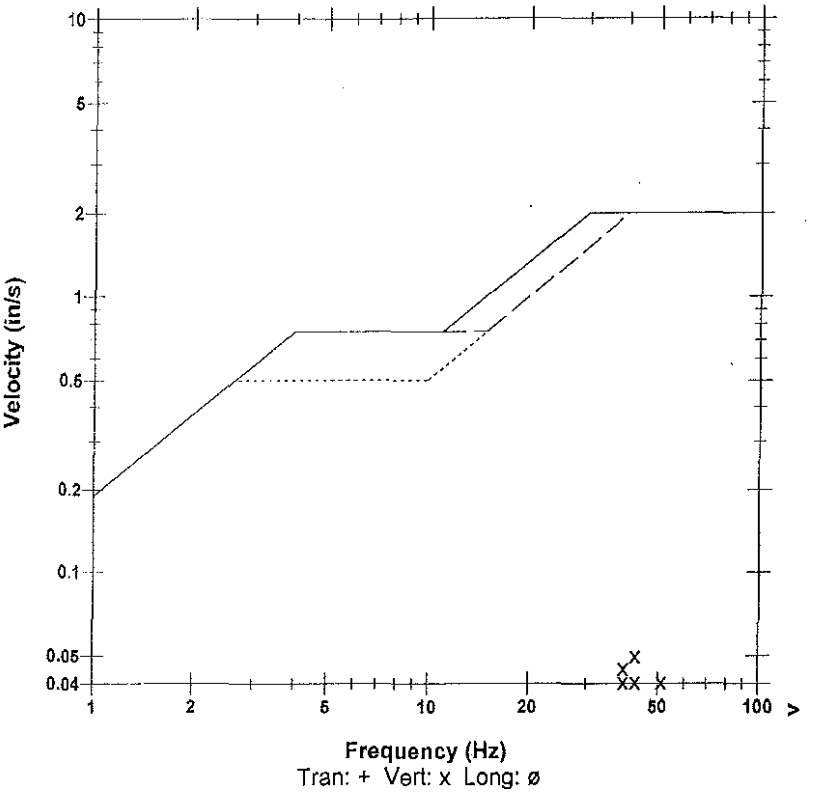
Date/Time	Vert at 13:56:52 February 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E58K.2S0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

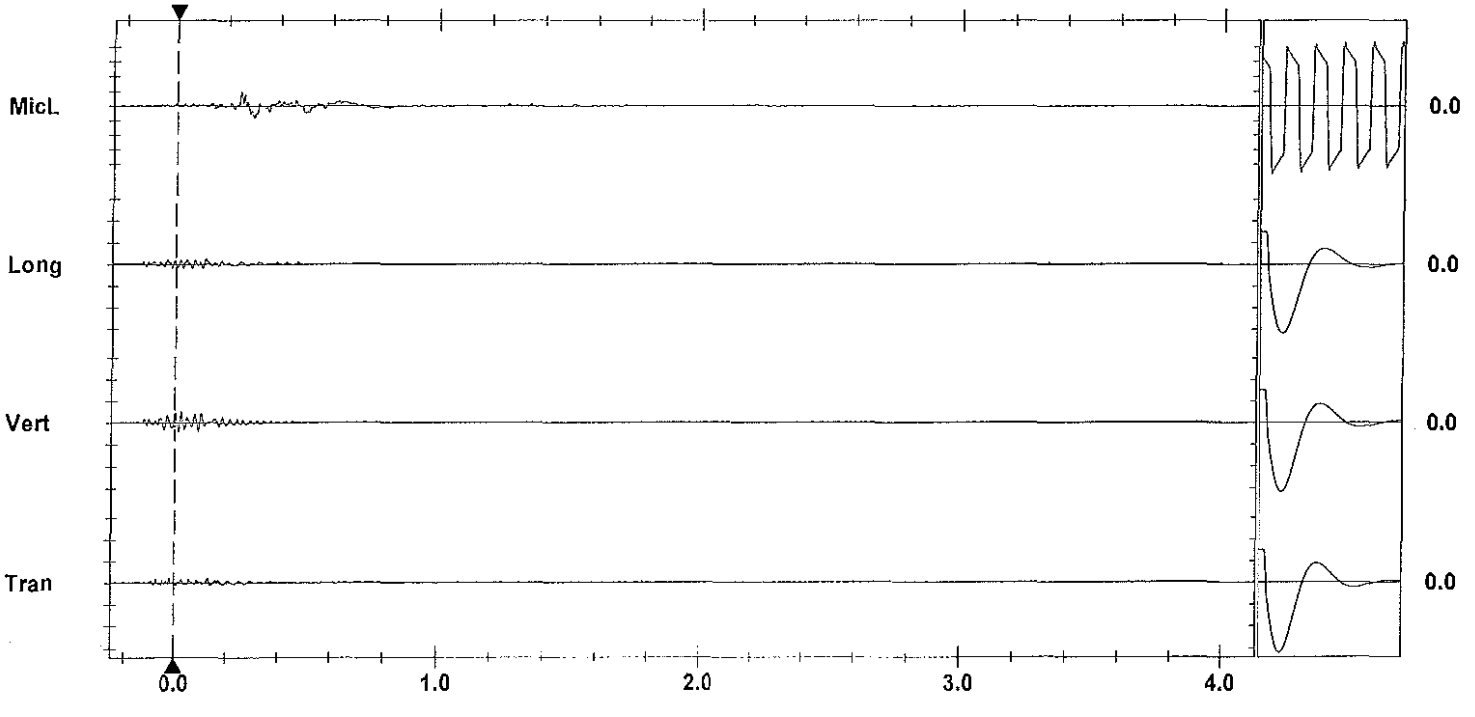
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00094 psi(L) at 0.247 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0500	0.0250	in/s
ZC Freq	64	43	26	Hz
Time (Rel. to Trig)	-0.072	0.026	0.116	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00007	0.00019	0.00015	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0520 in/s at 0.026 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

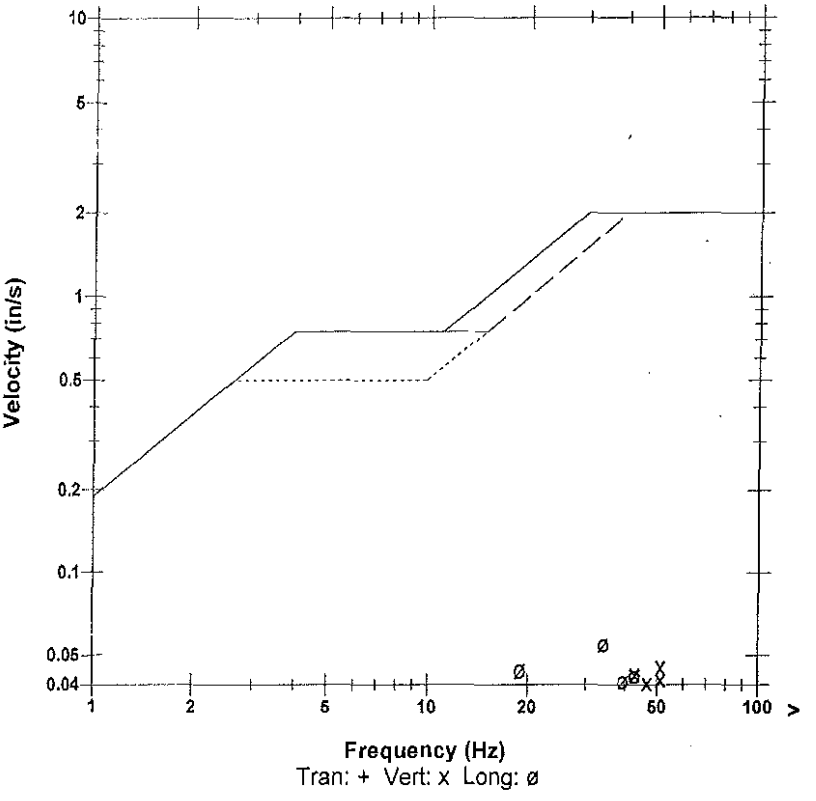
Date/Time	Long at 13:57:00 February 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E58K.300
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

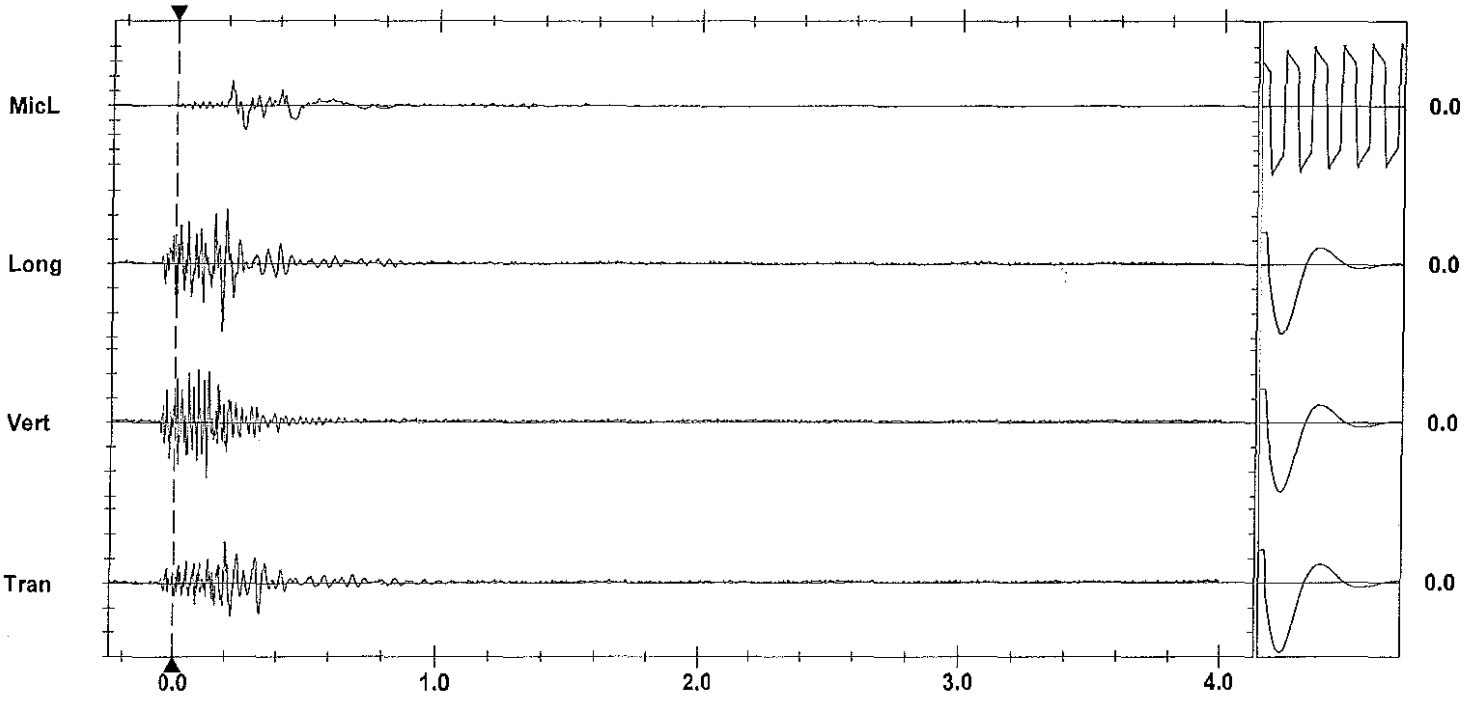
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.216 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 746 mv)

	Tran	Vert	Long	
PPV	0.0331	0.0456	0.0550	in/s
ZC Freq	27	51	34	Hz
Time (Rel. to Trig)	0.200	0.123	0.183	sec
Peak Acceleration	0.0331	0.0580	0.0348	g
Peak Displacement	0.00015	0.00012	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0600 in/s at 0.200 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: February 11, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Worsley
BLASTER'S CERTIFICATE NUMBER 5834 09

DATE PREPARED Feb 9/12
ACTUAL BLAST DATE Feb 9/12 2:54 PM
BLAST # MW-0104

HIGHWAY# 97
BLAST LOCATION AT: STN 129+85 - 129+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: no shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 600 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.5 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 28 (kg)
DELAY TYPE AND LENGTH 25 (ms)

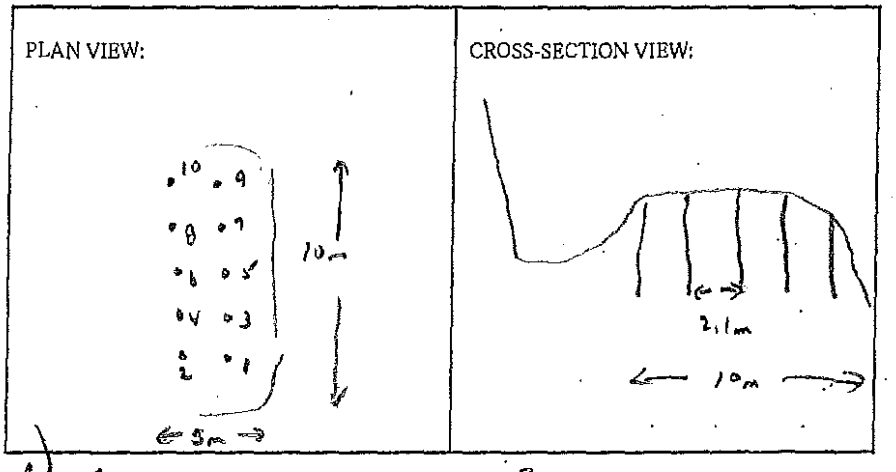
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Worsley COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13147 Cliffstone Crt. 0.094 in/s / 39 Hz
@ 13117 Cliffstone Crt. 0.075 in/s / 39 Hz

1' - 1.5' ANFO/hole primed w/ 1 each 1½# dynamite

Instantel

Event Report

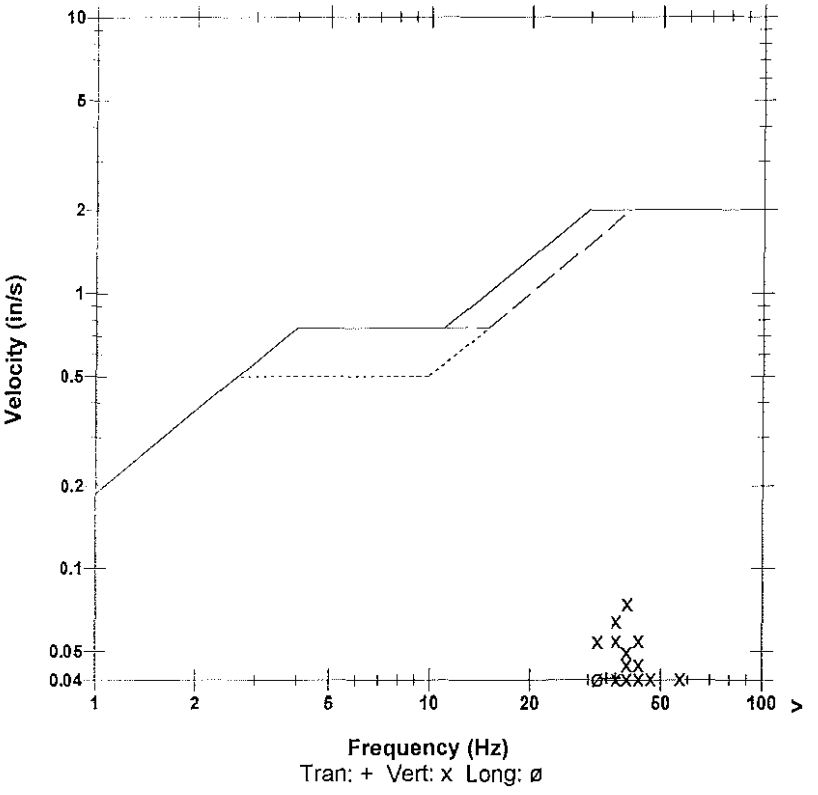
Date/Time	Vert at 14:54:42 February 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E58M.R60

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

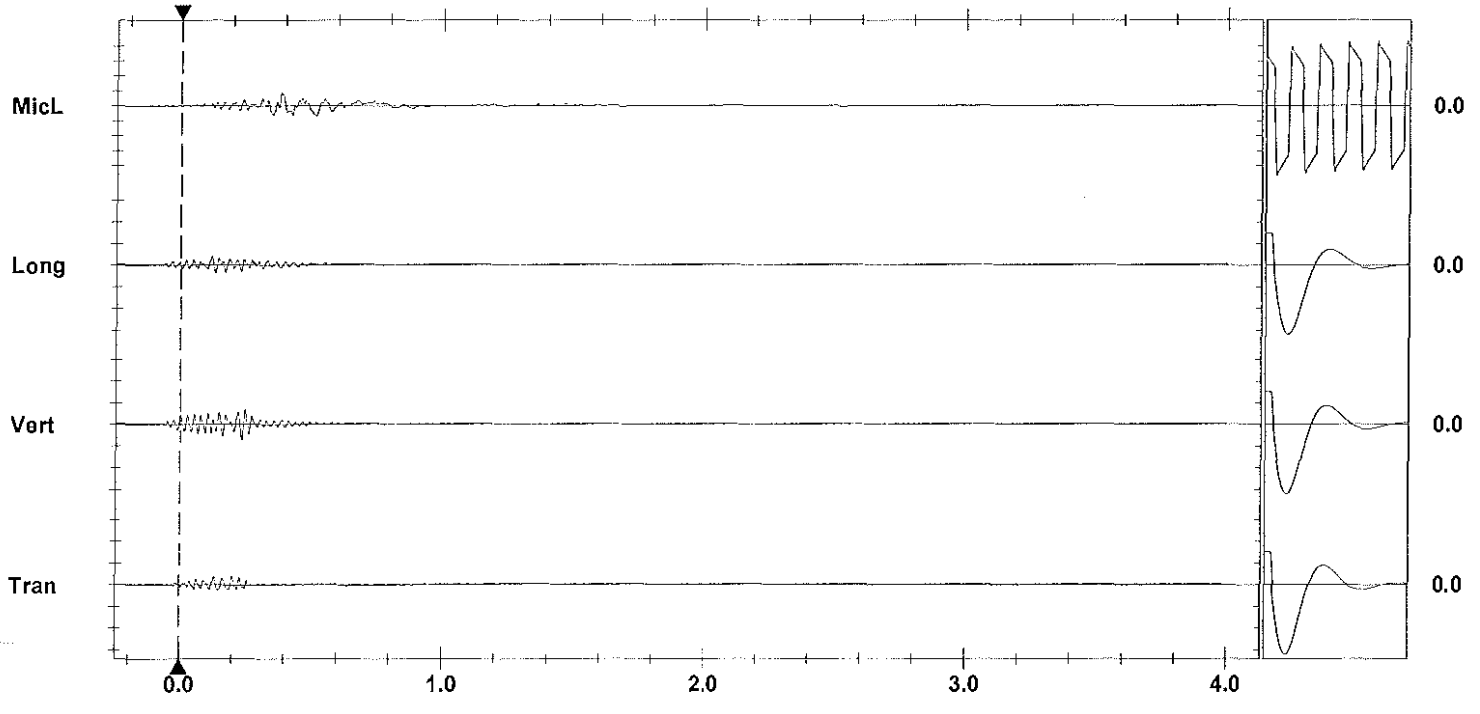
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00087 psi(L) at 0.385 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 685 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0750	0.0400	in/s
ZC Freq	34	39	32	Hz
Time (Rel. to Trig)	0.136	0.235	0.120	sec
Peak Acceleration	0.0265	0.0530	0.0398	g
Peak Displacement	0.00017	0.00029	0.00020	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.0802 in/s at 0.235 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Sensorcheck

Printed: February 11, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

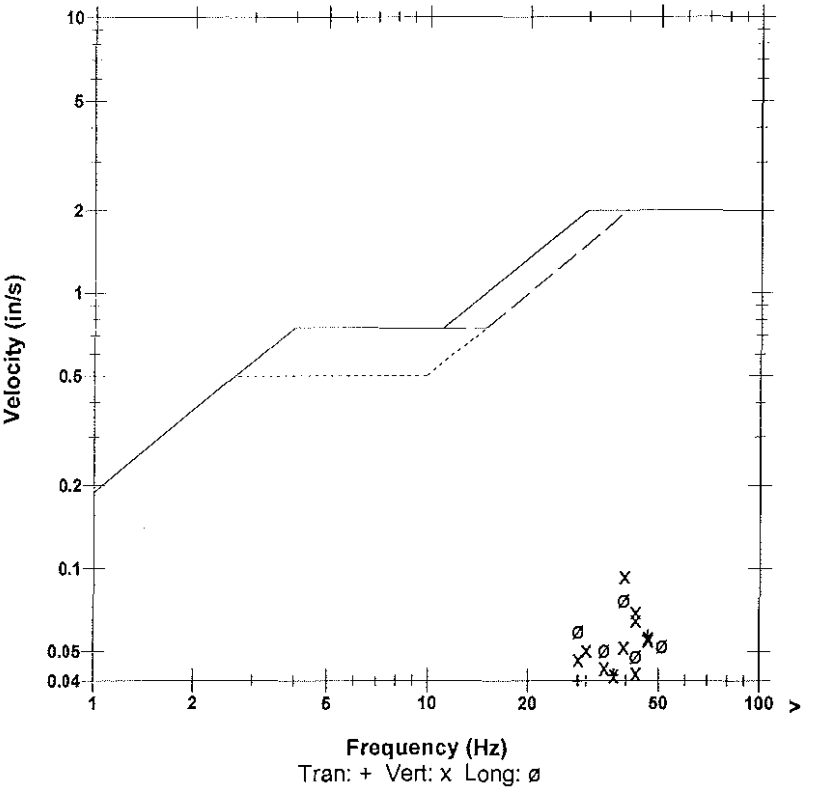
Date/Time	Vert at 14:54:50 February 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E58M.RE0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

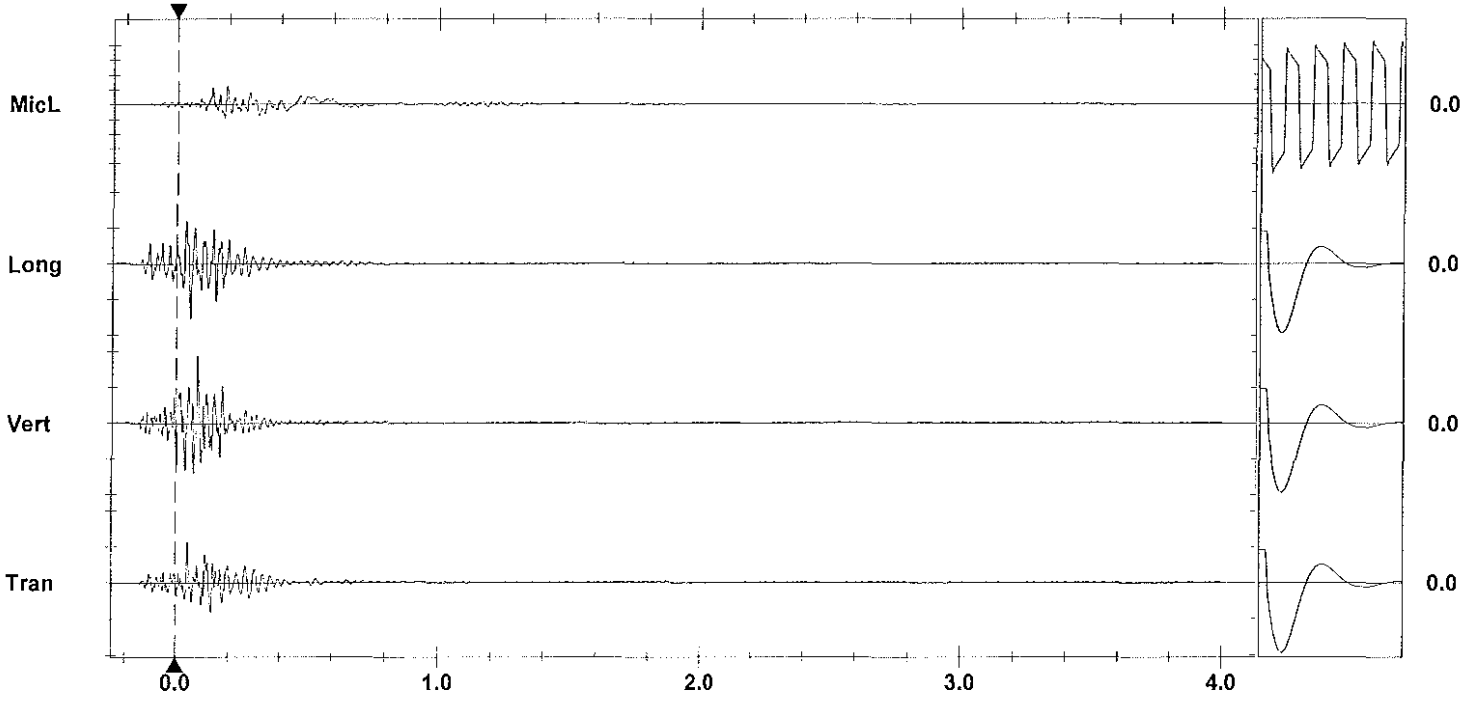
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0569	0.0937	0.0769	in/s
ZC Freq	47	39	39	Hz
Time (Rel. to Trig)	0.048	0.083	0.054	sec
Peak Acceleration	0.0414	0.0878	0.0530	g
Peak Displacement	0.00022	0.00033	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Microphone Linear Weighting
PSPL 0.00127 psi(L) at 0.189 sec
ZC Freq 39 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 687 mv)

Peak Vector Sum 0.0971 in/s at 0.083 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶---------◀

Sensorcheck

Printed: February 11, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 9/12
ACTUAL BLAST DATE Feb 9/12 11:13 AM
BLAST # MW-0105

HIGHWAY# 97
BLAST LOCATION AT: STA 129+90 - 129+95 LS (TO Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot muffled

HEIGHT ABOVE HWY 10 m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4
AVERAGE DEPTH 4.6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 4.8 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 45/11 11 Pond
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite Cartridge
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

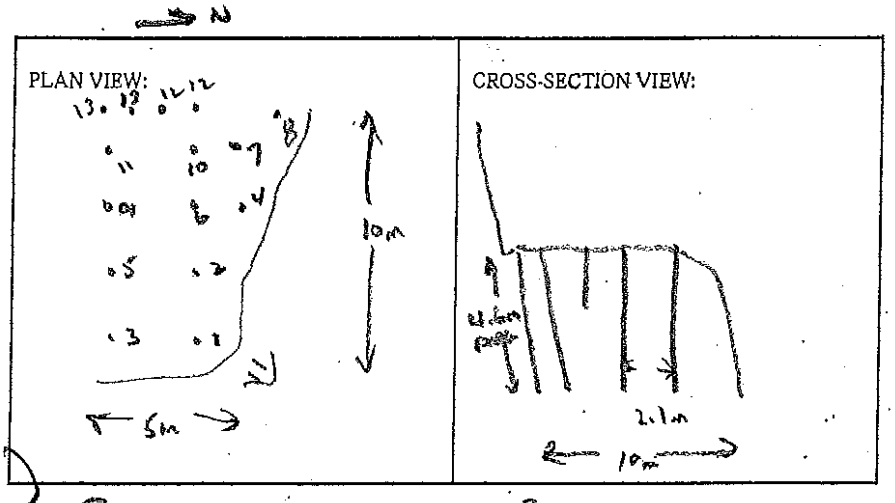
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB220 CAPACITY 80 Cars

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.19 ips / 28 Hz
" @ 13117 cliffstone crt - 0.17 ips / 43 Hz

Pre Holes - 3'-5' angle / hole

Stab holes - 1'-2' angle / hole

Buffer holes - 2.5-3 each 2"x16" dynamite

} Primed w/ 1 each 1" x 4" dynamite

B/L holes: 1 each 2"x16" dynamite @ 2 ring, det. cord to 4' collar.

Instantel

Event Report

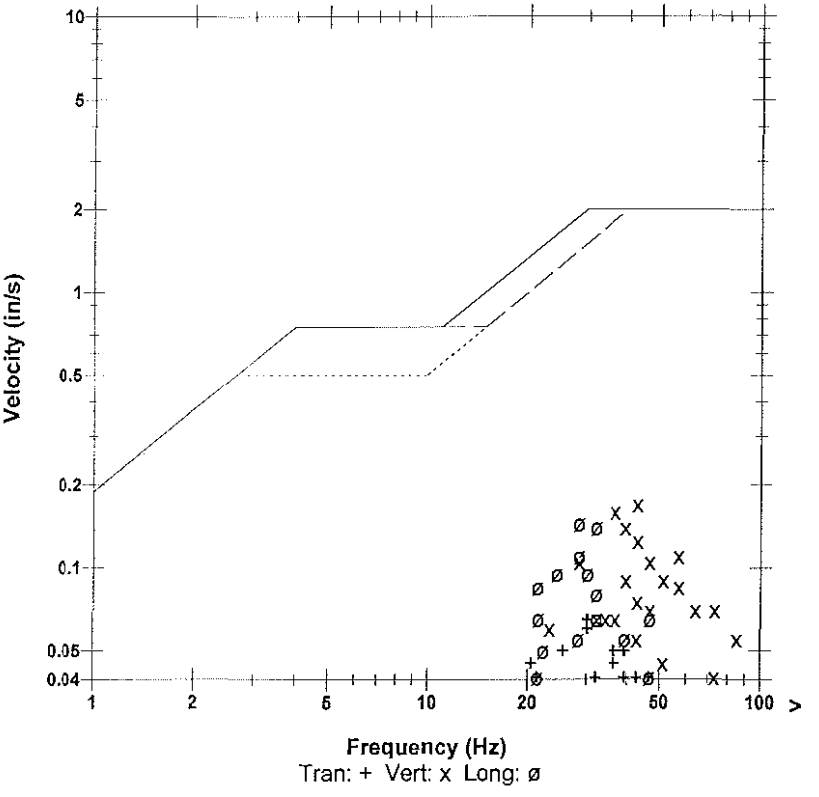
Date/Time	Vert at 11:13:50 February 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5A7.720

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

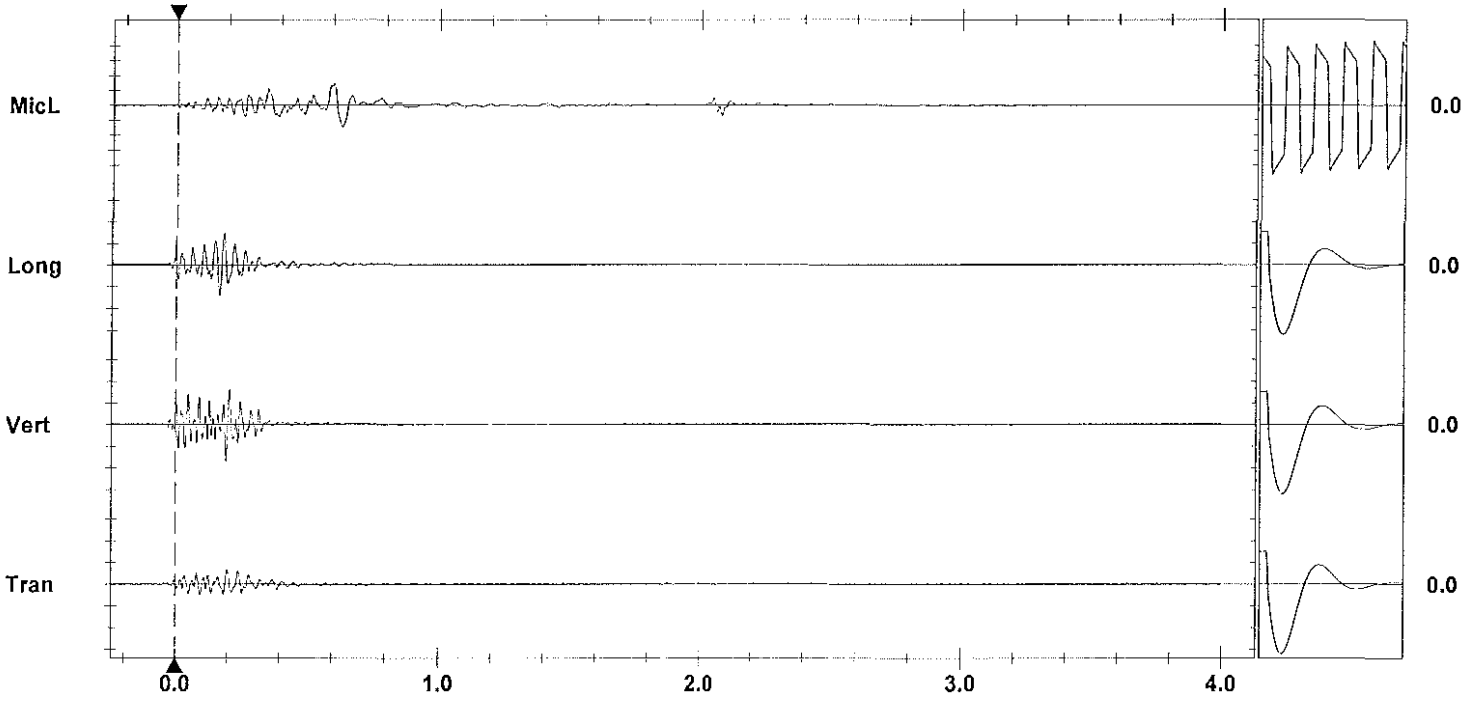
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00145 psi(L) at 0.628 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.0650	0.170	0.145	in/s
ZC Freq	30	43	28	Hz
Time (Rel. to Trig)	0.201	0.195	0.185	sec
Peak Acceleration	0.0398	0.106	0.0795	g
Peak Displacement	0.00033	0.00071	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.182 in/s at 0.195 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Sensorcheck

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Instantel

Event Report

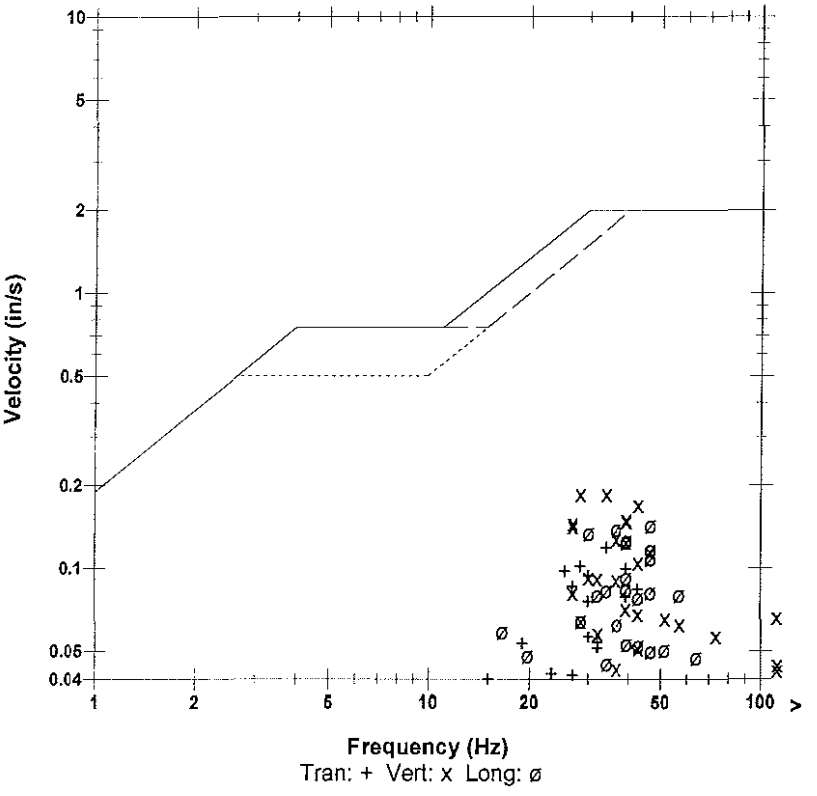
Date/Time	Vert at 11:13:59 February 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5A7.7B0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

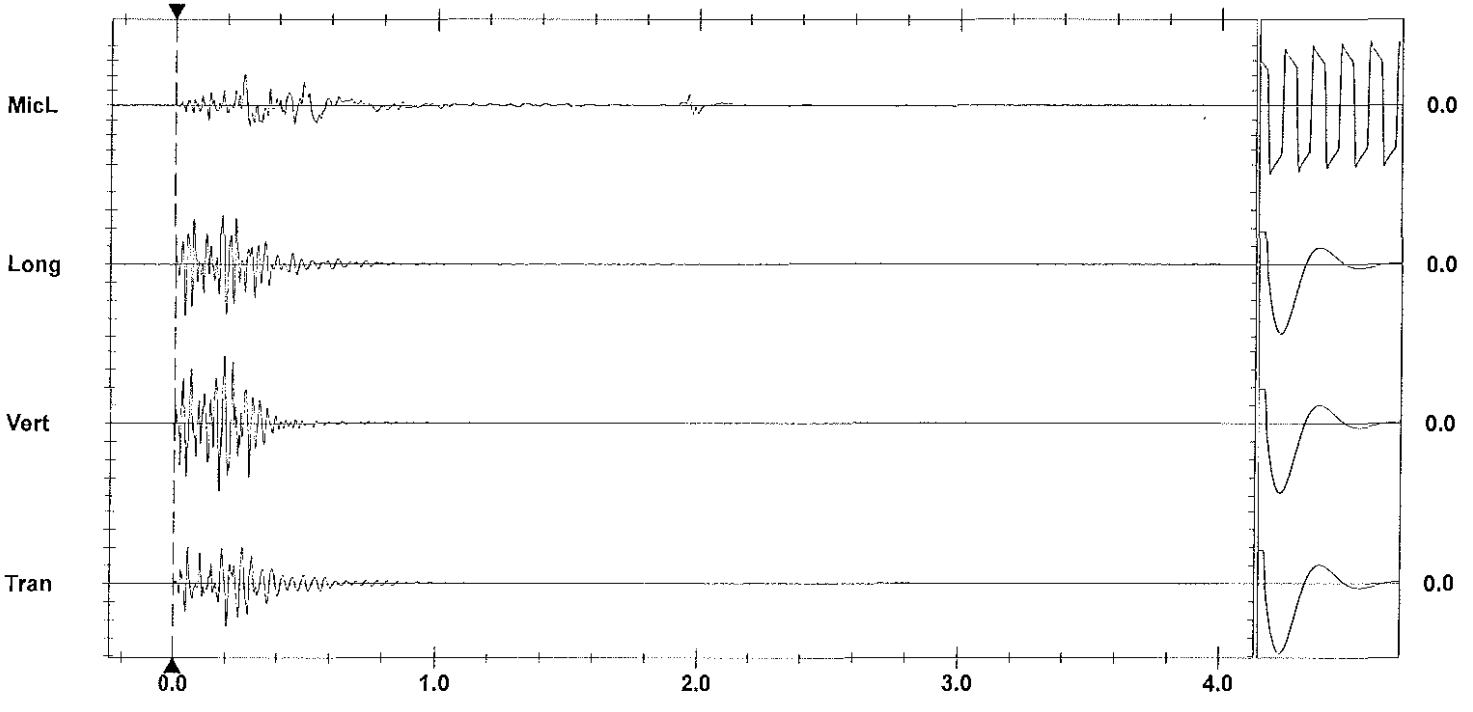
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00207 psi(L) at 0.265 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 735 mv)

	Tran	Vert	Long	
PPV	0.119	0.186	0.143	in/s
ZC Freq	34	28	47	Hz
Time (Rel. to Trig)	0.205	0.173	0.037	sec
Peak Acceleration	0.0845	0.191	0.111	g
Peak Displacement	0.00053	0.00087	0.00070	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.208 in/s at 0.191 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21847-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sloan Drilling + Blasting
BLASTER'S NAME Wayne Jensen
BLASTER'S CERTIFICATE NUMBER 5334489

DATE PREPARED Feb 9/12
ACTUAL BLAST DATE Feb 9/12 12:17 pm
BLAST # MW-0106

HIGHWAY# 97
BLAST LOCATION AT: SMN 129+81 - 129+86 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NS) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.9 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

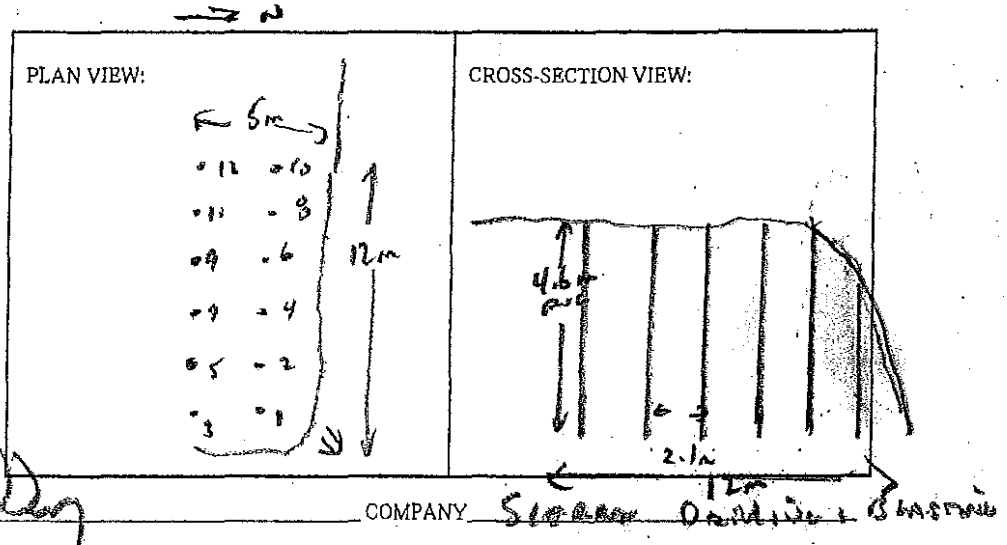
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE MB220 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 125 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sloan Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.099 ipd/43HZ
" @ 13117 Cliffstone Crt - 0.080 ipd/57HZ

2'-3' ANFO/Hole Primed W/ Slurry 1"x8" Dynamite

Instantel

Event Report

Date/Time	Vert at 12:17:38 February 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5AA.5E0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

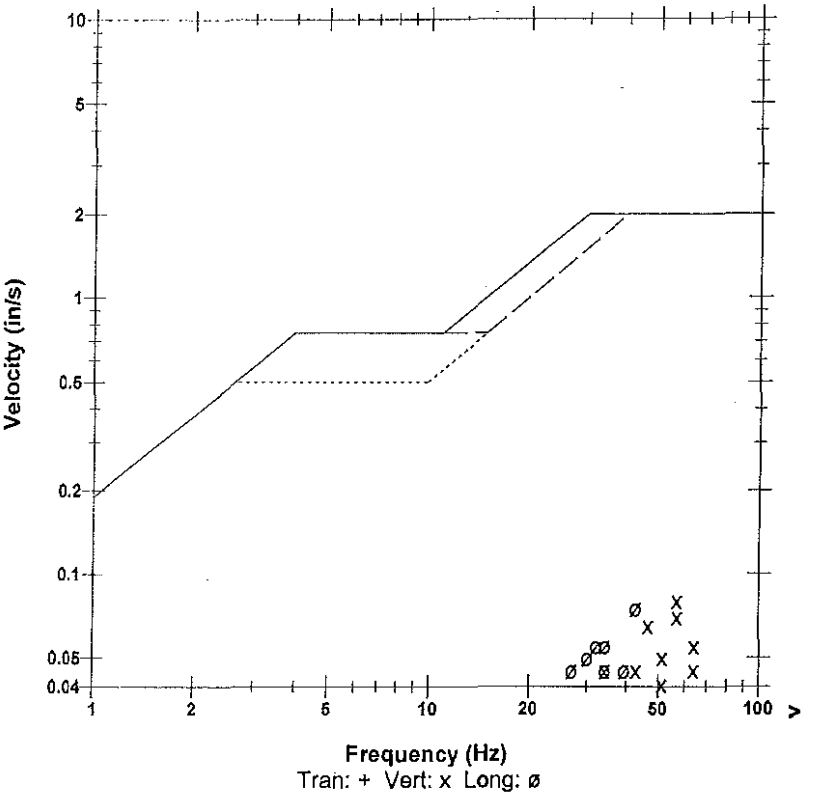
Extended Notes
Blast at stn 128

Post Event Notes

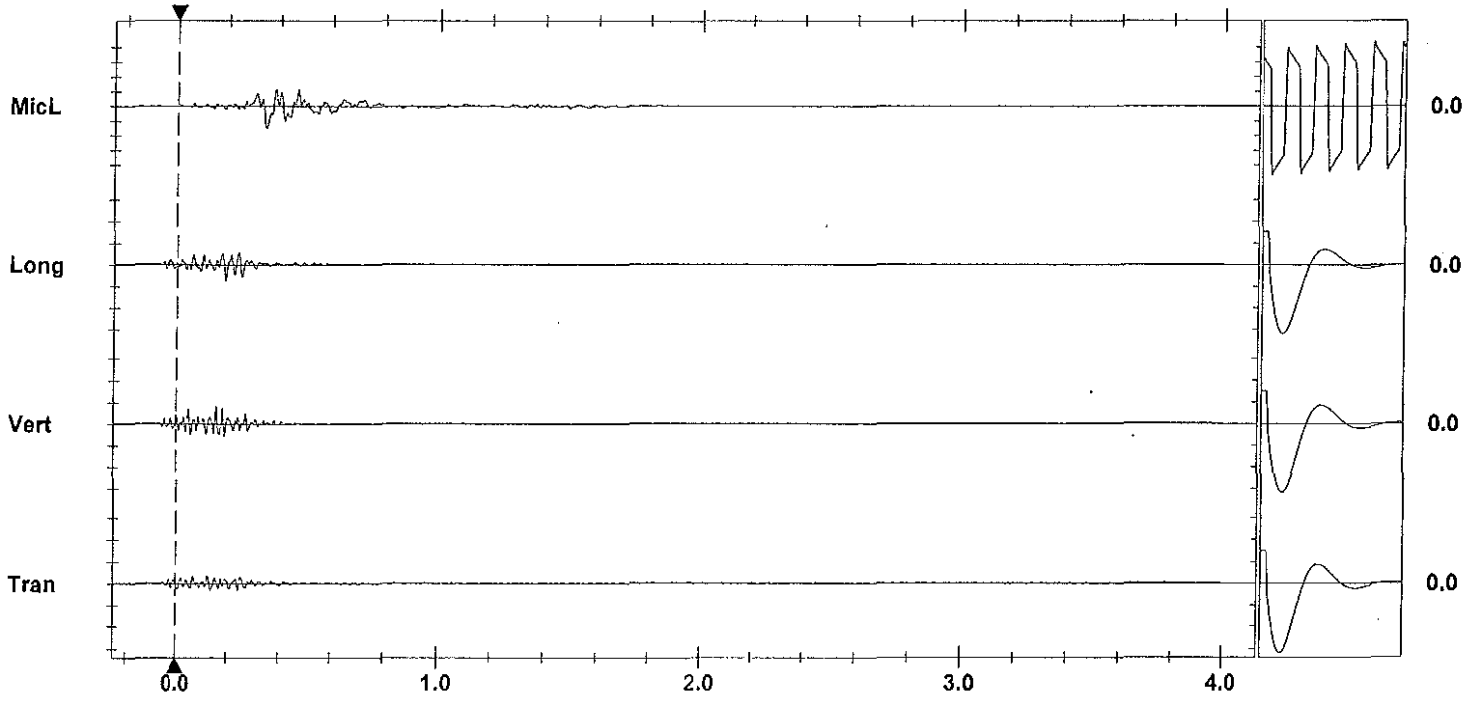
Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.344 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 670 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0800	0.0750	in/s
ZC Freq	43	57	43	Hz
Time (Rel. to Trig)	0.069	0.158	0.189	sec
Peak Acceleration	0.0265	0.0663	0.0398	g
Peak Displacement	0.00016	0.00024	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0907 in/s at 0.189 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

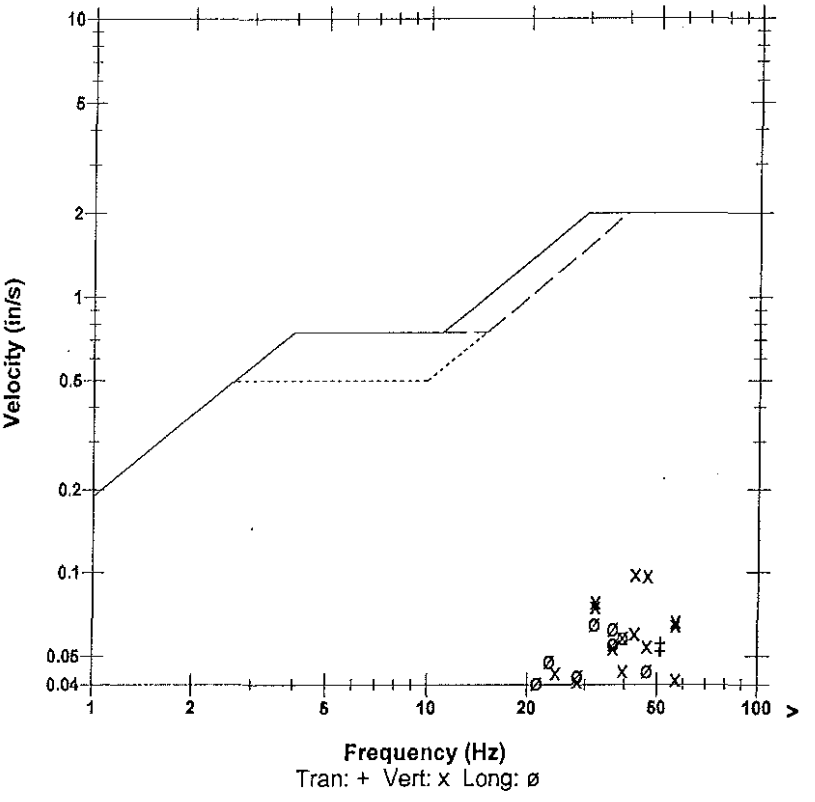
Date/Time	Long at 12:17:48 February 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5AA.5O0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

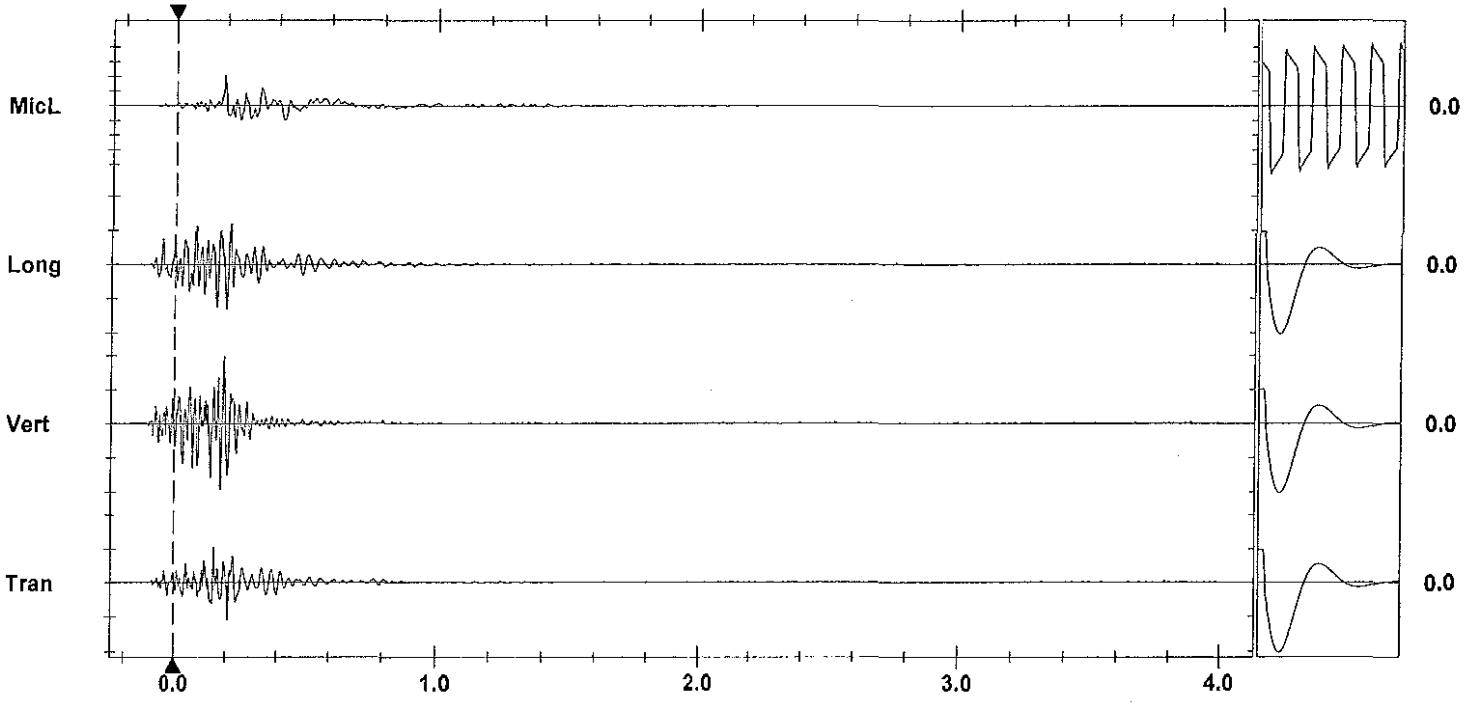
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00207 psi(L) at 0.188 sec			
ZC Freq	12 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 711 mv)			

	Tran	Vert	Long	
PPV	0.0556	0.0987	0.0656	in/s
ZC Freq	51	43	32	Hz
Time (Rel. to Trig)	0.211	0.193	0.201	sec
Peak Acceleration	0.0547	0.0845	0.0431	g
Peak Displacement	0.00022	0.00036	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.109 in/s at 0.182 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 9/12
ACTUAL BLAST DATE Feb 9/12 2:25PM
BLAST # MW-0107

HIGHWAY# 97
BLAST LOCATION AT: STN 129+85 - STN 129+50 L.S (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marking

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (1 loaded)
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.4 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 54 / 10 prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 13

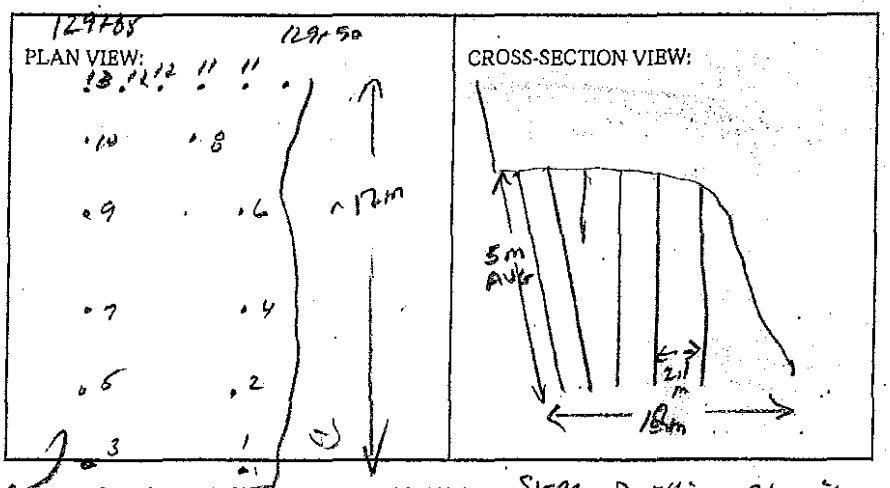
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE Hasco CAPACITY 80 caps

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone Crt - 0.13 in/s @ 32Hz
" @ 13117 Cliffstone Crt - 0.10 in/s @ 51Hz

PROD. Holes - 4'-5' ANFO/HOLE

STAB Holes - 1' ANFO/HOLE

BUFFER Holes - 3-4 CART 2X16 BLASTEX

} Primed w/ 1 CART 1½" DYNAMITE

B/L HOLES - 1 CART 2½16" + Emulsion dust. Cord to 4" collar

Instantel

Event Report

Date/Time	Vert at 14:25:33 February 9, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5AG.2L0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

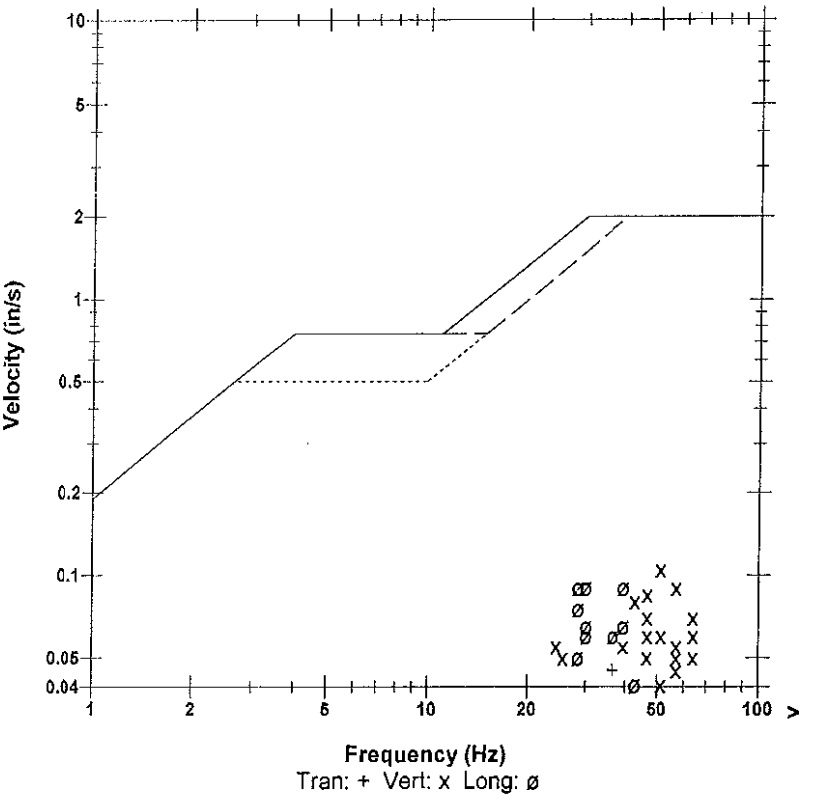
Extended Notes
Blast at stn 128

Post Event Notes

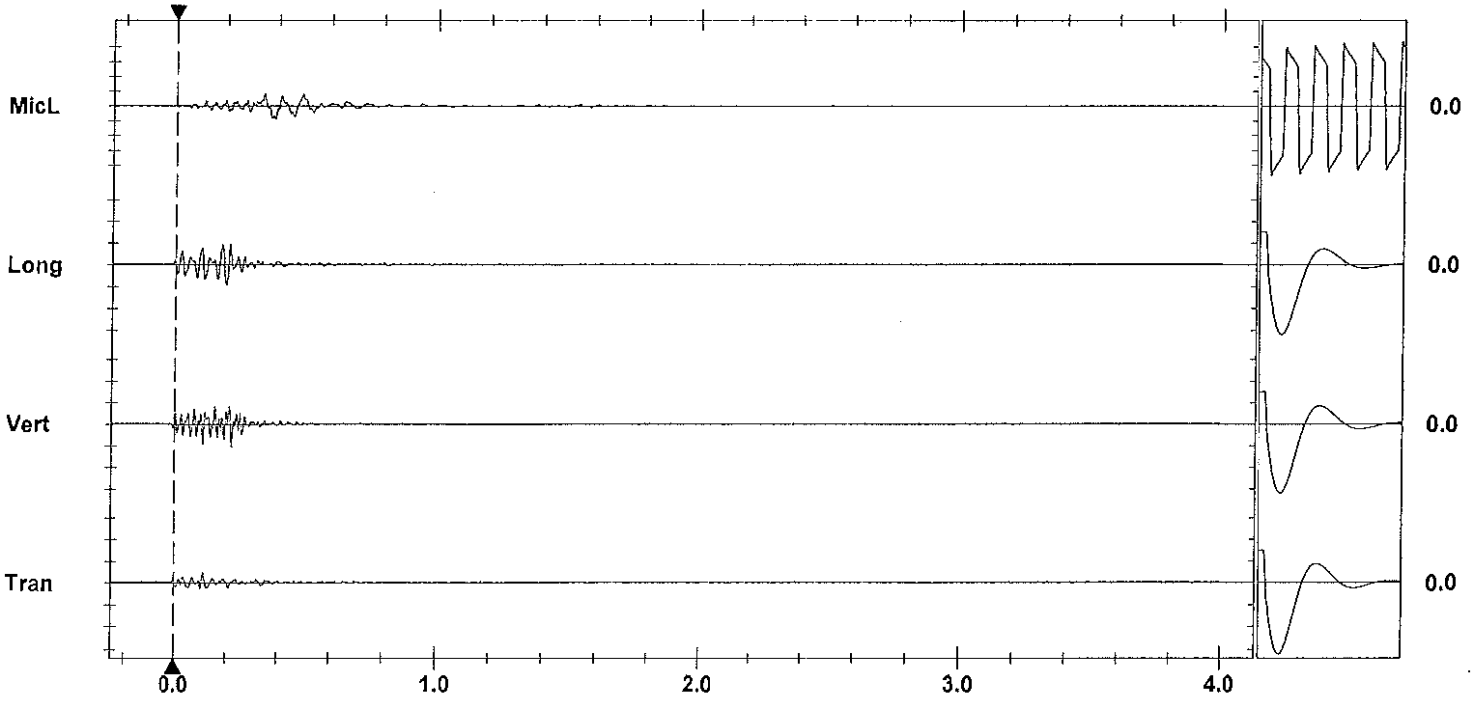
Microphone Linear Weighting
PSPL 0.00087 psi(L) at 0.384 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 666 mv)

	Tran	Vert	Long	
PPV	0.0450	0.105	0.0900	in/s
ZC Freq	37	51	28	Hz
Time (Rel. to Trig)	0.115	0.223	0.182	sec
Peak Acceleration	0.0265	0.0928	0.0663	g
Peak Displacement	0.00017	0.00032	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.119 in/s at 0.213 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

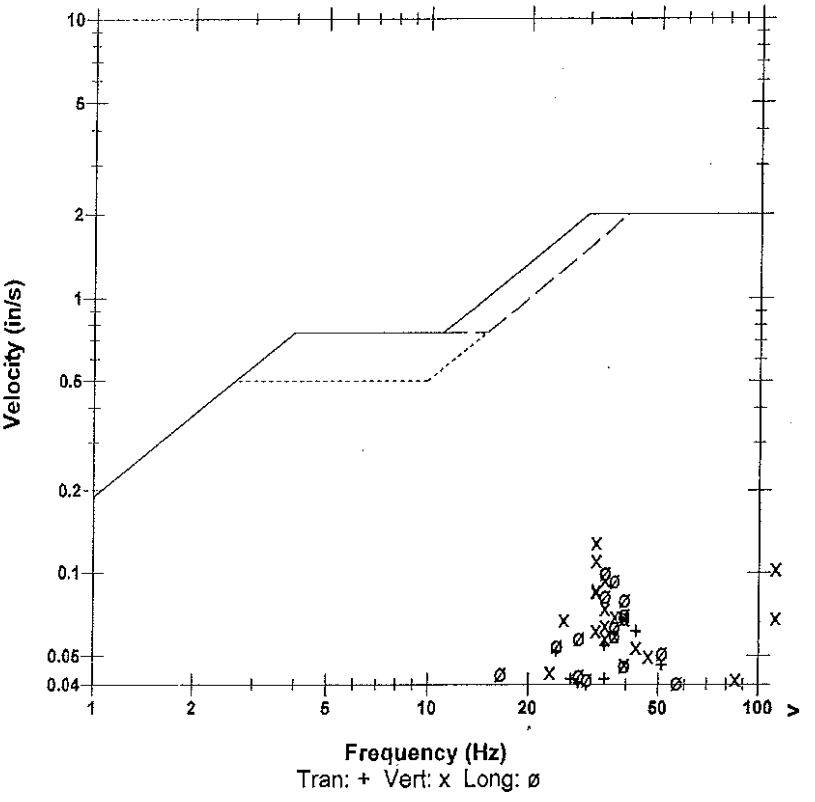
Date/Time	Vert at 14:25:43 February 9, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5AG.2V0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

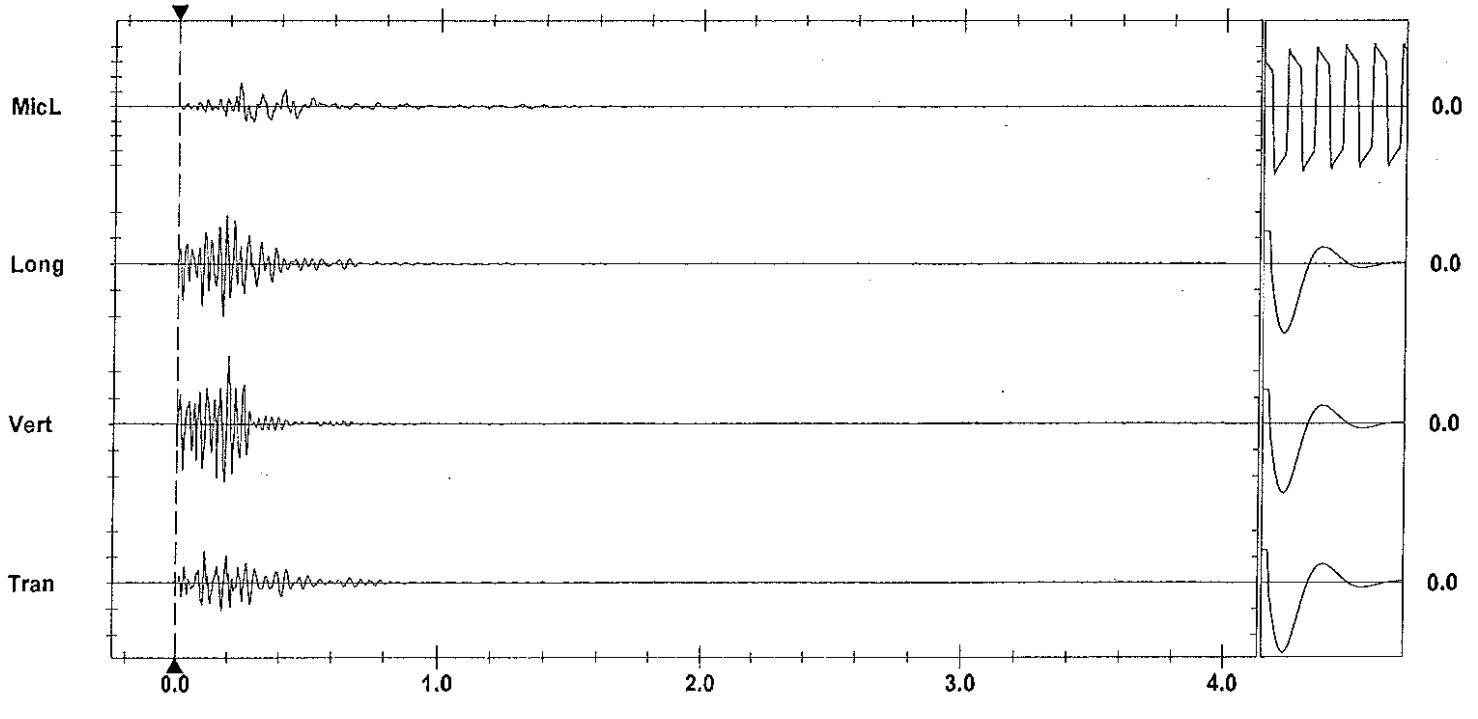
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00156 psi(L) at 0.240 sec
ZC Freq 27 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 695 mv)

	Tran	Vert	Long	
PPV	0.0612	0.129	0.1000	in/s
ZC Freq	43	32	34	Hz
Time (Rel. to Trig)	0.113	0.198	0.176	sec
Peak Acceleration	0.0597	0.133	0.0696	g
Peak Displacement	0.00025	0.00059	0.00040	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.144 in/s at 0.188 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — — —◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearsley
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Feb 10/12
ACTUAL BLAST DATE Feb 10/12 2:23 PM
BLAST # MW-0108

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80 ~ 129+85 (TO subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.3 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

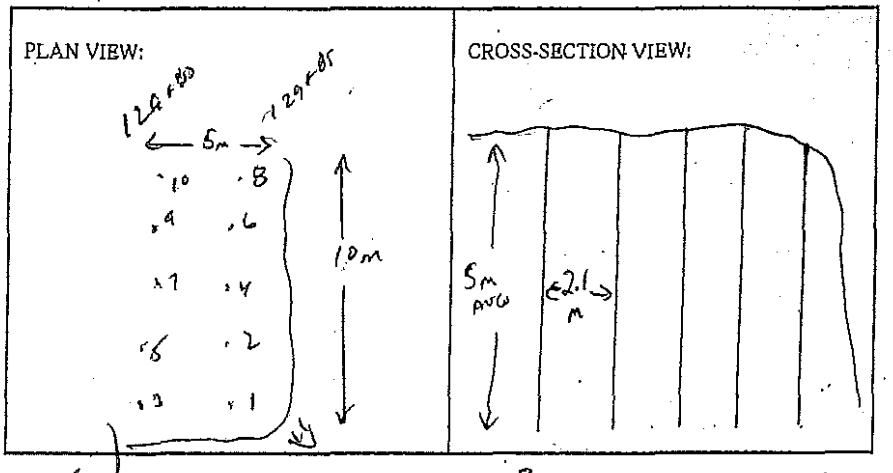
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vearsley COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.11 ips / 32 Hz

Seismograph @ 13117 Cliffstone Crt - not triggered (< 0.04 ips)

4'-5' ANFO/HHEP Primed w/ 1 each 1½# dynamite

Instantel

Event Report

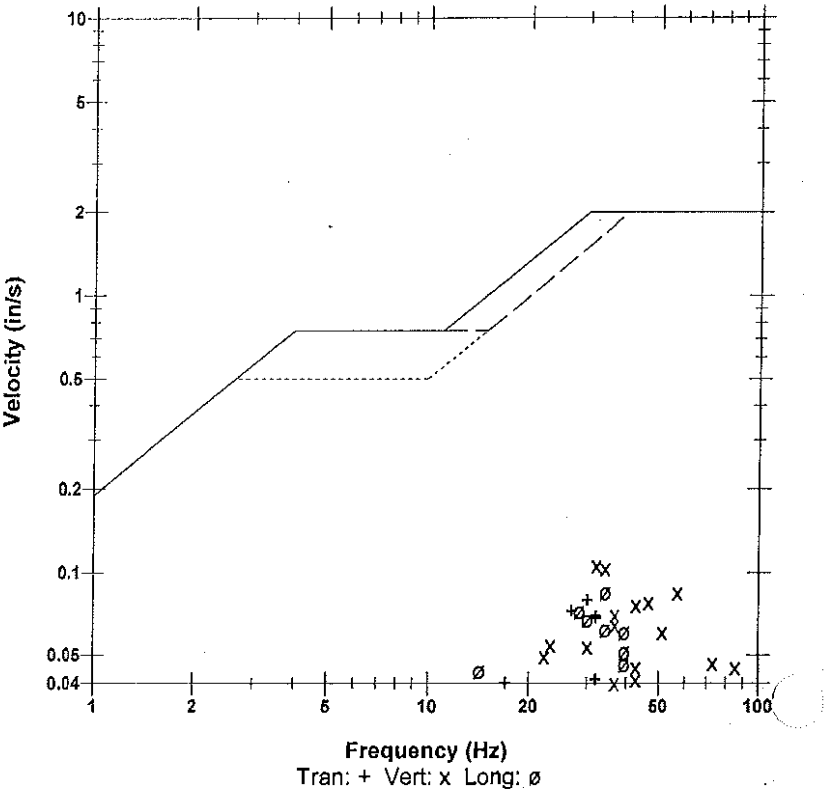
Date/Time	Vert at 14:23:57 February 10, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5CA.NX0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

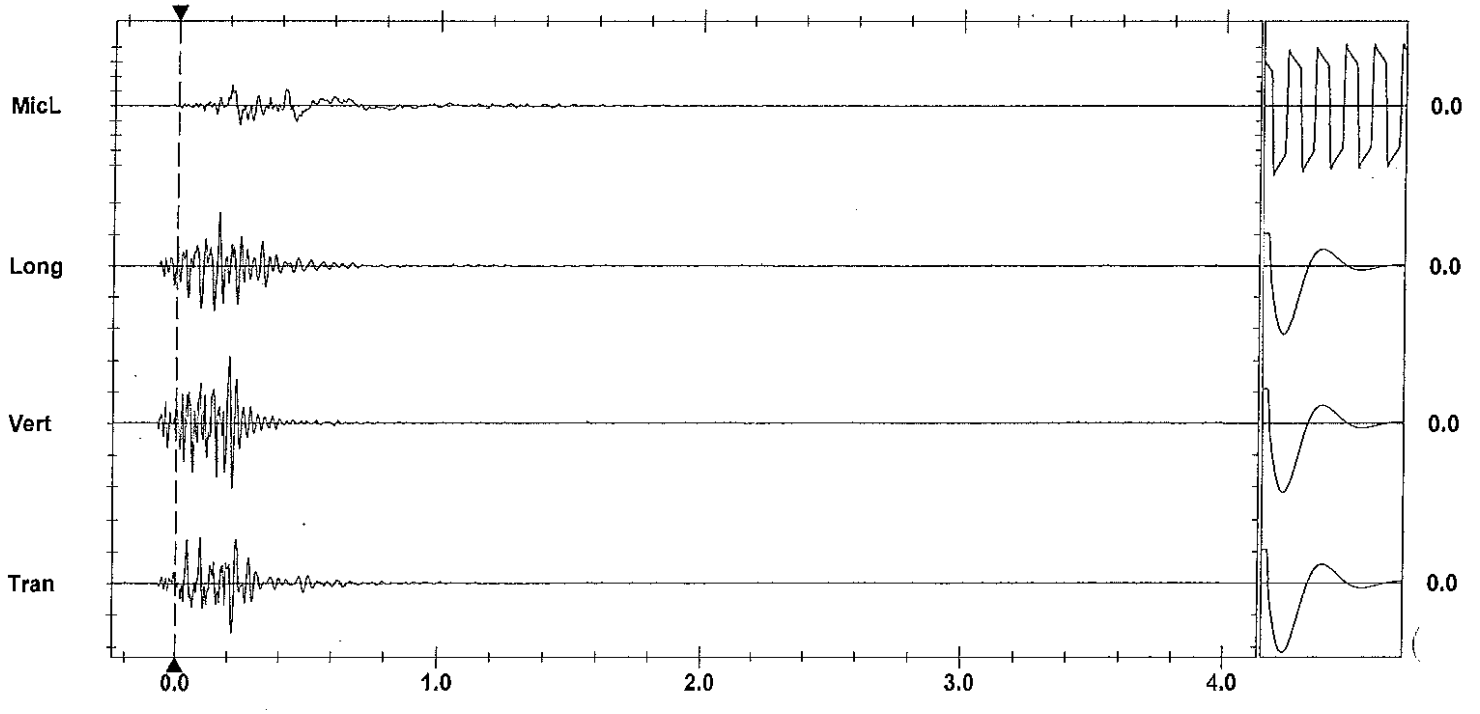
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00138 psi(L) at 0.205 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 668 mv)

	Tran	Vert	Long	
PPV	0.0794	0.106	0.0850	in/s
ZC Freq	30	32	34	Hz
Time (Rel. to Trig)	0.217	0.205	0.163	sec
Peak Acceleration	0.0497	0.0911	0.0464	g
Peak Displacement	0.00040	0.00053	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.131 in/s at 0.217 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED Feb 10/12
ACTUAL BLAST DATE Feb 10/12 3:08 PM
BLAST # MW-0109

HIGHWAY# 97
BLAST LOCATION AT: S00 129+83 - 129+85 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: + shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 2
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 26 // 16 after / 4 / 200.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

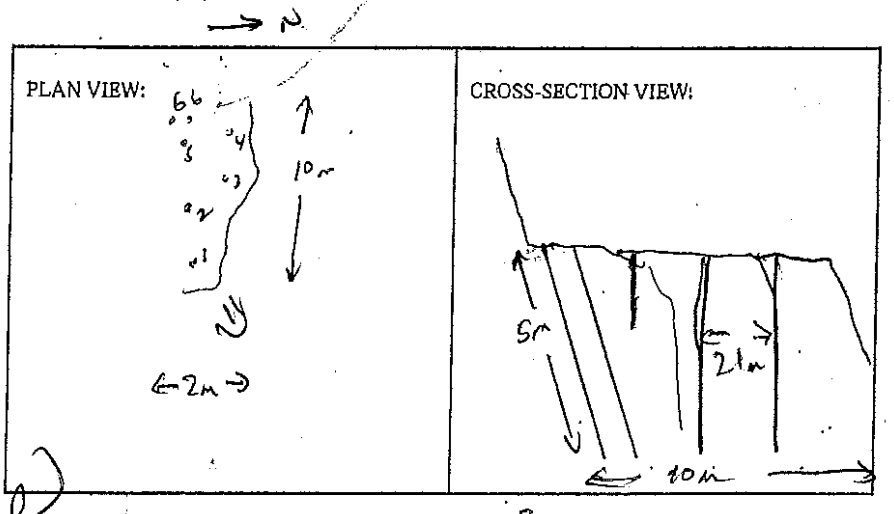
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.097 ips / 73 Hz
Seismograph @ 13117 Cliffstone Cut - no trigger (< 0.04 ips)

PROD. HOLES – 4'-5' ANFO/HOLE

STAB HOLES – 1'-1.5' ANFO/HOLE

BUFFER HOLES – 3-½ CART 2"x16" BLASTEX/HOLE

Primed w/ 1 CART 1½"x8" DYNAMITE

B/L HOLES – 1 CART 2"x16" DYNAMITE + 200gr

Det. cord to 4' collar

Instantel

Event Report

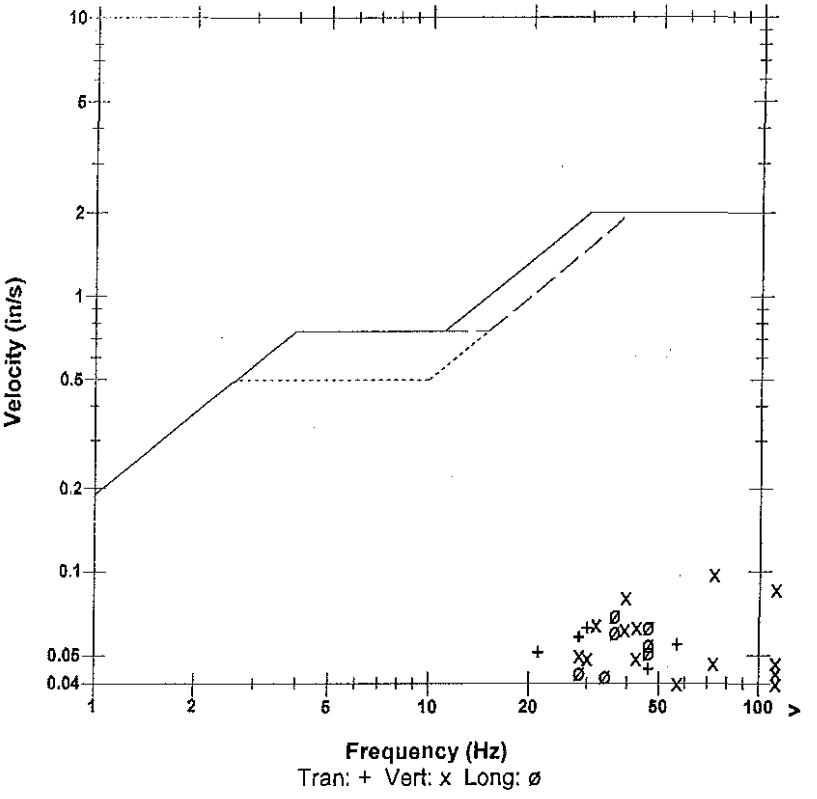
Date/Time	Long at 15:08:11 February 10, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5CC.PN0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

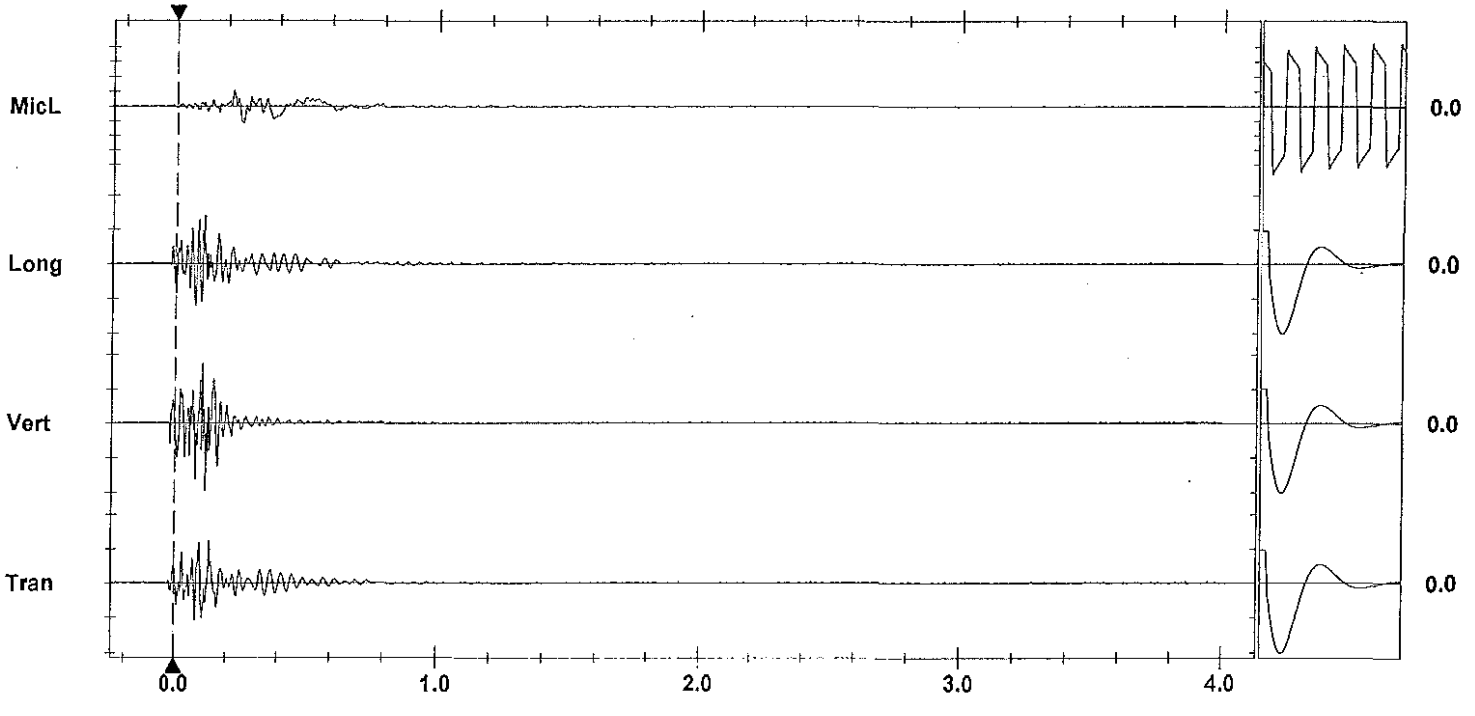
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00112 psi(L) at 0.256 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.0625	0.0975	0.0694	in/s
ZC Freq	30	73	37	Hz
Time (Rel. to Trig)	0.139	0.122	0.110	sec
Peak Acceleration	0.0514	0.129	0.0795	g
Peak Displacement	0.00032	0.00034	0.00026	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.115 in/s at 0.109 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: February 11, 2012 07:8:04 -8:04)
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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Feb 13/12
ACTUAL BLAST DATE Feb 13/12
BLAST # MW-0110 12:16 PM

HIGHWAY# 97
BLAST LOCATION AT: 129+20 - 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot-matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Granite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 3.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1' 04 Namite Powder
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

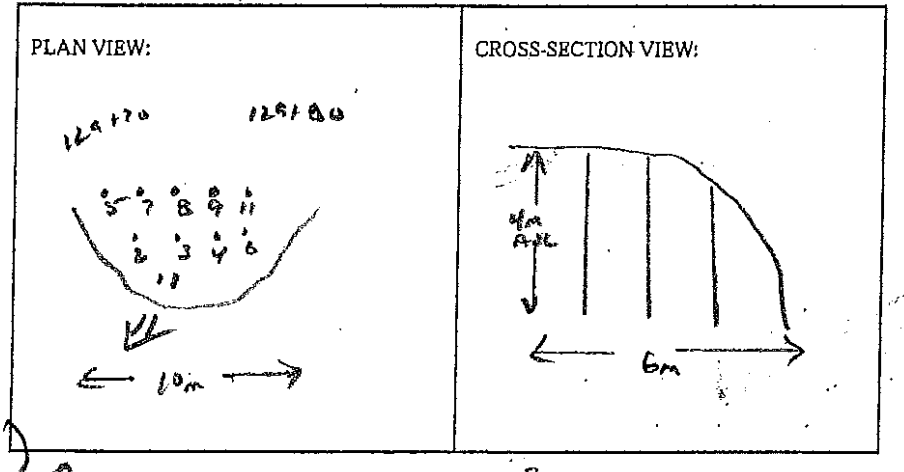
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffs Low Cut. 0.083 ips/ 39 Hz.
@ 13117 Cliffs Low Cut - 0.095 ips/ 51 Hz

2.5' - 3.5' ANFO/Hole Primed w/ 1 each 1½ x 8" Dynamite

Instantel

Event Report

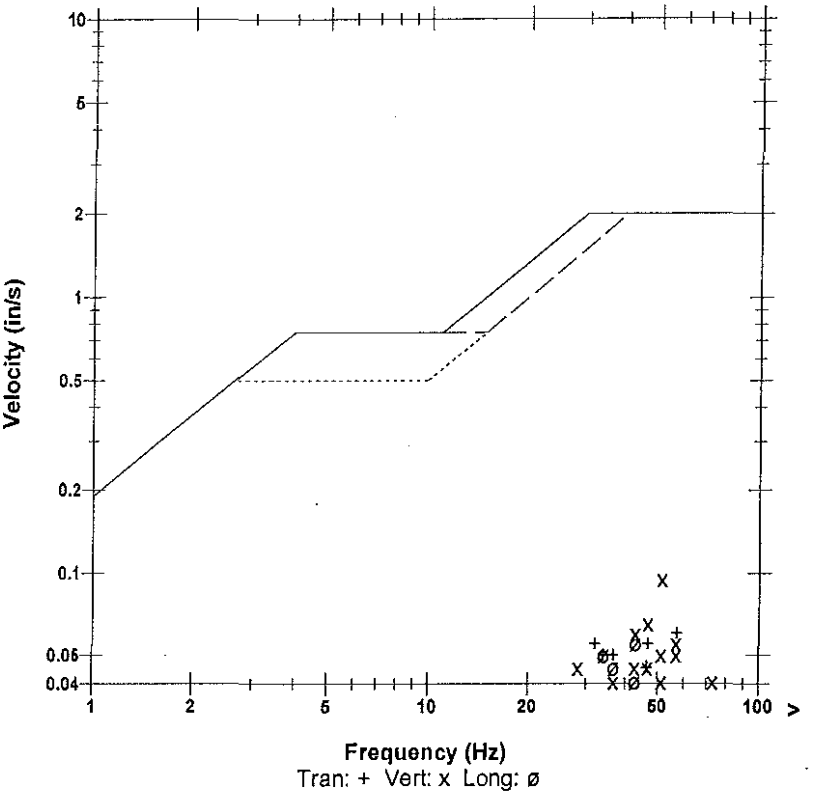
Date/Time	Vert at 12:16:13 February 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5HO.R10

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

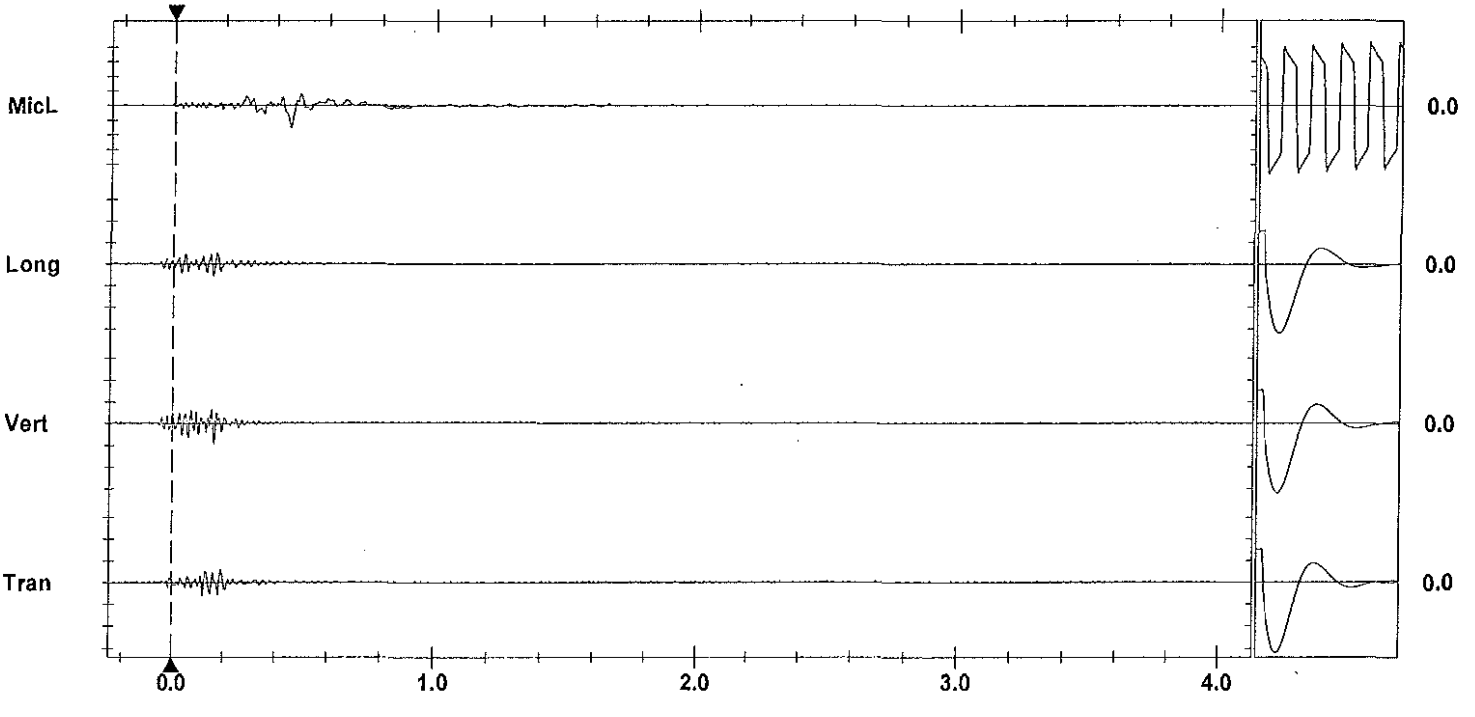
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00152 psi(L) at 0.452 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 684 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0950	0.0550	in/s
ZC Freq	57	51	43	Hz
Time (Rel. to Trig)	0.122	0.165	0.158	sec
Peak Acceleration	0.0530	0.0795	0.0398	g
Peak Displacement	0.00027	0.00029	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.7	3.7	4.4	

Peak Vector Sum 0.100 in/s at 0.163 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

Printed: February 19, 2012 0(8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

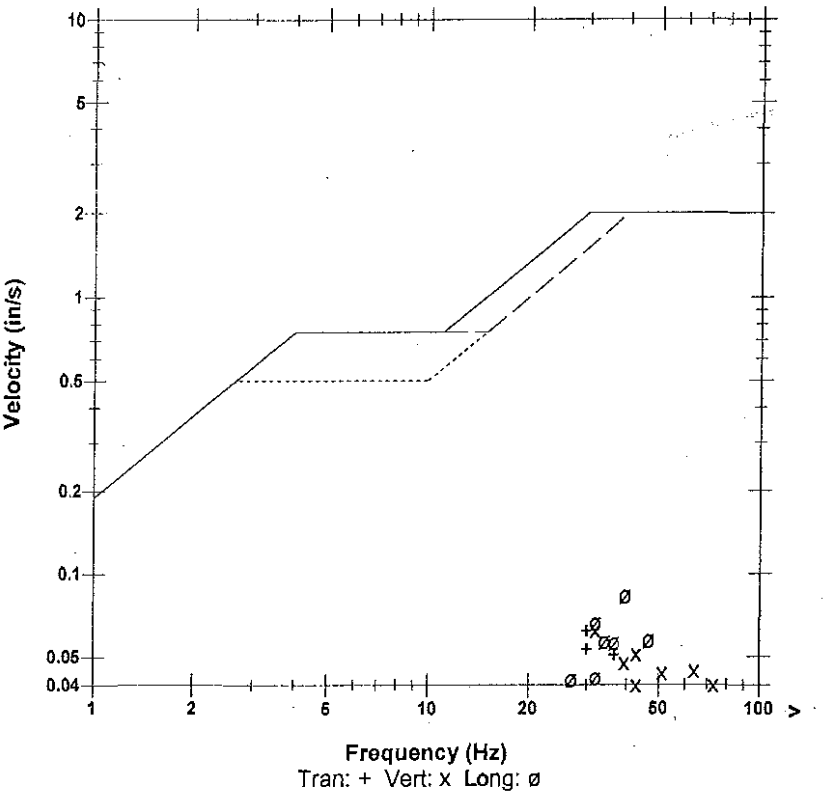
Date/Time	Vert at 12:16:27 February 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5HO.RF0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

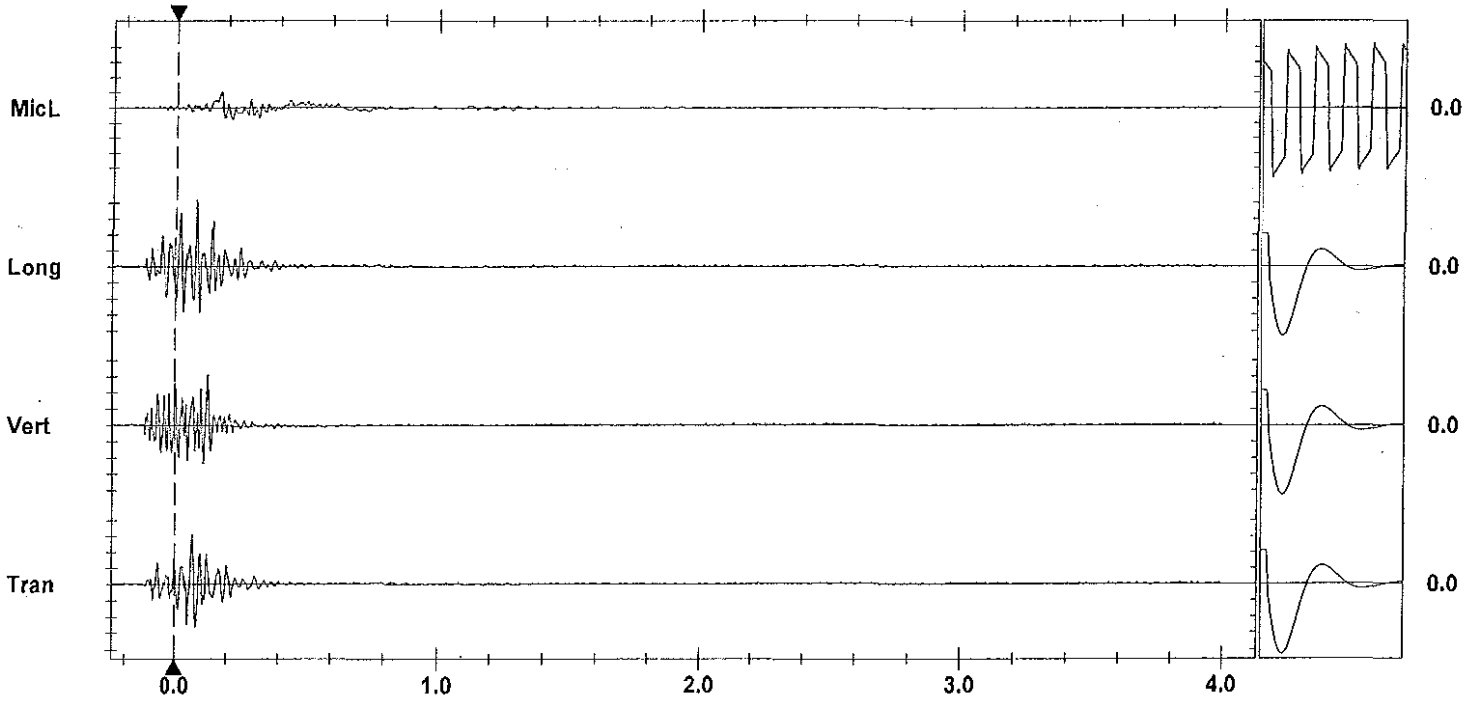


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00105 psi(L) at 0.172 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 654 mv)

	Tran	Vert	Long	
PPV	0.0619	0.0625	0.0831	in/s
ZC Freq	30	32	39	Hz
Time (Rel. to Trig)	0.068	0.130	0.084	sec
Peak Acceleration	0.0398	0.0497	0.0530	g
Peak Displacement	0.00031	0.00026	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.0985 in/s at 0.084 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: February 13, 2012 9:01:08.01
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 13/12
ACTUAL BLAST DATE Feb 13/12 1:18 PM
BLAST # MW-0111

HIGHWAY# 97
BLAST LOCATION AT: STN 129+70 - 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 53 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.3 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 4.9 (m)
TOTAL DEPTH 21.5 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 2.5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

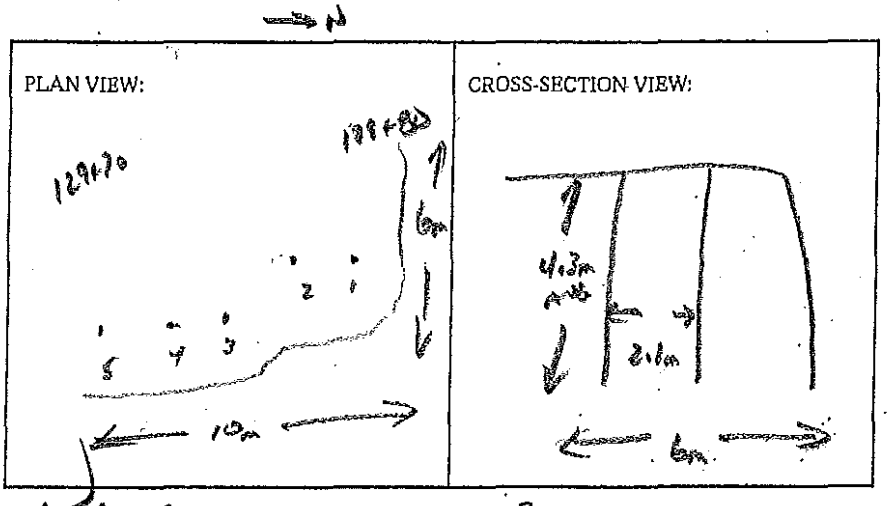
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE Hasco CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Chieftain Cut - 0.120 ips/ 30Hz
@ 13117 Chieftain Cut - 0.100 ips/ 32Hz

4'-5' ANFO/ITE primed w/ 1 each 1" x 8" DYNAMITE

Instantel

Event Report

Date/Time	Long at 13:13:44 February 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	5.9 Volts (Battery Low)
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5HR.EW0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

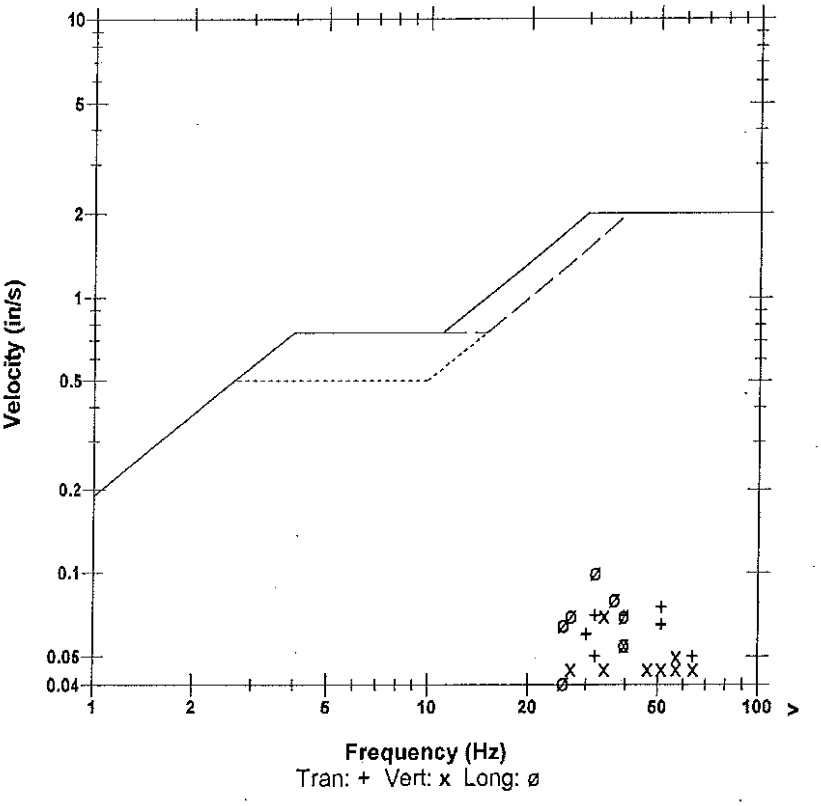
Post Event Notes

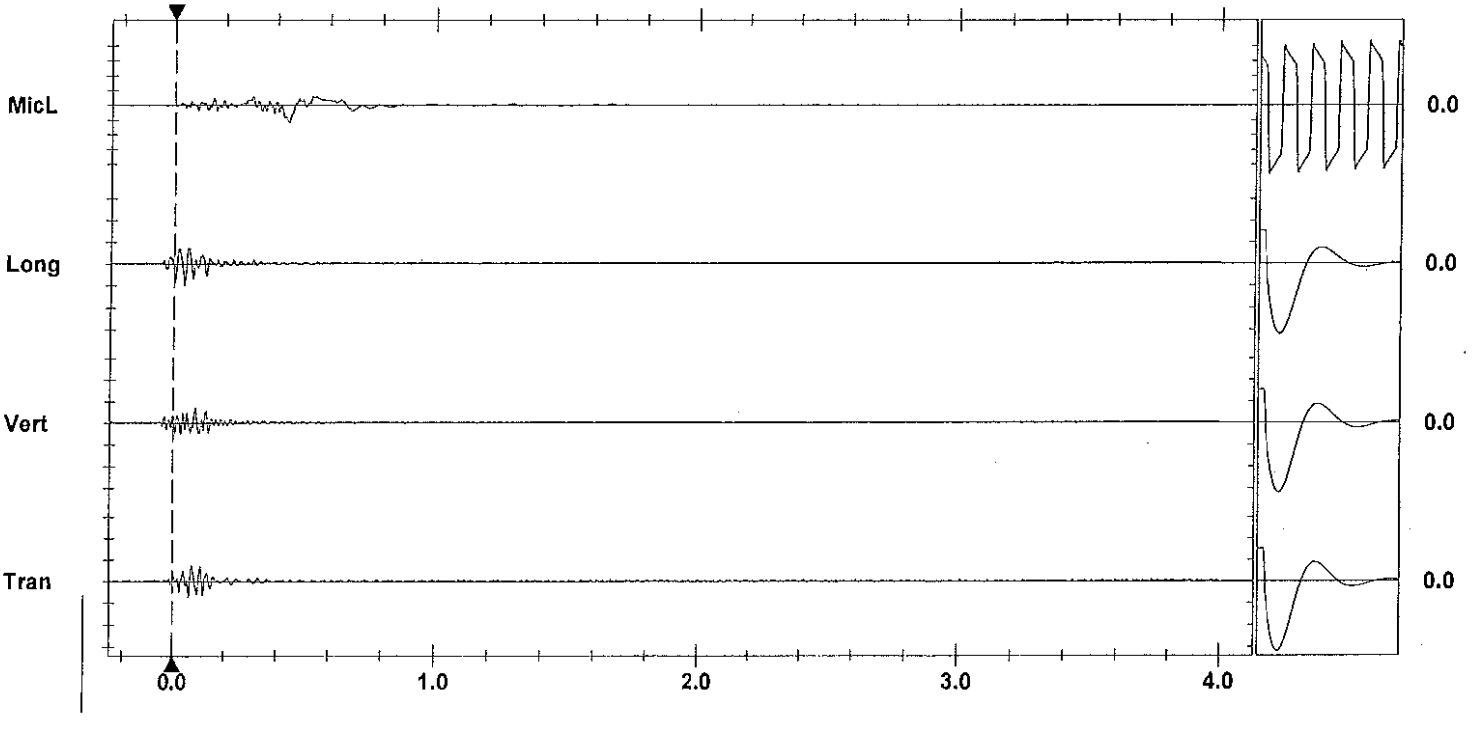
Microphone Linear Weighting
PSPL 0.00116 psi(L) at 0.439 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 650 mv)

	Tran	Vert	Long	
PPV	0.0750	0.0700	0.1000	in/s
ZC Freq	51	34	32	Hz
Time (Rel. to Trig)	0.063	0.089	0.041	sec
Peak Acceleration	0.0530	0.0530	0.0530	g
Peak Displacement	0.00036	0.00032	0.00047	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.115 in/s at 0.041 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

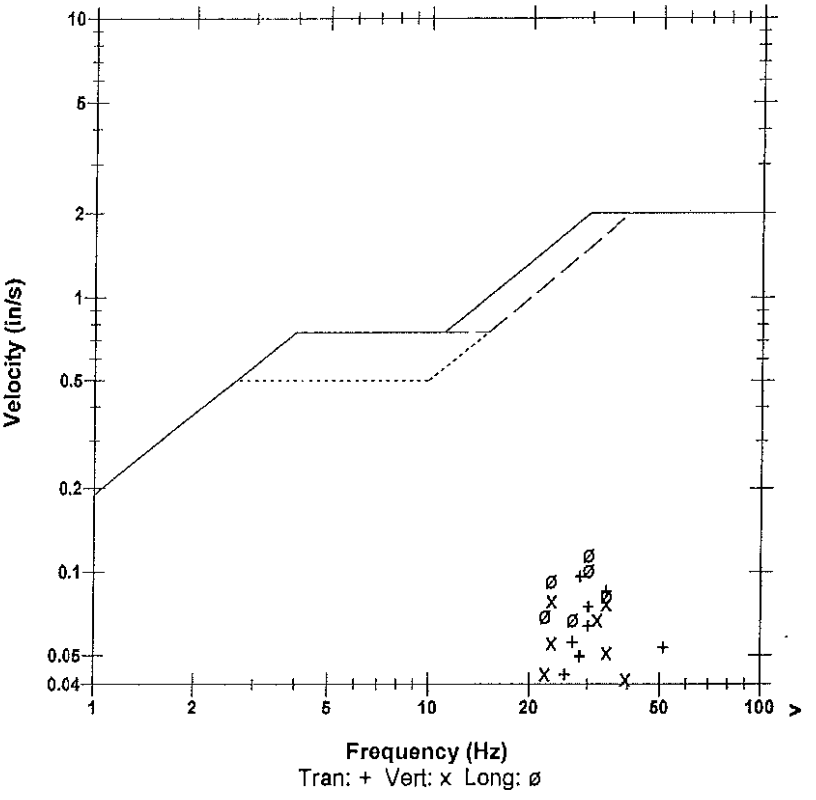
Date/Time	Vert at 13:13:57 February 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5HR.F90
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

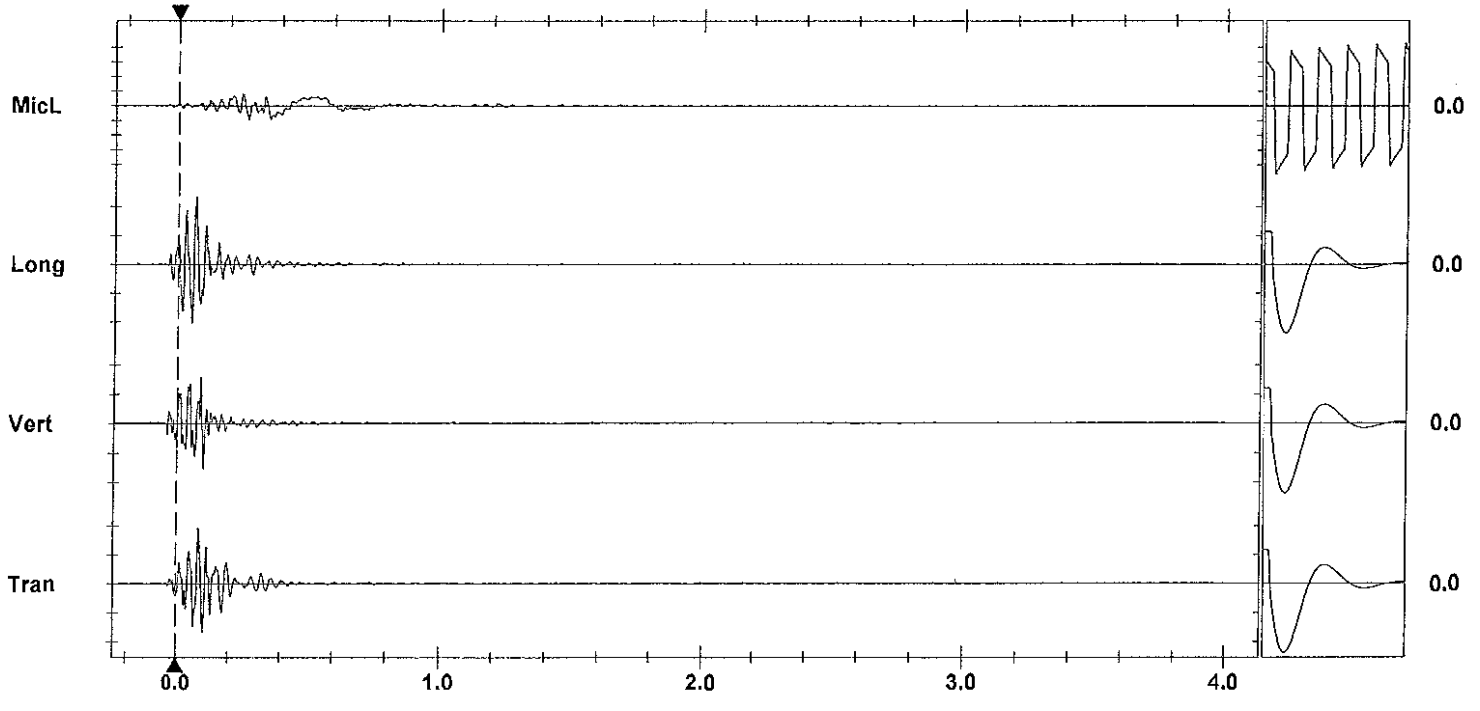
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0962	0.0787	0.116	in/s
ZC Freq	28	23	30	Hz
Time (Rel. to Trig)	0.088	0.093	0.069	sec
Peak Acceleration	0.0547	0.0779	0.0679	g
Peak Displacement	0.00046	0.00039	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Microphone Linear Weighting
PSPL 0.00094 psi(L) at 0.271 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 684 mv)

Peak Vector Sum 0.146 in/s at 0.070 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶—— -- -- —◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED Feb 14/12
ACTUAL BLAST DATE Feb 14/12 1:24PM
BLAST # MW-0412

HIGHWAY# 97
BLAST LOCATION AT: 129+64 - 129+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
*shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITICS
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE 1 AND 2
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25' (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

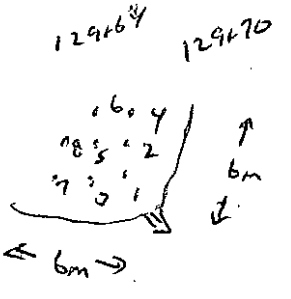
BLAST SKETCH:

N

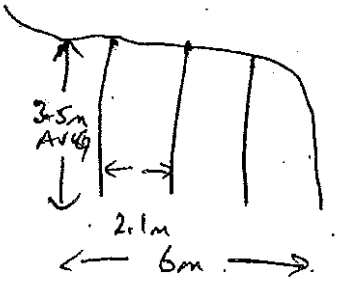
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



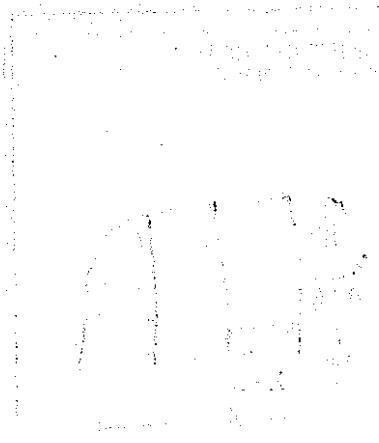
BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffshore Cut - 0.14 ips / 34 Hz
" @ 13117 Cliffshore Cut - 0.16 ips / 57 Hz

2'-4.' ANFO/ Hole Primed W/ 1 Count 1"x8" Dynamite



Instantel®

Event Report

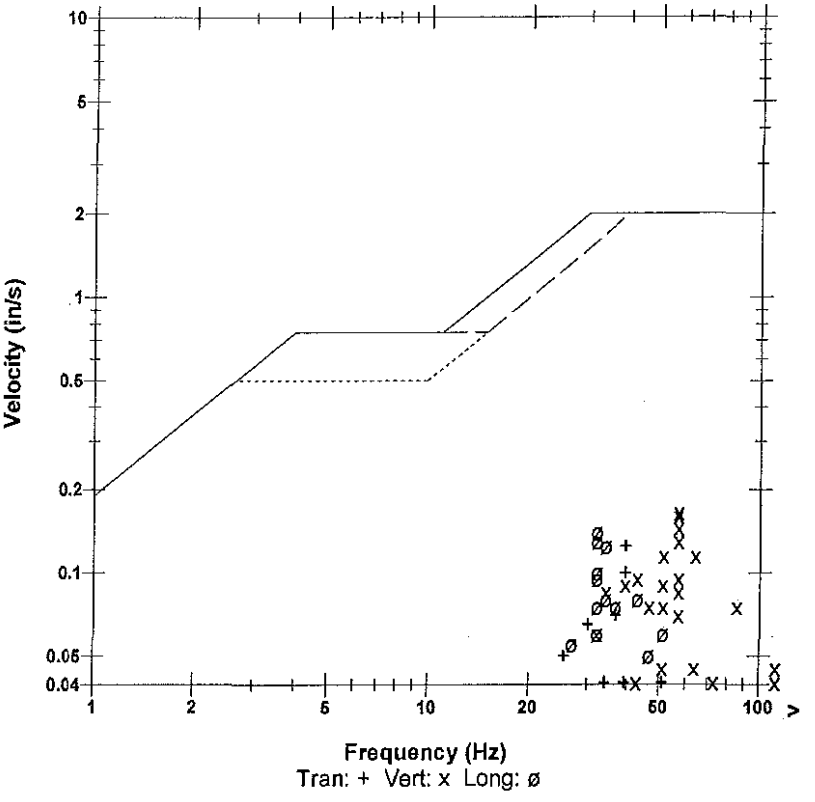
Date/Time	Vert at 13:24:42 February 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5JM.L60

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

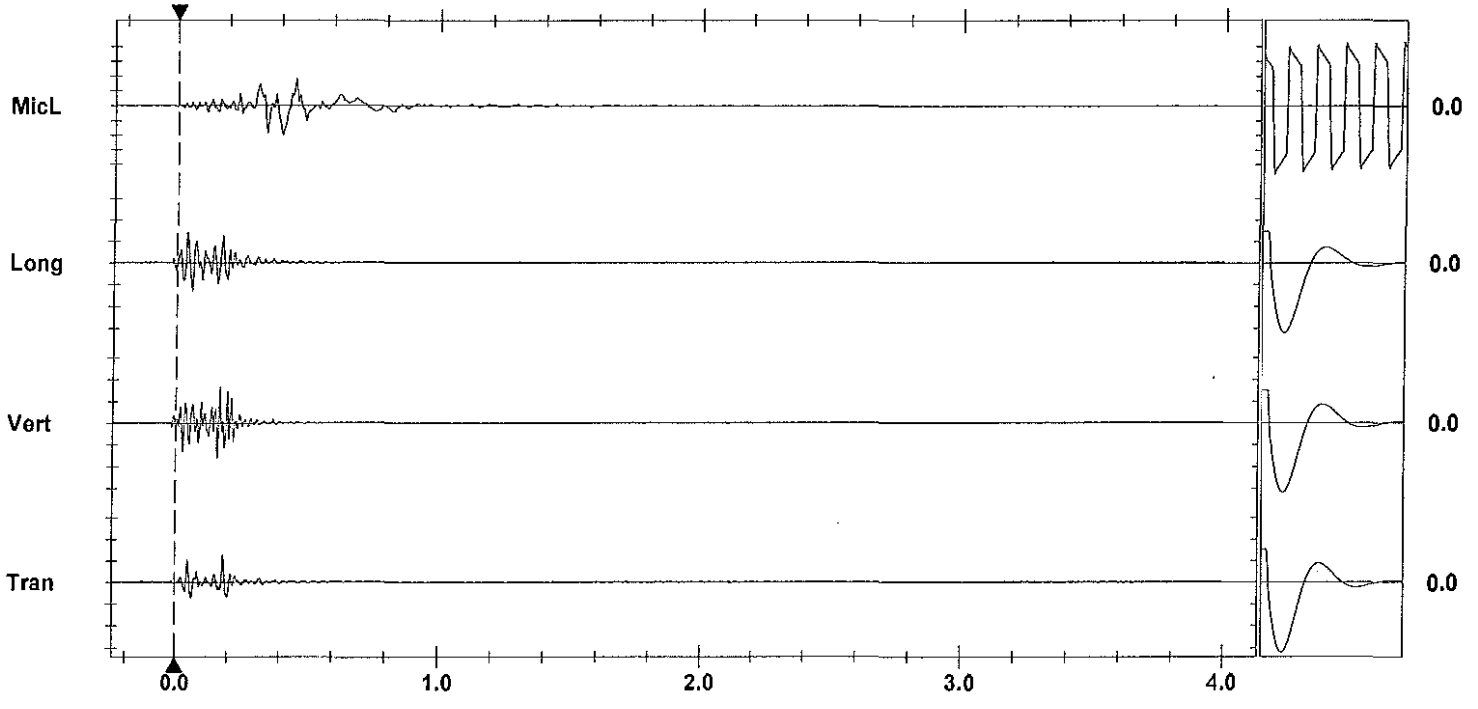
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00196 psi(L) at 0.400 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 742 mv)

	Tran	Vert	Long	
PPV	0.125	0.165	0.140	in/s
ZC Freq	39	57	32	Hz
Time (Rel. to Trig)	0.187	0.172	0.042	sec
Peak Acceleration	0.0795	0.146	0.0795	g
Peak Displacement	0.00046	0.00044	0.00062	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.179 in/s at 0.162 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

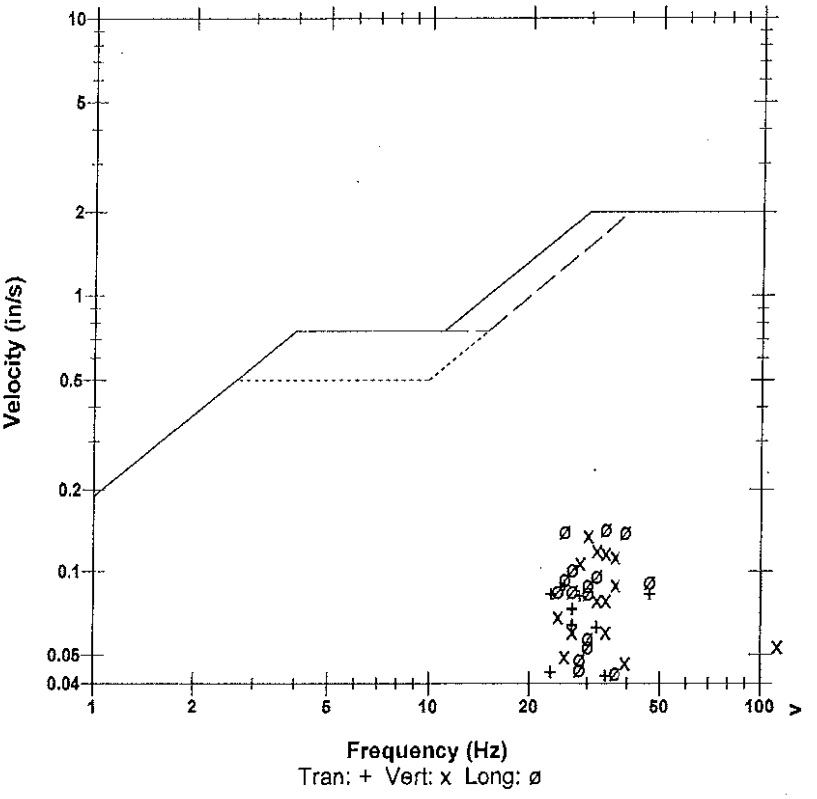
Date/Time	Vert at 13:24:56 February 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5JM.LK0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

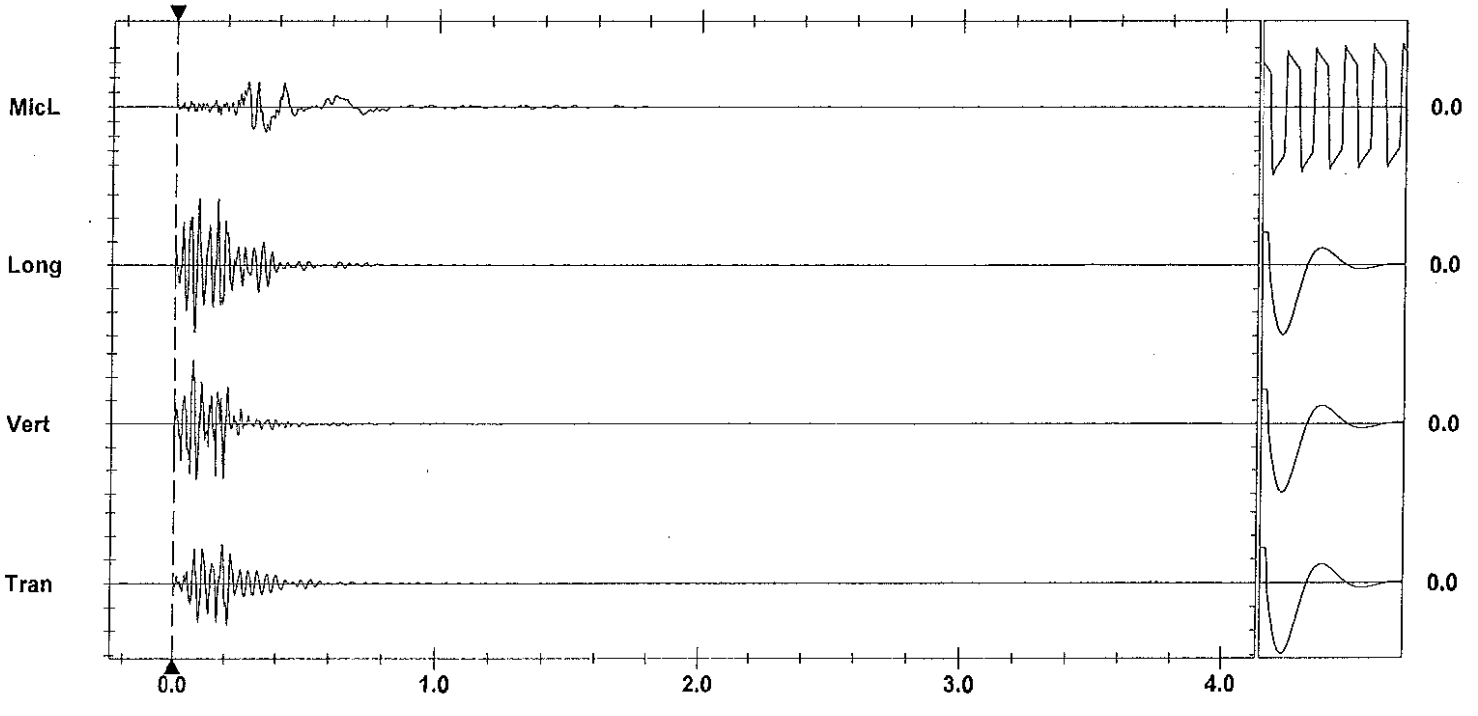
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00170 psi(L) at 0.348 sec			
ZC Freq	6.8 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 690 mv)			

	Tran	Vert	Long	
PPV	0.0887	0.136	0.143	in/s
ZC Freq	26	30	34	Hz
Time (Rel. to Trig)	0.212	0.075	0.078	sec
Peak Acceleration	0.0646	0.157	0.0994	g
Peak Displacement	0.00049	0.00071	0.00067	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.183 in/s at 0.077 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED Feb 15/12
ACTUAL BLAST DATE Feb 15/12 12:46 PM
BLAST # MW-0113

HIGHWAY# 97
BLAST LOCATION AT: 129+70 - 129+75

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: post matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/C
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

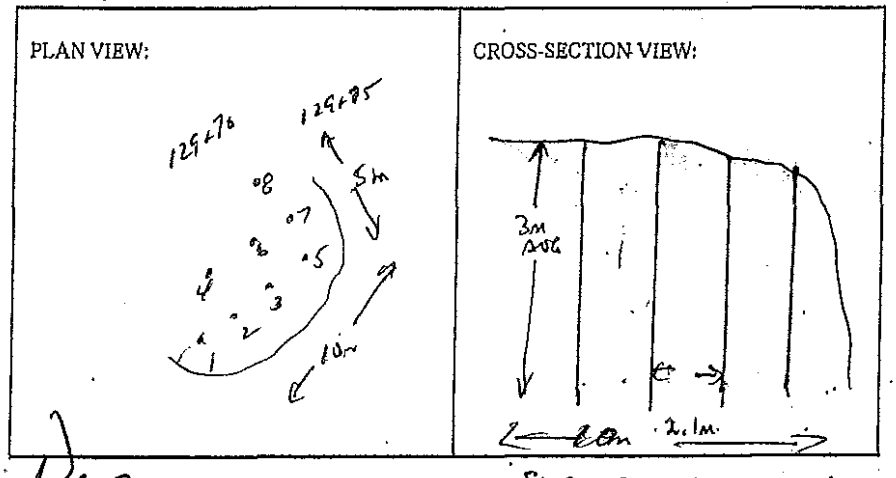
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HA320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



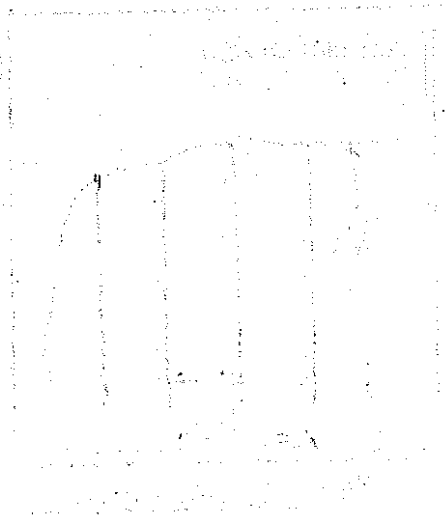
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.061 ips/26Hz
" @ 13117 Cliffstone Crt - 0.065 ips/43Hz

2.5'-4' ANFO/Hole primed w/1 each 1x8" DYNAMITE



Instantel

Event Report

Date/Time	Vert at 12:46:25 February 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5LF.HD0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

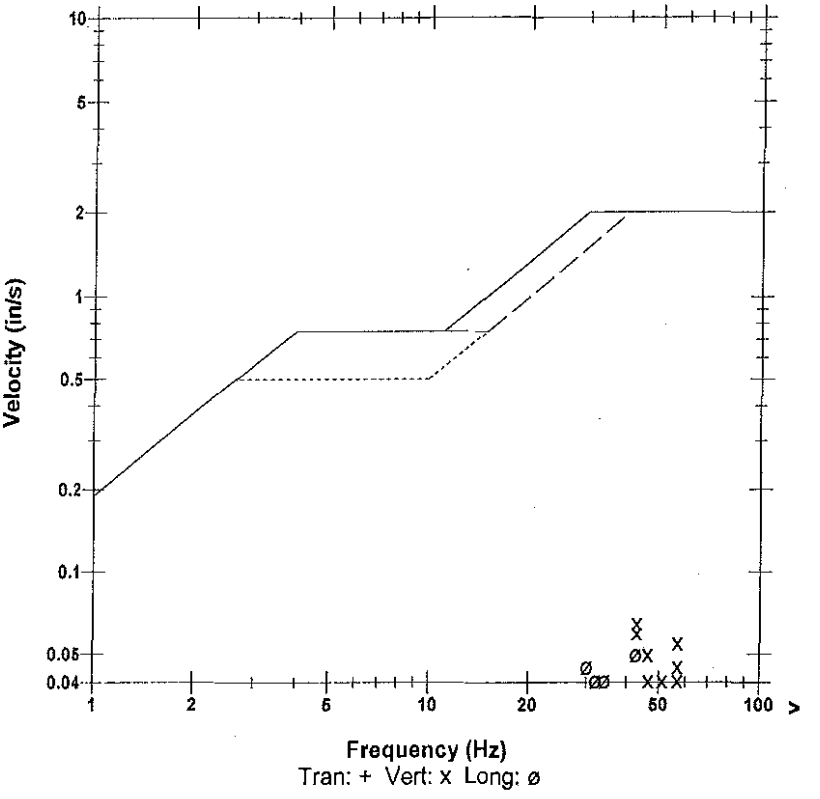
Post Event Notes

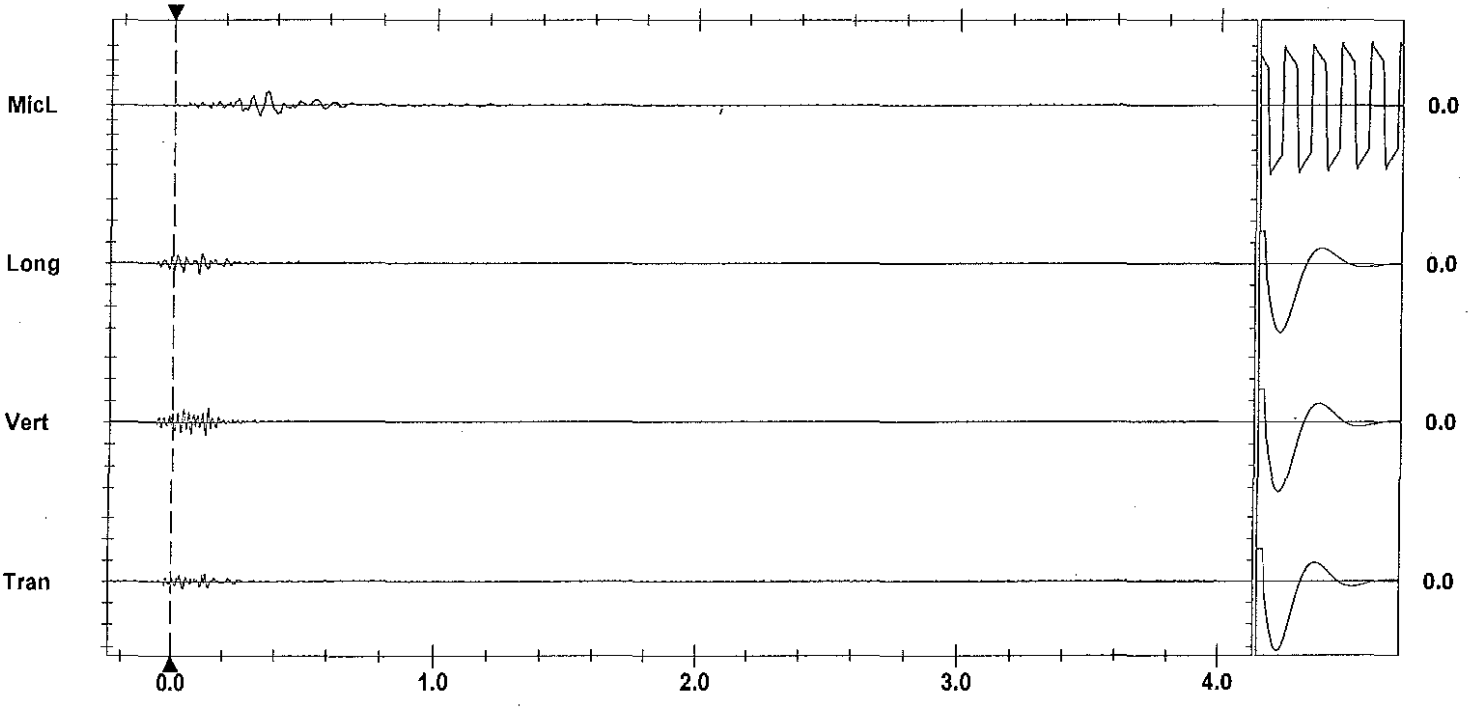
Microphone Linear Weighting
PSPL 0.00091 psi(L) at 0.364 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 649 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0650	0.0500	in/s
ZC Freq	64	43	43	Hz
Time (Rel. to Trig)	0.134	0.140	0.101	sec
Peak Acceleration	0.0398	0.0663	0.0398	g
Peak Displacement	0.00017	0.00022	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.0680 in/s at 0.043 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

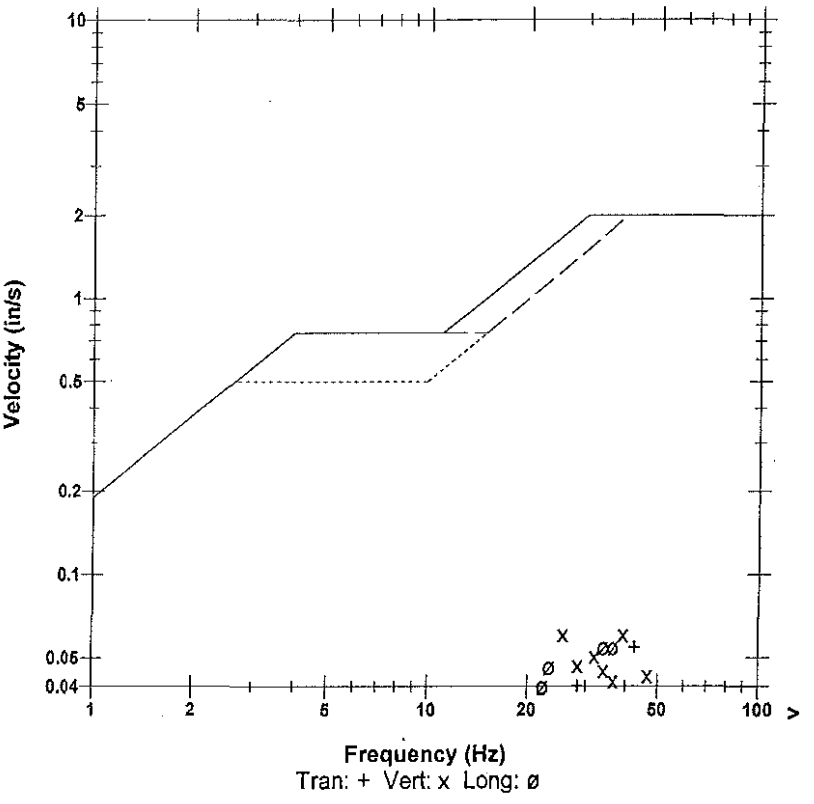
Date/Time	Long at 12:46:40 February 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5LF.HS0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

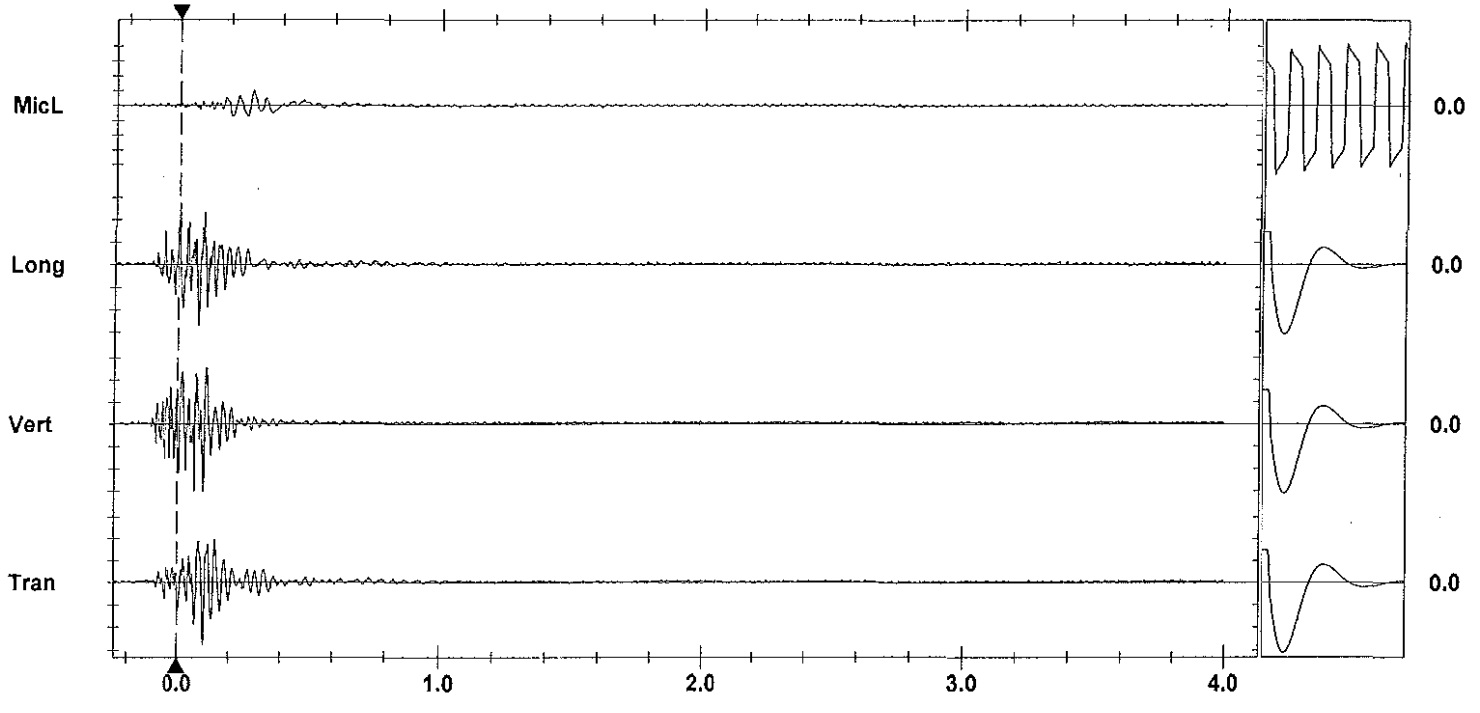
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.285 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 735 mv)

	Tran	Vert	Long	
PPV	0.0544	0.0606	0.0544	in/s
ZC Freq	43	26	34	Hz
Time (Rel. to Trig)	0.104	0.067	0.002	sec
Peak Acceleration	0.0365	0.0978	0.0365	g
Peak Displacement	0.00025	0.00026	0.00022	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.0850 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶---- — — —◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearsey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 15/12
ACTUAL BLAST DATE Feb 15/12
BLAST # MW-0114 2:32 PM

HIGHWAY# 97
BLAST LOCATION AT: Stn 129+60 - 129+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot netted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 4.7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 52 (m)

TOTAL NUMBER OF HOLES 12
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 12

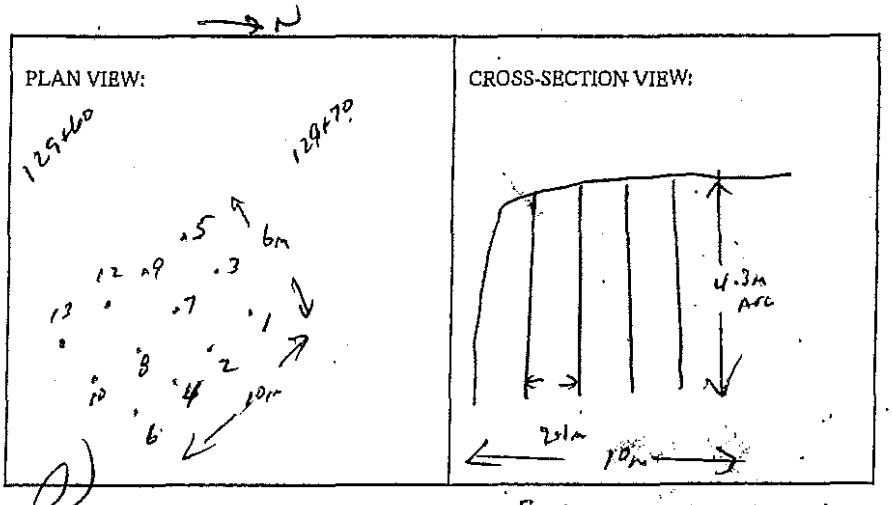
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



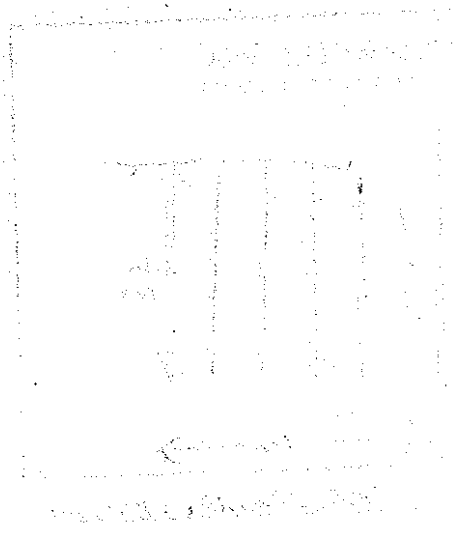
BLASTER'S SIGNATURE Wayne Vearsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt . 0.12 ips/ 43Hz
" @ 13117 Cliffstone Crt - 0.16 ips/ 47Hz

4'-5' ANFO/HOLE + 1 CART 1"X8" DYNAMITE PRIMER



Instantel

Event Report

Date/Time	Vert at 14:22:15 February 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5LJ.X30

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

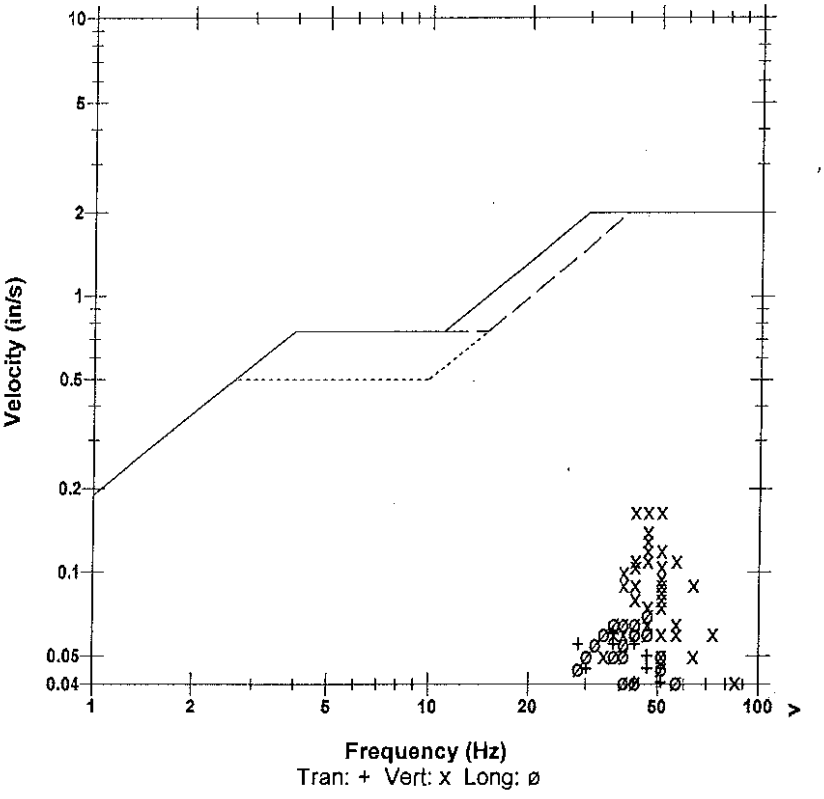
Extended Notes
Blast at stn 128

Post Event Notes

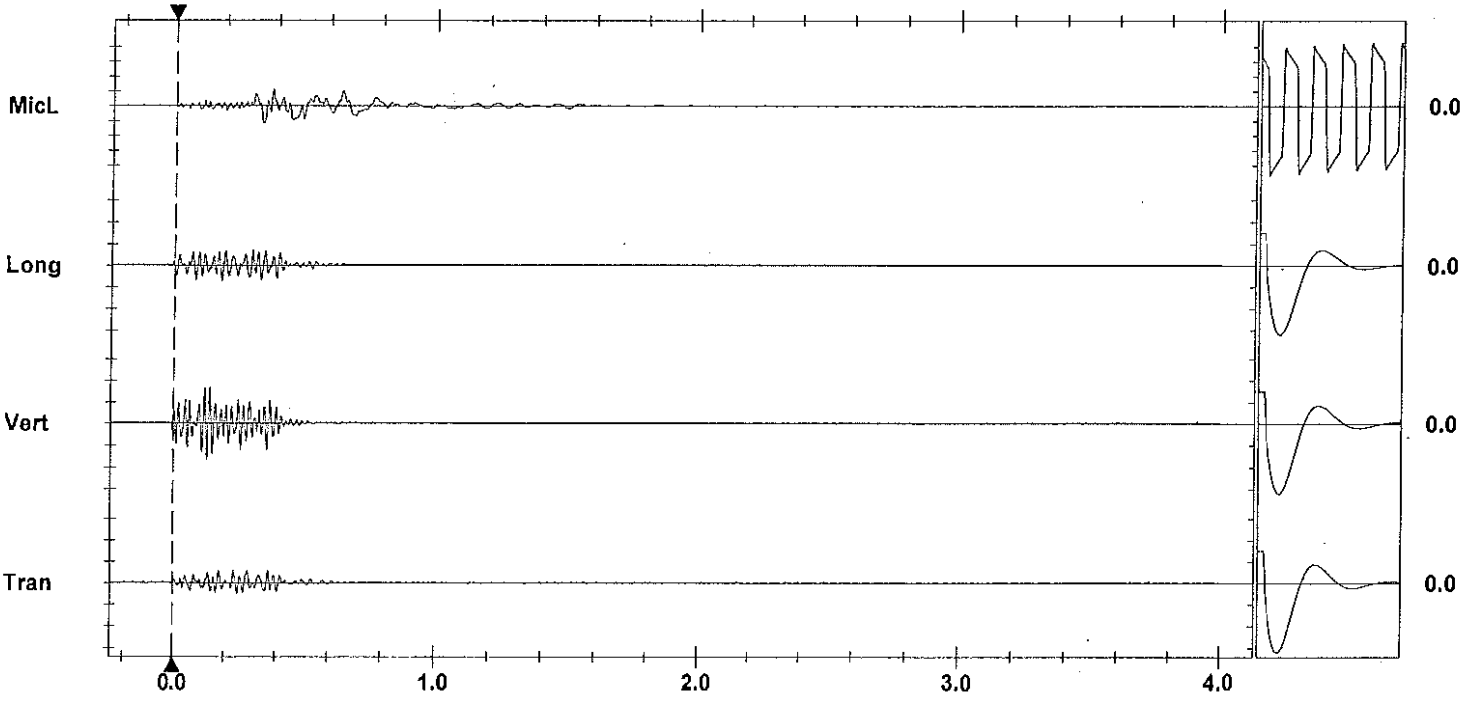
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 0.339 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.0600	0.165	0.0700	in/s
ZC Freq	37	47	47	Hz
Time (Rel. to Trig)	0.237	0.124	0.186	sec
Peak Acceleration	0.0398	0.133	0.0530	g
Peak Displacement	0.00031	0.00061	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.169 in/s at 0.133 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

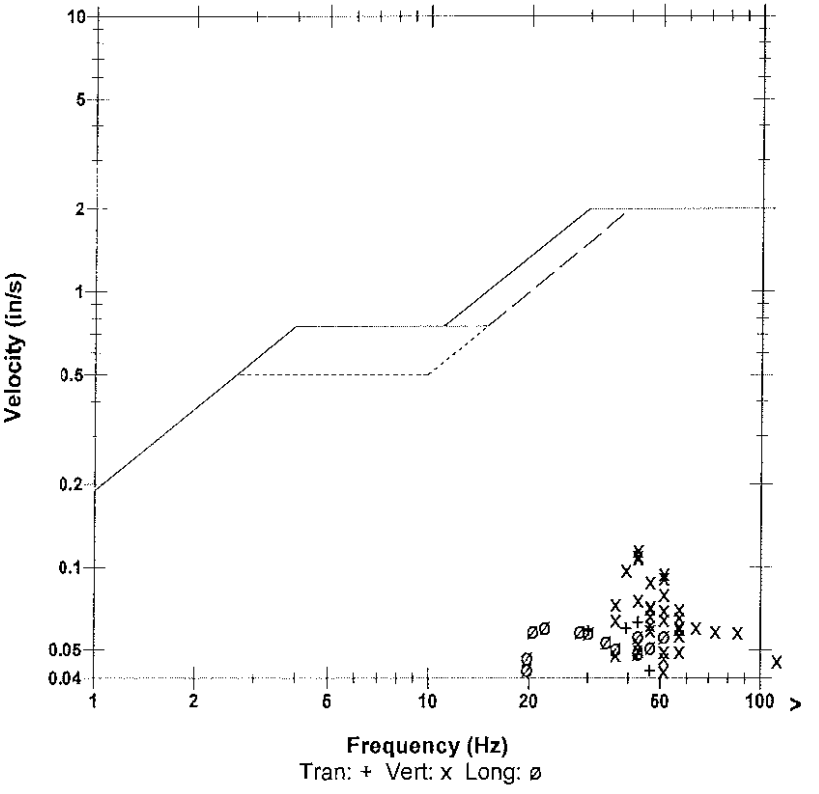
Date/Time	Vert at 14:22:29 February 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5LJ.XH0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

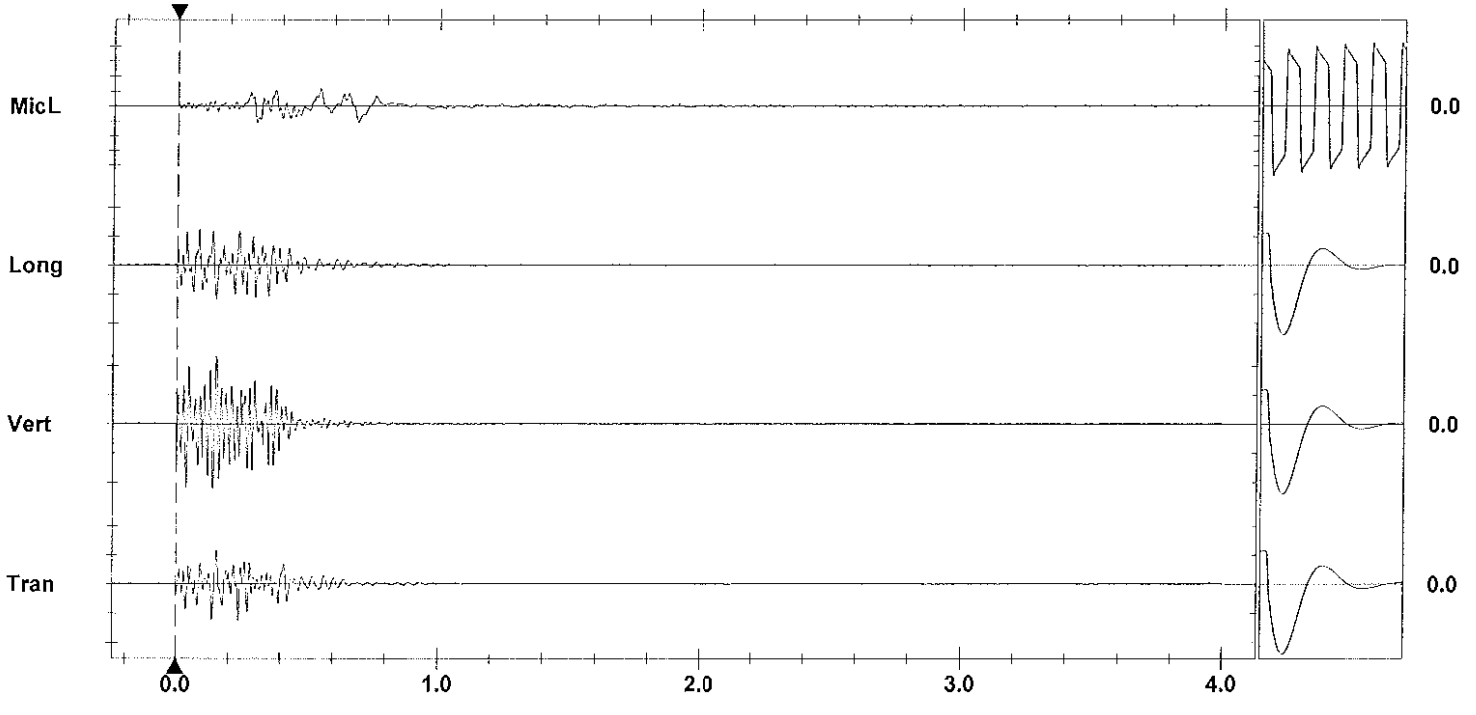
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00116 psi(L) at 0.546 sec			
ZC Freq	11 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 694 mv)			

	Tran	Vert	Long	
PPV	0.0631	0.116	0.0606	in/s
ZC Freq	43	43	22	Hz
Time (Rel. to Trig)	0.240	0.151	0.085	sec
Peak Acceleration	0.0431	0.104	0.0414	g
Peak Displacement	0.00028	0.00047	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.134 in/s at 0.151 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1995-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED FEB 16/12
ACTUAL BLAST DATE FEB 16/12 11:34 AM
BLAST # MW-0115

HIGHWAY# 97
BLAST LOCATION AT: STN 129+77 ⇒ 129+83

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shotmatted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 2
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 11 - 9 prod / 2 all
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 5.5
TOTAL NUMBER OF DELAYS 11

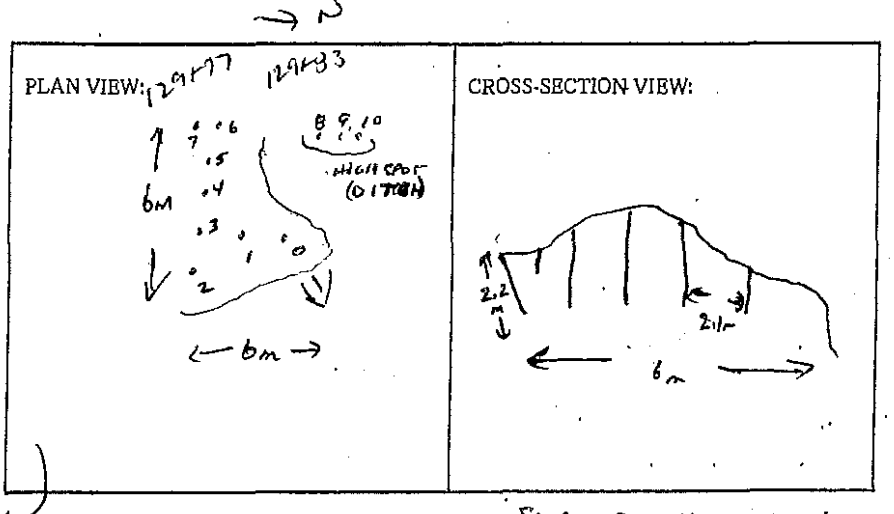
EXPLOSIVE SIZE 50 mm by 600 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt - 0.084 ips / 34Hz
@ 13117 cliffstone crt - 0.131 ips / 57Hz

PROD. HOLES - 1'-2' AWAY/HOLE

ISTAB HOLES - 1' AWAY/HOLE

B/L HOLES - 0.5 GRAIN 2"x16" DYNAMITE + 200gr det cord to 4' collar

Instantel

Event Report

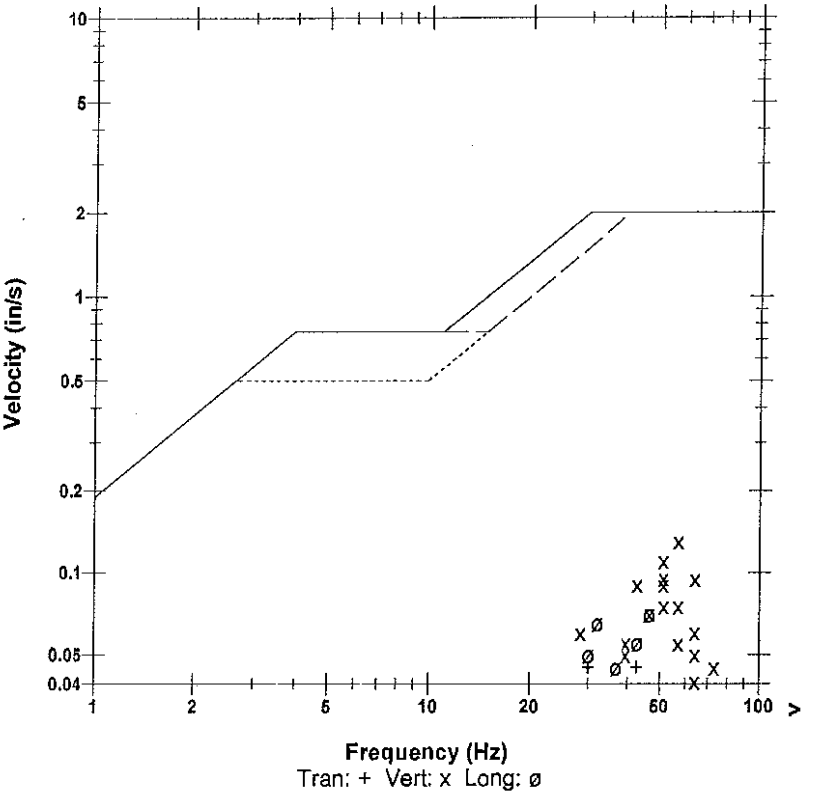
Date/Time	Vert at 11:34:46 February 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5N6.TY0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

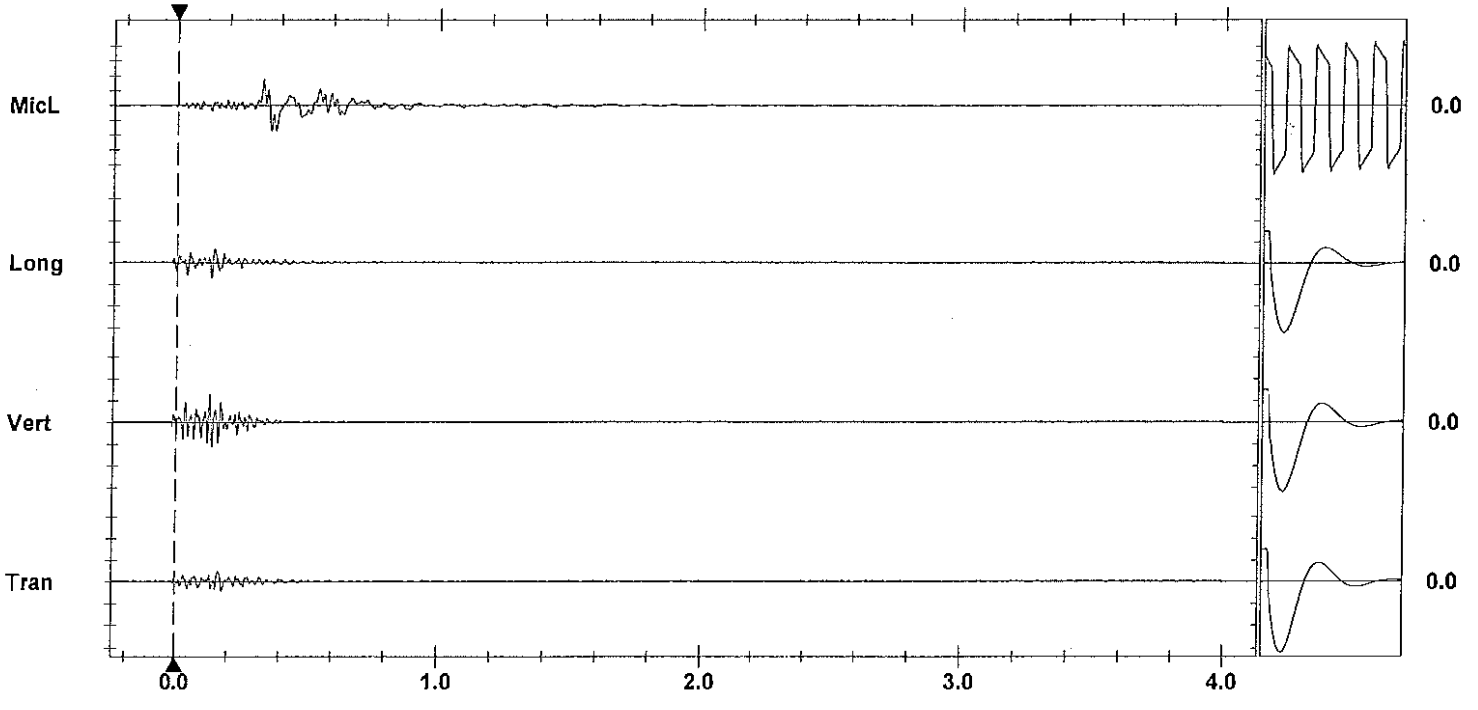
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.330 sec
ZC Freq	9.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 728 mv)

	Tran	Vert	Long	
PPV	0.0450	0.130	0.0700	in/s
ZC Freq	30	57	47	Hz
Time (Rel. to Trig)	0.167	0.131	0.134	sec
Peak Acceleration	0.0398	0.119	0.0530	g
Peak Displacement	0.00027	0.00035	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 0.136 in/s at 0.132 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

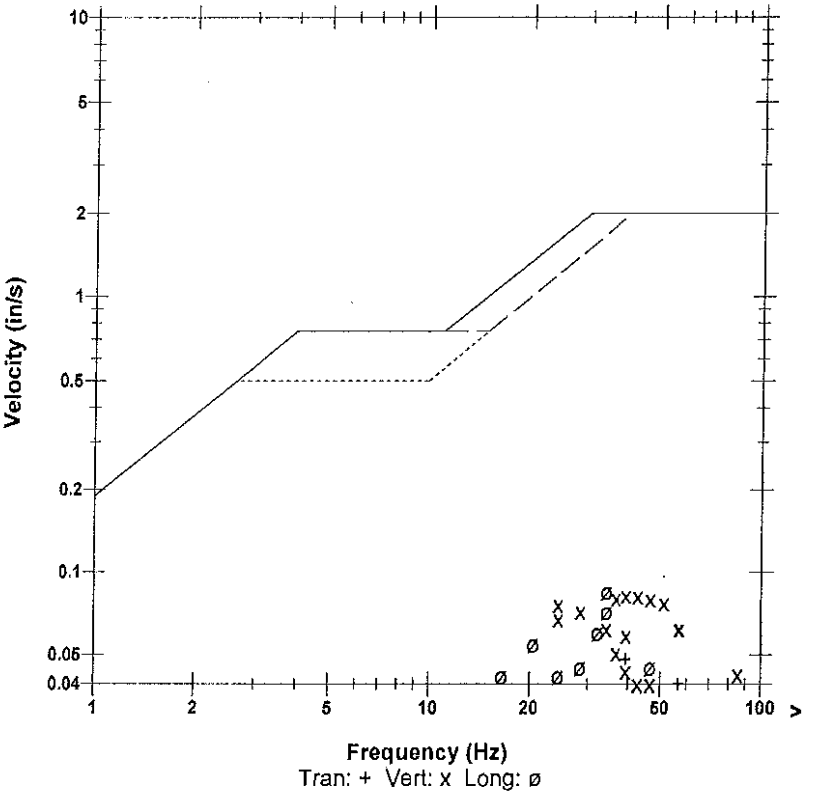
Date/Time	Vert at 11:35:01 February 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5N6.UD0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

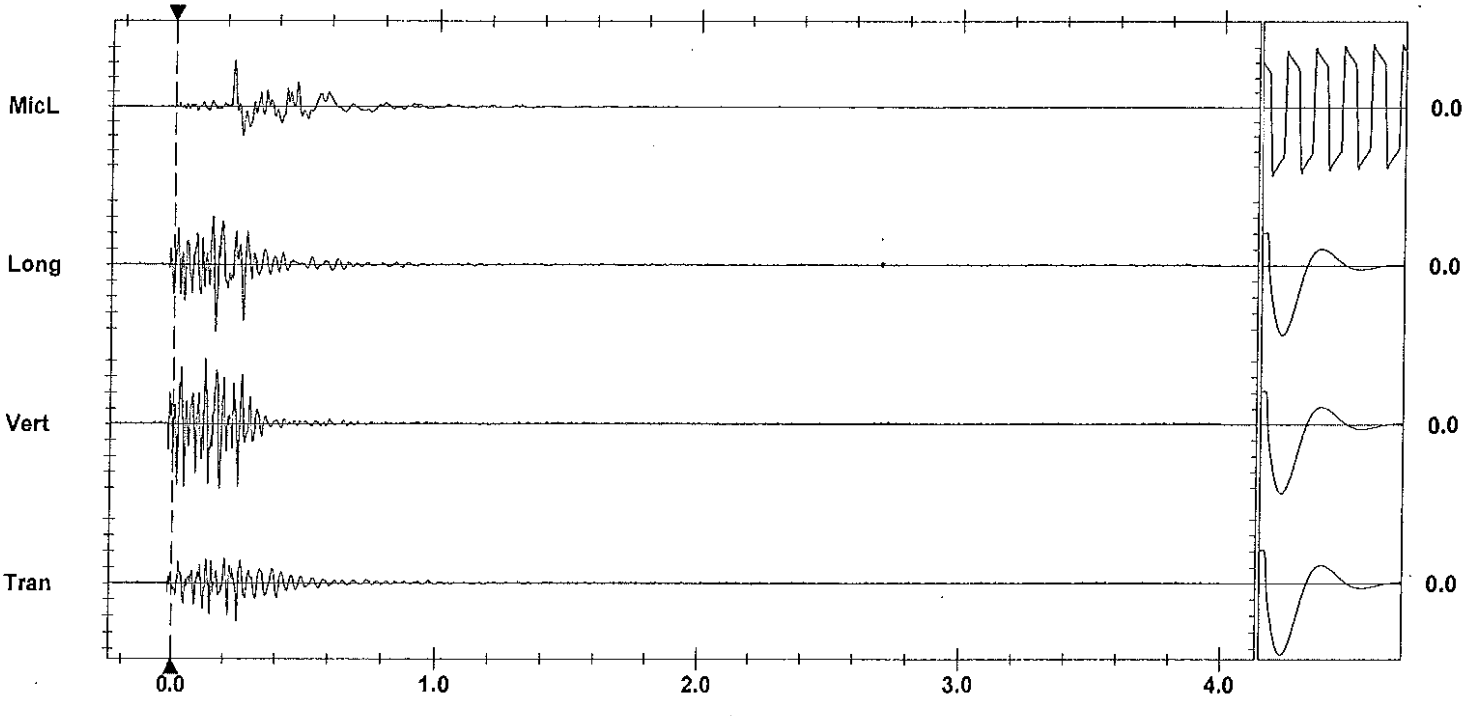
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	0.00312 psi(L) at 0.229 sec		
ZC Freq	19 Hz		
Channel Test	Passed (Freq = 20.5 Hz Amp = 743 mv)		

	Tran	Vert	Long	
PPV	0.0481	0.0819	0.0844	in/s
ZC Freq	39	39	34	Hz
Time (Rel. to Trig)	0.252	0.182	0.161	sec
Peak Acceleration	0.0514	0.124	0.0464	g
Peak Displacement	0.00016	0.00041	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.0953 in/s at 0.252 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶---◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834B9

DATE PREPARED Feb 16/12
ACTUAL BLAST DATE Feb 16/12 1:07 PM
BLAST # MW-0116

HIGHWAY# 97
BLAST LOCATION AT: STN

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/C
AVERAGE DEPTH 3.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMEX N + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HOD20 CAPACITY 80 CAPS

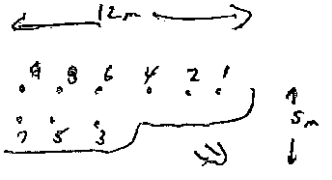
VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

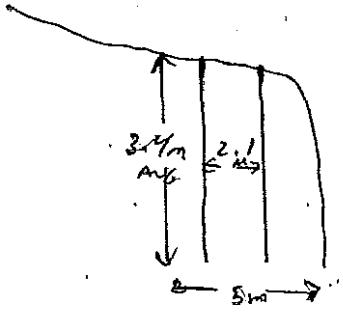
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.141 ips / 3742
" @ 13117 Cliffstone Crt - 0.171 ips / 5142

3'-4' ANFO / HOLE Primed w/ 1 each 1x8" DYNAMITE

Instantel

Event Report

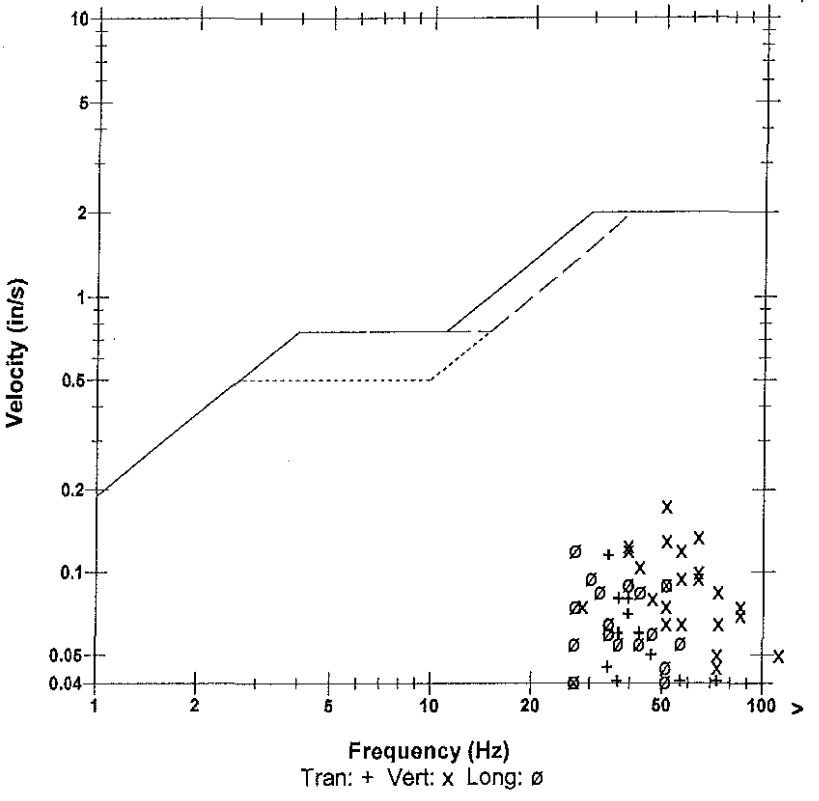
Date/Time	Long at 13:07:48 February 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5NB.500

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

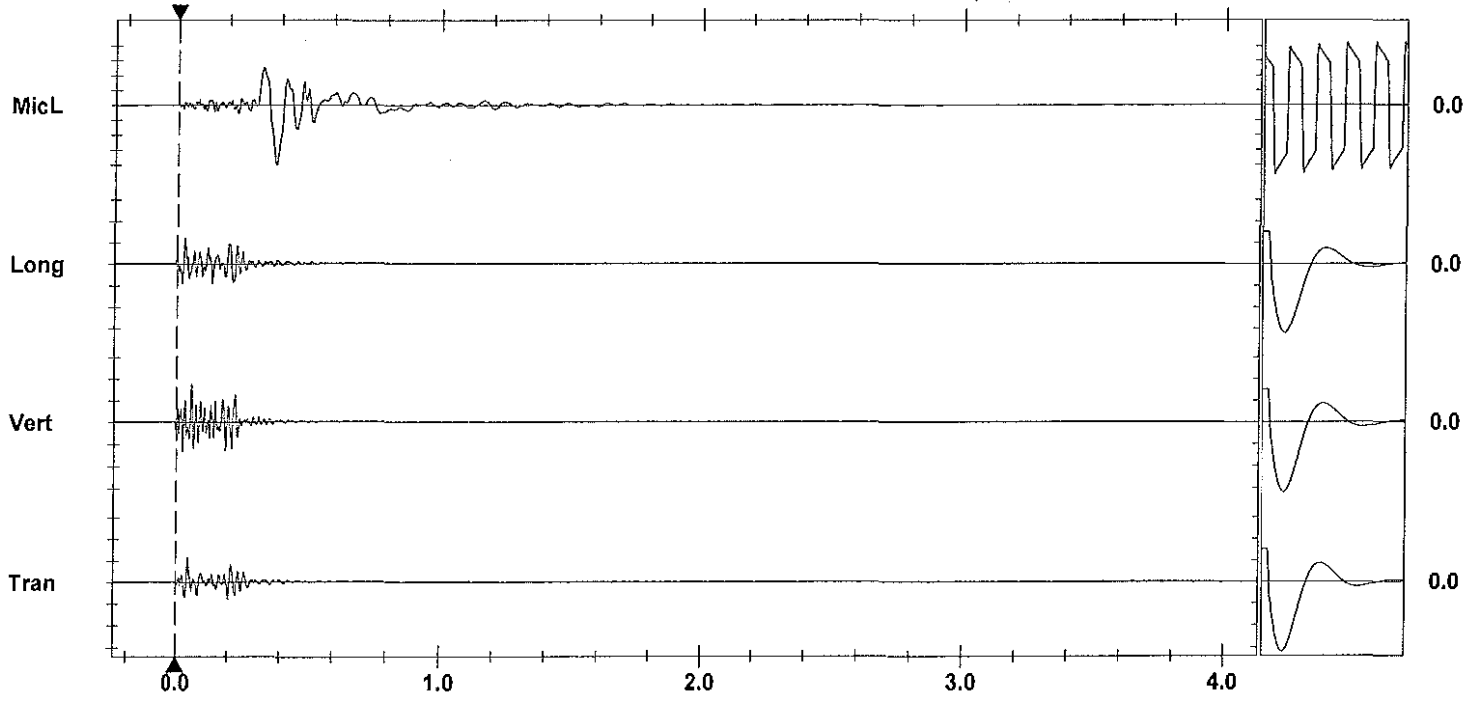
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00402 psi(L) at 0.381 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 721 mv)

	Tran	Vert	Long	
PPV	0.115	0.175	0.120	in/s
ZC Freq	34	51	27	Hz
Time (Rel. to Trig)	0.048	0.060	0.030	sec
Peak Acceleration	0.0663	0.172	0.0795	g
Peak Displacement	0.00042	0.00056	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.177 in/s at 0.060 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:08:04 February 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5NB.5G0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

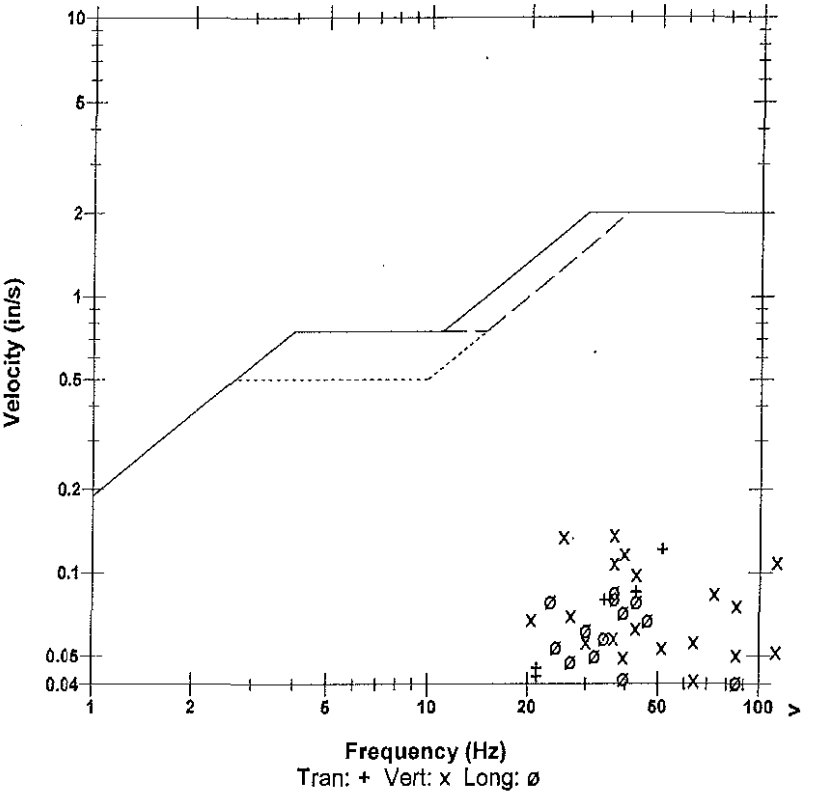
Post Event Notes

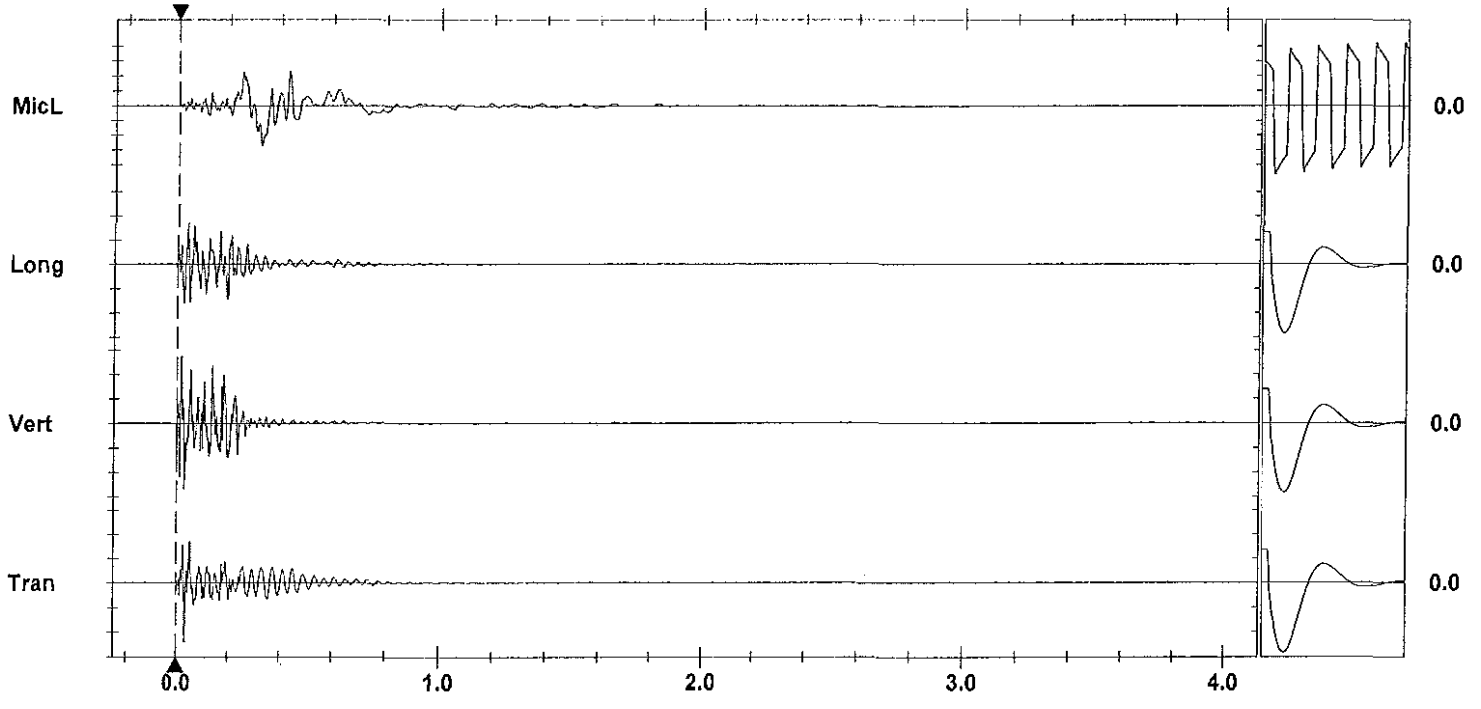
Microphone Linear Weighting
PSPL 0.00272 psi(L) at 0.323 sec
ZC Freq 8.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 738 mv)

	Tran	Vert	Long	
PPV	0.121	0.137	0.0850	in/s
ZC Freq	51	37	37	Hz
Time (Rel. to Trig)	0.034	0.017	0.041	sec
Peak Acceleration	0.116	0.262	0.0812	g
Peak Displacement	0.00031	0.00053	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.145 in/s at 0.030 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 16/12
ACTUAL BLAST DATE FEB 16/12 2:14PM
BLAST # MW-0117

HIGHWAY# 97
BLAST LOCATION AT: STN 129+70 - 129+77

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: ~~no~~ Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE MIXED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 (6 loaded)
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 76 111 3 bufferl 2 slab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2x1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS: + 65mm x 400mm Blastex

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

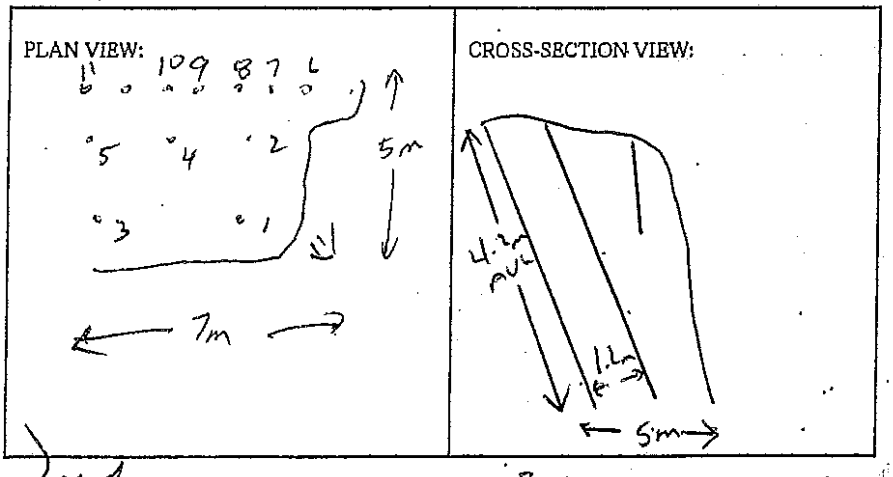
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HD32D CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone cut - 0.21 ips/ 47Hz
" @ 13117 cliffstone cut - 0.14 ips/ 51Hz

Buffer Holes. 3 count 2"x16" Bagley
Stab Holes - 1'-1.5' ANFO/Hole
} Primed w/ 1 count 1"x8" Dynamite

B/L Holes - 1 count 2"x16" Dynamite + 200 gr. det cord + 4' collar

Instantel

Event Report

Date/Time	Vert at 14:14:57 February 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5NE.8X0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

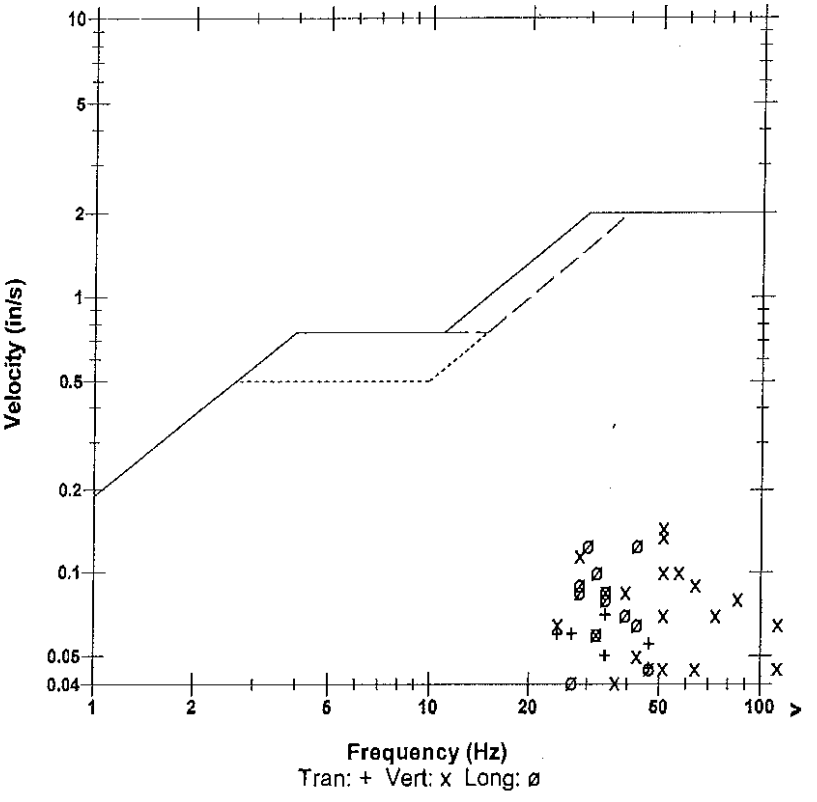
Post Event Notes

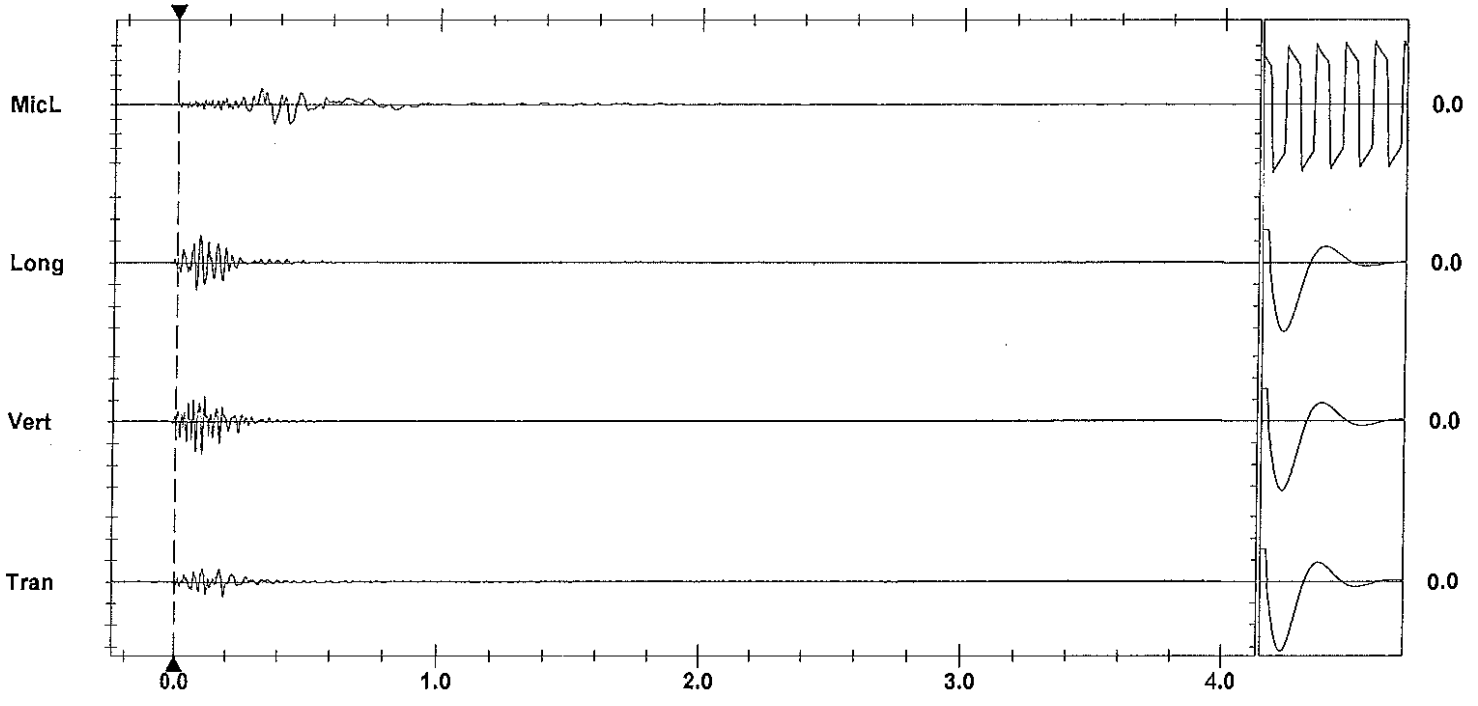
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.373 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.0700	0.145	0.125	in/s
ZC Freq	34	51	43	Hz
Time (Rel. to Trig)	0.191	0.104	0.076	sec
Peak Acceleration	0.0530	0.119	0.0928	g
Peak Displacement	0.00037	0.00043	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.177 in/s at 0.078 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 14:15:12 February 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5NE.9C0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

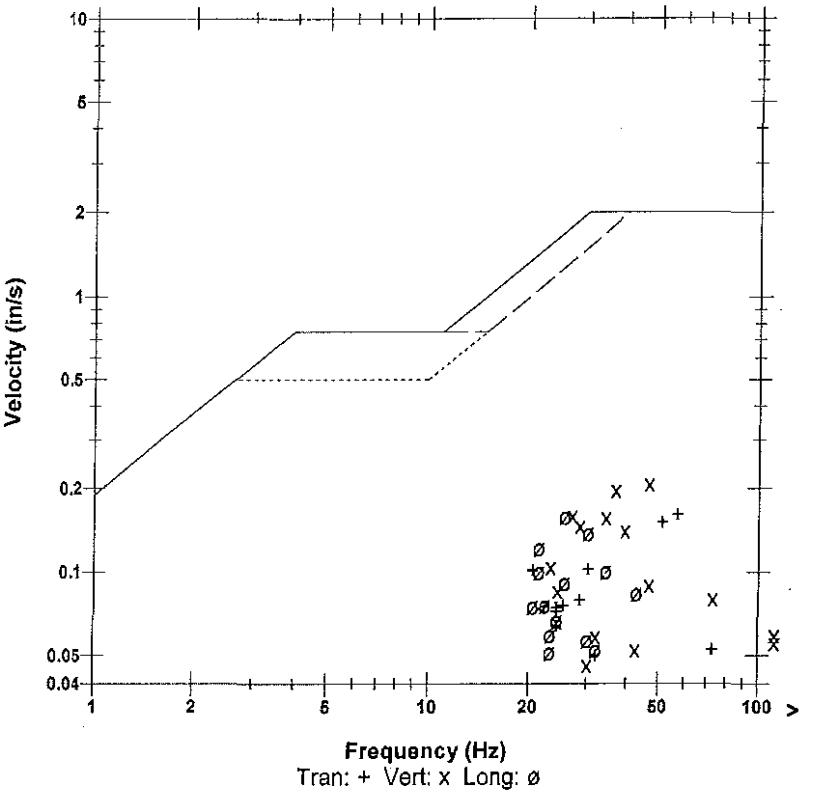
Post Event Notes

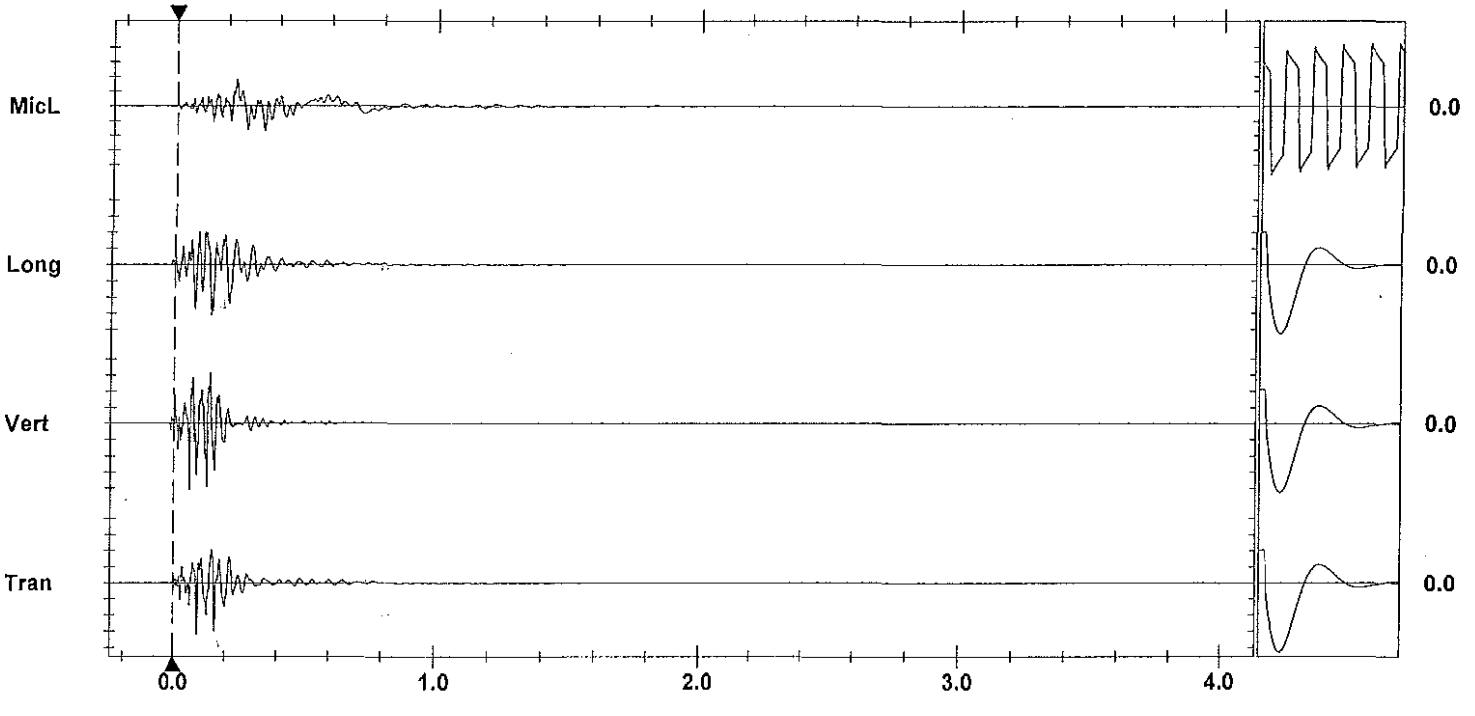
Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.230 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	0.161	0.207	0.157	in/s
ZC Freq	57	47	26	Hz
Time (Rel. to Trig)	0.094	0.063	0.145	sec
Peak Acceleration	0.156	0.287	0.0961	g
Peak Displacement	0.00060	0.00071	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.215 in/s at 0.130 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 17/12
ACTUAL BLAST DATE Feb 11/12 11:17am
BLAST # MW-011B

HIGHWAY # 97
BLAST LOCATION AT: SAN 129+65 - 129+76

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 117 (m)

TOTAL NUMBER OF HOLES 11 6" / 5 buffer / 3 str 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

1 Count 2" x 16" dynamite + 200 grain det. cord in 6" holes
4-8 Count 2½" x 16" Blasters in Buffer Holes / 1 Count 1" x 8" dynamite + 1.5' ANFO in STAB Holes

EXPLOSIVE TYPE 1" dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8 (1x8)
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

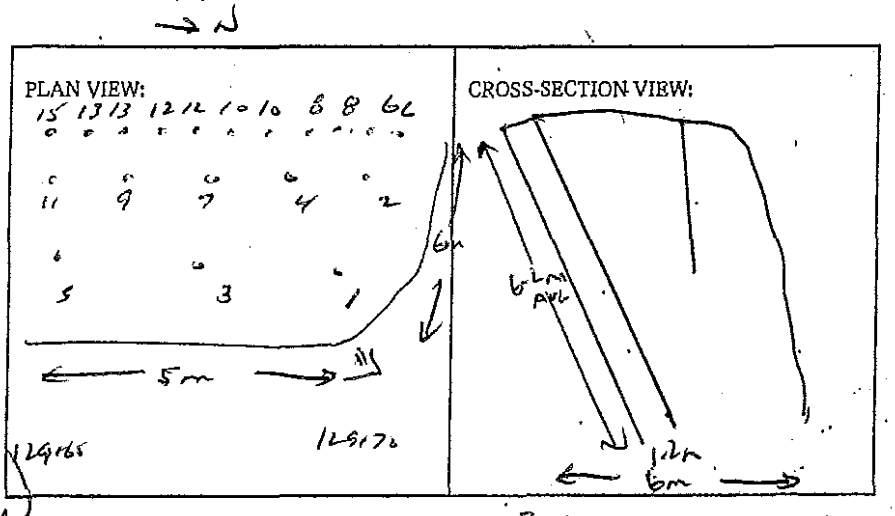
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismographs @ 13167 Cliffstone Crt. 0.19 ips / 39 Hz
@ 13117 Cliffstone Crt. 0.33 ips / 47 Hz

Instantel

Event Report

Date/Time	Vert at 11:17:24 February 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5P0.P00

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

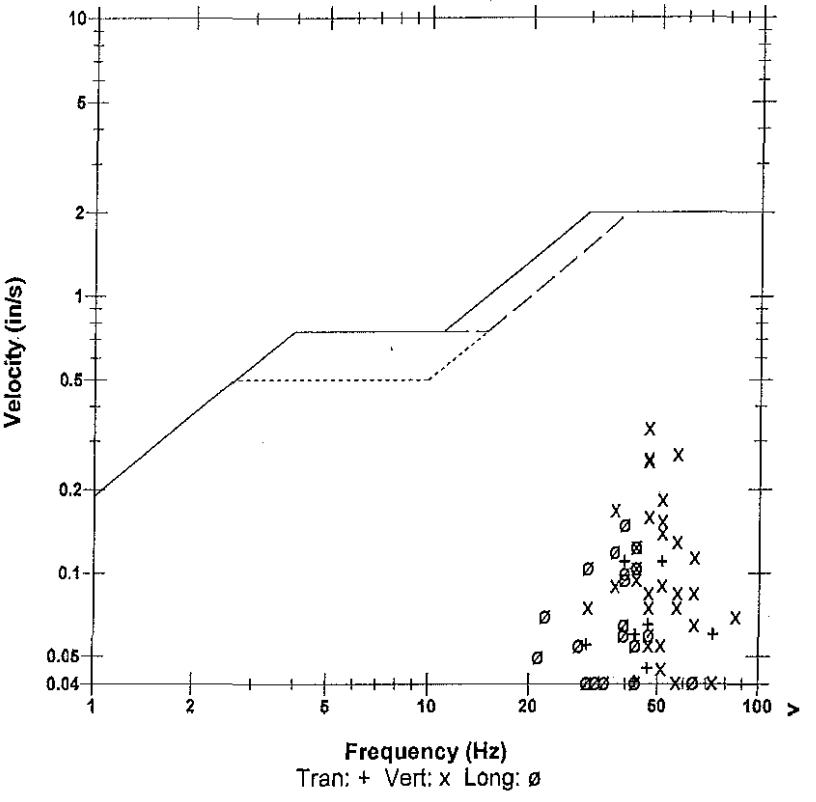
Post Event Notes

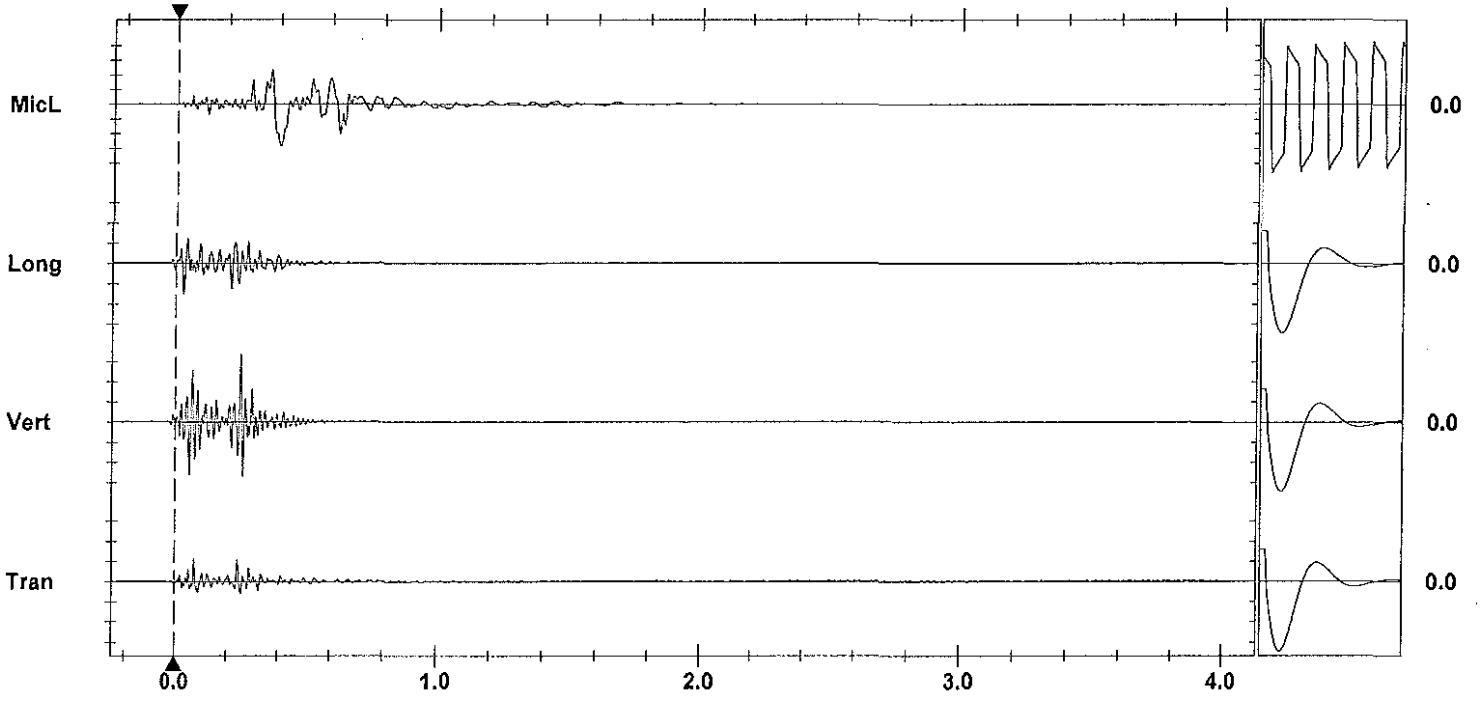
Microphone Linear Weighting
PSPL 0.00283 psi(L) at 0.397 sec
ZC Freq 9.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 657 mv)

	Tran	Vert	Long	
PPV	0.110	0.335	0.150	in/s
ZC Freq	51	47	39	Hz
Time (Rel. to Trig)	0.076	0.255	0.029	sec
Peak Acceleration	0.0795	0.265	0.119	g
Peak Displacement	0.00040	0.00112	0.00062	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.342 in/s at 0.255 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: February 13, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

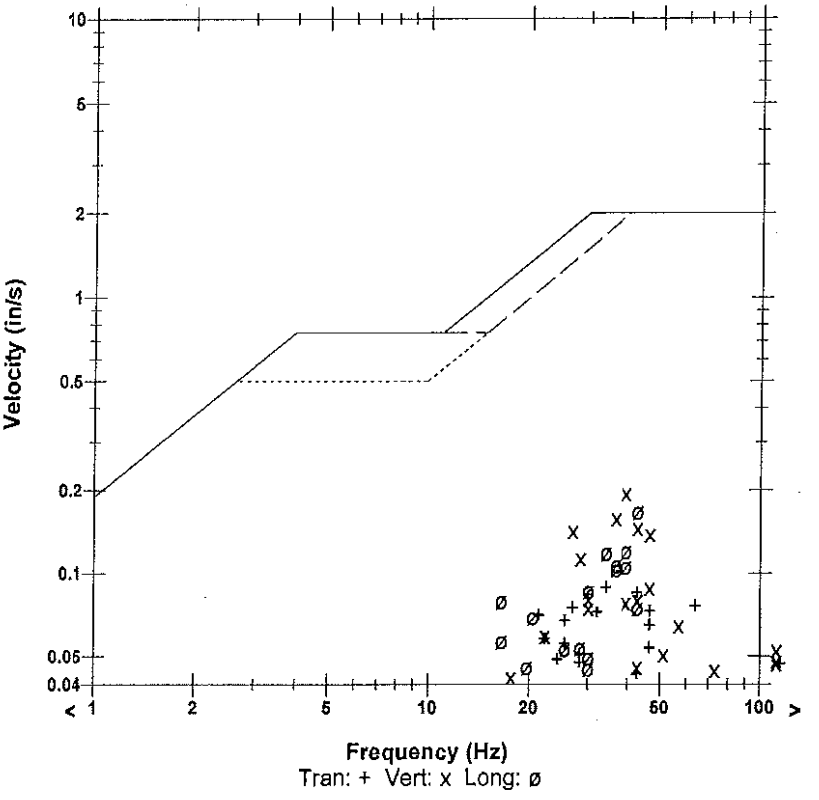
Date/Time	Long at 11:17:25 February 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5P0.P10
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

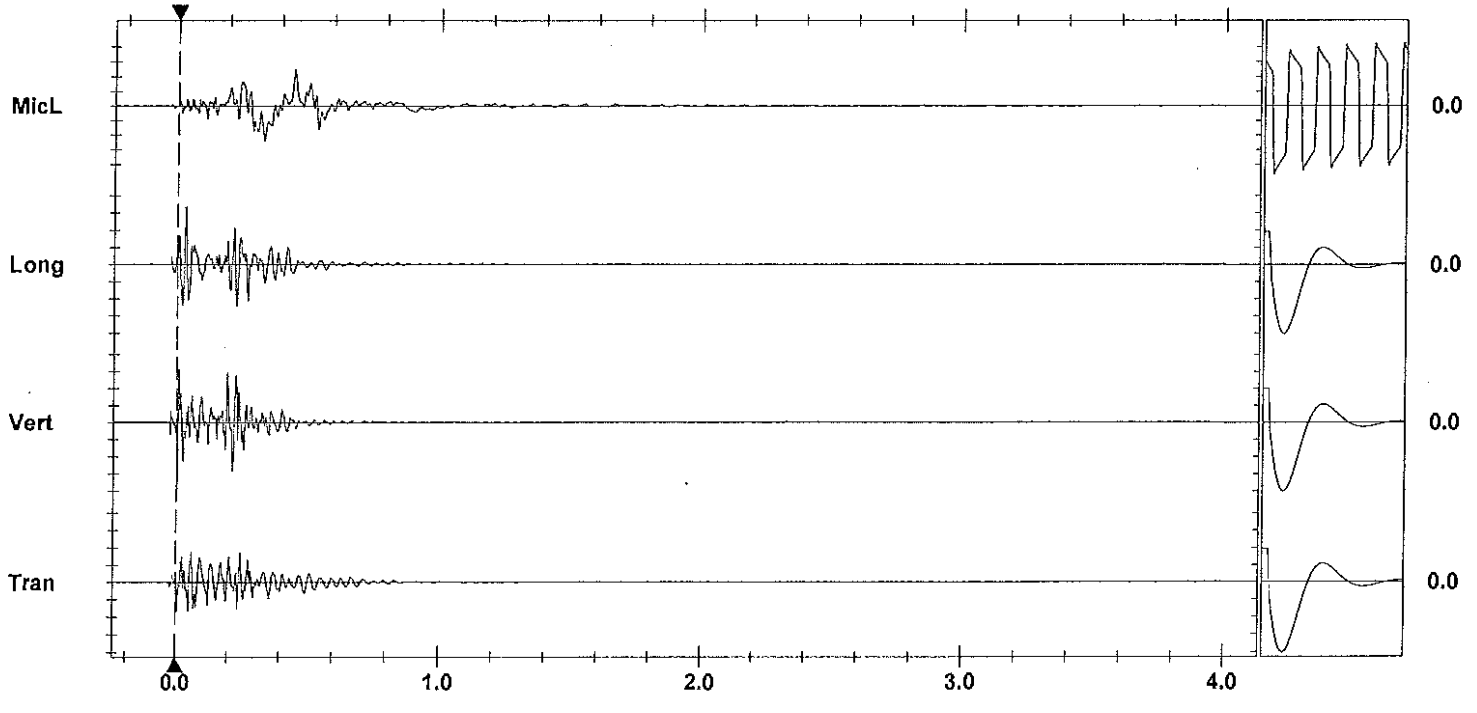
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00247 psi(L) at 0.447 sec
ZC Freq	6.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 706 mv)

	Tran	Vert	Long	
PPV	0.0887	0.194	0.167	in/s
ZC Freq	34	39	43	Hz
Time (Rel. to Trig)	0.063	0.004	0.033	sec
Peak Acceleration	0.126	0.328	0.133	g
Peak Displacement	0.00048	0.00074	0.00059	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.195 in/s at 0.004 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vedsmy
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 17/12
ACTUAL BLAST DATE Feb 17/12 12:56 PM
BLAST # MW-0119

HIGHWAY# 97
BLAST LOCATION AT: STN 129+60 - 129+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
40 shot method

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 66 (1 / 36 other / 1 pre)
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.0 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

1 other 2x16 dynamite + 200 gr det cord in b/l hole
5-7 cartridges 65x400 mm Blastrite in Buffer

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS _____

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

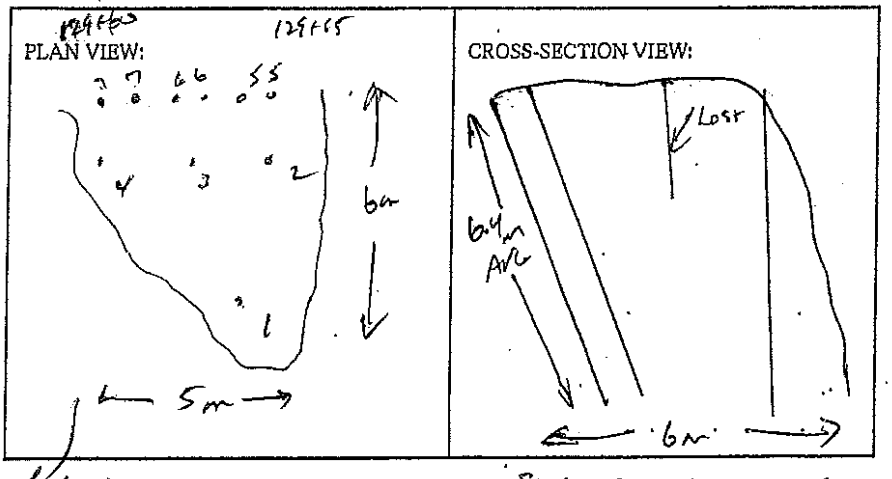
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct + 0.23 ips / 26 Hz
" @ 13167 Cliffstone Ct. 0.29 ips / 47 Hz

Instantel®

Event Report

Date/Time	Vert at 12:56:43 February 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5P5.AJ0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

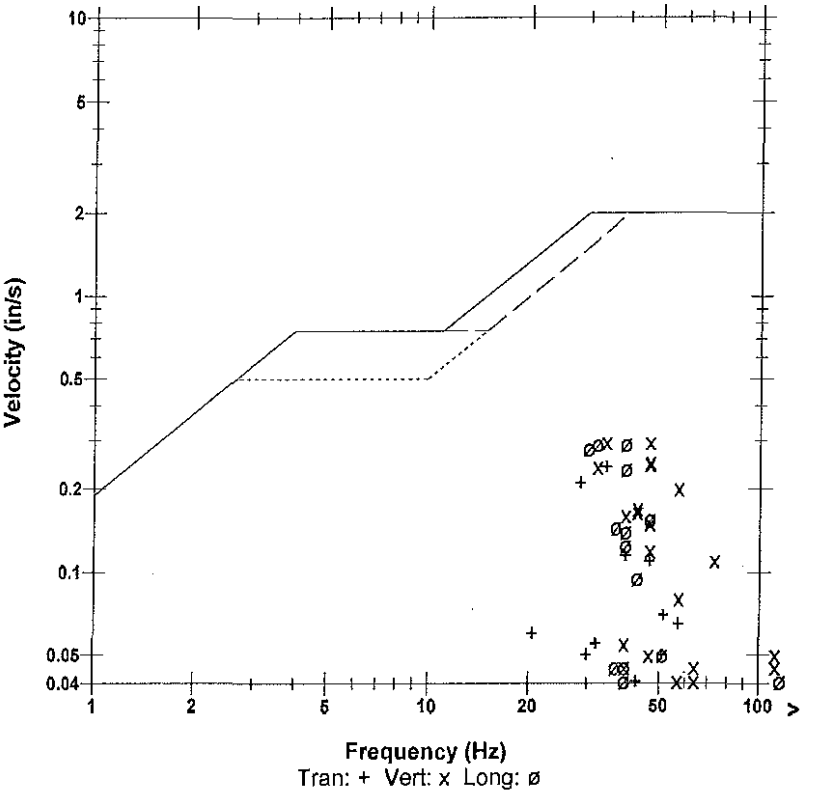
Extended Notes
Blast at stn 128

Post Event Notes

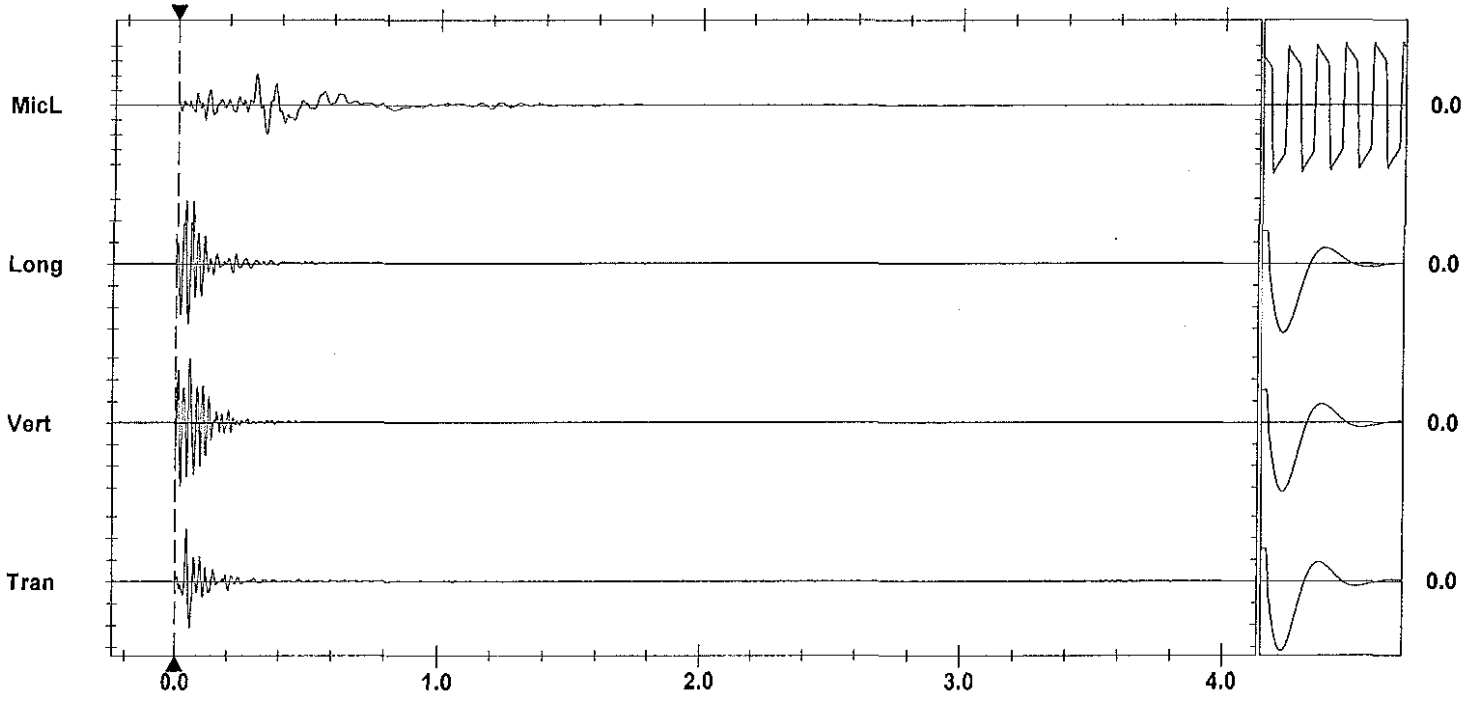
Microphone Linear Weighting
PSPL 0.00210 psi(L) at 0.304 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 652 mv)

	Tran	Vert	Long	
PPV	0.240	0.295	0.290	in/s
ZC Freq	34	47	32	Hz
Time (Rel. to Trig)	0.044	0.020	0.034	sec
Peak Acceleration	0.146	0.278	0.199	g
Peak Displacement	0.00111	0.00136	0.00146	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

USBM RI8507 And OSMRE



Peak Vector Sum 0.435 in/s at 0.046 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

Date/Time	Vert at 12:56:43 February 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5P5.AJ0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

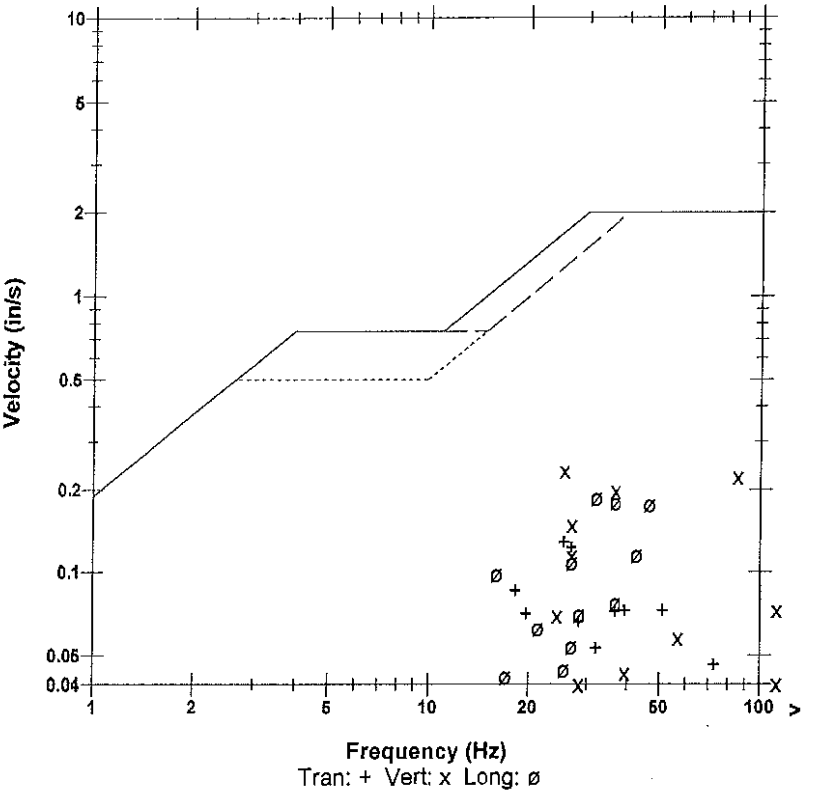
Post Event Notes

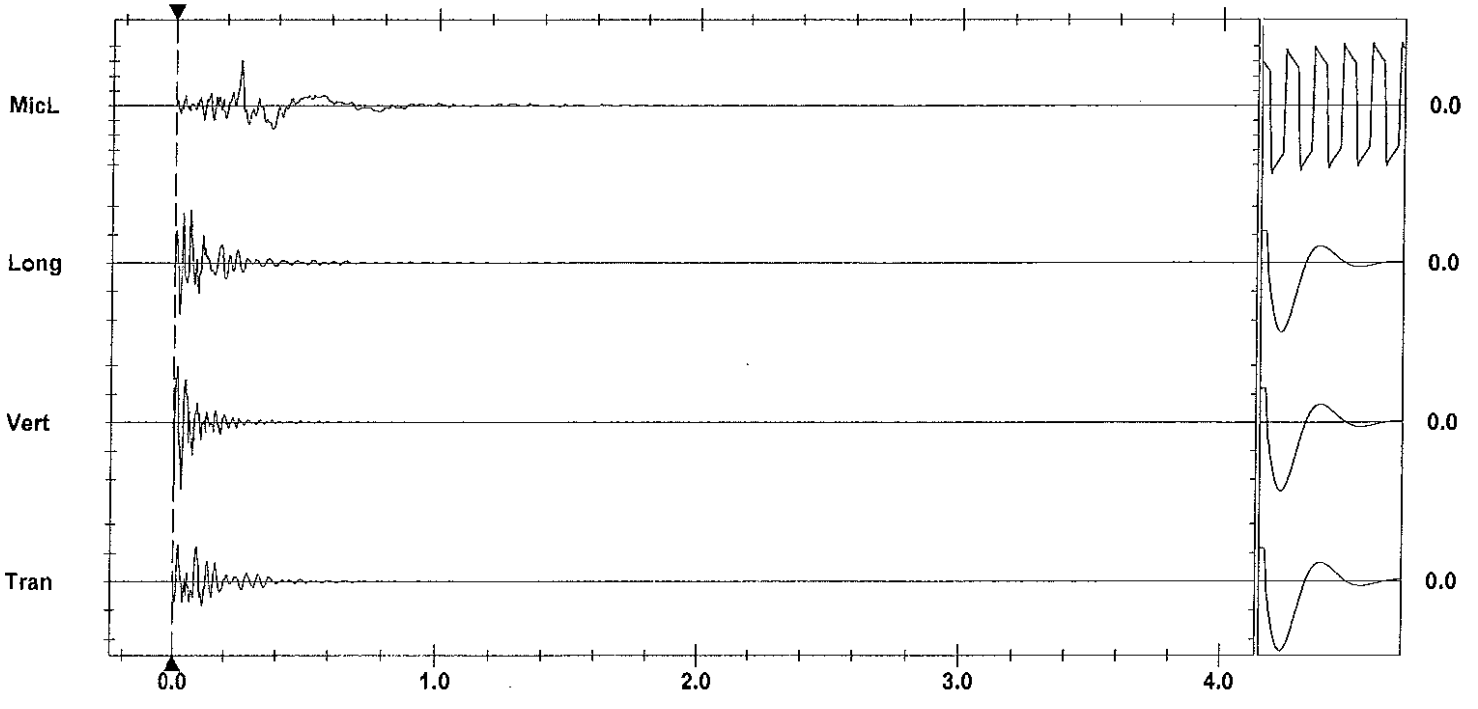
Microphone Linear Weighting
PSPL 0.00301 psi(L) at 0.256 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 715 mv)

	Tran	Vert	Long	
PPV	0.129	0.234	0.186	in/s
ZC Freq	26	26	32	Hz
Time (Rel. to Trig)	0.021	0.030	0.062	sec
Peak Acceleration	0.108	0.317	0.138	g
Peak Displacement	0.00077	0.00116	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.269 in/s at 0.031 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: February 18, 2012 07:04:04
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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 17/12
ACTUAL BLAST DATE Feb 17/12 11:33 PM
BLAST # MJ-0120

HIGHWAY# 97
BLAST LOCATION AT: STN 124+60 Trim

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: Pre shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 5.2 (m)

TOTAL NUMBER OF HOLES 2 Trim
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 2½" Blasting
TOTAL NUMBER OF CARTRIDGES 4
TOTAL NUMBER OF DELAYS 2

EXPLOSIVE SIZE 65 mm by 400 mm
TOTAL WEIGHT 5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

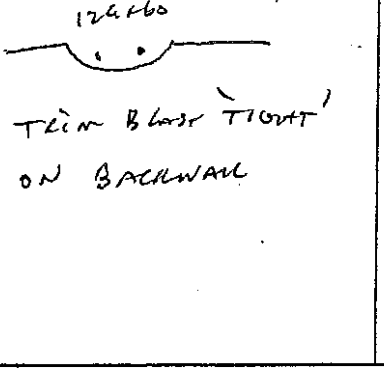
VOLUME OF ROCK BLASTED 10 (Trim) (m^3)

BLAST SKETCH:

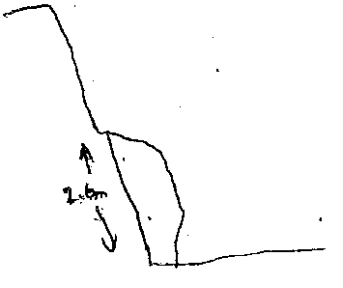
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vearsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut. 0.061 ips/51 Hz
@ 13117 Cliffstone Cut - 0.075 ips/51 Hz

Instantel

Event Report

Date/Time	Vert at 13:33:14 February 17, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5P6.ZE0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

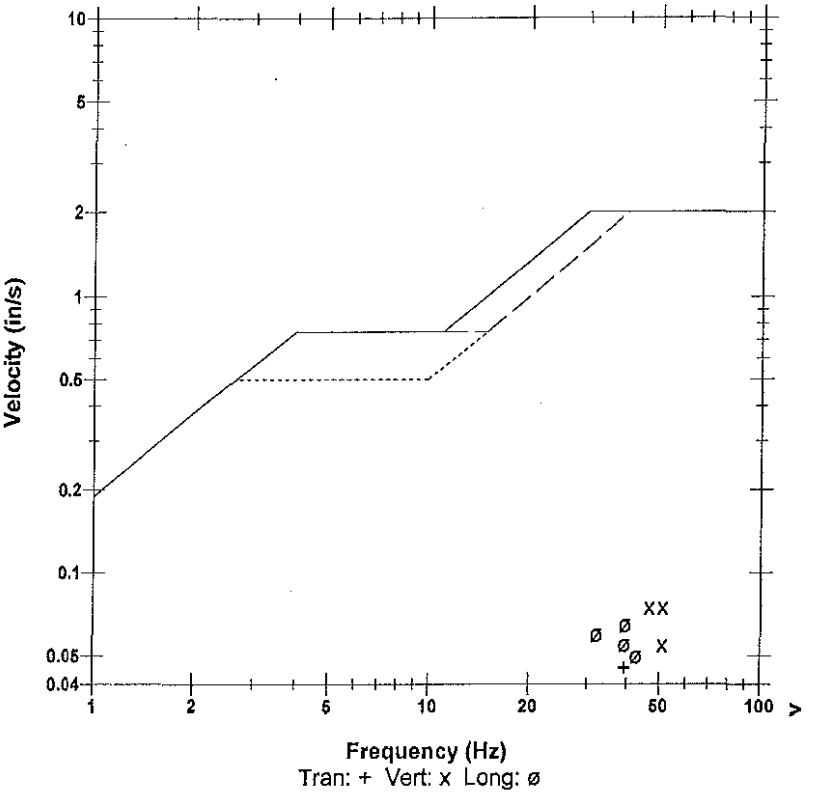
Post Event Notes

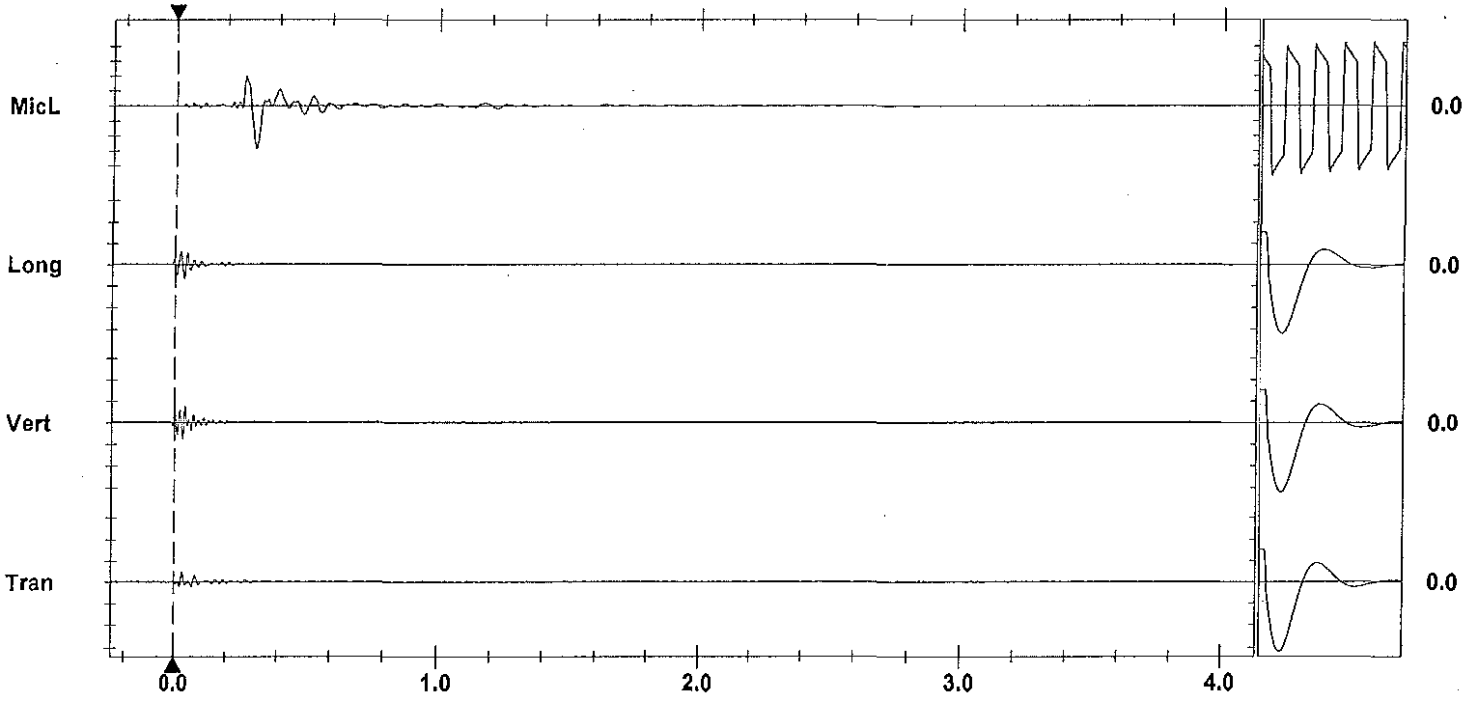
Microphone Linear Weighting
PSPL 0.00290 psi(L) at 0.311 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 661 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0750	0.0650	in/s
ZC Freq	39	51	39	Hz
Time (Rel. to Trig)	0.032	0.032	0.036	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00018	0.00025	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.6	

Peak Vector Sum 0.101 in/s at 0.033 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

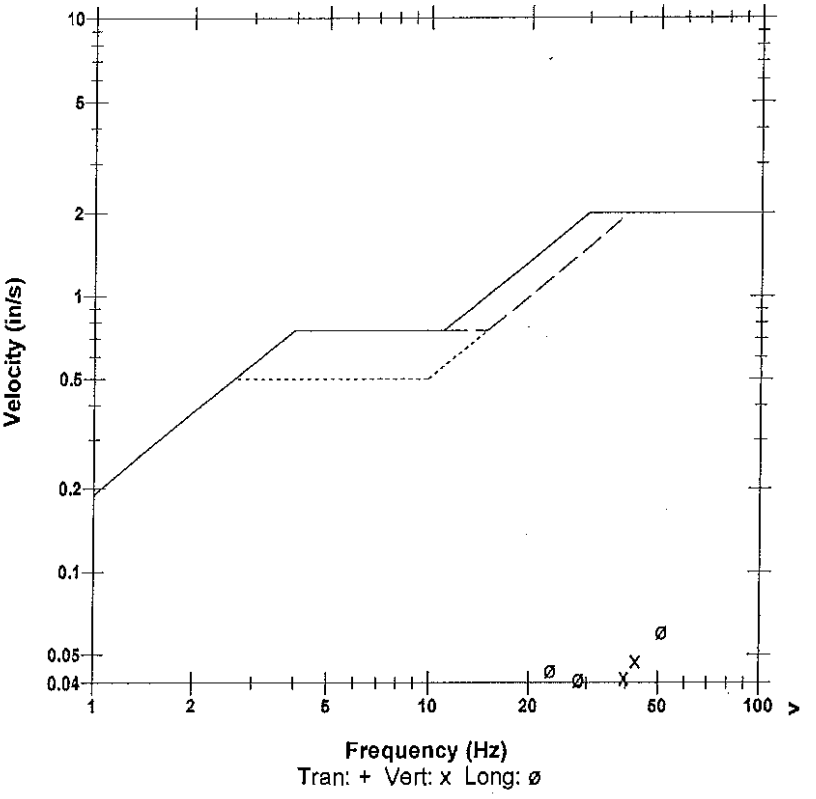
Date/Time	Vert at 13:33:14 February 17, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5P6.ZE0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

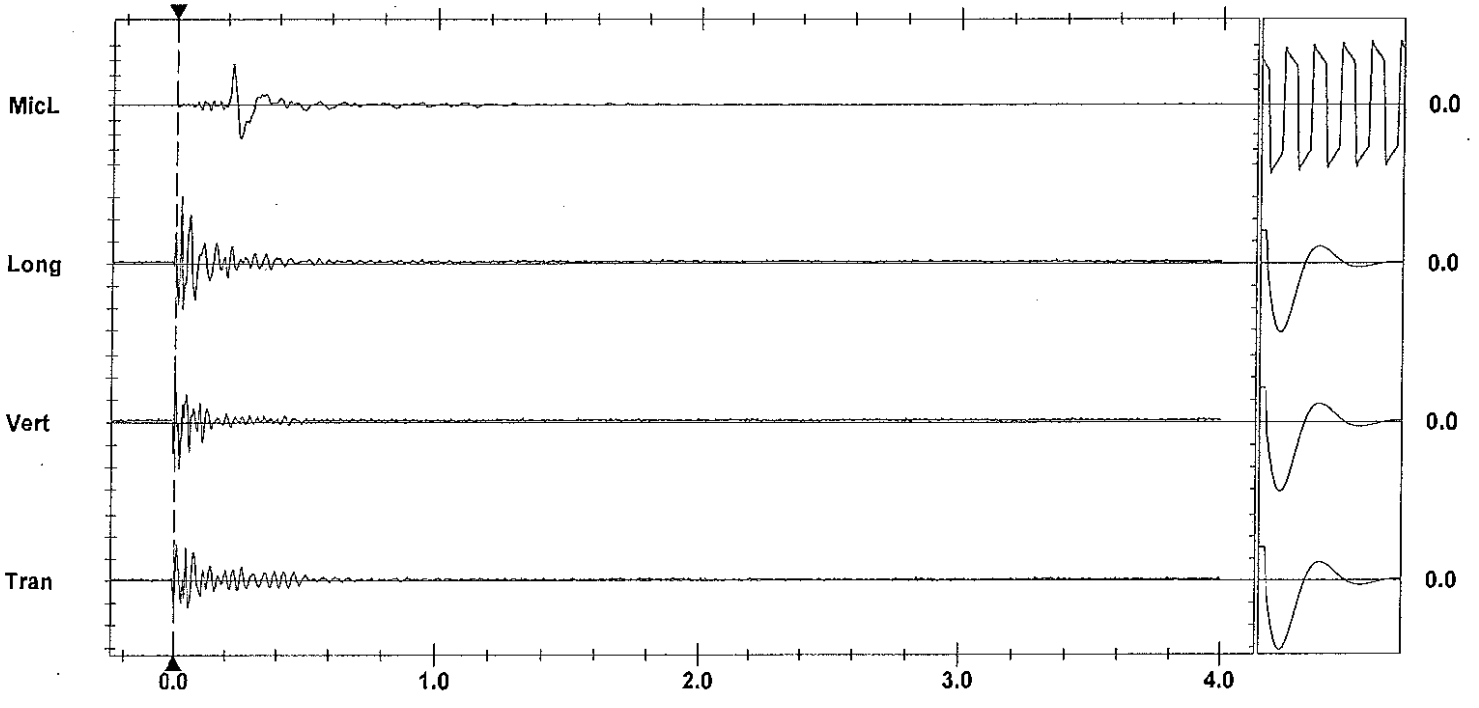
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00272 psi(L) at 0.221 sec			
ZC Freq	13 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 669 mv)			

	Tran	Vert	Long	
PPV	0.0331	0.0475	0.0606	in/s
ZC Freq	34	43	51	Hz
Time (Rel. to Trig)	0.009	0.001	0.021	sec
Peak Acceleration	0.0298	0.0447	0.0563	g
Peak Displacement	0.00017	0.00028	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0660 in/s at 0.021 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: February 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 20/12
ACTUAL BLAST DATE Feb 20/12 1:54 PM
BLAST # MW-0122

HIGHWAY# 97
BLAST LOCATION AT: SBN 129+45 - 129+50

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 62 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

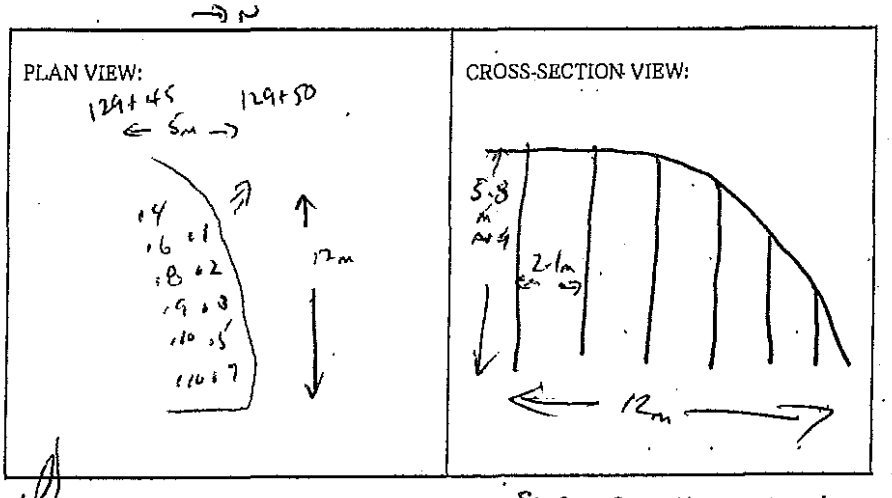
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

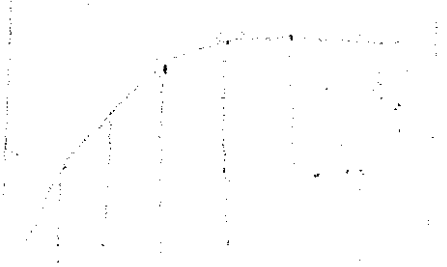
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.12 ips / 39 Hz
Seismograph @ 13127 Cliffstone Cut - 0.27 ips / 43 Hz

QCV

4'-6.5' ANFO/Hole Primed w/ 1 CAST 1x8" DYNAMITE



Instantel

Event Report

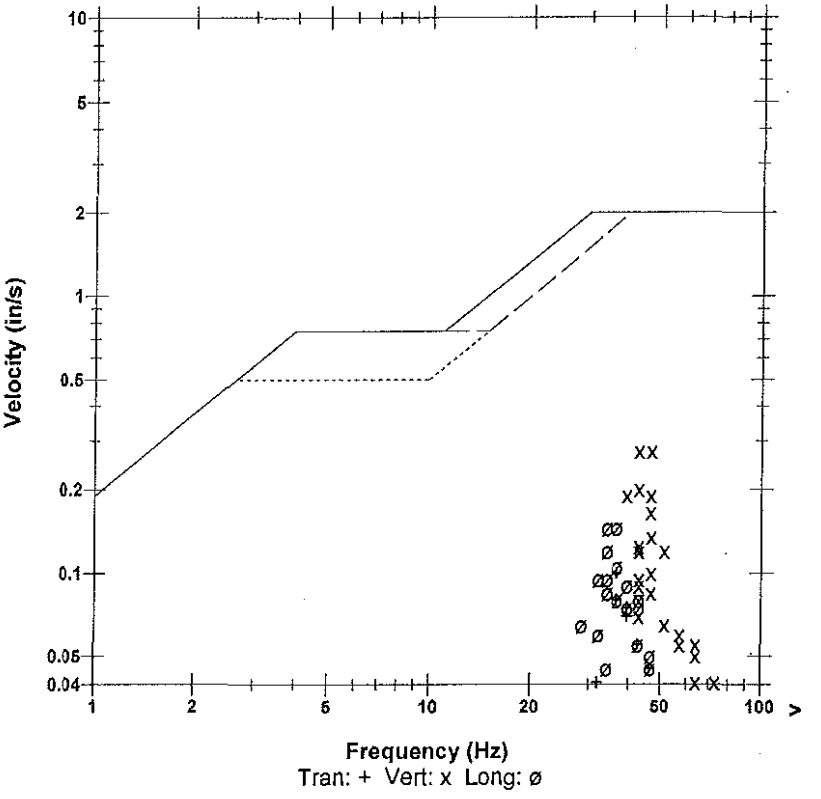
Date/Time	Vert at 13:54:36 February 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5UR.Z00

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

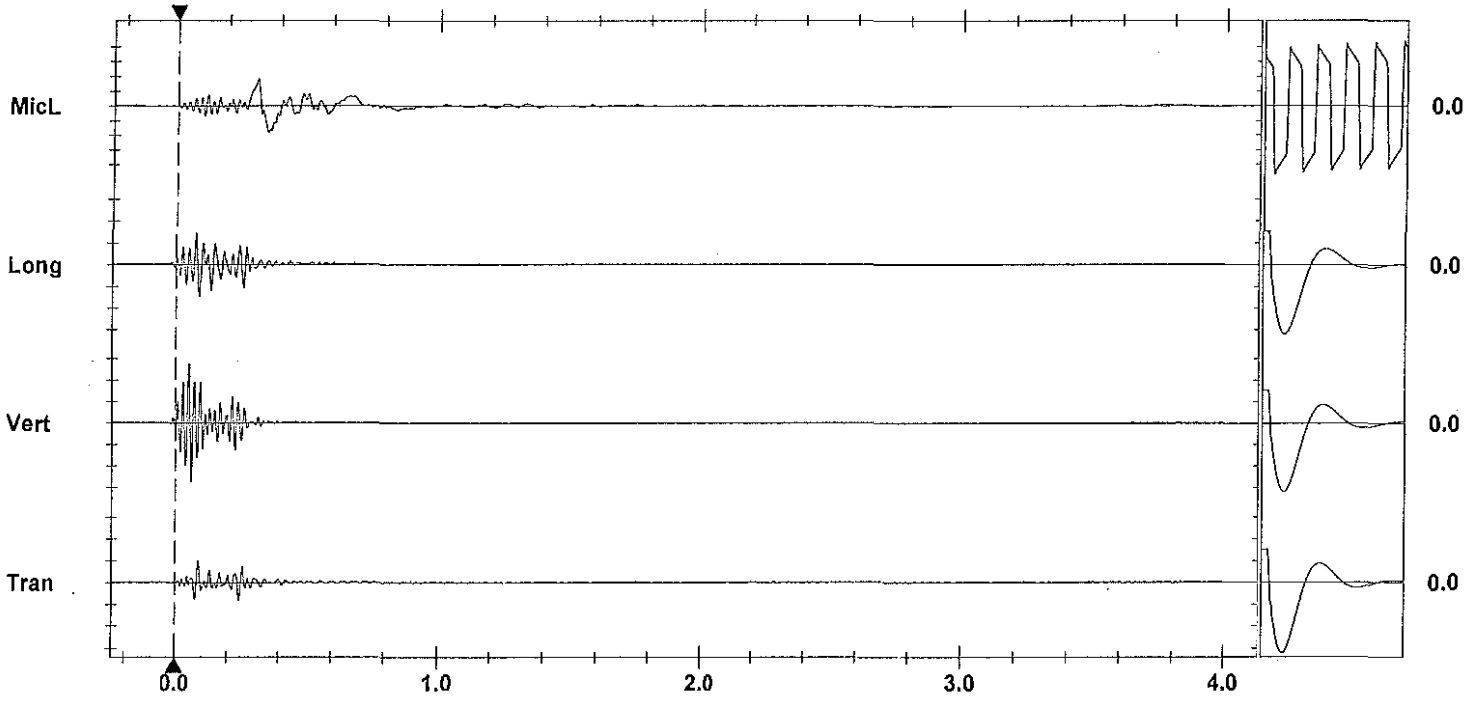
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.1000	0.275	0.145	in/s
ZC Freq	37	43	37	Hz
Time (Rel. to Trig)	0.092	0.054	0.079	sec
Peak Acceleration	0.0663	0.225	0.106	g
Peak Displacement	0.00041	0.00099	0.00068	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.309 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 690 mv)

Peak Vector Sum 0.285 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— — — —◀

Sensorcheck

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Instantel

Event Report

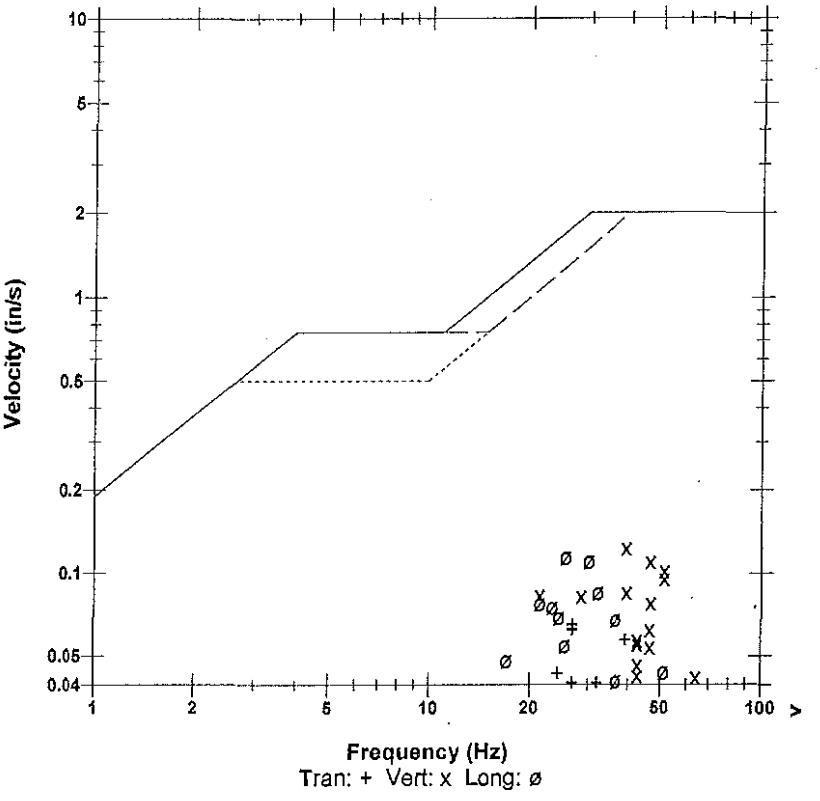
Date/Time	Vert at 13:54:40 February 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5UR.Z40
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

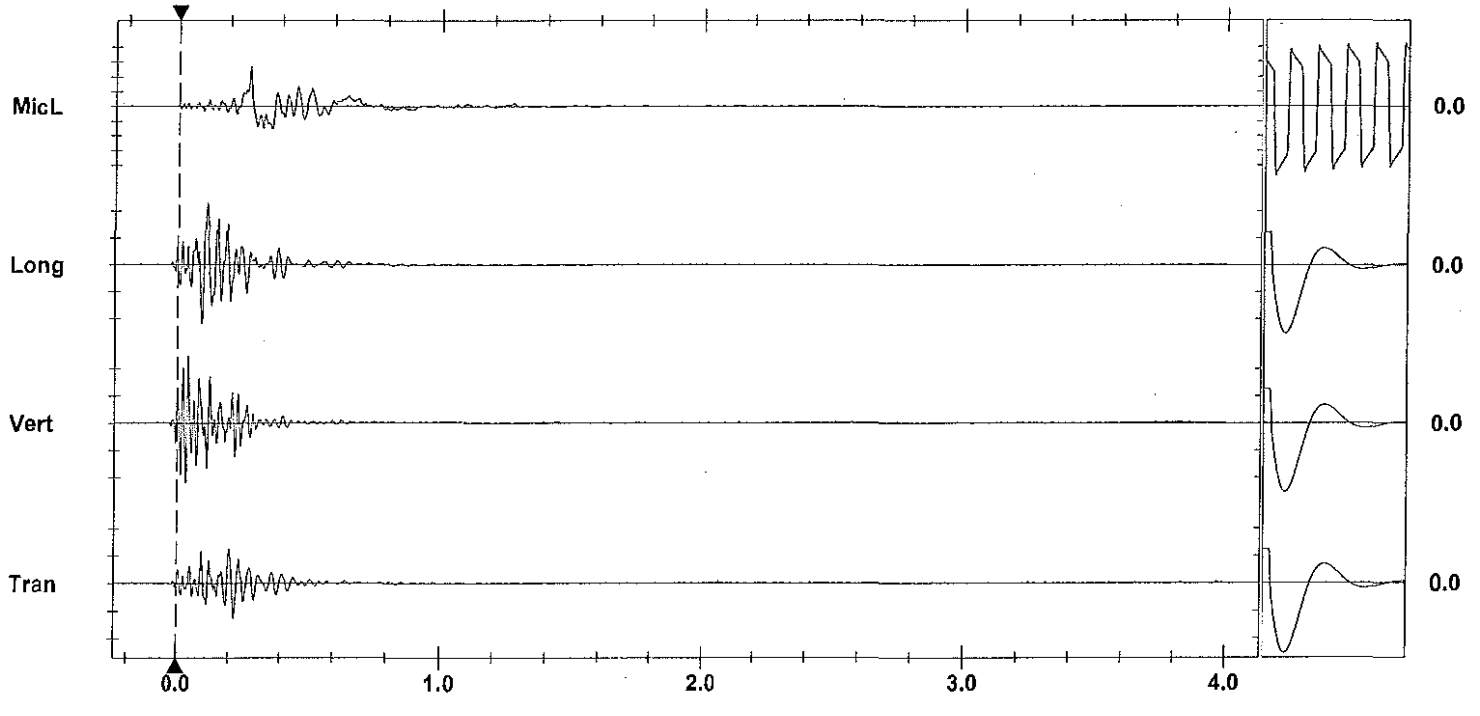
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00268 psi(L) at 0.277 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 709 mv)

	Tran	Vert	Long	
PPV	0.0644	0.123	0.114	in/s
ZC Freq	27	39	26	Hz
Time (Rel. to Trig)	0.224	0.043	0.114	sec
Peak Acceleration	0.0398	0.123	0.0530	g
Peak Displacement	0.00036	0.00043	0.00071	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.137 in/s at 0.116 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: March 3, 2012 07:04:04 PM
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED FEB 20/12
ACTUAL BLAST DATE FEB 20/12 11:23 AM
BLAST # MW-0121

HIGHWAY# 97
BLAST LOCATION AT: STN 129+50 - 129+55

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/L
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS: 65mm x 400mm Blasters

EXPLOSIVE TYPE 1x8 Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

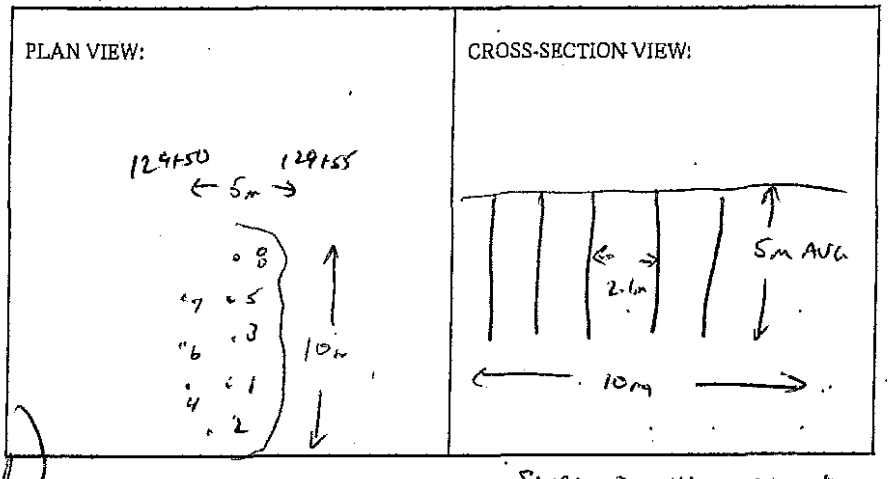
VOLUME OF ROCK BLASTED 125 (m^3)

BLAST SKETCH:

→ N

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffston Cut - 0.14 ips/ 37 Hz
" @ 13117 Cliffston Cut - 0.28 ips/ 43 Hz

QC

4'-6' AVG/Hole Primed w/ 1 CAST 1X8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 11:23:28 February 20, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5UK.Z40

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

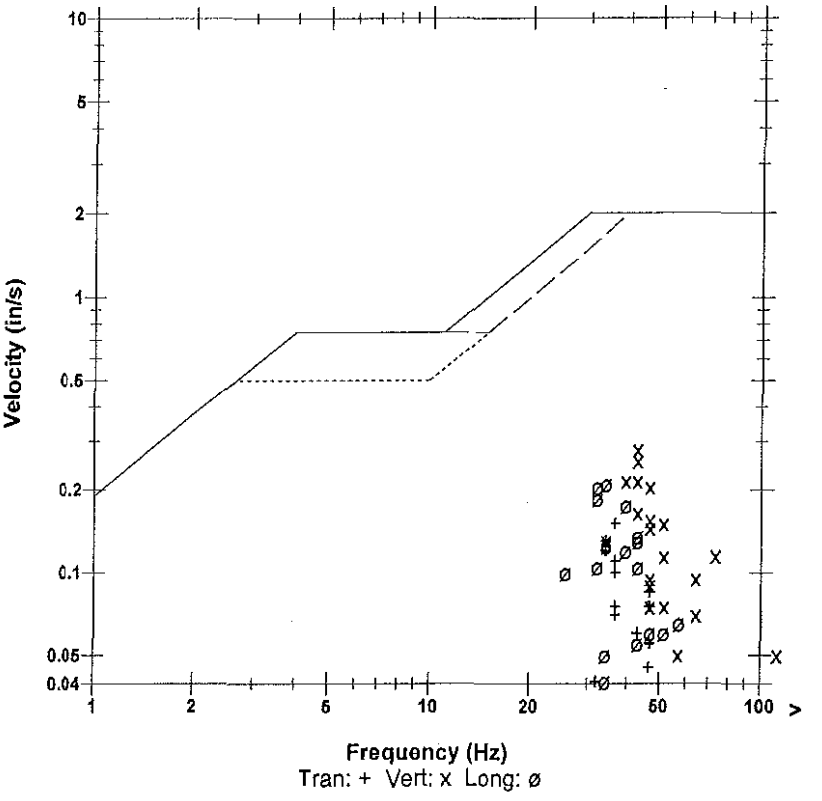
Extended Notes
Blast at stn 128

Post Event Notes

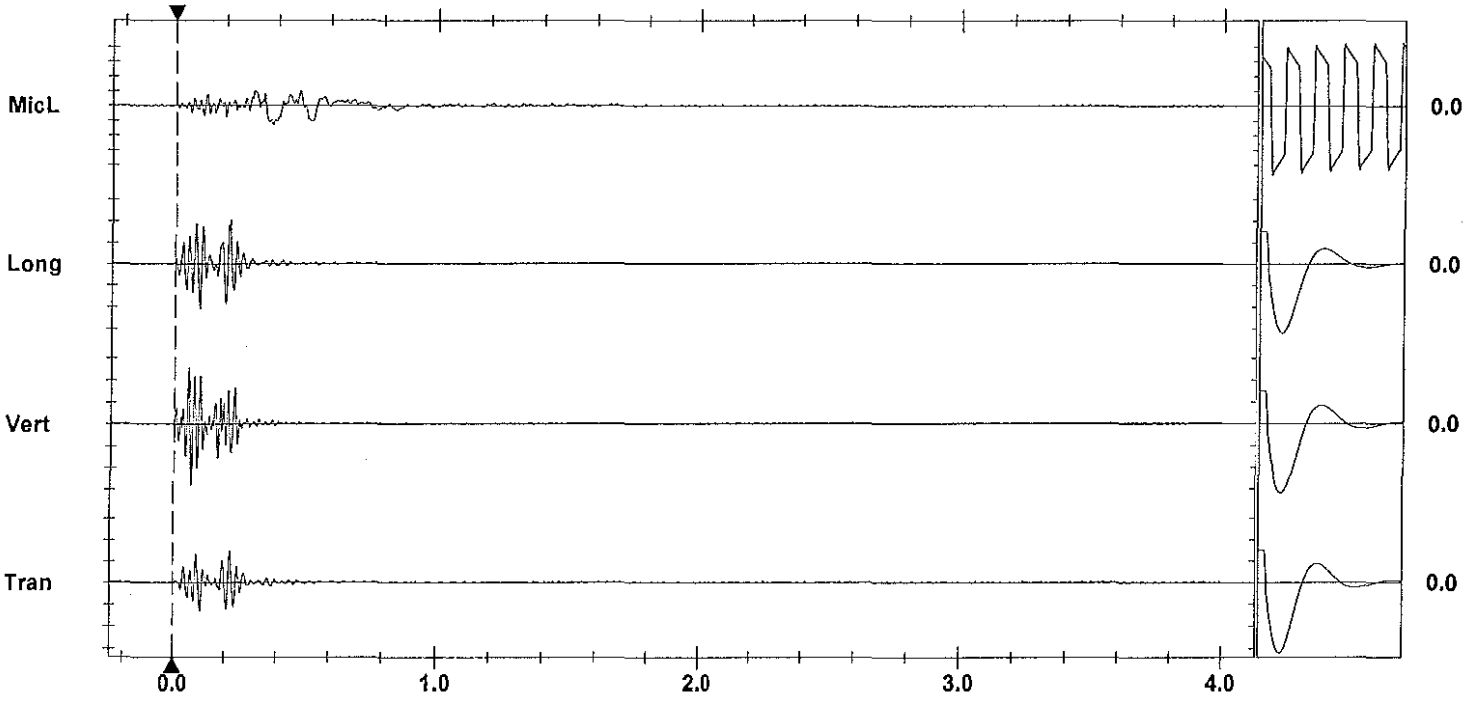
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.377 sec
ZC Freq 8.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.150	0.280	0.210	in/s
ZC Freq	37	43	34	Hz
Time (Rel. to Trig)	0.224	0.067	0.099	sec
Peak Acceleration	0.0928	0.239	0.133	g
Peak Displacement	0.00067	0.00102	0.00102	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.312 in/s at 0.068 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

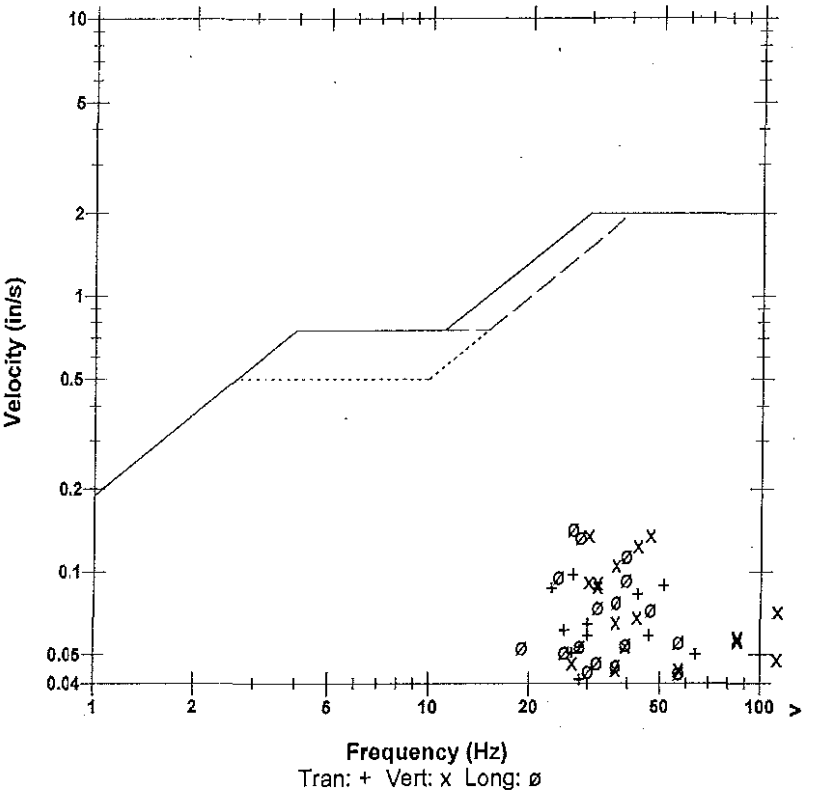
Date/Time	Vert at 11:23:32 February 20, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5UK.Z80
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

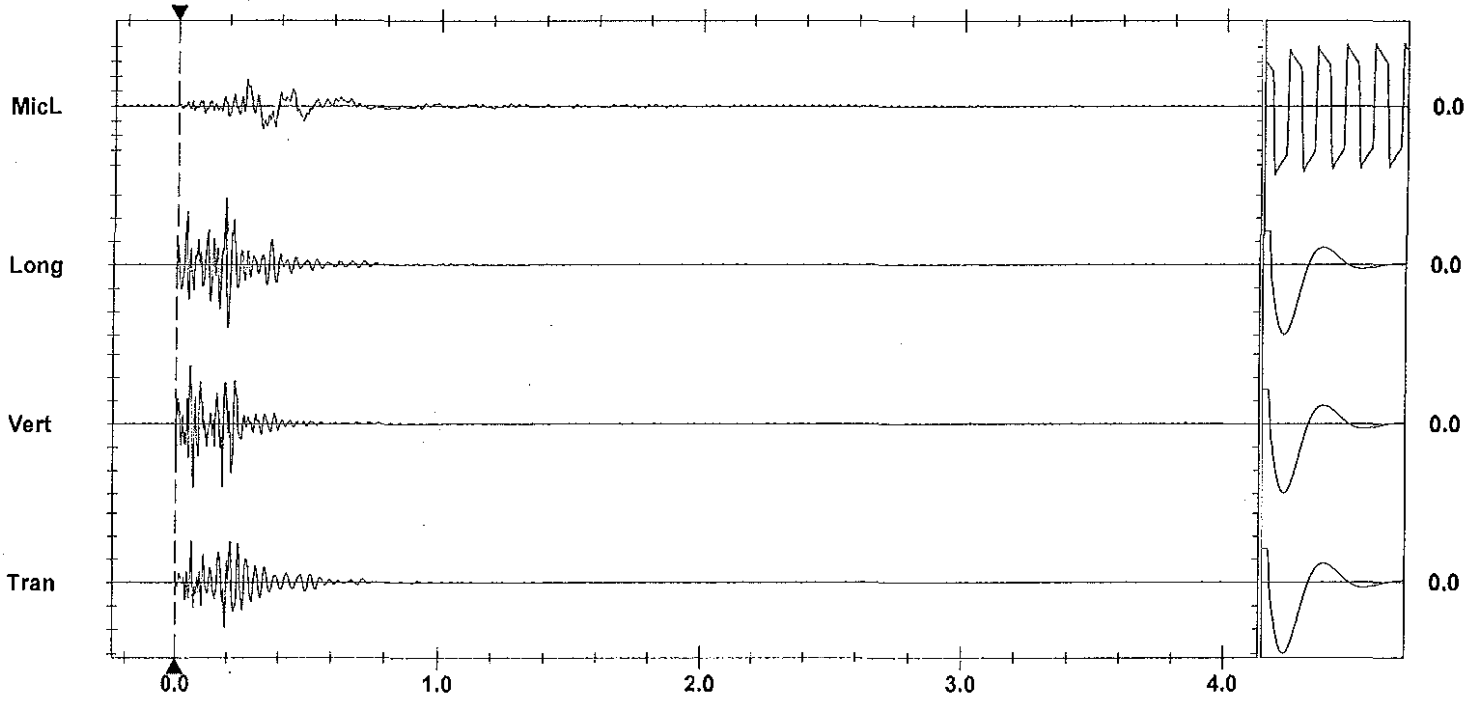
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.267 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.0975	0.136	0.144	in/s
ZC Freq	27	47	27	Hz
Time (Rel. to Trig)	0.194	0.069	0.188	sec
Peak Acceleration	0.0895	0.147	0.0911	g
Peak Displacement	0.00046	0.00048	0.00071	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.162 in/s at 0.189 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 21/12
ACTUAL BLAST DATE Feb 21/12 11:24 AM
BLAST # NW-0122

HIGHWAY# 97
BLAST LOCATION AT: 129+39 - 129+45 LS (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 67 (m)

TOTAL NUMBER OF HOLES 76 11 / 36 buffer / 24 rock / 1 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 1 emer 2x16 Dynamite + 200 grain det cord in 6 11 / 65 x 450 mm Blaster in both ends

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 76
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

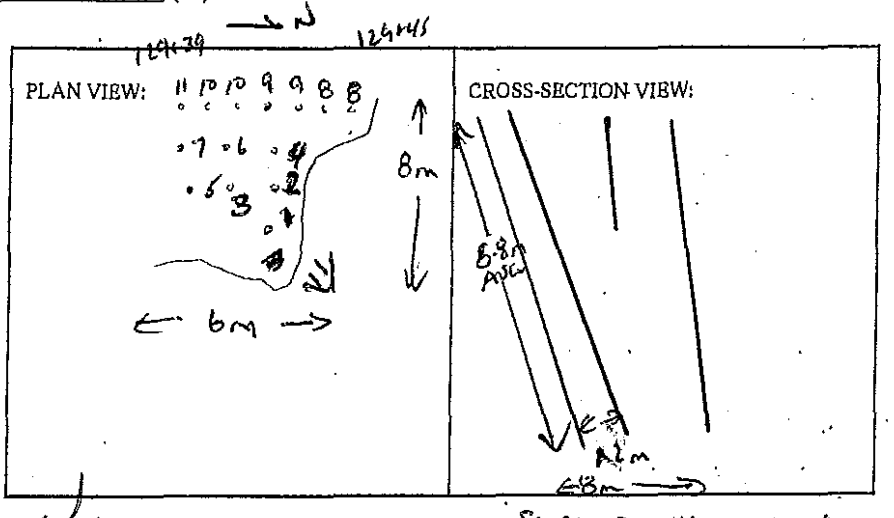
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 240 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

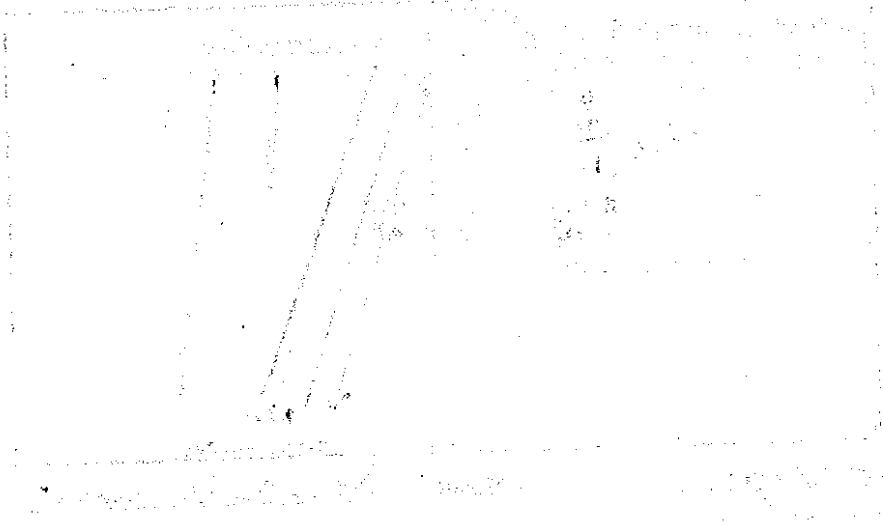
Seismograph @ 13167 Cliffstone Cut - 0.20 ips / 32 Hz
" @ 13117 Cliffstone Cut - 0.30 ips / 30 Hz

Prod Holes - 5' ANFO + 1 CART 1"x8" DYN. PRIMER

STUMP Holes - 1.5' - 2' ANFO / HOLE

BUFFER Holes - 3-4 CART 2"x16" BLASTEX } primed with 1 CART 1"x8" DYNAMITE

B/L Holes - 1 CART 2"x16" DYNAMITE + 200gm det. cord to 4' collar



Instantel®

Event Report

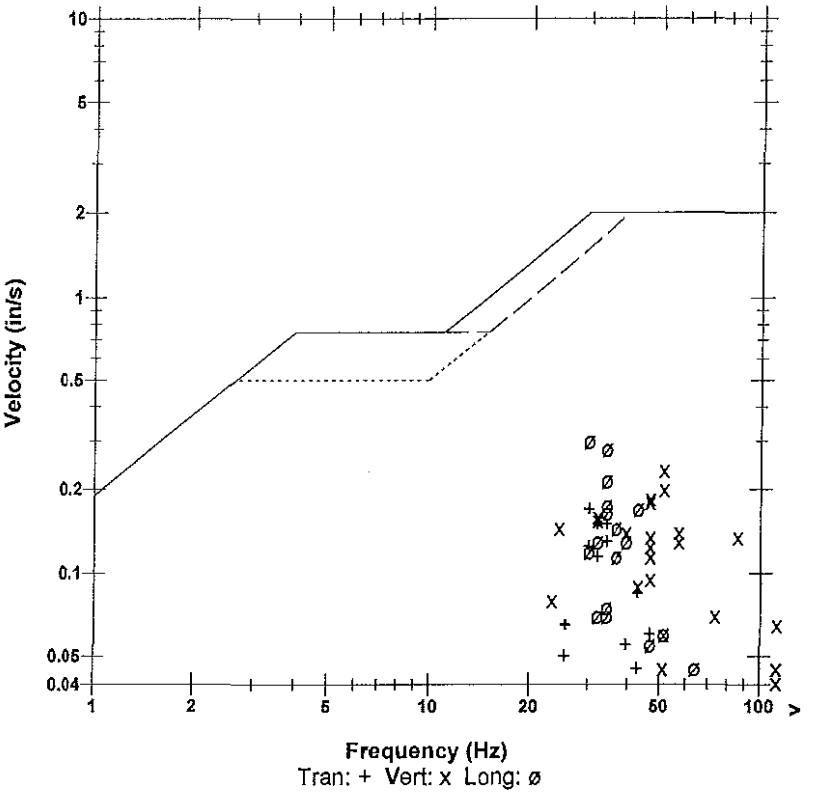
Date/Time	Vert at 11:24:09 February 21, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5WF.O90

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

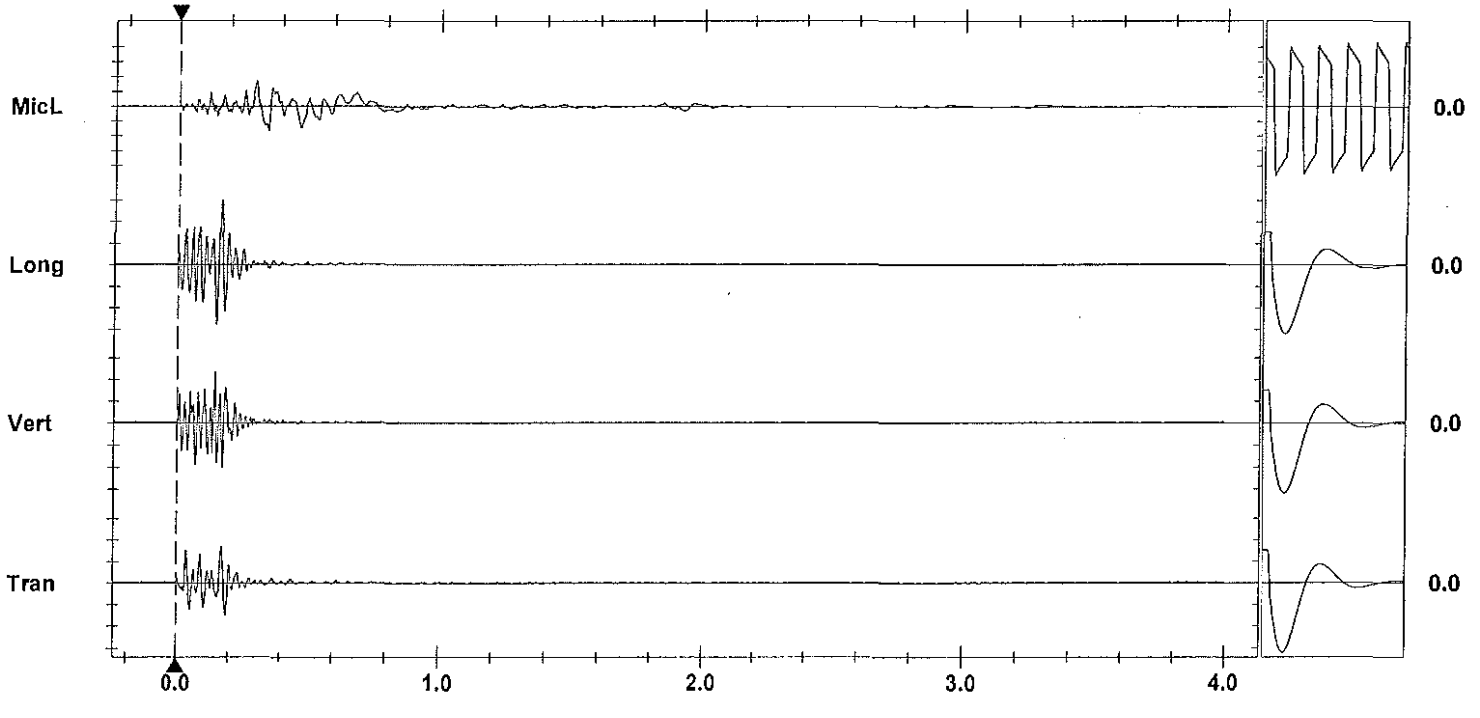
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.170	0.235	0.300	in/s
ZC Freq	30	51	30	Hz
Time (Rel. to Trig)	0.175	0.147	0.168	sec
Peak Acceleration	0.0928	0.239	0.172	g
Peak Displacement	0.00086	0.00080	0.00153	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.8	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00170 psi(L) at 0.298 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 686 mv)

Peak Vector Sum 0.324 in/s at 0.168 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

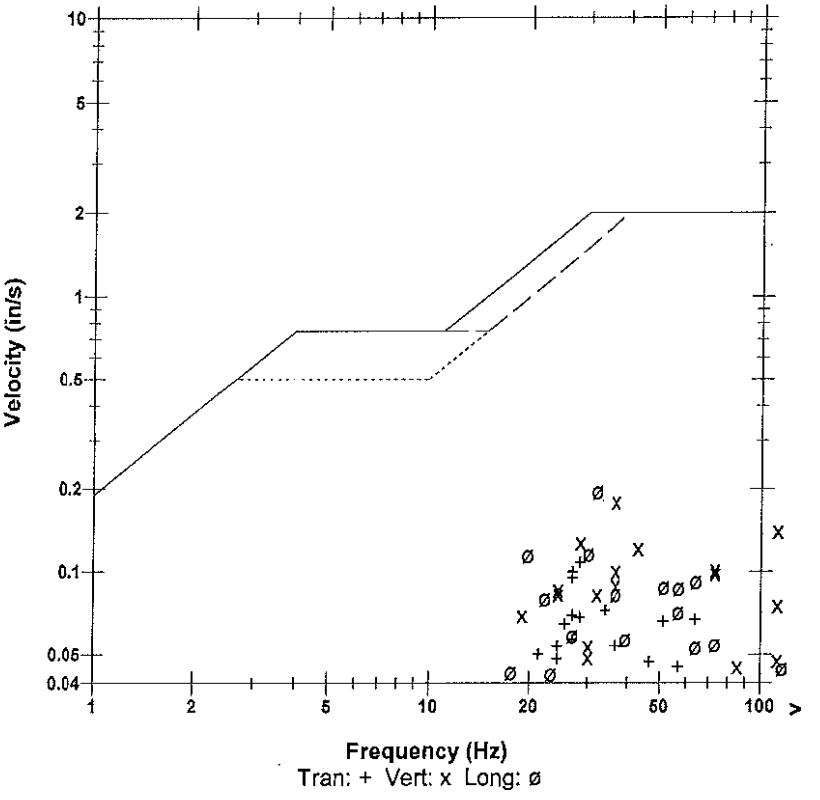
Date/Time	Vert at 11:24:13 February 21, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5WF.OD0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

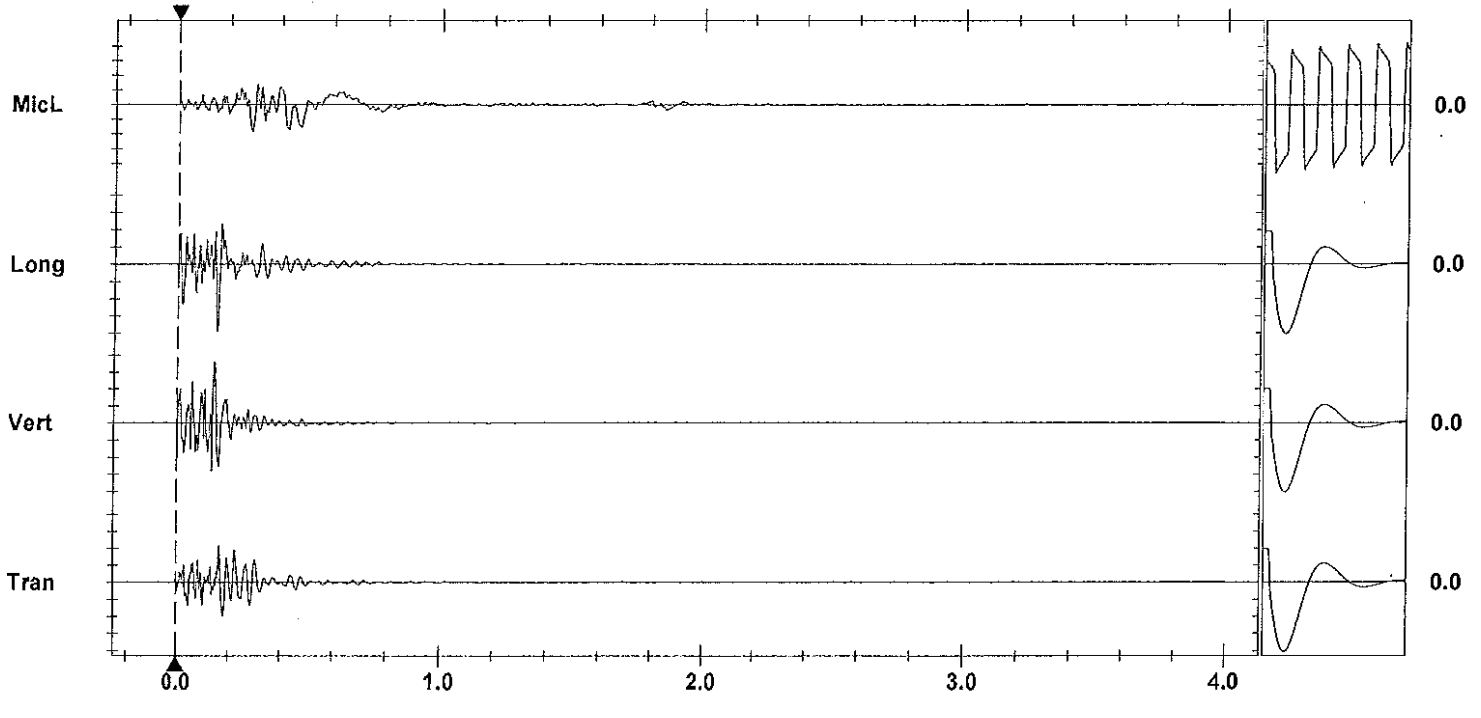
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00181 psi(L) at 0.283 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.108	0.179	0.196	in/s
ZC Freq	28	37	32	Hz
Time (Rel. to Trig)	0.169	0.145	0.153	sec
Peak Acceleration	0.0928	0.205	0.128	g
Peak Displacement	0.00058	0.00081	0.00091	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.203 in/s at 0.145 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 21/12
ACTUAL BLAST DATE FEB 21/12 3:03 PM
BLAST # MW-0123

HIGHWAY# 97
BLAST LOCATION AT: 129+41 - 129+45

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.8 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

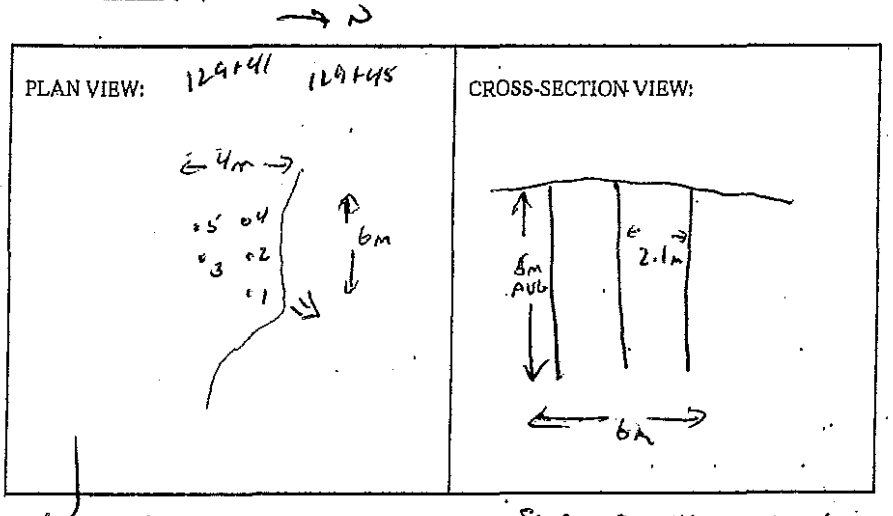
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HA320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting Inc.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 C1: AAstone Crt. 0.14 ips / 39 Hz
@ 13117 C1: AAstone Crt. 0.17 ips / 51 Hz

QL ✓

5'-7' AW.Gs/Holo Primed w/ 1 CAST 1x8' DYNAMITE

Instantel

Event Report

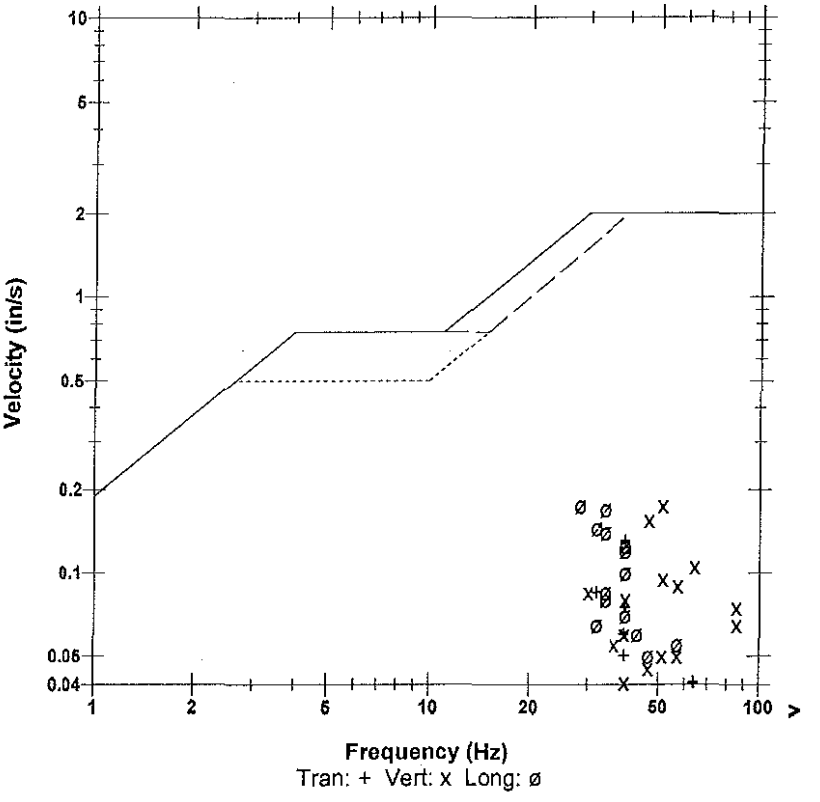
Date/Time	Vert at 15:03:38 February 21, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5WP.U20

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

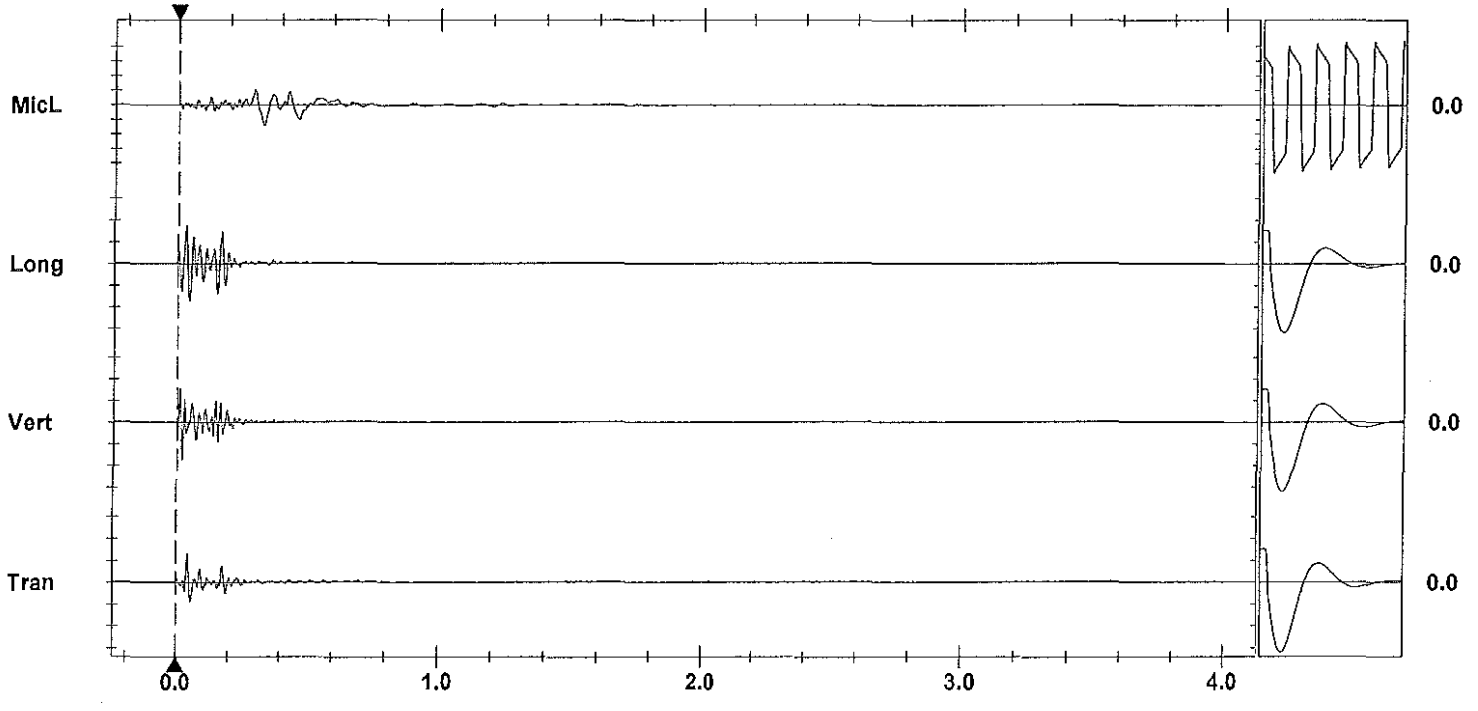
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00141 psi(L) at 0.330 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 737 mv)

	Tran	Vert	Long	
PPV	0.130	0.175	0.175	in/s
ZC Freq	39	51	28	Hz
Time (Rel. to Trig)	0.046	0.020	0.034	sec
Peak Acceleration	0.0795	0.159	0.119	g
Peak Displacement	0.00049	0.00052	0.00086	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.8	3.8	4.5	

Peak Vector Sum 0.214 in/s at 0.047 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

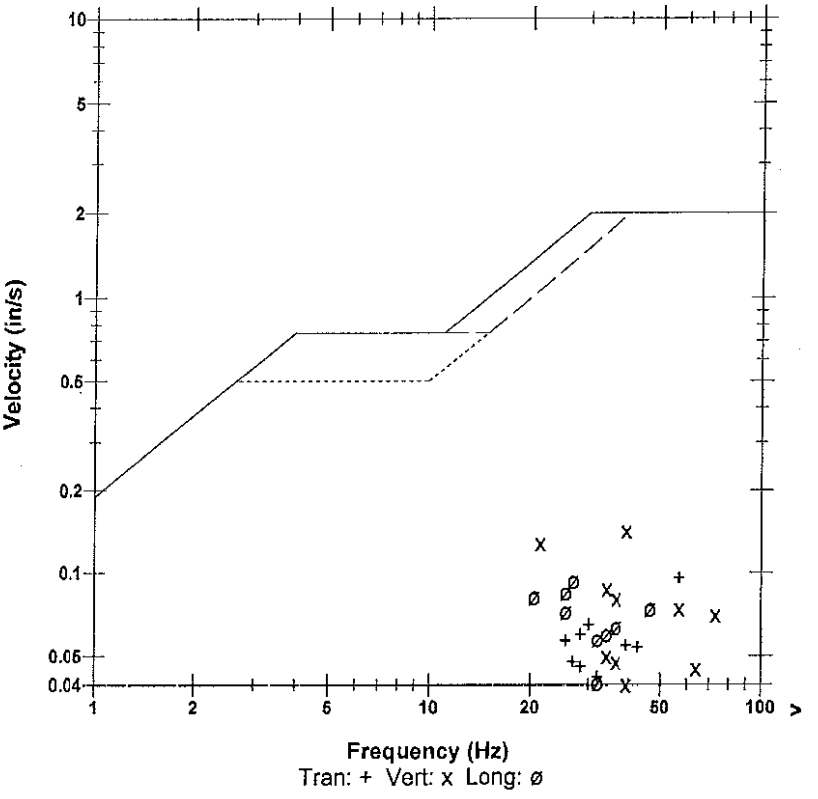
Date/Time	Vert at 15:03:42 February 21, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5WP.U60
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

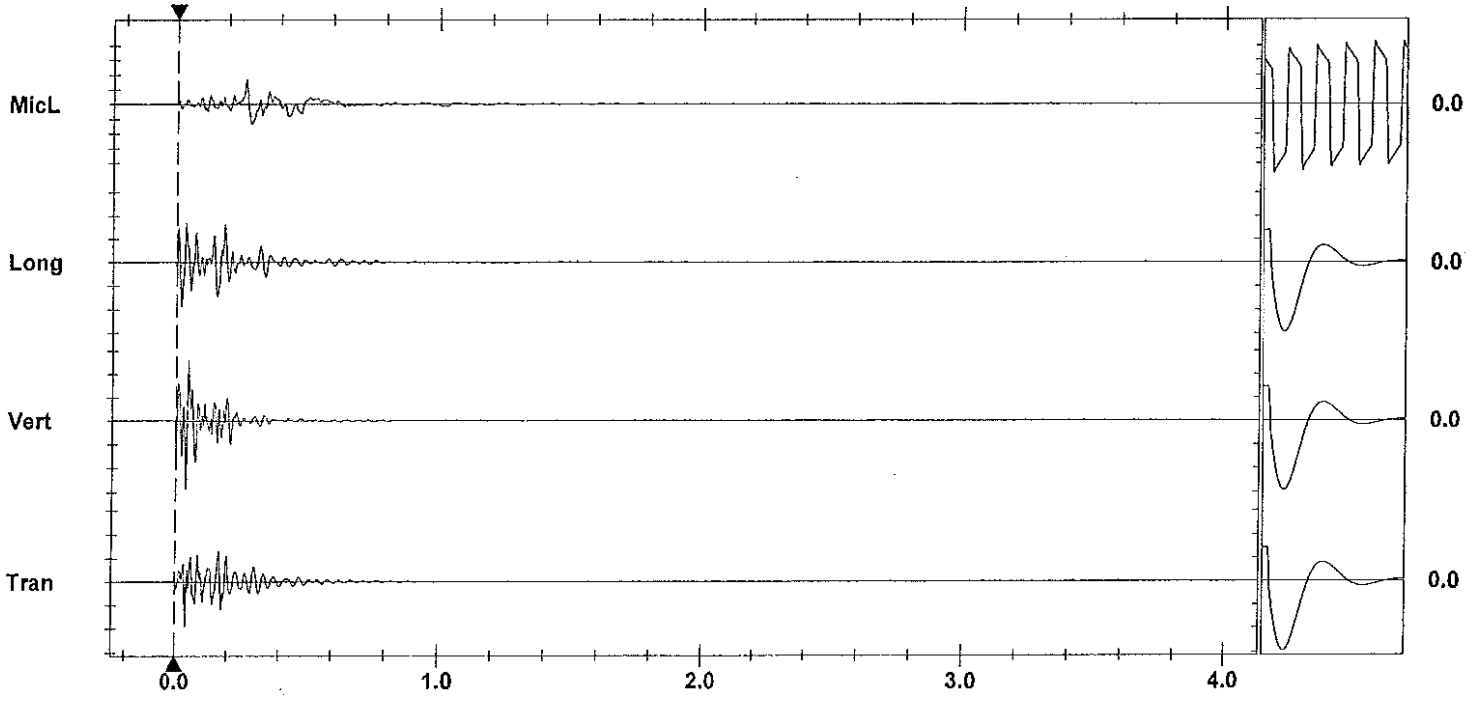
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.267 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 680 mv)

	Tran	Vert	Long	
PPV	0.0956	0.142	0.0931	in/s
ZC Freq	57	39	27	Hz
Time (Rel. to Trig)	0.041	0.039	0.018	sec
Peak Acceleration	0.0729	0.114	0.0580	g
Peak Displacement	0.00030	0.00070	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.178 in/s at 0.040 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 22/12
ACTUAL BLAST DATE Feb 22/12 12:45 PM
BLAST # MW-0124

HIGHWAY# 97
BLAST LOCATION AT: STN 129+33 - 129+39 LS (To subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * 8 hot mutted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Altered Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 86 11/3 Buffer/ 2 Stab/2 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

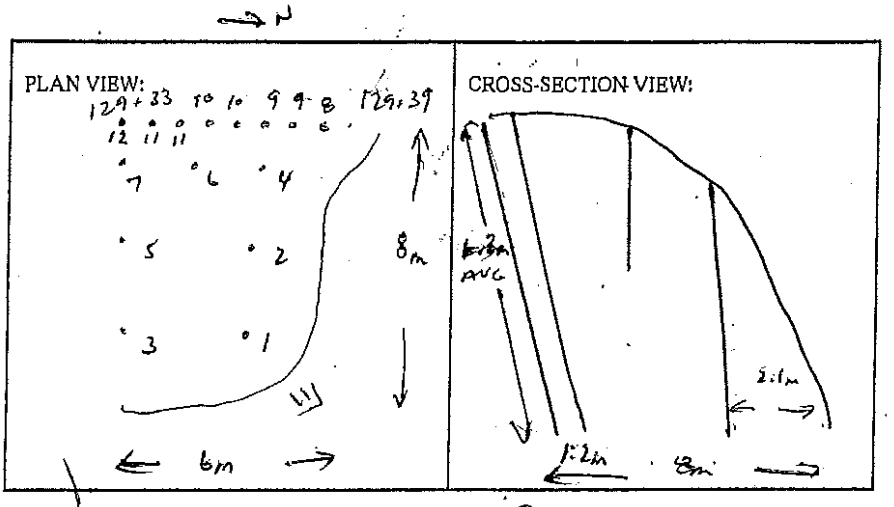
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 285 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

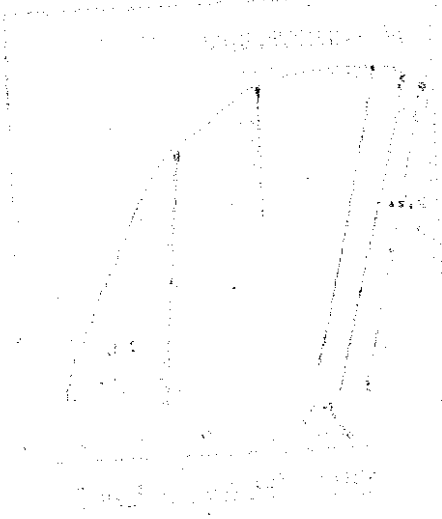
QCV

Seismograph @ 13167 cliffstone cut - 0.20 ips/ 37Hz
" @ 13117 cliffstone cut - 0.33 ips/ 57Hz

Prod Holes - 5'-7' ANFO/Hole
Stab Holes - 1.5'-2' ANFO/Hole
Buffer Holes - 4-5 Cart 2x16 Blasting/Hole

} primed w/ 1 cart 1½" dynamite

B/L Holes - 1 Cart 2½x16" Dynamite + 200gr det cord + 4' collar



Instantel

Event Report

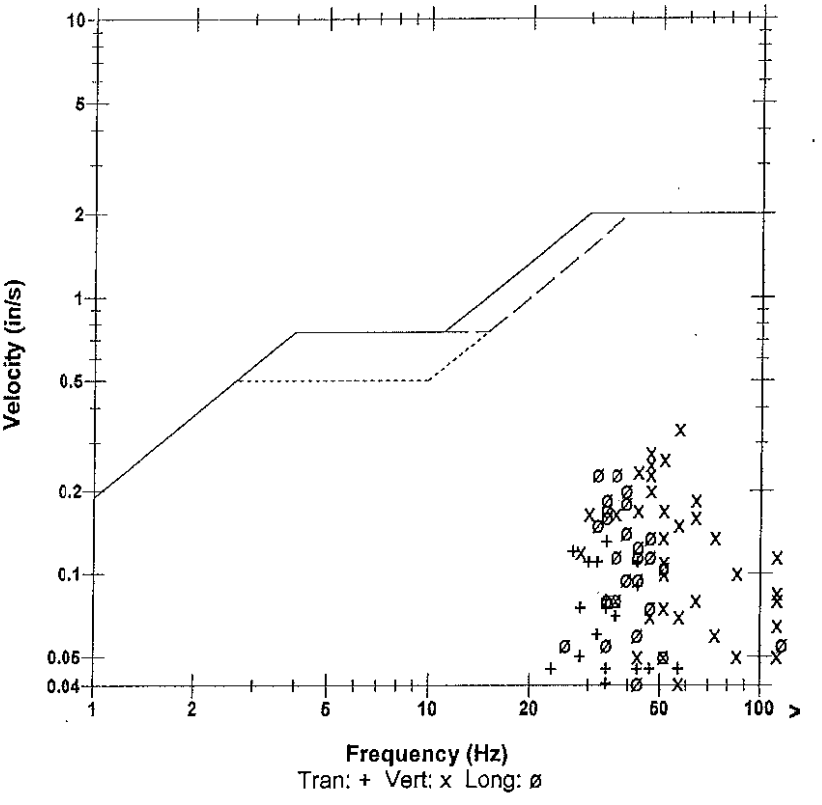
Date/Time	Vert at 12:45:51 February 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec et 1024 sps	**File Name**	M866E5YE.4F0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

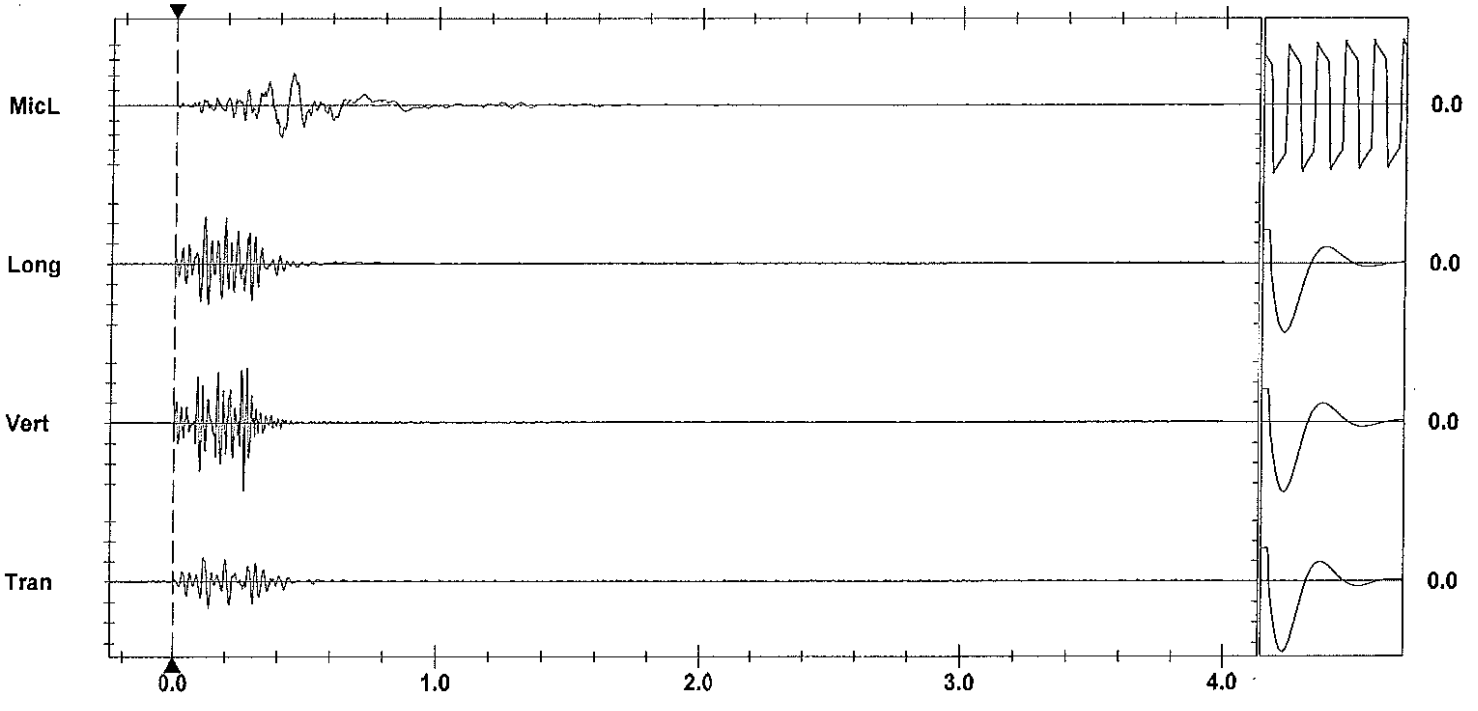
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.130	0.335	0.230	in/s
ZC Freq	34	57	32	Hz
Time (Rel. to Trig)	0.139	0.271	0.115	sec
Peak Acceleration	0.0795	0.358	0.159	g
Peak Displacement	0.00074	0.00095	0.00115	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.5	7.1	Hz
Overswing Ratio	3.7	3.7	4.4	

Microphone	Linear Weighting
PSPL	0.00221 psi(L) at 0.405 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 660 mv)

Peak Vector Sum 0.346 in/s at 0.271 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 12:45:56 February 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5YE.4K0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

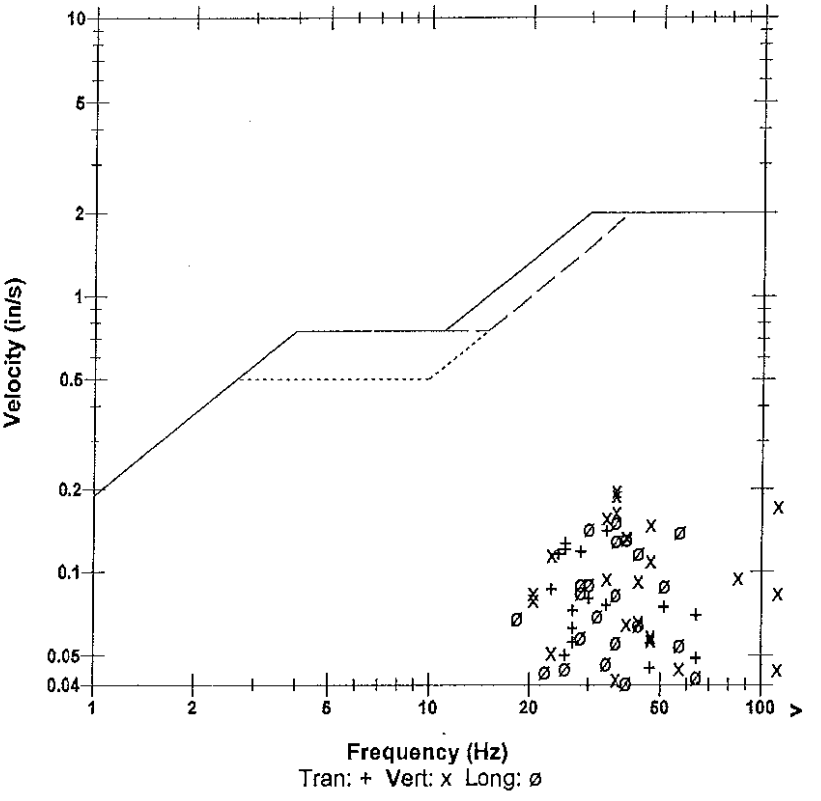
Post Event Notes

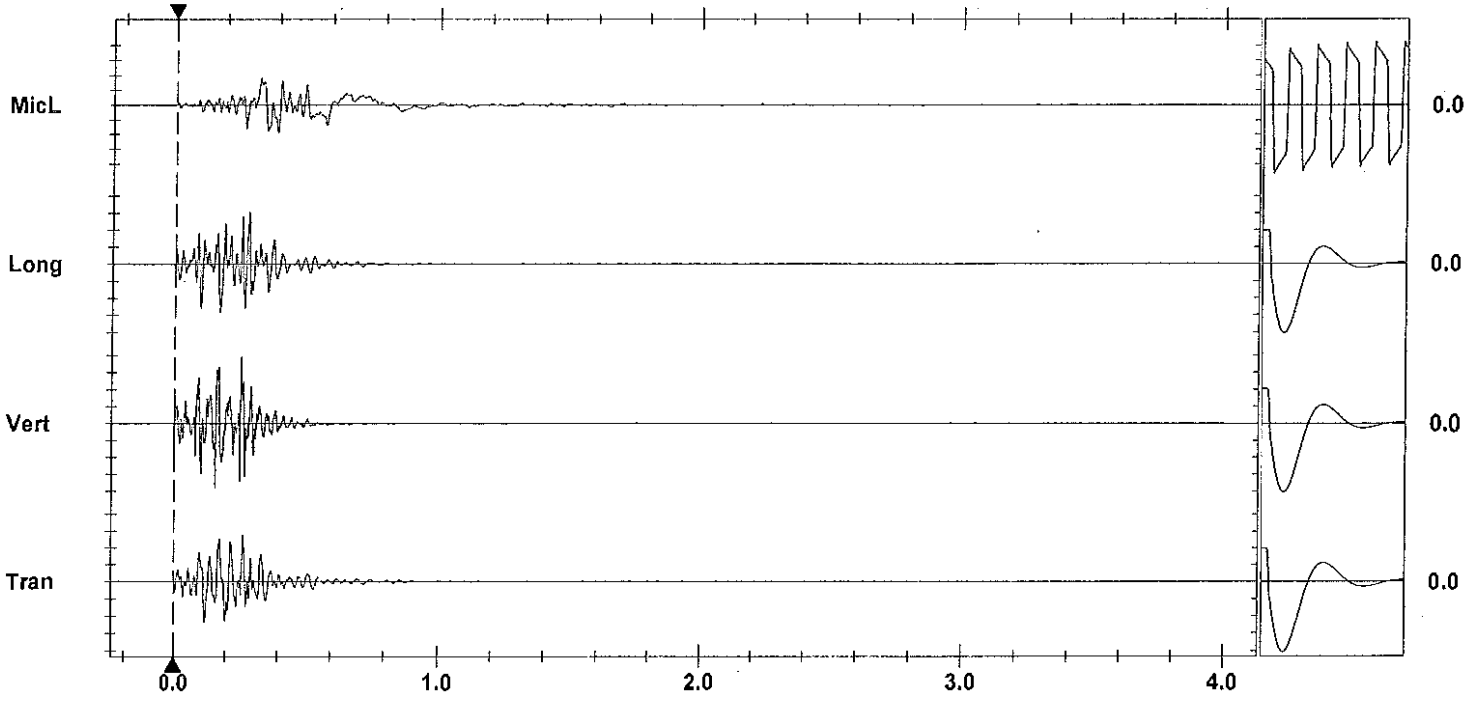
Microphone Linear Weighting
PSPL 0.00192 psi(L) at 0.392 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 655 mv)

	Tran	Vert	Long	
PPV	0.141	0.197	0.151	in/s
ZC Freq	34	37	37	Hz
Time (Rel. to Trig)	0.268	0.259	0.284	sec
Peak Acceleration	0.0862	0.383	0.134	g
Peak Displacement	0.00077	0.00084	0.00072	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.243 in/s at 0.259 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verity
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Feb 22/12
ACTUAL BLAST DATE Feb 22/12 2:36 PM
BLAST # MW-0725

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION

SITE DETAILS: to shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 4 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 4
TOTAL NUMBER OF DELAYS 4

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

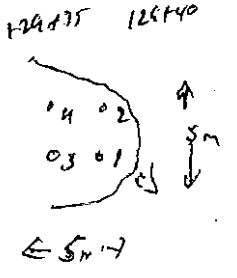
INITIATION DEVICE: (CIRCLE) E.E. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 100 (m^3)

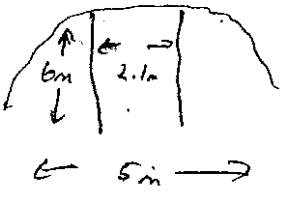
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verity COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliff Structure - 0.15 ips / 5 Hz
" @ 13117 Cliff Structure - 0.23 ips / 34 Hz

QCV

5'-6' Ave. Spacing/Hole Primed w/ 1 each 1"x8" dynamite

Instantel

Event Report

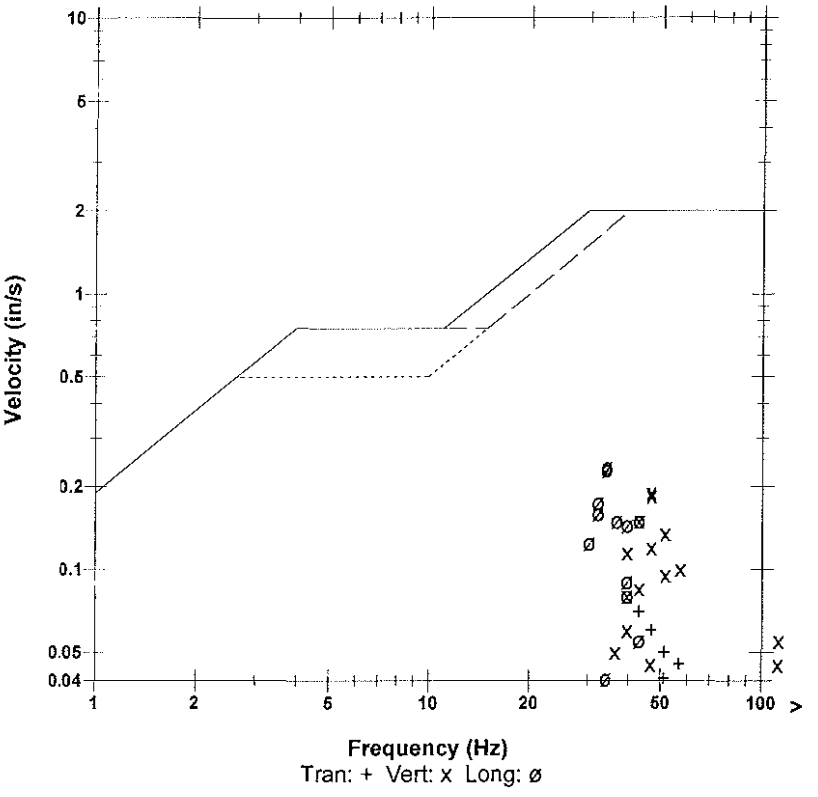
Date/Time	Vert at 14:36:37 February 22, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E5YJ.910

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

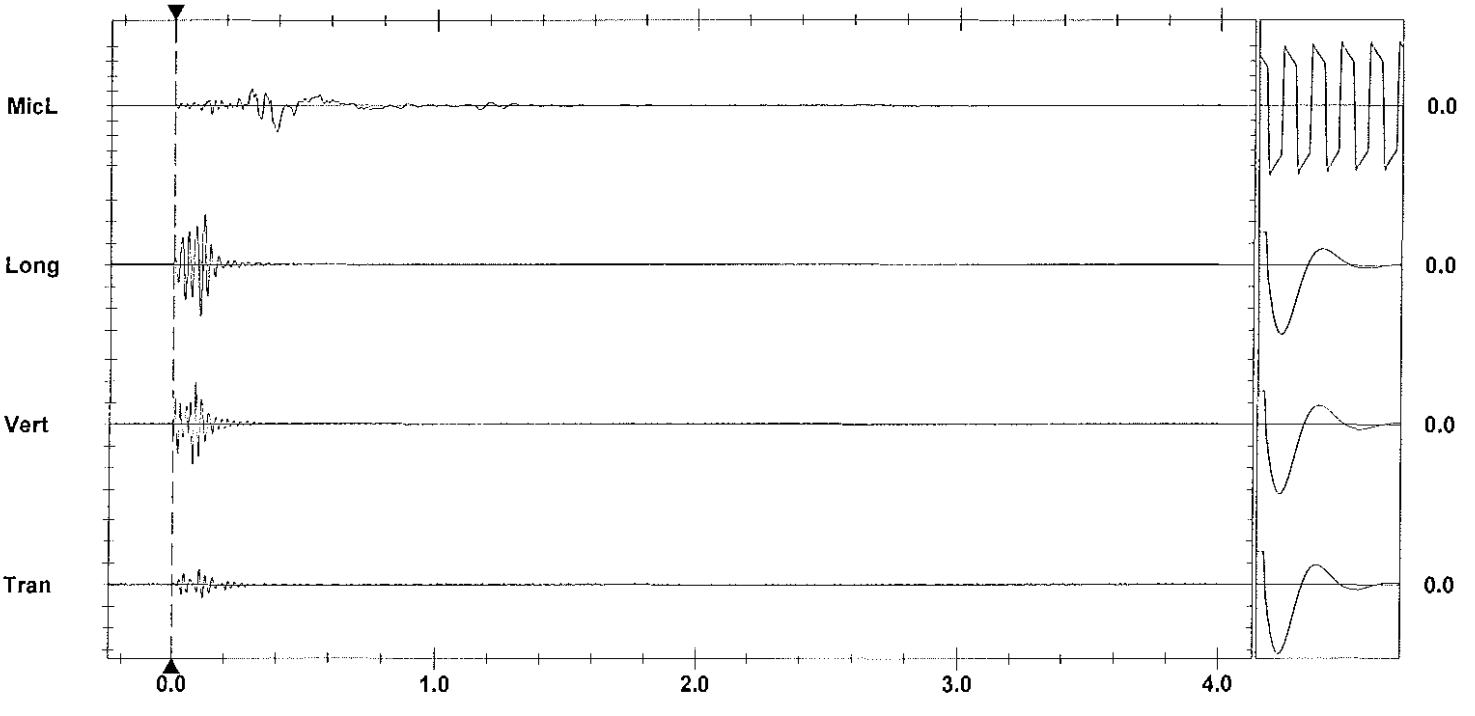
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00174 psi(L) at 0.393 sec
ZC Freq 9.8 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 639 mv)

	Tran	Vert	Long	
PPV	0.0700	0.190	0.235	in/s
ZC Freq	43	47	34	Hz
Time (Rel. to Trig)	0.105	0.089	0.103	sec
Peak Acceleration	0.0530	0.159	0.146	g
Peak Displacement	0.00025	0.00061	0.00108	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.4	7.1	Hz
Overswing Ratio	3.7	3.7	4.4	

Peak Vector Sum 0.255 in/s at 0.089 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

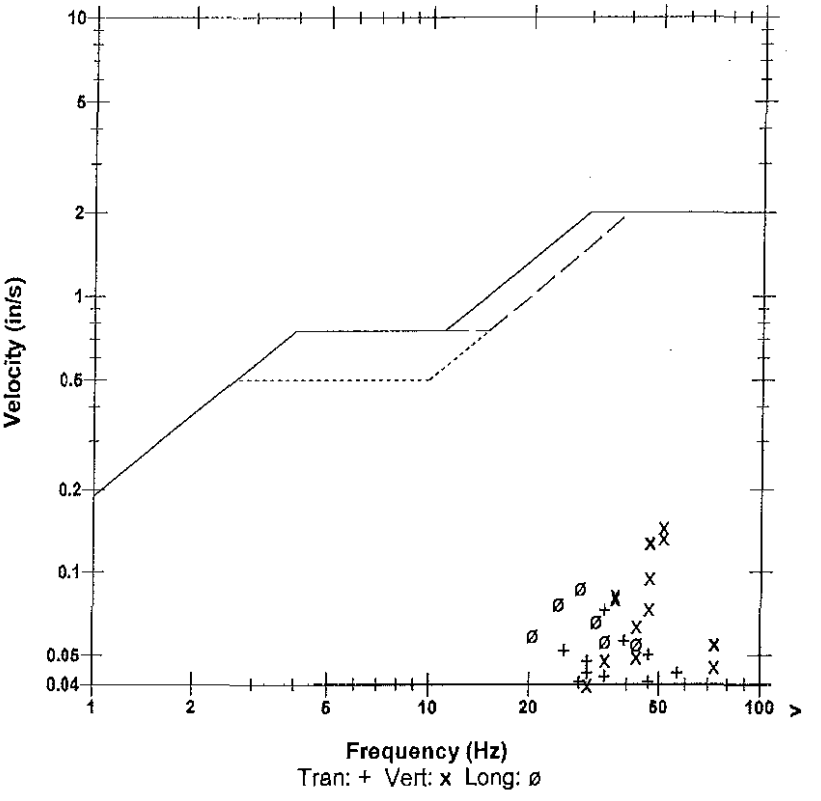
Date/Time	Vert at 14:36:42 February 22, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E5YJ.960
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

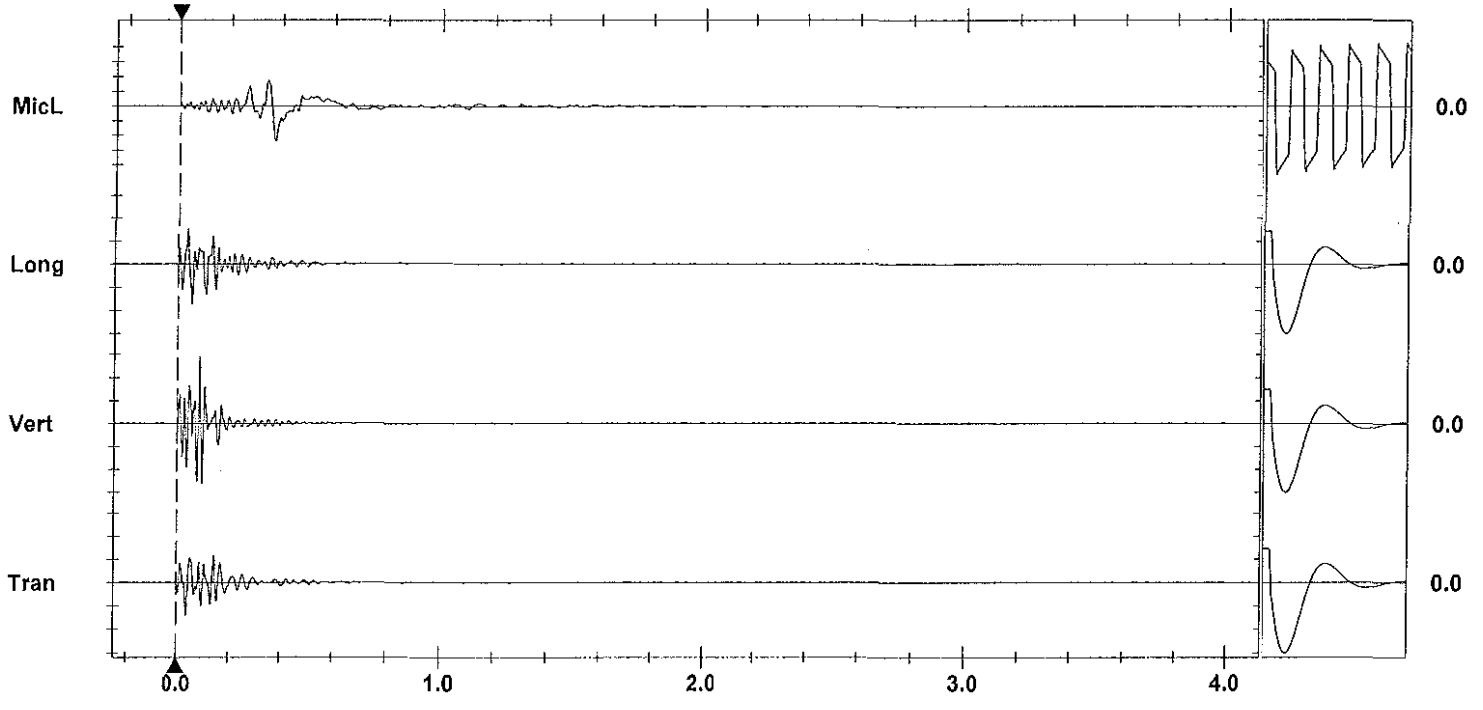
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00243 psi(L) at 0.370 sec
ZC Freq	5.9 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 669 mv)

	Tran	Vert	Long	
PPV	0.0725	0.146	0.0875	in/s
ZC Freq	34	51	28	Hz
Time (Rel. to Trig)	0.038	0.089	0.057	sec
Peak Acceleration	0.0464	0.116	0.0580	g
Peak Displacement	0.00035	0.00045	0.00043	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.154 in/s at 0.089 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 23/12
ACTUAL BLAST DATE Feb. 23/12
BLAST # MW-0126 @ 12:30

HIGHWAY# 97
BLAST LOCATION AT: STN # 129+45 - 129+50

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 7 prod.
HOLE DIAMETER (mm) 76
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Detcord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

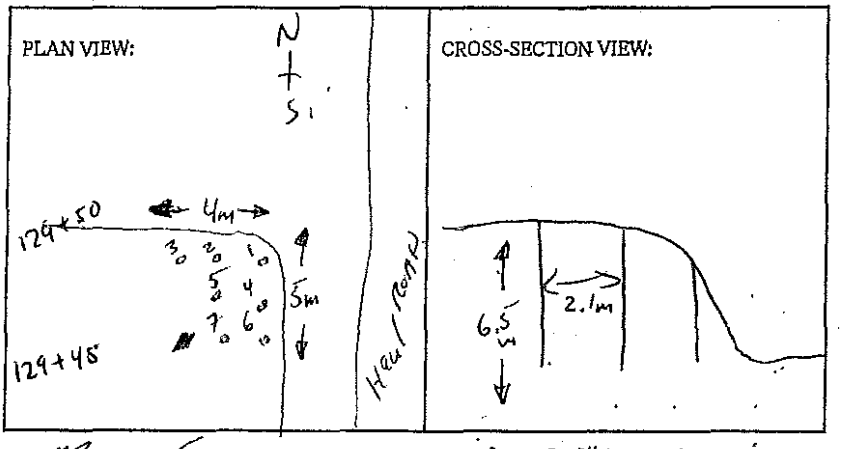
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ~~EBC initiation of Nonel system~~
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 130 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

7 - Electric dets.

3 - 2½" x 16"
1 - WR.
1 - Anfo
8 sticks 1½" x 16"

Instantel

Event Report

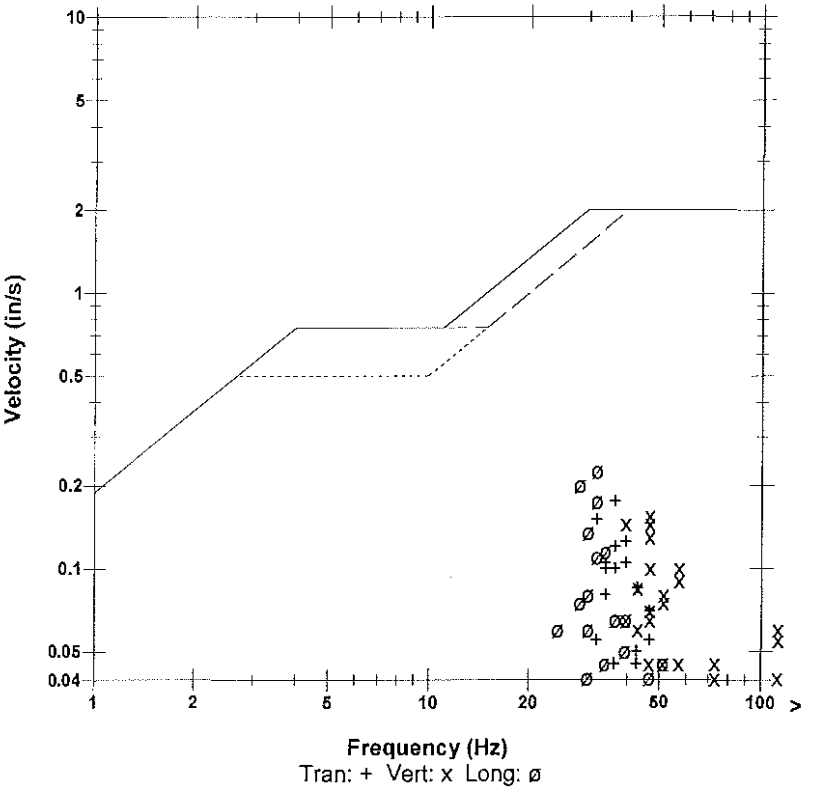
Date/Time	Vert at 12:29:06 February 23, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E608.0I0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

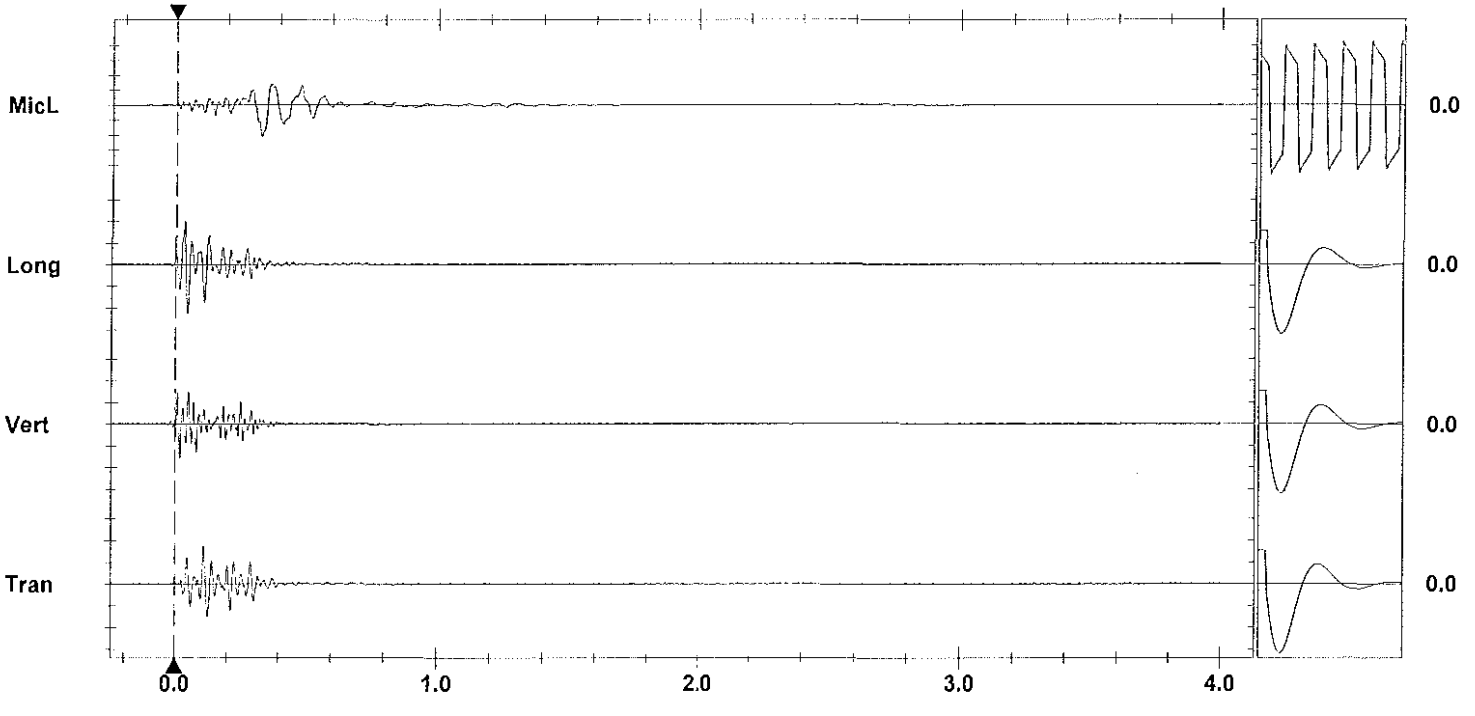
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.175	0.155	0.225	in/s
ZC Freq	37	47	32	Hz
Time (Rel. to Trig)	0.113	0.020	0.049	sec
Peak Acceleration	0.0928	0.119	0.119	g
Peak Displacement	0.00078	0.00056	0.00109	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Microphone Linear Weighting
PSPL 0.00210 psi(L) at 0.328 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 668 mv)

Peak Vector Sum 0.262 in/s at 0.050 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

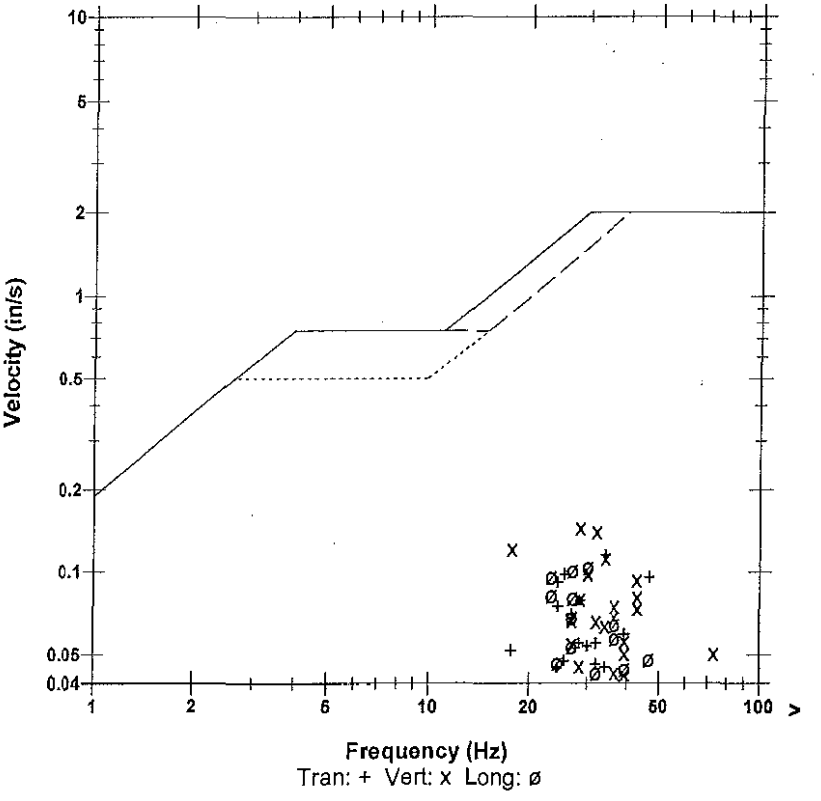
Date/Time	Vert at 12:29:12 February 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E608.0O0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

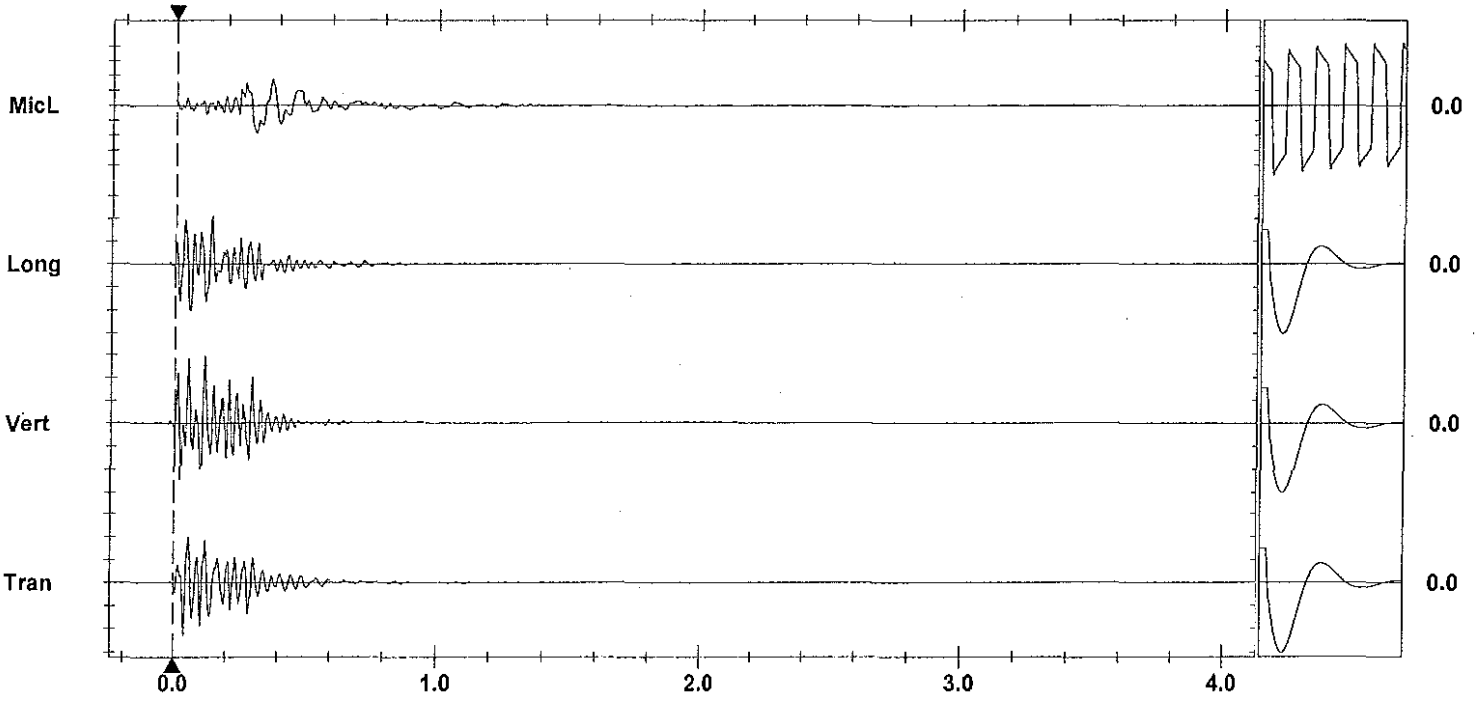
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.311 sec
ZC Freq	9.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 625 mv)

	Tran	Vert	Long	
PPV	0.116	0.146	0.104	in/s
ZC Freq	34	28	30	Hz
Time (Rel. to Trig)	0.041	0.118	0.143	sec
Peak Acceleration	0.0663	0.0994	0.0597	g
Peak Displacement	0.00061	0.00075	0.00066	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.7	Hz
Overswing Ratio	3.6	3.8	3.9	

Peak Vector Sum 0.180 in/s et 0.057 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 2, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 23/12
ACTUAL BLAST DATE Feb. 23/12
BLAST # MW-0127 @ 15:40

HIGHWAY # 97
BLAST LOCATION AT: STN # 129+45 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 10 production
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
* Every 2nd B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 325 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

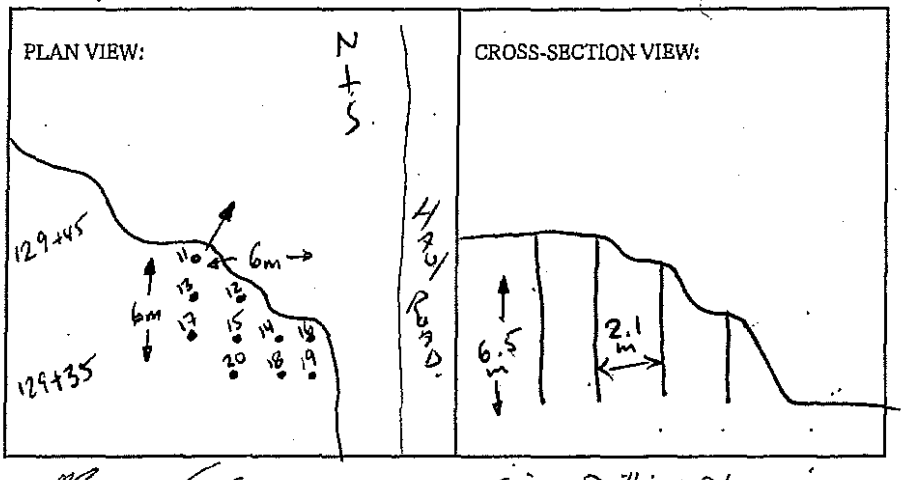
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) EBC initiation of Nonel system
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 252 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

10 - Electric caps.

2½ Anfo

1½ - wR.

4 - 2½" x 16"

6 sticks 1½" x 16"

Instantel

Event Report

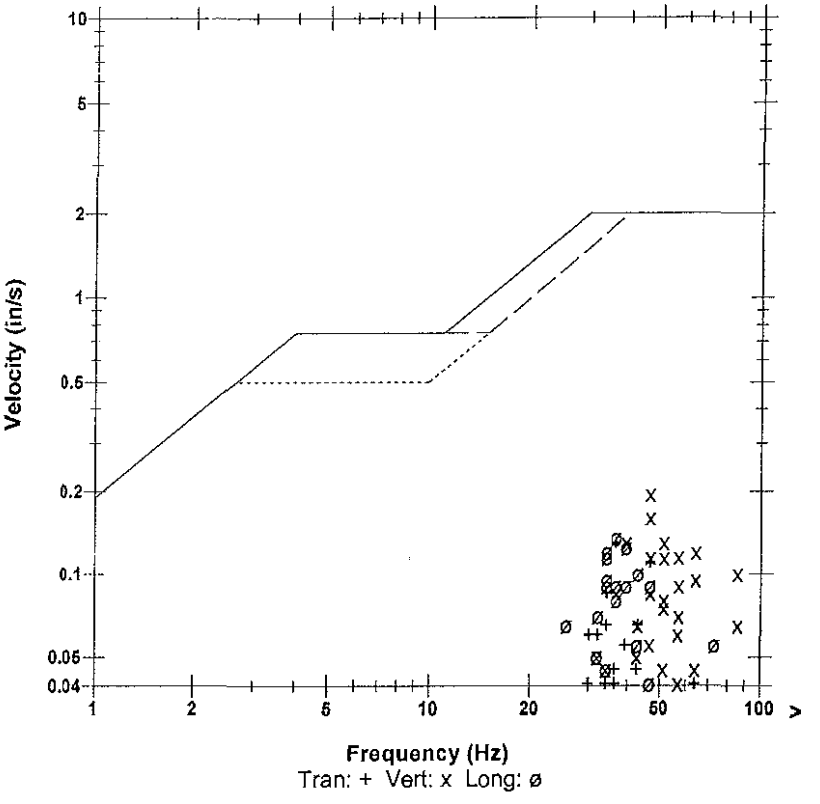
Date/Time	Vert at 15:40:09 February 23, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E60G.UX0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

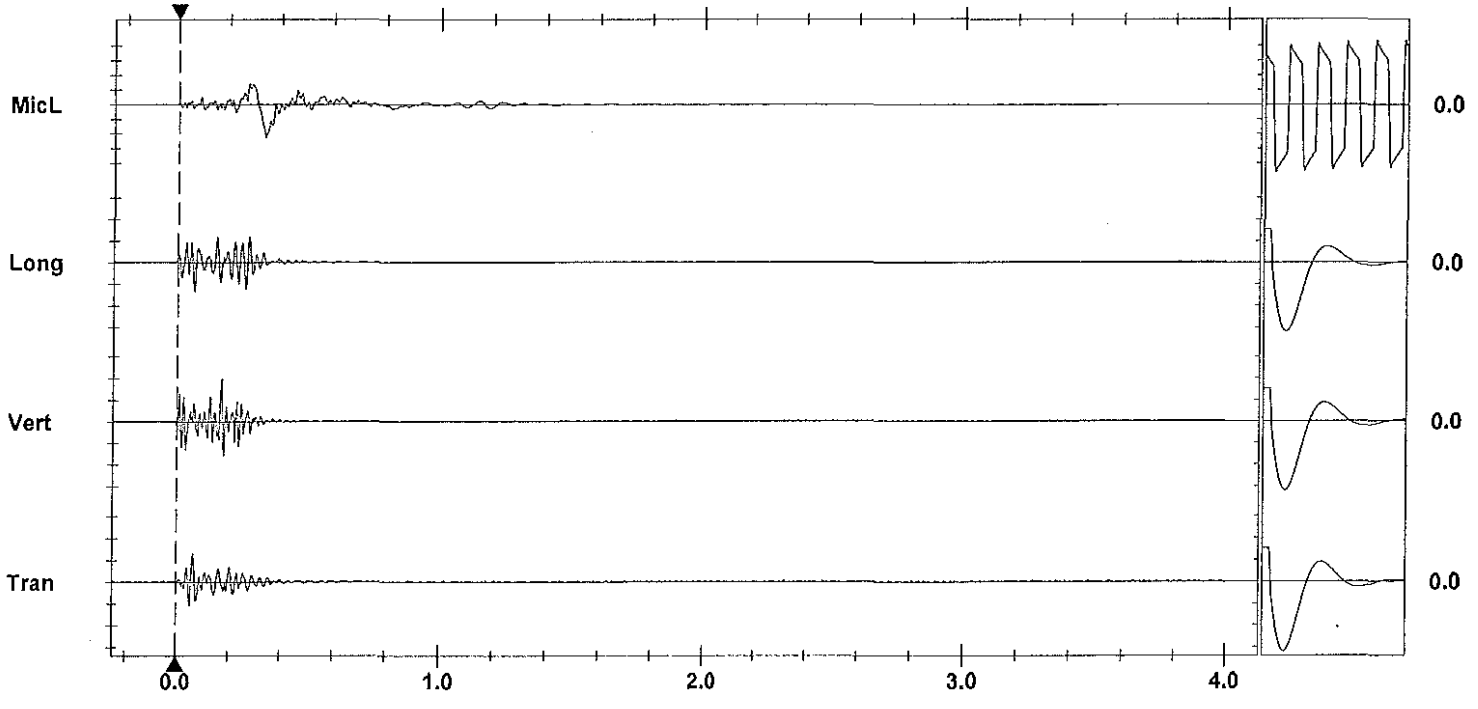
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00228 psi(L) at 0.337 sec
ZC Freq	7.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 654 mv)

	Tran	Vert	Long	
PPV	0.130	0.195	0.135	in/s
ZC Freq	37	47	37	Hz
Time (Rel. to Trig)	0.066	0.174	0.066	sec
Peak Acceleration	0.0928	0.186	0.0795	g
Peak Displacement	0.00058	0.00069	0.00058	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.5	

Peak Vector Sum 0.204 in/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: March 3, 2012 07:8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

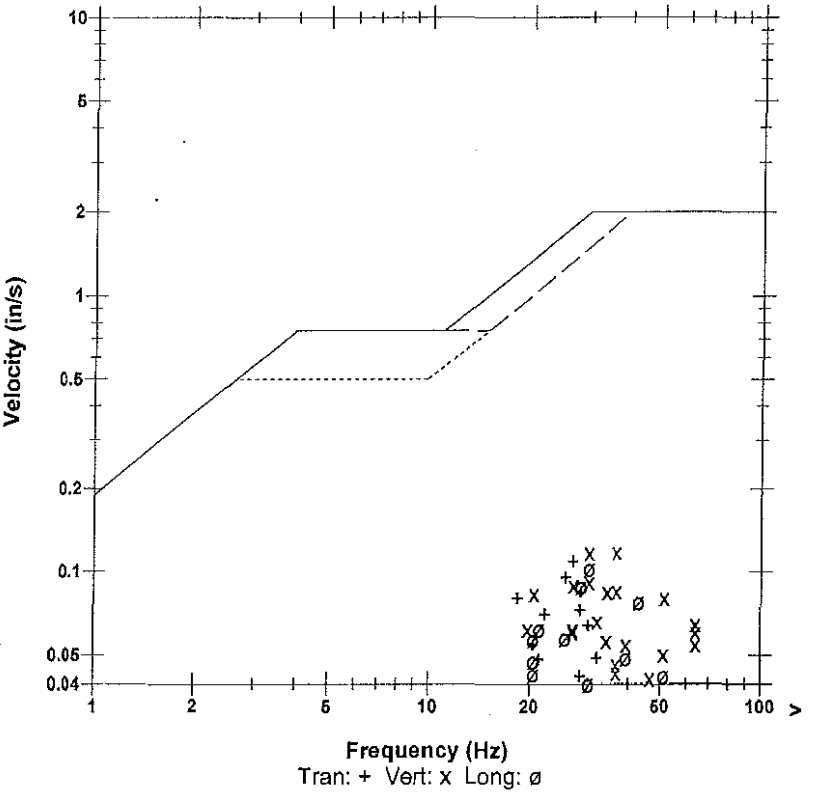
Date/Time	Vert at 15:40:16 February 23, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E60G.V40
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

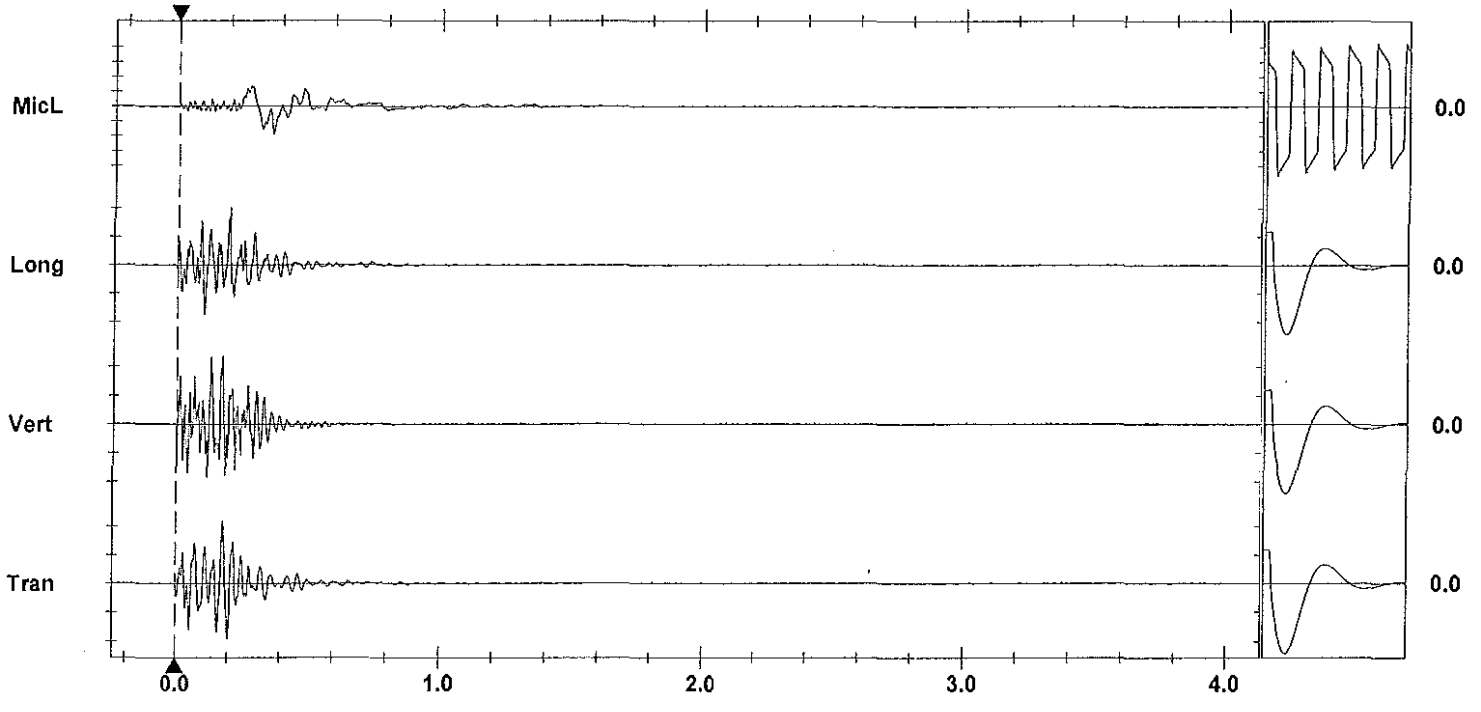
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.362 sec
ZC Freq	5.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 664 mv)

	Tran	Vert	Long	
PPV	0.109	0.117	0.102	in/s
ZC Freq	27	37	30	Hz
Time (Rel. to Trig)	0.182	0.176	0.199	sec
Peak Acceleration	0.0597	0.144	0.0663	g
Peak Displacement	0.00056	0.00052	0.00044	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.136 in/s at 0.201 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED Feb. 24/12.
ACTUAL BLAST DATE Feb 24/12
BLAST # MW-128 @ 11:15

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

HIGHWAY # 97
BLAST LOCATION AT: STN # 129+40 - 129+45

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 10 production
HOLE DIAMETER ~~76~~ (mm) 76
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole Loaded with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 125 (kg)
DELAY TYPE AND LENGTH 25 + 42 (ms)

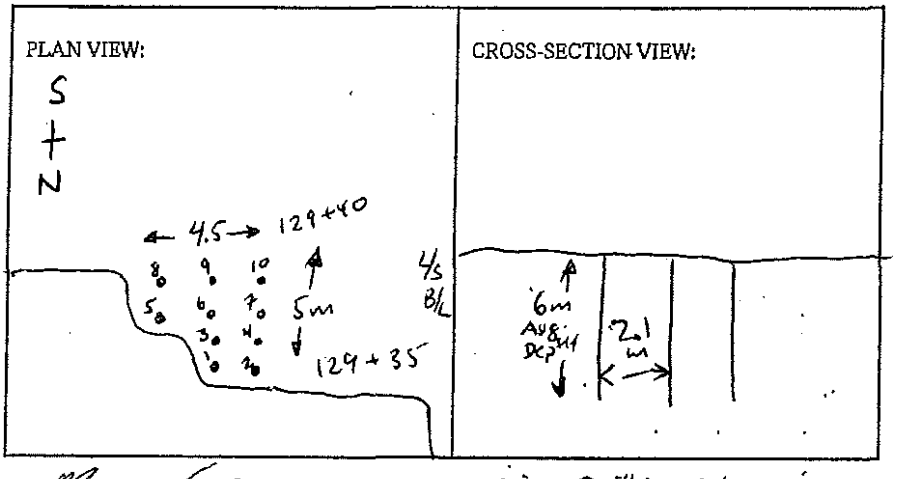
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ~~EBC initiation of Nonel system~~
BLASTING MACHINE: TYPE HB320 CAPACITY 85 caps.

VOLUME OF ROCK BLASTED 135 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

10 - Elec dets.

1 CASE 2 1/2" x 16"
2 Anfo
1 - WR.
1 - 2" x 16"

Instantel

Event Report

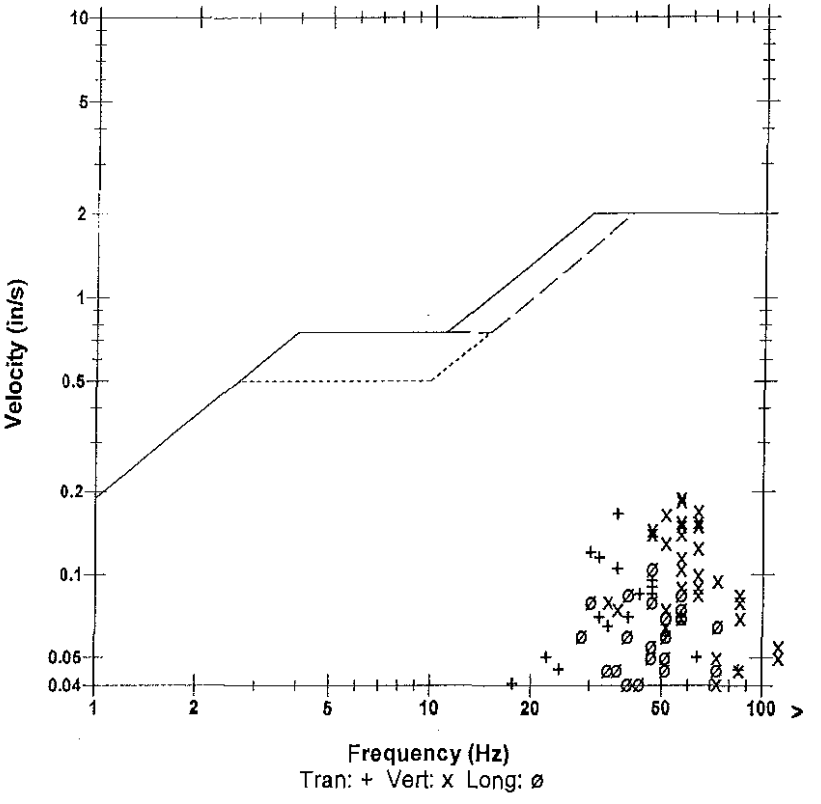
Date/Time	Vert at 11:11:38 February 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E61Z.3E0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

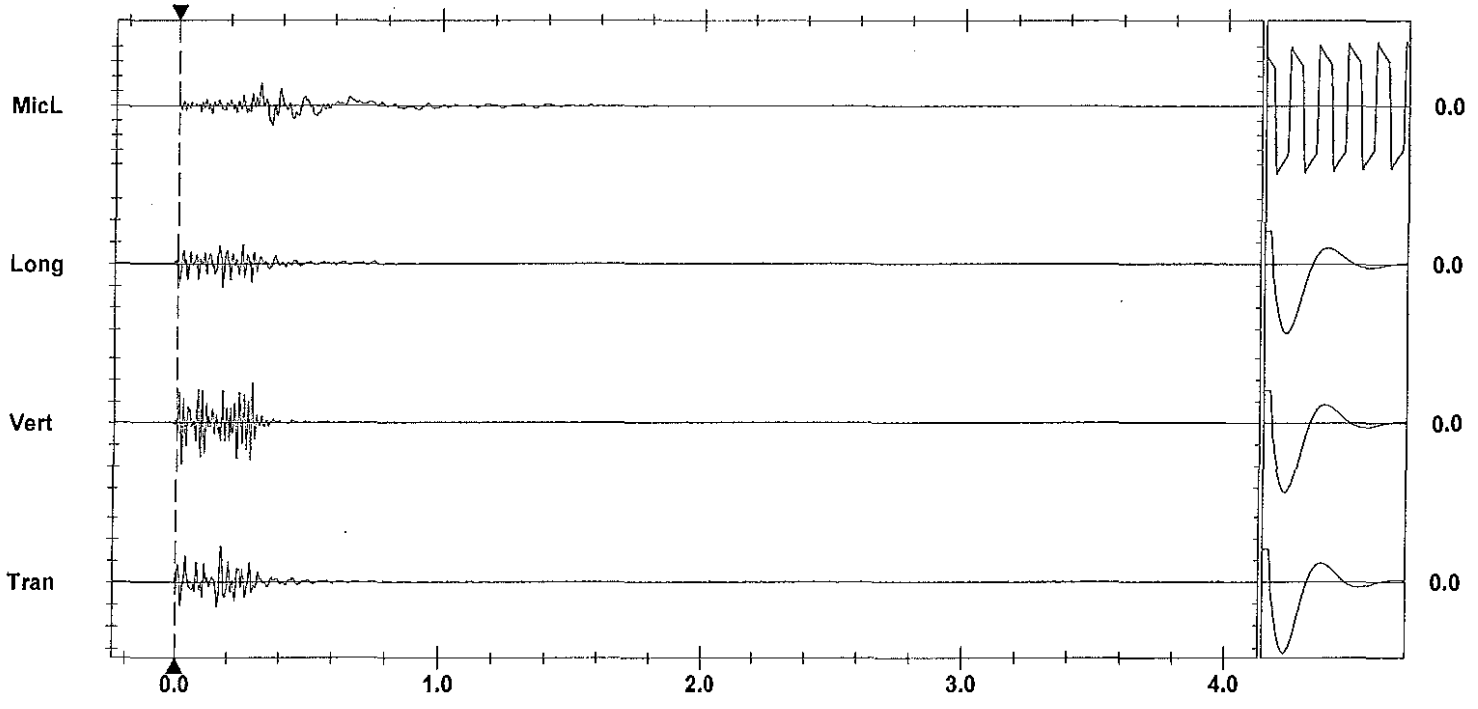
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00152 psi(L) at 0.318 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.165	0.190	0.105	in/s
ZC Freq	37	57	47	Hz
Time (Rel. to Trig)	0.176	0.019	0.173	sec
Peak Acceleration	0.106	0.199	0.133	g
Peak Displacement	0.00073	0.00050	0.00041	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.229 in/s at 0.177 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

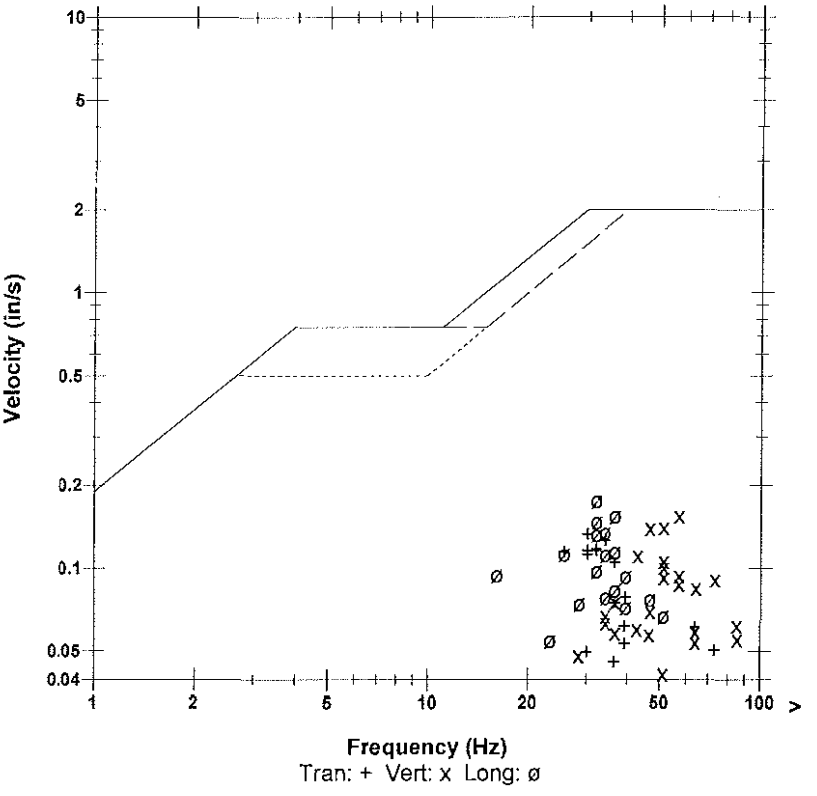
Date/Time	Vert at 11:11:45 February 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E61Z.3L0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

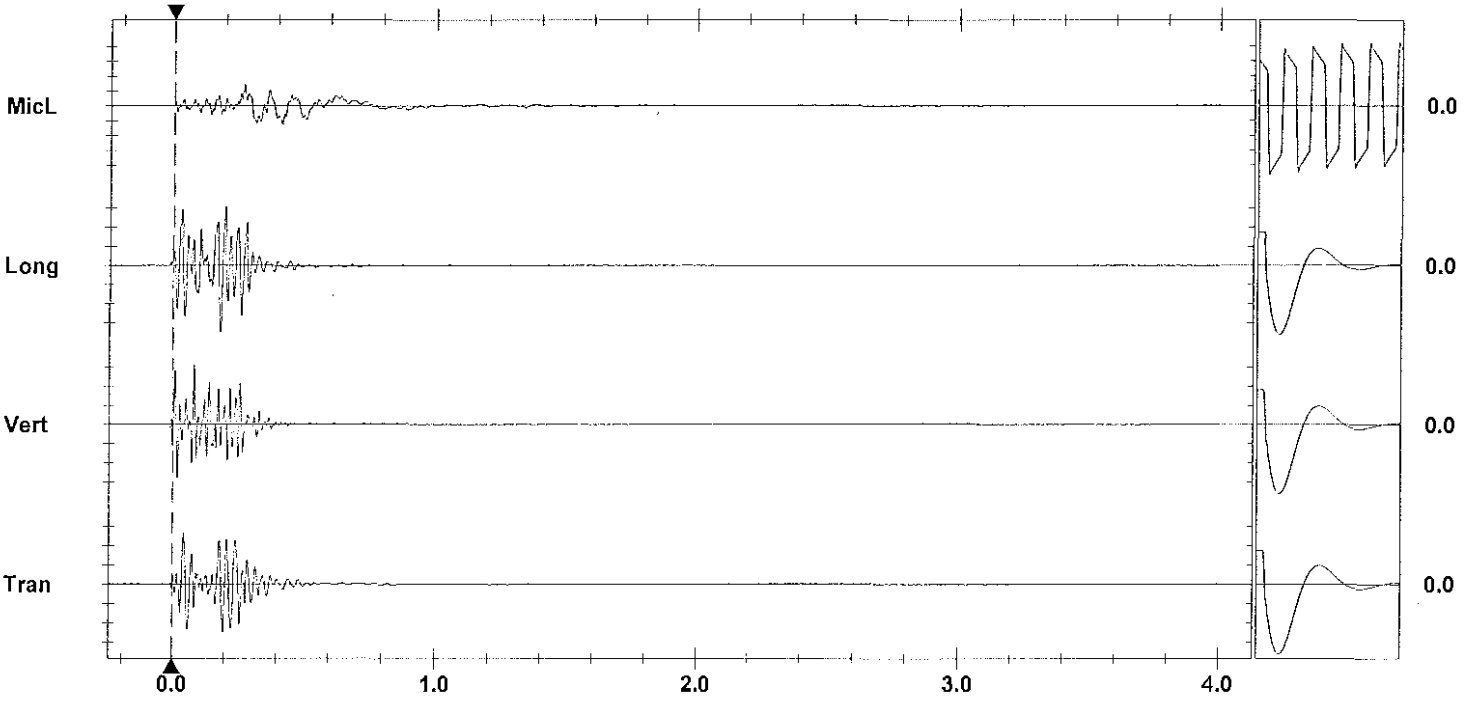
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00141 psi(L) at 0.271 sec			
ZC Freq	8.3 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 697 mv)			

	Tran	Vert	Long	
PPV	0.132	0.154	0.176	in/s
ZC Freq	30	57	32	Hz
Time (Rel. to Trig)	0.044	0.083	0.184	sec
Peak Acceleration	0.0812	0.131	0.108	g
Peak Displacement	0.00073	0.00042	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.210 in/s at 0.184 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James MacWhinney
BLASTER'S CERTIFICATE NUMBER 554643

DATE PREPARED Feb. 24/12
ACTUAL BLAST DATE Feb. 24/12
BLAST # MW-129 @ 14:05

HIGHWAY # 97
BLAST LOCATION AT: STN # 129+45 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 125 (m)

TOTAL NUMBER OF HOLES 8 B/L / 4 Buffer / 2 prod.
HOLE DIAMETER ~~165~~ (mm) 76mm
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
* Every 2nd B/L Hole LOADED with 200 grain Det cord.

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Anfo
TOTAL NUMBER OF CARTRIDGES ~~48~~ 14
TOTAL NUMBER OF DELAYS ~~48~~ 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 100 (kg)
DELAY TYPE AND LENGTH 25 +42 (ms)

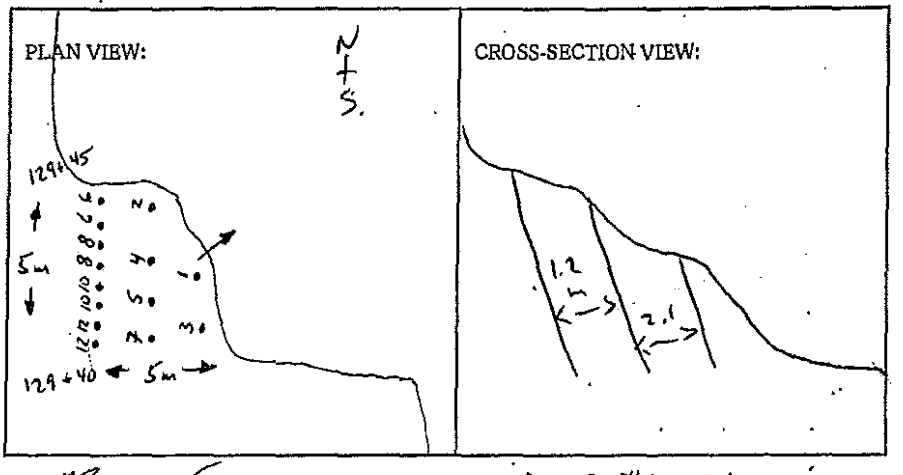
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ~~EBC initiation of Nonel system~~
BLASTING MACHINE: TYPE HB320 CAPACITY 85 CAPS.

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE James MacWhinney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

14 Electric def

2 - 2" x 16"

1 - Anfo

1 - WR.

Instantel

Event Report

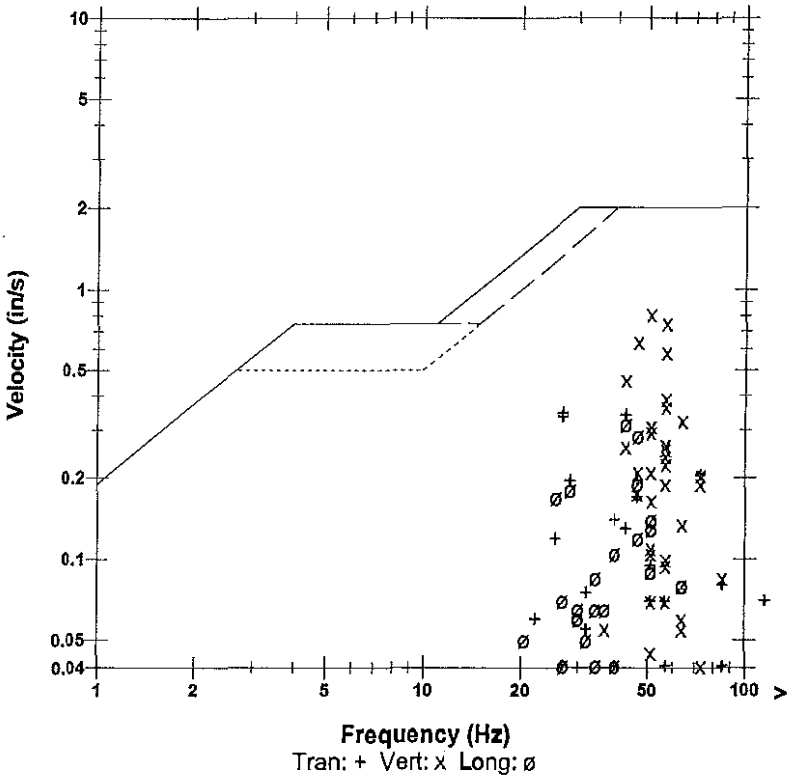
Date/Time	Vert at 14:01:46 February 24, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E626.YY0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

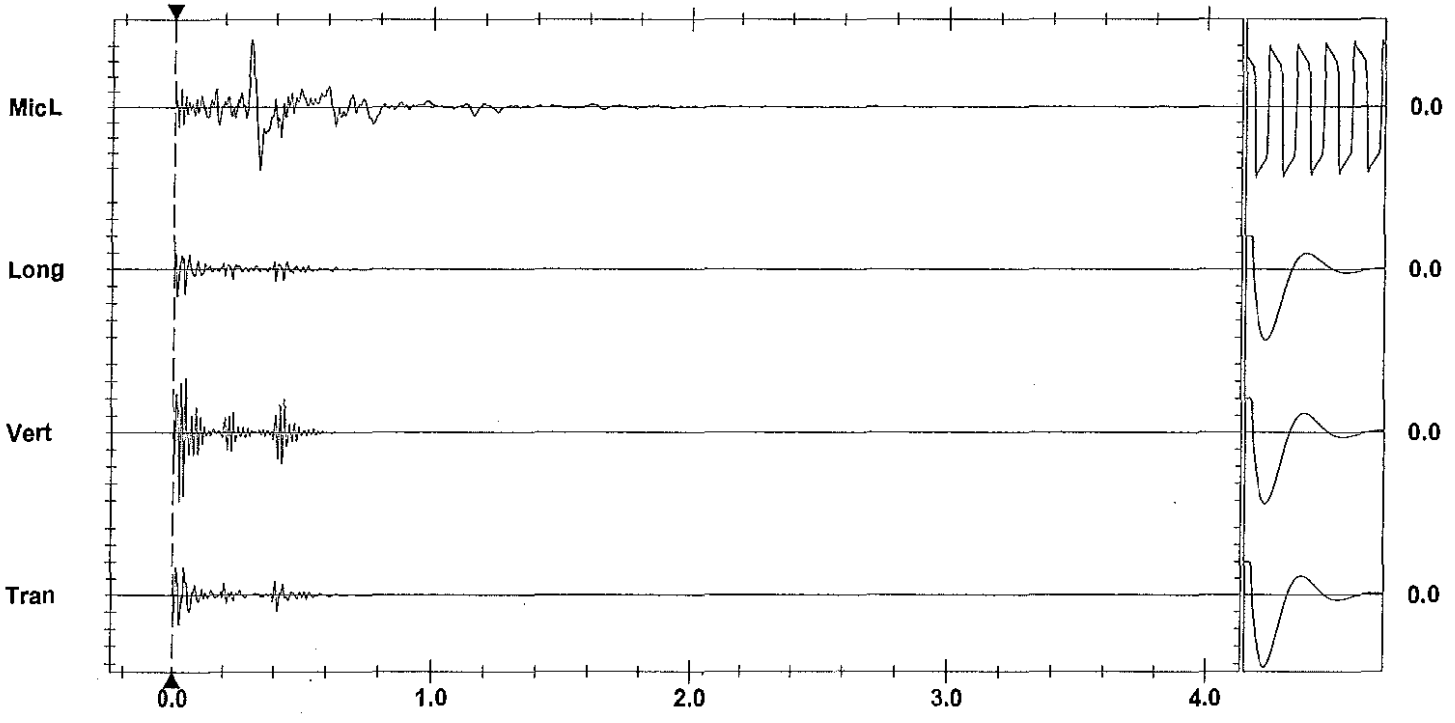
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00435 psi(L) at 0.302 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 705 mv)

	Tran	Vert	Long	
PPV	0.345	0.810	0.315	in/s
ZC Freq	27	51	43	Hz
Time (Rel. to Trig)	0.024	0.023	0.012	sec
Peak Acceleration	0.384	0.689	0.318	g
Peak Displacement	0.00166	0.00216	0.00109	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.879 In/s at 0.023 sec



Time Scale:0.20 sec/div **Amplitude Scale**Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: April 13, 2012 (V 8.01 - 8.01) Format Copyrighted 1999-2004 Instantel Inc.

Instantel

Event Report

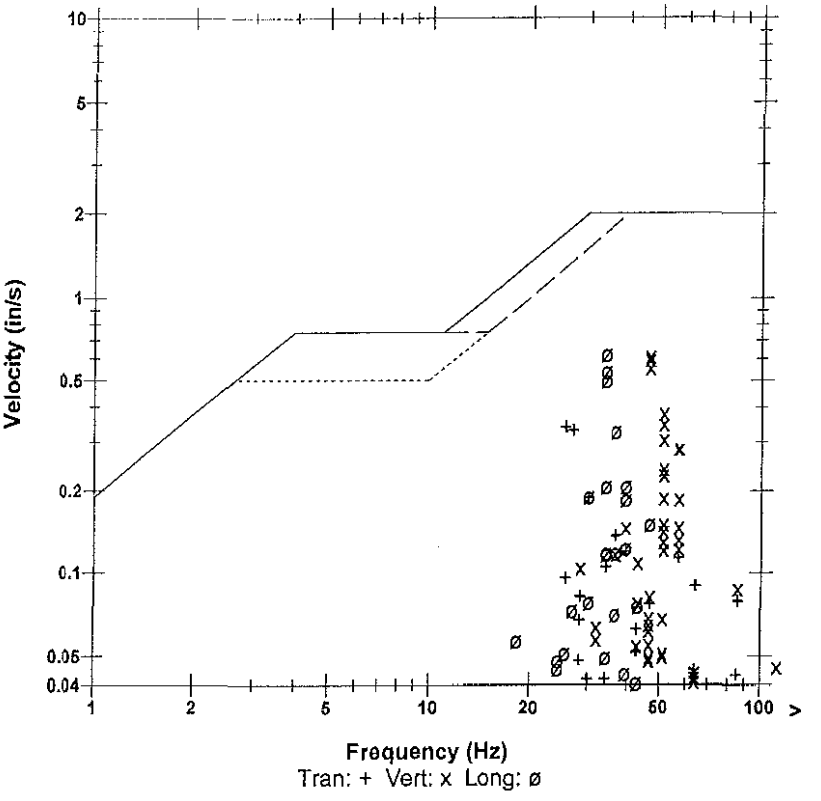
Date/Time	Vert at 14:01:53 February 24, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E626.Z50
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

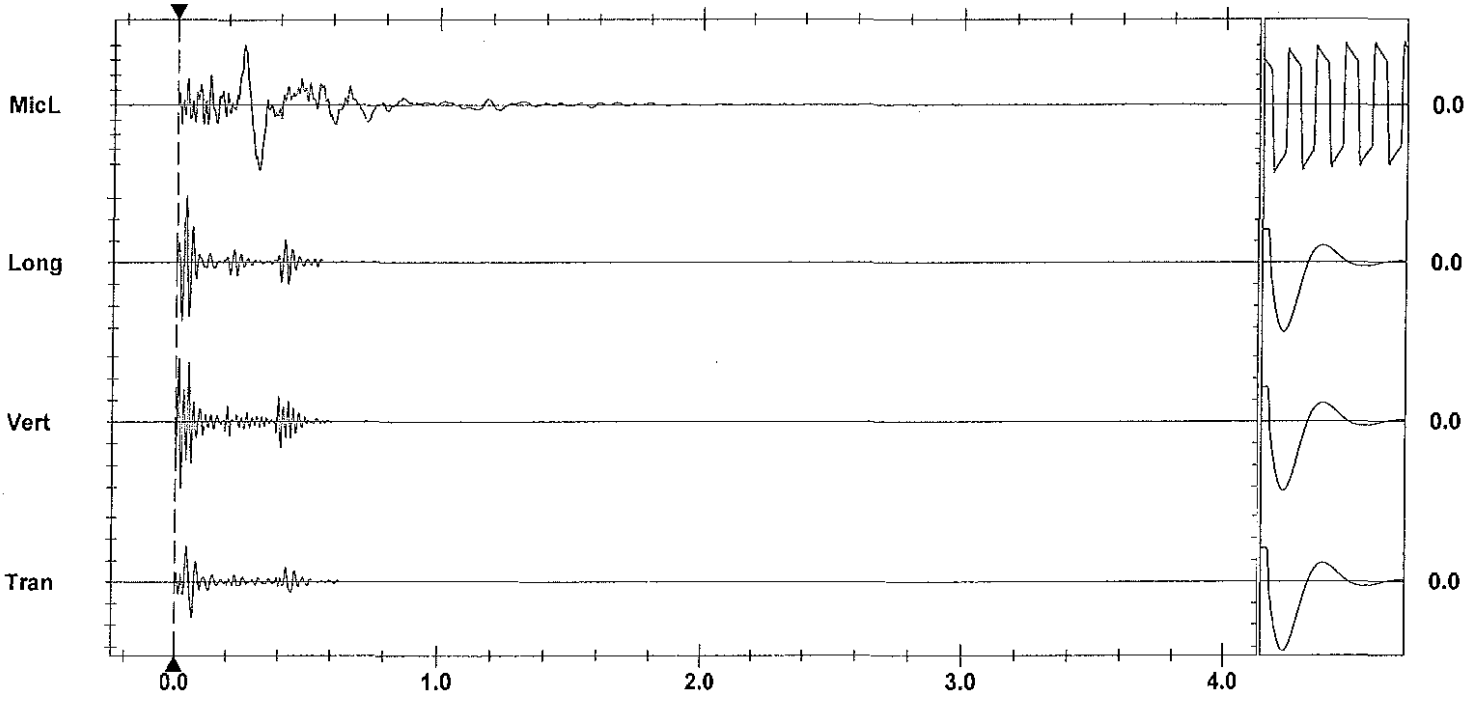
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00446 psi(L) at 0.317 sec
ZC Freq	8.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 705 mv)

	Tran	Vert	Long	
PPV	0.337	0.611	0.619	in/s
ZC Freq	26	47	34	Hz
Time (Rel. to Trig)	0.069	0.022	0.037	sec
Peak Acceleration	0.157	0.638	0.343	g
Peak Displacement	0.00197	0.00195	0.00281	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.811 in/s at 0.022 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: March 2, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VESSEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 27/12
ACTUAL BLAST DATE FEB 27/12 3:15 PM
BLAST # MW-0130

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 - 129+45

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ANDESITE GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 95 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

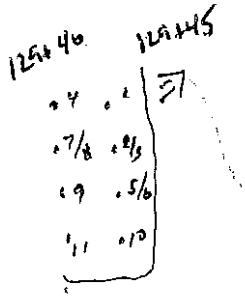
VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

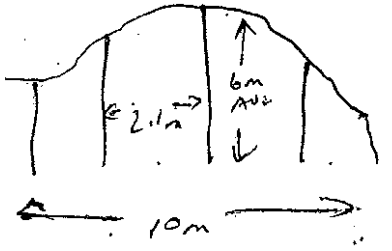
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vessey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 1367 Cliffston Crt - 0.066 ips / 43Hz
" @ 1117 Cliffston Crt - 0.121 ips / 39Hz

REV

BOTTOM DECKS - 4'-6' AND
TOP DECKS - 2'-4' AND } PRIMED W/ 1 COAT 1X8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 15:15:58 February 27, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E67U.EM0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

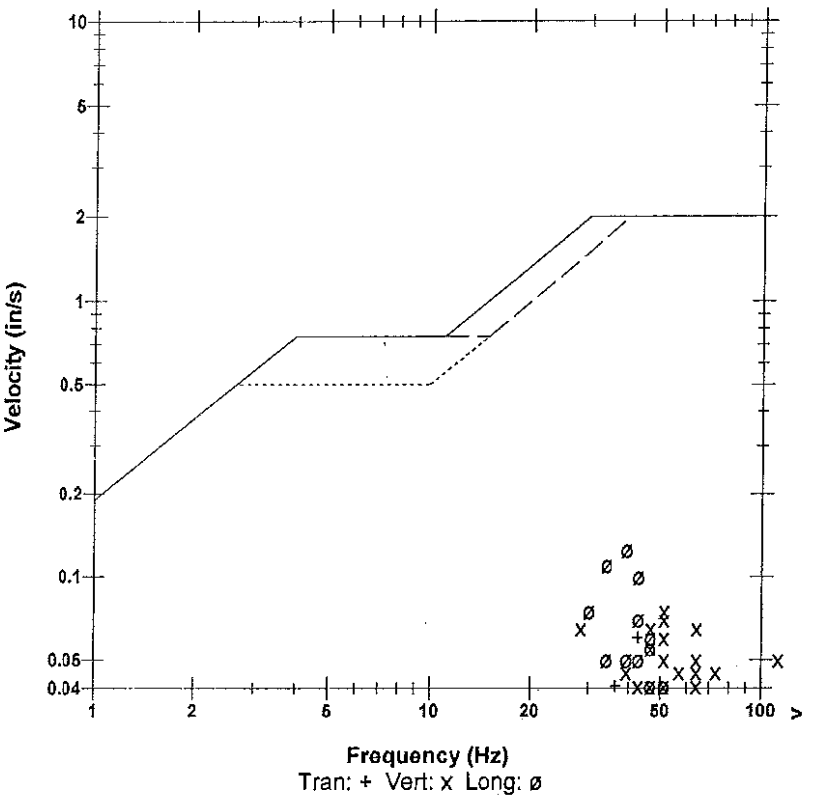
Extended Notes
Blast at stn 128

Post Event Notes

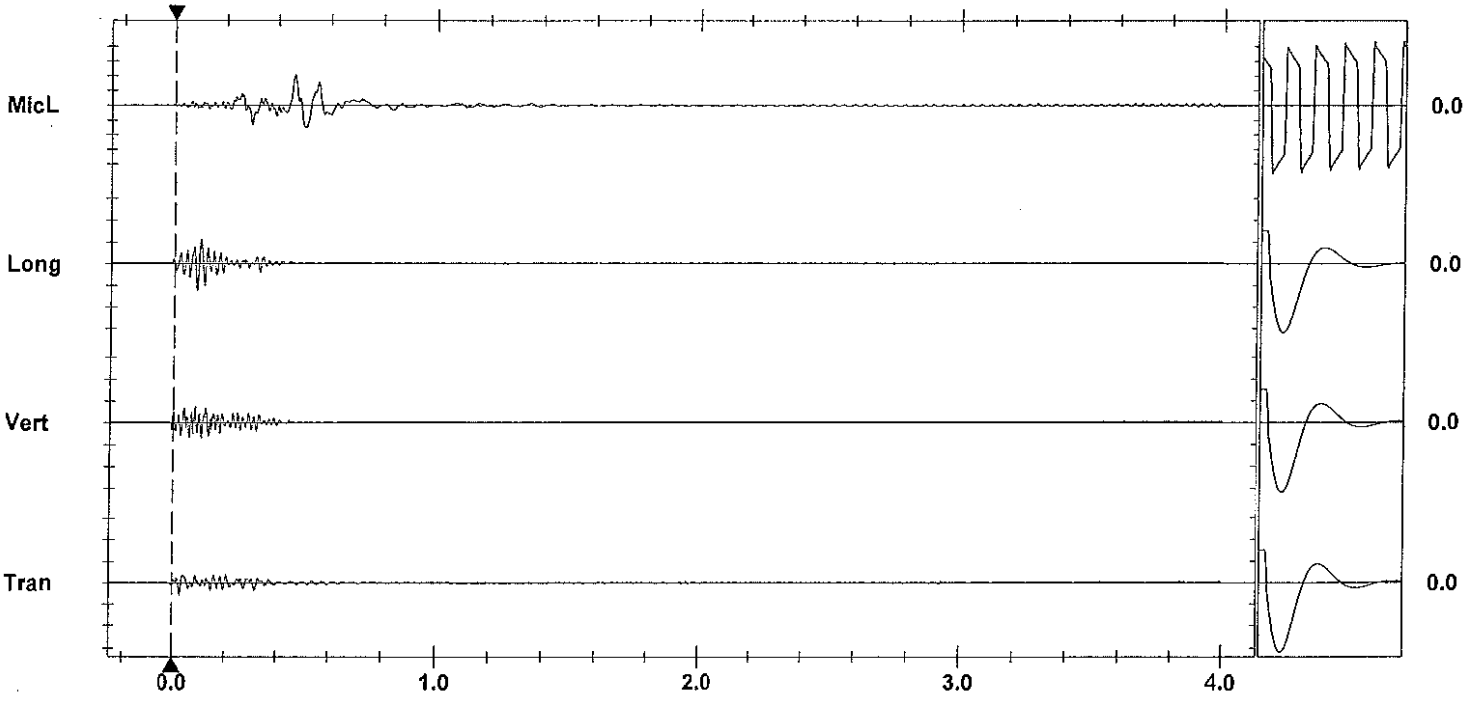
Microphone Linear Weighting
PSPL 0.00203 psi(L) at 0.463 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 695 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0750	0.125	in/s
ZC Freq	43	51	39	Hz
Time (Rel. to Trig)	0.030	0.086	0.088	sec
Peak Acceleration	0.0398	0.106	0.0795	g
Peak Displacement	0.00026	0.00032	0.00053	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.6	7.2	Hz
Overswing Ratio	3.8	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.132 in/s at 0.088 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 15:16:08 February 27, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E67U.EW0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

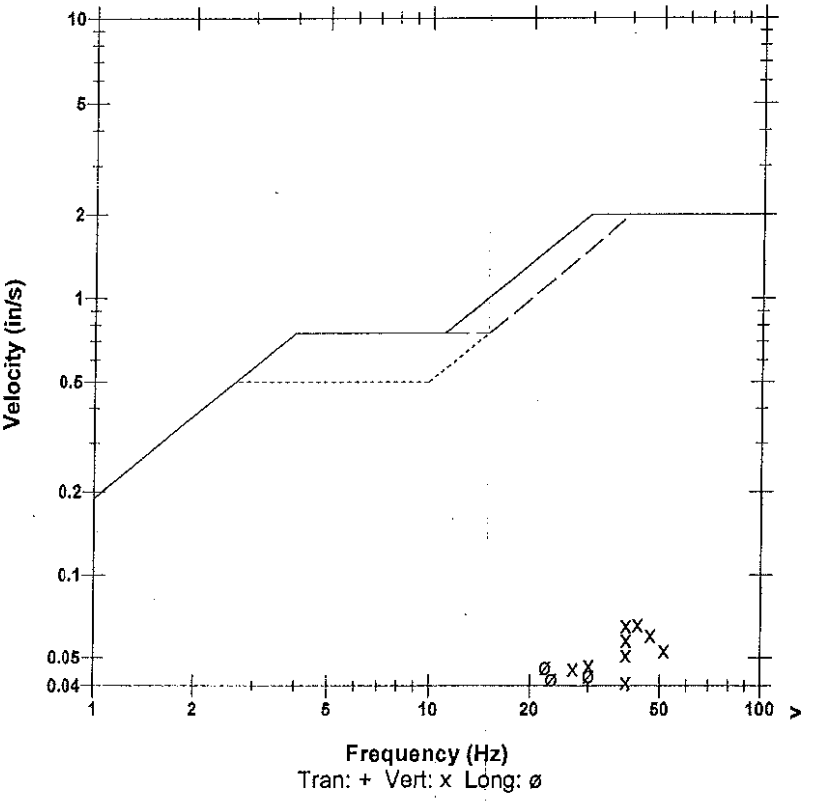
Post Event Notes

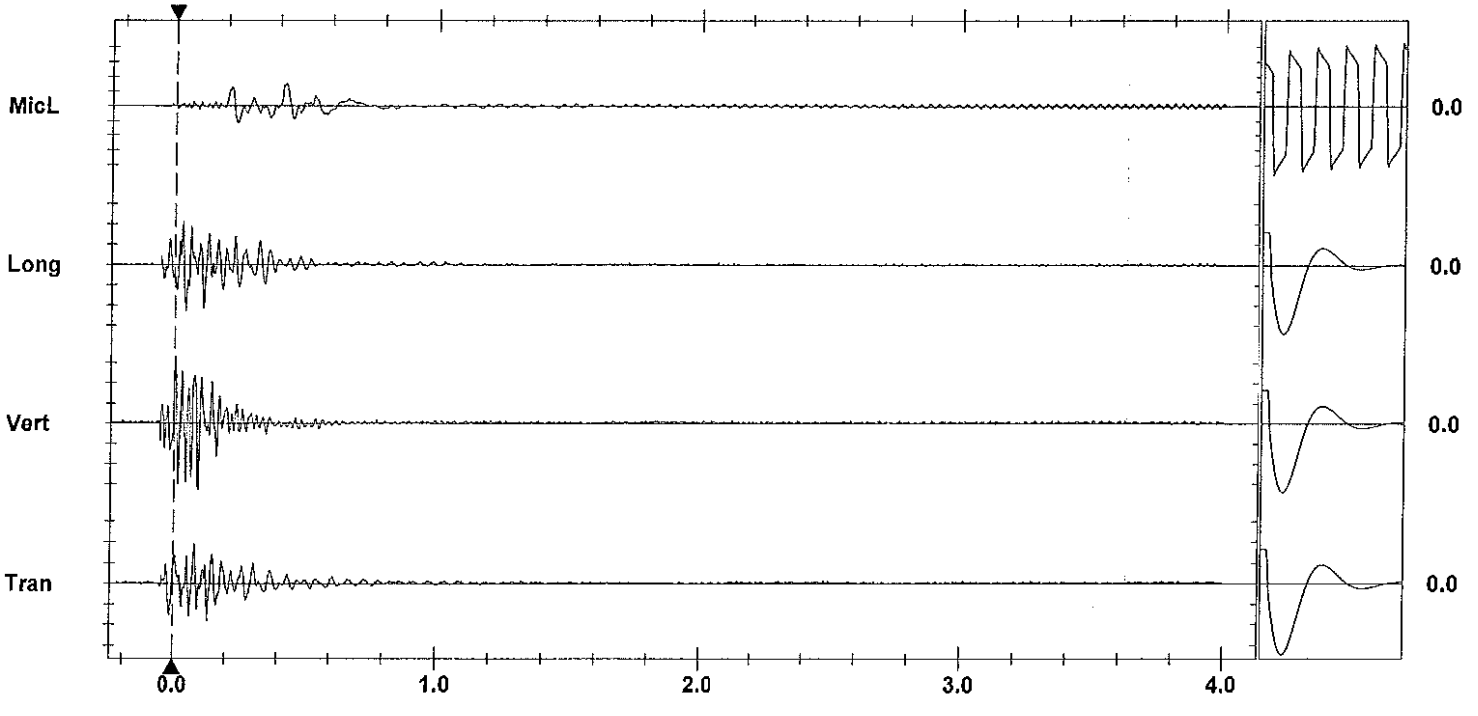
Microphone Linear Weighting
PSPL 0.00152 psi(L) at 0.424 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 753 mv)

	Tran	Vert	Long	
PPV	0.0375	0.0662	0.0462	in/s
ZC Freq	28	43	22	Hz
Time (Rel. to Trig)	0.082	0.094	0.043	sec
Peak Acceleration	0.0265	0.0663	0.0331	g
Peak Displacement	0.00020	0.00030	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0734 in/s at 0.004 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶—— —— ——◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED FEB 29/12
ACTUAL BLAST DATE FEB 29/12
BLAST # MW-0131 11:14 AM

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 66 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 4400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

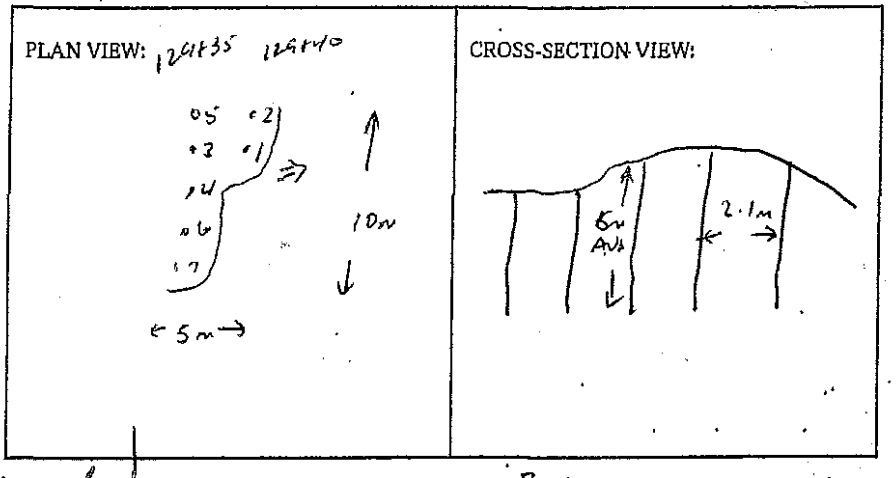
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffster Cnt - 0.052 ips / 51Hz
" 13117 Cliffster Cnt - 0.121 ips / 39Hz

QCV.

4'-5' ANGLE/ITEM + 0.5 CAULK 2"x16" DYNAMIC Primer

Instantel

Event Report

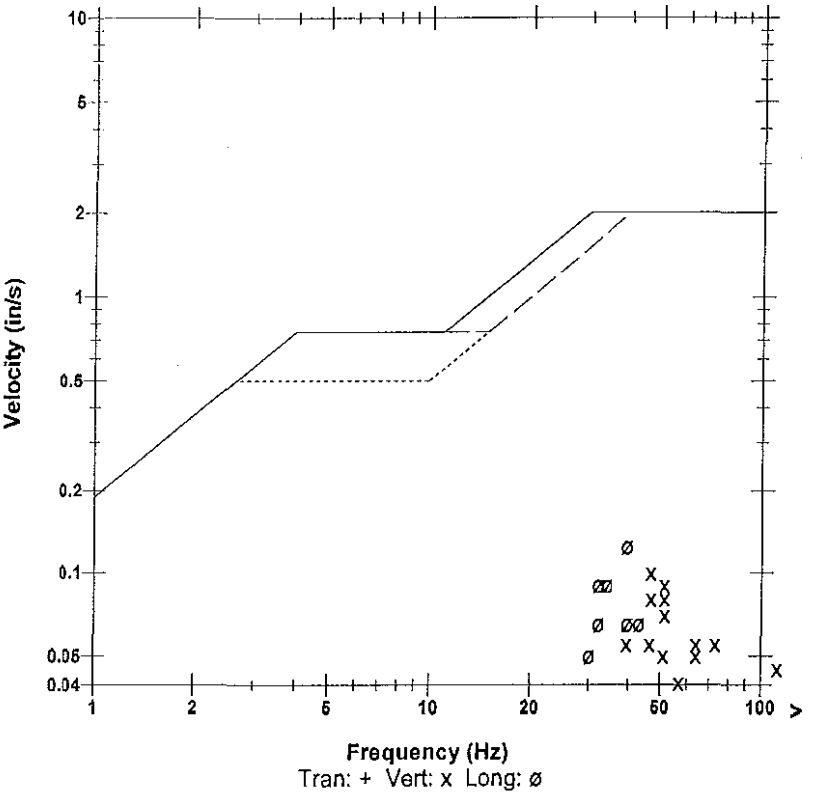
Date/Time	Vert at 11:14:54 February 29, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6B8.KU0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

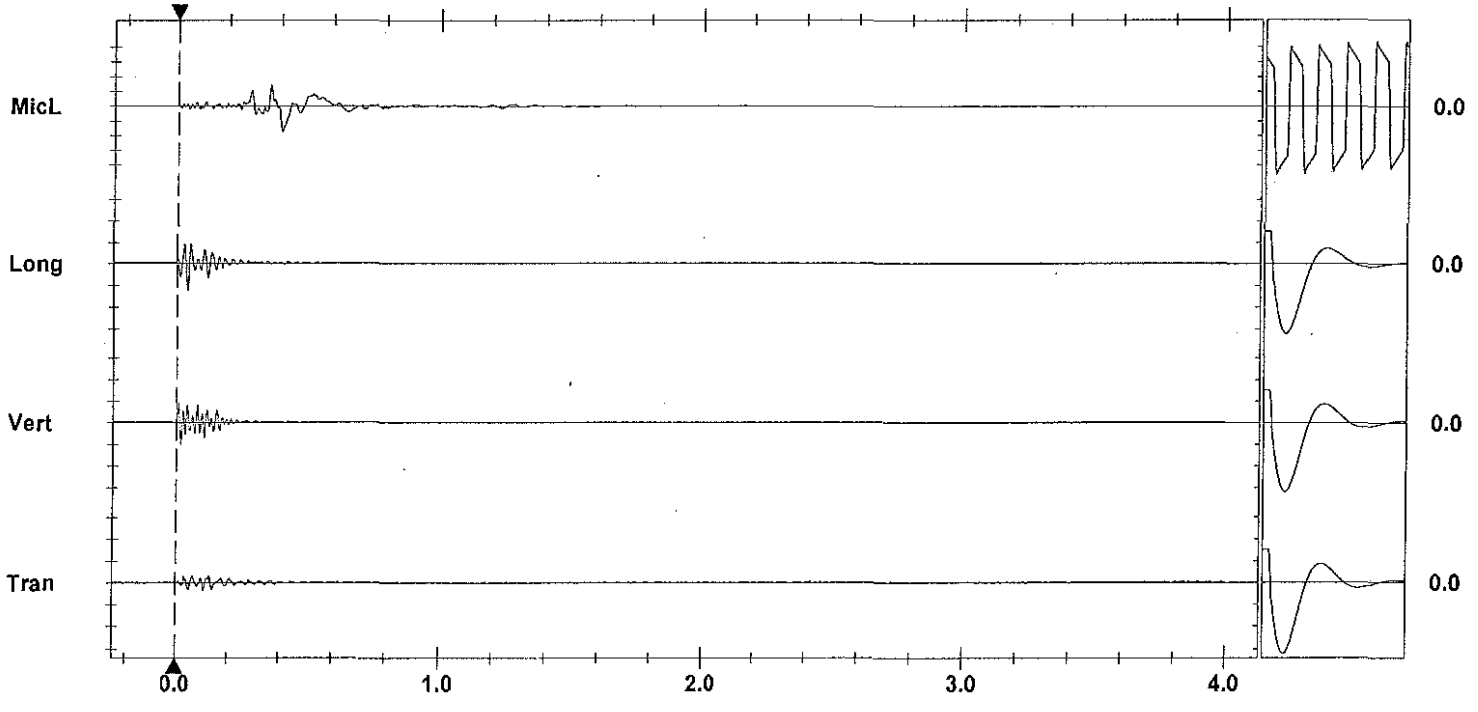
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00178 psi(L) at 0.403 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 696 mv)

	Tran	Vert	Long	
PPV	0.0350	0.1000	0.125	in/s
ZC Freq	47	47	39	Hz
Time (Rel. to Trig)	0.110	0.018	0.042	sec
Peak Acceleration	0.0398	0.106	0.0928	g
Peak Displacement	0.00021	0.00030	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.146 in/s at 0.043 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— —— ——◀

Sensorcheck

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Event Report

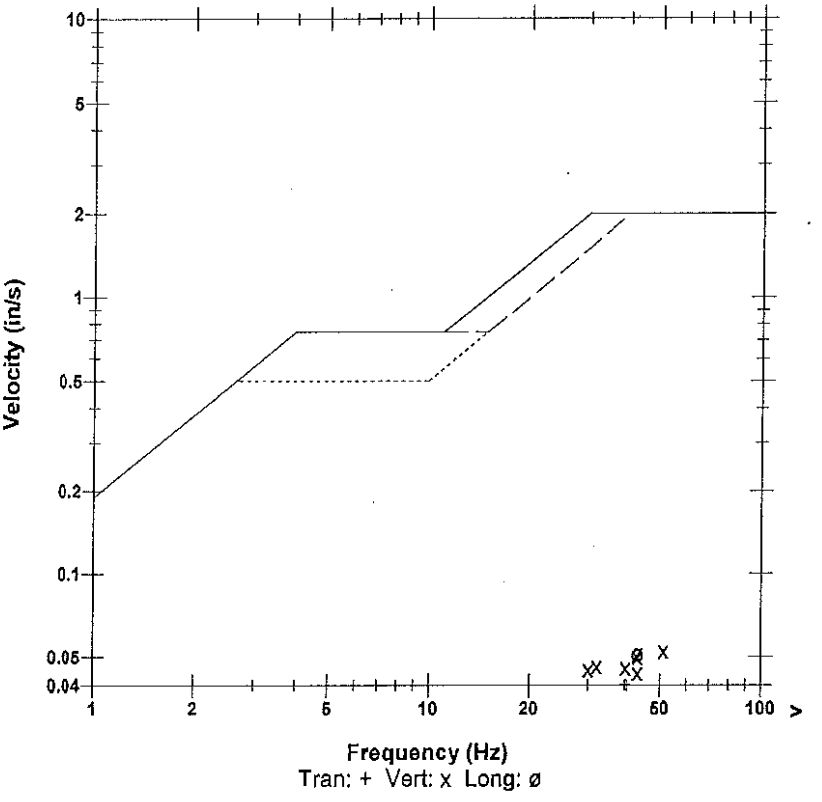
Date/Time	Vert at 11:15:05 February 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6B8.L50
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

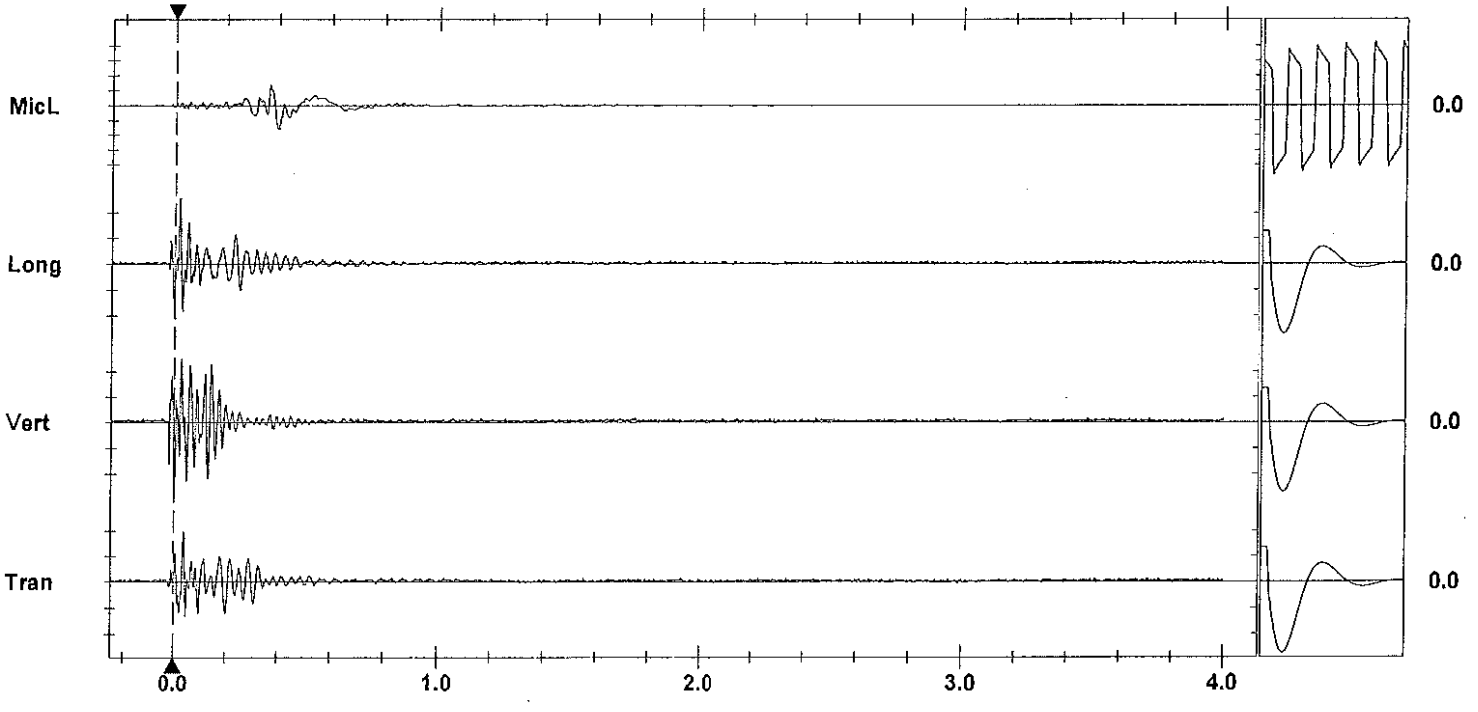
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00160 psi(L) at 0.396 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.0394	0.0525	0.0512	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.041	0.003	0.019	sec
Peak Acceleration	0.0381	0.0597	0.0331	g
Peak Displacement	0.00016	0.00022	0.00018	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0601 in/s at 0.028 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: March 3, 2012 0(8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorosy
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 29/12
ACTUAL BLAST DATE FEB 29/12 12:54 PM
BLAST # MW-0132

HIGHWAY# 97
BLAST LOCATION AT: STN 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Massive Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 22.5 (m)

TOTAL NUMBER OF HOLES 3
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Blaster
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

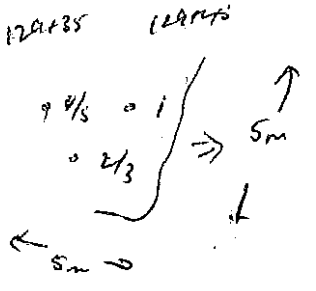
VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

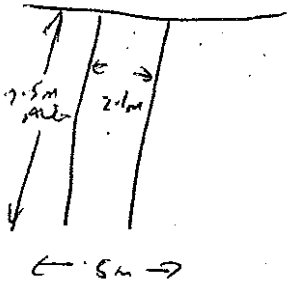
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cl: Adjacent cut - 0.12 ips/ 32mm @ CW
@ 13117 Cl: Adjacent cut - 0.21 ips/ 37mm

BOTTOM DECKS - 3-4 CART 2"X6" BLASTEX

TOP DECKS - 2-3 CART 2"X6" BLASTEX

PRIMED W/ 0.5 CART 2"X6" DYNAMITE

Instantel

Event Report

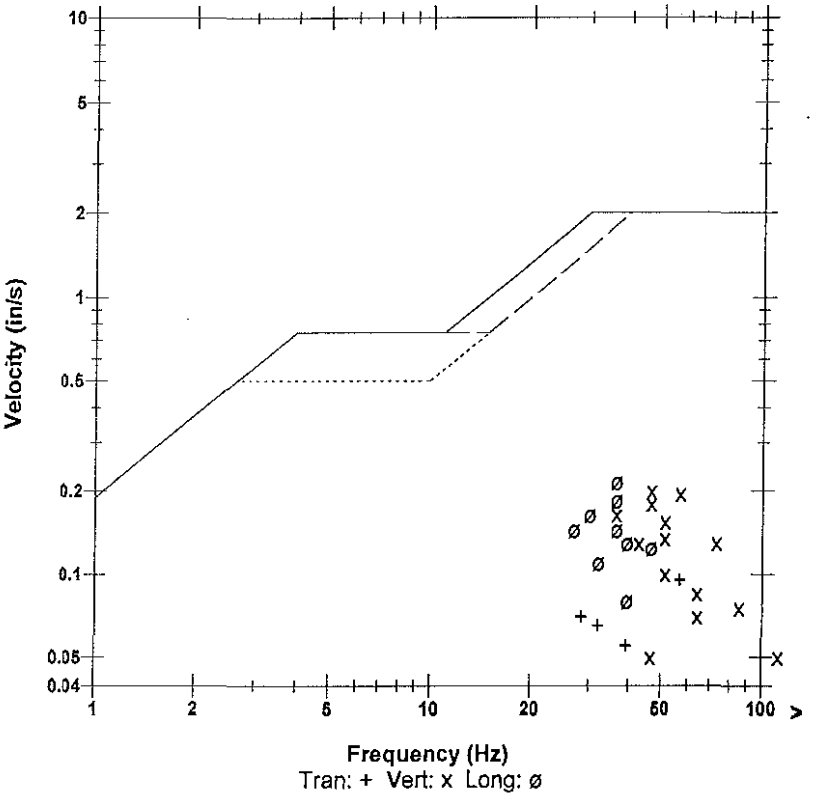
Date/Time	Vert at 12:54:33 February 29, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6BD.6X0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

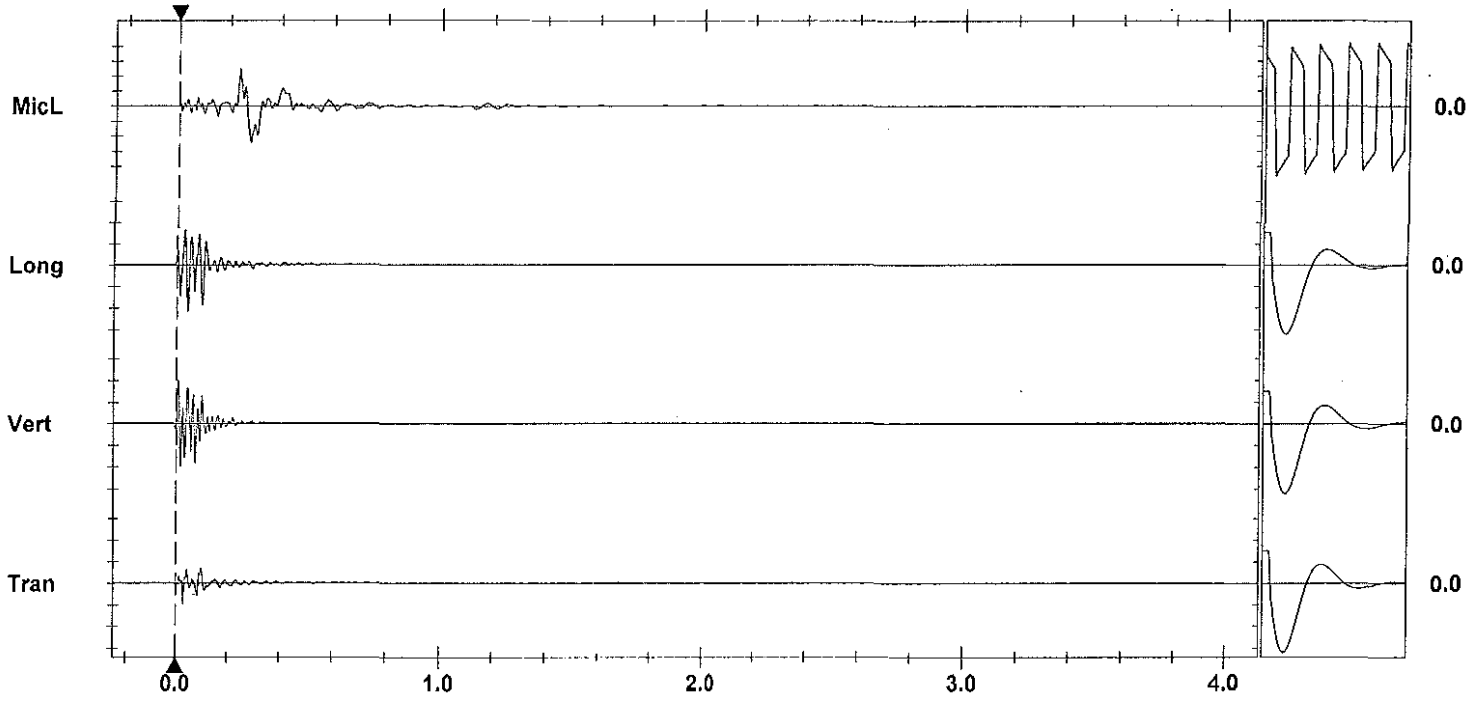
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0950	0.200	0.215	in/s
ZC Freq	57	47	37	Hz
Time (Rel. to Trig)	0.030	0.007	0.044	sec
Peak Acceleration	0.0795	0.265	0.133	g
Peak Displacement	0.00039	0.00071	0.00090	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00247 psi(L) at 0.236 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 714 mv)

Peak Vector Sum 0.279 in/s at 0.045 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

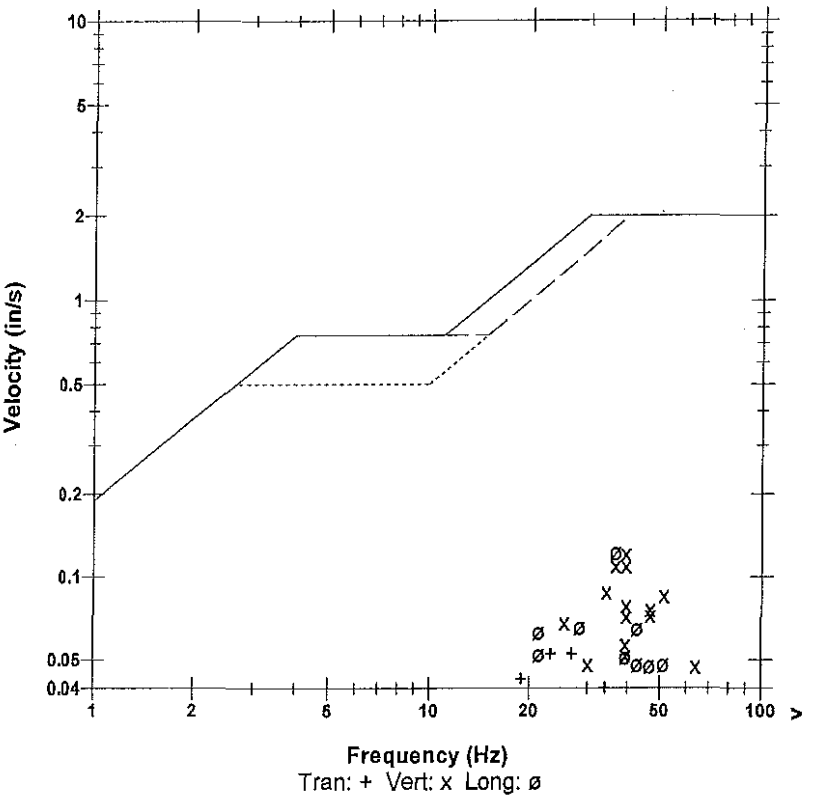
Date/Time	Vert at 12:54:44 February 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps.	**File Name**	O960E6BD.780
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

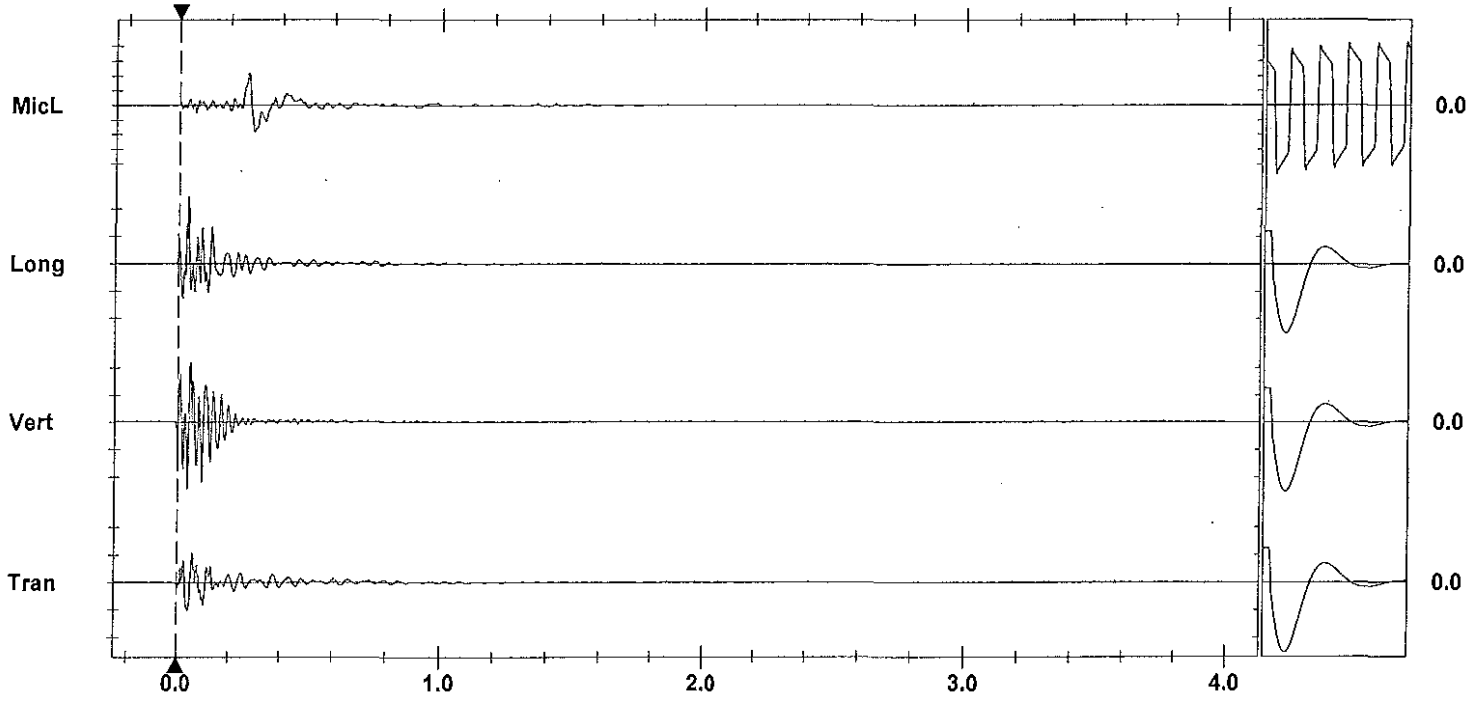
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00218 psi(L) at 0.269 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 717 mv)

	Tran	Vert	Long	
PPV	0.0525	0.121	0.122	in/s
ZC Freq	23	39	37	Hz
Time (Rel. to Trig)	0.043	0.040	0.039	sec
Peak Acceleration	0.0464	0.159	0.0679	g
Peak Displacement	0.00039	0.00046	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.174 in/s at 0.040 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 2, 2012 (V 8.04 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 29/12
ACTUAL BLAST DATE FEB 29/12 2:23 PM
BLAST # MW-0133

HIGHWAY# 97
BLAST LOCATION AT: STN 129+27 – 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

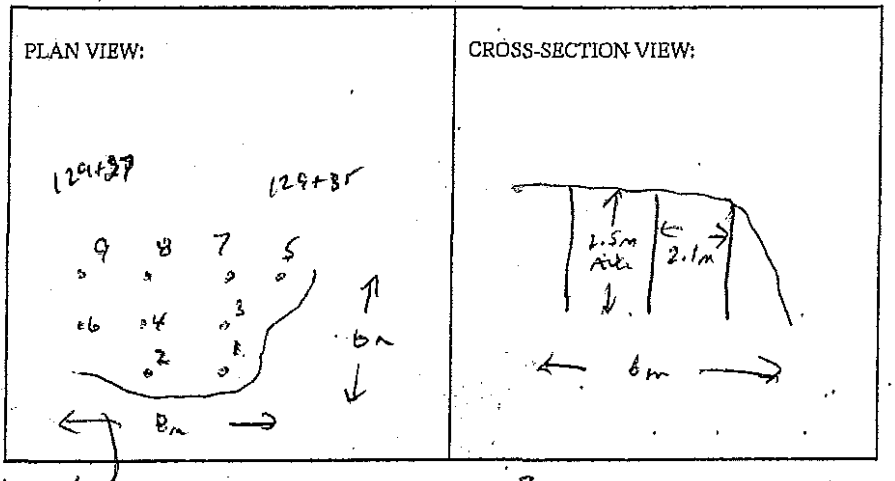
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 95 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

QCV

Seismograph @ 13167 Cliffstone Crt 0.046 ips/ 37 Hz
" @ 13117 Cliffstone Crt. 0.095 ips/ 51 Hz

2'-2.5' ANFO/Hole Primed w/ 1 Each 1x8" Dynamite

Instantel®

Event Report

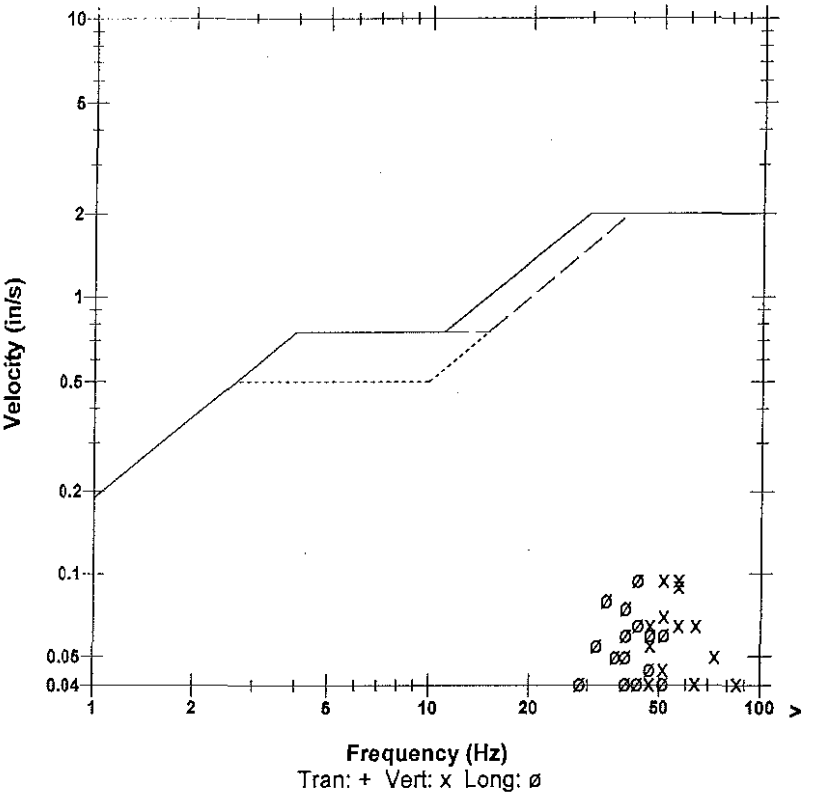
Date/Time	Vert at 14:23:48 February 29, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6BH.BO0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

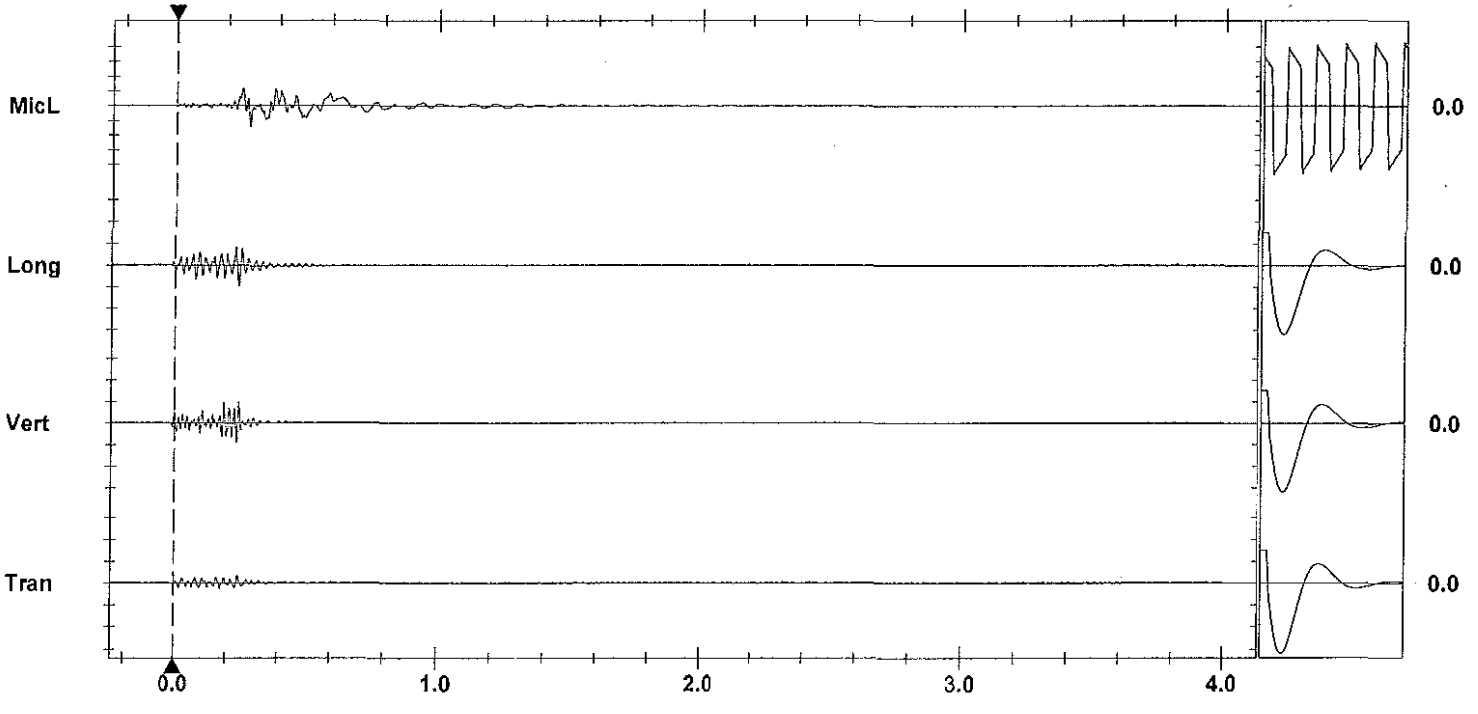
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0350	0.0950	0.0950	in/s
ZC Freq	43	51	43	Hz
Time (Rel. to Trig)	0.248	0.191	0.248	sec
Peak Acceleration	0.0265	0.106	0.0663	g
Peak Displacement	0.00013	0.00028	0.00036	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Microphone Linear Weighting
PSPL 0.00145 psi(L) at 0.285 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 659 mv)

Peak Vector Sum 0.135 in/s at 0.249 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

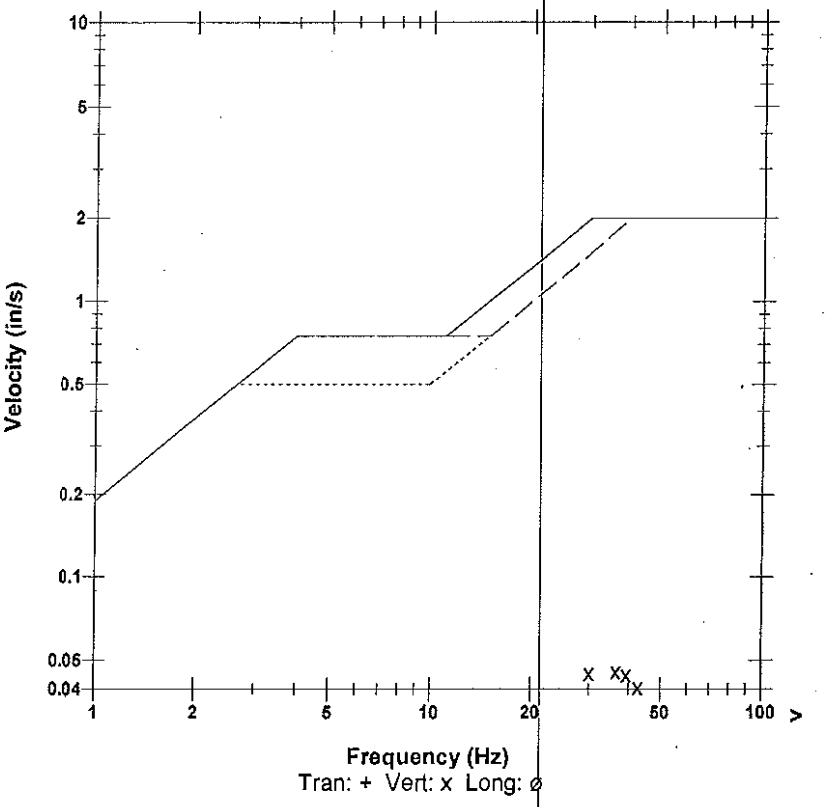
Date/Time	Vert at 14:23:59 February 29, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6BH.BZ0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

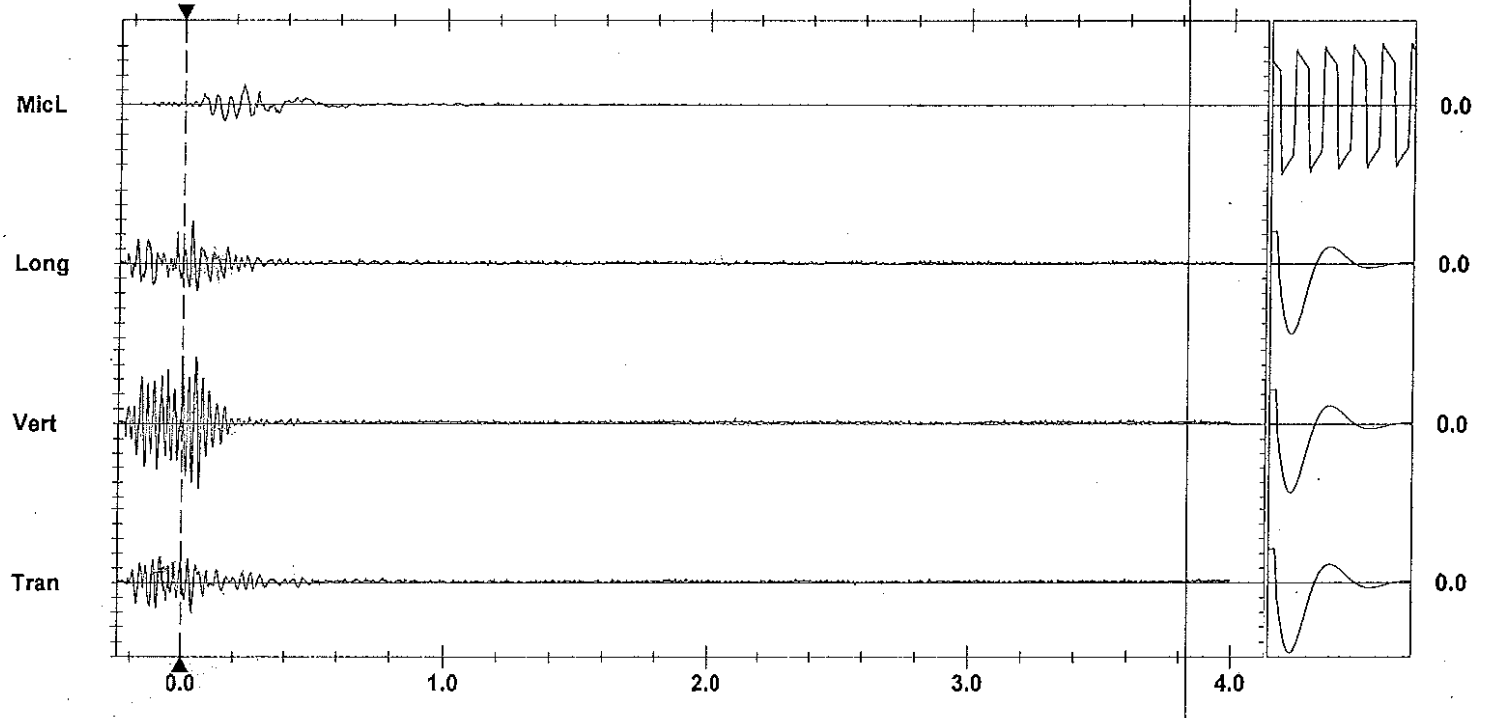


Tran: + Vert: x Long: ø

Microphone	Linear Weighting
PSPL	0.00138 psi(L) at 0.229 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 725 mv)

	Tran	Vert	Long	
PPV	0.0206	0.0456	0.0287	in/s
ZC Freq	34	37	30	Hz
Time (Rel. to Trig)	0.042	0.000	0.034	sec
Peak Acceleration	0.0182	0.0497	0.0182	g
Peak Displacement	0.00010	0.00022	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0494 in/s at 0.055 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div

Sensorcheck

Trigger

Printed: March 2, 2012 07:8.01 - 8.04) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vearsley
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 11:02 AM
BLAST # M.W.-0134

HIGHWAY# 97
BLAST LOCATION AT: SW 129+40 - 129+50 (High Slabs)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

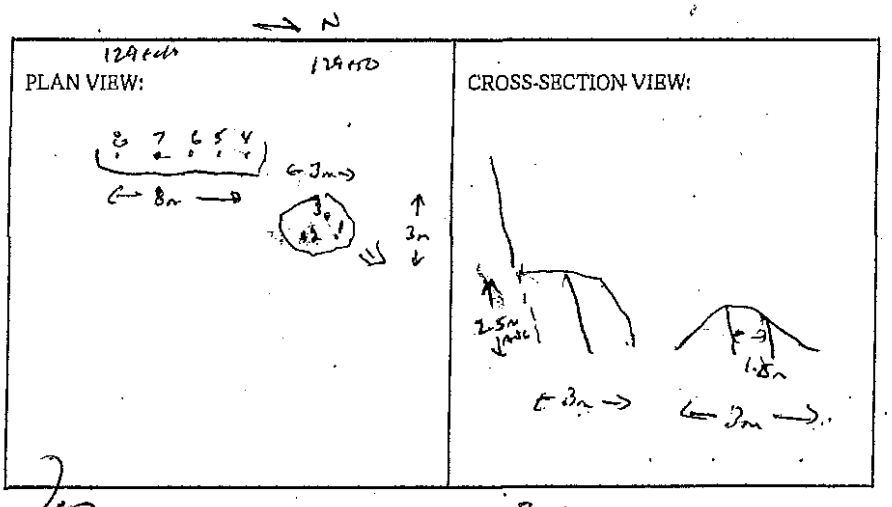
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HG320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED High Slabs (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vearsley COMPANY Sierra Drilling + Blasting Inc

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.092 ips | 47 Hz
@ 13117 Cliffstone Cut - 0.171 ips | 43 Hz

2'-3' auger/hole @ 1 cart 1"x8" dynamic primer

Instantel

Event Report

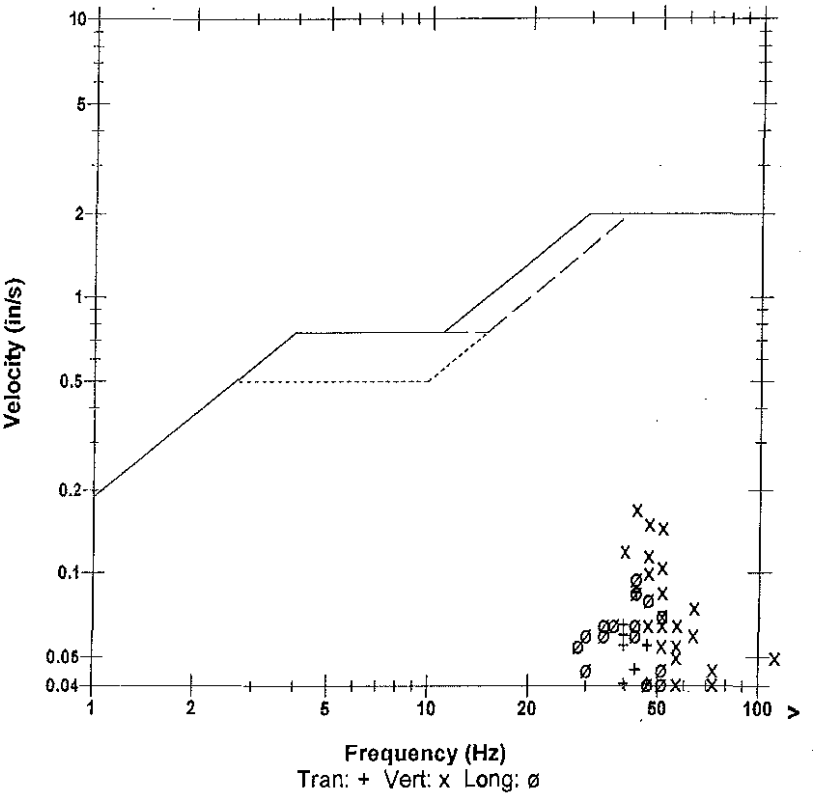
Date/Time	Vert at 11:02:24 March 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6D2.O00

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

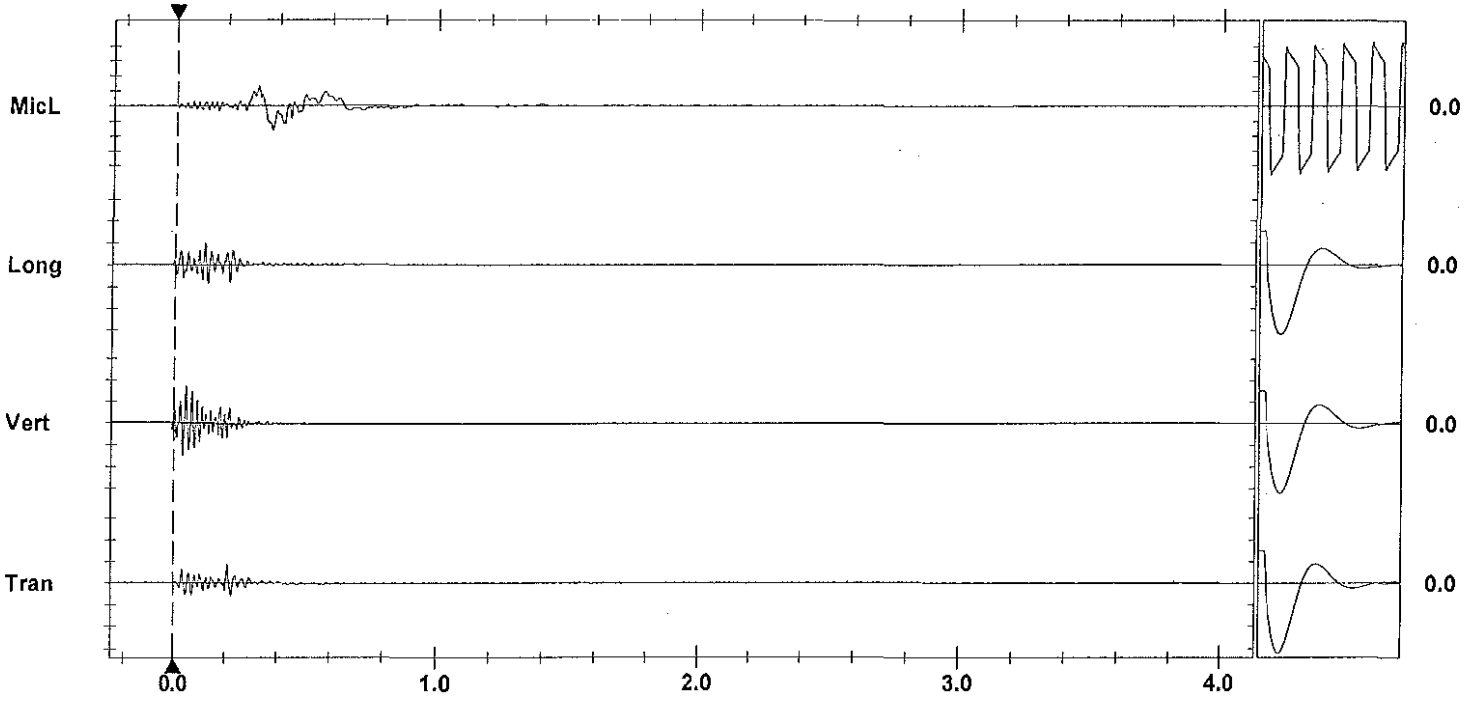
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00163 psi(L) at 0.371 sec
ZC Freq	5.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 676 mv)

	Tran	Vert	Long	
PPV	0.0850	0.170	0.0950	in/s
ZC Freq	43	43	43	Hz
Time (Rel. to Trig)	0.211	0.047	0.116	sec
Peak Acceleration	0.0663	0.146	0.0795	g
Peak Displacement	0.00030	0.00057	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.178 in/s at 0.047 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: March 2, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

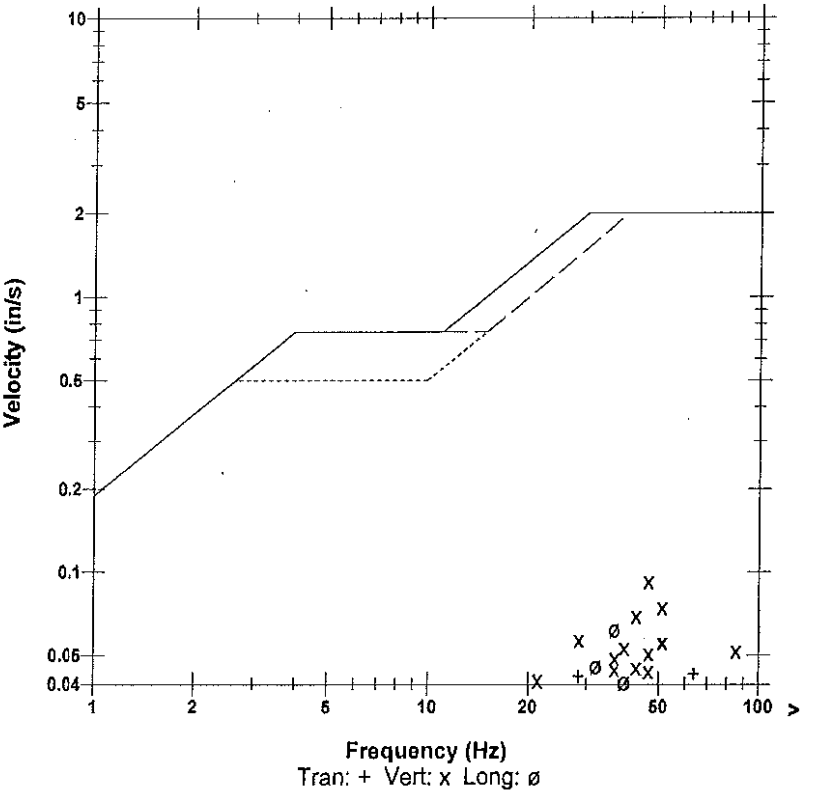
Date/Time	Vert at 11:02:35 March 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6D2.OB0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

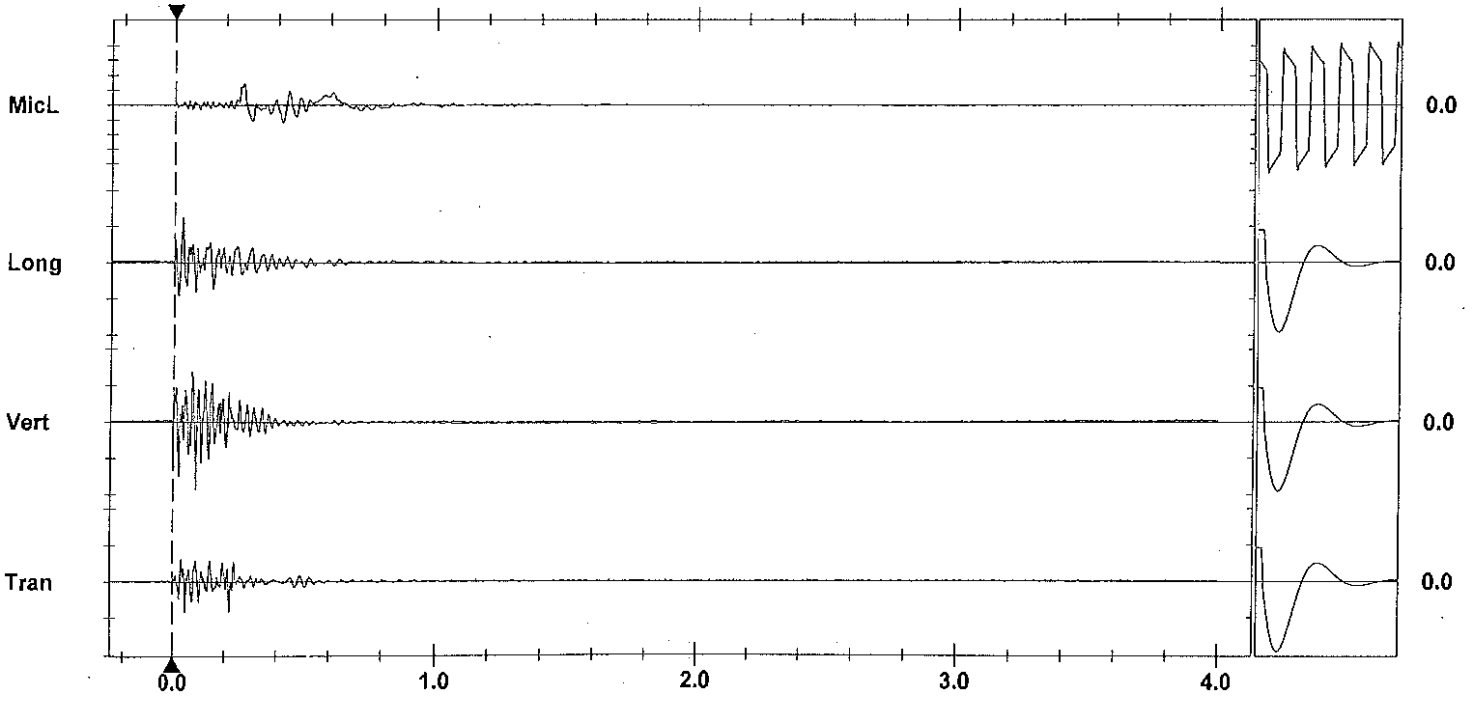
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.268 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 688 mv)

	Tran	Vert	Long	
PPV	0.0425	0.0925	0.0619	in/s
ZC Freq	64	47	37	Hz
Time (Rel. to Trig)	0.051	0.091	0.034	sec
Peak Acceleration	0.0431	0.128	0.0497	g
Peak Displacement	0.00016	0.00027	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0948 in/s at 0.091 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 1:08 PM
BLAST # MW-0135

HIGHWAY# 97
BLAST LOCATION AT: S+N 129+35 - 129+40 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 1 Prod/2 Stab/Buffer 5 61/
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: * 200 grain cord + 2" Dynamite in B/I 50mm x 40cm Blasted in Buffer

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

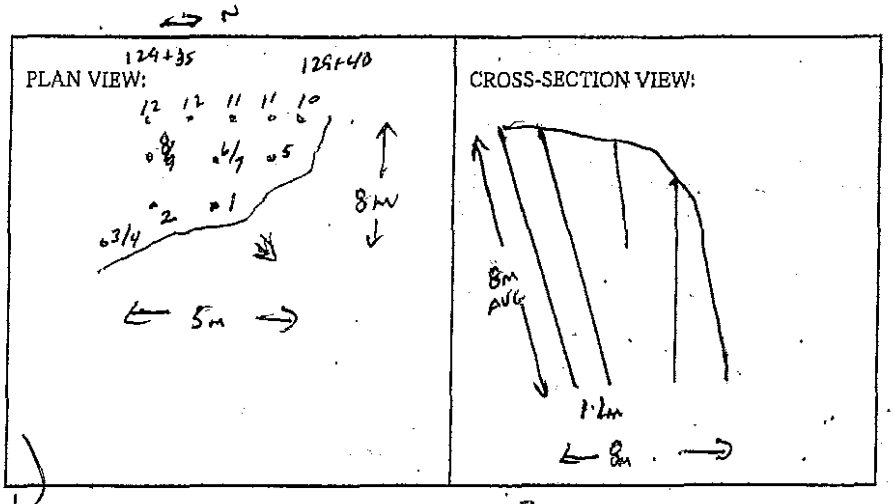
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt 0.15 ips/ 43Hz
" @ 13117 Cliffstone Crt 0.19 ips/ 43Hz

PROD HOLES – BOTTOM DECK – 5' ANFO

TOP DECK – 2.5' ANFO

STAB HOLES – 1.5' ANFO / HOLE

BUFFER HOLES – BOTTOM DECKS – 4–5 CART 2"x16" BLASTEX

– TOP DECKS – 2–3 CART 2"x16" BLASTEX

ALL ABOVE PRIMED W/ 1 CART 1"x8" DYNAMITE

B/L HOLES – 1 CART 2"x16" DYNAMITE + 200gr det cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 13:08:18 March 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6D8.HU0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

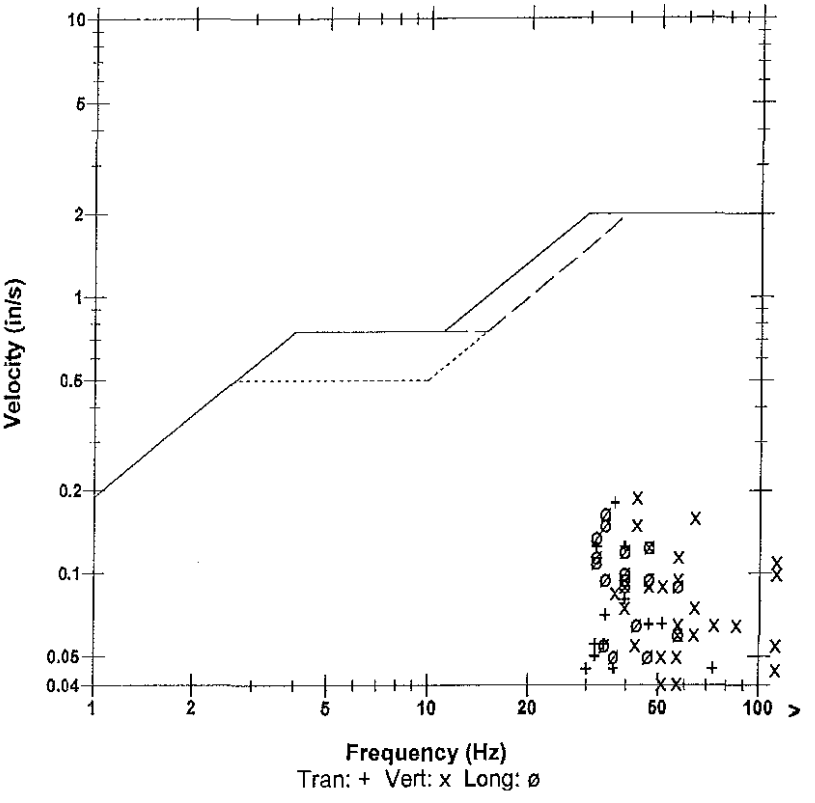
Post Event Notes

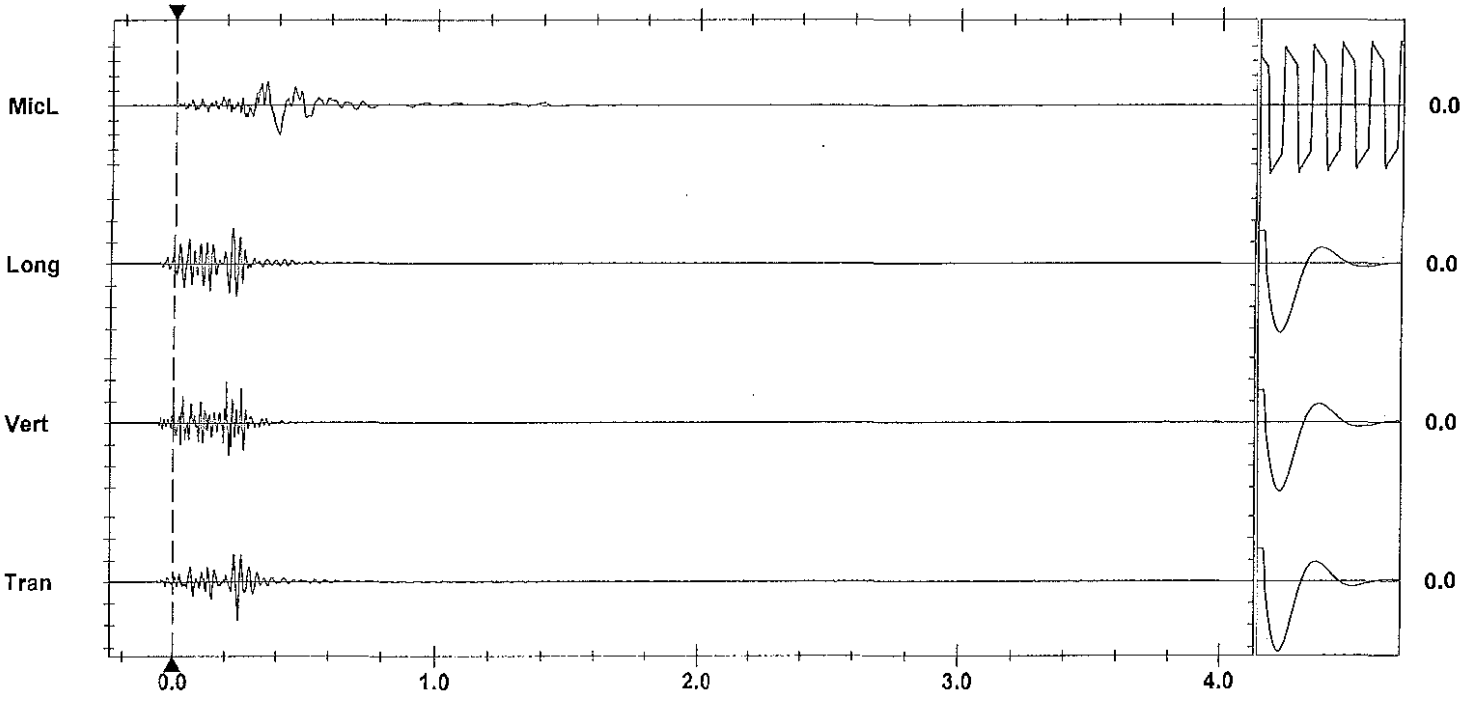
Microphone Linear Weighting
PSPL 0.00199 psi(L) at 0.400 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 677 mv)

	Tran	Vert	Long	
PPV	0.180	0.190	0.165	in/s
ZC Freq	37	43	34	Hz
Time (Rel. to Trig)	0.253	0.205	0.227	sec
Peak Acceleration	0.106	0.239	0.119	g
Peak Displacement	0.00068	0.00046	0.00079	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.213 in/s at 0.254 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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Instantel

Event Report

Date/Time	Long at 13:08:29 March 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6D8.I50
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

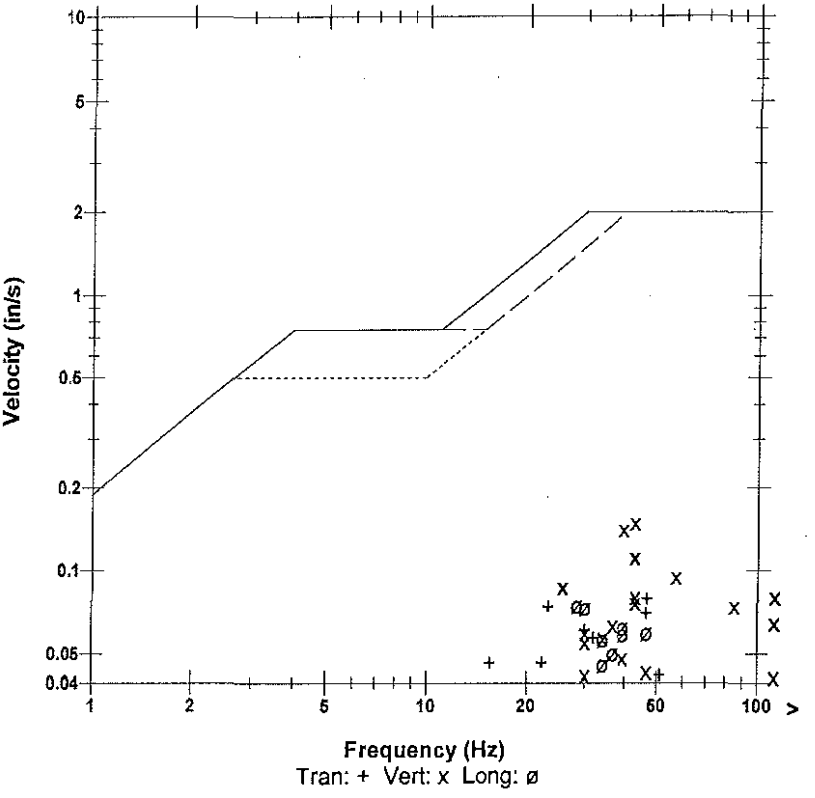
Post Event Notes

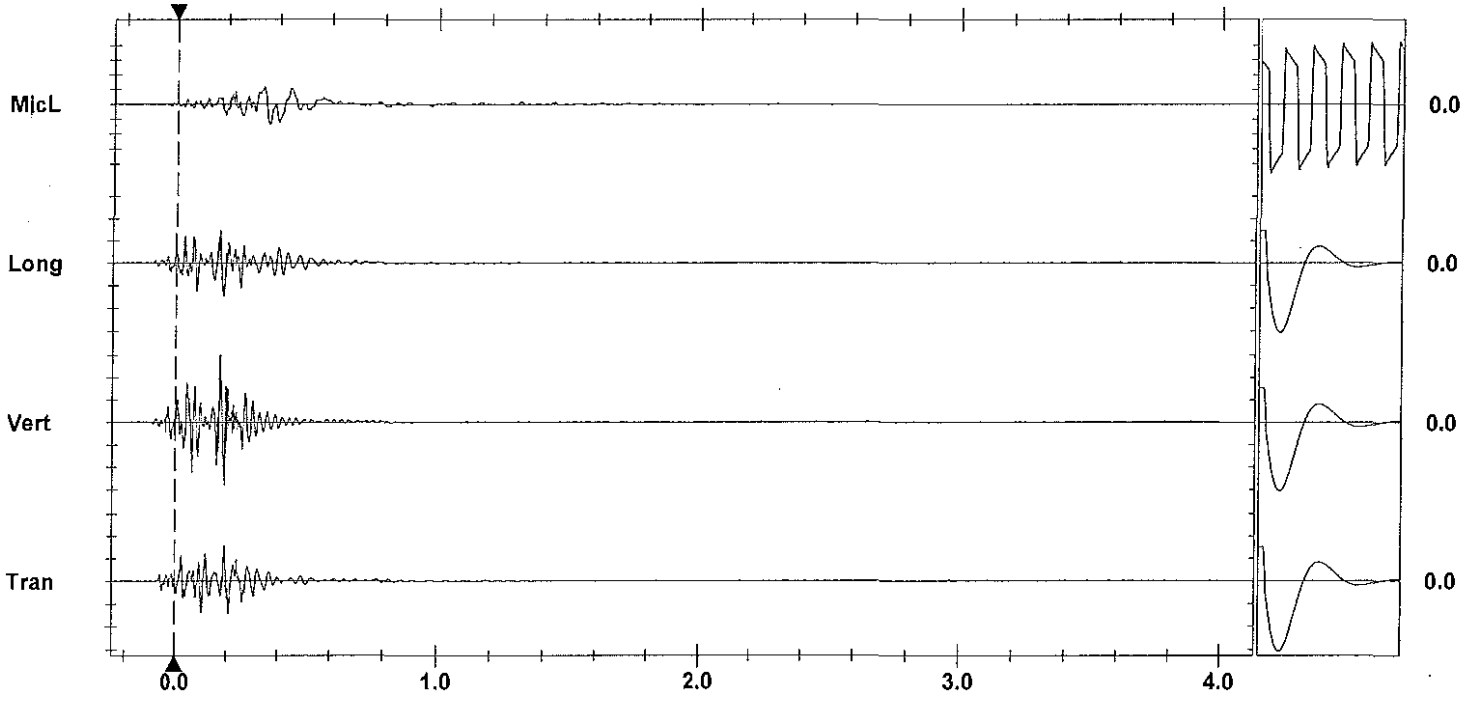
Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.359 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 666 mv)

	Tran	Vert	Long	
PPV	0.0787	0.149	0.0744	in/s
ZC Freq	47	43	28	Hz
Time (Rel. to Trig)	0.193	0.174	0.185	sec
Peak Acceleration	0.0729	0.247	0.0779	g
Peak Displacement	0.00038	0.00050	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.162 in/s at 0.193 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2013 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 2:26 PM
BLAST # MW-0136

HIGHWAY# 97
BLAST LOCATION AT: SB 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: shot + netted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Arkosic Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 PRE
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 7 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

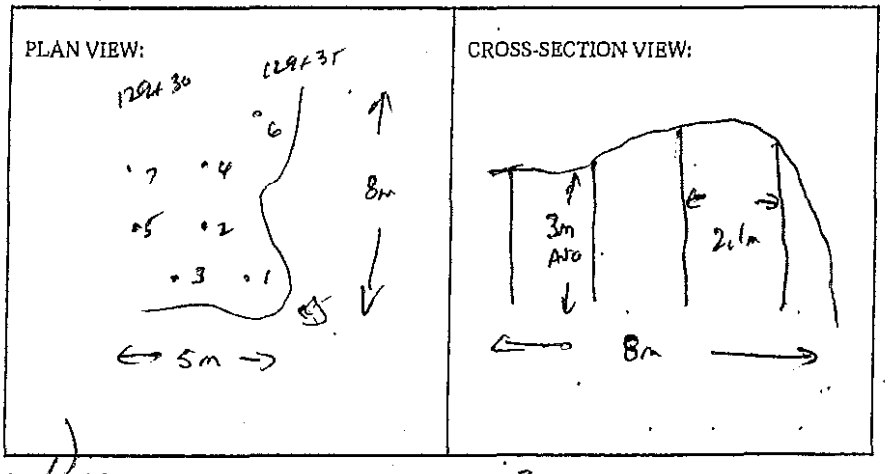
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.081 ips / 23Hz
" @ 13117 Cliffstone Crt - 0.141 ips / 47Hz

2- 3' ANFO/1 hole 1"x8" Dynamite Primer
(1 each)

Instantel

Event Report

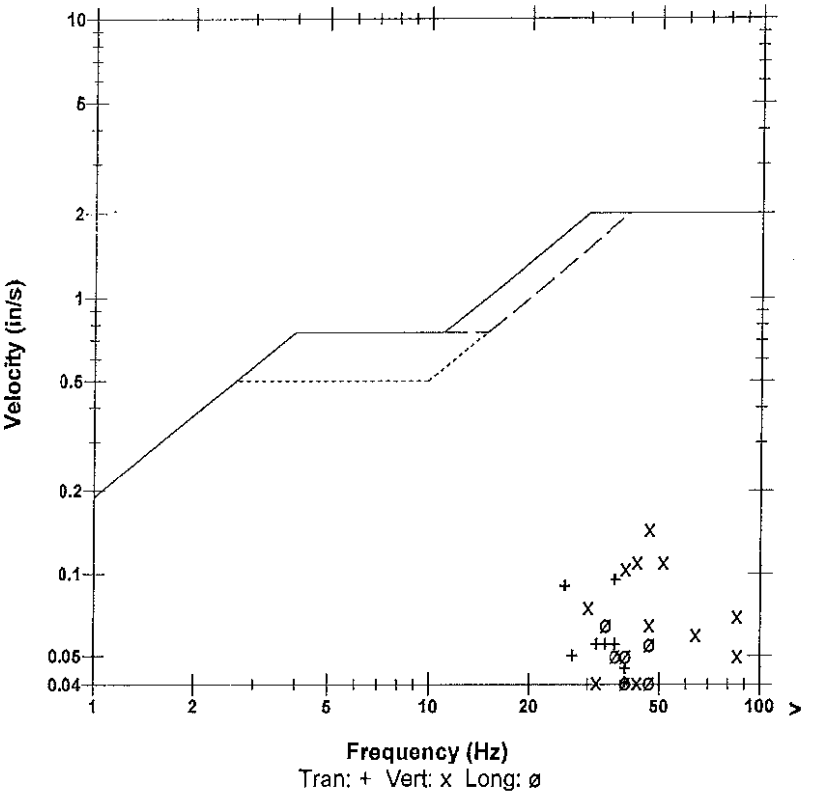
Date/Time	Vert at 14:26:09 March 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6DC.3L0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

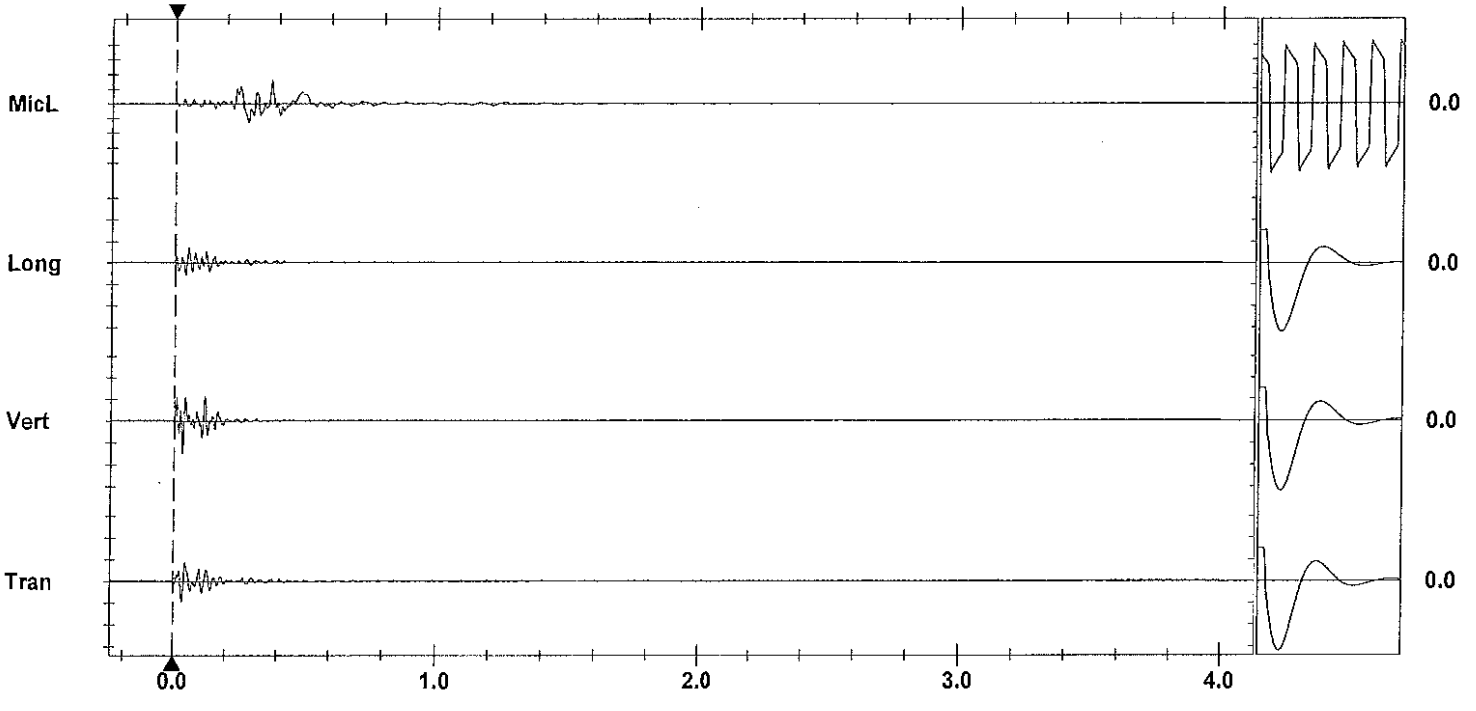
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00160 psi(L) at 0.372 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0950	0.145	0.0650	in/s
ZC Freq	37	47	34	Hz
Time (Rel. to Trig)	0.032	0.033	0.054	sec
Peak Acceleration	0.0795	0.119	0.0398	g
Peak Displacement	0.00051	0.00050	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.174 in/s at 0.033 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: March 3, 2012 (V 9.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

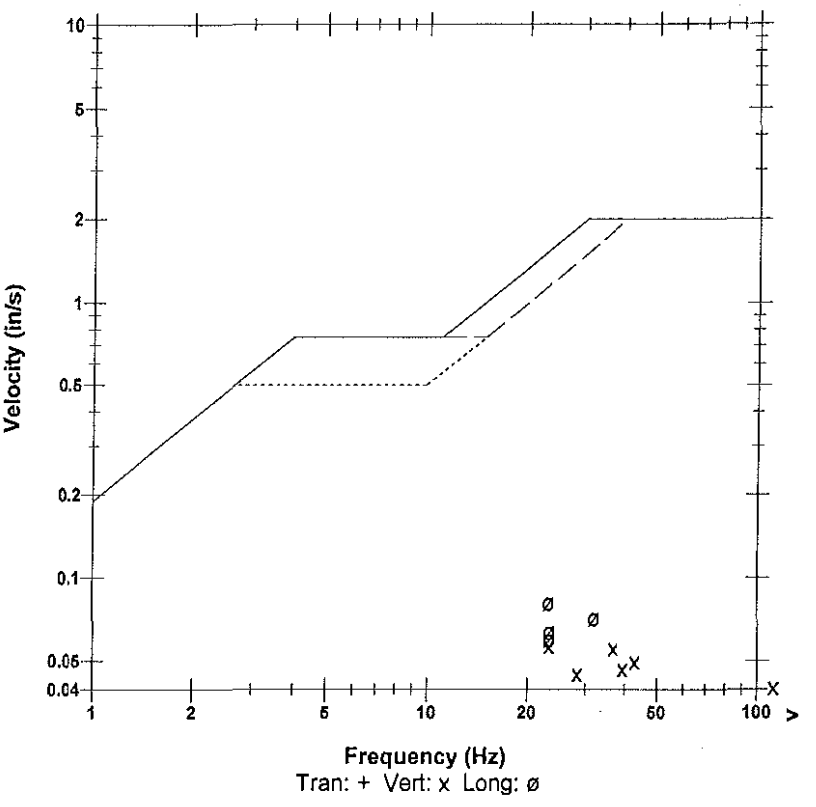
Date/Time	Vert at 14:26:20 March 1, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6DC.3W0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

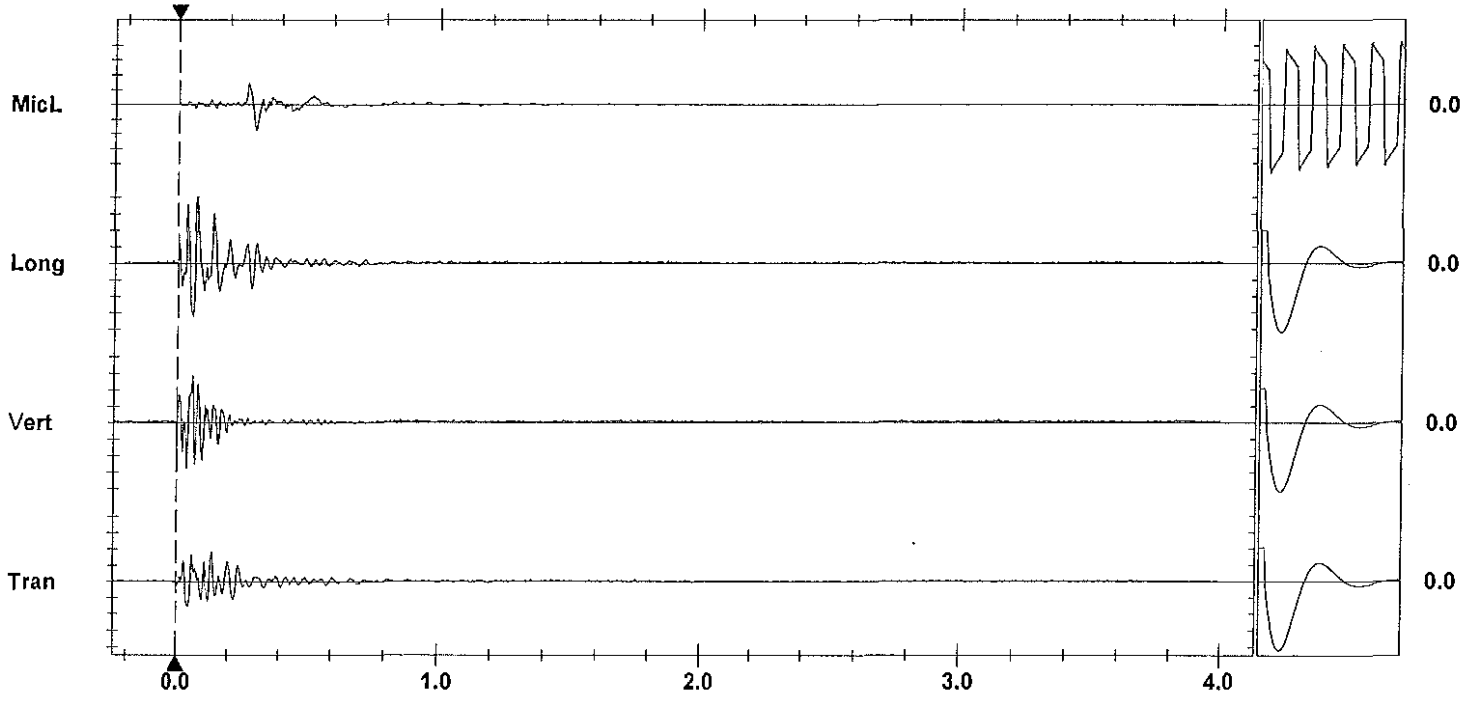
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00174 psi(L) at 0.303 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 684 mv)

	Tran	Vert	Long	
PPV	0.0369	0.0569	0.0812	in/s
ZC Freq	30	23	23	Hz
Time (Rel. to Trig)	0.141	0.062	0.077	sec
Peak Acceleration	0.0232	0.0696	0.0431	g
Peak Displacement	0.00023	0.00038	0.00049	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0918 in/s at 0.039 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 1/12
ACTUAL BLAST DATE MAR 1/12 3:32PM
BLAST # MW-0137

HIGHWAY# 97
BLAST LOCATION AT: SB 129+28 - 129+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: *shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 9 @200
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

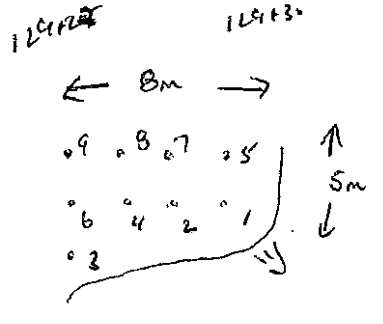
VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

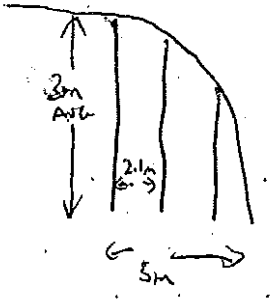
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Clifford ct, NO TRIG < 0.04 ips
" @ 13167 Clifford ct - 0.080 ips / 64hz

3'-4' ANFO/Hole primed w/1 each 1" x 8" dynamite

Instantel

Event Report

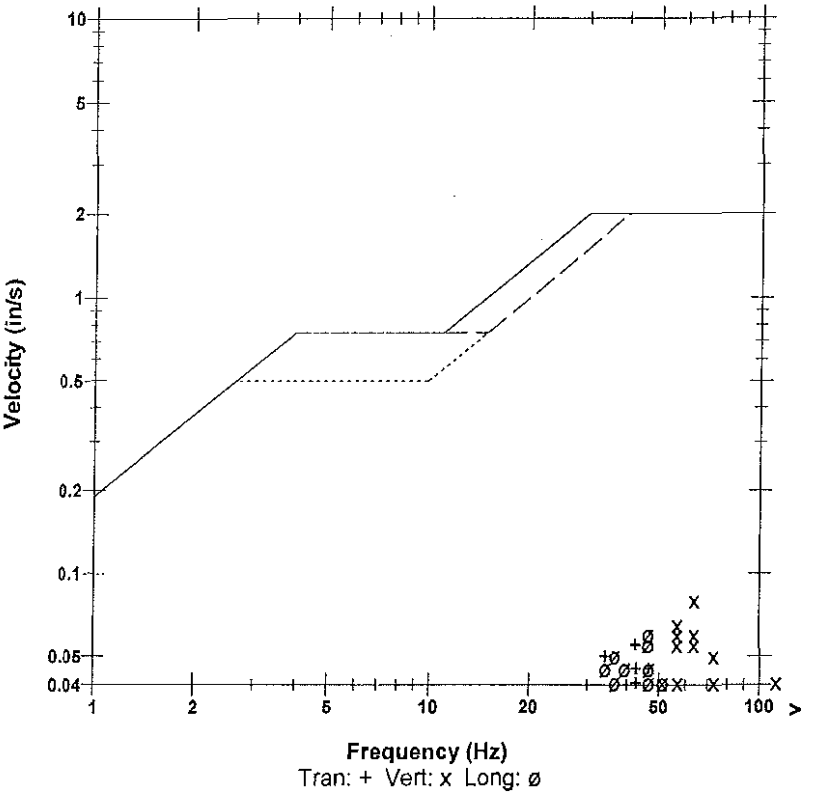
Date/Time	Vert at 15:32:44 March 1, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6DF.6K0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

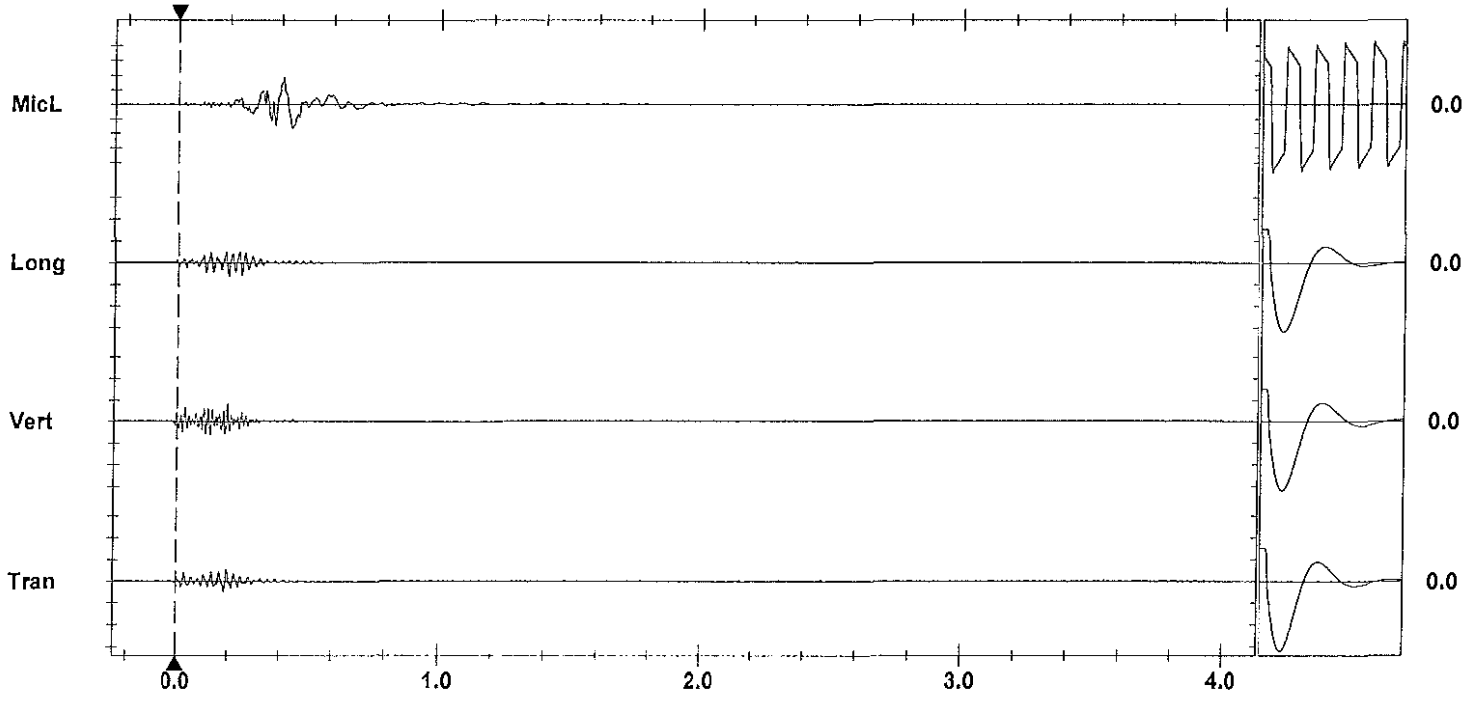
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00189 psi(L) at 0.406 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 650 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0800	0.0600	in/s
ZC Freq	43	64	47	Hz
Time (Rel. to Trig)	0.198	0.196	0.197	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00020	0.00019	0.00023	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.112 in/s at 0.197 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
ACTUAL BLAST DATE Mar 2/12 10:43 AM
BLAST # Mar-013#

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 7 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

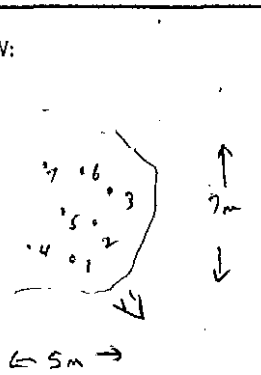
VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

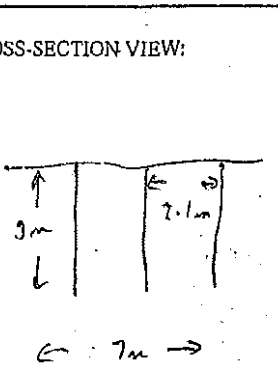
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1316 CLAA to Nc - 0.048 ips/39 Hz
" @ 1311 CLAA to Cut - 0.090 ips/5 Hz

2'-3' ANFO/Hole primed w/ ½ Cart 1¼" x 16" DYNAMITE

Instantel

Event Report

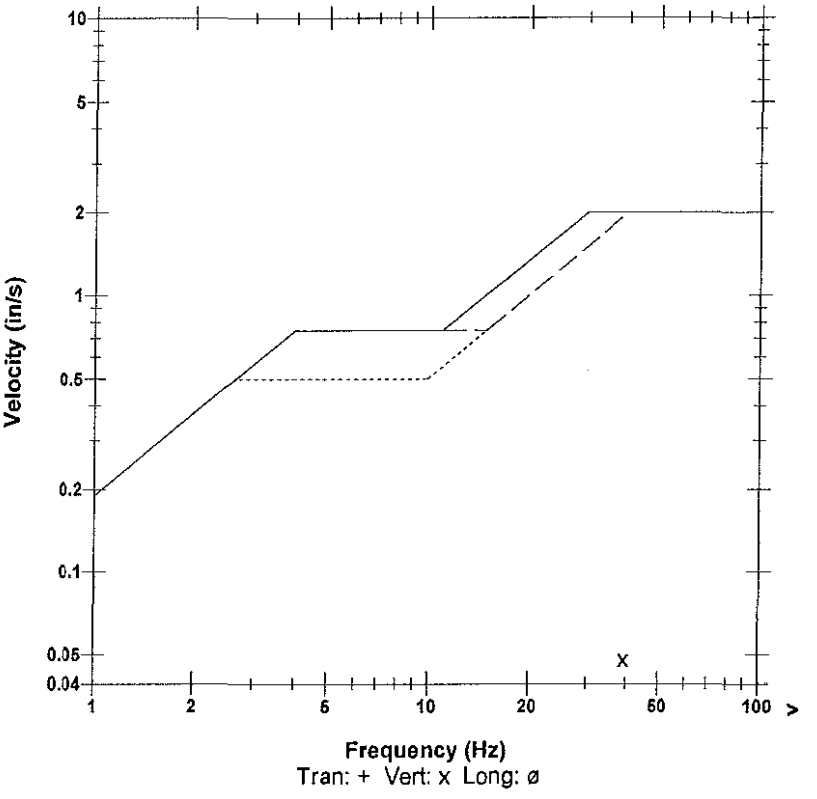
Date/Time	Vert at 10:43:31 March 2, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6EW.GJ0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

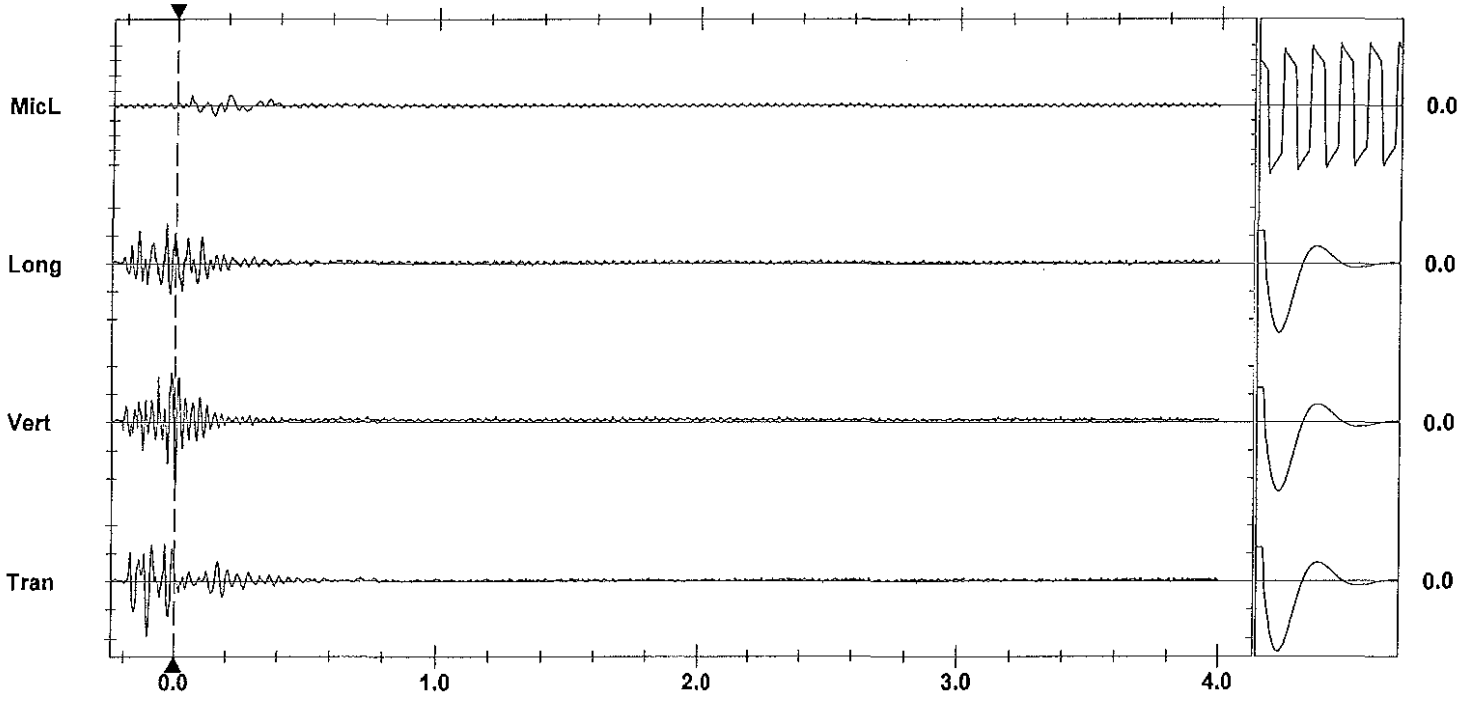
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00073 psi(L) at 0.203 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 701 mv)

	Tran	Vert	Long	
PPV	0.0381	0.0481	0.0281	in/s
ZC Freq	28	39	27	Hz
Time (Rel. to Trig)	-0.108	0.002	-0.033	sec
Peak Acceleration	0.0215	0.0398	0.0182	g
Peak Displacement	0.00021	0.00022	0.00014	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.1	

Peak Vector Sum 0.0525 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: August 5, 2013 07:08:01
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Instantel

Event Report

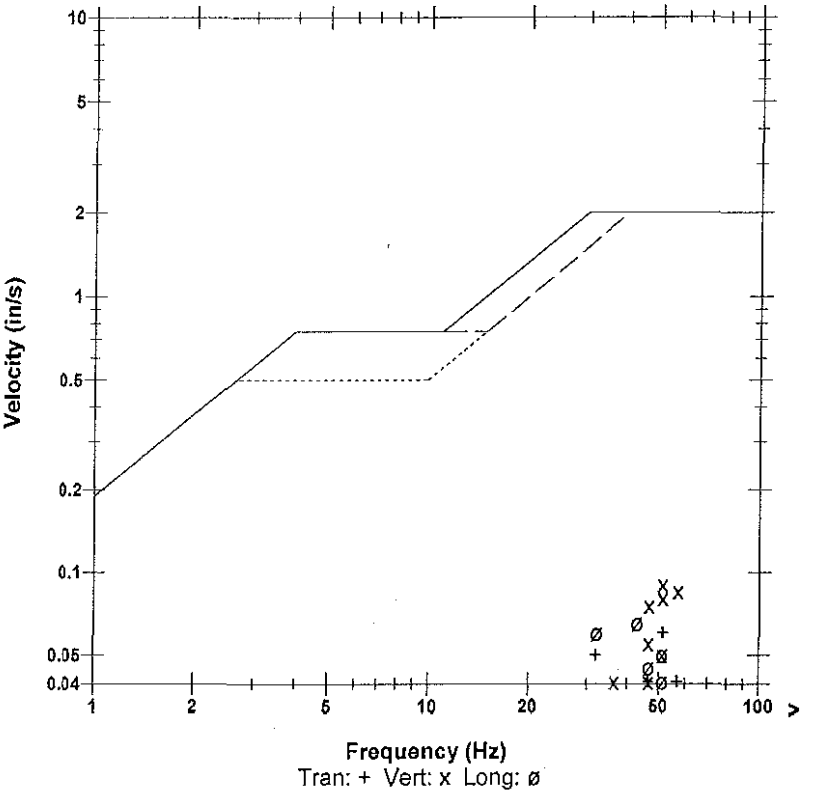
Date/Time	Vert at 10:43:18 March 2, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6EW.G60

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

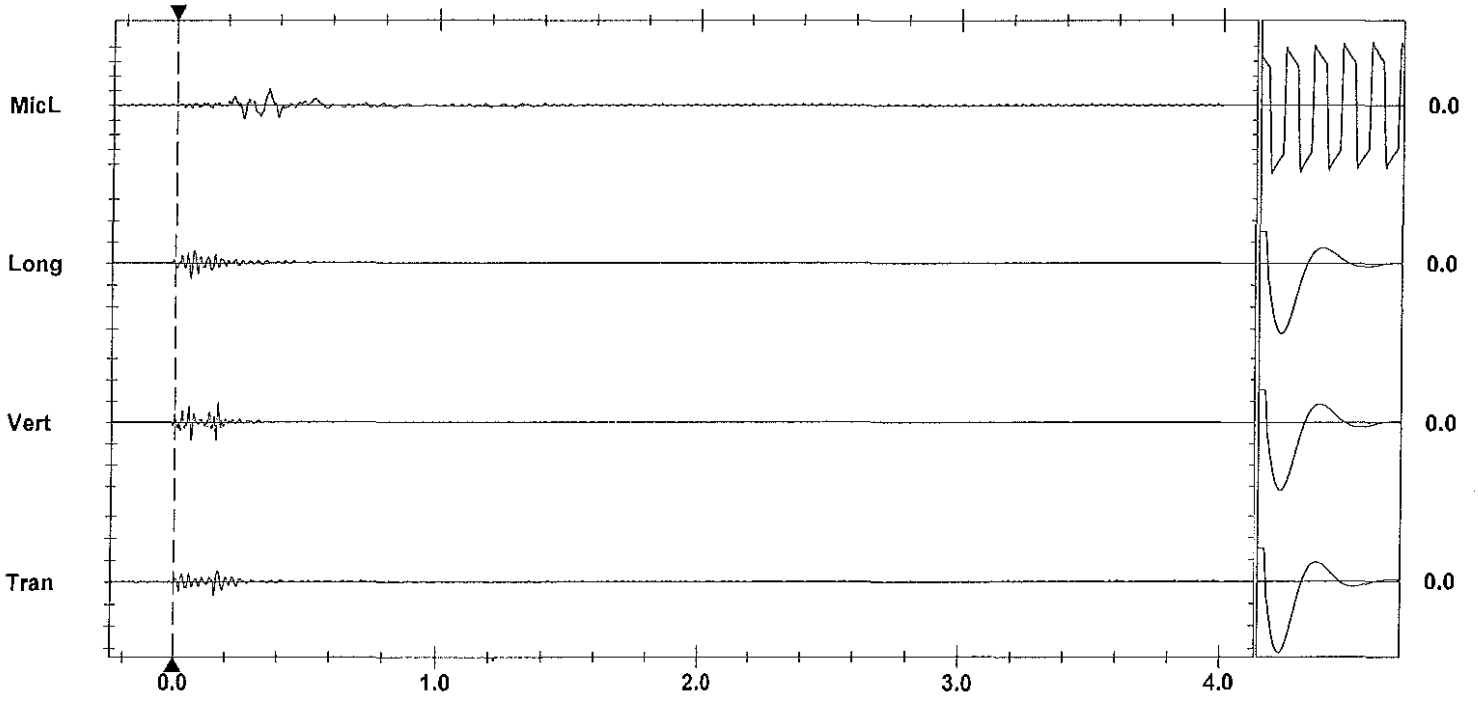
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00109 psi(L) at 0.357 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 647 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0900	0.0650	in/s
ZC Freq	51	51	43	Hz
Time (Rel. to Trig)	0.158	0.169	0.063	sec
Peak Acceleration	0.0530	0.0795	0.0398	g
Peak Displacement	0.00028	0.00027	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.102 in/s at 0.169 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veaney
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED Mar 2/12
ACTUAL BLAST DATE Mar 2/12 12:36PM
BLAST # MIN-0139

HIGHWAY# 97
BLAST LOCATION AT: STA 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY 10m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 89/1/46 buffer/2 sta 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 50mm x 400mm Blastex
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE MS320 CAPACITY 80 CAPS

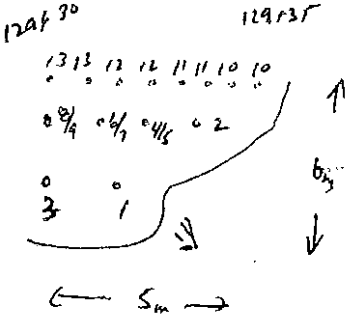
VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

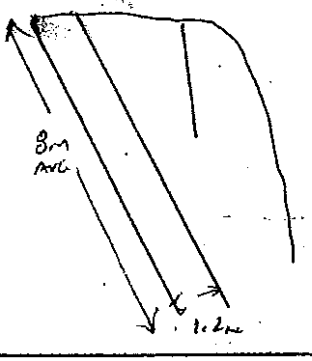
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Veaney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone ct. 0.12 ips/37Hz
@ 13117 Cliffstone ct. 0.15 ips/5Hz

STAB Holes - 2' ANFO/HOLE

BUFFER HOLES - BOTTOM DECK - 4-5 CART 2"x16" BLASTEX

- TOP DECKS - 2-4 CART 2"x16" BLASTEX

ALL ABOVE primed w/0.5 CART 2"x16" DYNAMITE

B/L HOLES - 1 CART 2"x16" DYNAMITE + 200 gr. det. cord to 4' collar

Instantel

Event Report

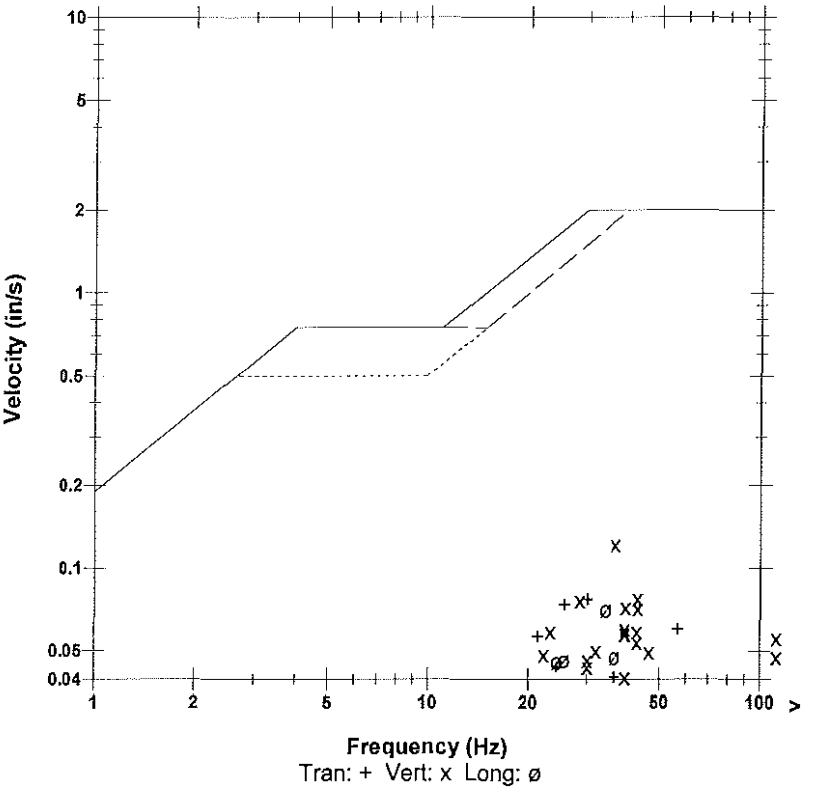
Date/Time	Vert at 12:36:12 March 2, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6F1.OC0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

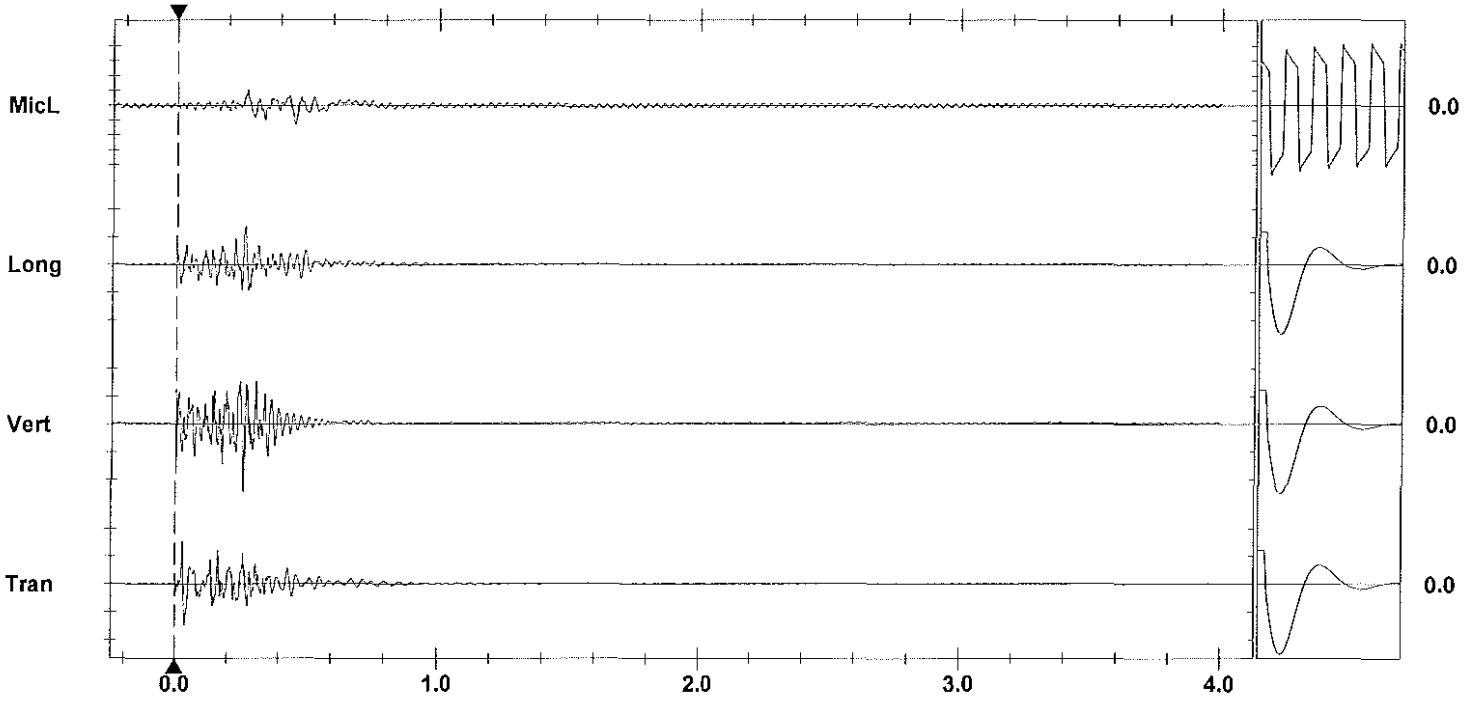
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00123 psi(L) at 0.453 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 661 mv)

	Tran	Vert	Long	
PPV	0.0769	0.122	0.0706	in/s
ZC Freq	30	37	34	Hz
Time (Rel. to Trig)	0.030	0.262	0.269	sec
Peak Acceleration	0.0829	0.151	0.0580	g
Peak Displacement	0.00042	0.00043	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.131 in/s at 0.262 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — — —◀

Sensorcheck

Printed: August 6, 2012 (V 8.01 - 8.01)

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Instantel

Event Report

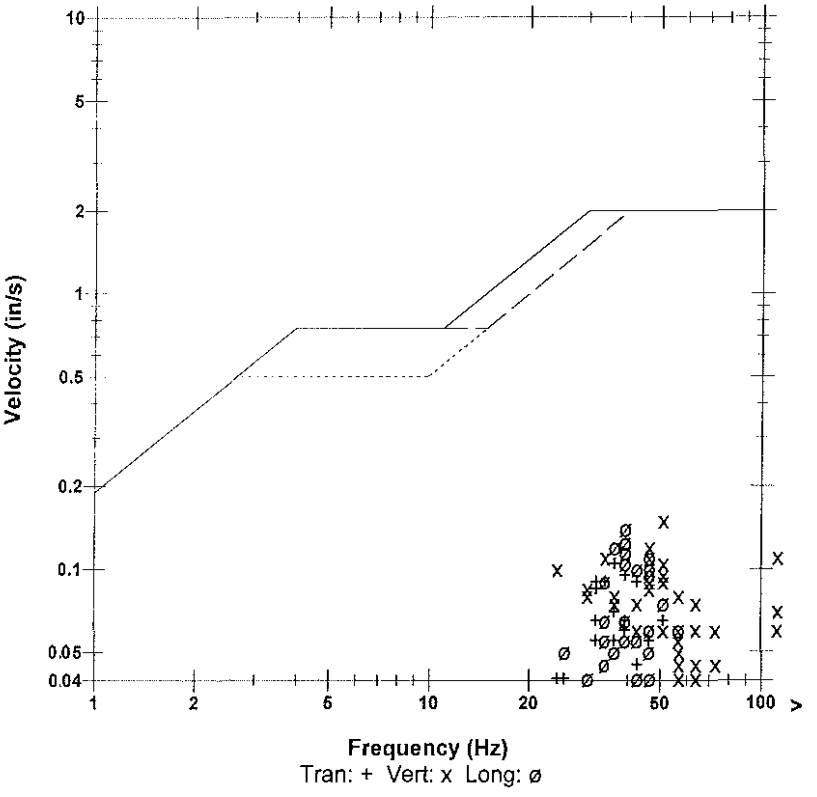
Date/Time	Vert at 12:36:00 March 2, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6F1.O00

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

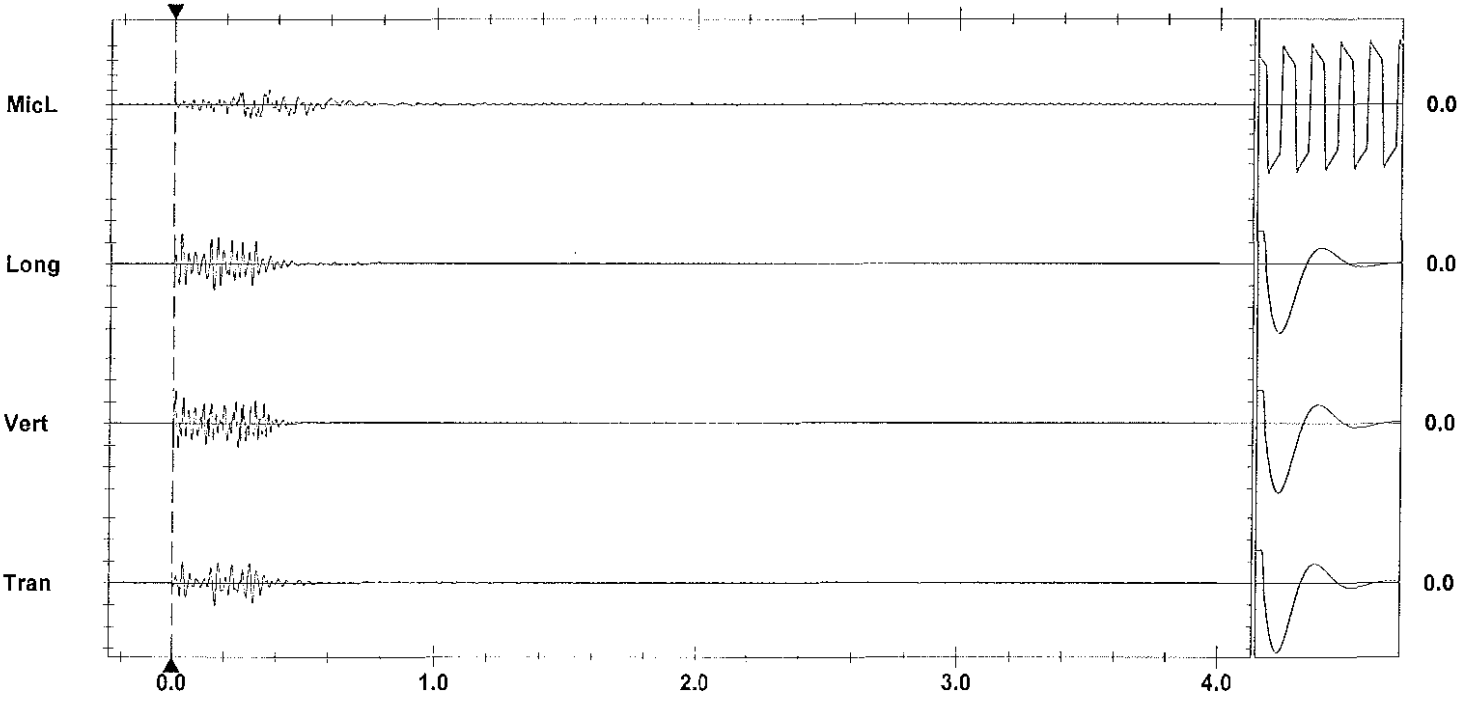
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.364 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 633 mv)

	Tran	Vert	Long	
PPV	0.105	0.150	0.140	in/s
ZC Freq	37	51	39	Hz
Time (Rel. to Trig)	0.164	0.011	0.032	sec
Peak Acceleration	0.0795	0.199	0.106	g
Peak Displacement	0.00047	0.00052	0.00060	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.164 in/s at 0.042 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED MAR 2/12
ACTUAL BLAST DATE MAR 2/12 2:09 PM
BLAST # MW-0148

HIGHWAY# 97
BLAST LOCATION AT: STN 129+21 - 129+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: no blast matting

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 60 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 62 (m)

TOTAL NUMBER OF HOLES 7 & 11 / 36 buffer / 2 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite x 9" Blasting Agent
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 406 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

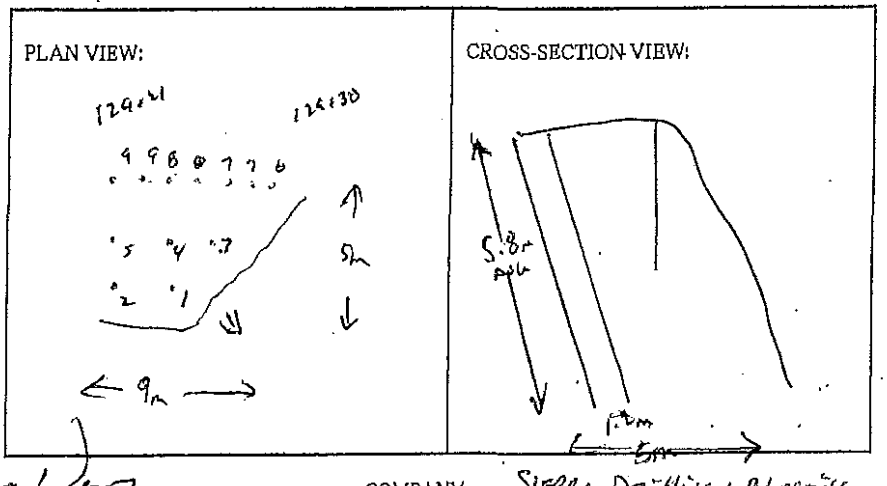
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone cut: 0.12ips / 30Hz
@ 13117 cliff stone cut, 0.22ips / 47Hz

STAB Holes – 2' ANFO/Hole

Buffer Holes – 4-5 each 2"x16" BLASTEX/Hole

} Primed w/0.5 each 2"x16" DYNAMITE

BIL Holes – 1 each 2"x16" DYNAMITE + 200 gr det. cord to 4' Collar

Instantel

Event Report

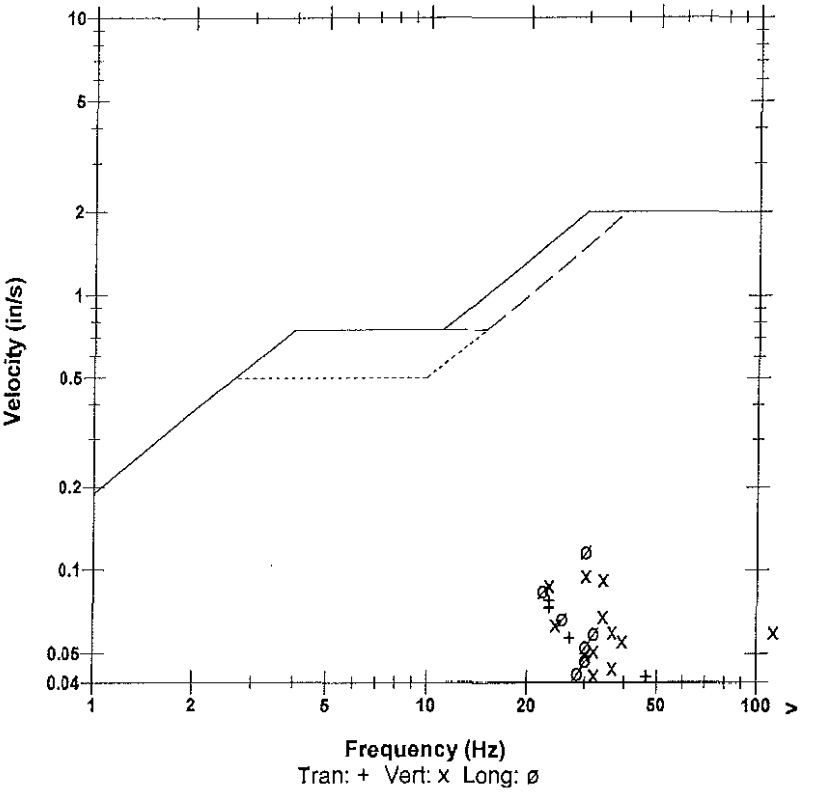
Date/Time	Vert at 14:09:53 March 2, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6F6.0H0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

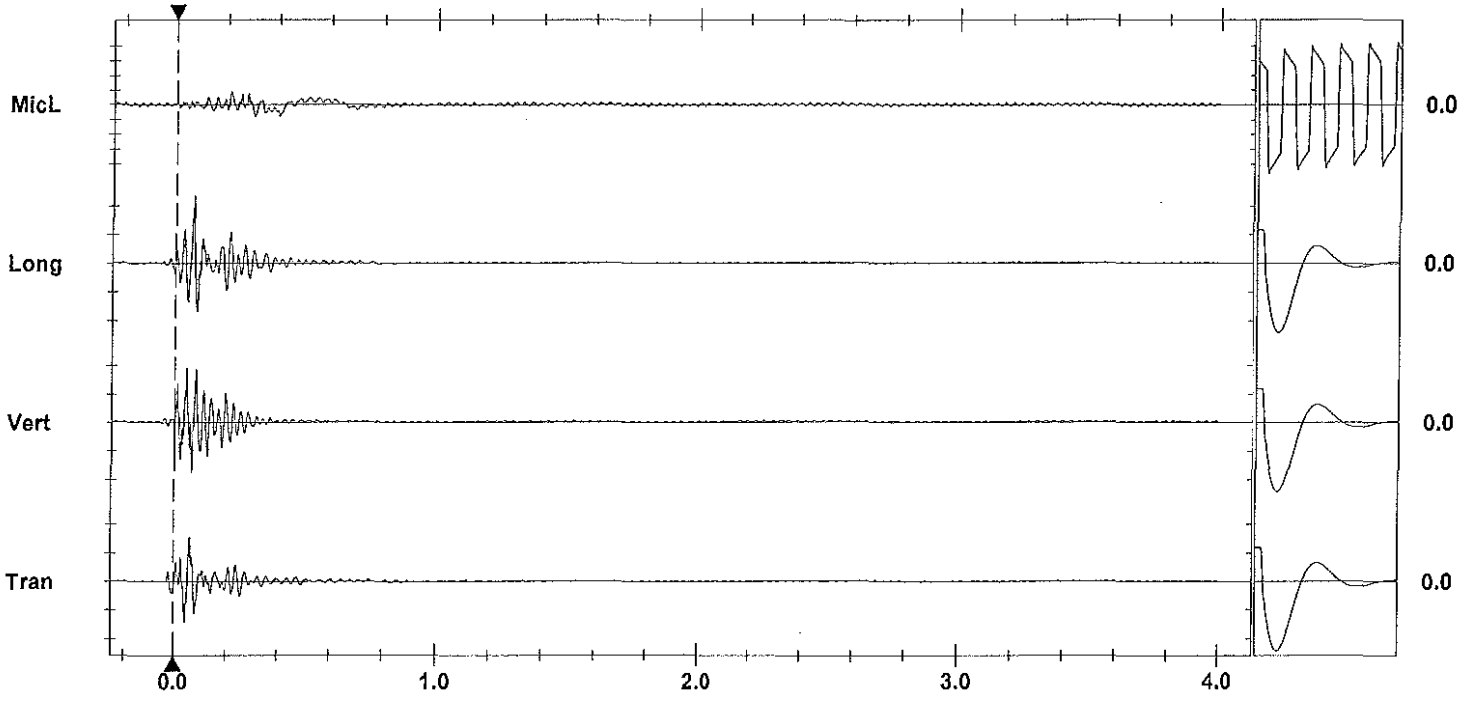
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00083 psi(L) at 0.209 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 654 mv)

	Tran	Vert	Long	
PPV	0.0775	0.0956	0.117	in/s
ZC Freq	23	30	30	Hz
Time (Rel. to Trig)	0.064	0.048	0.071	sec
Peak Acceleration	0.0547	0.101	0.0597	g
Peak Displacement	0.00045	0.00038	0.00051	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.135 in/s at 0.070 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

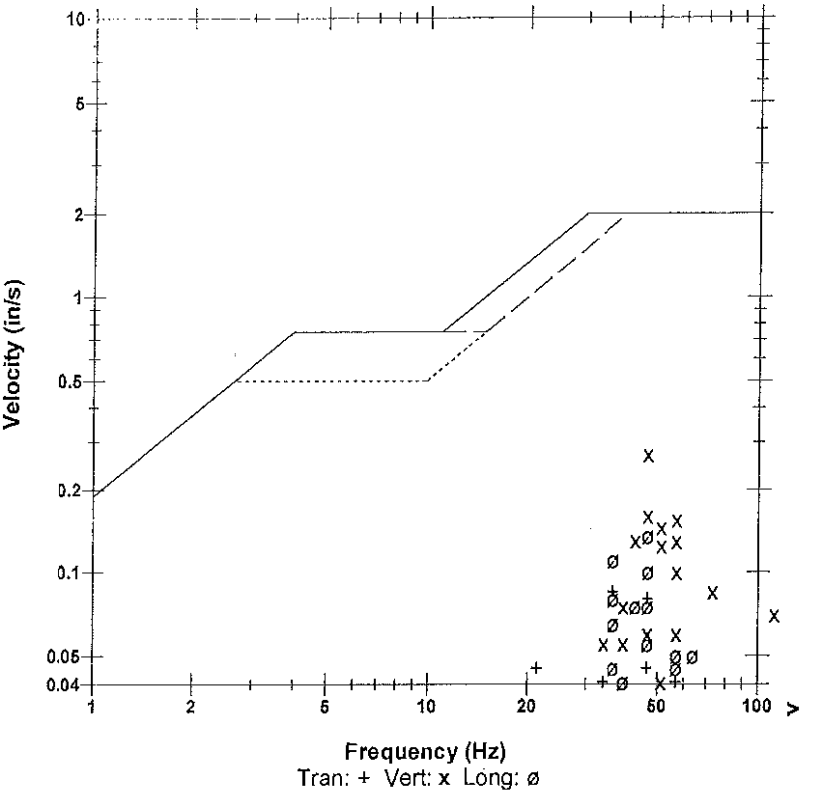
Date/Time	Vert at 14:09:40 March 2, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6F6.040

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

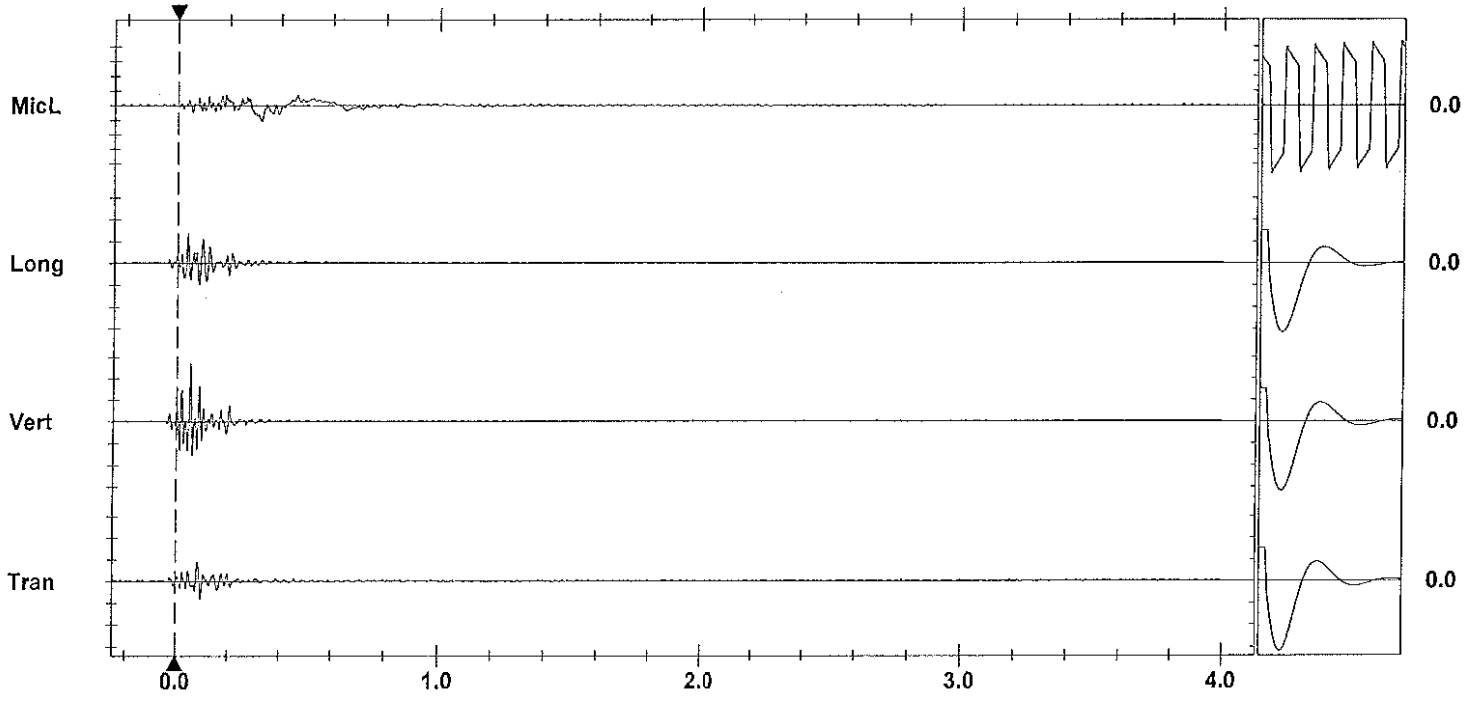
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00105 psi(L) at 0.324 sec
ZC Freq	8.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 630 mv)

	Tran	Vert	Long	
PPV	0.0850	0.270	0.135	in/s
ZC Freq	37	47	47	Hz
Time (Rel. to Trig)	0.086	0.054	0.041	sec
Peak Acceleration	0.0663	0.225	0.0928	g
Peak Displacement	0.00038	0.00086	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.277 in/s at 0.054 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — —◀

Sensorcheck

Printed: March 3, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED MAR 5/11
ACTUAL BLAST DATE MAR 5/11 2:18 PM
BLAST # MW-0141

HIGHWAY# 97
BLAST LOCATION AT: Stn 129+15 - 129+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slash material

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 8 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH ms (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

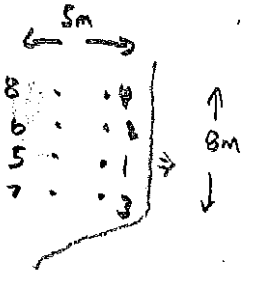
VOLUME OF ROCK BLASTED 150 (m^3) → 10

BLAST SKETCH: 129+15 129+20

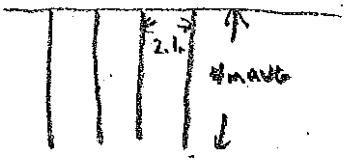
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliff/stone Co+. 0.092 ips/37Hz
@ 13117 cliff/stone Co+. 0.171 ips/57Hz

2'-4' ANFO/hole primed w/ 1 each 1¼x8" DYNAMITE

Instantel

Event Report

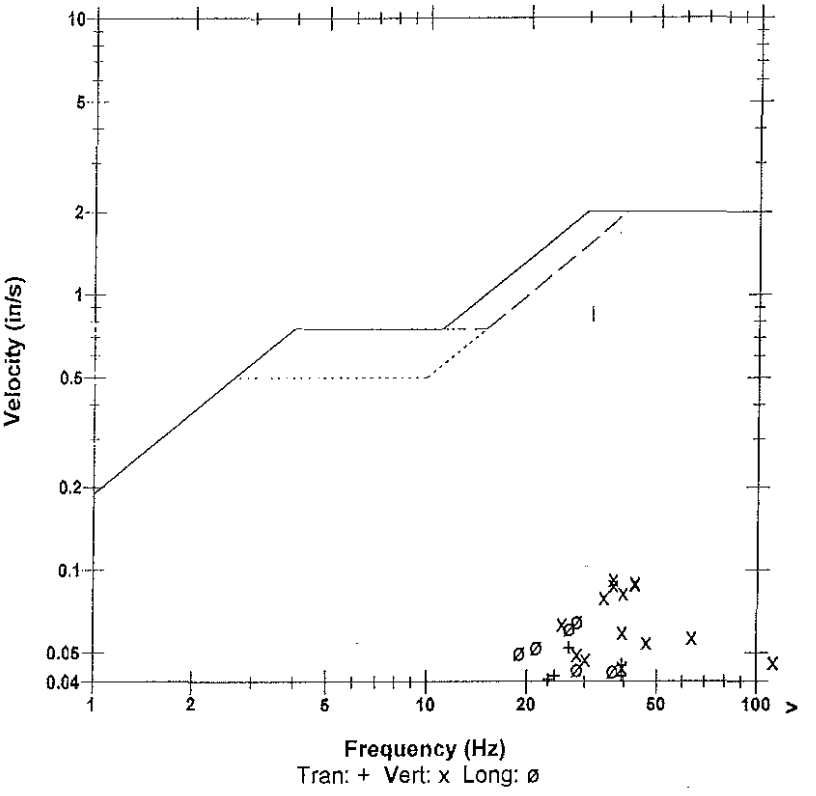
Date/Time	Vert at 14:18:22 March 5, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6KQ.EM0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

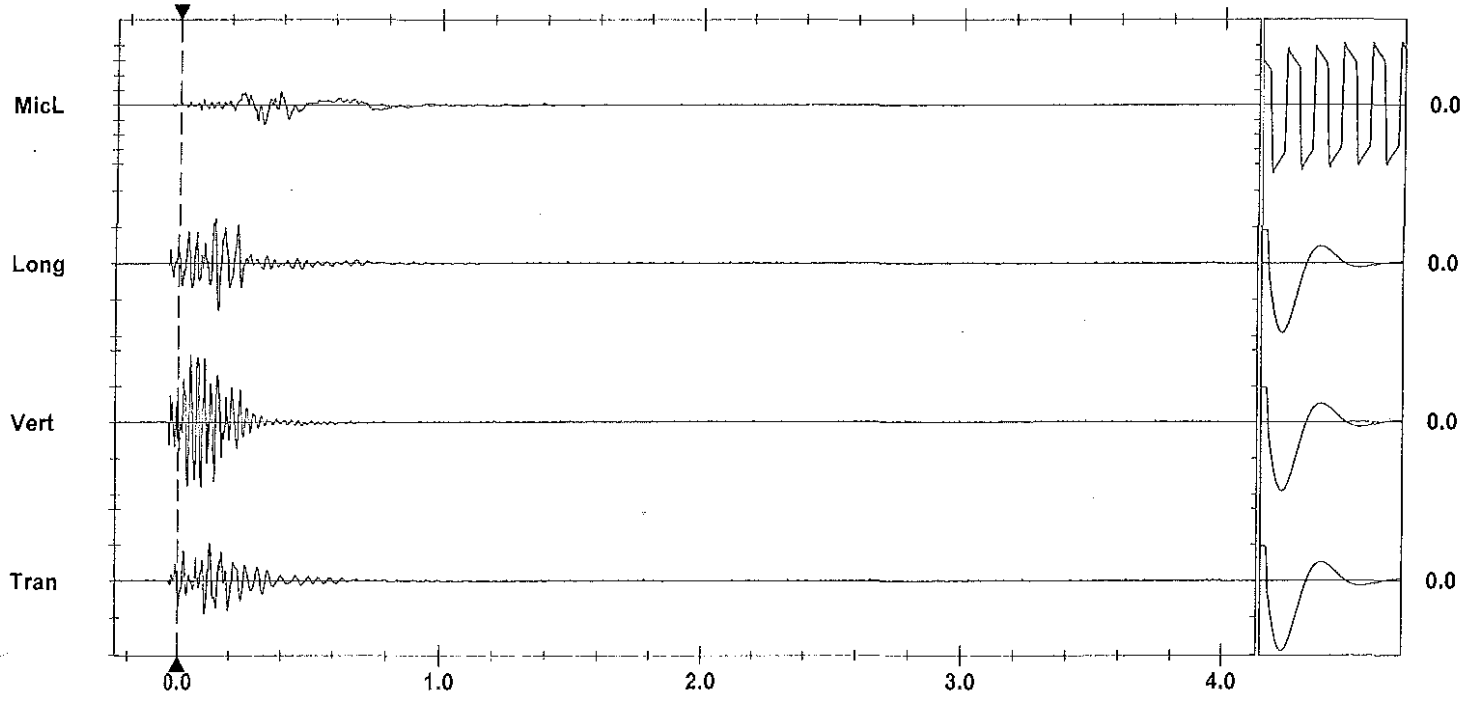
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.325 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 680 mv)

	Tran	Vert	Long	
PPV	0.0519	0.0925	0.0650	in/s
ZC Freq	27	37	28	Hz
Time (Rel. to Trig)	0.125	0.049	0.156	sec
Peak Acceleration	0.0497	0.116	0.0414	g
Peak Displacement	0.00026	0.00041	0.00037	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.104 in/s at 0.142 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel®

Event Report

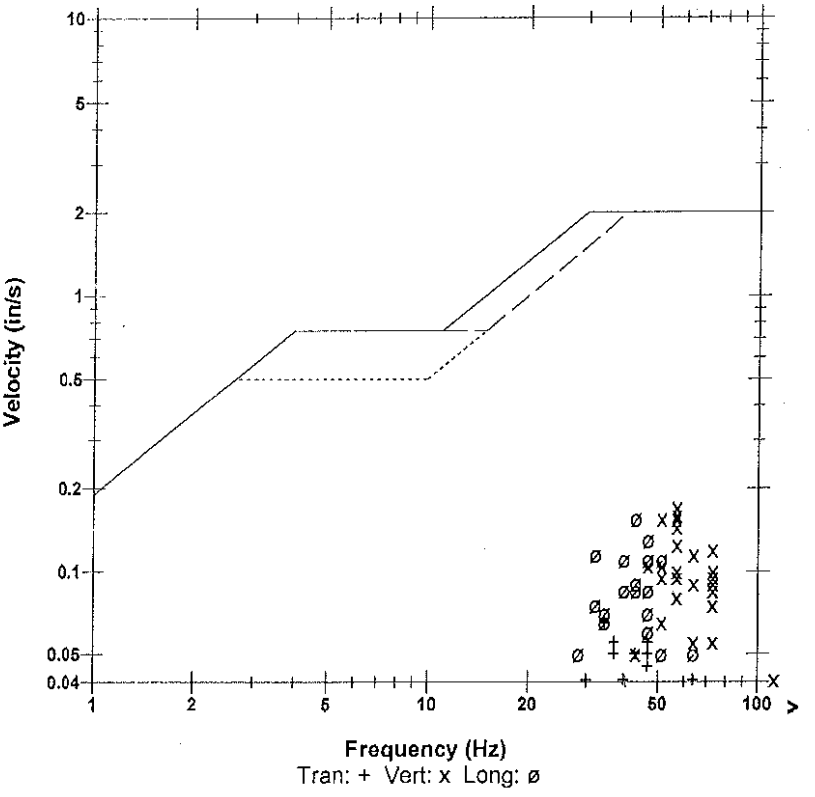
Date/Time	Vert at 14:18:07 March 5, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	5.9 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6KQ.E70

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

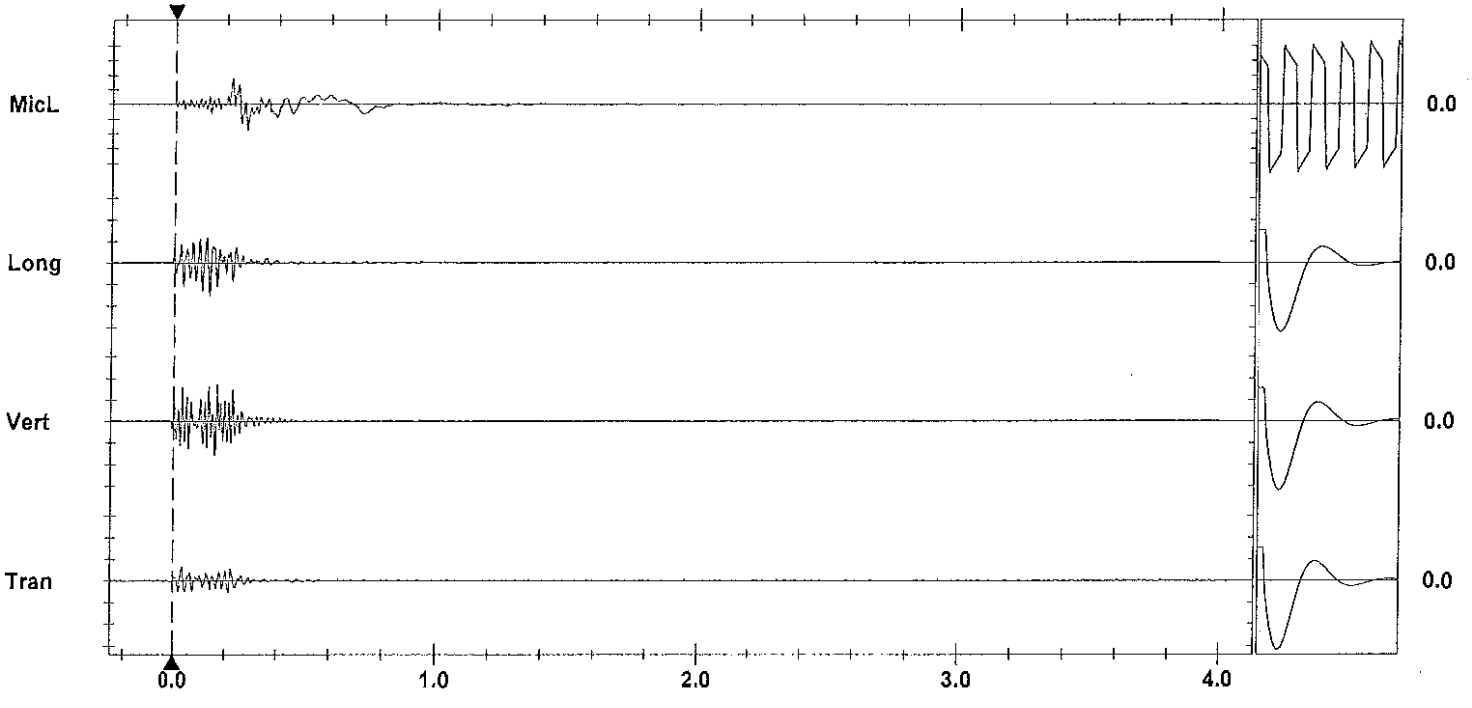
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00178 psi(L) at 0.222 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 660 mv)

	Tran	Vert	Long	
PPV	0.0650	0.170	0.155	in/s
ZC Freq	34	57	43	Hz
Time (Rel. to Trig)	0.035	0.171	0.140	sec
Peak Acceleration	0.0530	0.146	0.106	g
Peak Displacement	0.00029	0.00046	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.0	Hz
Overswing Ratio	3.6	3.7	4.4	

Peak Vector Sum 0.223 in/s at 0.140 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5934089

DATE PREPARED MAR 6/12
ACTUAL BLAST DATE MAR 6/12 11:08 AM
BLAST # MW-0142

HIGHWAY# 97
BLAST LOCATION AT: STA 129 +40 (High spot)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alaskite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 12.5 (m)

TOTAL NUMBER OF HOLES 5 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1¼ Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HOSCO CAPACITY 80 CAPS

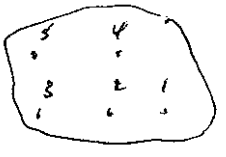
VOLUME OF ROCK BLASTED Nil (High spot) (m^3)

BLAST SKETCH:

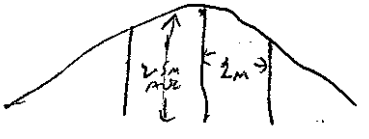
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 129 +40



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE [signature] COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct 0.047 ips / 51 Hz
" @ 13117 Cliffstone Ct. 0.070 / 43 Hz

2'-3' ANFO/Hole Primed w/ 1 Cast 1"x8" Dynamite

Instantel

Event Report

Date/Time	Vert at 11:08:01 March 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6MC.9D0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

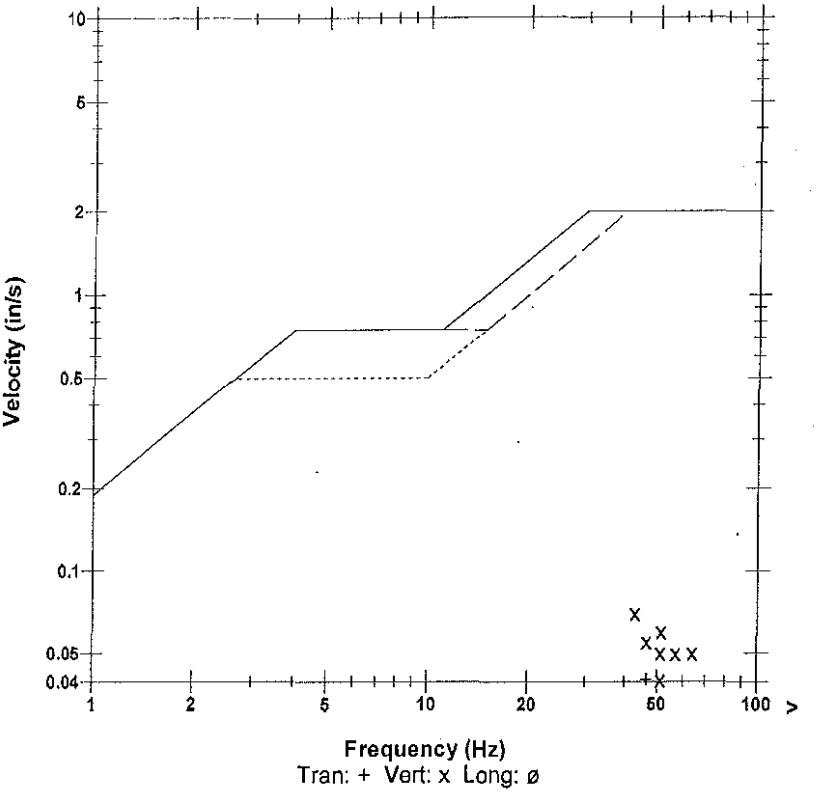
Extended Notes
Blast at stn 128

Post Event Notes

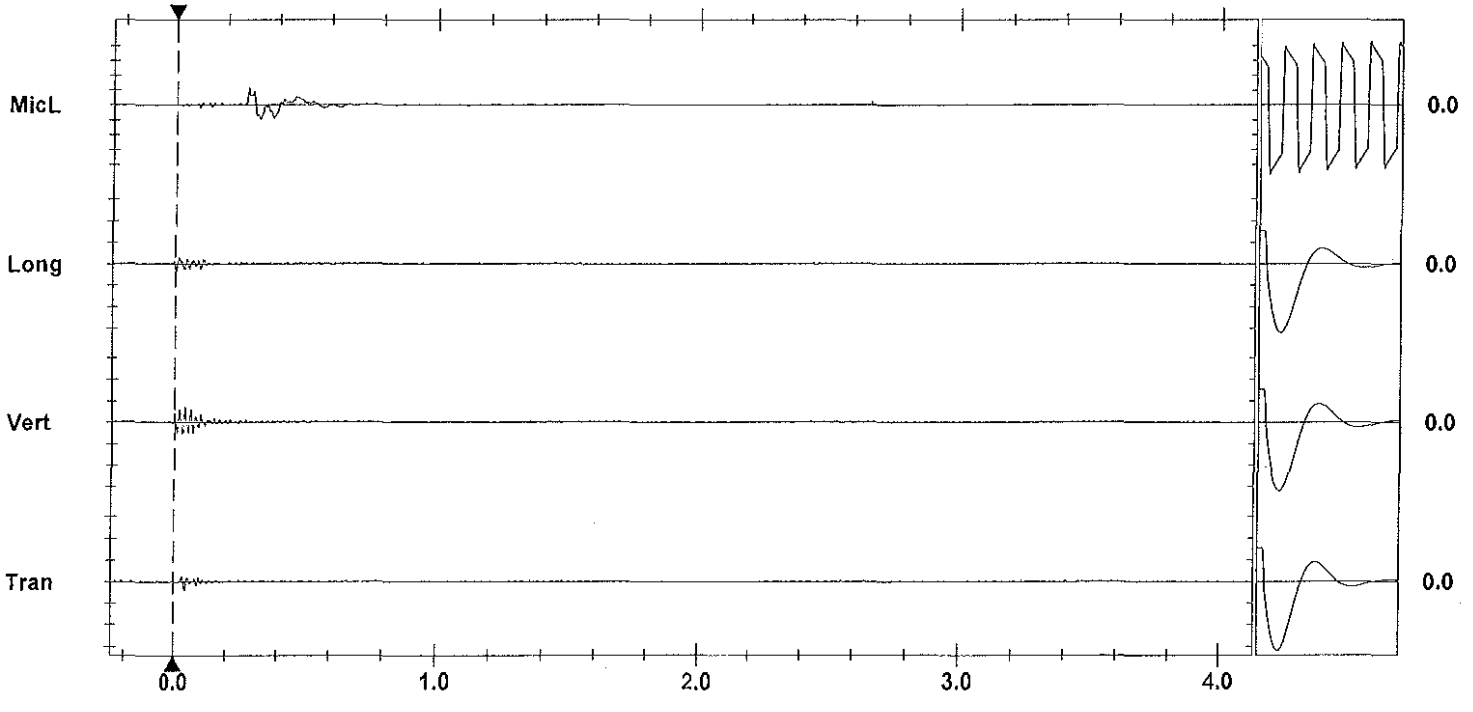
Microphone Linear Weighting
PSPL 0.00112 psi(L) at 0.279 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 649 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0700	0.0350	in/s
ZC Freq	47	43	57	Hz
Time (Rel. to Trig)	0.045	0.041	0.004	sec
Peak Acceleration	0.0265	0.0663	0.0265	g
Peak Displacement	0.00014	0.00023	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0735 in/s at 0.041 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: March 11, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

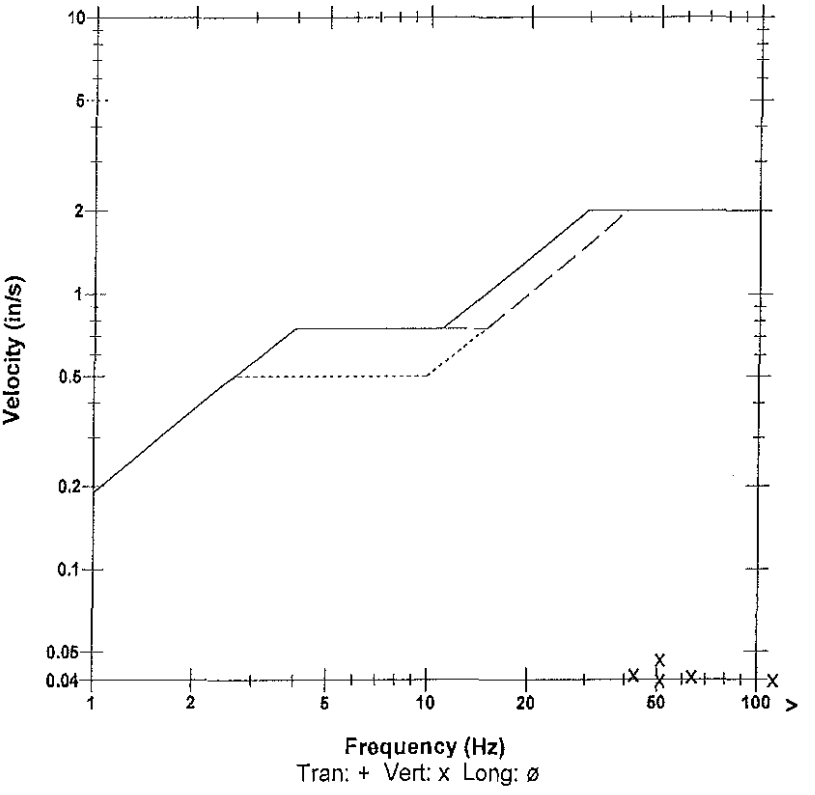
Date/Time	Vert at 11:08:17 March 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6MC.9T0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

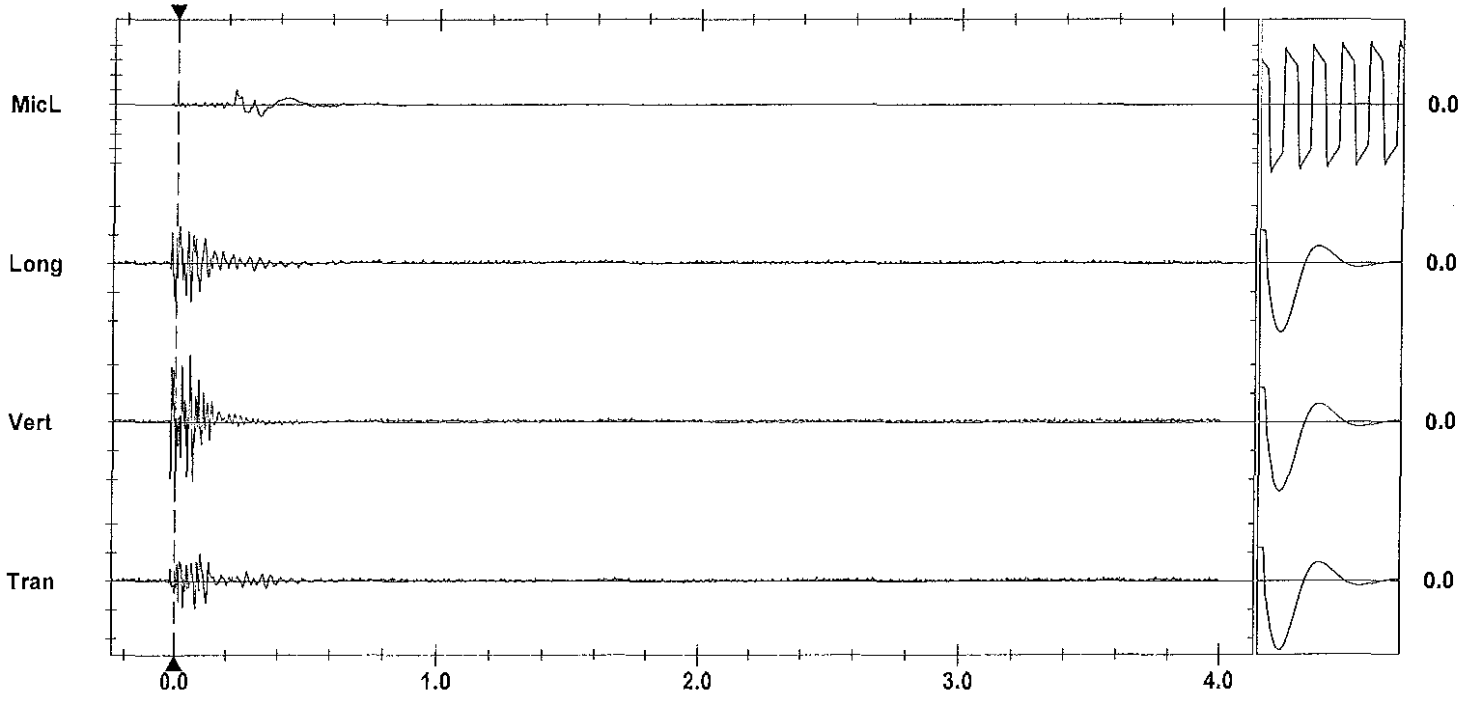
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.227 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 663 mv)

	Tran	Vert	Long	
PPV	0.0194	0.0469	0.0262	in/s
ZC Freq	30	51	32	Hz
Time (Rel. to Trig)	0.102	0.057	0.013	sec
Peak Acceleration	0.0265	0.0895	0.0282	g
Peak Displacement	0.00008	0.00013	0.00012	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.2	

Peak Vector Sum 0.0521 in/s at 0.058 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 11, 2012 (V 8.01 - 8.01)
Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vogan
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 6/12
ACTUAL BLAST DATE Mar 6/12 1:12 PM
BLAST # MW-0193

HIGHWAY# 97
BLAST LOCATION AT: SBD 129+16 - 129+20 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 4 shot marked

HEIGHT ABOVE HWY Pla (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Diorite Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 33 (m)

TOTAL NUMBER OF HOLES 6 611 / 36 buffer / 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

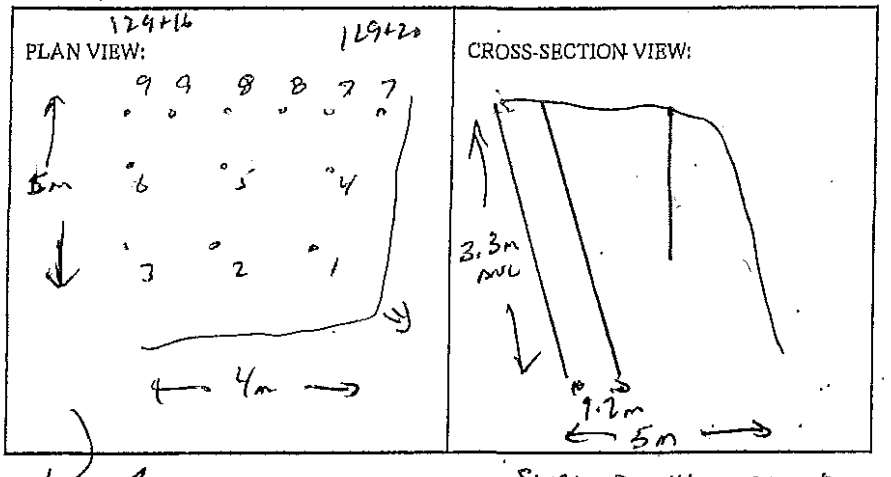
EXPLOSIVE TYPE 1" Dynamite + 2" Blaster EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 24
TOTAL NUMBER OF DELAYS 9
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vogan COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.13 ips / 51 Hz
" @ 13117 Cliffstone Cut - 0.18 ips / 47 Hz

STAB HOLES - 2' ANFO/HOLE

BUFFER HOLES - 2 - 3.5 CAST 2"x16" BLASTEX / HOLES

} Primed w/ 0.5 CAST 2"x16" DYNAMITE

B/L HOLES - 1 CAST 2"x16" DYNAMITE + 200 gm det. cord to 4' collar

Instantel

Event Report

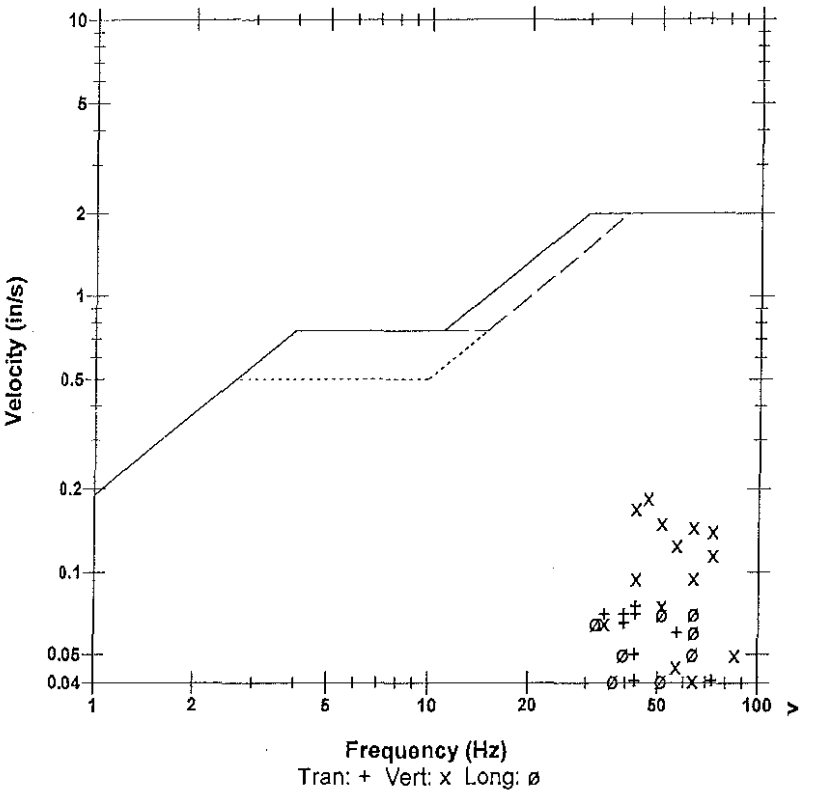
Date/Time	Vert at 13:12:30 March 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6MI.0U0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

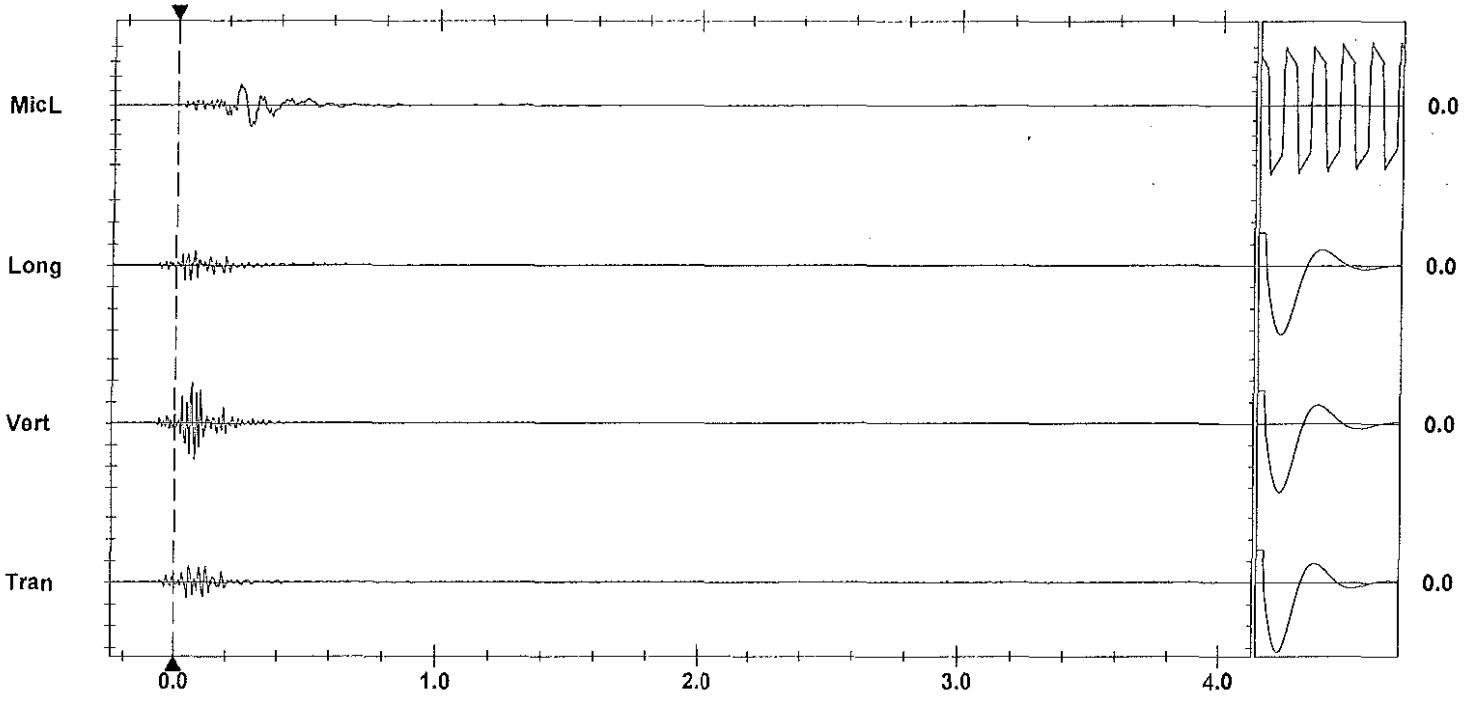
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00141 psi(L) at 0.245 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 681 mv)

	Tran	Vert	Long	
PPV	0.0750	0.185	0.0700	in/s
ZC Freq	43	47	64	Hz
Time (Rel. to Trig)	0.052	0.066	0.035	sec
Peak Acceleration	0.0663	0.186	0.0663	g
Peak Displacement	0.00032	0.00064	0.00024	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.7	4.5	

Peak Vector Sum 0.192 in/s at 0.066 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

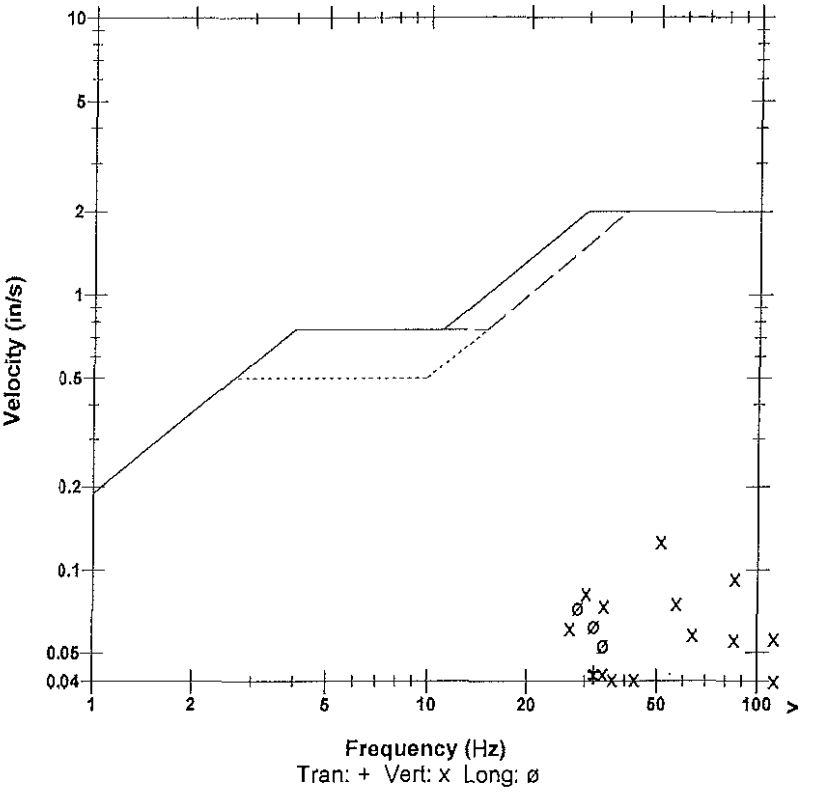
Date/Time	Vert at 13:12:47 March 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6MI.1B0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

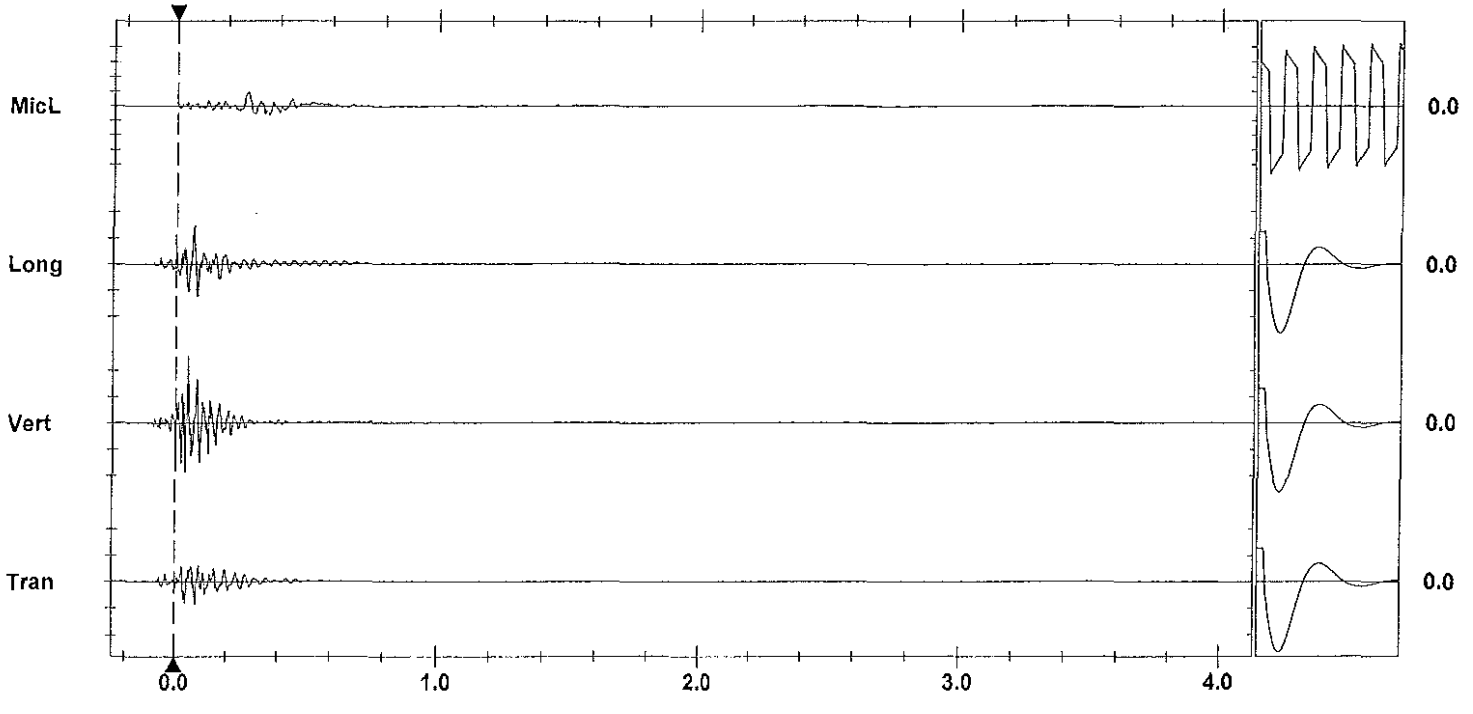
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00098 psi(L) at 0.274 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 681 mv)

	Tran	Vert	Long	
PPV	0.0425	0.127	0.0731	in/s
ZC Freq	32	51	28	Hz
Time (Rel. to Trig)	0.083	0.050	0.071	sec
Peak Acceleration	0.0481	0.141	0.0497	g
Peak Displacement	0.00020	0.00032	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.136 in/s at 0.050 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 6/12
ACTUAL BLAST DATE Mar 6/12 2:15 PM
BLAST # MW-0144

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 (HIGH SPOT)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.0 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

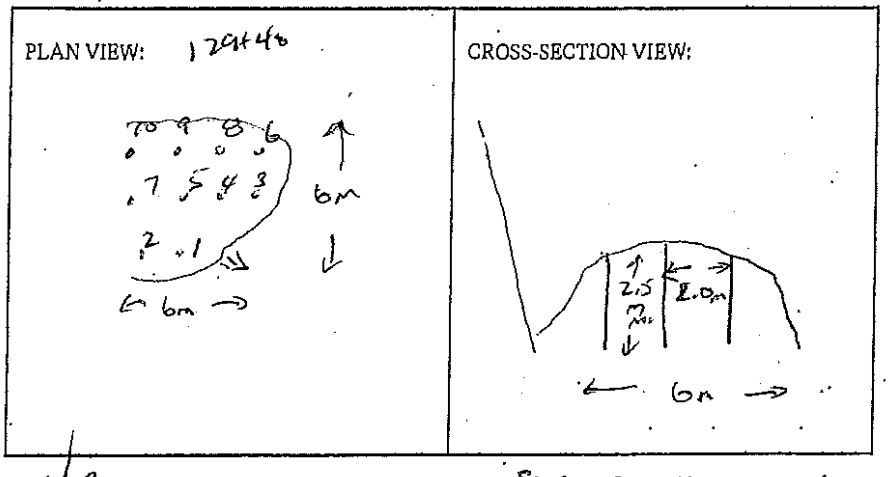
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED NIL (HIGH SPOT) (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt – 0.091 ips / 47 Hz
@ 13117 Cliffstone Crt – 0.11 ips / 47 Hz

2'-3' ANFO/Hole Primed w/ 1 emer 1"x8" DYNAMITE

Instantel

Event Report

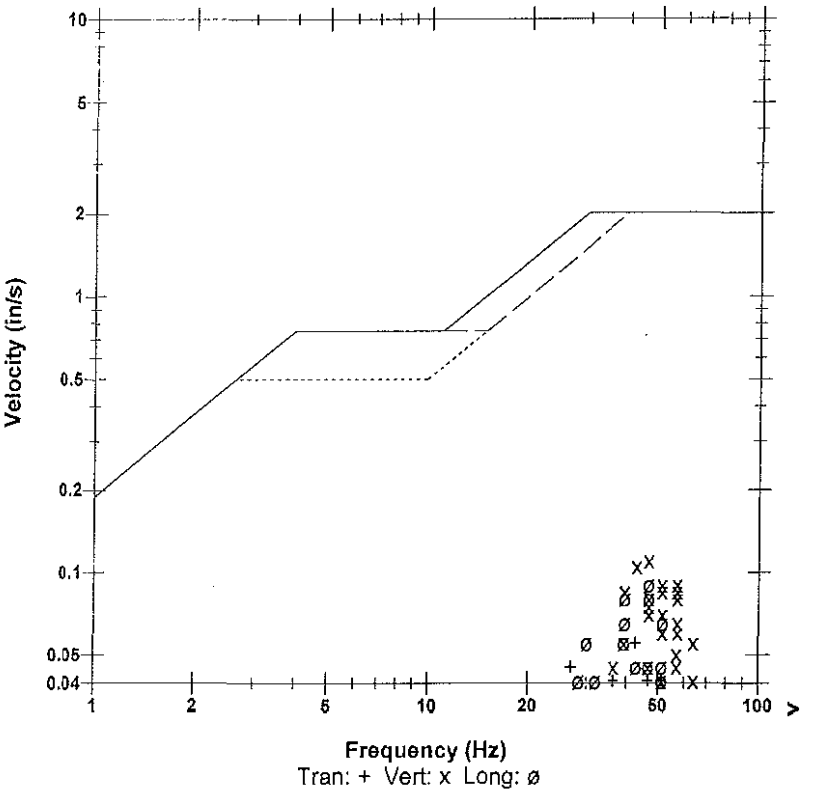
Date/Time	Vert at 14:15:19 March 6, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6MK.XJ0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

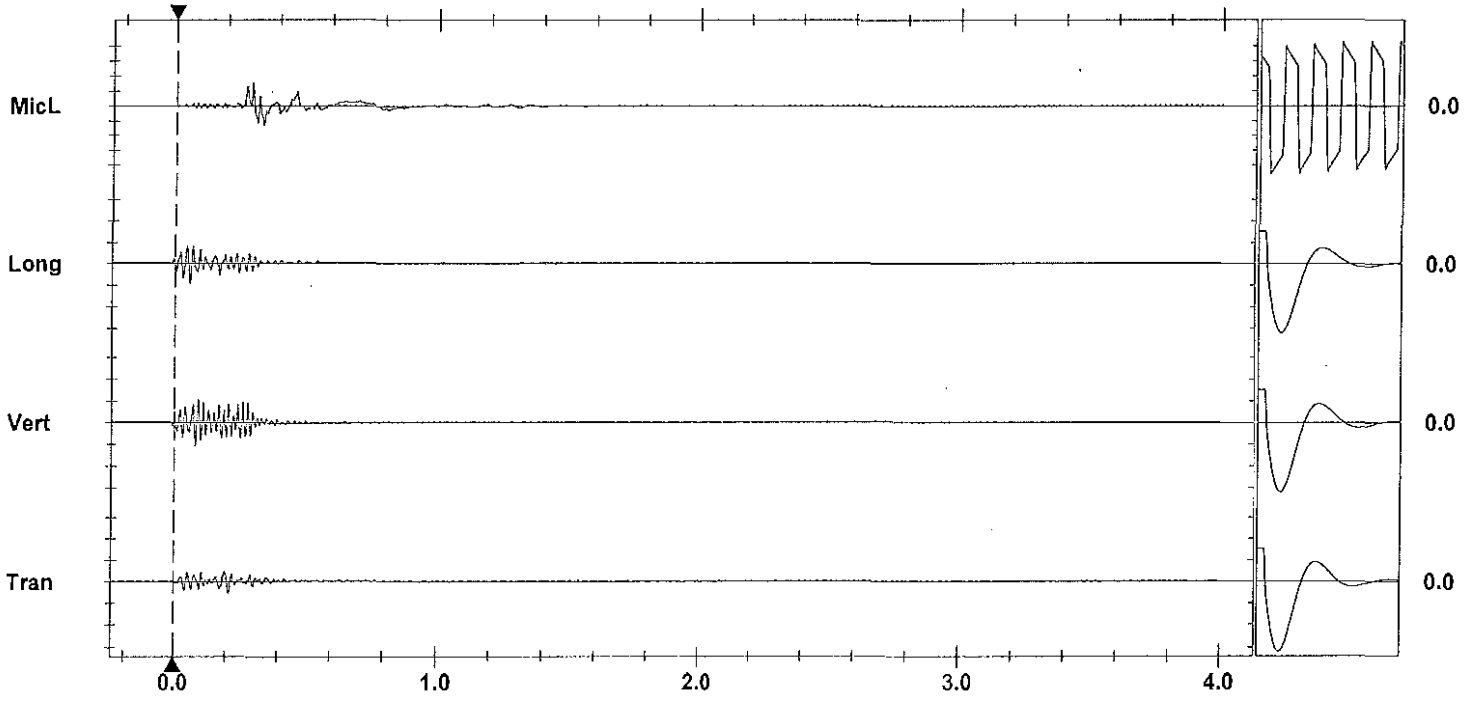
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00152 psi(L) at 0.295 sec
ZC Freq	39 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 686 mv)

	Tran	Vert	Long	
PPV	0.0550	0.110	0.0900	in/s
ZC Freq	43	47	47	Hz
Time (Rel. to Trig)	0.213	0.082	0.059	sec
Peak Acceleration	0.0398	0.106	0.0663	g
Peak Displacement	0.00028	0.00036	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.6	7.1	Hz
Overswing Ratio	3.6	3.7	4.5	

Peak Vector Sum 0.117 in/s at 0.083 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

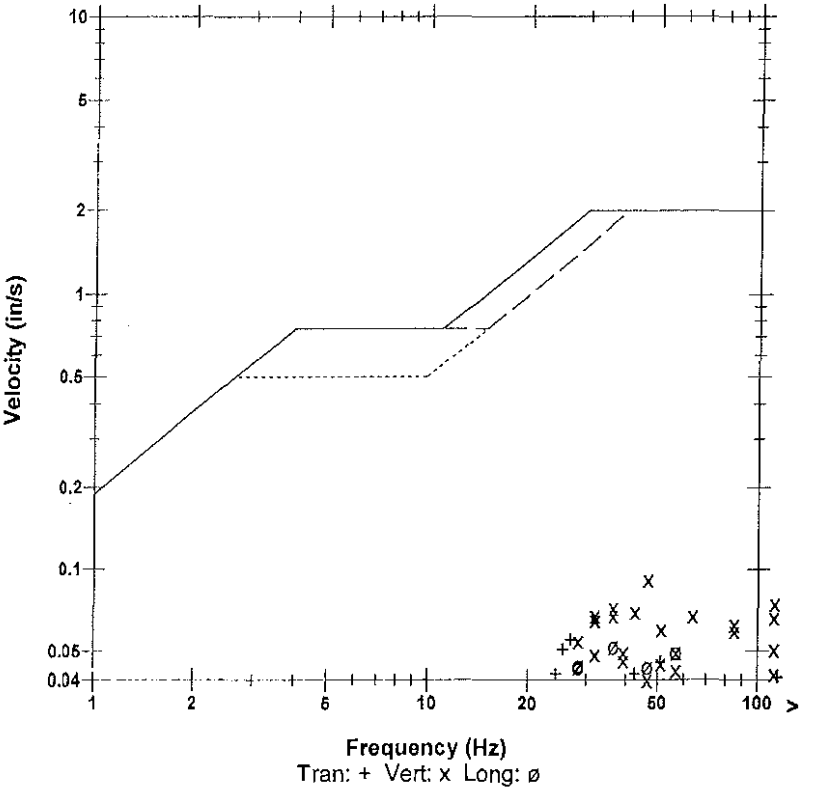
Date/Time	Vert at 14:15:35 March 6, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6MK.XZ0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

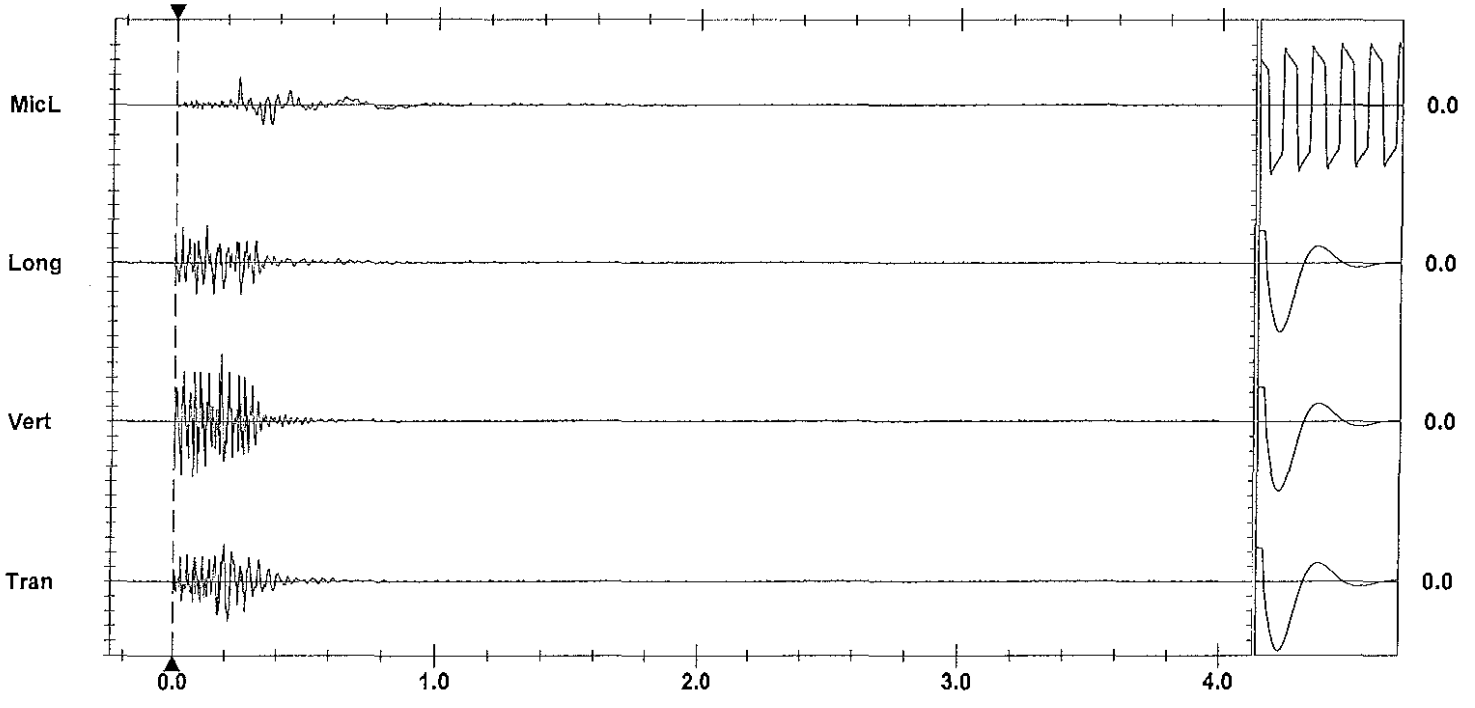
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00189 psi(L) at 0.244 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 699 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0912	0.0519	in/s
ZC Freq	27	47	37	Hz
Time (Rel. to Trig)	0.213	0.182	0.123	sec
Peak Acceleration	0.0928	0.186	0.0563	g
Peak Displacement	0.00032	0.00027	0.00021	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0942 in/s at 0.182 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 7/12
ACTUAL BLAST DATE Mar 7/12 12:46 PM
BLAST # MW-0145

HIGHWAY# 97
BLAST LOCATION AT: SHN 129+10 - 129+15

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
+ shot matted

SITE DETAILS:

HEIGHT ABOVE HWY 5m (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5?
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 9 Appx.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2-1 (m) BURDEN 2-1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

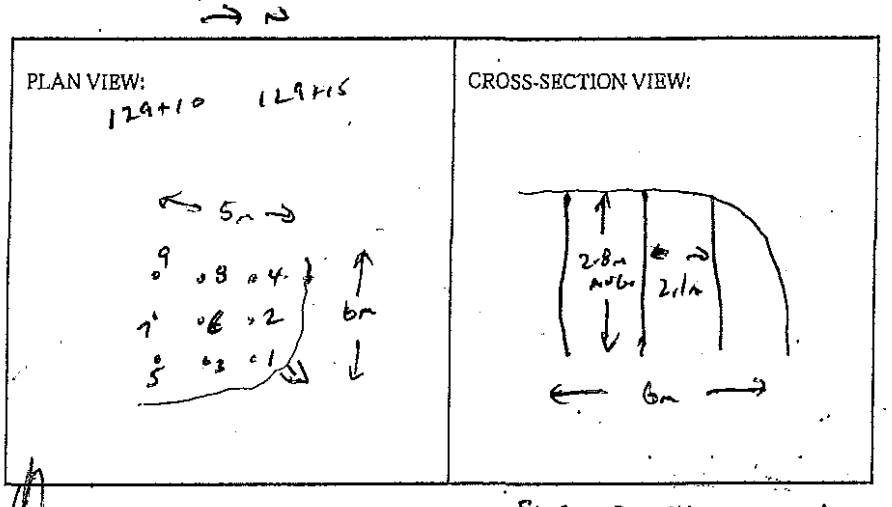
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Cut - 0.049 ips/39 Hz
" @ 13117 Cliffstone Cut - 0.090 ips/47 Hz

2'-3' ANFO/Hole primed w/ 1 each 1"x8" Dynamite

Instantel

Event Report

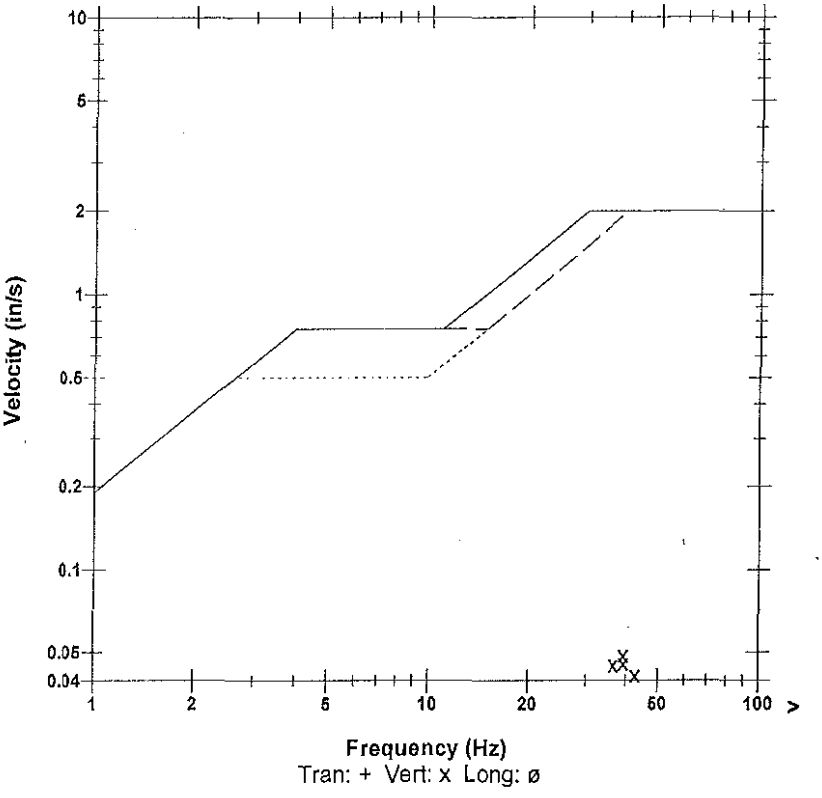
Date/Time	Vert at 12:46:17 March 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6OB.H50
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

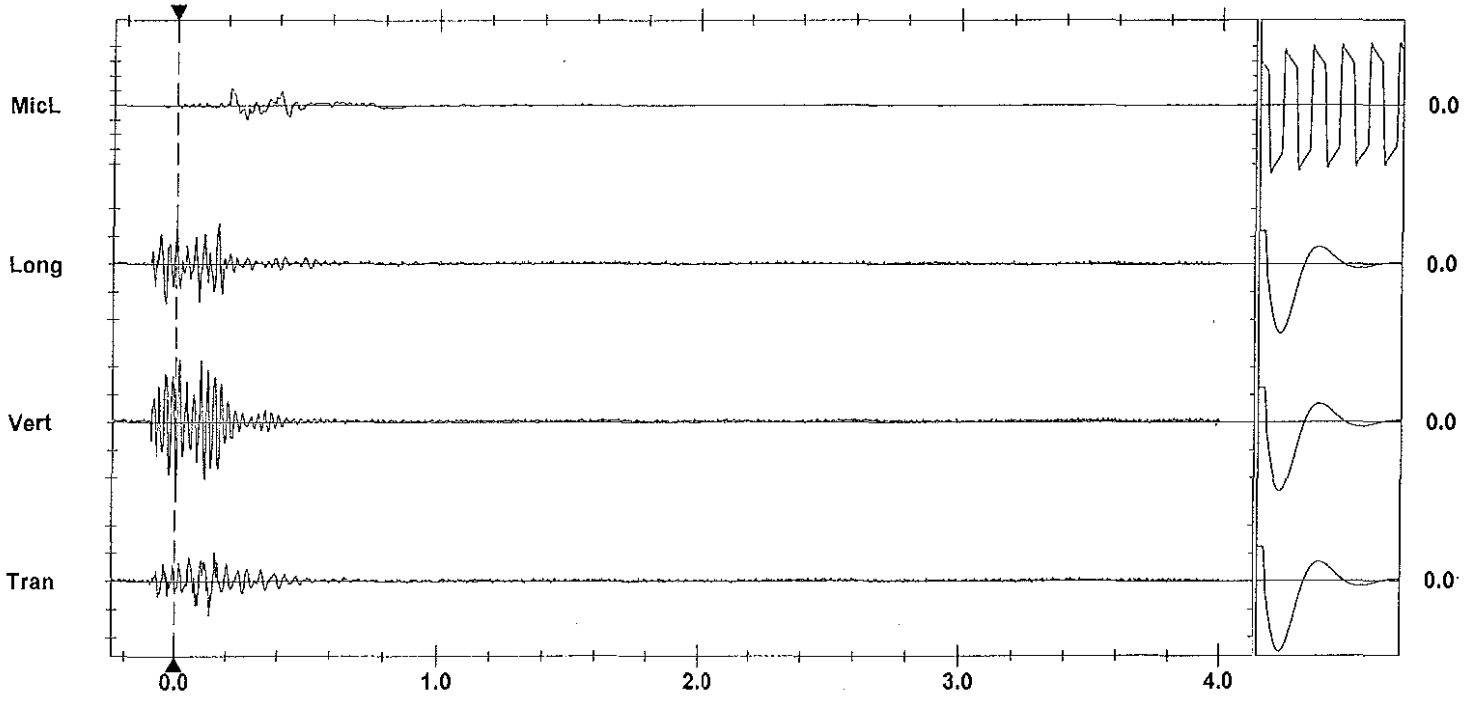
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.211 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 660 mv)

	Tran	Vert	Long	
PPV	0.0244	0.0487	0.0294	in/s
ZC Freq	28	39	30	Hz
Time (Rel. to Trig)	0.137	0.002	0.165	sec
Peak Acceleration	0.0215	0.0464	0.0182	g
Peak Displacement	0.00014	0.00018	0.00015	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.0544 in/s at 0.002 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 12:45:59 March 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6OB.GN0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

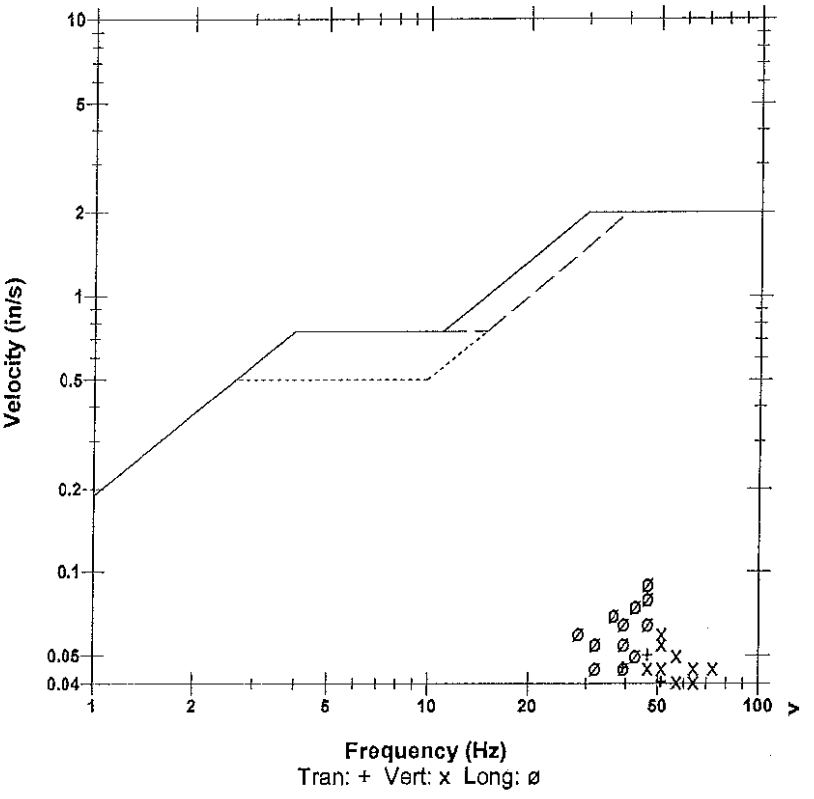
Post Event Notes

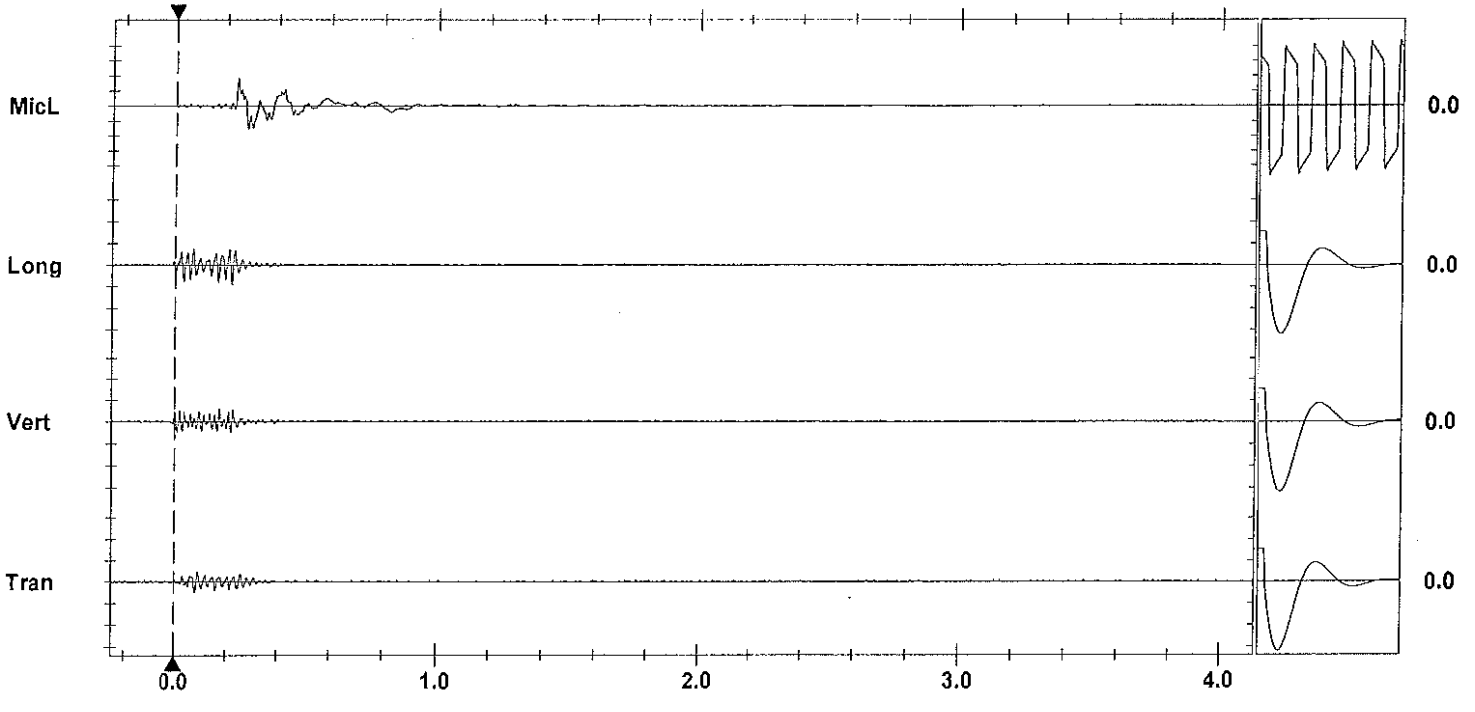
Microphone Linear Weighting
PSPL 0.00185 psi(L) at 0.240 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 635 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0600	0.0900	in/s
ZC Freq	47	51	47	Hz
Time (Rel. to Trig)	0.083	0.176	0.222	sec
Peak Acceleration	0.0398	0.0530	0.0663	g
Peak Displacement	0.00018	0.00017	0.00031	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.3	

Peak Vector Sum 0.0971 in/s at 0.222 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 7/12
ACTUAL BLAST DATE MAR 7/12 1:58 PM
BLAST # MW-0146

HIGHWAY# 97
BLAST LOCATION AT: STN 129+05 - 129+10

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 7 Pond
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

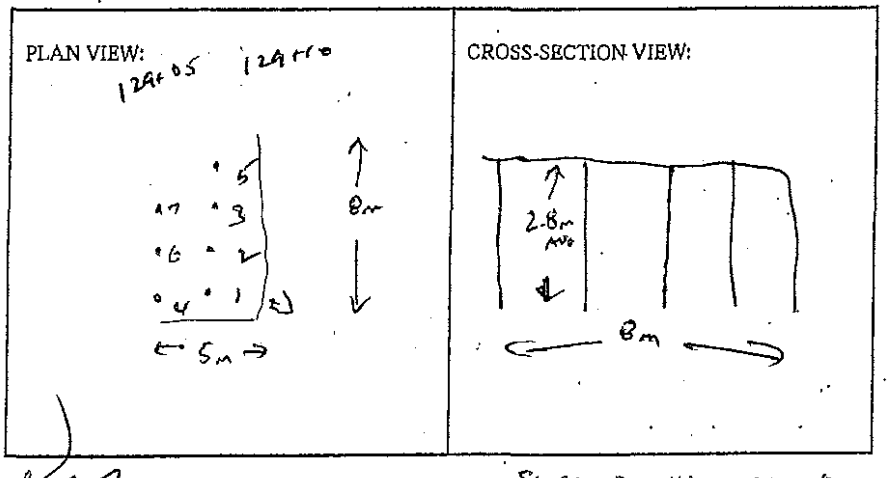
INITIATION DEVICE: (CIRCLE) (E.E. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.086 ips/ 43 Hz
@ 13117 Cliffstone Crt. 0.20 ips/ 51 Hz

2'-3' ANFO/Hole primed w/ 1 each 1¼x8" DYNAMITE

Instantel

Event Report

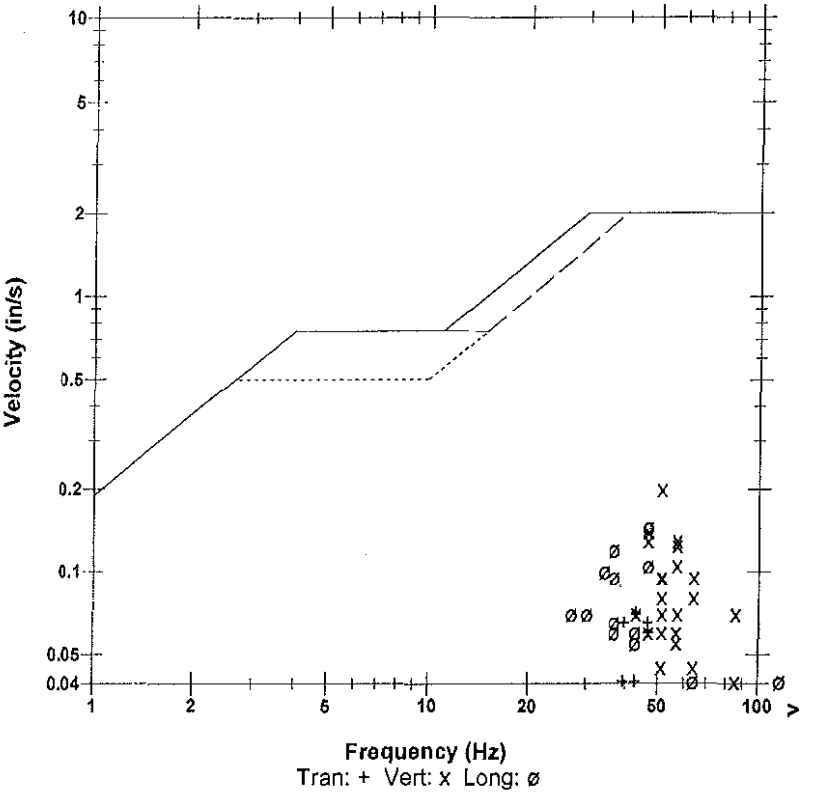
Date/Time	Vert at 13:58:33 March 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6OE.TL0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

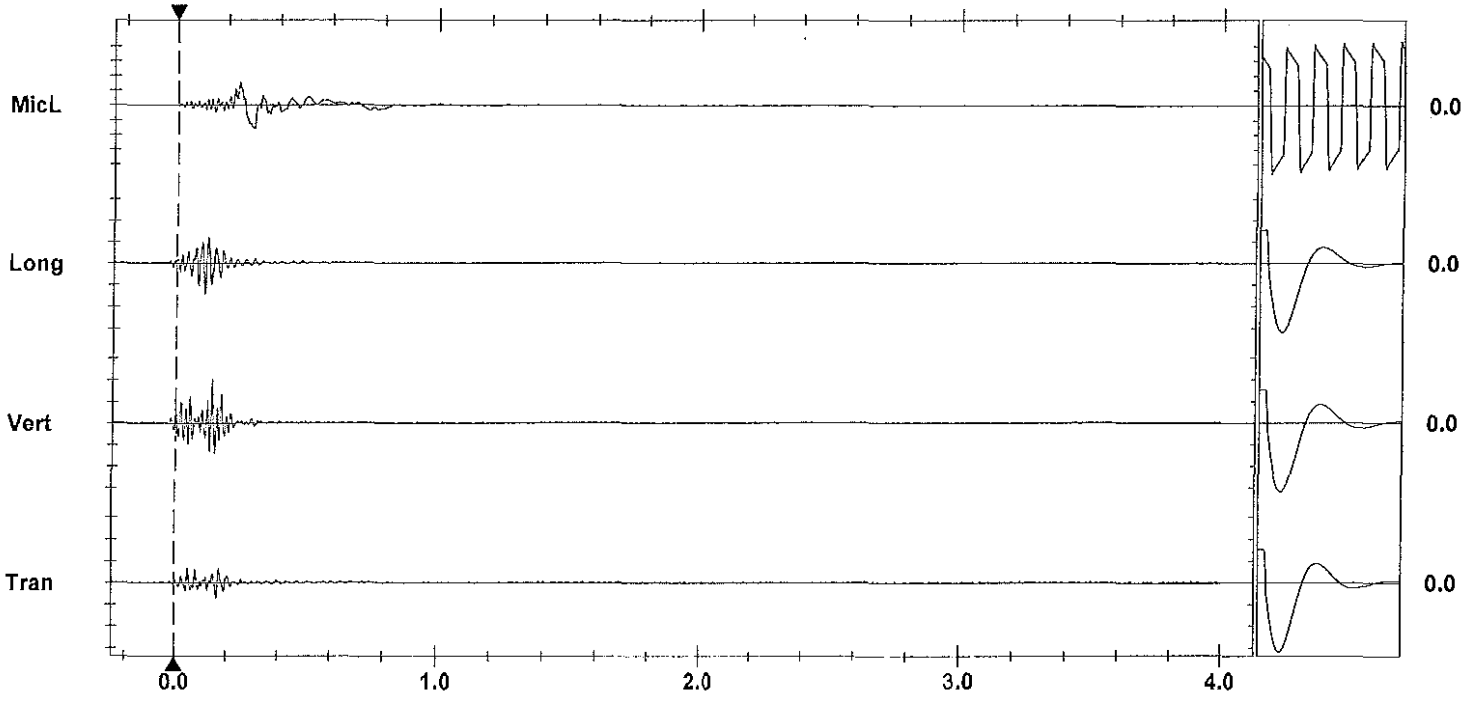
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00160 psi(L) at 0.297 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 670 mv)

	Tran	Vert	Long	
PPV	0.0700	0.200	0.145	in/s
ZC Freq	43	51	47	Hz
Time (Rel. to Trig)	0.165	0.144	0.111	sec
Peak Acceleration	0.0663	0.146	0.119	g
Peak Displacement	0.00025	0.00059	0.00050	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.8	4.3	

Peak Vector Sum 0.202 in/s at 0.144 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

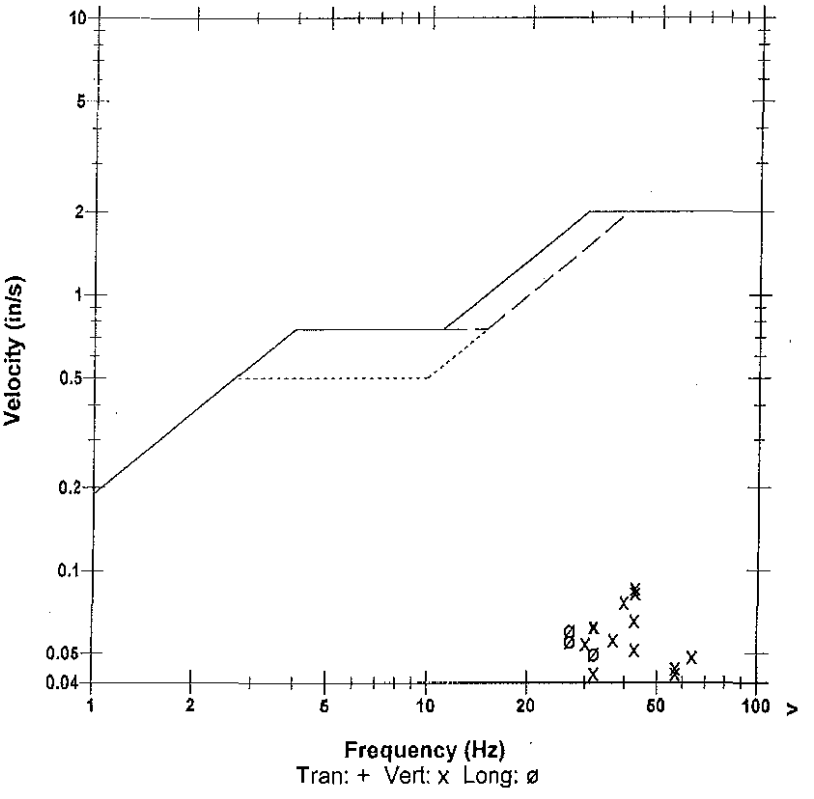
Date/Time	Vert at 13:58:50 March 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6OE.U20
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

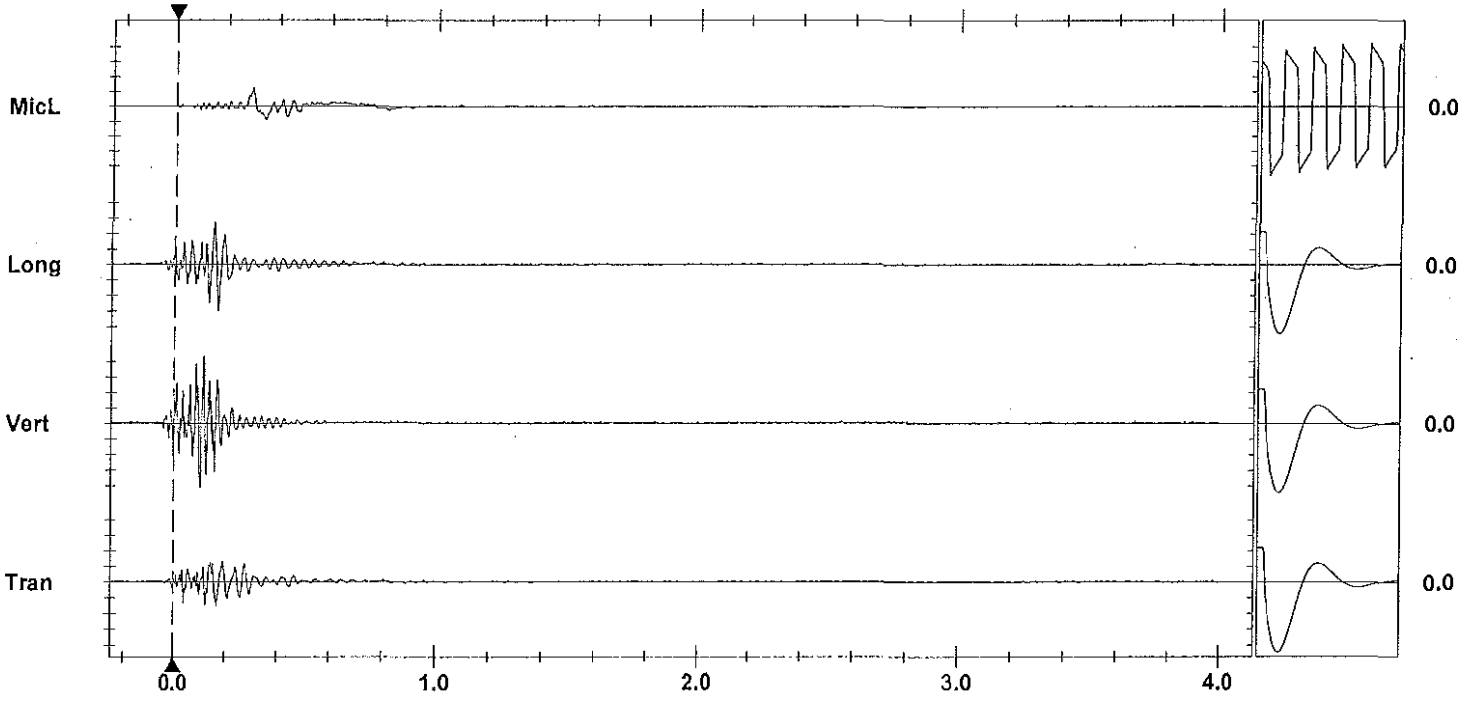
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.295 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.0312	0.0862	0.0606	in/s
ZC Freq	23	43	27	Hz
Time (Rel. to Trig)	0.170	0.116	0.170	sec
Peak Acceleration	0.0331	0.106	0.0331	g
Peak Displacement	0.00019	0.00032	0.00030	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.6	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.0884 in/s at 0.170 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Heaney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAR 7/12
ACTUAL BLAST DATE MAR 7/12 3:22PM
BLAST # MW-0147

HIGHWAY# 97
BLAST LOCATION AT: STN 129+05 - 129+15

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite and 20
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

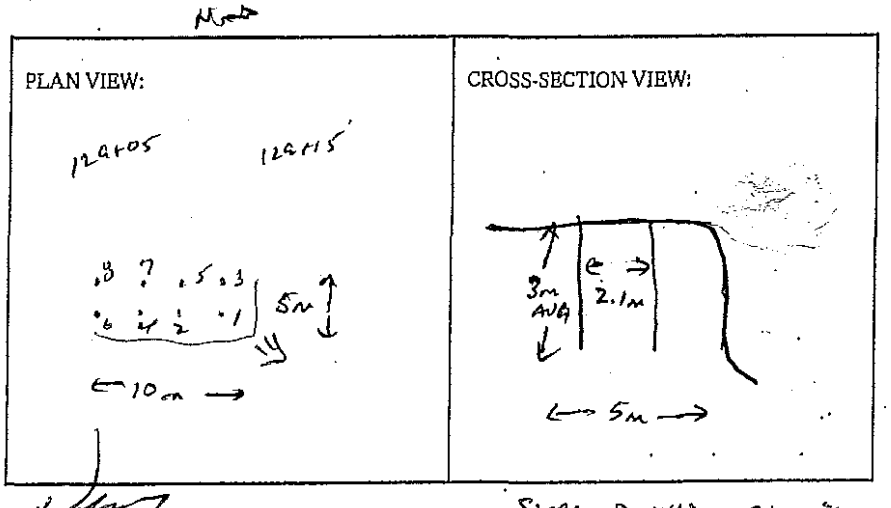
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.097 ips/37Hz
" @ 13117 Cliffstone Crt. 0.18 ips / 47Hz

2'-3' ANFO/HOLE primed w/ 1 CAST 1"x8" DYNAMITE

Instantel

Event Report

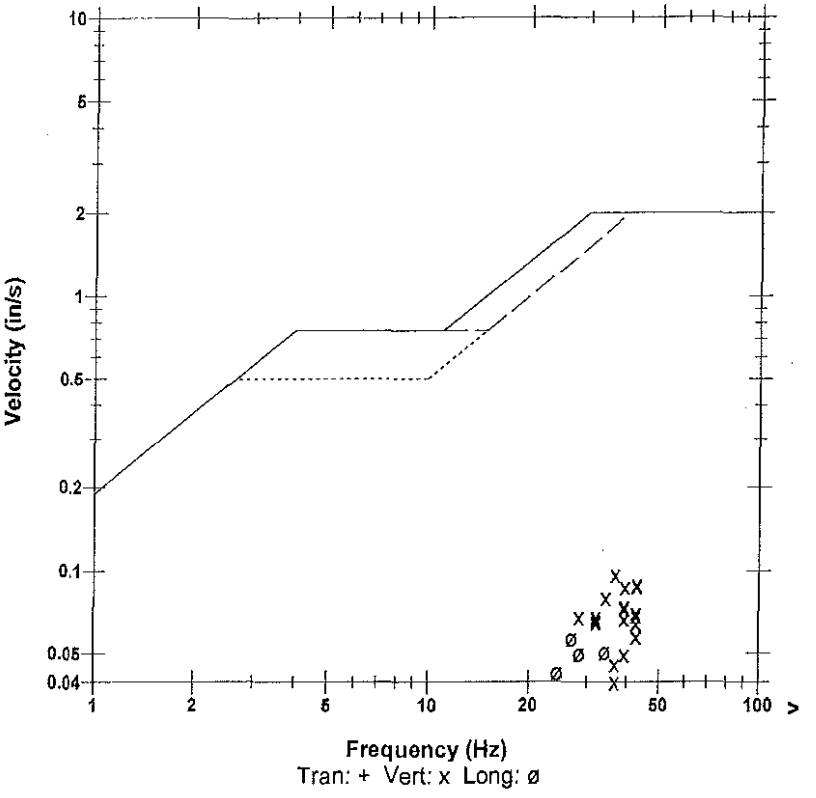
Date/Time	Vert at 15:22:49 March 7, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6OI.Q10
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

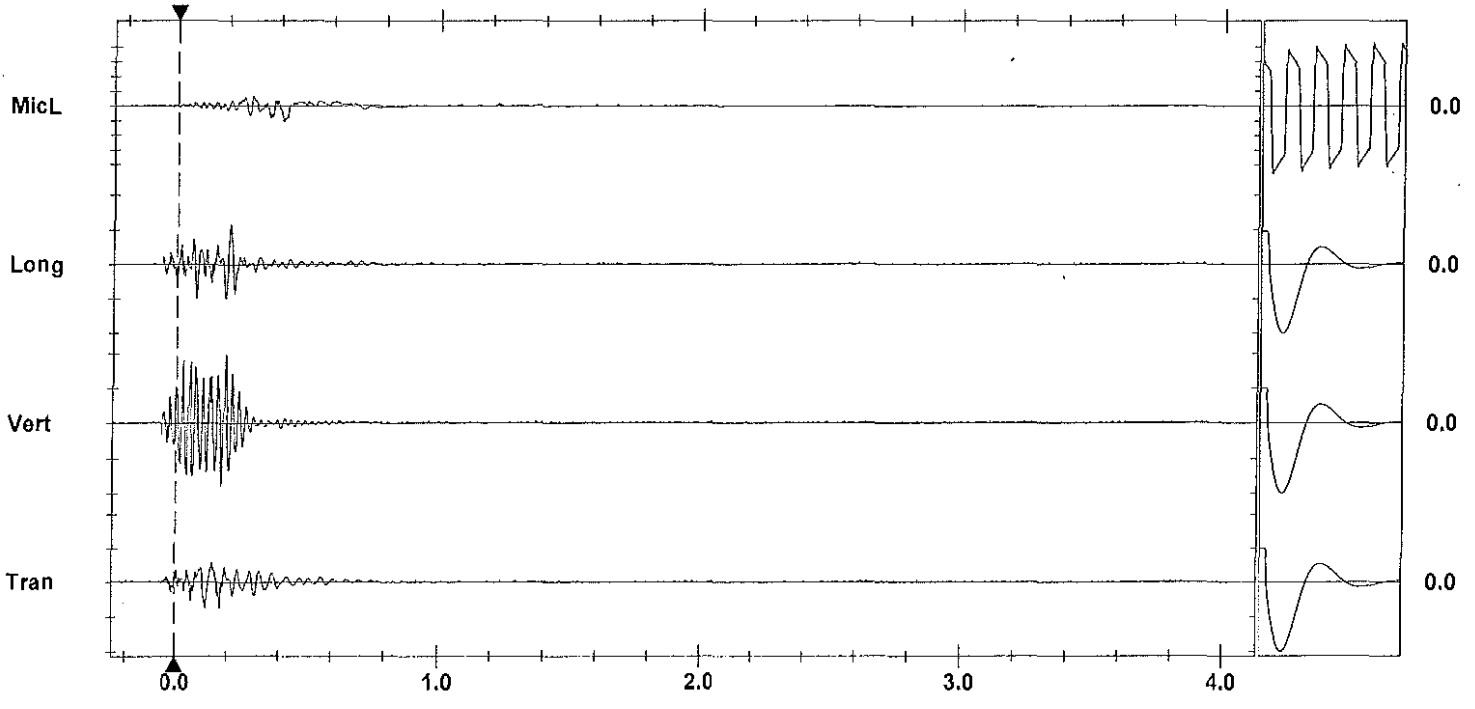
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00102 psi(L) at 0.407 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 699 mv)

	Tran	Vert	Long	
PPV	0.0375	0.0969	0.0569	in/s
ZC Freq	23	37	27	Hz
Time (Rel. to Trig)	0.121	0.191	0.207	sec
Peak Acceleration	0.0232	0.103	0.0365	g
Peak Displacement	0.00023	0.00039	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.107 in/s at 0.191 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — — —◀

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Instantel

Event Report

Date/Time	Vert at 15:22:32 March 7, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6OI.PK0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

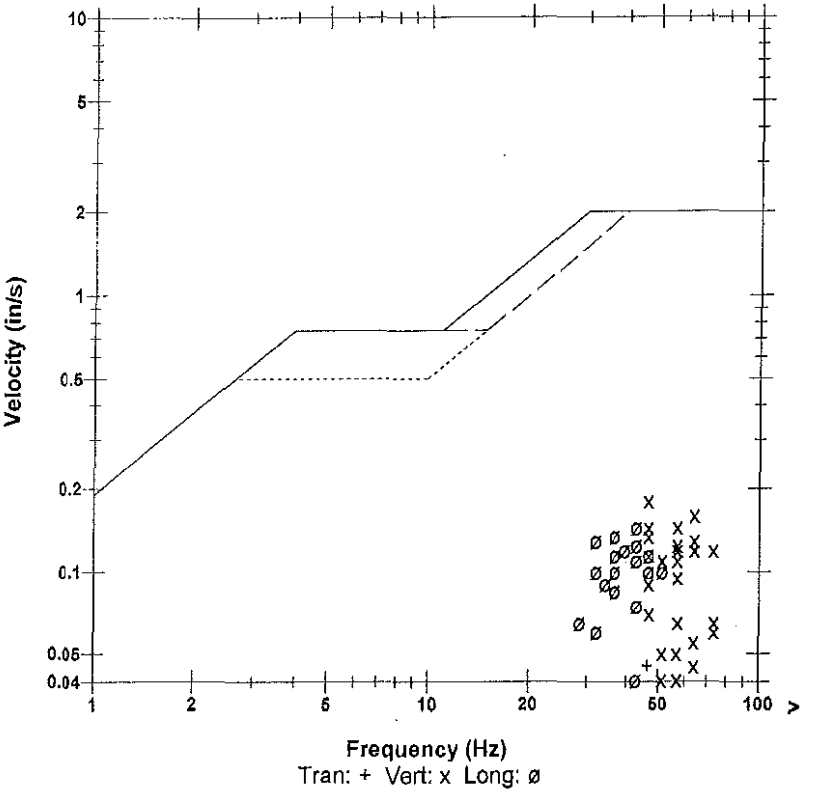
Extended Notes
Blast at stn 128

Post Event Notes

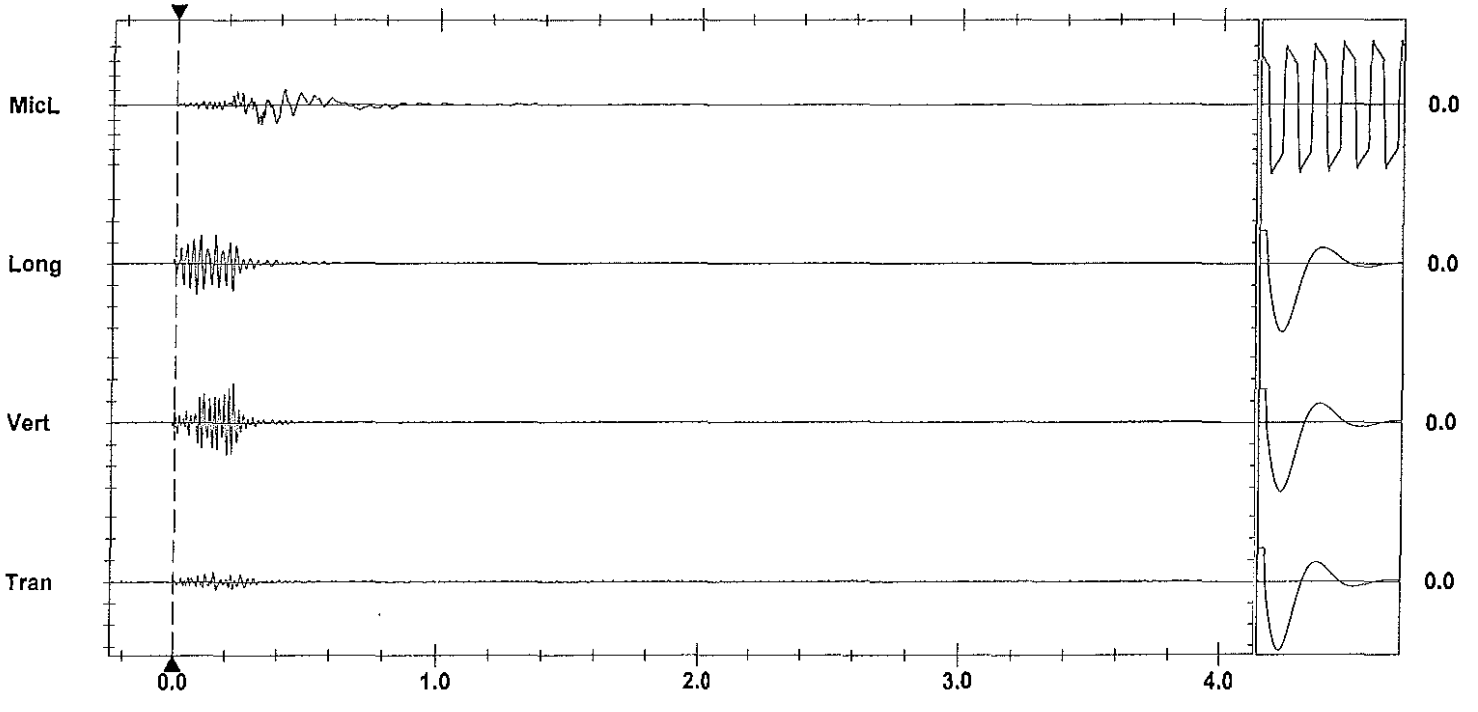
Microphone Linear Weighting
PSPL 0.00131 psi(L) at 0.328 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 665 mv)

	Tran	Vert	Long	
PPV	0.0450	0.180	0.145	in/s
ZC Freq	47	47	43	Hz
Time (Rel. to Trig)	0.156	0.229	0.082	sec
Peak Acceleration	0.0398	0.146	0.106	g
Peak Displacement	0.00016	0.00052	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.7	4.3	

USBM RI8507 And OSMRE



Peak Vector Sum 0.189 in/s at 0.212 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: March 11, 2012 (V 8.01 - 8.01)
Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veaudry
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Mar 8/12
ACTUAL BLAST DATE Mar 8/12 12:14 PM
BLAST # MW-0148

HIGHWAY# 97
BLAST LOCATION AT: STN 129+000 - 129+025

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Mixed Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 9 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamine + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 56 (kg)
DELAY TYPE AND LENGTH 25 (ms)

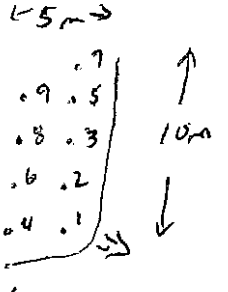
INITIATION DEVICE: (CIRCLE) E.D. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 175 (m^3)

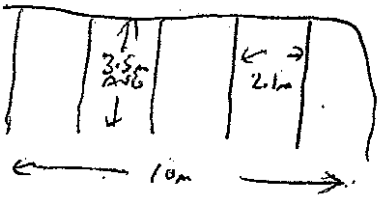
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.115 ips/ 32Hz
" @ 13117 Cliffstone Crt - 0.165 ips/ 39Hz

4'-5' ANFO/ holes primed w/ 1 each 1'x8" dynamite

Instantel

Event Report

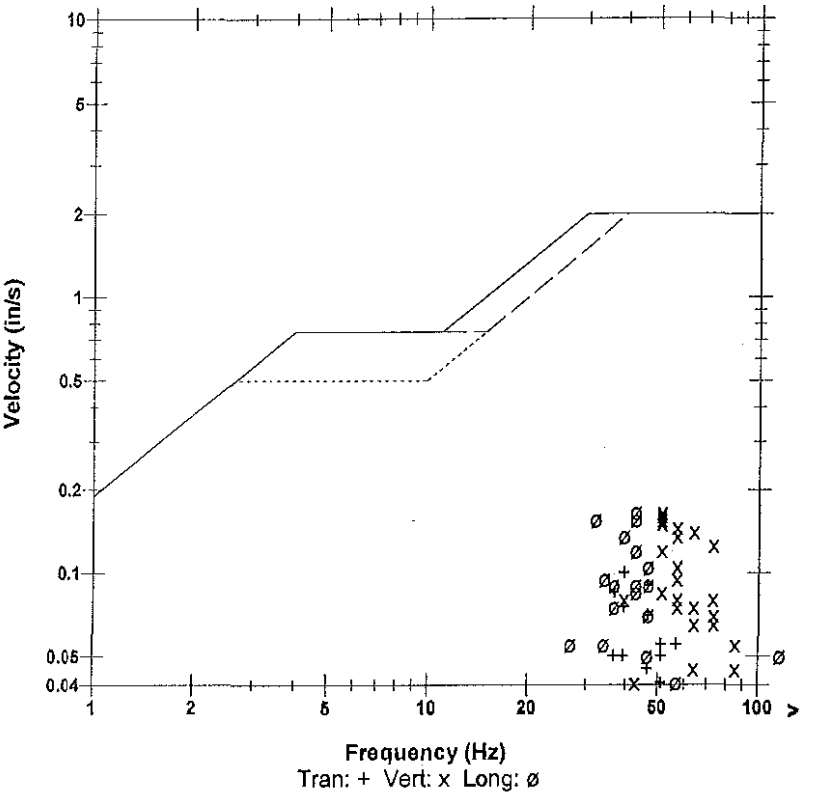
Date/Time	Vert at 12:14:59 March 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6Q4.OZ0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

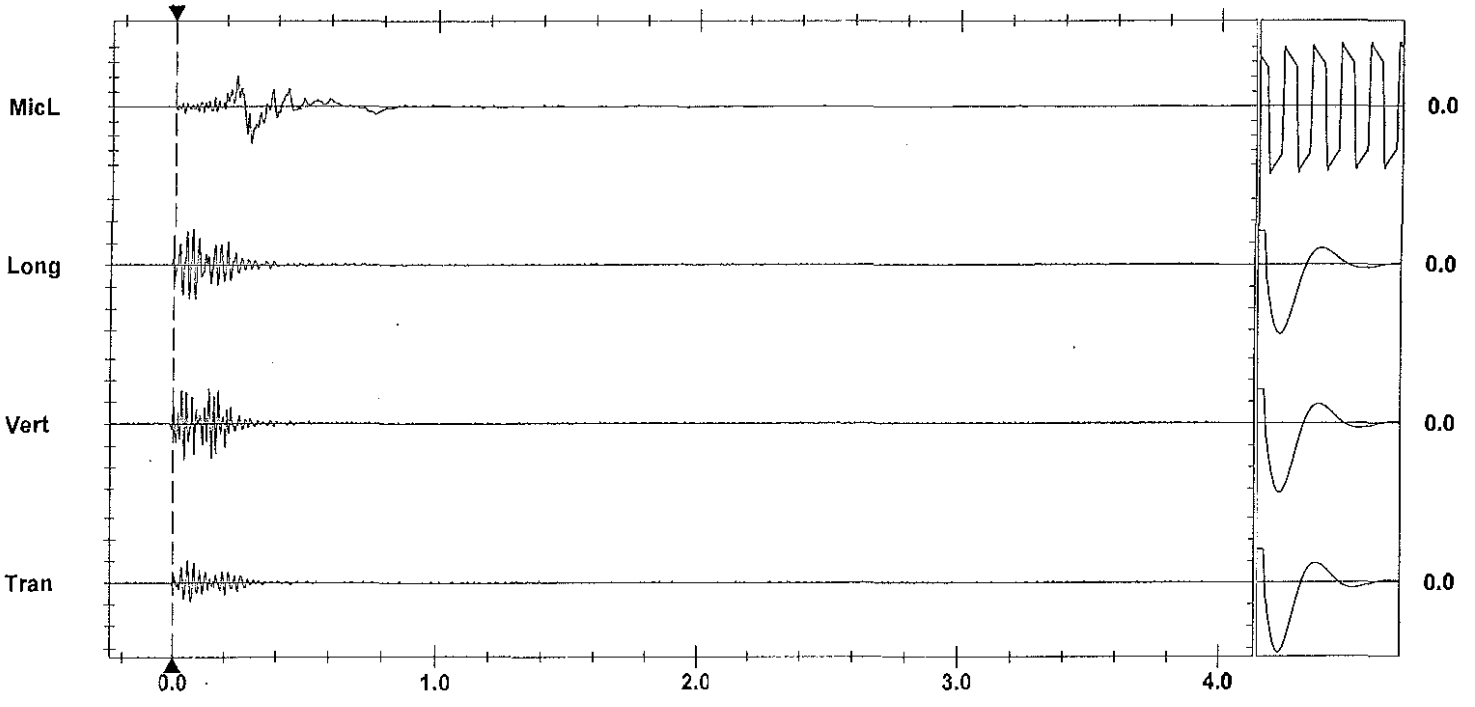
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00254 psi(L) at 0.296 sec
ZC Freq 6.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 665 mv)

	Tran	Vert	Long	
PPV	0.1000	0.165	0.165	in/s
ZC Freq	39	51	43	Hz
Time (Rel. to Trig)	0.060	0.045	0.076	sec
Peak Acceleration	0.0663	0.159	0.146	g
Peak Displacement	0.00041	0.00049	0.00061	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.218 in/s at 0.085 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

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Instantel

Event Report

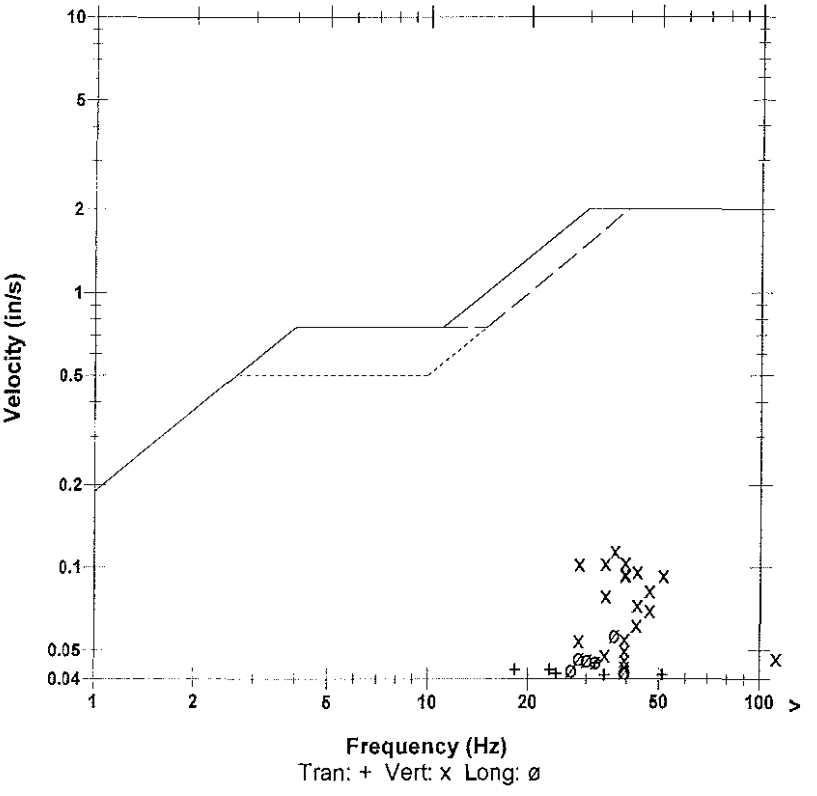
Date/Time	Vert at 12:15:01 March 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6Q4.P10
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

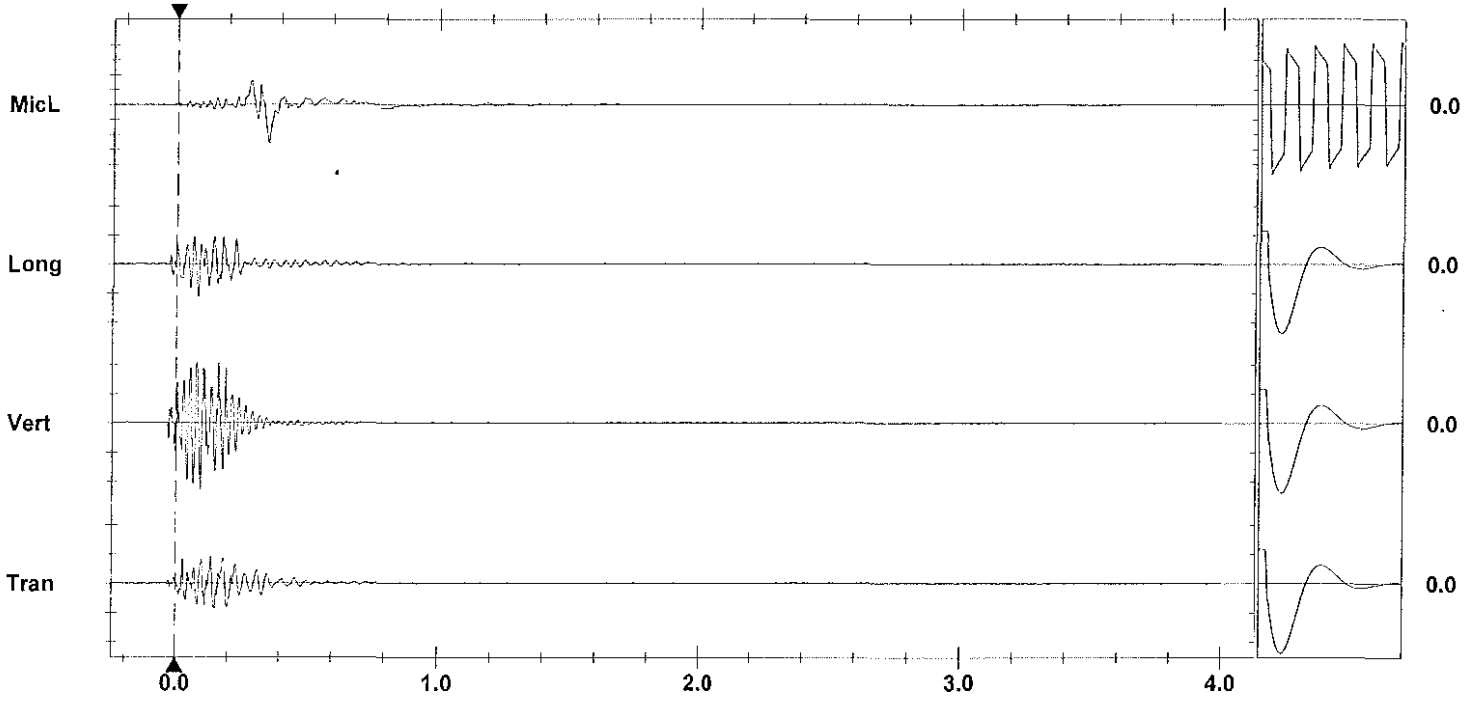
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00257 psi(L) at 0.351 sec			
ZC Freq	8.8 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)			

	Tran	Vert	Long	
PPV	0.0450	0.115	0.0569	in/s
ZC Freq	32	37	37	Hz
Time (Rel. to Trig)	0.139	0.097	0.086	sec
Peak Acceleration	0.0464	0.123	0.0365	g
Peak Displacement	0.00033	0.00049	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.123 in/s at 0.097 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶ ◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Heaney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAR 8/12
ACTUAL BLAST DATE MAR 8/12 1:44 PM
BLAST # MW-0149

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Layered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 38 (m)

TOTAL NUMBER OF HOLES 10 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT [redacted] 70 (kg)
DELAY TYPE AND LENGTH 25 (ms)

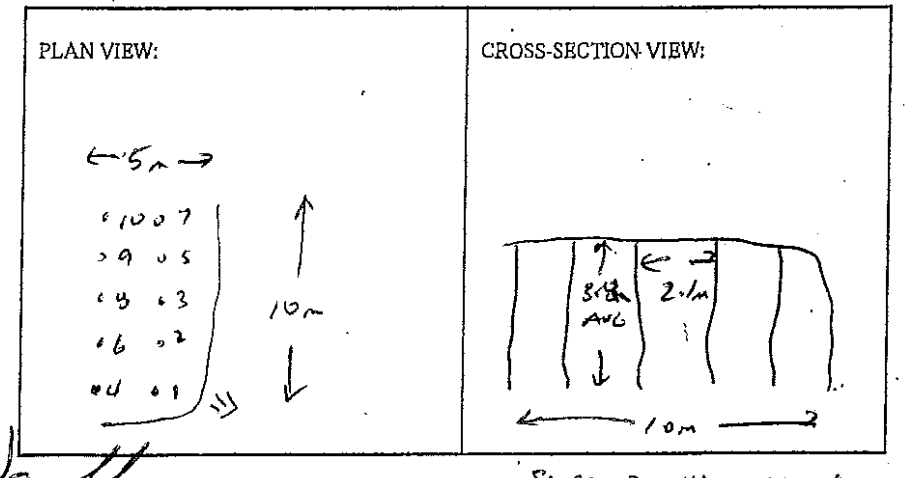
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 190 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Heaney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cnt - 0.10 in/s @ 19 Hz
" @ 13117 Cliffstone Cnt. 0.20 ips @ 43 Hz

5'-65' ANFO/Hole primed w/1 count 1"x8" dynamite

Instantel

Event Report

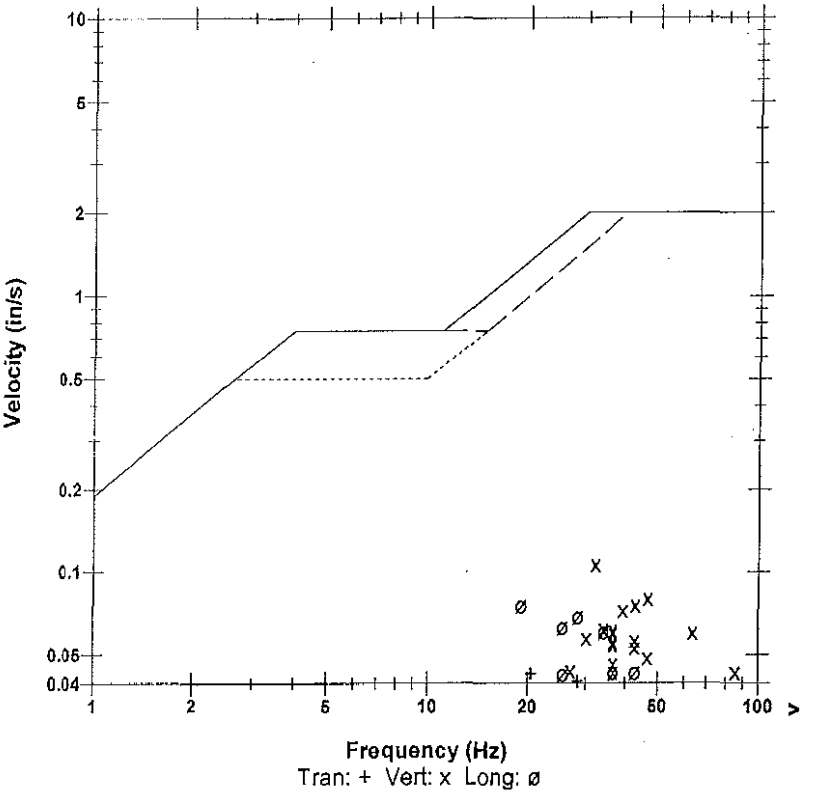
Date/Time	Vert at 13:44:03 March 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6Q8.TF0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

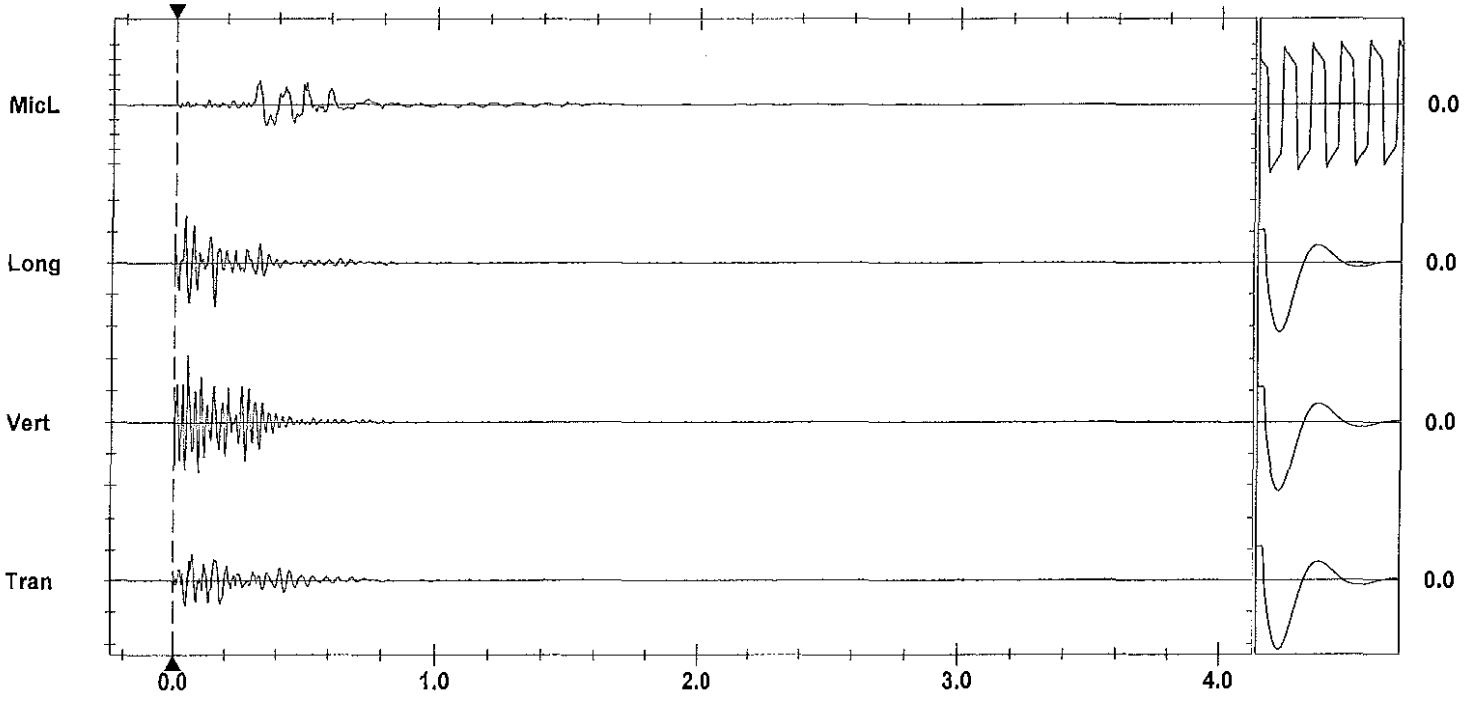
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00156 psi(L) at 0.323 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 678 mv)

	Tran	Vert	Long	
PPV	0.0425	0.106	0.0756	in/s
ZC Freq	20	32	19	Hz
Time (Rel. to Trig)	0.075	0.055	0.041	sec
Peak Acceleration	0.0282	0.0812	0.0398	g
Peak Displacement	0.00031	0.00041	0.00038	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 0.123 in/s at 0.055 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶— — ···· —◀

Sensorcheck

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Instantel

Event Report

Date/Time	Vert at 13:44:01 March 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6Q8.TD0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

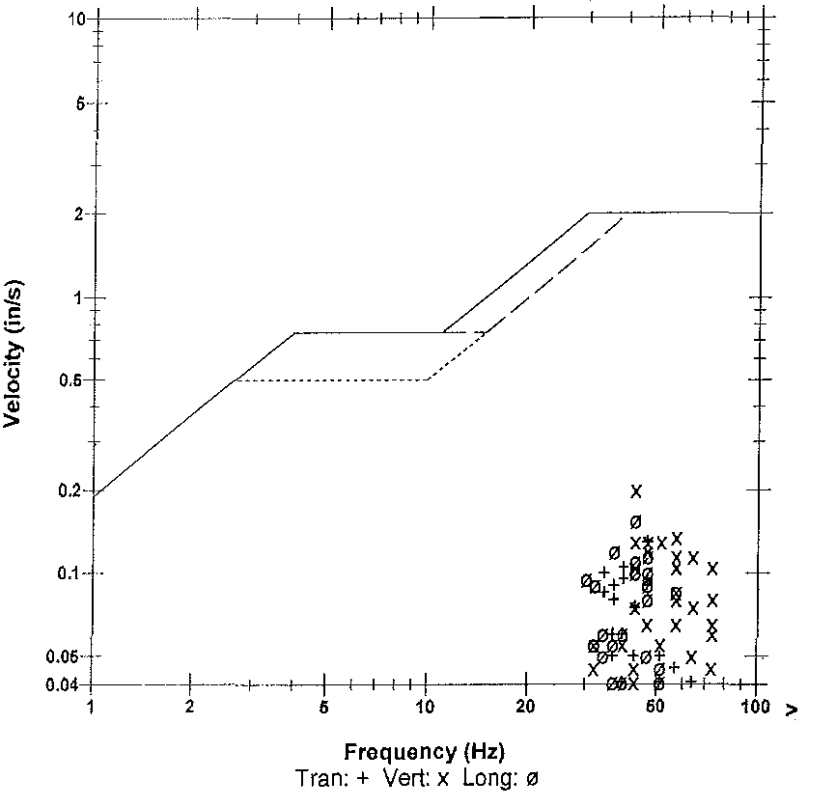
Extended Notes
Blast at stn 128

Post Event Notes

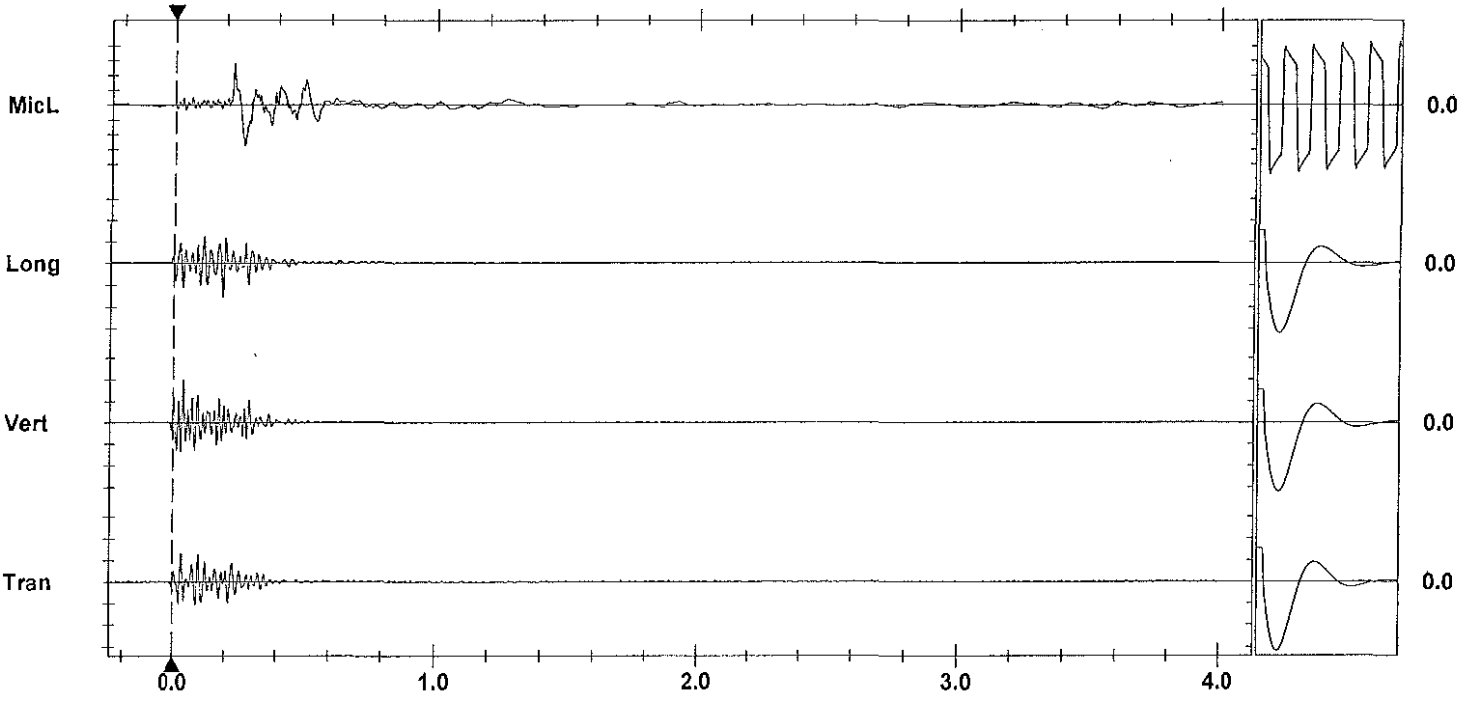
Microphone Linear Weighting
PSPL 0.00279 psi(L) at 0.229 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 666 mv)

	Tran	Vert	Long	
PPV	0.130	0.200	0.155	in/s
ZC Freq	47	43	43	Hz
Time (Rel. to Trig)	0.035	0.040	0.191	sec
Peak Acceleration	0.106	0.133	0.106	g
Peak Displacement	0.00045	0.00063	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.212 in/s at 0.040 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— —— ——◀

Sensorcheck

Printed: March 11, 2012 (V 8.01 - 8.01)
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED MAR 8/12
ACTUAL BLAST DATE Mar 8/12 3:18 PM
BLAST # MW-0130

HIGHWAY# 97
BLAST LOCATION AT: SW 128+92 - 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: + shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.5 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 8 PRO
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

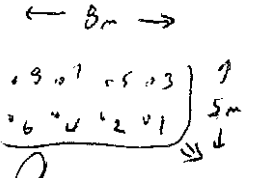
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 160 (m^3)

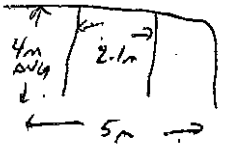
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cl: AA Structure Cnt - 0.1171 ppv/23Hz
" @ 13117 Cl: AA Structure Cnt - 0.2301 ppv/43Hz

6' ANFO/HOLE + 1 EACH 1"x8" DYNAMITE PRIMER

Instantel

Event Report

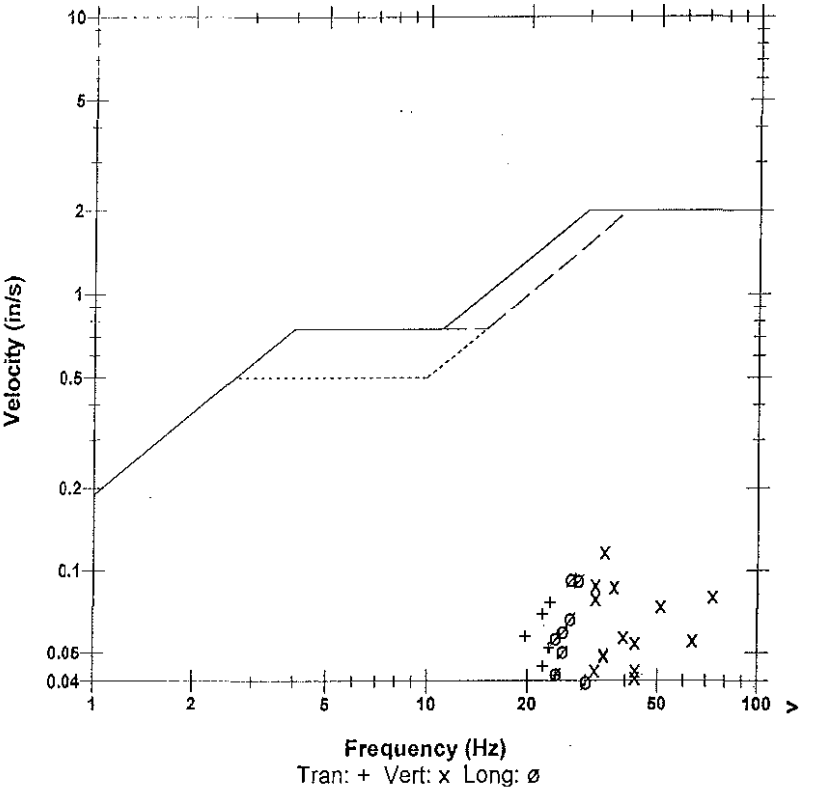
Date/Time	Vert at 15:18:15 March 8, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6QD.6F0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

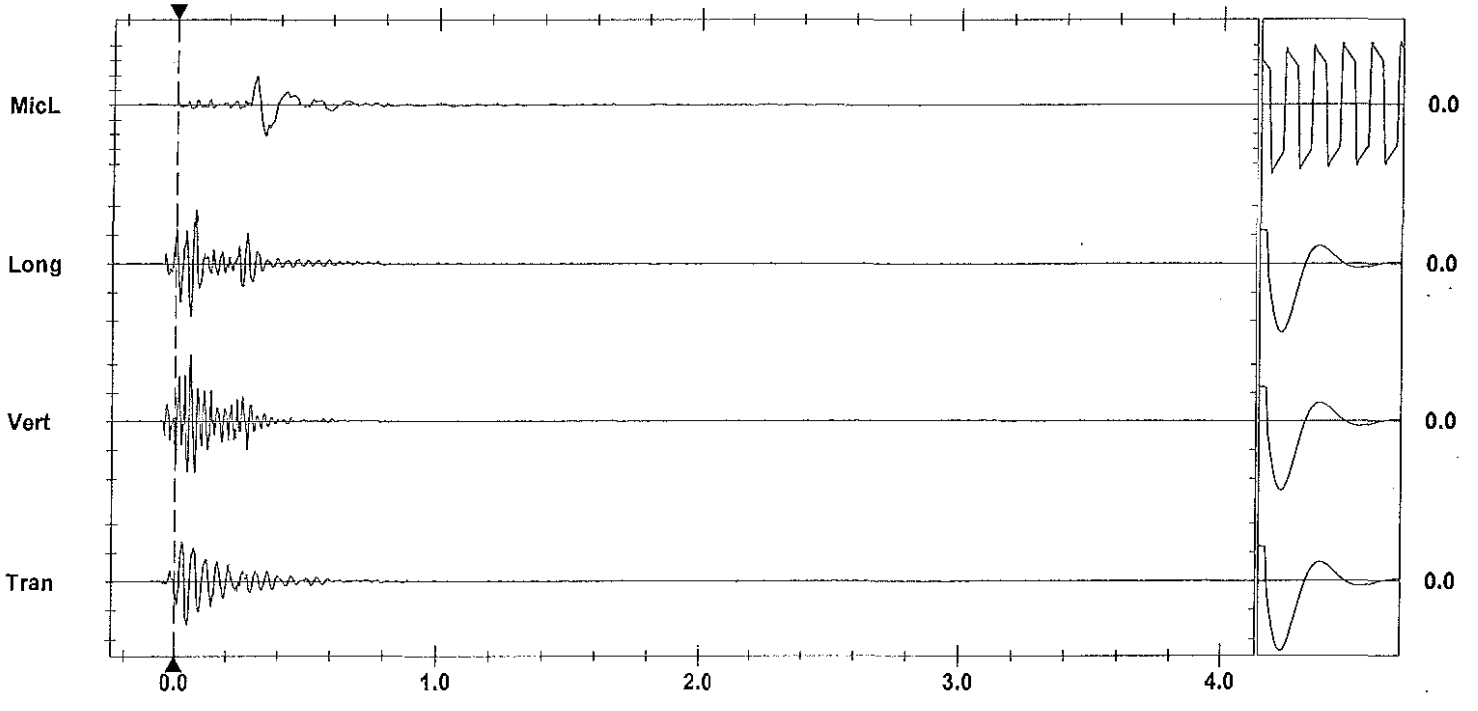
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00214 psi(L) at 0.343 sec
ZC Freq	7.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 682 mv)

	Tran	Vert	Long	
PPV	0.0762	0.117	0.0931	in/s
ZC Freq	23	34	27	Hz
Time (Rel. to Trig)	0.052	0.061	0.079	sec
Peak Acceleration	0.0547	0.106	0.0497	g
Peak Displacement	0.00056	0.00050	0.00055	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.149 in/s at 0.061 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: March 11, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

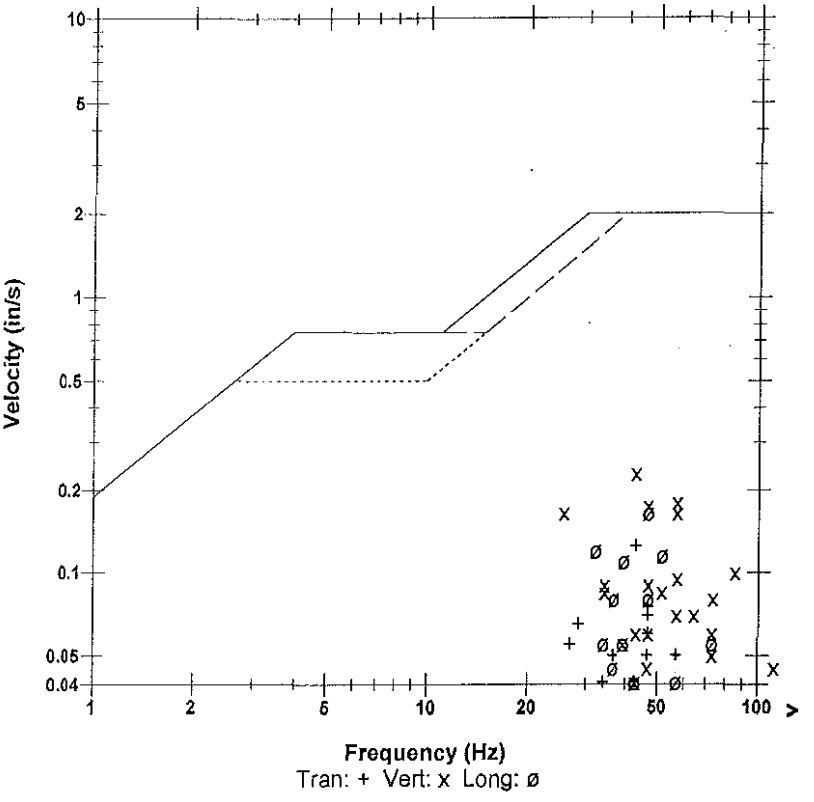
Date/Time	Vert at 15:18:14 March 8, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6QD.6E0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

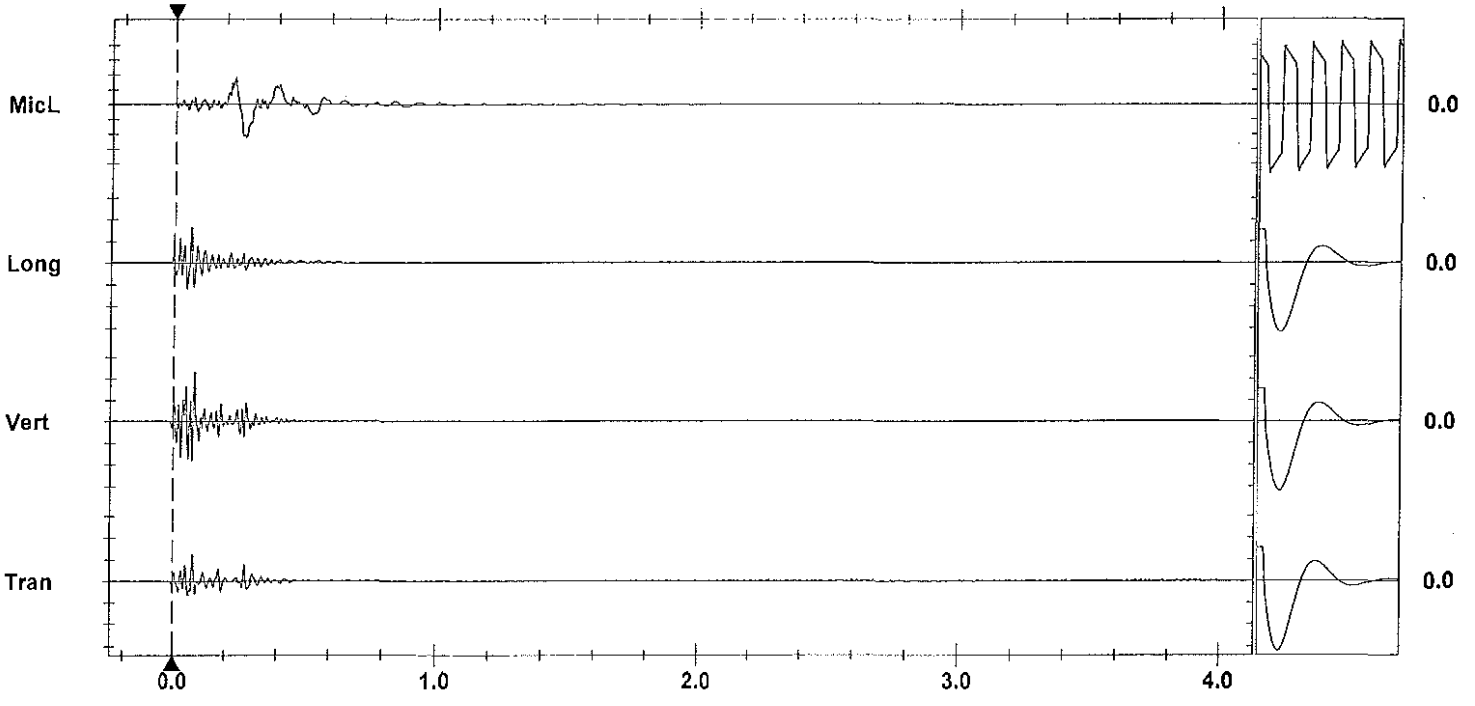
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00225 psi(L) at 0.272 sec
ZC Freq 8.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 679 mv)

	Tran	Vert	Long	
PPV	0.125	0.230	0.165	in/s
ZC Freq	43	43	47	Hz
Time (Rel. to Trig)	0.079	0.083	0.067	sec
Peak Acceleration	0.0928	0.199	0.133	g
Peak Displacement	0.00045	0.00084	0.00056	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.241 in/s at 0.083 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: March 11, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 12/12
ACTUAL BLAST DATE Mar 12/12 3:07 PM
BLAST # MW-0151

HIGHWAY# 97
BLAST LOCATION AT: STN 129+08 - 129+165

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Slot marked

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered sandstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.7 (m)
TOTAL DEPTH 82 (m)

TOTAL NUMBER OF HOLES 104/156 Rows
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Booster
TOTAL NUMBER OF CARTRIDGES 35
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH LP (ms)

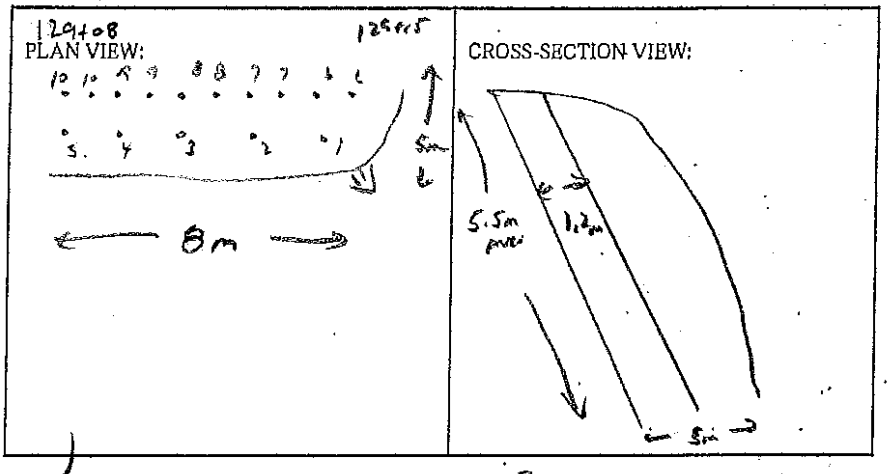
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Clifford Cst - 0.085 ips / 39 Hz
" 13117 Clifford Cst - 0.17 ips / 47 Hz

Buffer Holes - 4-5 count 2½" Blastex

B/L Holes - 1 count 2½" Dynamite + 200gm det. cord to 4' collar.

Instantel®

Event Report

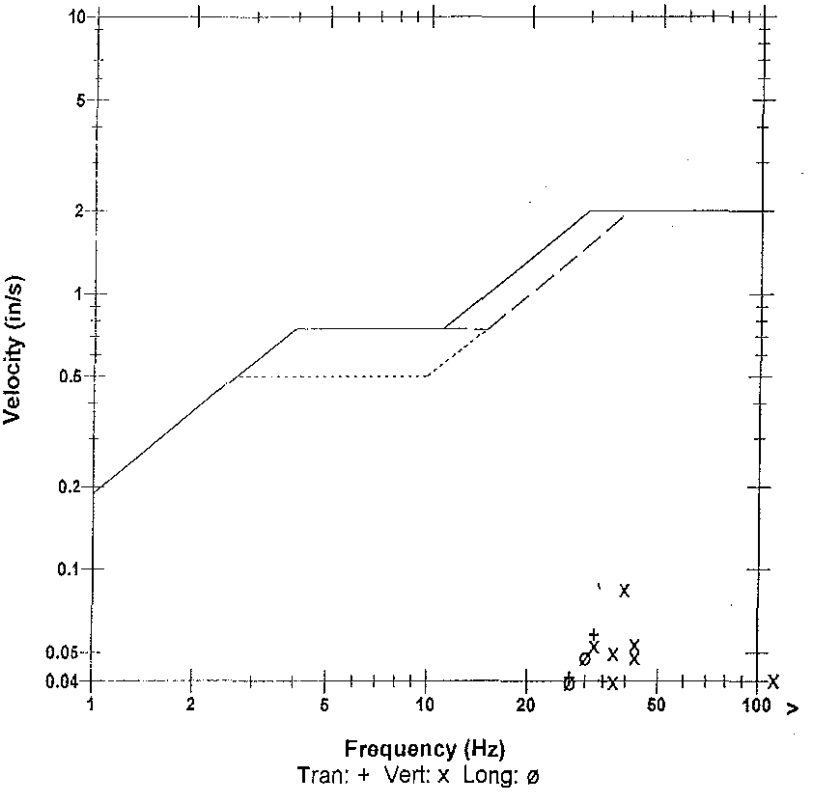
Date/Time	Vert at 15:07:08 March 12, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6XR.BW0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

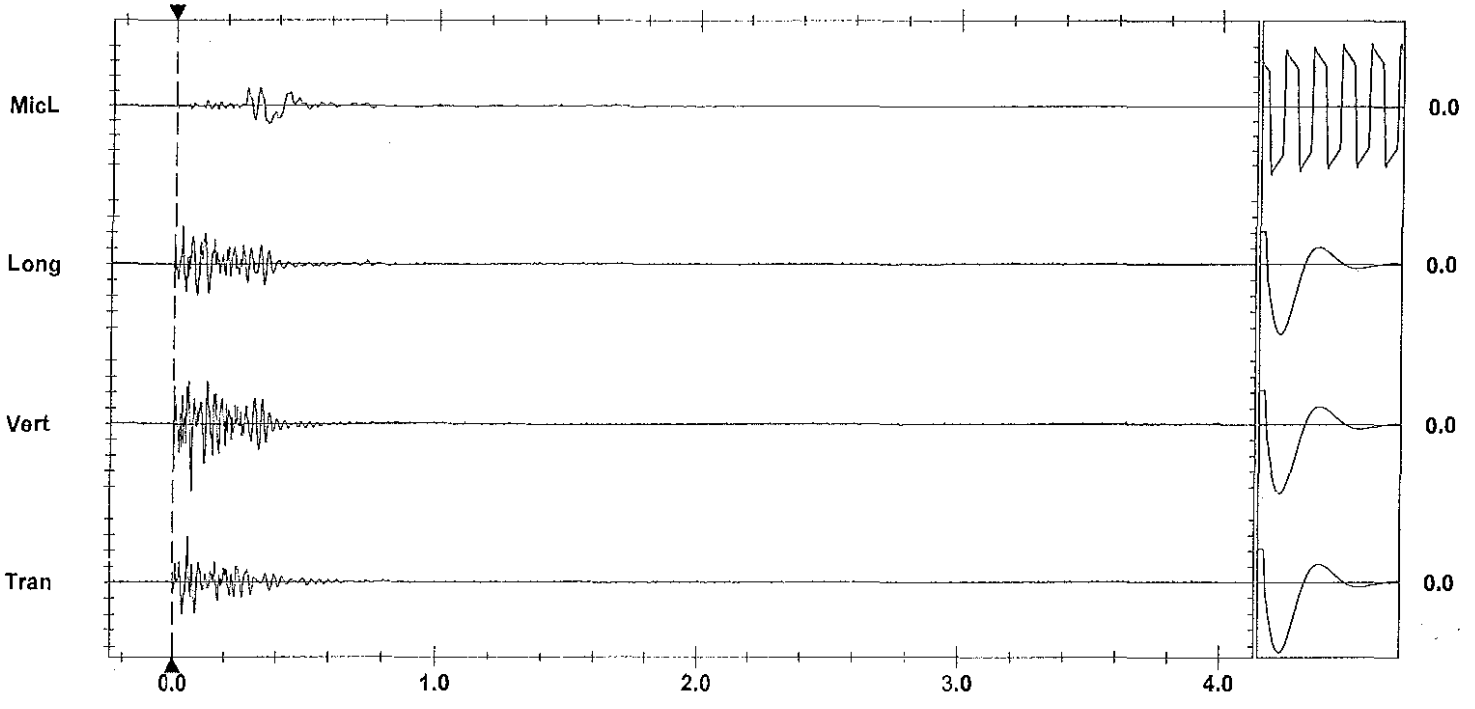
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.277 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 667 mv)

	Tran	Vert	Long	
PPV	0.0581	0.0850	0.0481	in/s
ZC Freq	32	39	30	Hz
Time (Rel. to Trig)	0.060	0.070	0.032	sec
Peak Acceleration	0.0447	0.0895	0.0431	g
Peak Displacement	0.00020	0.00027	0.00029	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0921 in/s at 0.070 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶———◀

Sensorcheck

Printed: March 18, 2012 (V 8.01 - 8.01)
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Instantel

Event Report

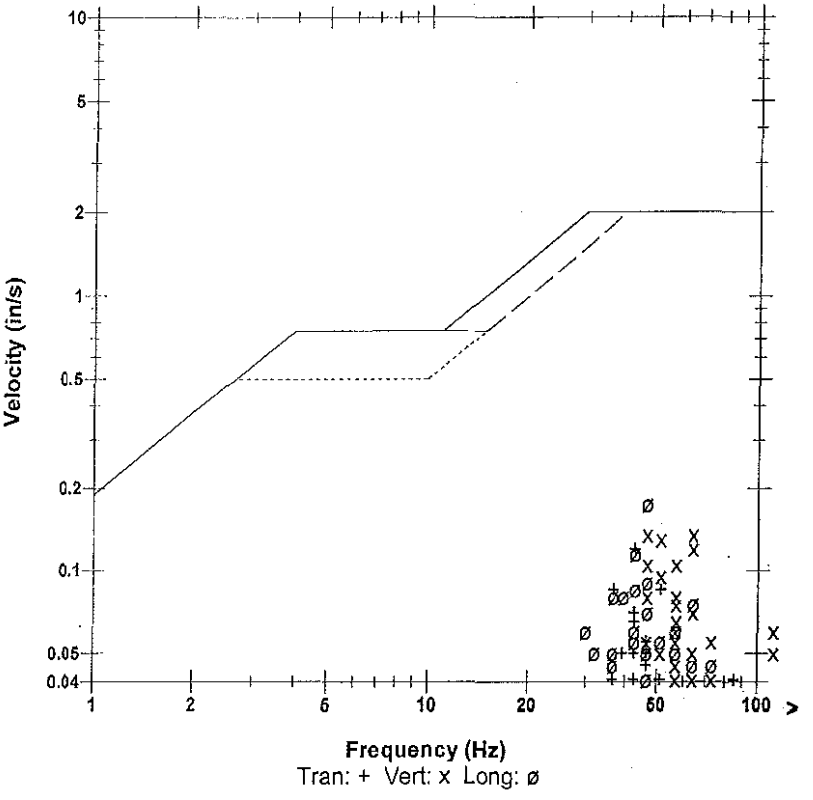
Date/Time	Long at 15:07:08 March 12, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6XR.BW0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

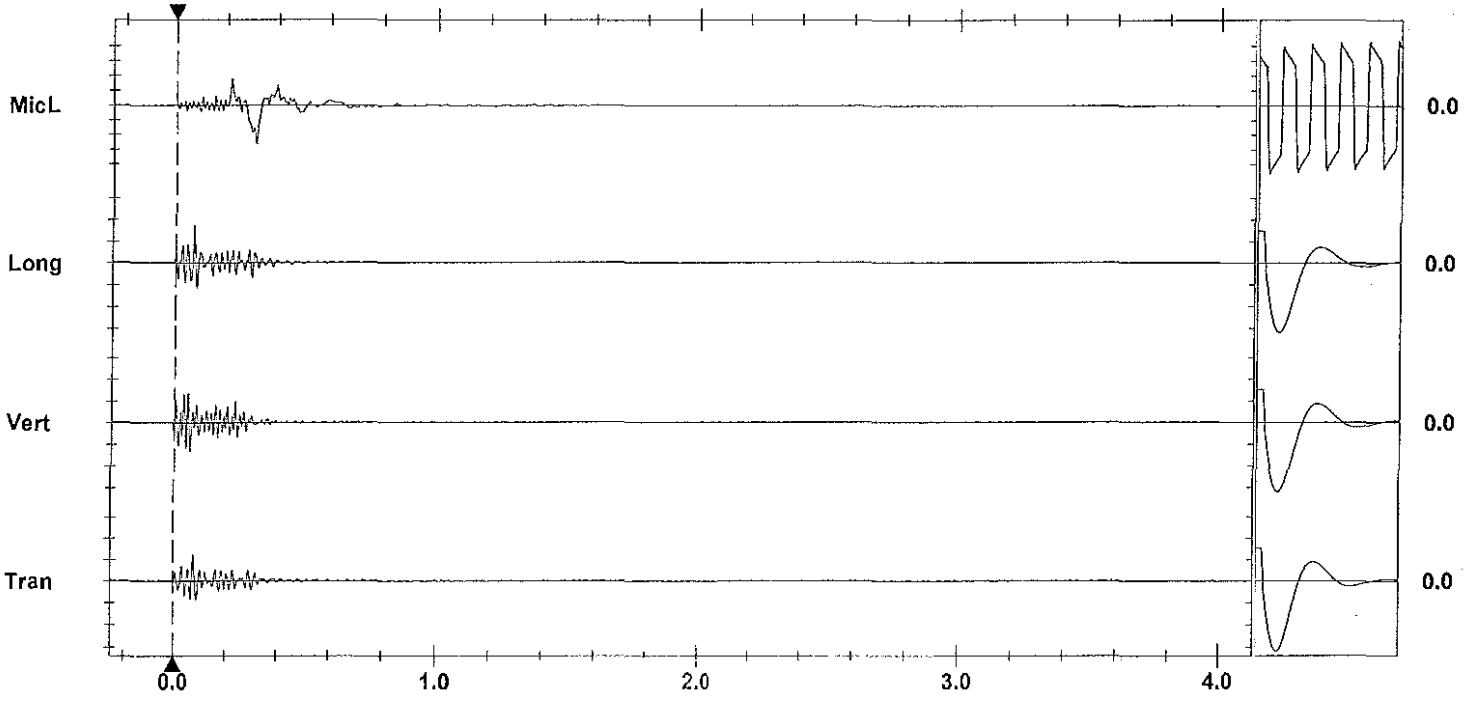
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00265 psi(L) at 0.311 sec
ZC Freq	8.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 635 mv)

	Tran	Vert	Long	
PPV	0.120	0.135	0.175	in/s
ZC Freq	43	64	47	Hz
Time (Rel. to Trig)	0.079	0.053	0.075	sec
Peak Acceleration	0.0795	0.146	0.119	g
Peak Displacement	0.00043	0.00041	0.00057	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.178 in/s at 0.075 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 10:32AM
BLAST # MW-0152

HIGHWAY# 97
BLAST LOCATION AT: STN 129+00 - 129+05 2ND BENCH

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.6 (m)
TOTAL DEPTH 32 (m)

TOTAL NUMBER OF HOLES 6 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite Tamp
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT ~~75~~ .52 (kg)
DELAY TYPE AND LENGTH 25 (ms)

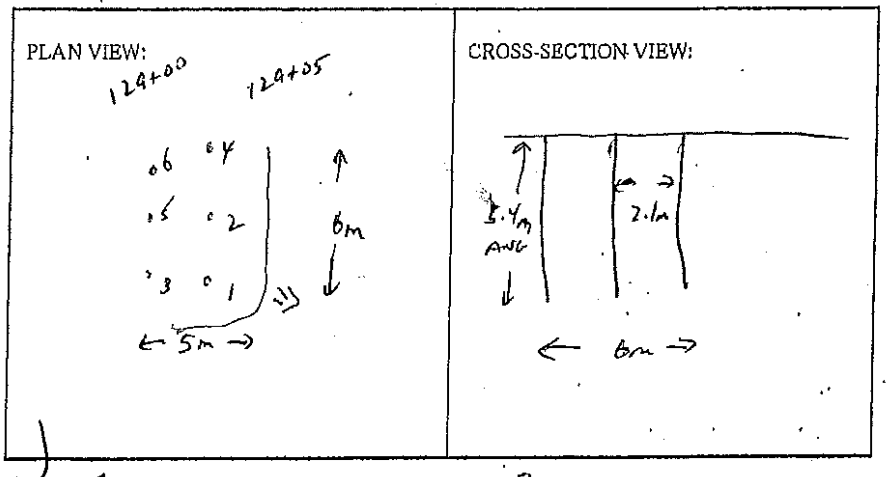
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 150 (m^3) → N

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.11 ips/ 32Hz
" @ 13117 Cliffstone Cut - 0.22 ips/ 51Hz

5'-8' ANFO/HOLE primed w/ 1 each 1"x8" DYNAMITE

Instantel

Event Report

Date/Time	Vert at 10:32:47 March 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6Z9.AN0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

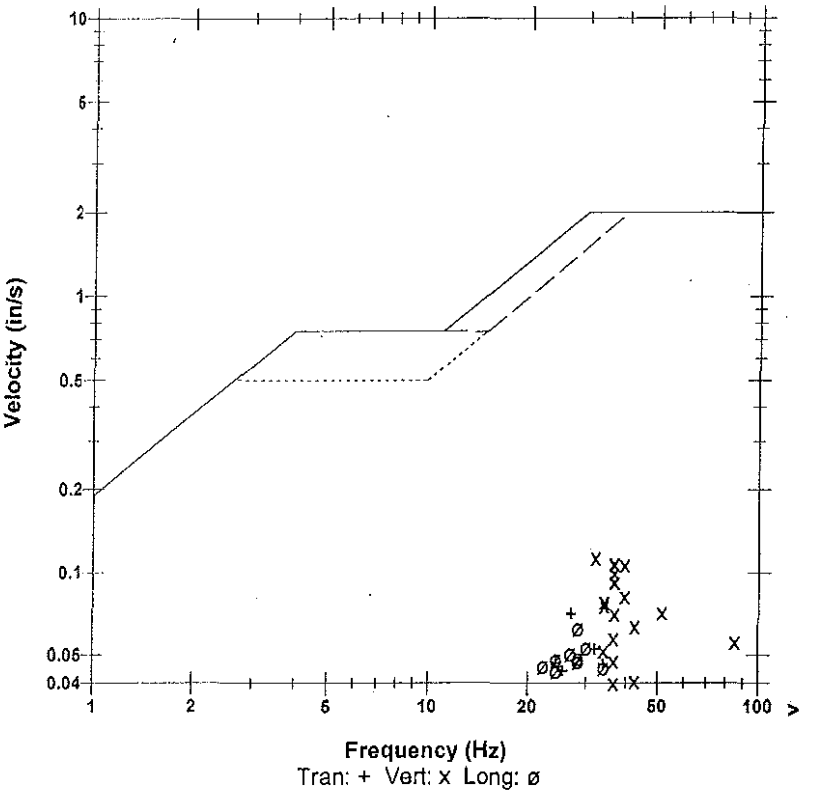
Post Event Notes

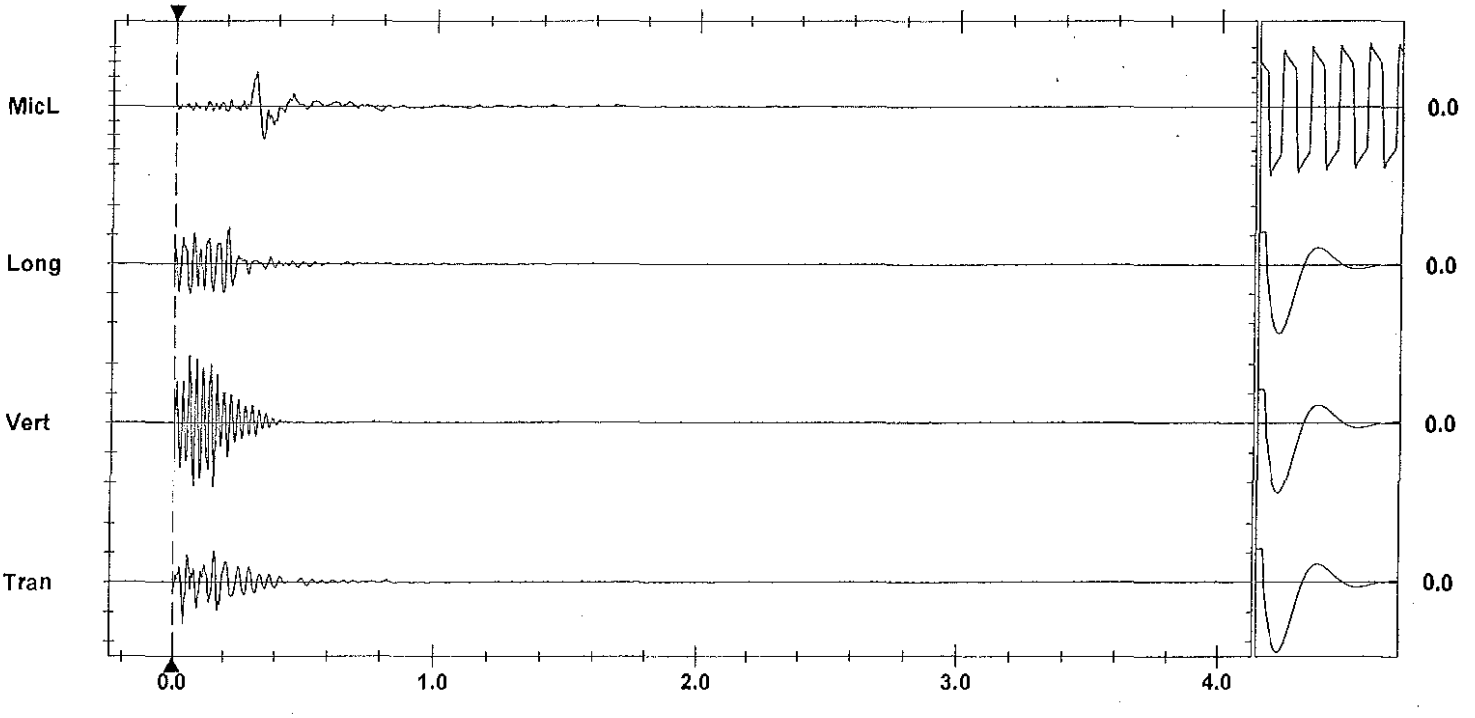
Microphone Linear Weighting
PSPL 0.00232 psi(L) at 0.313 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 624 mv)

	Tran	Vert	Long	
PPV	0.0706	0.114	0.0625	in/s
ZC Freq	27	32	28	Hz
Time (Rel. to Trig)	0.043	0.060	0.209	sec
Peak Acceleration	0.0431	0.134	0.0331	g
Peak Displacement	0.00032	0.00048	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.9	4.2	

Peak Vector Sum 0.130 in/s at 0.060 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorchack

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Instantel

Event Report

Date/Time	Vert at 10:32:47 March 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6Z9.AN0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

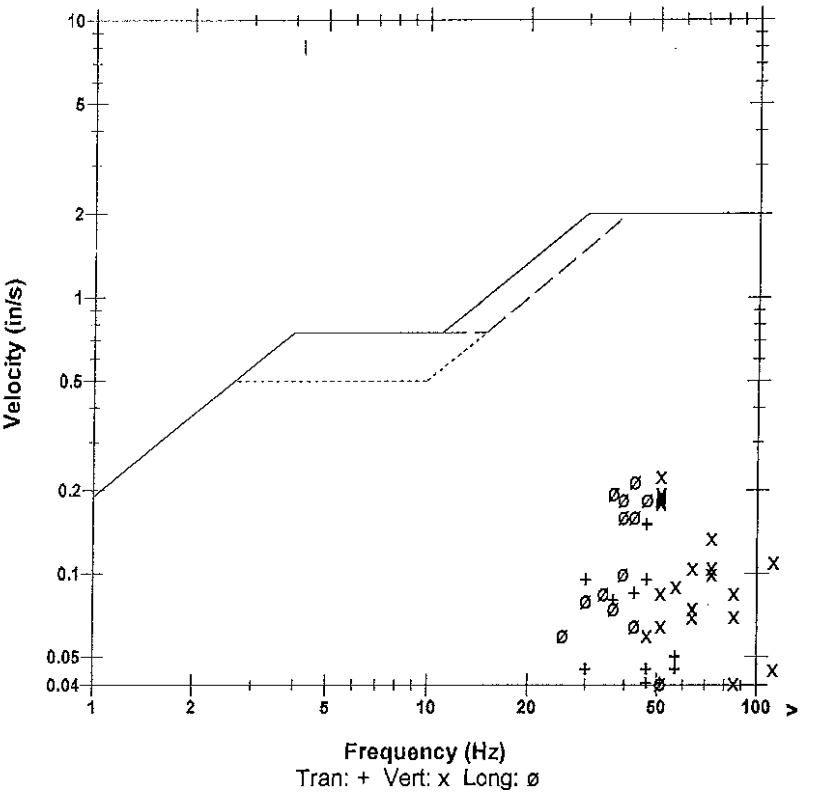
Post Event Notes

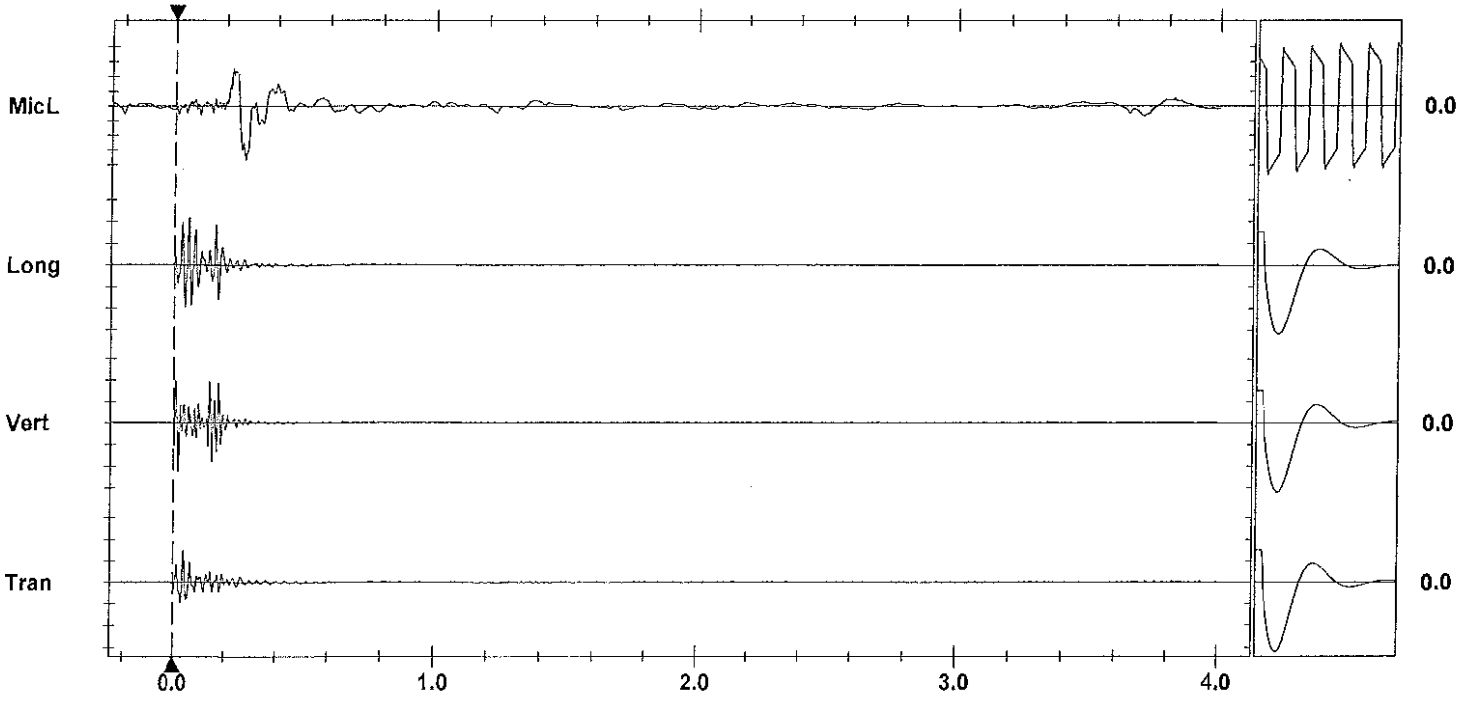
Microphone Linear Weighting
PSPL 0.00370 psi(L) at 0.275 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 675 mv)

	Tran	Vert	Long	
PPV	0.150	0.225	0.215	in/s
ZC Freq	47	51	43	Hz
Time (Rel. to Trig)	0.042	0.019	0.058	sec
Peak Acceleration	0.119	0.239	0.159	g
Peak Displacement	0.00052	0.00070	0.00083	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.7	7.4	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.252 in/s at 0.043 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Heaney
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED Mar 13/12
ACTUAL BLAST DATE Mar 13/12 11:51 AM
BLAST # MW-0153

HIGHWAY# 97
BLAST LOCATION AT: SW 129+00 - 129+08

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.9 (m)
TOTAL DEPTH 72 (m)

TOTAL NUMBER OF HOLES 76 11/46 buffer/1 stab/1 Pilot
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Blaster
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

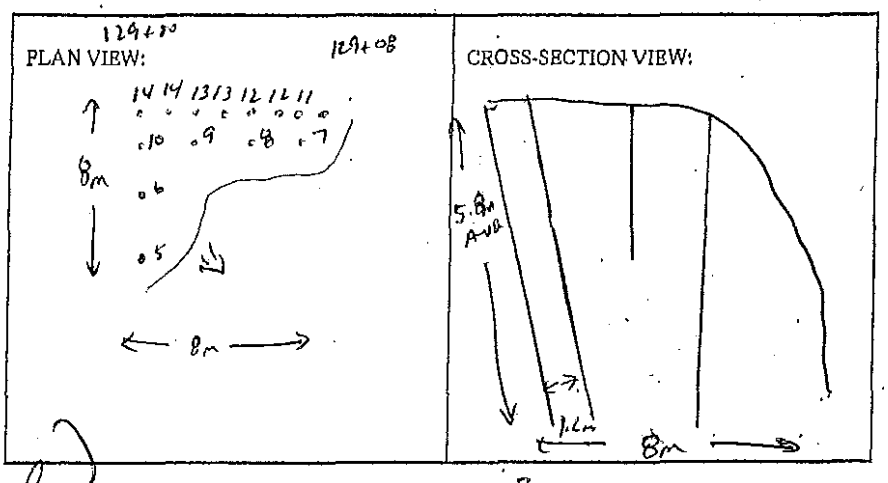
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE M6820 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Heaney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.093 ips/26 Hz
" @ 13111 Cliffstone Cut - 0.27 ips/5 Hz

Prod Hole - 6' ANFO

Buffer Holes - 4-6 CART 2"x16" BLASTEX } Primed w/ 1 e
1½" DYNAMITE

Stab Holes - 1.5' ANFO

Instantel

Event Report

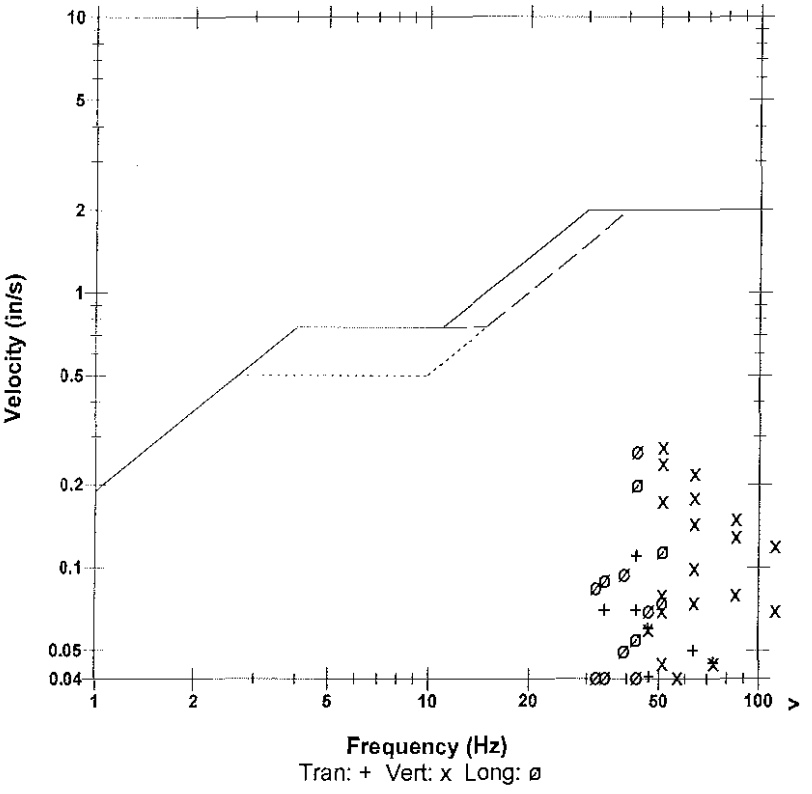
Date/Time	Vert at 11:51:17 March 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6ZC.XH0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

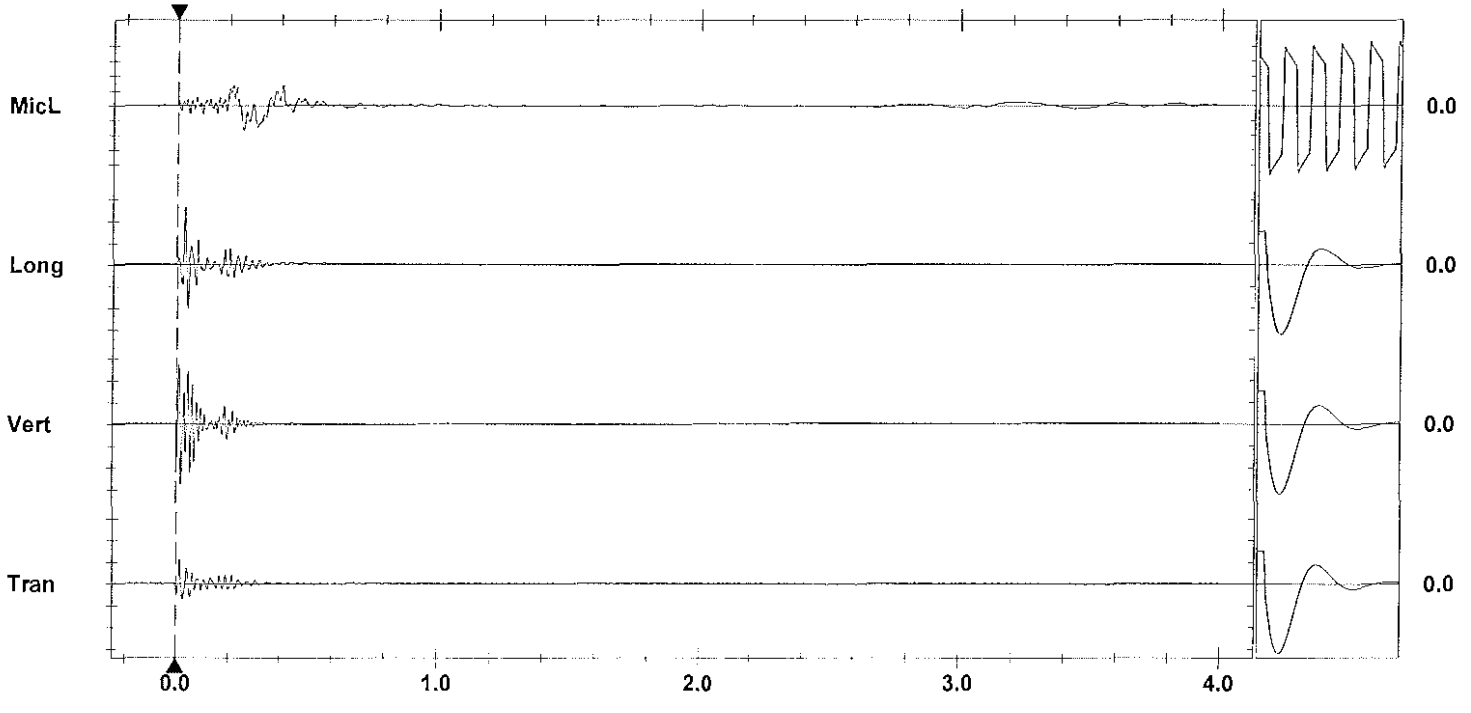
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00167 psi(L) at 0.253 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.110	0.275	0.265	in/s
ZC Freq	43	51	43	Hz
Time (Rel. to Trig)	0.014	0.009	0.031	sec
Peak Acceleration	0.0795	0.318	0.199	g
Peak Displacement	0.00034	0.00090	0.00085	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.7	3.7	4.4	

Peak Vector Sum 0.295 in/s at 0.031 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

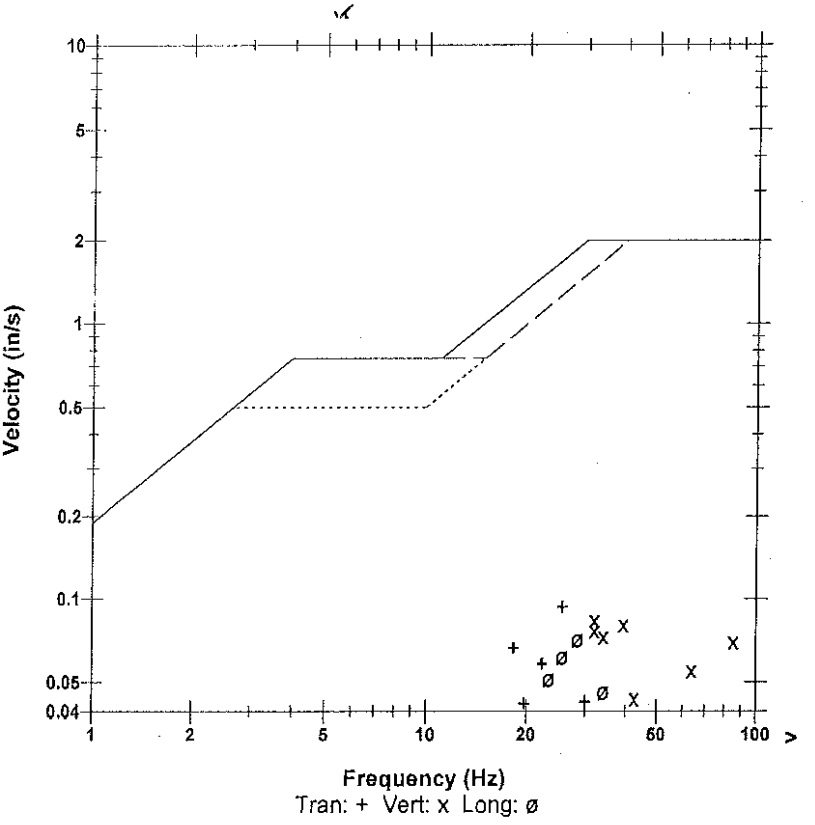
Date/Time	Vert at 11:51:18 March 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6ZC.XI0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

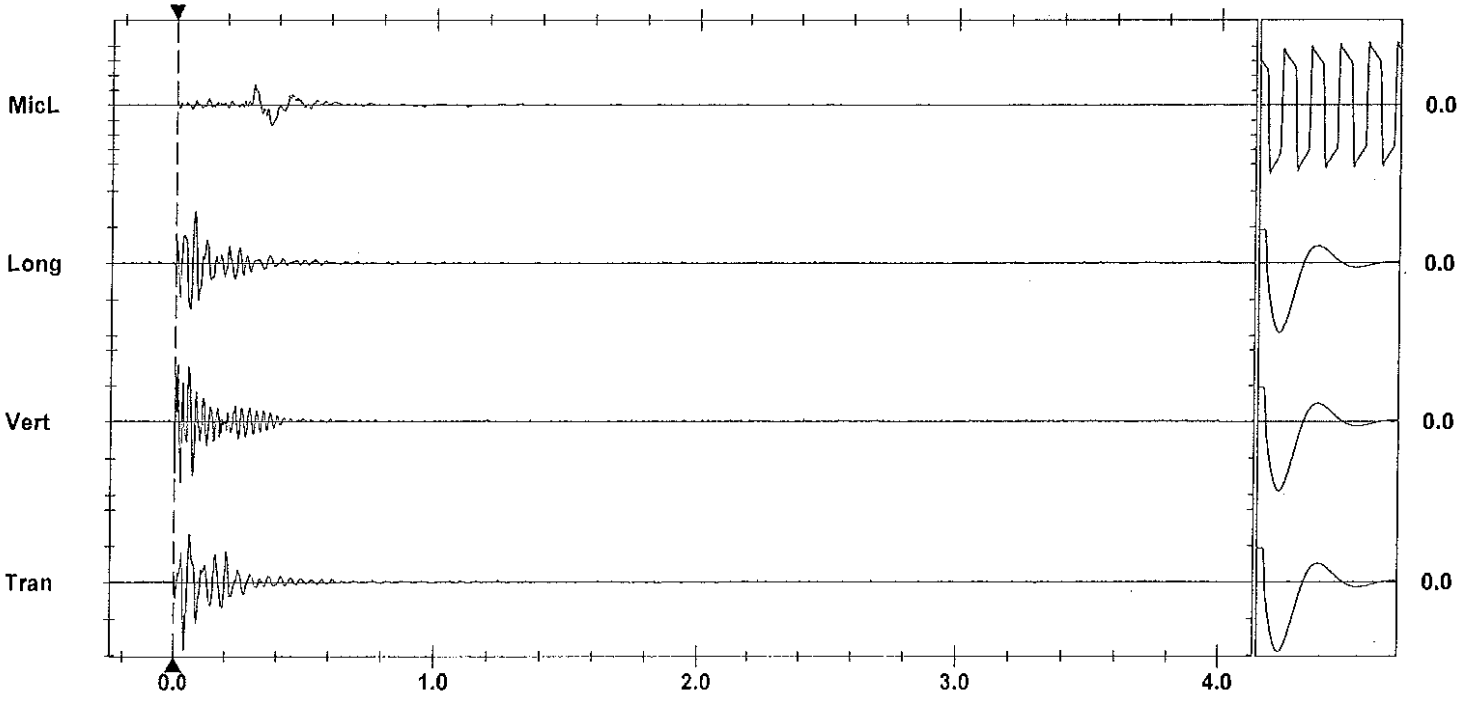
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00134 psi(L) at 0.303 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 618 mv)

	Tran	Vert	Long	
PPV	0.0931	0.0837	0.0712	in/s
ZC Freq	26	32	28	Hz
Time (Rel. to Trig)	0.044	0.023	0.079	sec
Peak Acceleration	0.0497	0.143	0.0414	g
Peak Displacement	0.00049	0.00035	0.00042	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.108 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 1:44 PM
BLAST # MW-0154

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/C
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.2 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 85 (kg)
DELAY TYPE AND LENGTH 25 (ms)

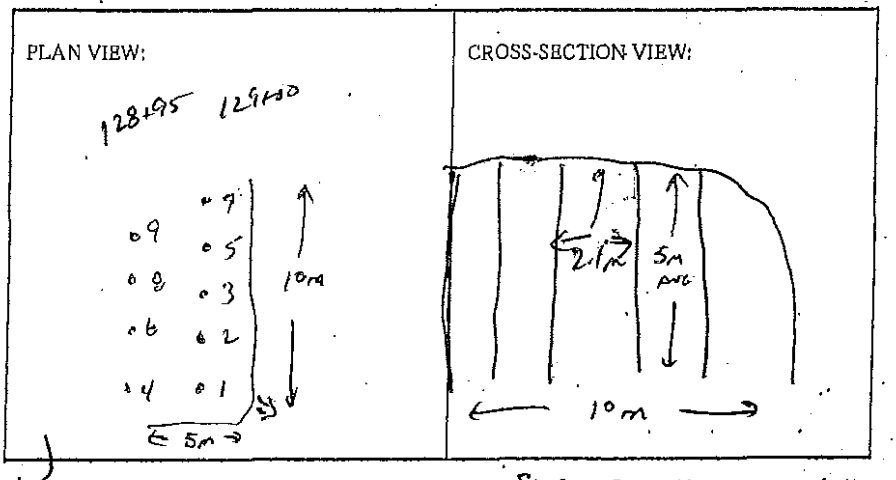
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HG320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone crt. 0.10 ips/39Hz
@ 13117 cliffstone crt. 0.18 ips/37Hz

8' ANFO/Hole + 1 emat 1"x8" Dynamite Primer

Instantel

Event Report

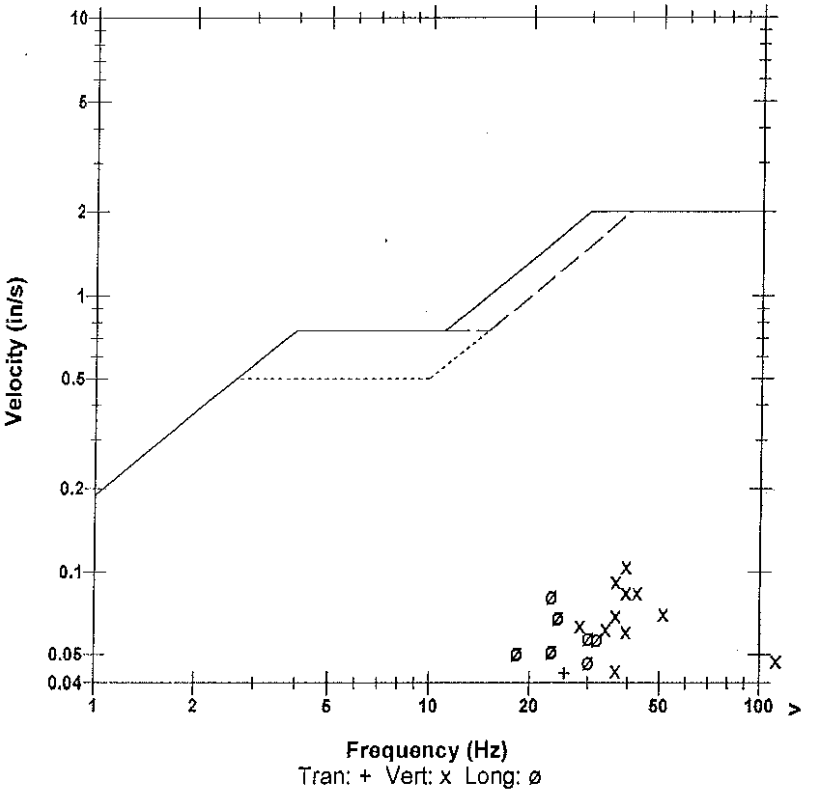
Date/Time	Vert at 13:44:53 March 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6ZI.6T0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

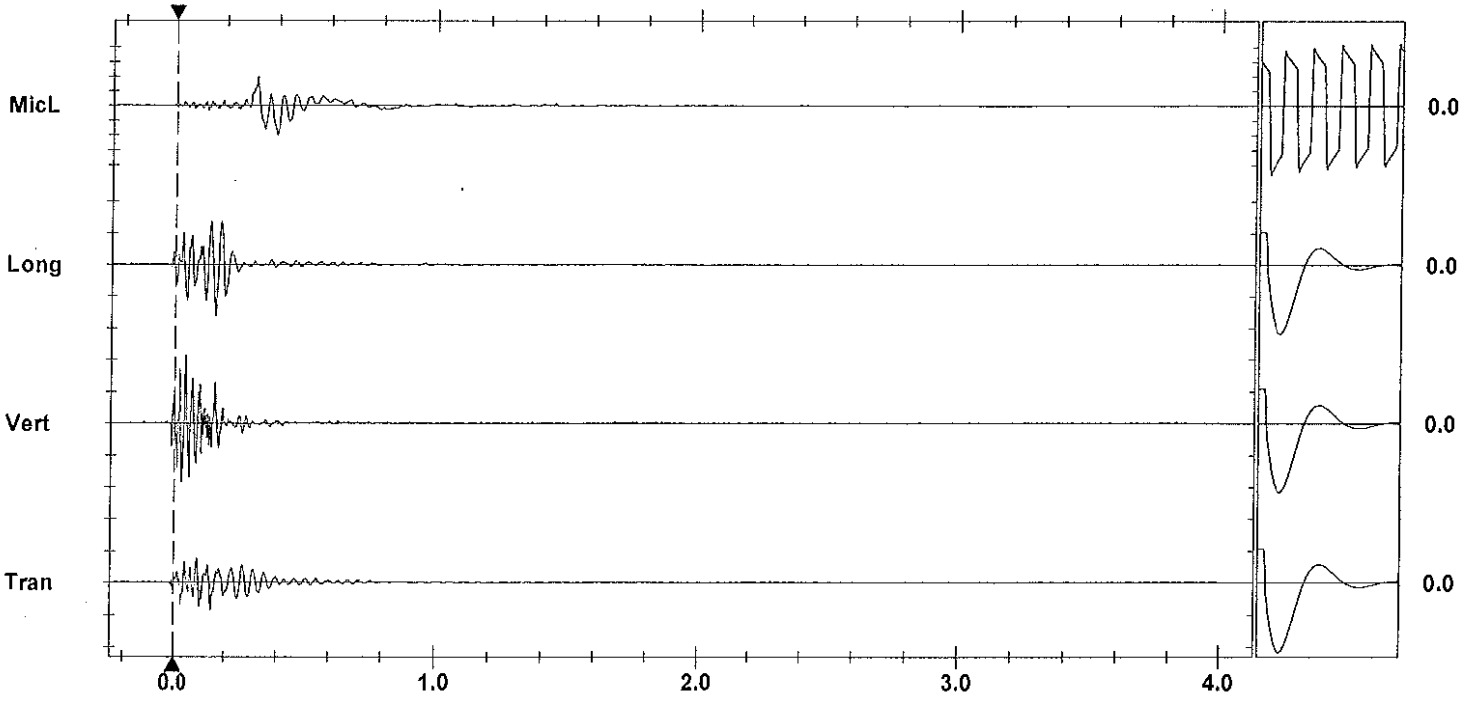
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00199 psi(L) at 0.394 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 680 mv)

	Tran	Vert	Long	
PPV	0.0425	0.105	0.0819	in/s
ZC Freq	26	39	23	Hz
Time (Rel. to Trig)	0.149	0.046	0.161	sec
Peak Acceleration	0.0315	0.0878	0.0414	g
Peak Displacement	0.00020	0.00038	0.00048	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.120 in/s at 0.047 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

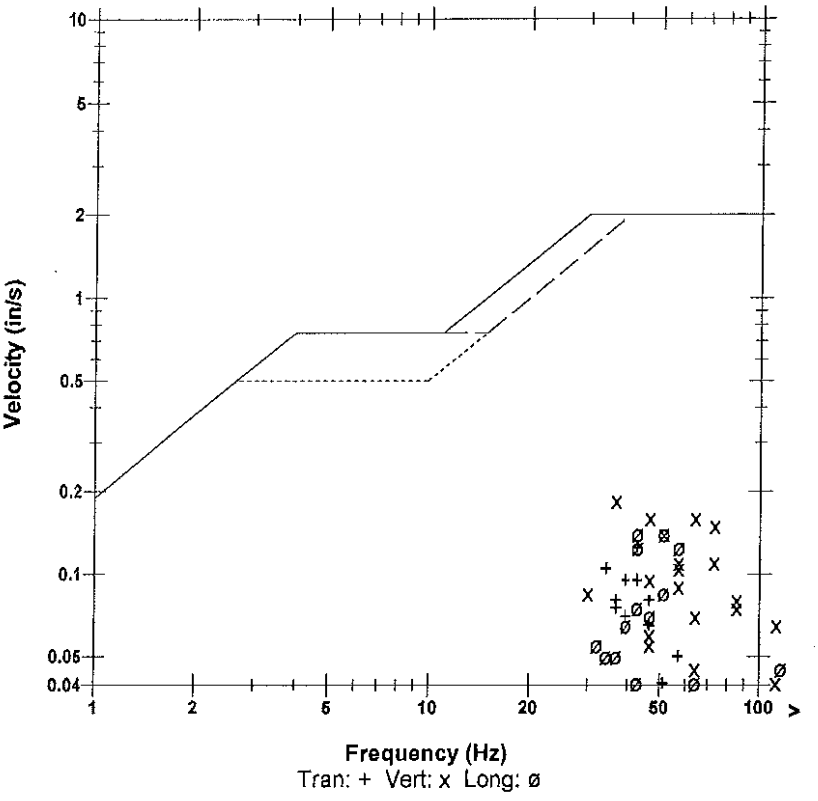
Date/Time	Vert at 13:44:52 March 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6ZI.6S0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

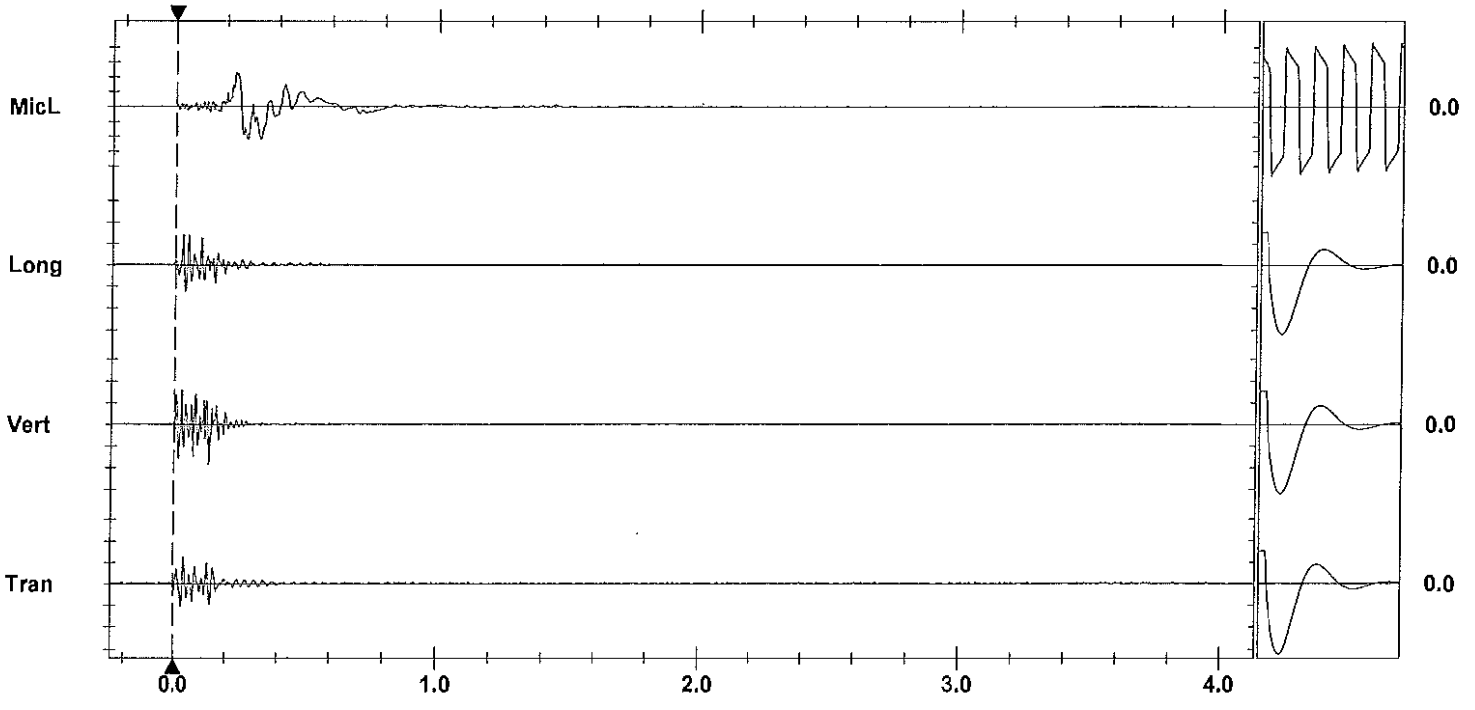
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.125	0.185	0.140	in/s
ZC Freq	43	37	43	Hz
Time (Rel. to Trig)	0.042	0.136	0.030	sec
Peak Acceleration	0.106	0.212	0.133	g
Peak Displacement	0.00044	0.00064	0.00052	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Microphone Linear Weighting
PSPL 0.00228 psi(L) at 0.229 sec
ZC Freq 6.4 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 692 mv)

Peak Vector Sum 0.222 in/s at 0.029 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 13/12
ACTUAL BLAST DATE MAR 13/12 2:53 PM
BLAST # MW-0155

HIGHWAY# 97
BLAST LOCATION AT: STN 128+95 - 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 68 (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 5.9 (m)
TOTAL DEPTH 63 (m)

TOTAL NUMBER OF HOLES 66 / 36 offset / 18 stab / 2 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO + 2 1/2 BLASTEX
TOTAL NUMBER OF CARTRIDGES 12
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 150 (kg)
DELAY TYPE AND LENGTH 25 (ms)

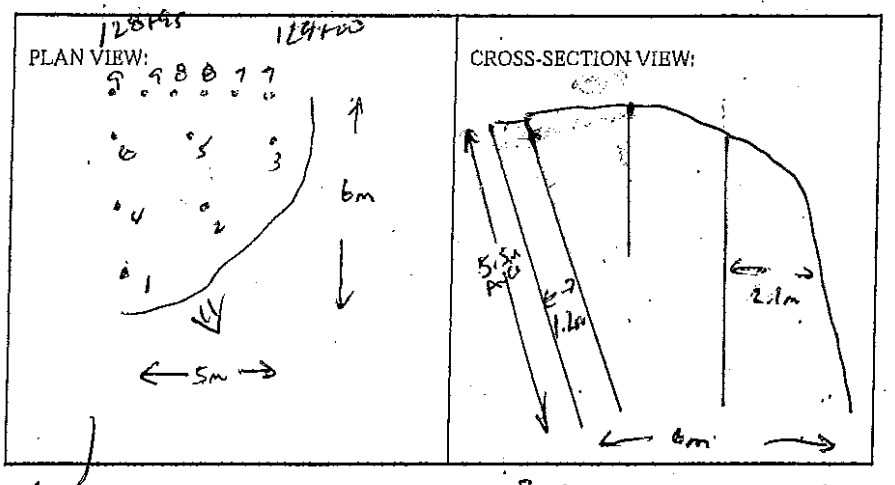
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 cliffstreet - 0.097 ips/39 H_z
" @ 13117 cliffstreet - 0.26 ips/ 47 H_z

PROD Holes - 6'-8' ANFO/Hole

STAB Hole - 2' ANFO

BUFFER Holes - 4-5 CART 2"x16" BLASTEX

} ALL Primed w/ 1 CART 1"x8" DYNAMITE

B/L Holes - 1 CART 2"x16" DYNAMITE + 200 gr. det cord to 4' collar

Instantel

Event Report

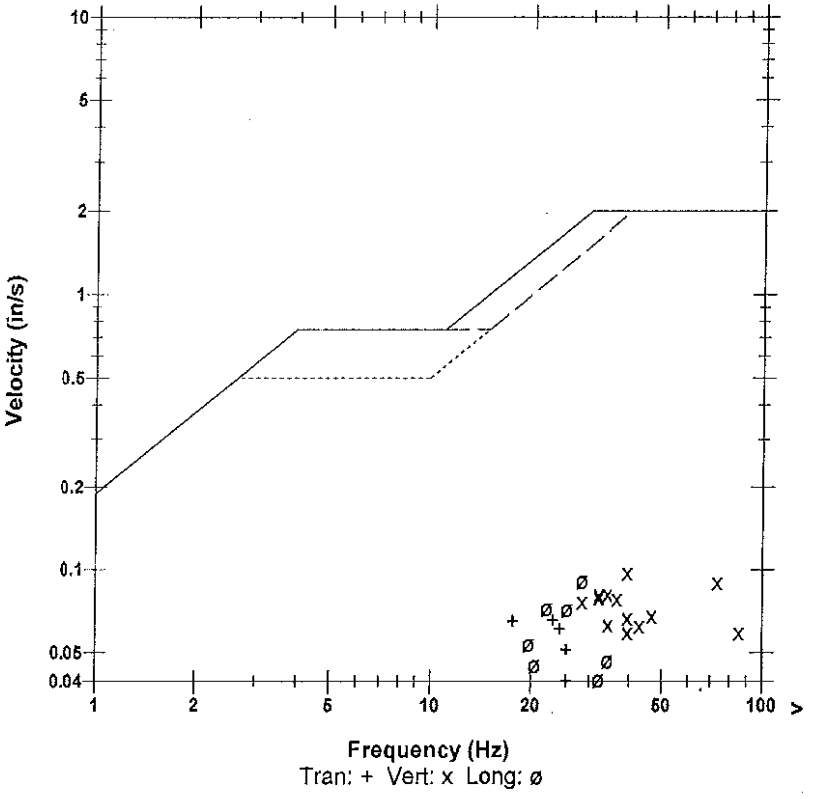
Date/Time	Vert at 14:53:04 March 13, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E6ZL.CG0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

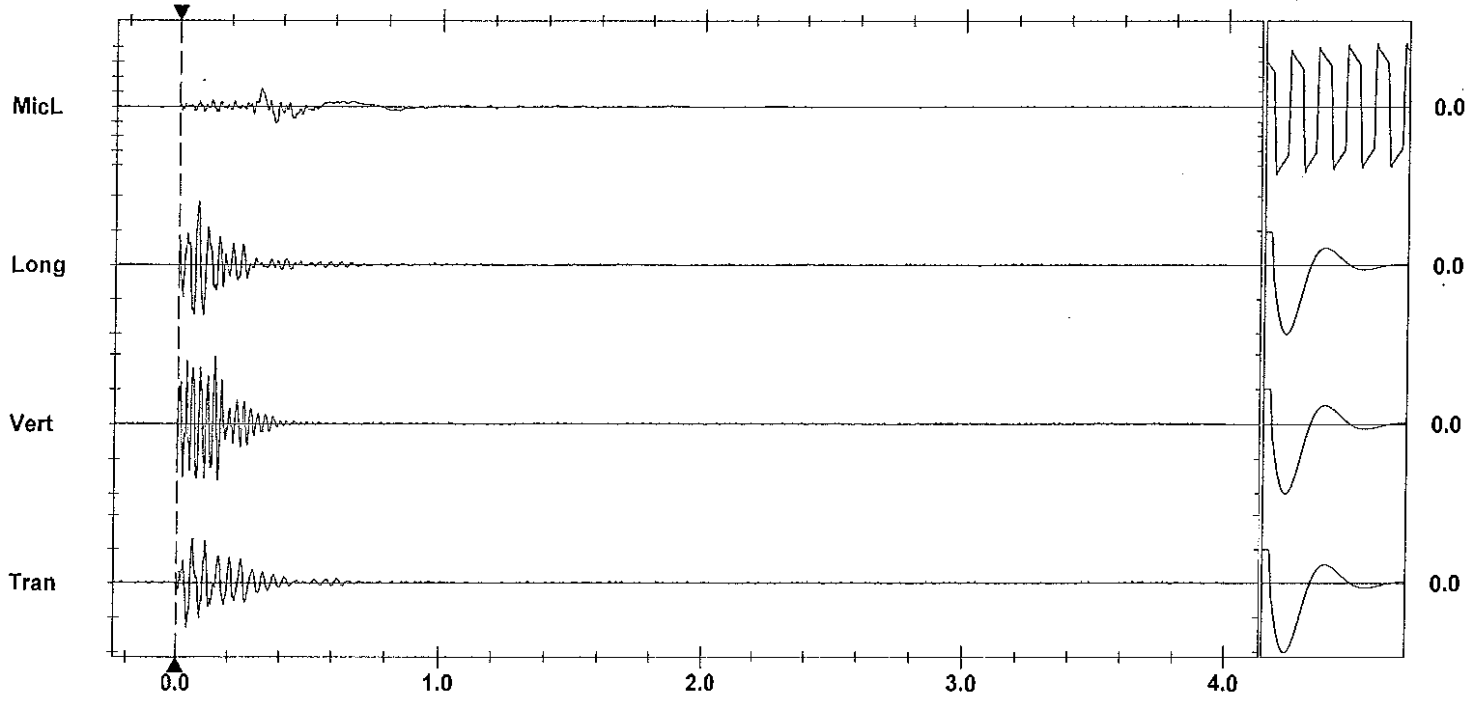
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00116 psi(L) at 0.316 sec			
ZC Freq	11 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 676 mv)			

	Tran	Vert	Long	
PPV	0.0656	0.0975	0.0912	in/s
ZC Freq	23	39	28	Hz
Time (Rel. to Trig)	0.042	0.146	0.078	sec
Peak Acceleration	0.0348	0.106	0.0580	g
Peak Displacement	0.00040	0.00043	0.00054	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.123 in/s at 0.062 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

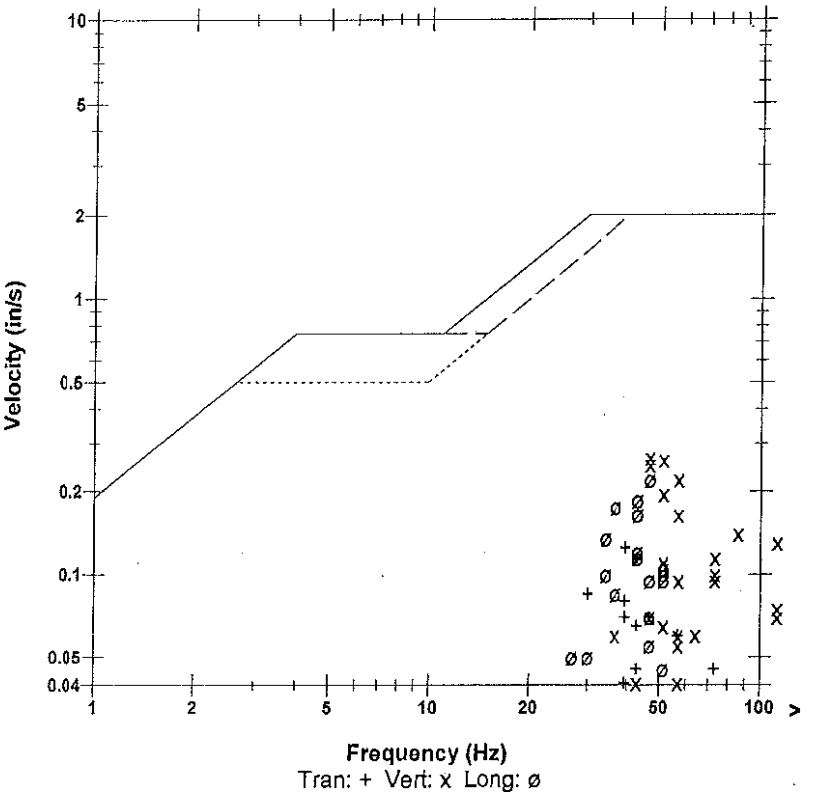
Date/Time	Vert at 14:53:03 March 13, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E6ZL.CF0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

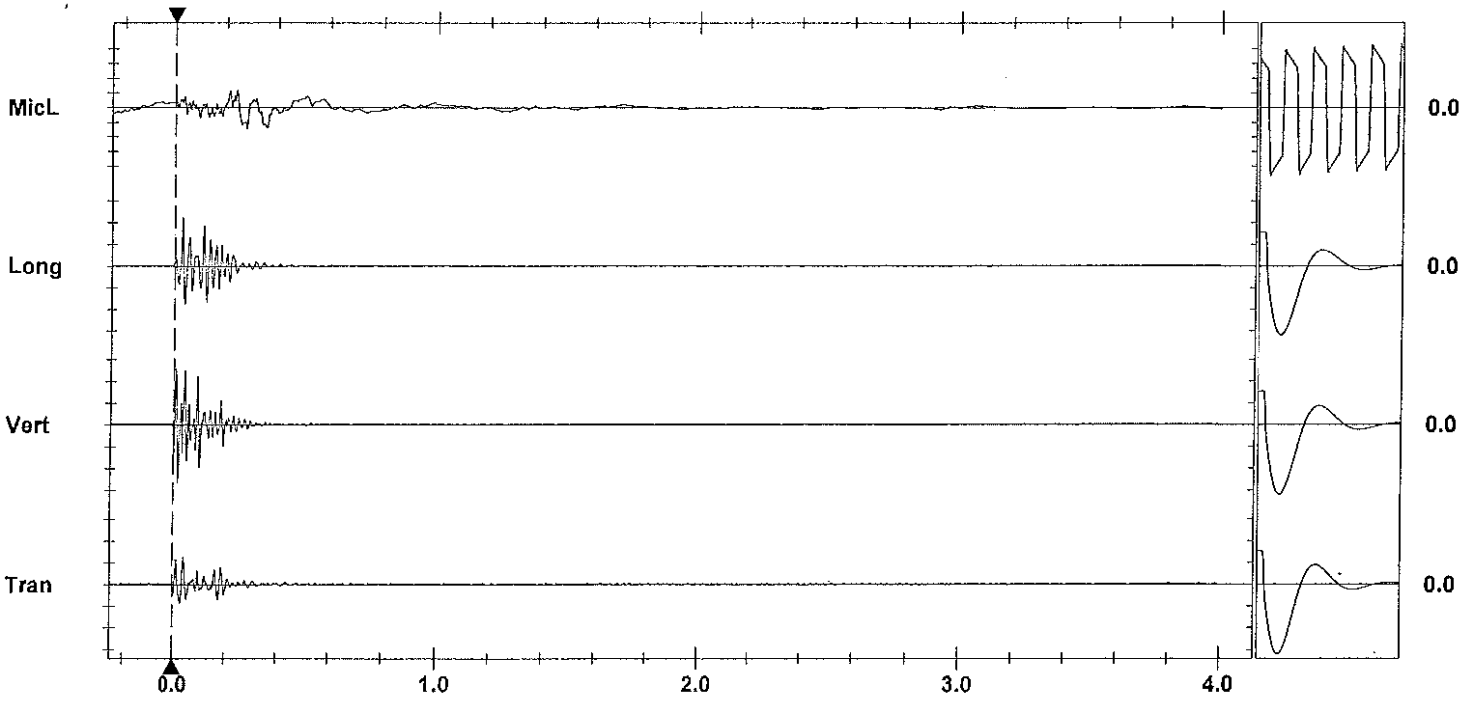
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00149 psi(L) at 0.278 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 677 mv)

	Tran	Vert	Long	
PPV	0.125	0.265	0.220	in/s
ZC Freq	39	47	47	Hz
Time (Rel. to Trig)	0.044	0.018	0.030	sec
Peak Acceleration	0.0795	0.305	0.172	g
Peak Displacement	0.00048	0.00083	0.00074	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.7	4.4	

Peak Vector Sum 0.298 in/s at 0.044 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 14/12
ACTUAL BLAST DATE ~~March 13/12~~ March 14/12 1:39 PM
BLAST # MW-C956

HIGHWAY# 97
BLAST LOCATION AT: STN 128+90 - 128+98

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION
shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 8 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE & ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

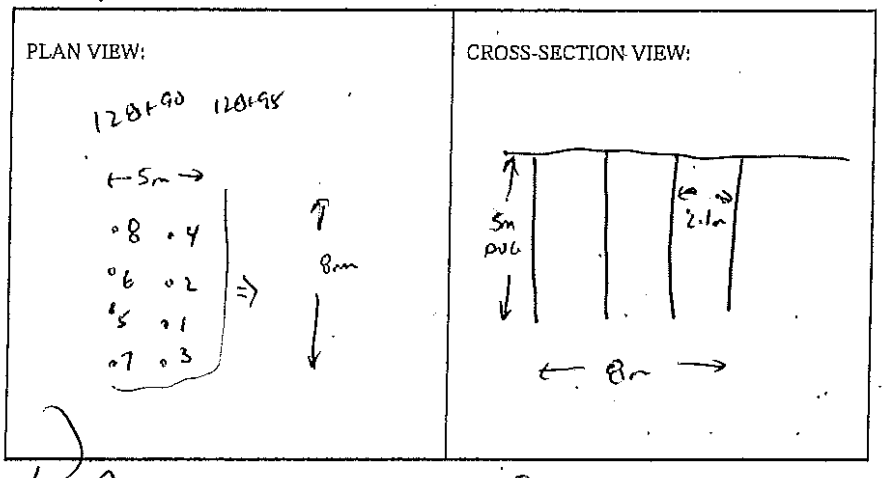
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.093ips/34Hz
" @ 13117 Cliffstone Crt - 0.17ips/43Hz

7'-9' ANFO/Hole primed w/ 1 CAST 1"x8" DYNAMITE

Instantel

Event Report

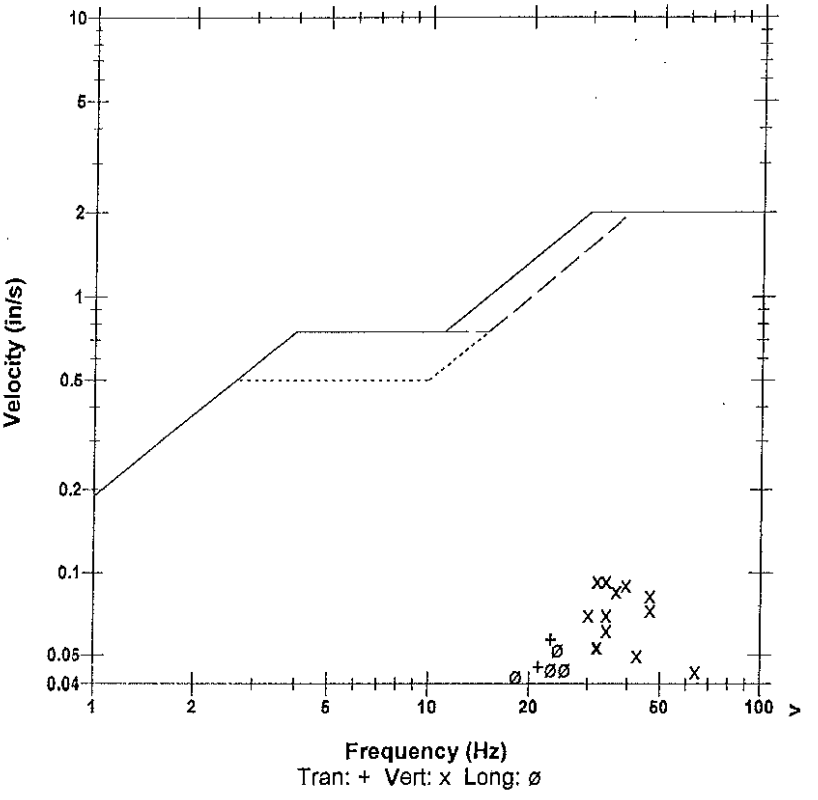
Date/Time	Vert at 13:39:59 March 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E71C.MN0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

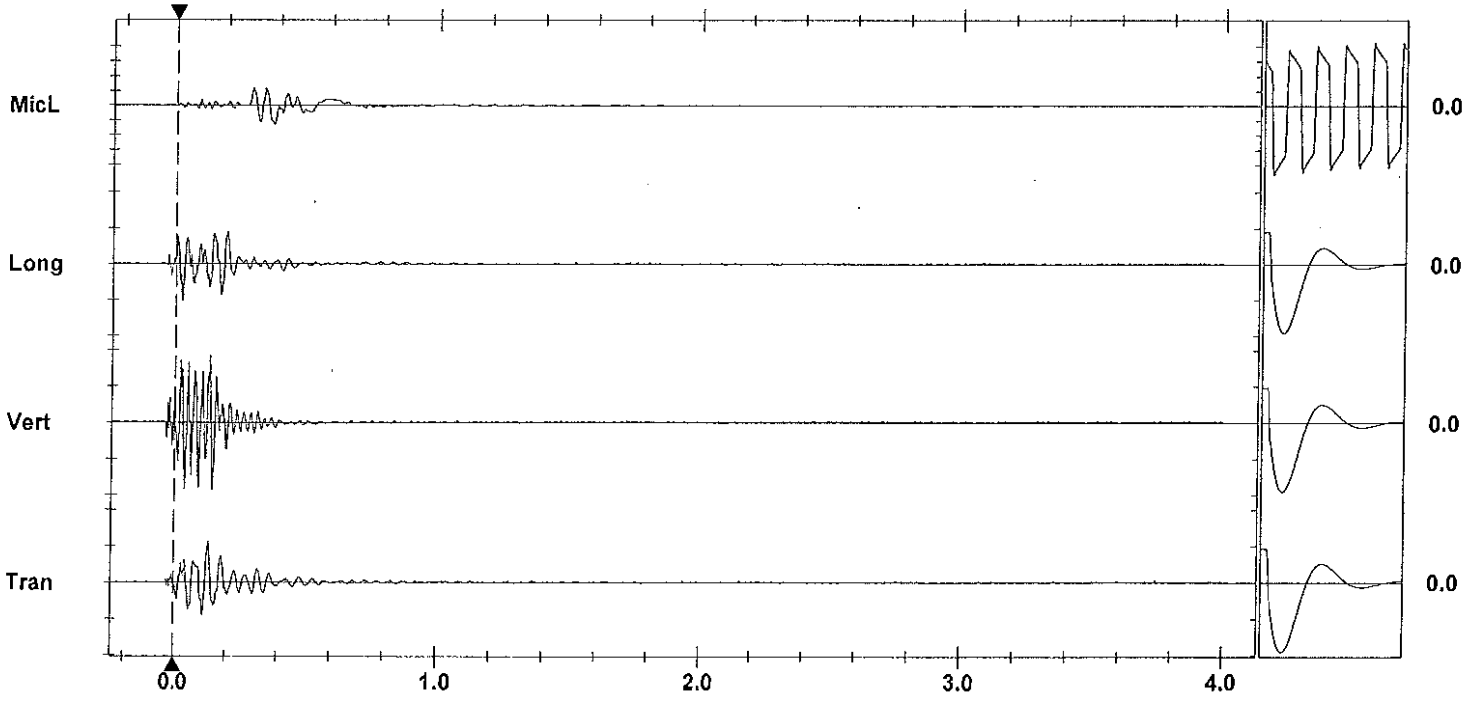
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00127 psi(L) at 0.374 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.0569	0.0931	0.0525	in/s
ZC Freq	23	34	24	Hz
Time (Rel. to Trig)	0.136	0.040	0.024	sec
Peak Acceleration	0.0282	0.0945	0.0282	g
Peak Displacement	0.00036	0.00042	0.00033	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.110 in/s at 0.137 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: March 19, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

Instantel

Event Report

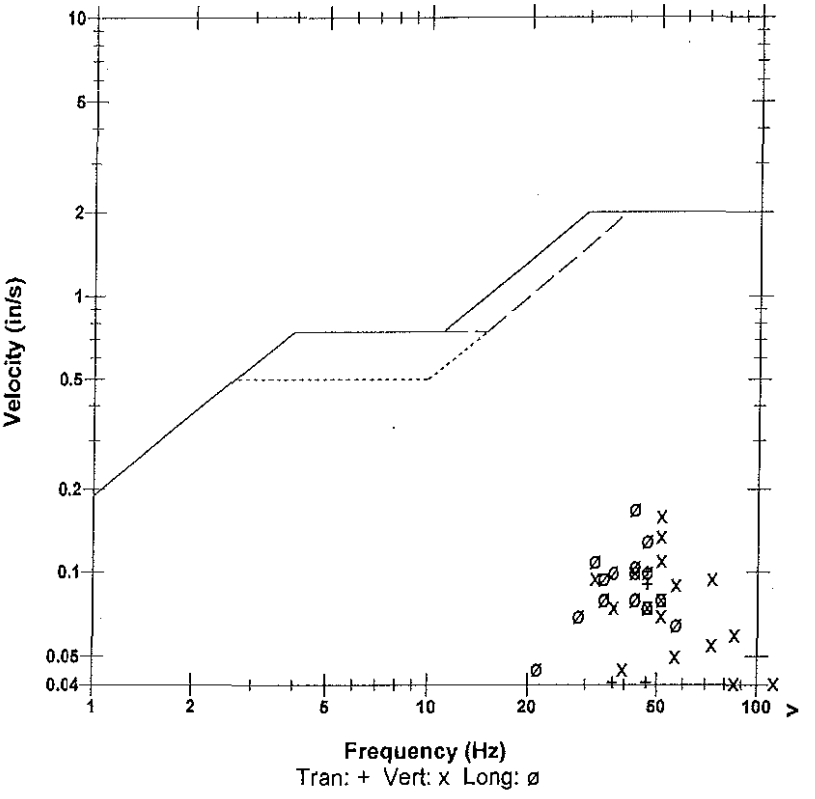
Date/Time	Vert at 13:39:57 March 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E71C.ML0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

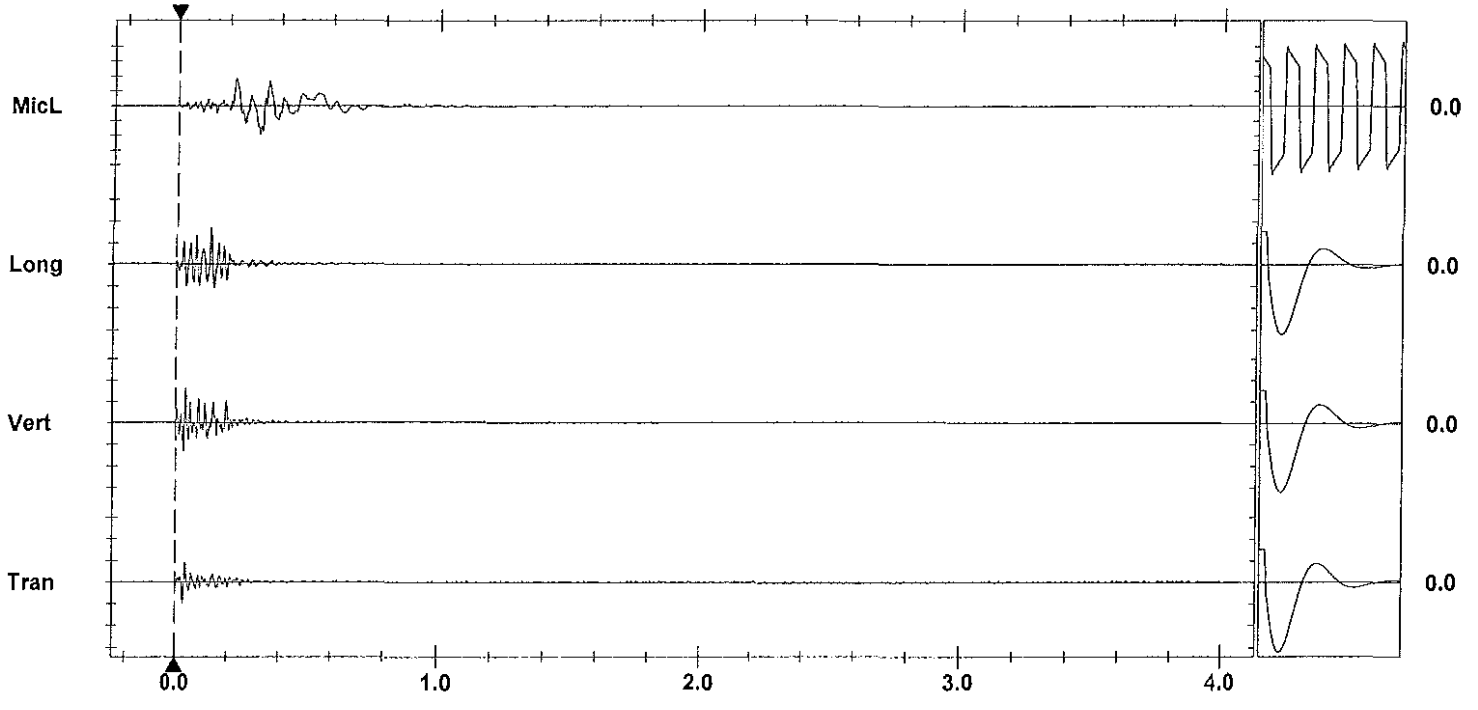
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00196 psi(L) at 0.317 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 717 mv)

	Tran	Vert	Long	
PPV	0.1000	0.160	0.170	in/s
ZC Freq	47	51	43	Hz
Time (Rel. to Trig)	0.030	0.040	0.137	sec
Peak Acceleration	0.0795	0.146	0.106	g
Peak Displacement	0.00031	0.00047	0.00061	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.4	

Peak Vector Sum 0.209 in/s at 0.040 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vedress
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 14/12
ACTUAL BLAST DATE MAR 14/12 2:59 PM
BLAST # MW-0157

HIGHWAY# 97
BLAST LOCATION AT: STN 128+99 - 128+95 LS Bench 2

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: # shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Altered Graphitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 5.4 (m)
NUMBER OF ROWS 5
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 66 / 30 buffer / 2 stab / 8 relief
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 80 (kg)
DELAY TYPE AND LENGTH 25 (ms)

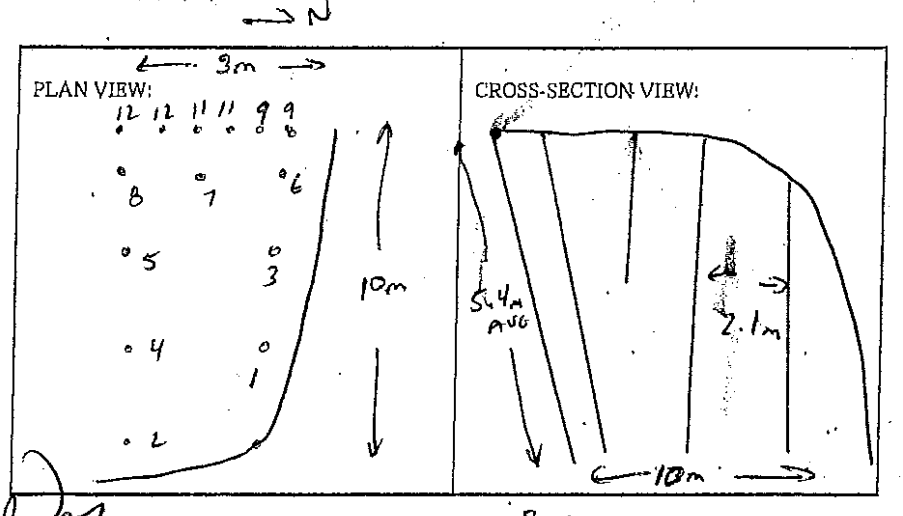
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE Hasco CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vedress COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Siesmograph @ 13167 Cliffstone crt - 0.14 ips / 37 Hz
" @ 13117 Cliffstone crt - 0.22 ips / 47 Hz

PROD. HOLES - 6'-7' ANFO/HOLE

STAB HOLES - 2' ANFO

BUFFER HOLES - 4-5 CART 2"x16" BLASTEX

B/L HOLES - 1 CART 2"x16" DYNAMITE + 200 gr. det cord to 4' collar

Instantel

Event Report

Date/Time	Vert at 14:59:43 March 14, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E71G.BJ0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

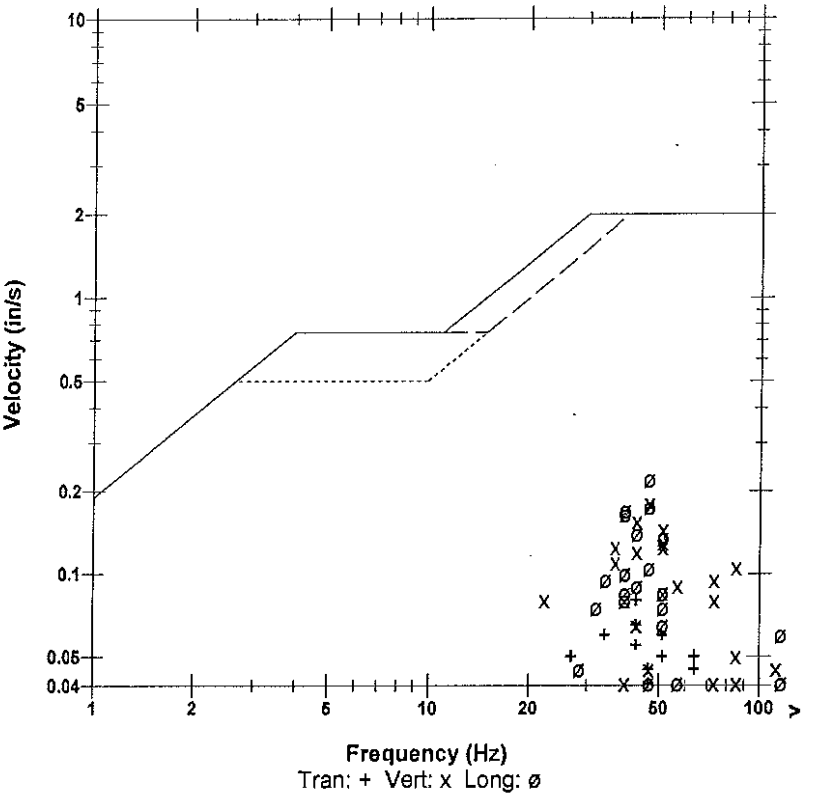
Extended Notes
Blast at stn 128

Post Event Notes

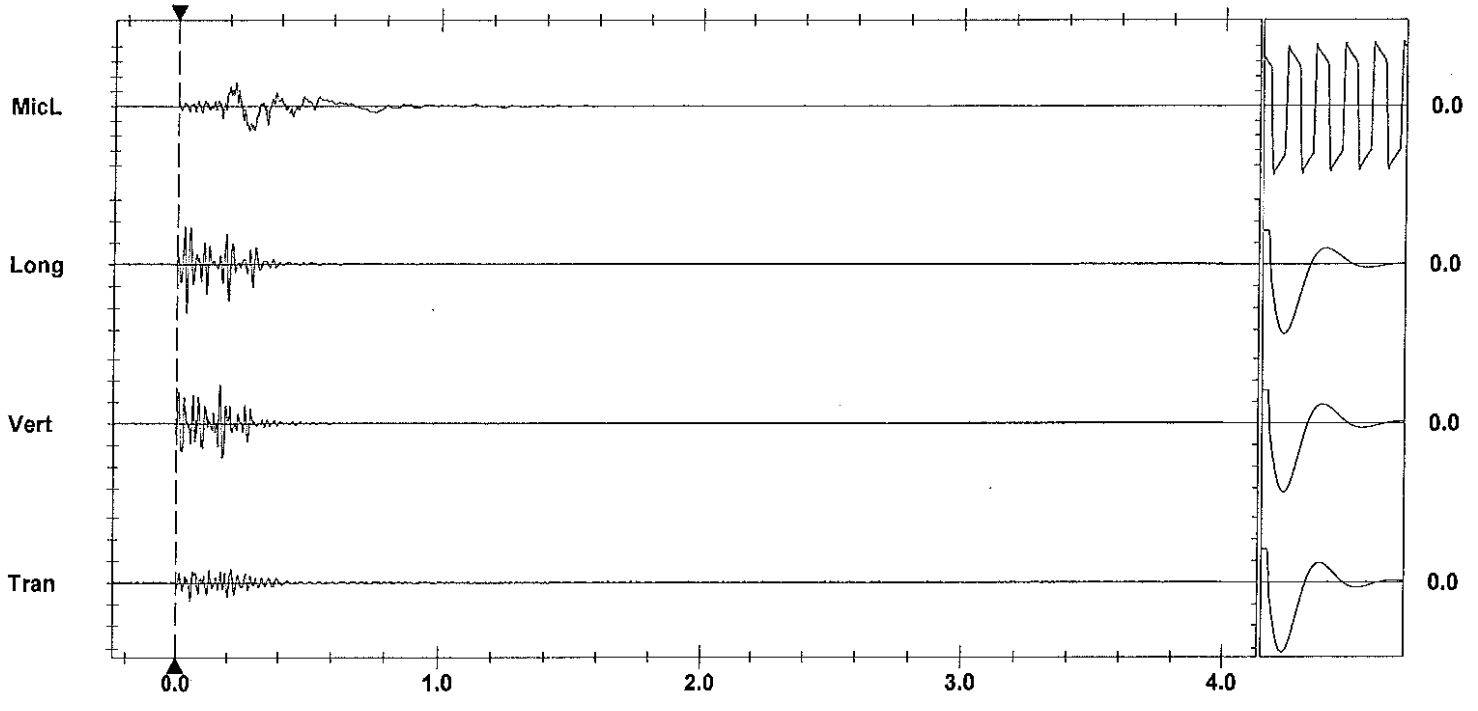
Microphone Linear Weighting
PSPL 0.00167 psi(L) at 0.276 sec
ZC Freq 7.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 638 mv)

	Tran	Vert	Long	
PPV	0.0800	0.180	0.220	in/s
ZC Freq	43	47	47	Hz
Time (Rel. to Trig)	0.058	0.170	0.038	sec
Peak Acceleration	0.0530	0.212	0.172	g
Peak Displacement	0.00035	0.00067	0.00077	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.224 in/s at 0.038 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: August 6, 2012 04:04:08 PM
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Instantel

Event Report

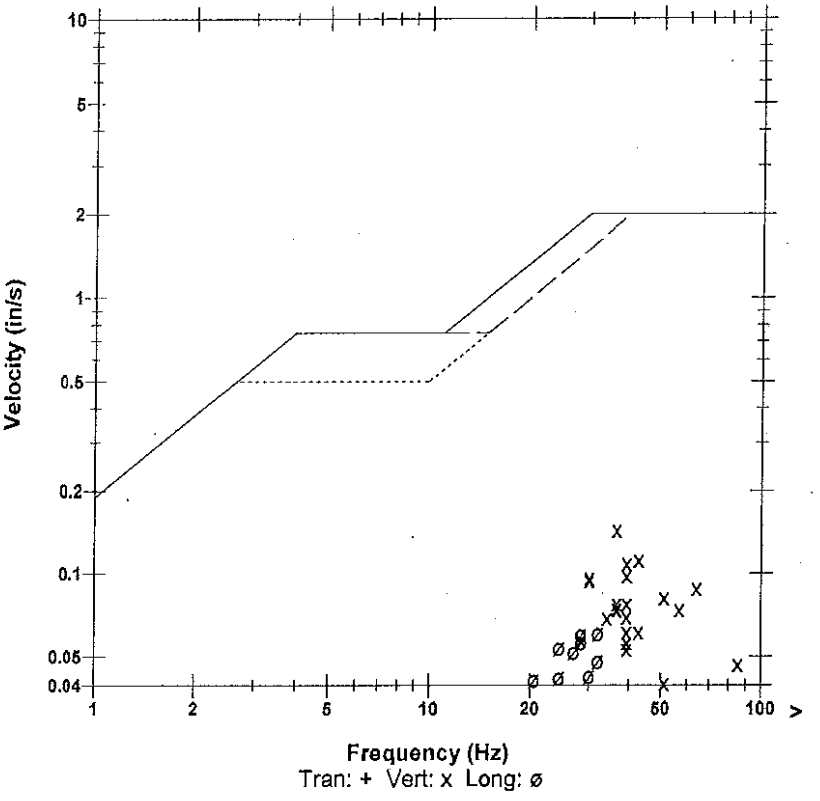
Date/Time	Vert at 14:59:45 March 14, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E71G.BL0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

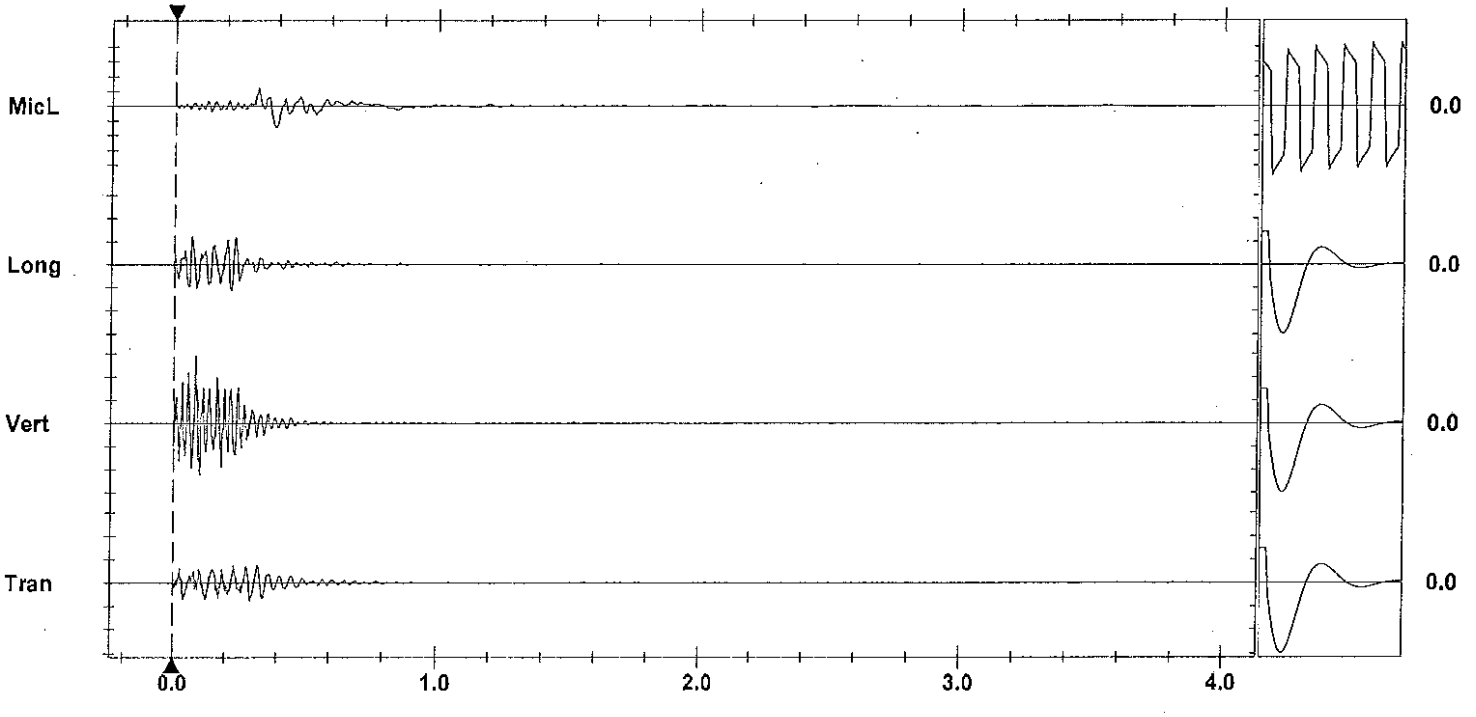
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00145 psi(L) at 0.388 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 681 mv)

	Tran	Vert	Long	
PPV	0.0387	0.144	0.0606	in/s
ZC Freq	24	37	32	Hz
Time (Rel. to Trig)	0.301	0.086	0.069	sec
Peak Acceleration	0.0514	0.131	0.0481	g
Peak Displacement	0.00026	0.00051	0.00034	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.152 in/s at 0.086 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 15/12
ACTUAL BLAST DATE MAR 15/12 11:30AM
BLAST # MW-0158

HIGHWAY# 97
BLAST LOCATION AT: 128+85 - 128+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slate material

HEIGHT ABOVE HWY N/A (m) - SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Sedimentary
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4-8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.1 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 10 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

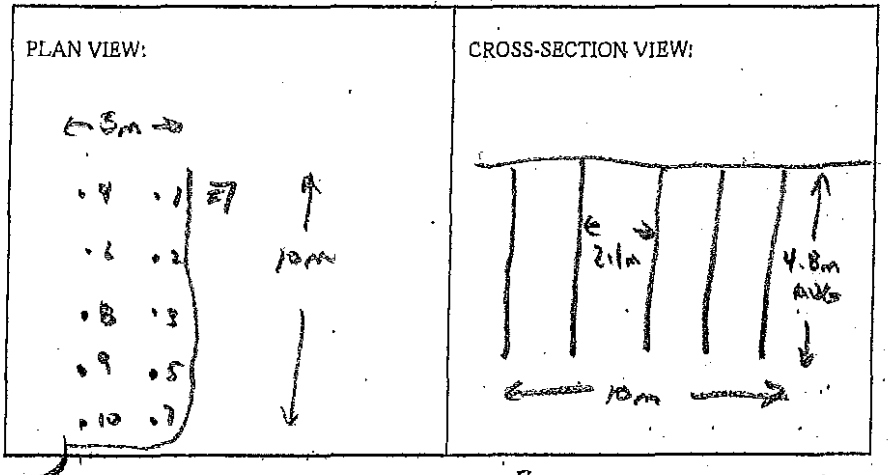
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.082in/s 34 Hz
@ 13117 Cliffstone Ct - 0.12ips 39 Hz

7'-8' ANFO/Hole primed w/ 1 CART 1"x8" DYNAMITE

Instantel

Event Report

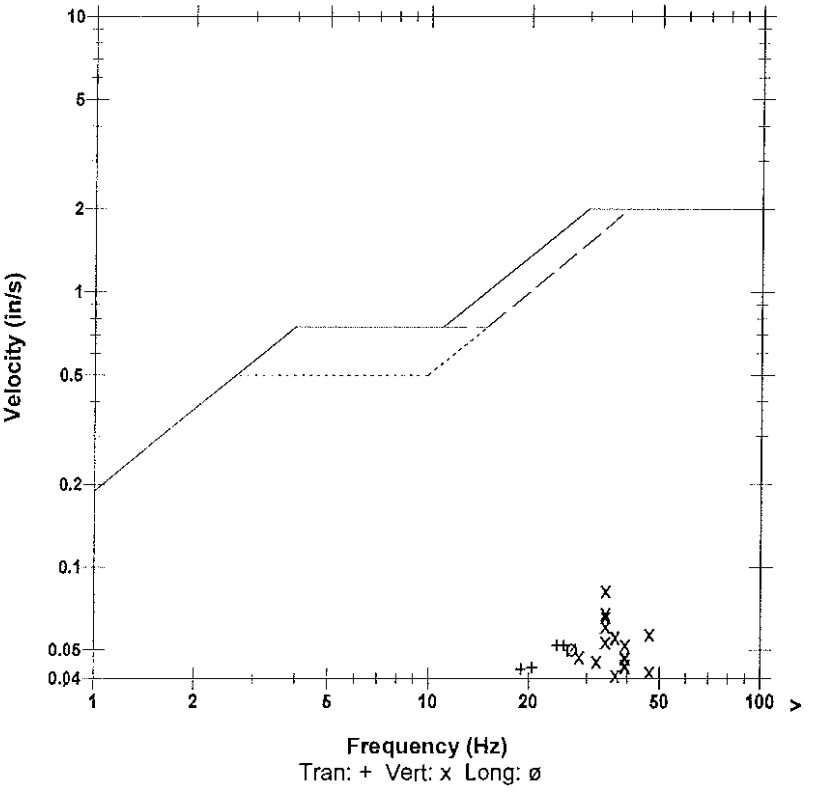
Date/Time	Vert at 11:30:52 March 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E731.BG0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

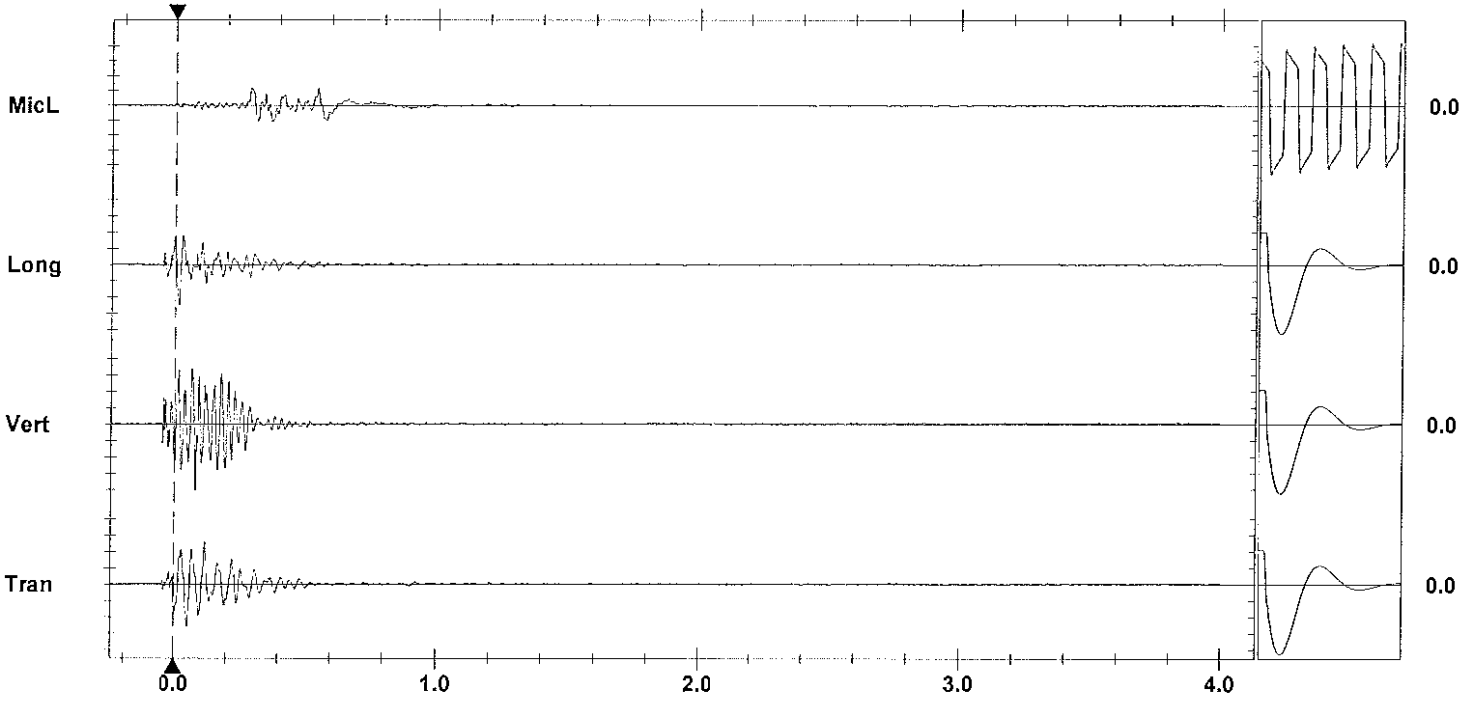
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00116 psi(L) at 0.289 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 659 mv)

	Tran	Vert	Long	
PPV	0.0519	0.0825	0.0506	in/s
ZC Freq	26	34	27	Hz
Time (Rel. to Trig)	0.051	0.082	0.015	sec
Peak Acceleration	0.0265	0.0713	0.0315	g
Peak Displacement	0.00033	0.00032	0.00027	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.0834 in/s at 0.082 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

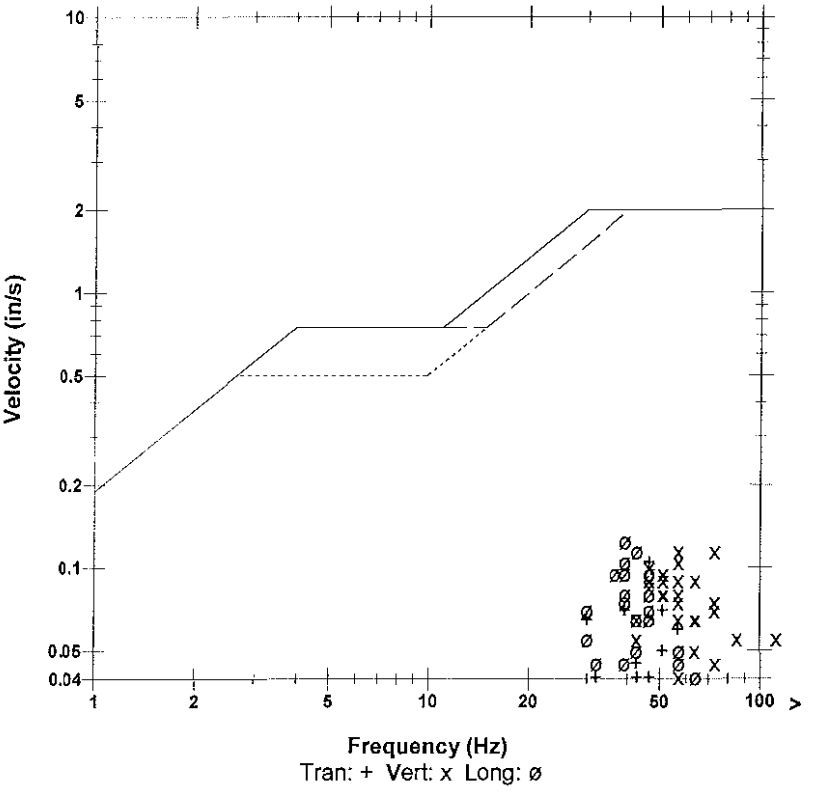
Date/Time	Vert at 11:30:49 March 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E731.BD0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

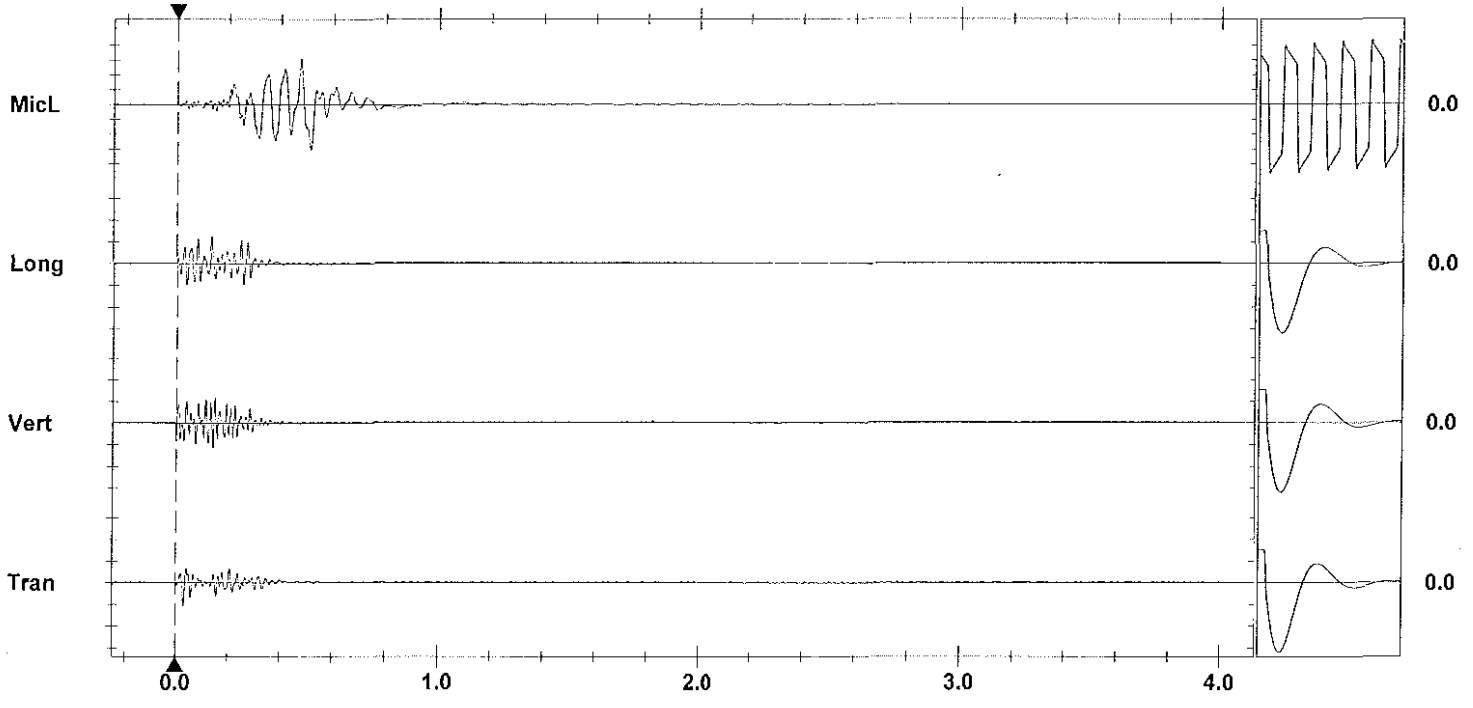
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00312 psi(L) at 0.475 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 666 mv)

	Tran	Vert	Long	
PPV	0.105	0.115	0.125	in/s
ZC Freq	47	73	39	Hz
Time (Rel. to Trig)	0.031	0.142	0.135	sec
Peak Acceleration	0.0795	0.133	0.0928	g
Peak Displacement	0.00036	0.00033	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.143 in/s at 0.077 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vowsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 15/12
ACTUAL BLAST DATE Mar 15/12 12:26 PM
BLAST # MW-0159

HIGHWAY# 97
BLAST LOCATION AT: STN 128+83 - 128+85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
*shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 4.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 18 (m)

TOTAL NUMBER OF HOLES 4 plus 0
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite Tanto
TOTAL NUMBER OF CARTRIDGES 4
TOTAL NUMBER OF DELAYS 4

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

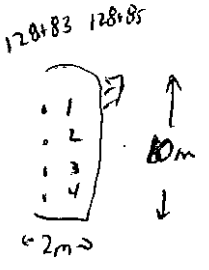
VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

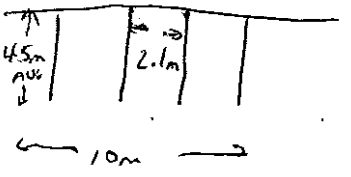
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - No Trigger (< 0.04 ips)
" @ 13117 Cliffstone Crt. 0.070 ips / SHL

5'-6' ANFO/HOLE PRIMED W/ 1 EACH 1"x8" DYNAMITE

Instantel

Event Report

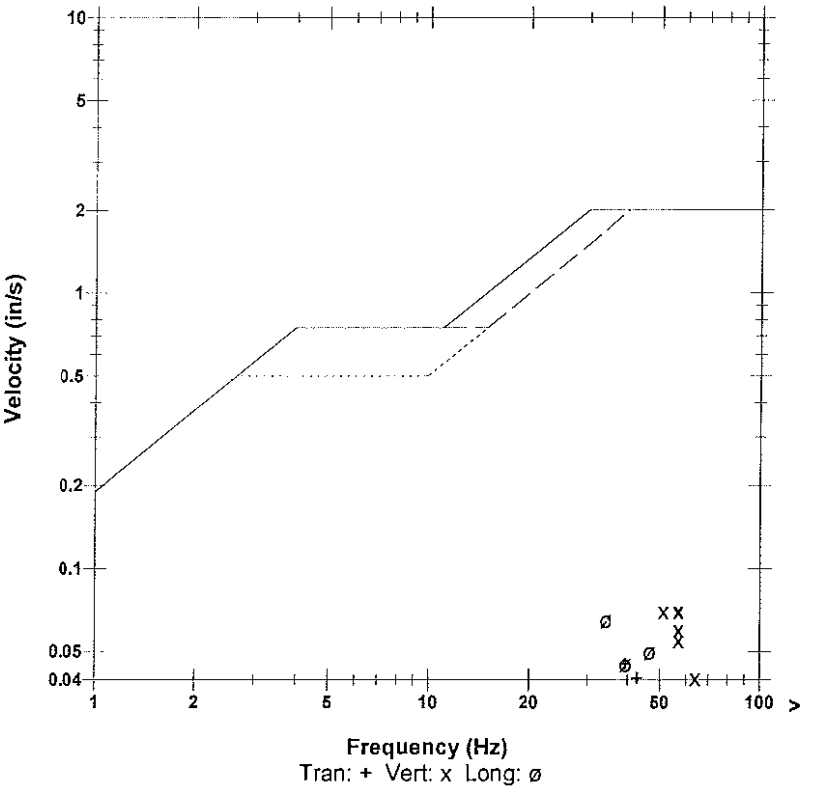
Date/Time	Vert at 12:26:32 March 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E733.W80

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

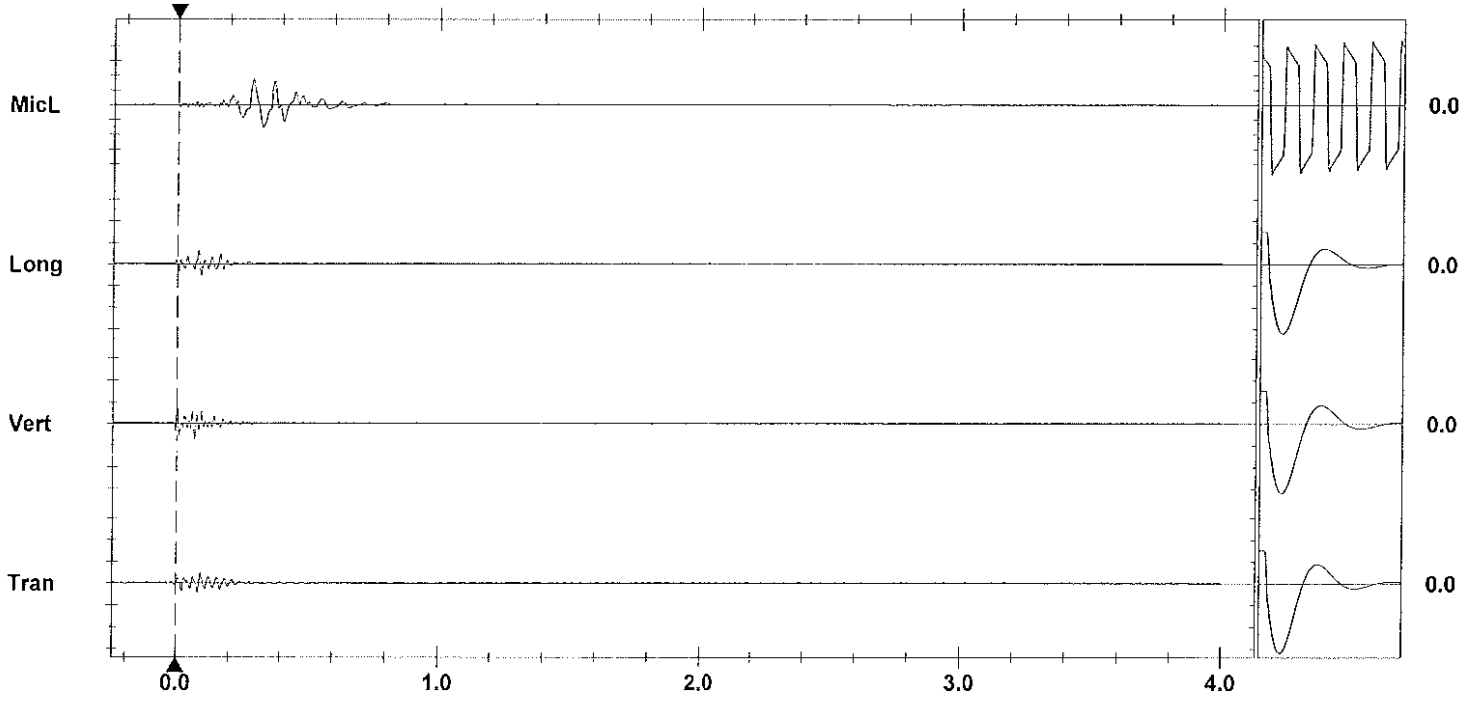
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00174 psi(L) at 0.288 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 659 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0700	0.0650	in/s
ZC Freq	39	51	34	Hz
Time (Rel. to Trig)	0.094	0.003	0.082	sec
Peak Acceleration	0.0398	0.0928	0.0530	g
Peak Displacement	0.00017	0.00021	0.00025	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.0841 in/s at 0.094 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834789

DATE PREPARED Mar 15/12
ACTUAL BLAST DATE Mar 15/12 1:38 PM
BLAST # MW-0160

HIGHWAY# 97
BLAST LOCATION AT: SBD 128+86 - 128+83

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot notified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 5.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 65 (m)

TOTAL NUMBER OF HOLES 86/1/360 ft + 1/2 shot
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16 Blastex
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

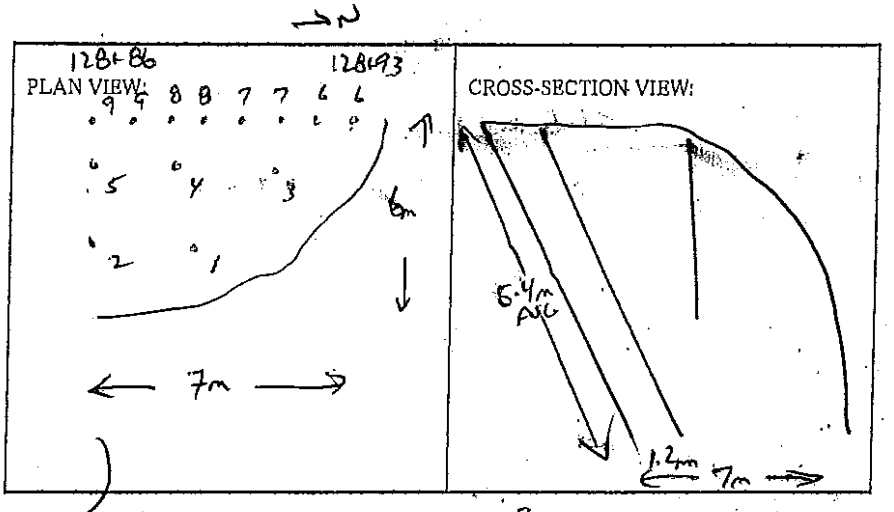
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HD22O CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Crt - 0.063 ips/ 39 Hz
" @ 13117 Cliffstone Crt - 0.141 ips/ 47 Hz

STAB HOLES – 2' ANFO / HOLE

BUFFER HOLES – 4-5 CART 2"x16" BLASTEX } Primed w/ 0.5 CART 2"x16" DYNAMITE

B/L HOLES – 1 CART 2"x16" DYNAMITE + 200 gr. det. cord. to 4' collar

Instantel

Event Report

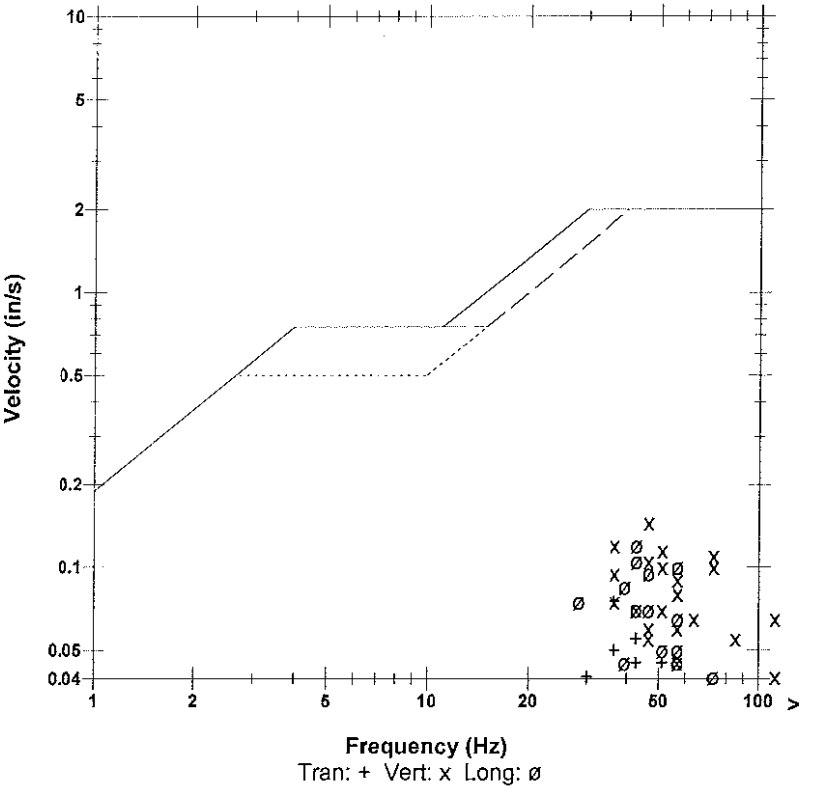
Date/Time	Vert at 13:38:26 March 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E737.820

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

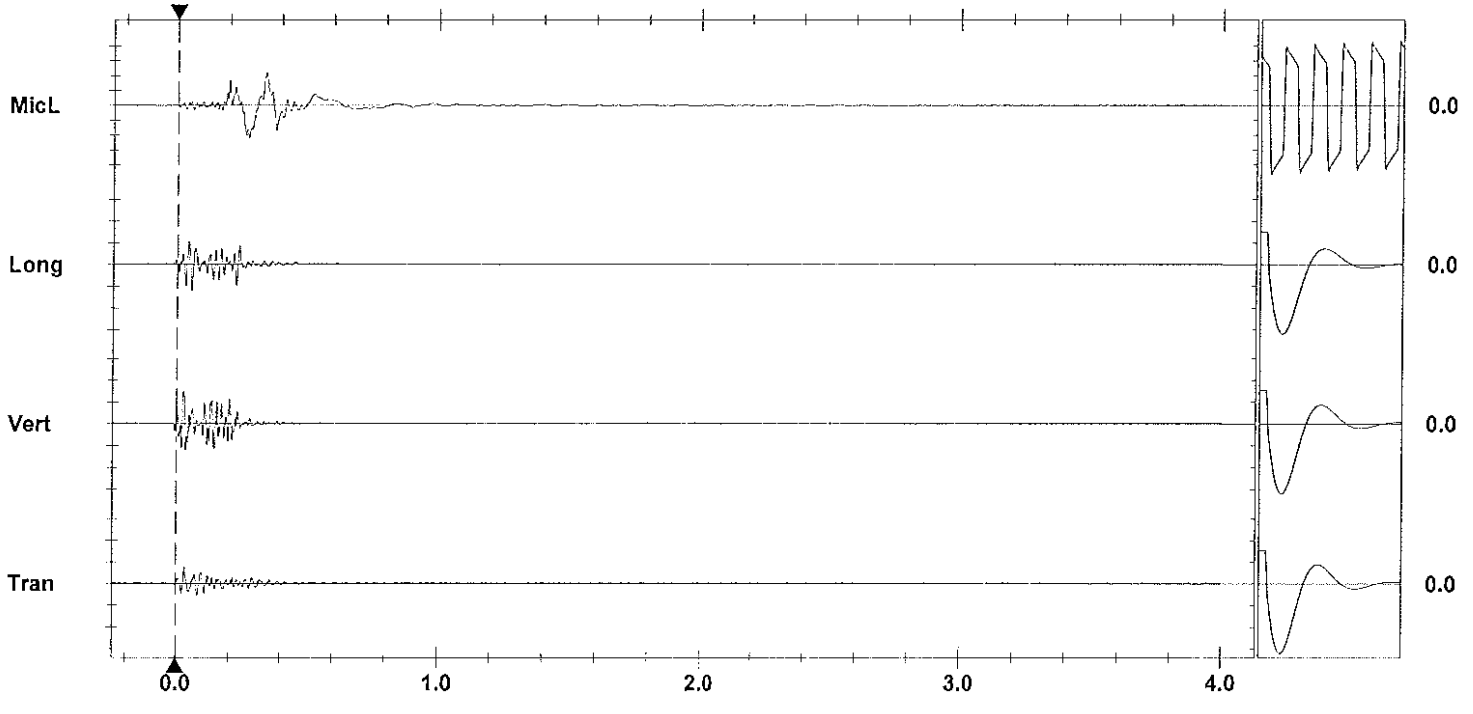
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00221 psi(L) at 0.341 sec
ZC Freq 8.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 644 mv)

	Tran	Vert	Long	
PPV	0.0750	0.145	0.120	in/s
ZC Freq	37	47	43	Hz
Time (Rel. to Trig)	0.033	0.024	0.055	sec
Peak Acceleration	0.0530	0.225	0.0928	g
Peak Displacement	0.00027	0.00057	0.00046	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.153 in/s at 0.029 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

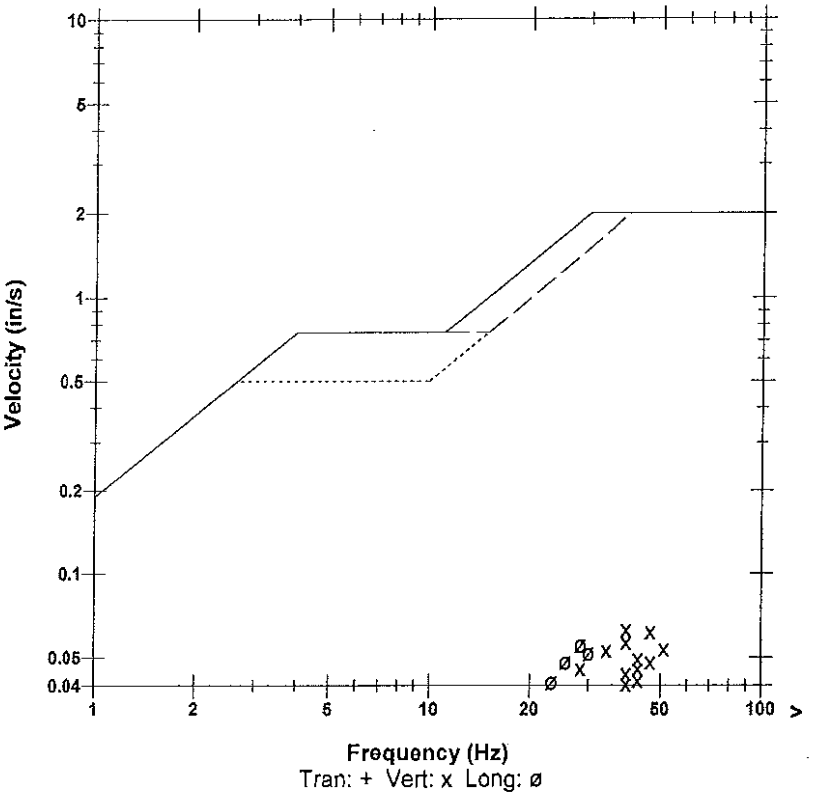
Date/Time	Vert at 13:38:29 March 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E737.850
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

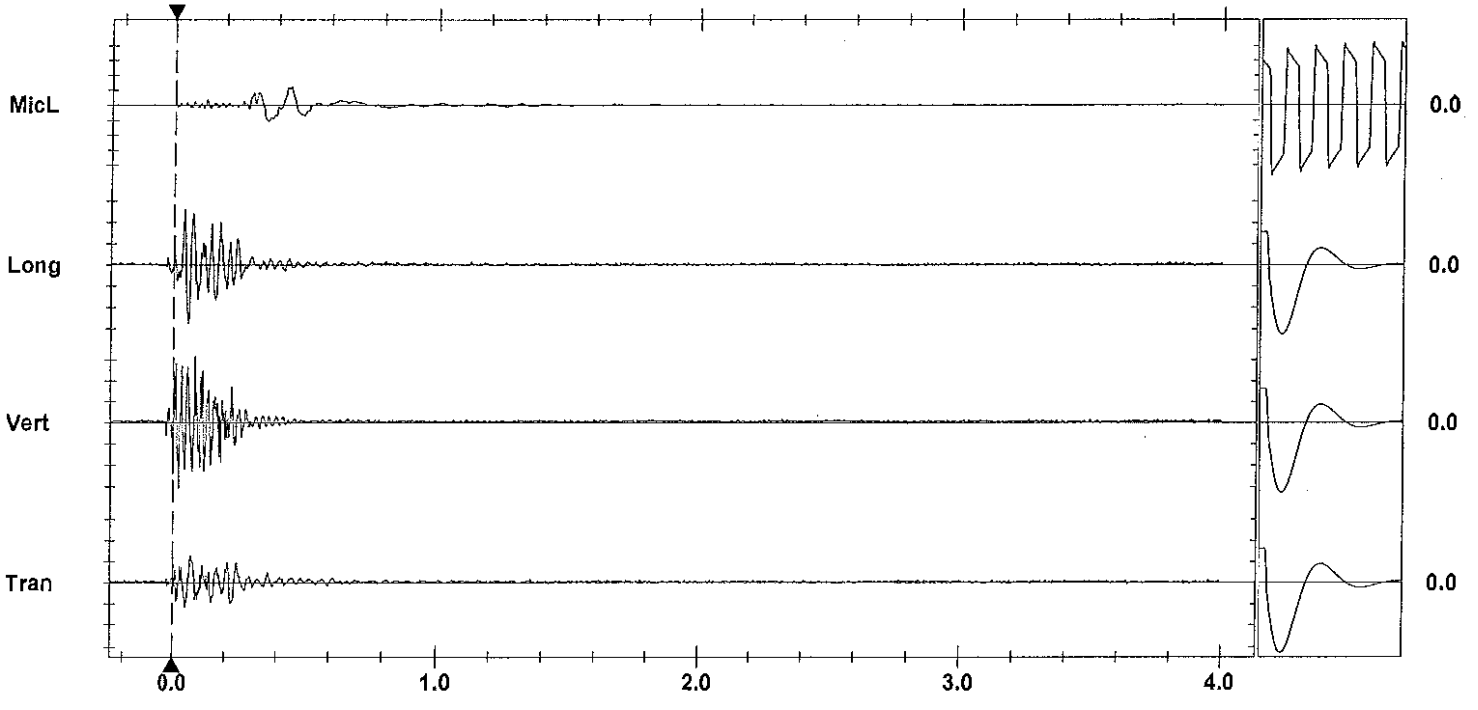
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00120 psi(L) at 0.446 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 715 mv)

	Tran	Vert	Long	
PPV	0.0256	0.0631	0.0556	in/s
ZC Freq	20	39	28	Hz
Time (Rel. to Trig)	0.070	0.086	0.059	sec
Peak Acceleration	0.0331	0.0978	0.0348	g
Peak Displacement	0.00019	0.00024	0.00032	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.0768 in/s at 0.058 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED MAR 15/12
ACTUAL BLAST DATE MAR 15/12 3:48 PM
BLAST # MW-0161

HIGHWAY# 97
BLAST LOCATION AT: 128+78 - 128+86 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 8 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 84 (m)

TOTAL NUMBER OF HOLES 96/1/36 Aft
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Bigarex
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

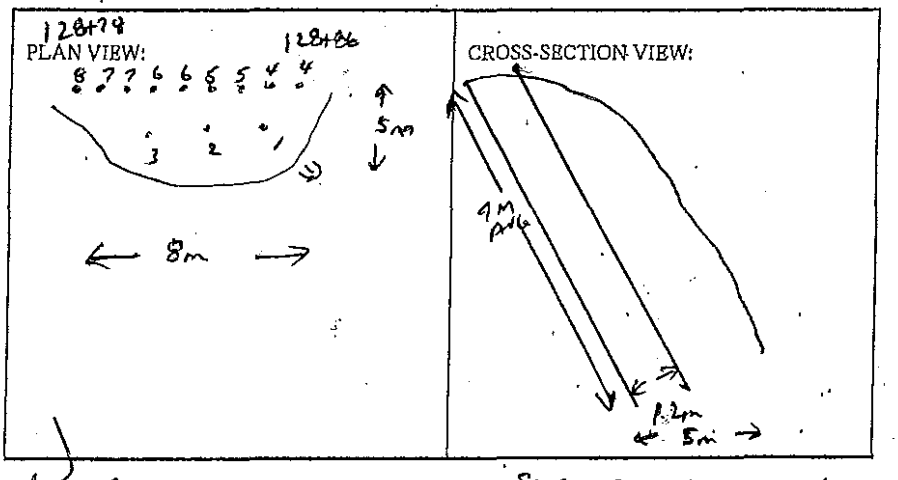
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 225 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt - D.16 ips / 24Hz
@ 13117 Cliffstone Crt - D.44 ips / 47Hz

BUFFER HOLES - 5 emmt 2"x16" BLASTEX primed w/ 0.5 emmt 2"x16" DYNAMITE

B/L HOLES - 1 emmt 2"x16" DYNAMITE + 200 gr. det. cord to 4' collar.

Instantel

Event Report

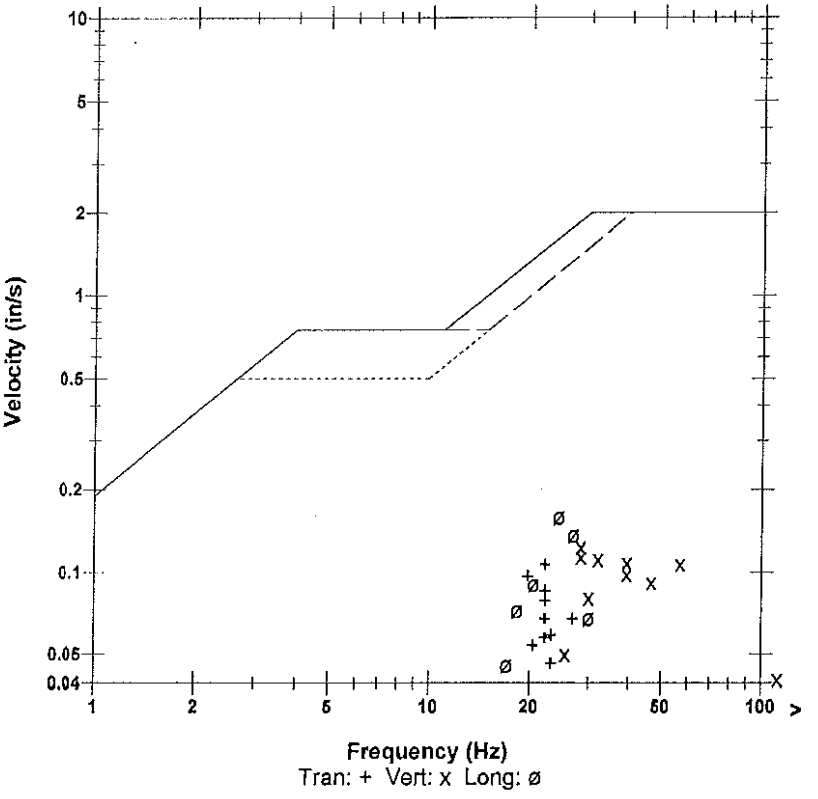
Date/Time	Vert at 15:48:14 March 15, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E73D.8E0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

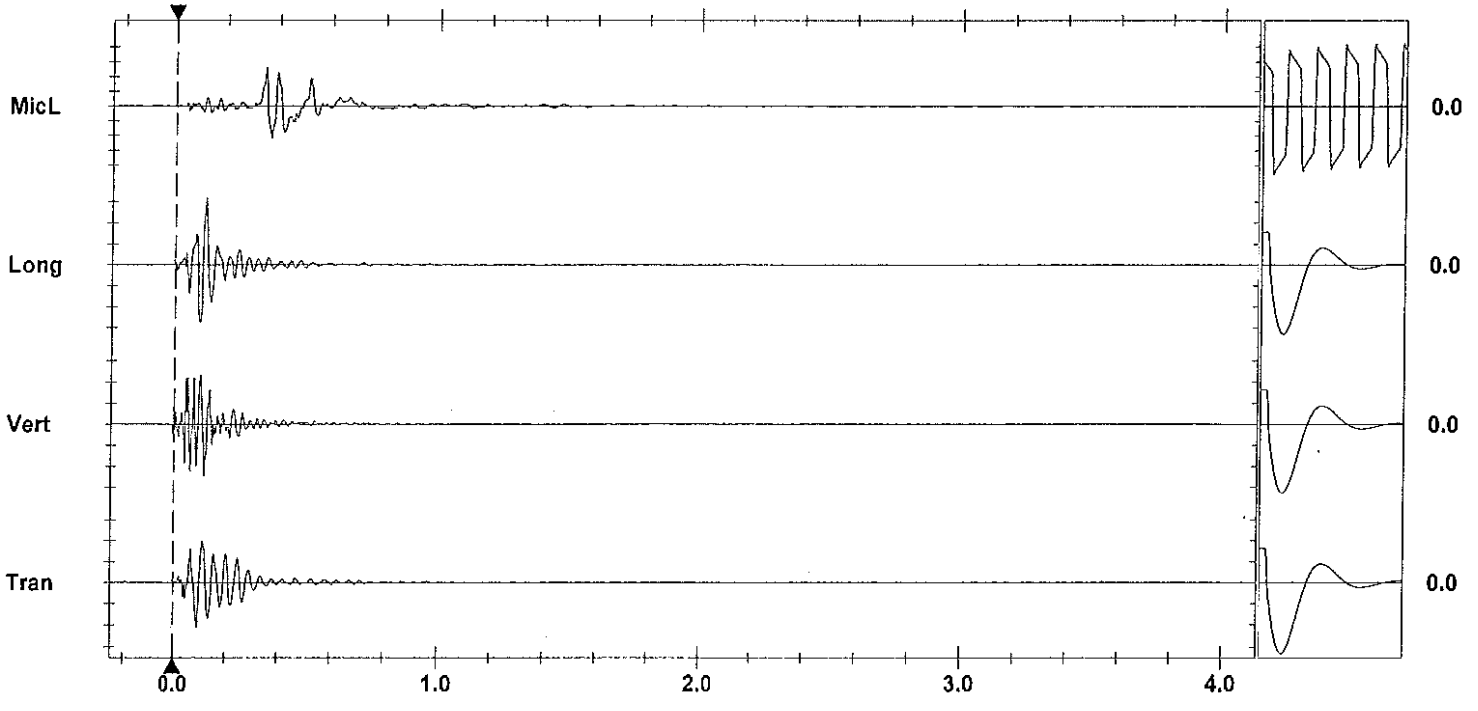
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00265 psi(L) at 0.347 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 641 mv)

	Tran	Vert	Long	
PPV	0.107	0.124	0.159	in/s
ZC Freq	22	28	24	Hz
Time (Rel. to Trig)	0.093	0.120	0.121	sec
Peak Acceleration	0.0514	0.199	0.0895	g
Peak Displacement	0.00079	0.00061	0.00099	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.216 in/s at 0.120 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

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Instantel

Event Report

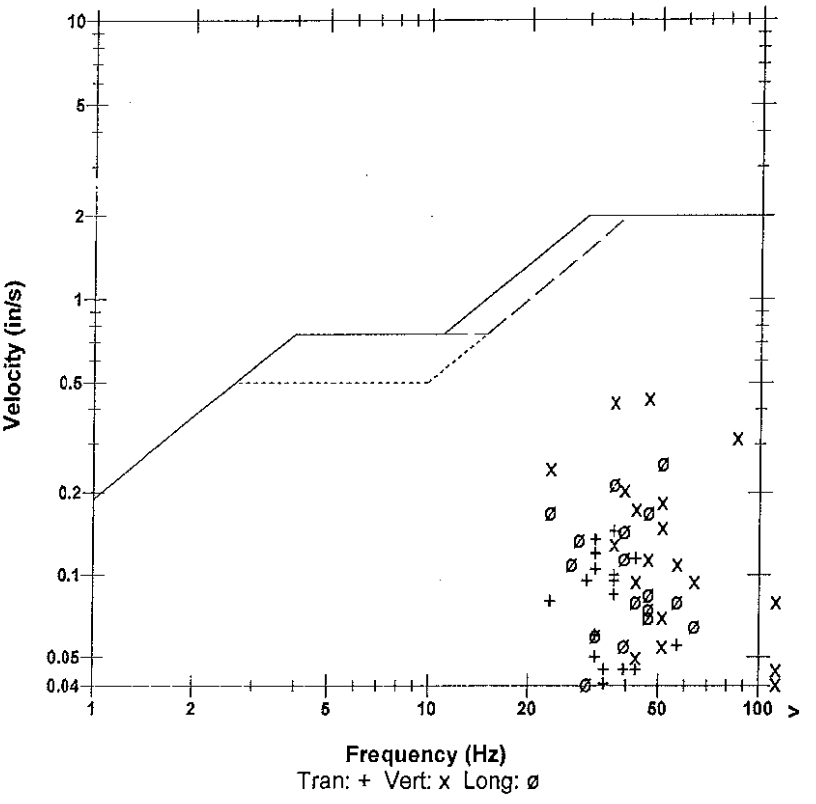
Date/Time	Vert at 15:48:11 March 15, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E73D.8B0

Notes
location:13117 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

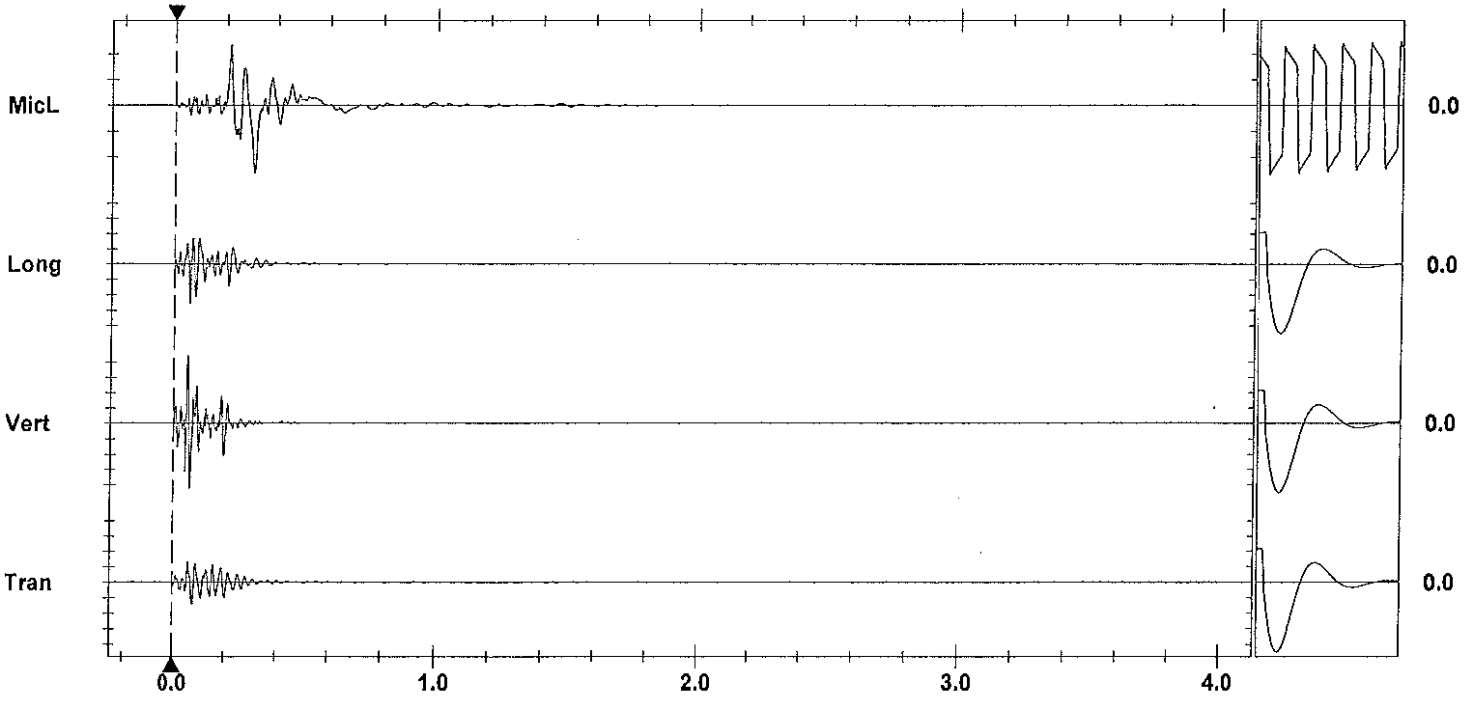
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00518 psi(L) at 0.309 sec			
ZC Freq	9.1 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 659 mv)			

	Tran	Vert	Long	
PPV	0.145	0.440	0.255	in/s
ZC Freq	37	47	51	Hz
Time (Rel. to Trig)	0.079	0.056	0.062	sec
Peak Acceleration	0.0928	0.530	0.186	g
Peak Displacement	0.00063	0.00170	0.00107	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.0	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.457 in/s at 0.063 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00200 psi(L)/div Sensorcheck
Trigger = ▶———◀

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AS-BUILT BLASTING RECORD

File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 16/12
ACTUAL BLAST DATE Mar 16/12 10:27 am
BLAST # MW-0162

HIGHWAY# 97
BLAST LOCATION AT: STN 130+62 - 130+70 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION

SITE DETAILS: & shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 26 (m)

TOTAL NUMBER OF HOLES 13 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Blasting EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 13
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

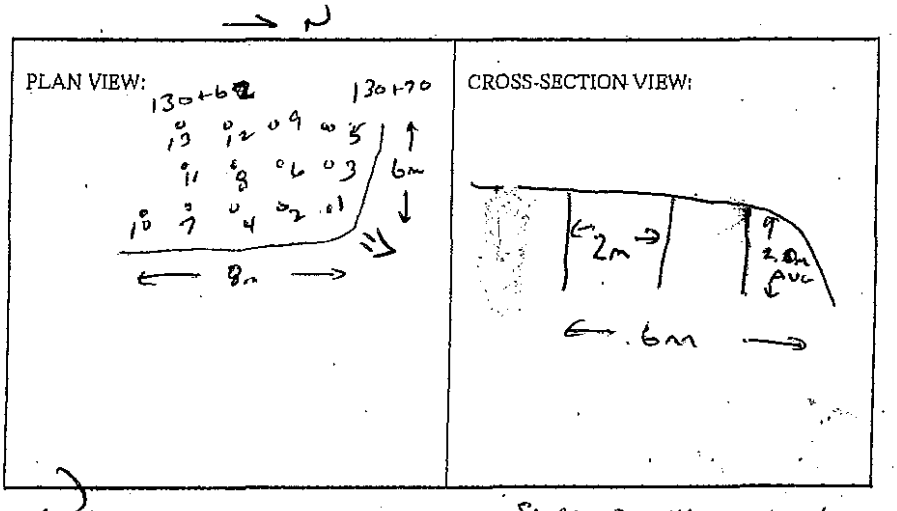
INITIATION DEVICE: (CIRCLE) ~~E.B. CAPS~~ SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 50 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt 0.079 ips/39Hz
" @ 13221 Cliffstone Crt - 0.13 ips/51Hz

1 — 1.5 CARTRIDGE/1WG PRIMED W/ 0.33 CAST 2"x6" DYNAMITE

Instantel

Event Report

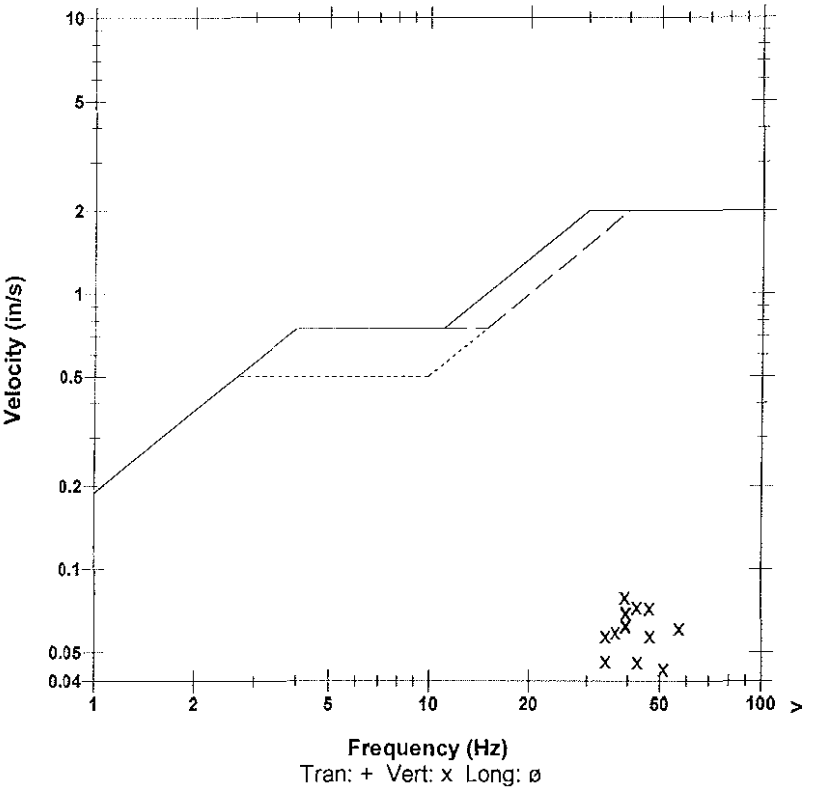
Date/Time	Vert at 10:27:38 March 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E74T.220
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

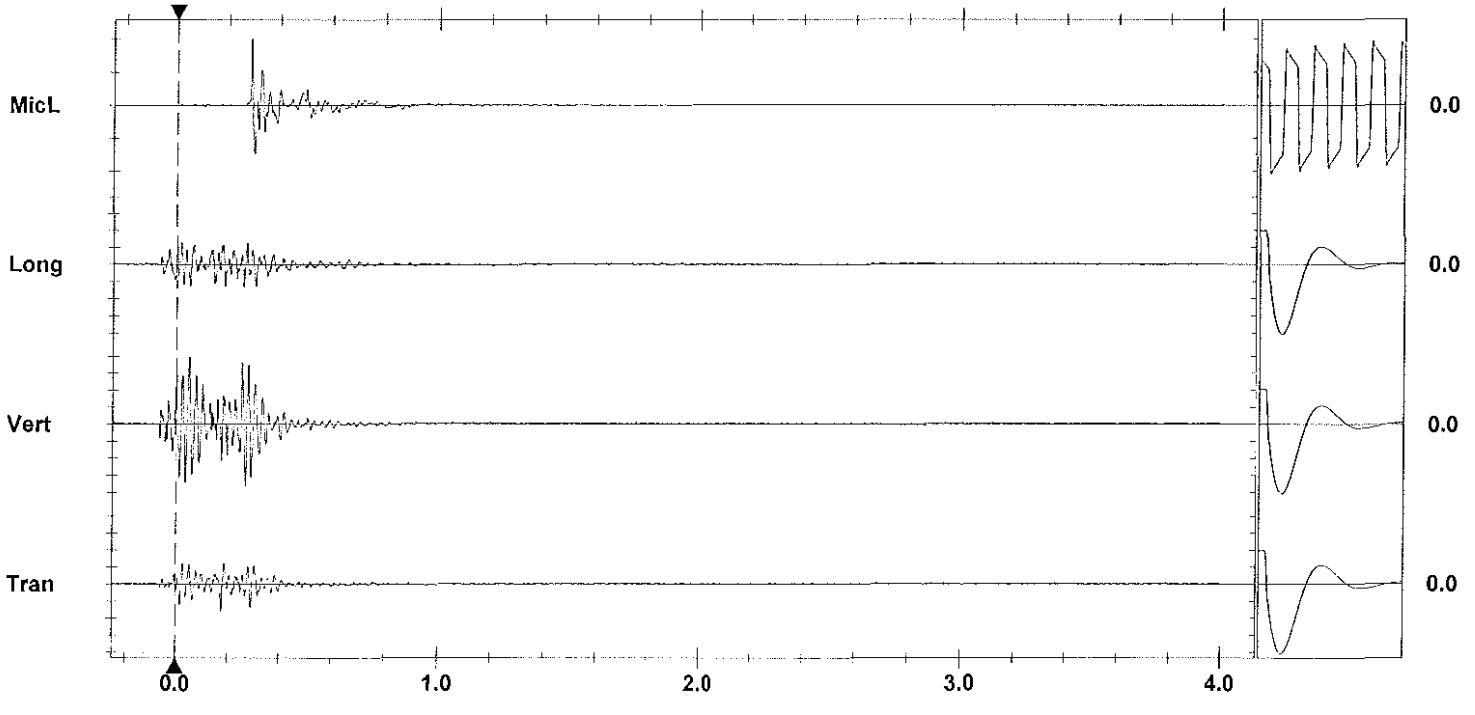
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.0102 psi(L) at 0.287 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 642 mv)

	Tran	Vert	Long	
PPV	0.0325	0.0794	0.0262	in/s
ZC Freq	47	39	43	Hz
Time (Rel. to Trig)	0.177	0.052	0.016	sec
Peak Acceleration	0.0282	0.0945	0.0464	g
Peak Displacement	0.00010	0.00032	0.00011	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.0859 in/s at 0.052 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00500 psi(L)/div Sensorcheck
Trigger = ▶———◀

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Instantel

Event Report

Date/Time	Vert at 10:27:35 March 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.2 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E74T.1Z0

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

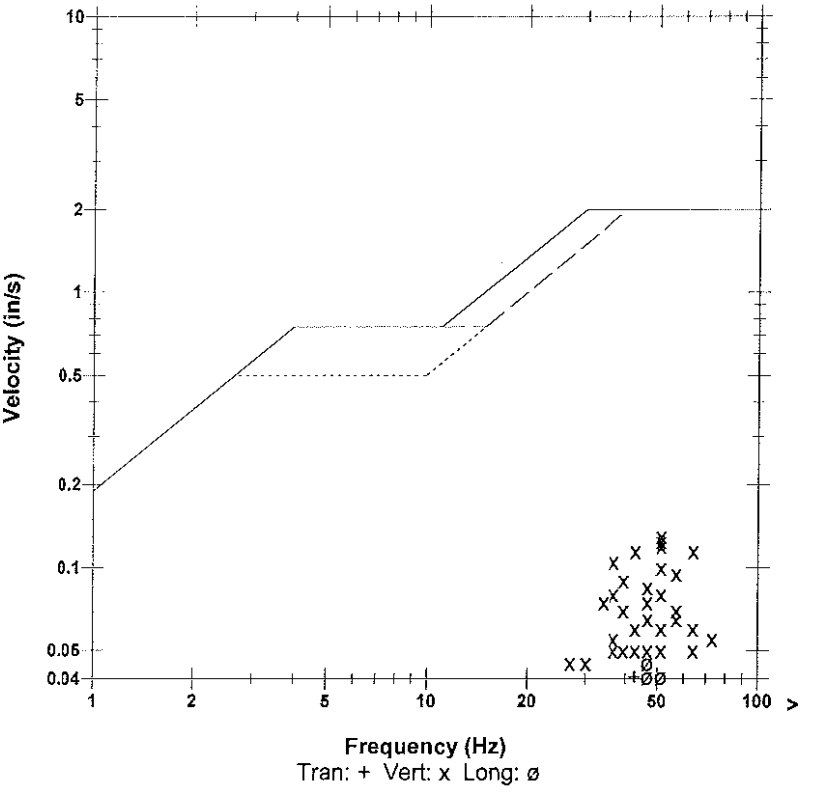
Extended Notes
Blast at stn 128

Post Event Notes

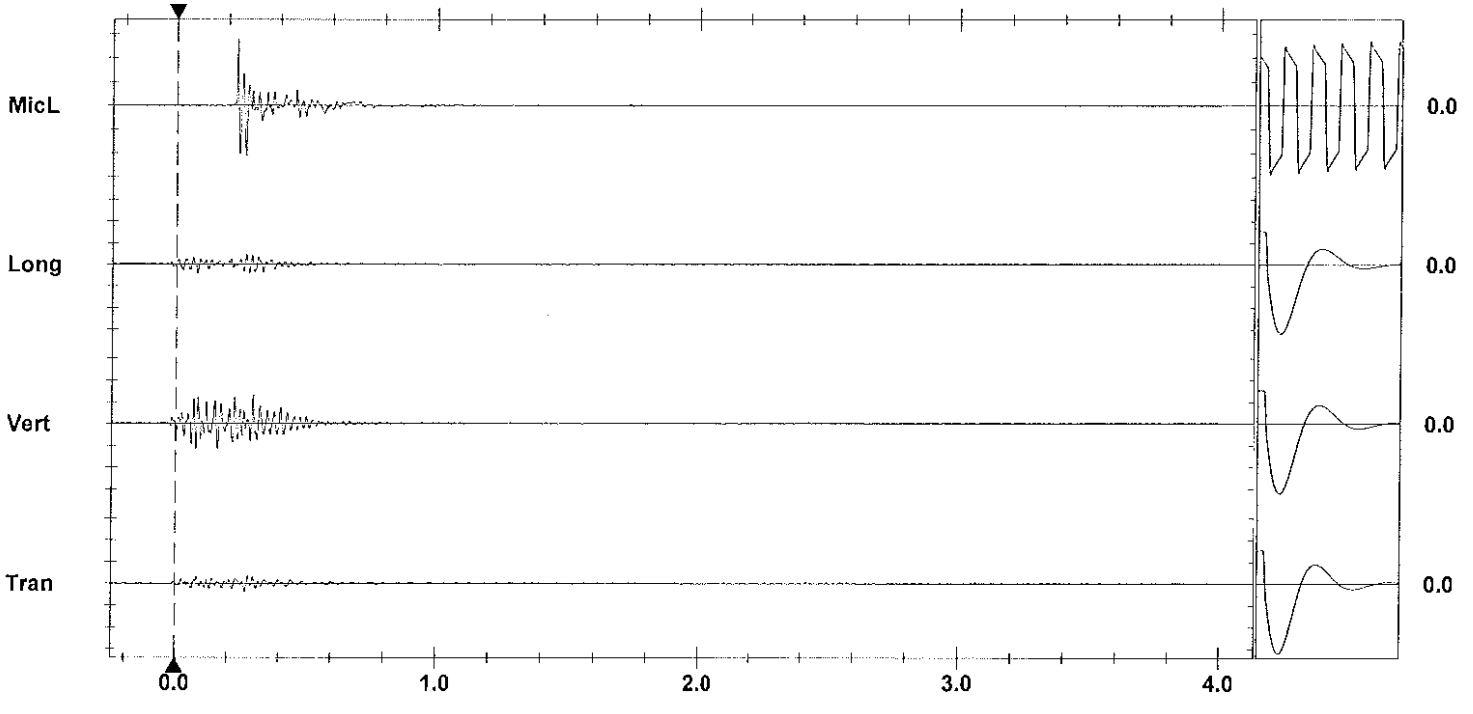
Microphone Linear Weighting
PSPL 0.0140 psi(L) at 0.234 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0400	0.130	0.0450	in/s
ZC Freq	43	51	47	Hz
Time (Rel. to Trig)	0.271	0.300	0.271	sec
Peak Acceleration	0.0265	0.119	0.0398	g
Peak Displacement	0.00015	0.00042	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.4	7.1	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.135 in/s at 0.301 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00500 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 16/12
ACTUAL BLAST DATE Mar 16/12 11:52 AM
BLAST # MW-0163

HIGHWAY# 97
BLAST LOCATION AT: STN 130+55 - 130+62 (to subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 16 (m)

TOTAL NUMBER OF HOLES 8 prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2"x16" Booster EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 13 TOTAL WEIGHT 20 (kg)
TOTAL NUMBER OF DELAYS 8 DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRGLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

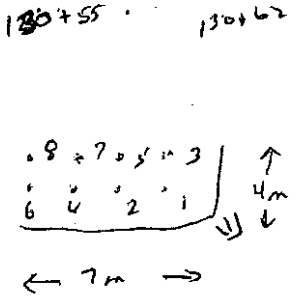
VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

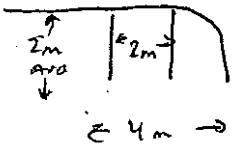
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vorsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Cut - 0.046 ips / 47Hz
@ 13221 Cliffstone Cut 0.13 ips / 5Hz

1.5 CARTRIDGES 2"x16" BLASTEX / Hole Primed w/ 0.33 GMLT 2"x16" DYNAMITE

Instantel

Event Report

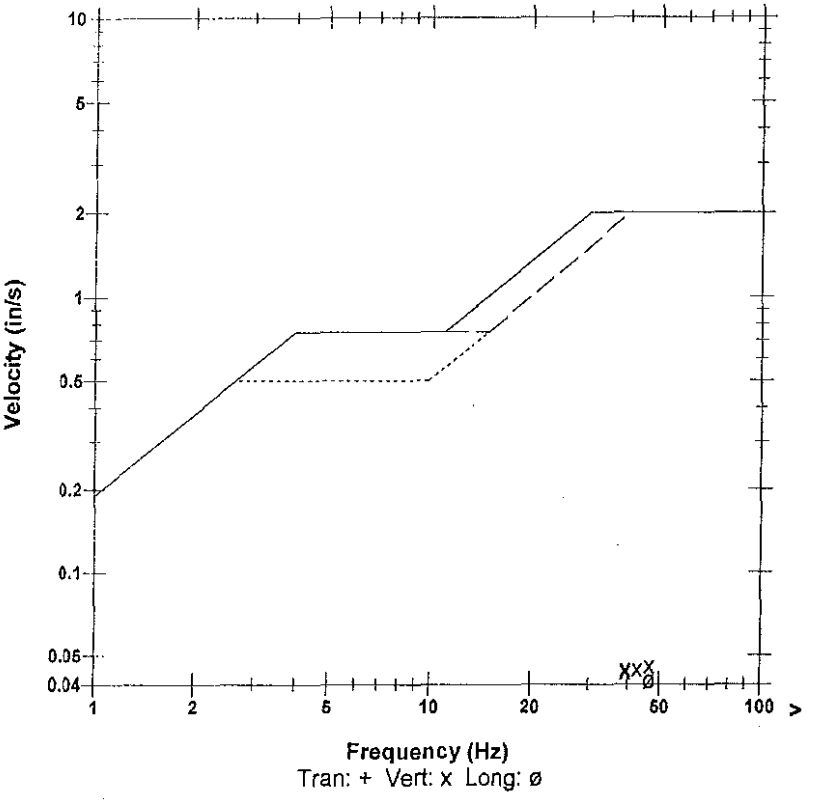
Date/Time	Vert at 11:52:57 March 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E74X.090
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

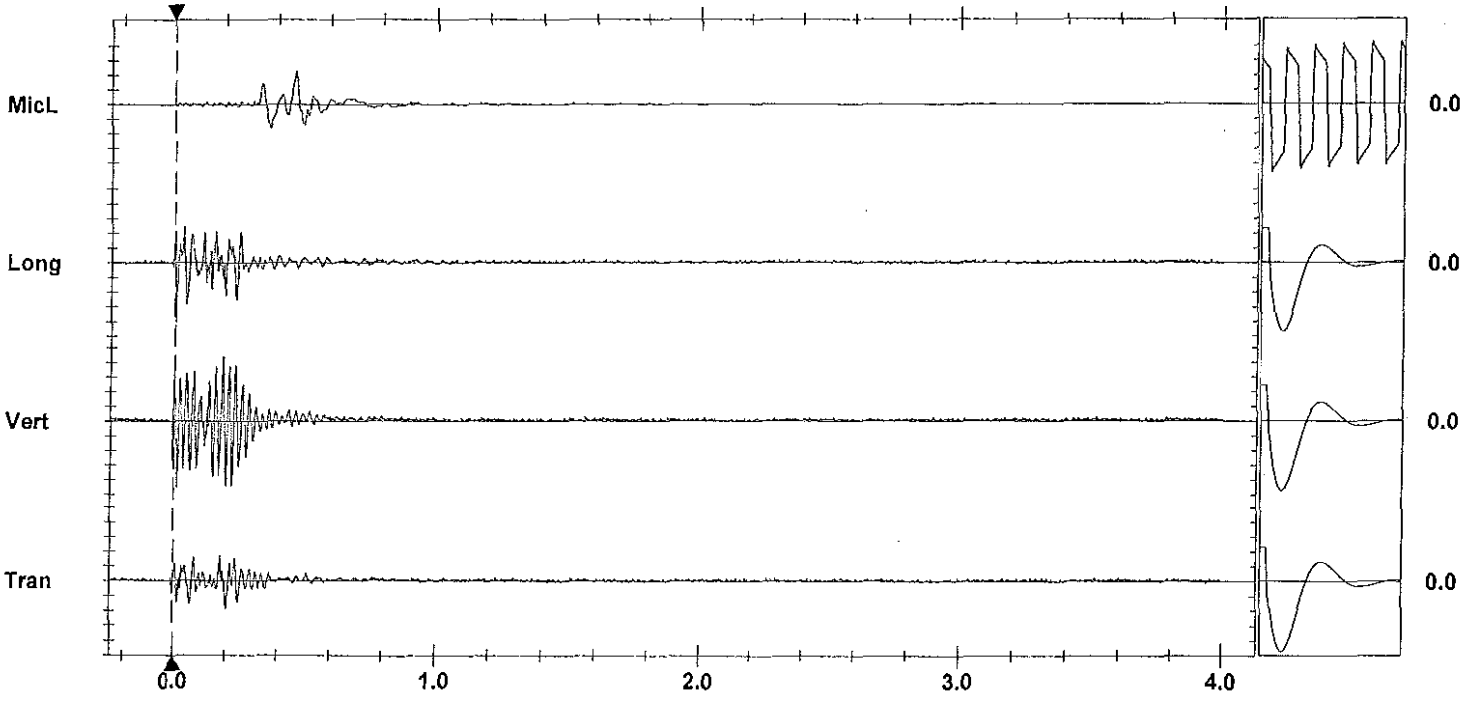
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00225 psi(L) at 0.463 sec			
ZC Freq	15 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 600 mv)			

	Tran	Vert	Long	
PPV	0.0187	0.0456	0.0406	in/s
ZC Freq	30	47	47	Hz
Time (Rel. to Trig)	0.206	0.014	0.007	sec
Peak Acceleration	0.0133	0.0497	0.0348	g
Peak Displacement	0.00009	0.00017	0.00015	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0475 in/s at 0.239 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—·····—◀

Sensorcheck

Printed: March 18, 2013 (V 8.04 - 8.04)

Instantel

Event Report

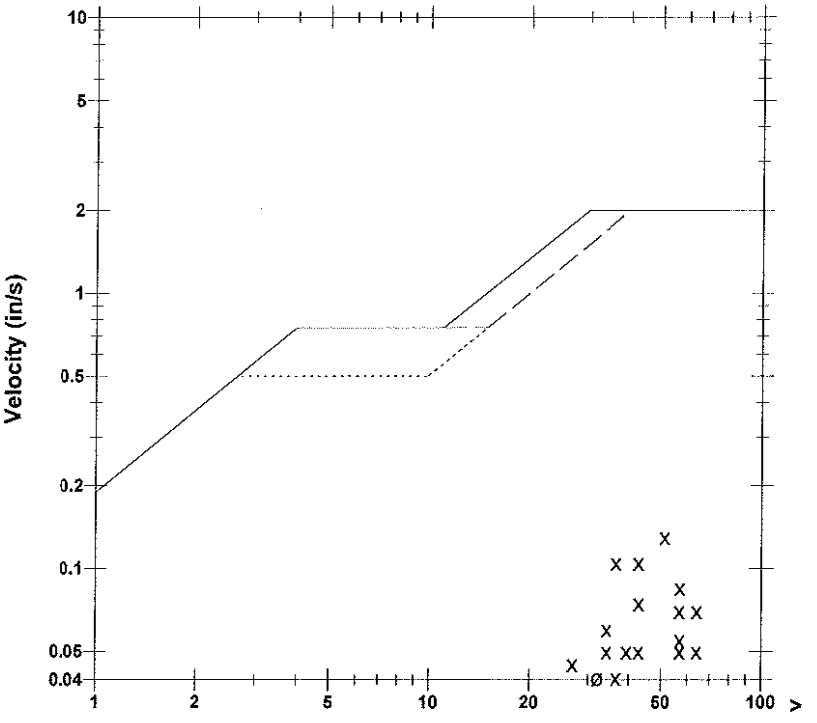
Date/Time	Vert at 11:52:53 March 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E74X.050

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

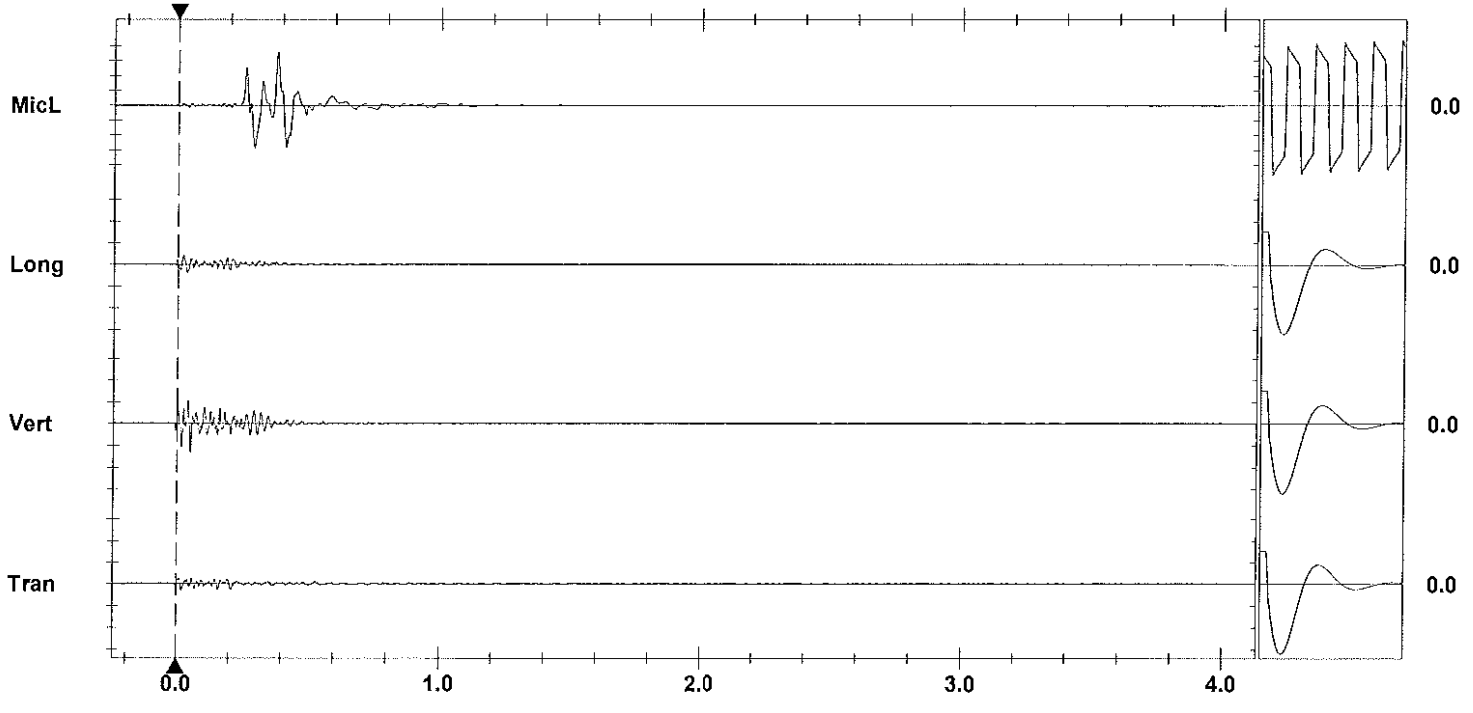
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00355 psi(L) at 0.380 sec			
ZC Freq	14 Hz			
Channel Test	Passed (Freq = 20.1 Hz Amp = 614 mv)			

	Tran	Vert	Long	
PPV	0.0300	0.130	0.0400	in/s
ZC Freq	47	51	32	Hz
Time (Rel. to Trig)	0.020	0.052	0.021	sec
Peak Acceleration	0.0265	0.106	0.0530	g
Peak Displacement	0.00012	0.00040	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.133 in/s at 0.052 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶———◀

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veverka
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED Mar 16/12
ACTUAL BLAST DATE Mar 16/12 1:03 PM
BLAST # MW-0164

HIGHWAY# 97
BLAST LOCATION AT: SW 130+56 - 130+62

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 14 (m)

TOTAL NUMBER OF HOLES 7 @200.
HOLE DIAMETER 2¼ (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2x16" Blasrite EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 13 TOTAL WEIGHT 20 (kg)
TOTAL NUMBER OF DELAYS 7 DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 Cams

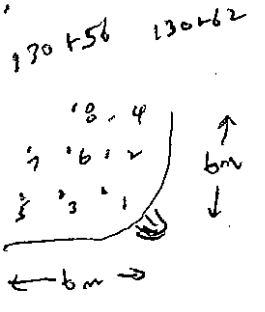
VOLUME OF ROCK BLASTED 30 (m^3)

BLAST SKETCH:

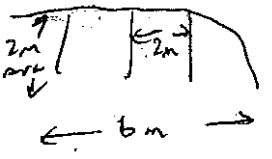
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Veverka COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

seismograph @ 13167 Cliffstone Crt. 0.061 ips/43Hz
v. @ 13221 @ Cliffstone Crt - 0.16 ips/37Hz

1.5-2 @ ART 2"x16" BLASTEX / HAG Primed w/ 0.33 @ ART
2"x16" DYNAMITE

Instantel

Event Report

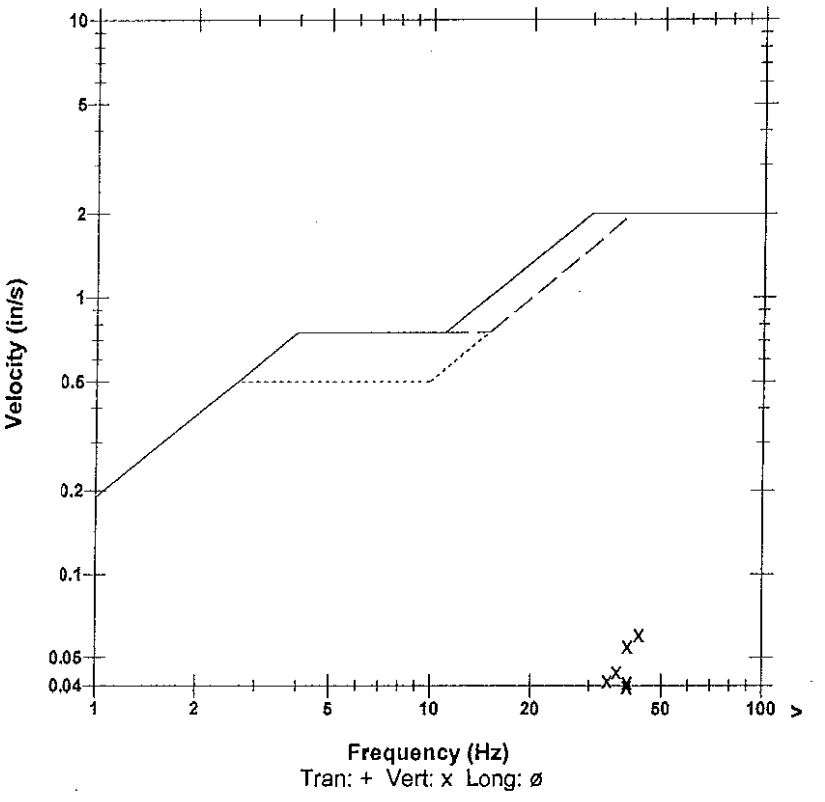
Date/Time	Vert at 13:03:08 March 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.4 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E750.980
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

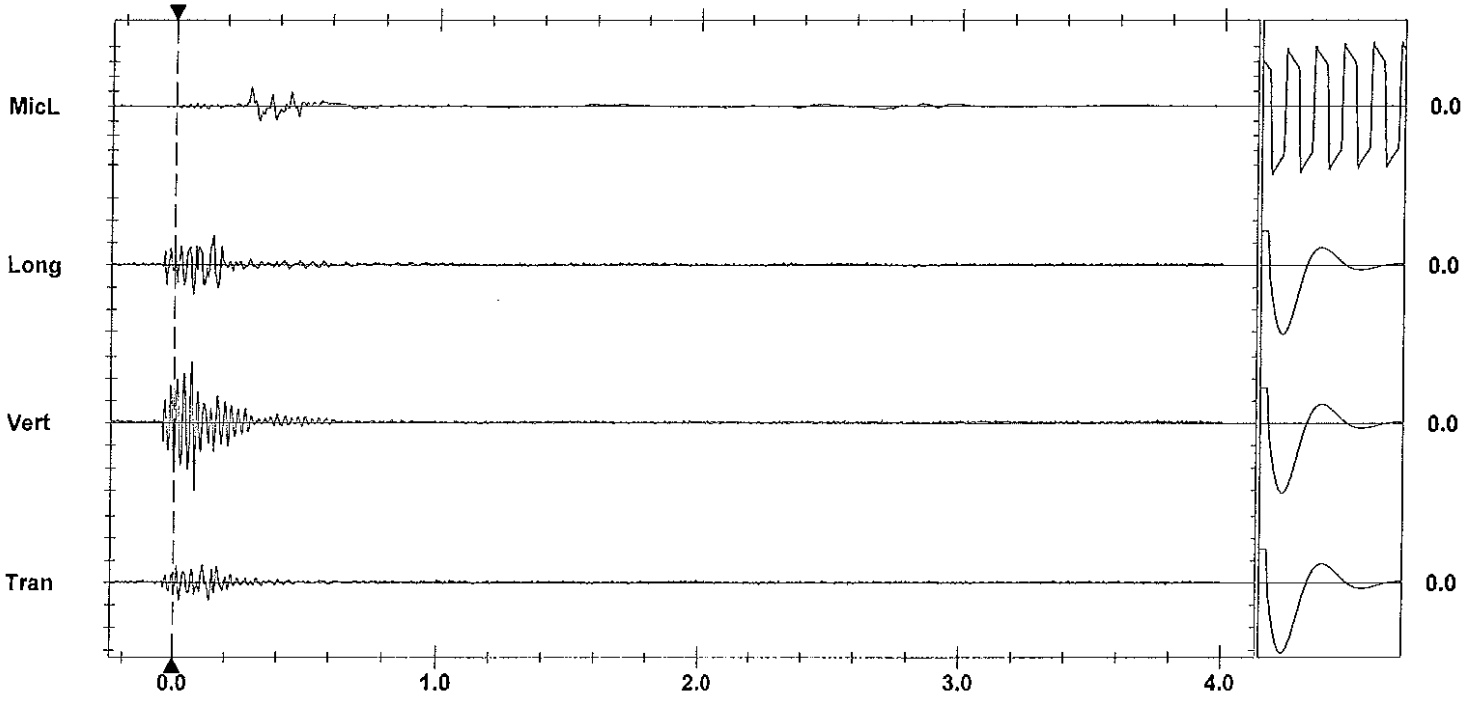
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00131 psi(L) at 0.292 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	0.0162	0.0606	0.0269	in/s
ZC Freq	28	43	39	Hz
Time (Rel. to Trig)	0.115	0.080	0.073	sec
Peak Acceleration	0.0166	0.0580	0.0331	g
Peak Displacement	0.00008	0.00021	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.0607 in/s at 0.080 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——————◀

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

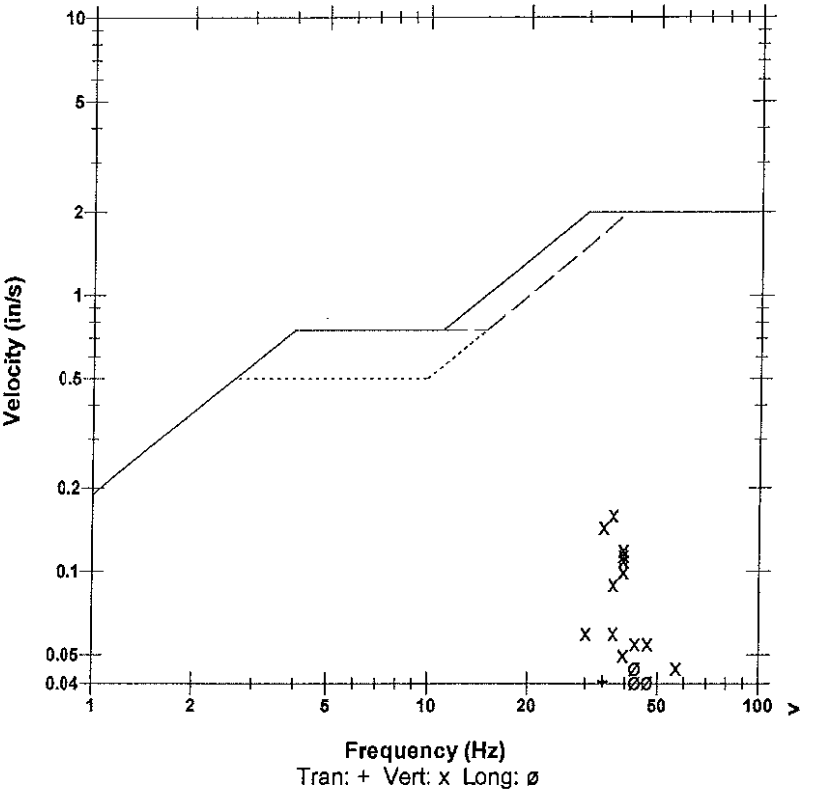
Date/Time	Vert at 13:03:05 March 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E750.950

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

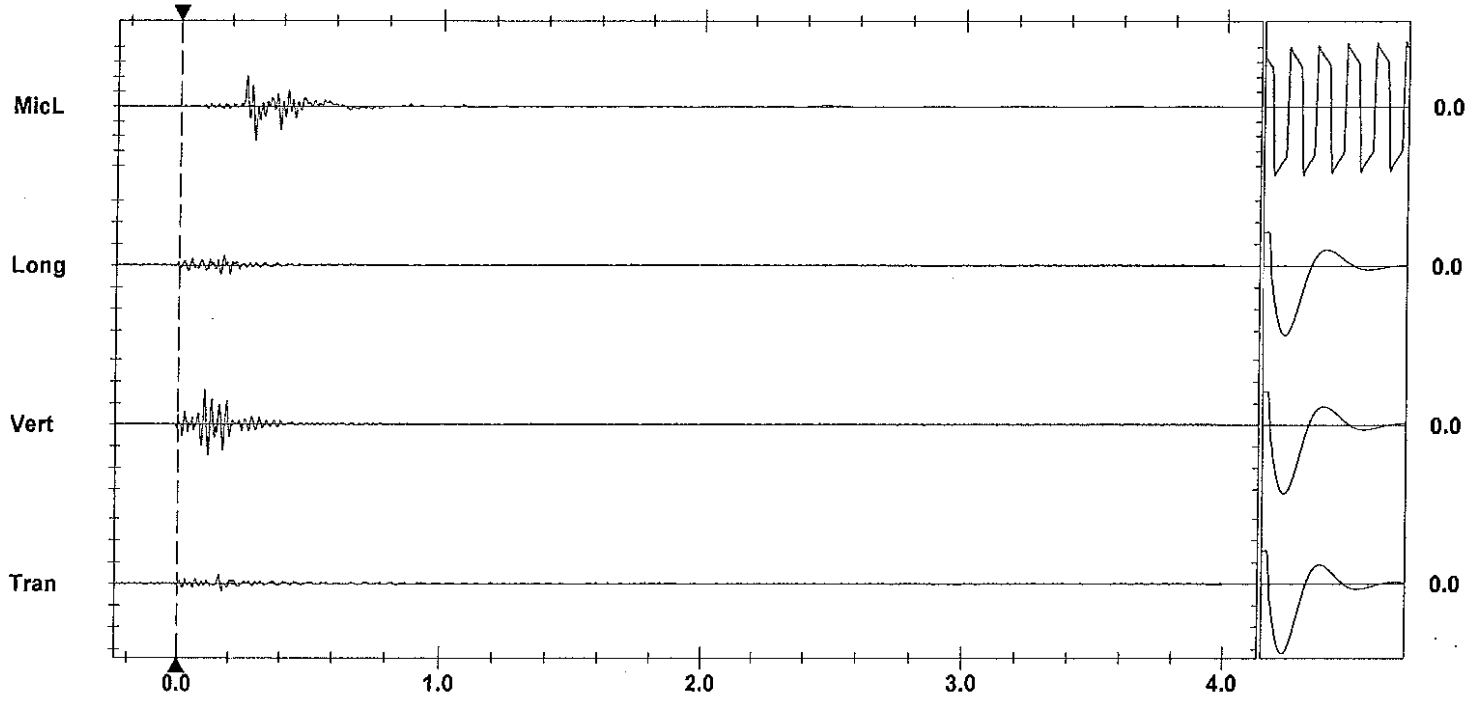
USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0400	0.160	0.0450	in/s
ZC Freq	34	37	43	Hz
Time (Rel. to Trig)	0.162	0.105	0.175	sec
Peak Acceleration	0.0265	0.0928	0.0398	g
Peak Displacement	0.00017	0.00061	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Microphone Linear Weighting
PSPL 0.00232 psi(L) at 0.293 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 617 mv)

Peak Vector Sum 0.161 in/s at 0.105 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 16/12
ACTUAL BLAST DATE Mar 16/12 1:51 PM
BLAST # NW-0165

HIGHWAY # 97
BLAST LOCATION AT: STN 130+48 - 130+56

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 16 (m)

TOTAL NUMBER OF HOLES 8 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

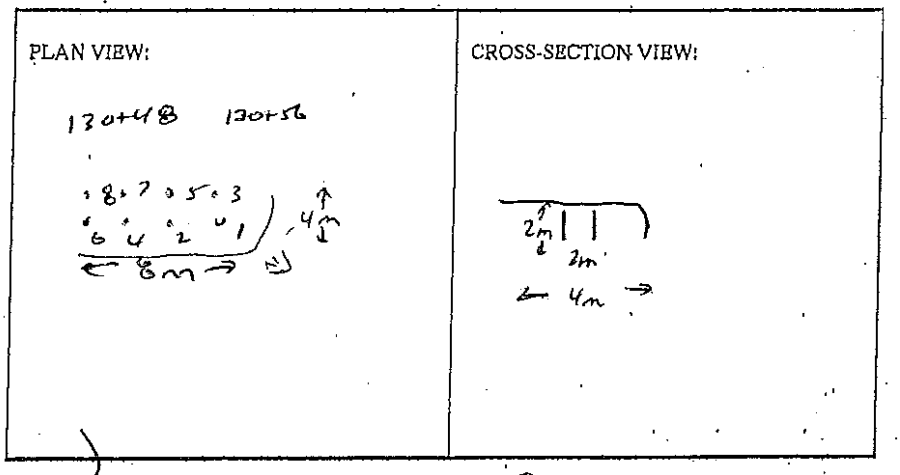
VOLUME OF ROCK BLASTED 40 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Veasey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone ct - No trig (<0.07 ips)
" @ 13221 cliffstone ct - 0.08 ips / 43 Hz

2'-2.5' ANCO/Hulit primed w/ 1 EACH 1"x8" DYNAMITE

Instantel

Event Report

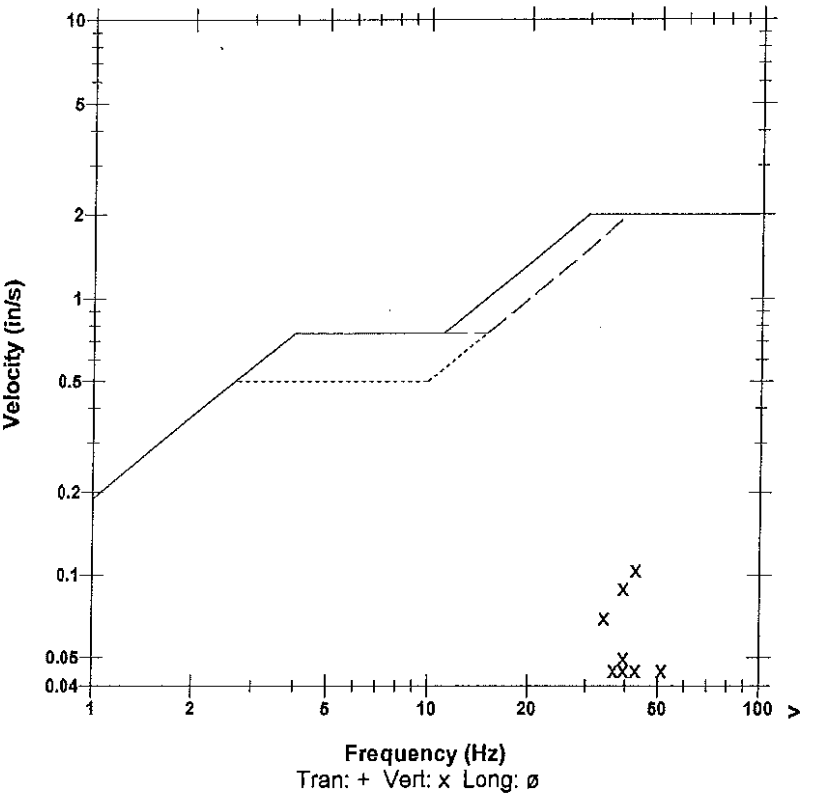
Date/Time	Vert at 13:51:27 March 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.0 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E752.HR0

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

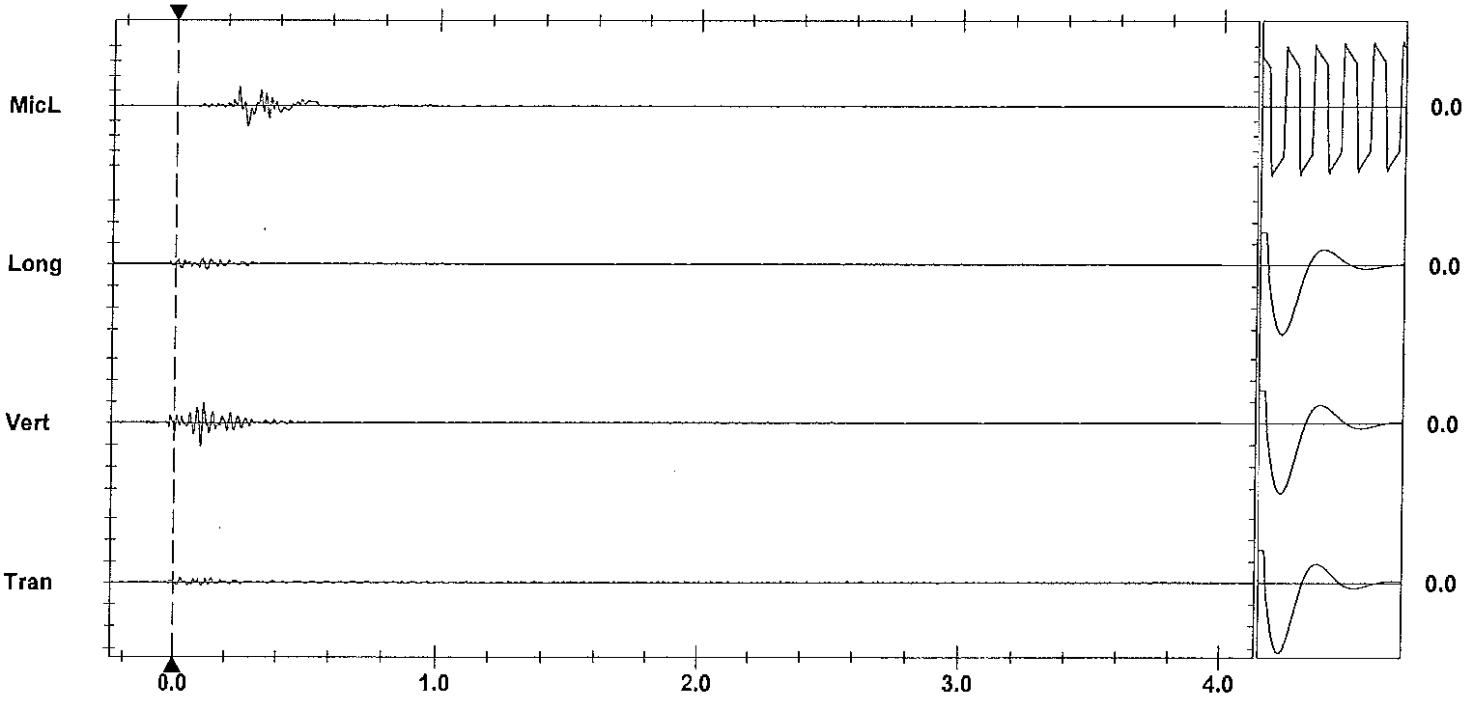
USBM RI8507 And OSMRE



Microphone Linear Weighting
PSPL 0.00138 psi(L) at 0.276 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 624 mv)

	Tran	Vert	Long	
PPV	0.0200	0.105	0.0250	in/s
ZC Freq	43	43	30	Hz
Time (Rel. to Trig)	0.027	0.104	0.105	sec
Peak Acceleration	0.0133	0.0795	0.0265	g
Peak Displacement	0.00009	0.00041	0.00012	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.107 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: August 5, 2012 (V 8.01 - 8.01) Format Copyrighted 1996-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VEARSLEY
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED MAR 16/12
ACTUAL BLAST DATE MAR 16/12 2:50 PM
BLAST # MW-0166

HIGHWAY# 97
BLAST LOCATION AT: SB 130+48 - 170+56

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 16 (m)

TOTAL NUMBER OF HOLES 8 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + 2"x16" BLASTCAP
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 8
TOTAL WEIGHT 20 (kg)
TOTAL NUMBER OF DELAYS 8
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

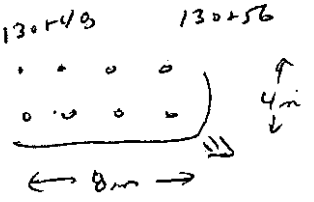
VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

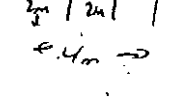
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vearsley COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct. 0.051 IPS/39HZ
" @ 13221 Cliffstone Ct. 0.085 IPS/43HZ

1 CART 2"x16" BLASTEX/Hole primed w/ 0.33 ounce 2"x16" DYNAMITE

Instantel

Event Report

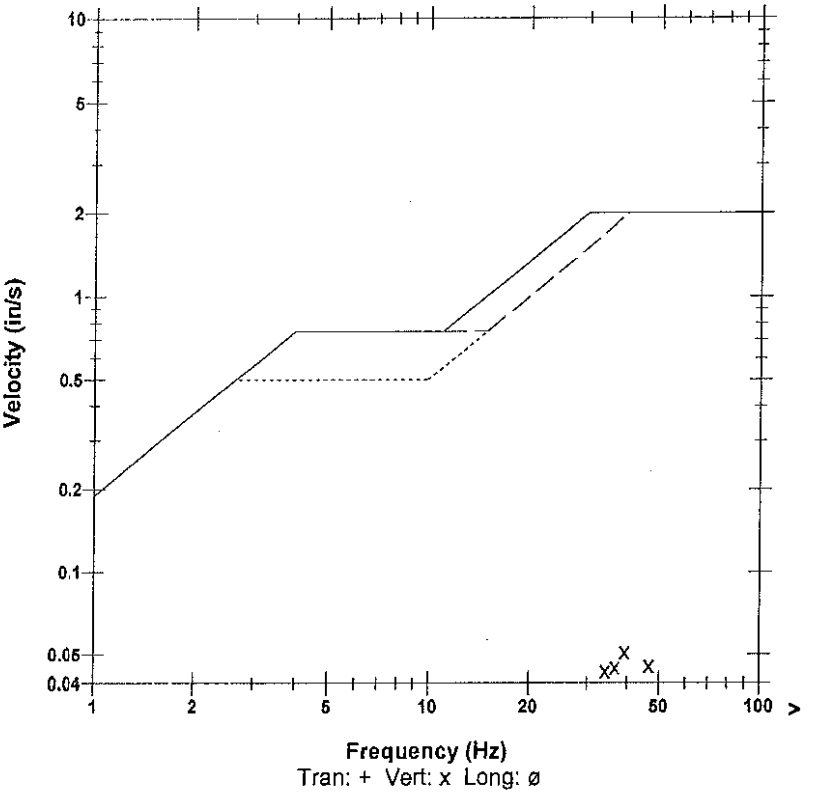
Date/Time	Vert at 14:50:56 March 16, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E755.8W0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

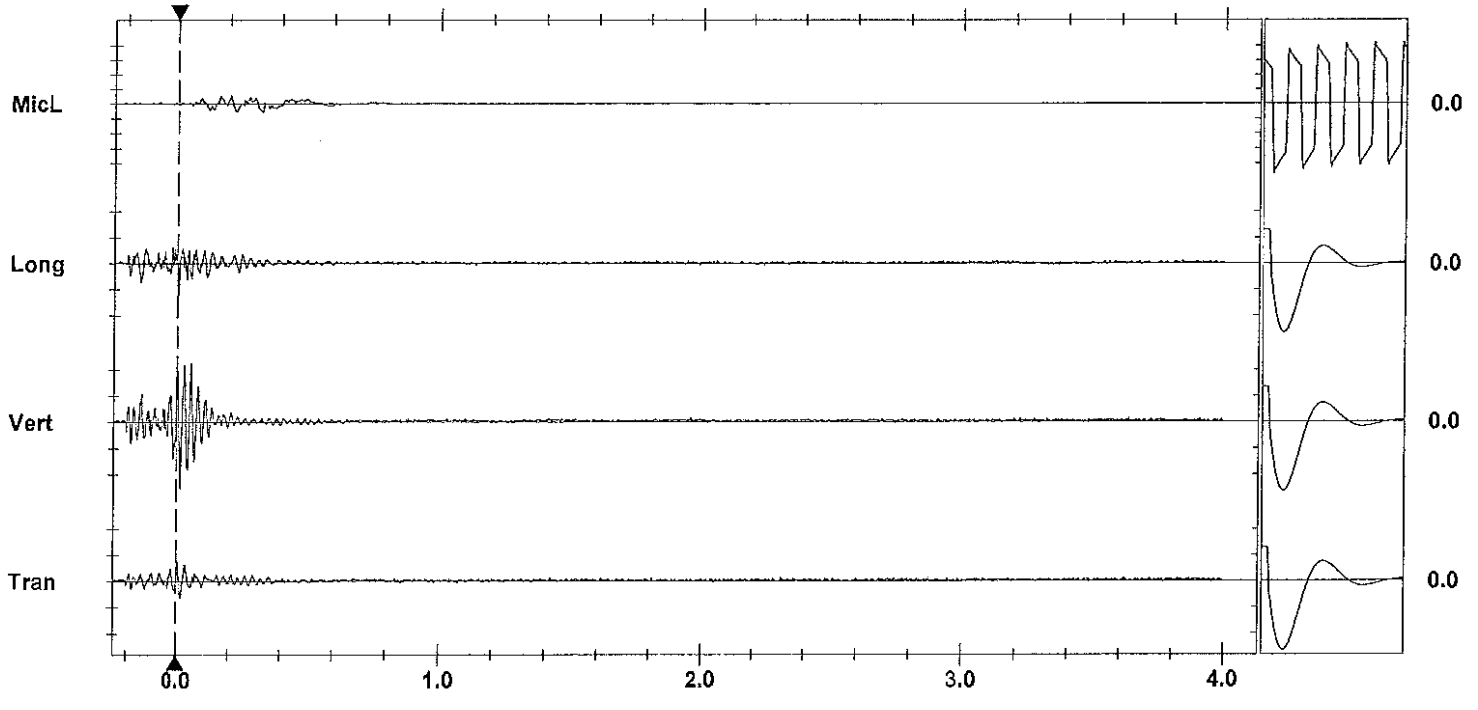
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00058 psi(L) at 0.201 sec
ZC Freq	27 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	0.0156	0.0512	0.0237	in/s
ZC Freq	43	39	47	Hz
Time (Rel. to Trig)	0.006	0.015	0.004	sec
Peak Acceleration	0.0133	0.0414	0.0249	g
Peak Displacement	0.00006	0.00020	0.00008	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.0528 in/s at 0.015 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶——◀

Printed: March 18, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

Instantel

Event Report

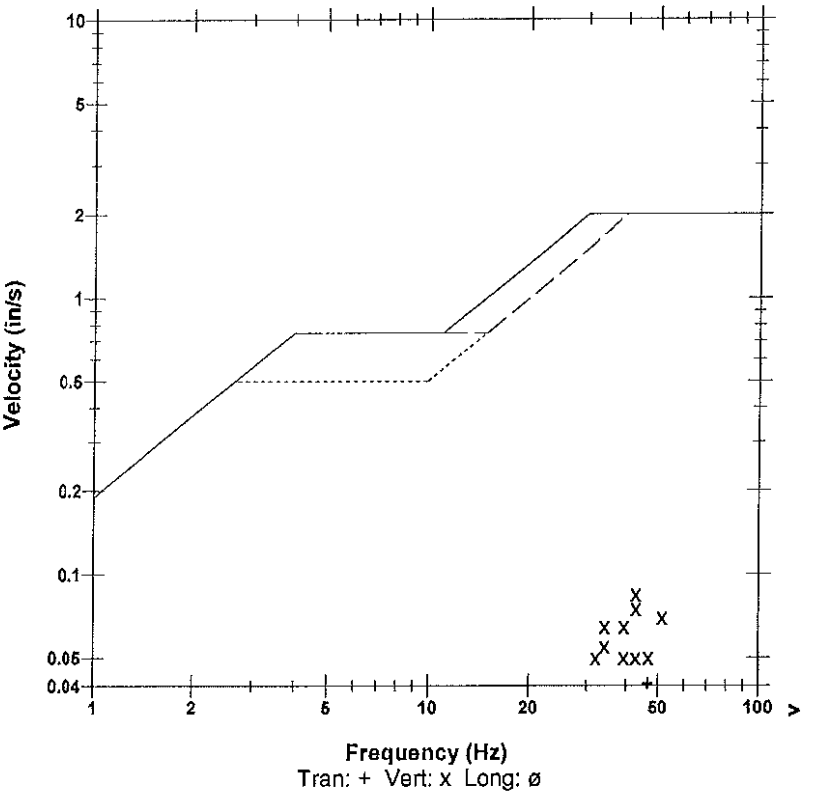
Date/Time	Vert at 14:50:53 March 16, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E755.8T0

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

Post Event Notes

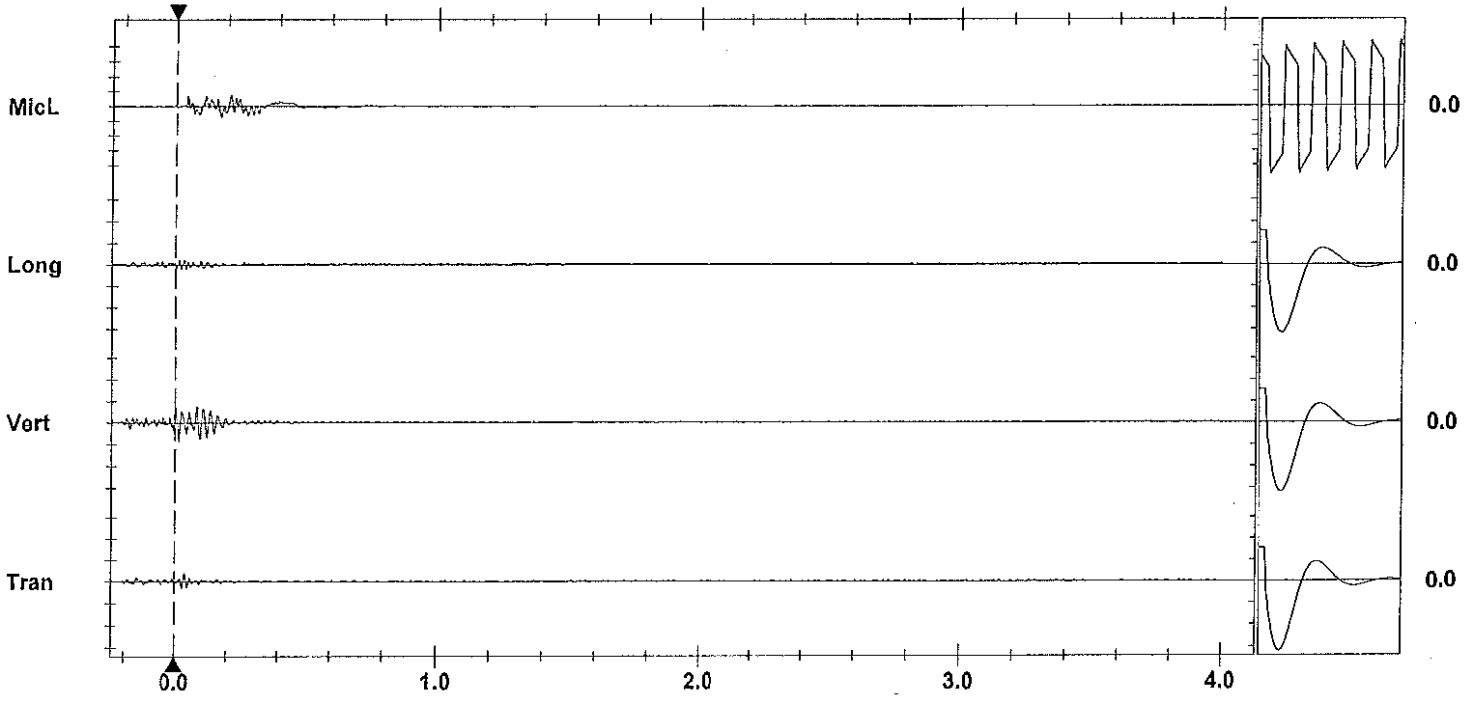
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00073 psi(L) at 0.171 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 628 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0850	0.0200	in/s
ZC Freq	47	43	64	Hz
Time (Rel. to Trig)	0.039	0.016	0.015	sec
Peak Acceleration	0.0398	0.0663	0.0265	g
Peak Displacement	0.00014	0.00032	0.00007	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

Peak Vector Sum 0.0869 in/s at 0.016 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶—— —— ——◀

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AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583V89

DATE PREPARED Mar 19/12
ACTUAL BLAST DATE Mar 19/12 10:10 AM
BLAST # MW-0167

HIGHWAY# 97
BLAST LOCATION AT: SB 130+55 - 130+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: to shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 12 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 14 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

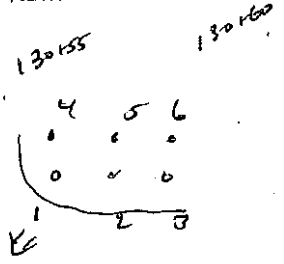
VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

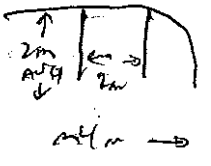
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Chimney rock @ 13467 Cliffstone Crk - 0.079 ips/ 51 Hz
" @ 13227 Cliffstone Crk - 0.11 ips/ 34 Hz

3' apart/ Hole primed w/ 1 each 1"x8" dynamite

Instantel

Event Report

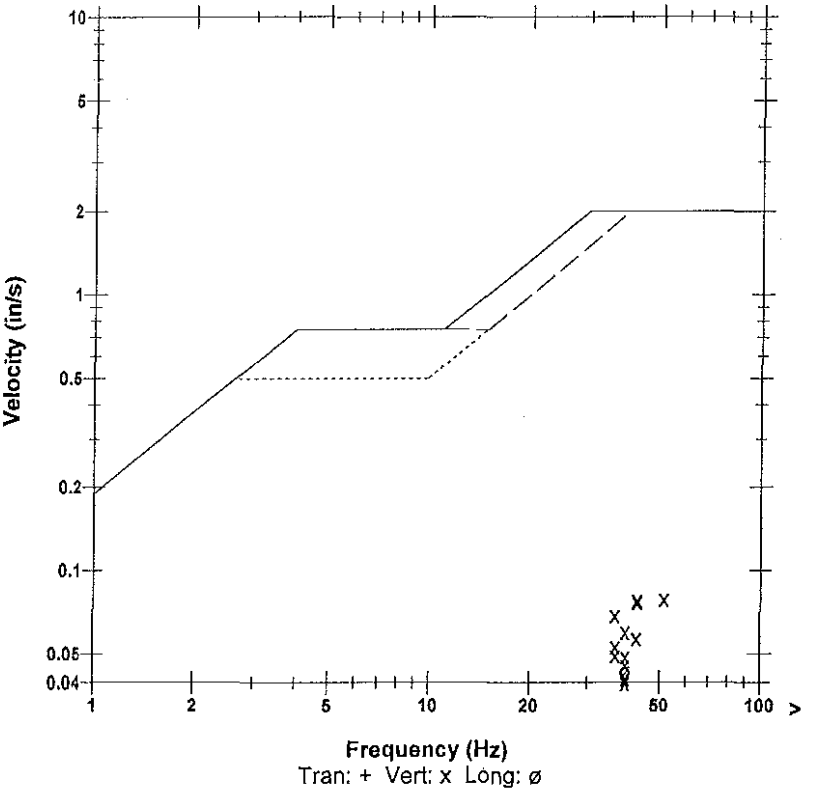
Date/Time	Vert at 10:18:47 March 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E7AC.NB0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

USBM RI8507 And OSMRE

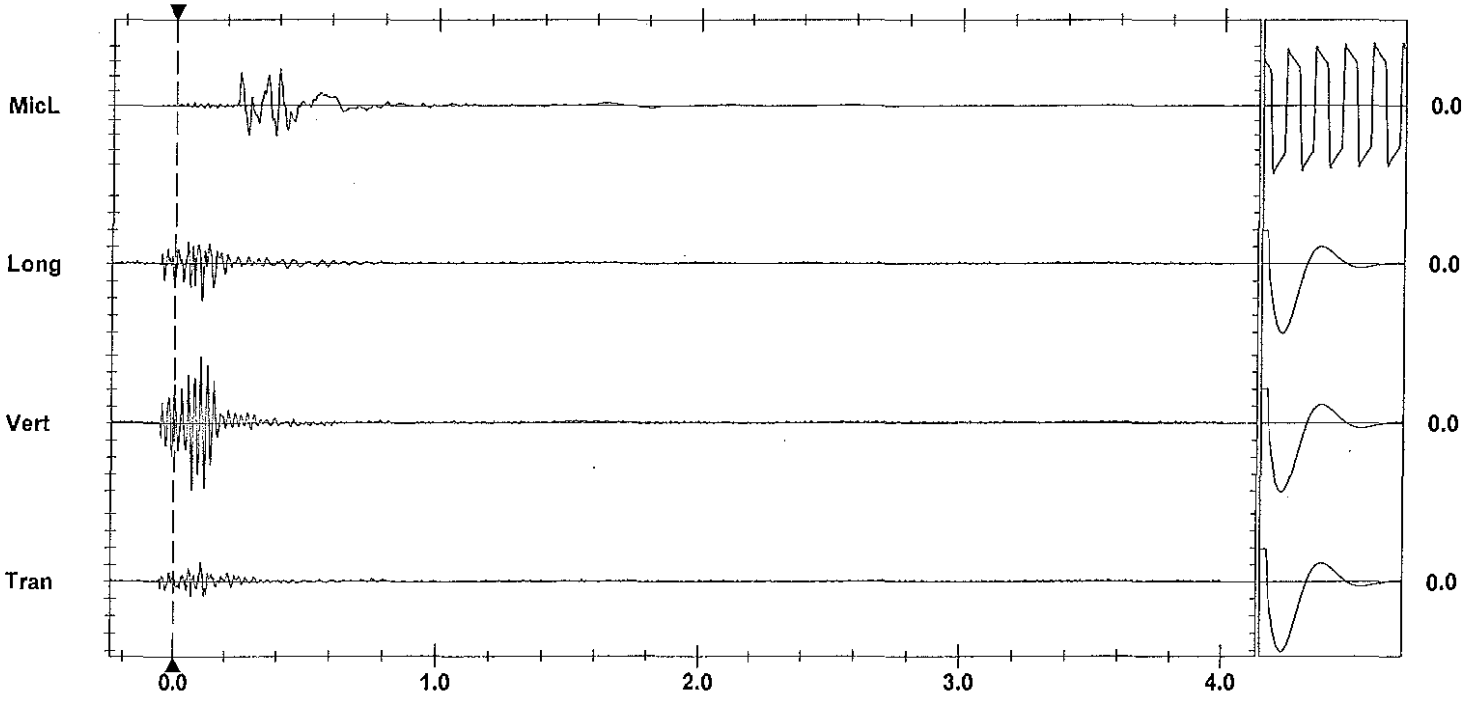


Tran: + Vert: x Long: ø

Microphone	Linear Weighting		
PSPL	0.00247 psi(L) at 0.400 sec		
ZC Freq	26 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 675 mv)		

	Tran	Vert	Long	
PPV	0.0225	0.0787	0.0431	in/s
ZC Freq	28	51	39	Hz
Time (Rel. to Trig)	0.107	0.068	0.106	sec
Peak Acceleration	0.0215	0.0795	0.0348	g
Peak Displacement	0.00010	0.00027	0.00017	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.8	4.1	

Peak Vector Sum 0.0857 in/s at 0.104 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger = ▶— — —◀

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Instantel

Event Report

Date/Time	Vert at 10:18:40 March 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E7AC.N40

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

Extended Notes
Blast at stn 128

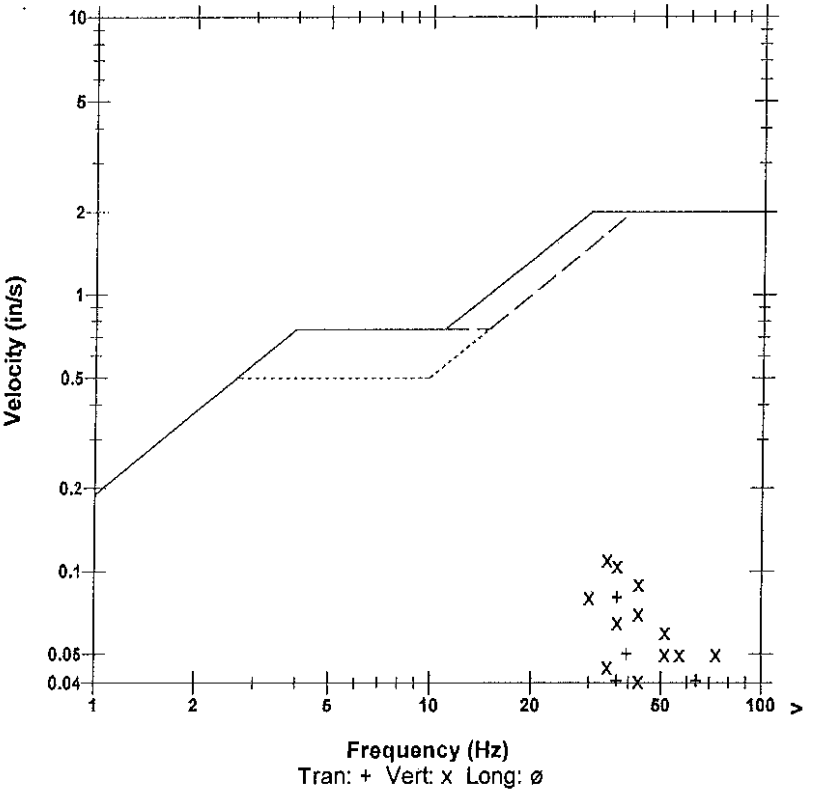
Post Event Notes

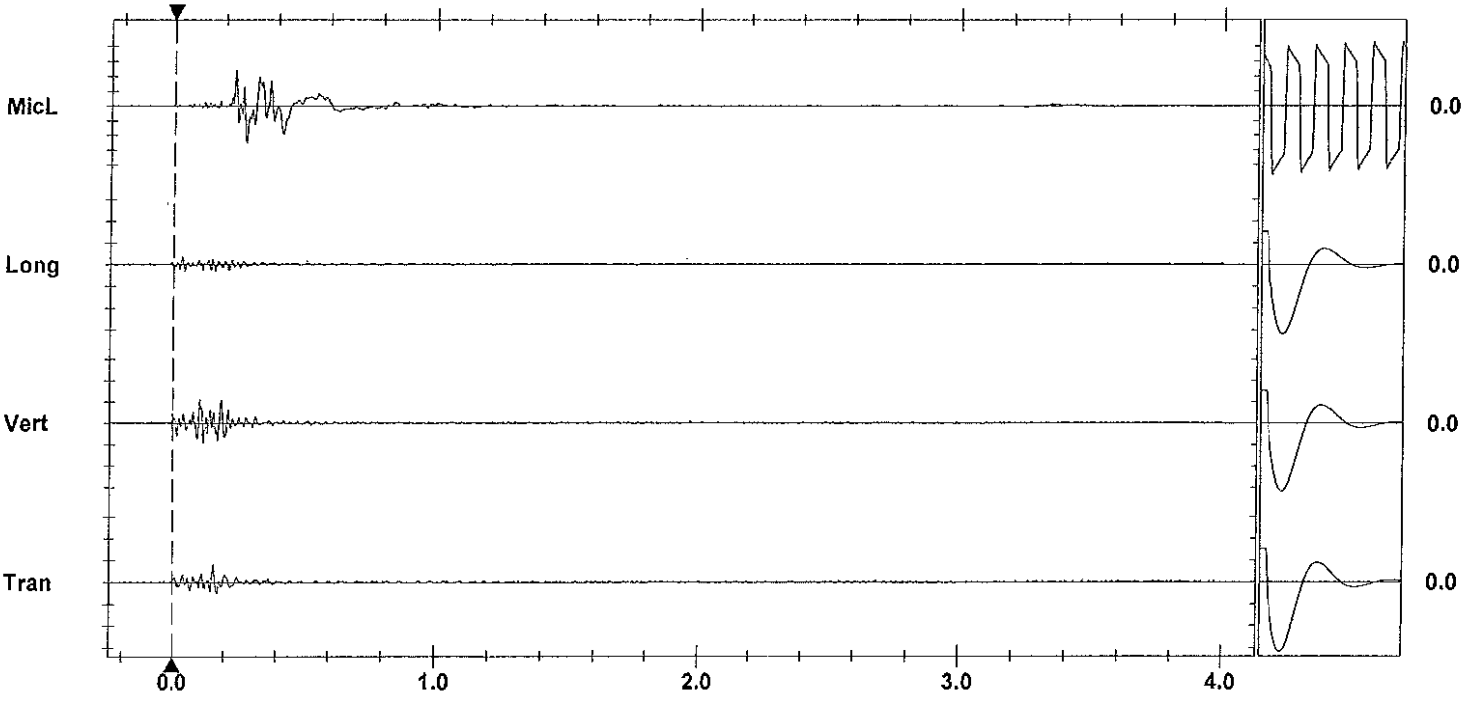
Microphone Linear Weighting
PSPL 0.00254 psi(L) at 0.278 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 681 mv)

	Tran	Vert	Long	
PPV	0.0800	0.110	0.0350	in/s
ZC Freq	37	34	47	Hz
Time (Rel. to Trig)	0.162	0.105	0.032	sec
Peak Acceleration	0.0530	0.146	0.0530	g
Peak Displacement	0.00032	0.00049	0.00012	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

Peak Vector Sum 0.111 in/s at 0.105 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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AS-BUILT BLASTING RECORD

File #:

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Worsley
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED March 9/12
ACTUAL BLAST DATE March 9/12 11:09
BLAST # MW-0168

HIGHWAY# 97
BLAST LOCATION AT: STA 130+60 - 136+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.2 (m)
TOTAL DEPTH 10 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 12 (kg)
DELAY TYPE AND LENGTH 25 (ms)

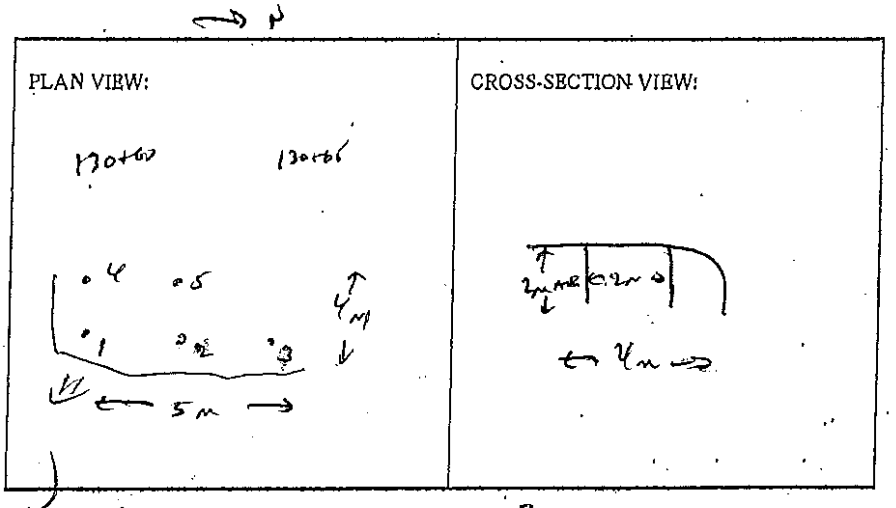
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Worsley COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffside Cut - 0.051 ips/37 Hz
" @ 13228 Cliffside Cut - 0.085 ips/39 Hz

2' ANFO/Hole Primed w/ 1 CART 1" x 8" DYNAMITE

Instantel

Event Report

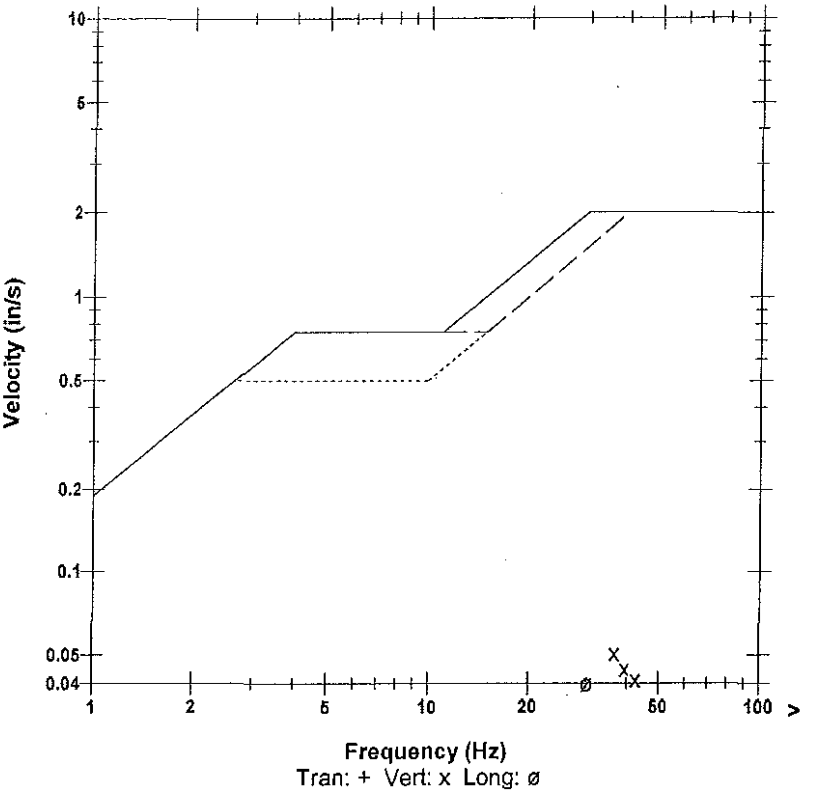
Date/Time	Vert at 11:09:25 March 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E7AE.ZP0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

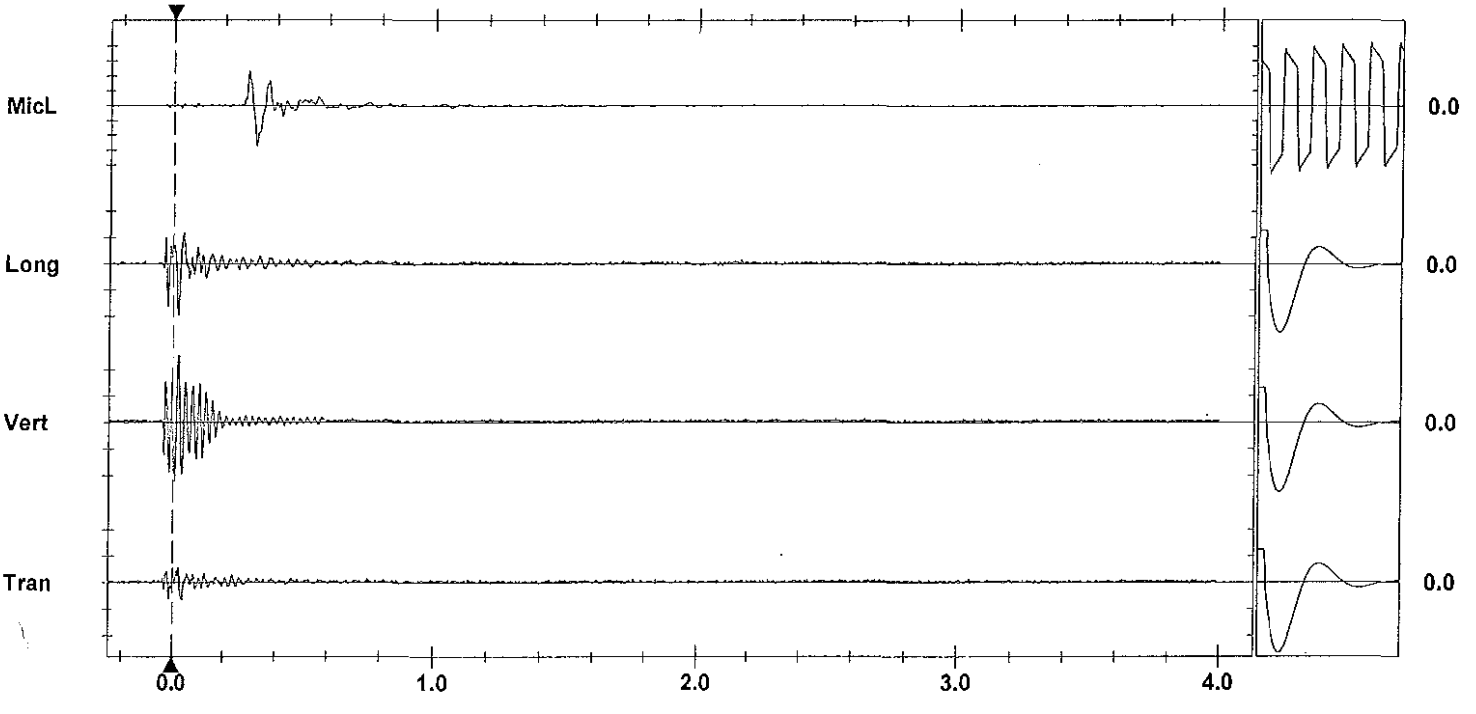
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	0.00272 psi(L) at 0.320 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	0.0131	0.0506	0.0394	in/s
ZC Freq	32	37	30	Hz
Time (Rel. to Trig)	0.041	0.024	0.022	sec
Peak Acceleration	0.0116	0.0464	0.0298	g
Peak Displacement	0.00007	0.00023	0.00019	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.0635 in/s at 0.023 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 11:09:18 March 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E7AE.ZI0

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

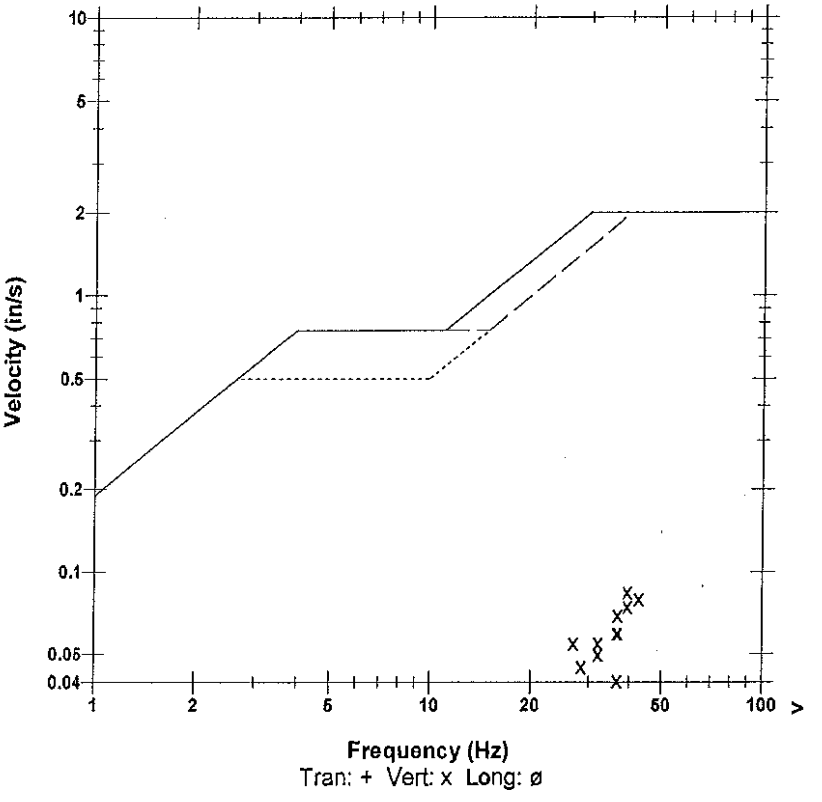
Extended Notes
Blast at stn 128

Post Event Notes

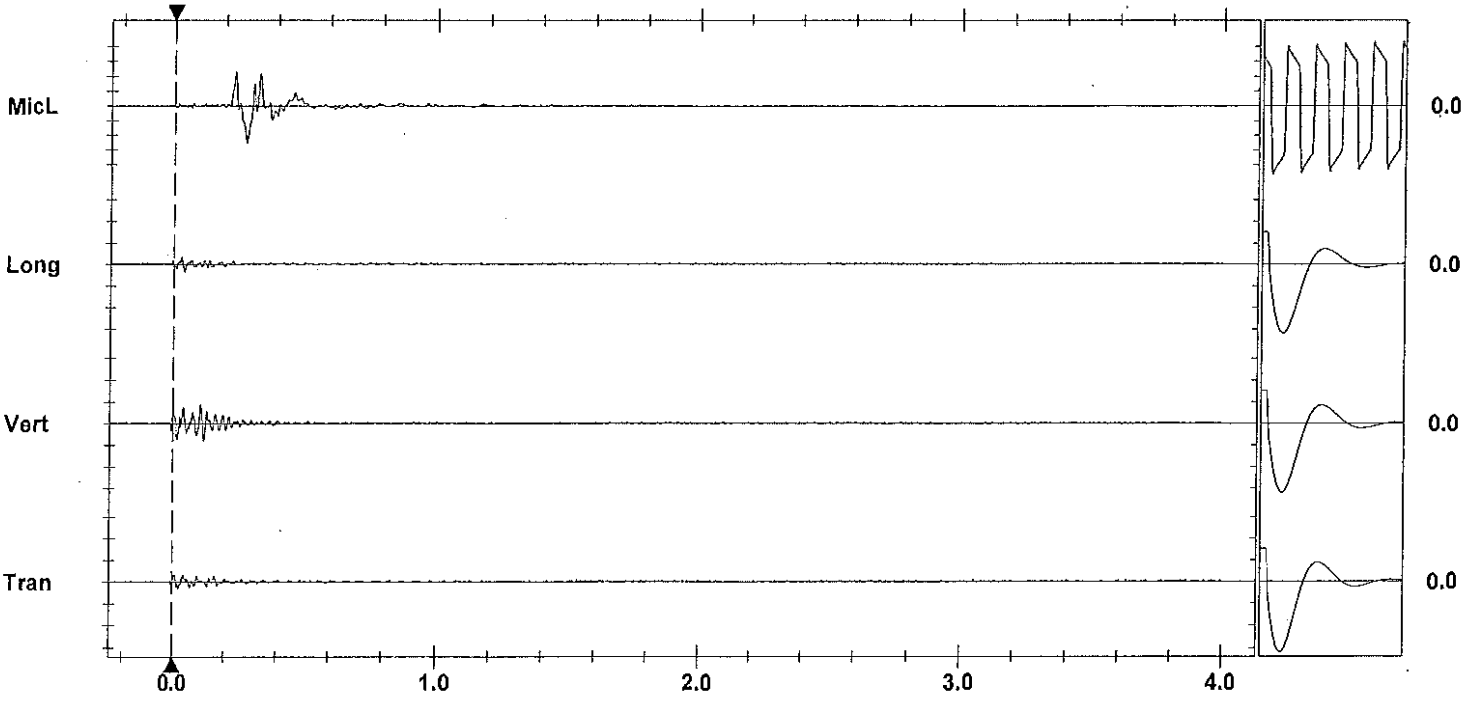
Microphone Linear Weighting
PSPL 0.00254 psi(L) at 0.279 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 657 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0850	0.0350	in/s
ZC Freq	37	39	26	Hz
Time (Rel. to Trig)	0.006	0.108	0.029	sec
Peak Acceleration	0.0265	0.0795	0.0398	g
Peak Displacement	0.00015	0.00035	0.00016	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.8	7.5	7.1	Hz
Overswing Ratio	3.7	3.8	4.5	

USBM RI8507 And OSMRE



Peak Vector Sum 0.0856 in/s at 0.109 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Sensorcheck

Printed: April 1, 2012 (V 8.01 - 8.01) Format Copyrighted 1998-2004 Instantel Inc.

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583409

DATE PREPARED March 9/12
ACTUAL BLAST DATE March 9/12 3:13 PM
BLAST # MW-0169

HIGHWAY# 97
BLAST LOCATION AT: SB 130+65 - 130+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: see sketch noted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 1.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 1.8 (m)
TOTAL DEPTH 14.5 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 16 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

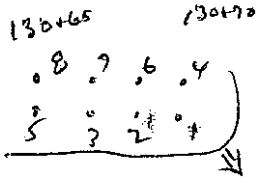
VOLUME OF ROCK BLASTED 20 (m^3)

BLAST SKETCH:

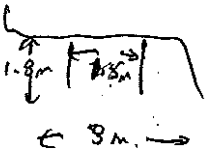
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.10 ips / 43 Hz
" @ 13221 Cliffstone Cut - 0.21 ips / 32 Hz

1.5' - 2' ANFO / Hole PRIMED W/ 1 CART 1X8" DYNAMITE

Instantel

Event Report

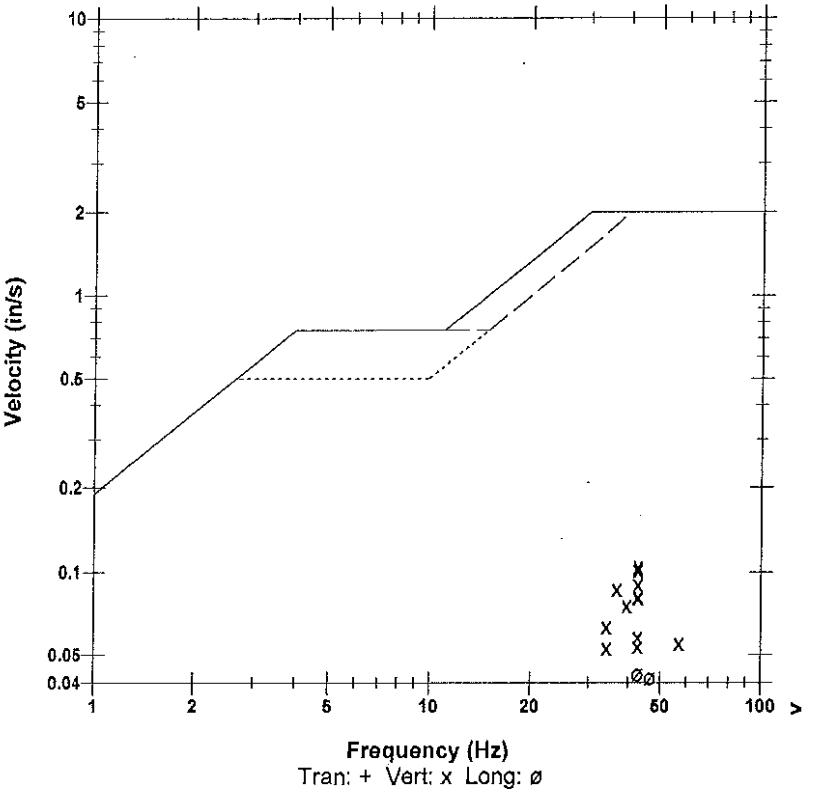
Date/Time	Vert at 15:13:30 March 19, 2012	**Serial Number**	BA13960 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.3 Volts
Range	Geo :1.25 in/s	**Calibration**	December 22, 2010 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	O960E7AQ.AI0
Job Number:	1		

Notes
location:on rear patio slab 13167
Cliffstone Crt
User Name:W Verwey
General:

Extended Notes

Post Event Notes

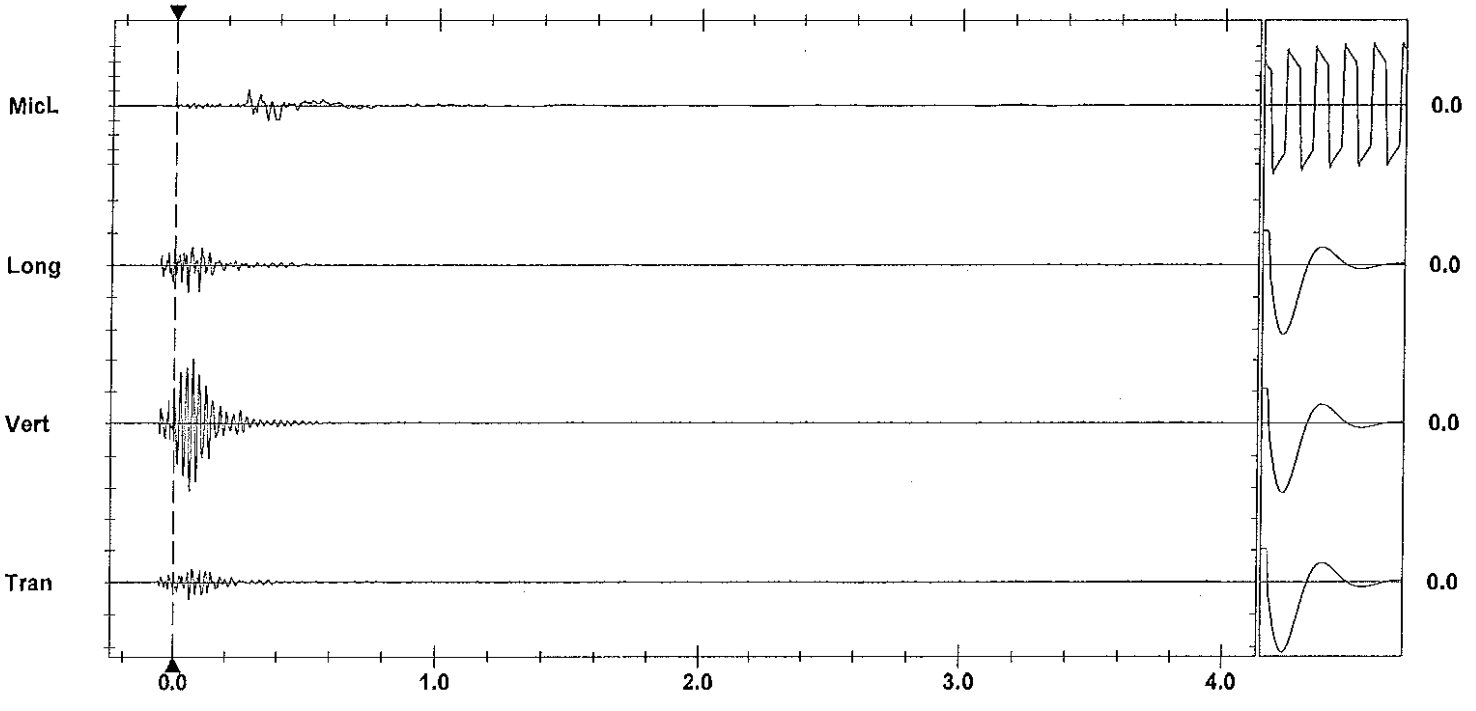
USBM RI8507 And OSMRE



Microphone	Linear Weighting			
PSPL	0.00109 psi(L) at 0.277 sec			
ZC Freq	17 Hz			
Channel Test	Passed (Freq = 20.5 Hz Amp = 665 mv)			

	Tran	Vert	Long	
PPV	0.0262	0.105	0.0425	in/s
ZC Freq	47	43	43	Hz
Time (Rel. to Trig)	0.063	0.062	0.051	sec
Peak Acceleration	0.0282	0.0862	0.0398	g
Peak Displacement	0.00008	0.00040	0.00013	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.1	

Peak Vector Sum 0.108 in/s at 0.062 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00100 psi(L)/div Sensorcheck
Trigger =

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Instantel

Event Report

Date/Time	Vert at 15:13:23 March 19, 2012	**Serial Number**	BA11866 V 10.10-8.17 BlastMate III
Trigger Source	Geo: 0.0400 in/s	**Battery Level**	6.1 Volts
Range	Geo :10.00 in/s	**Calibration**	January 26, 2011 by Instantel Inc.
Record Time	4.0 sec at 1024 sps	**File Name**	M866E7AQ.AB0

Notes
location:13221 Cliffstone Crt on
rear patio slab corner sandbagged
User Name:Wayne V
General:

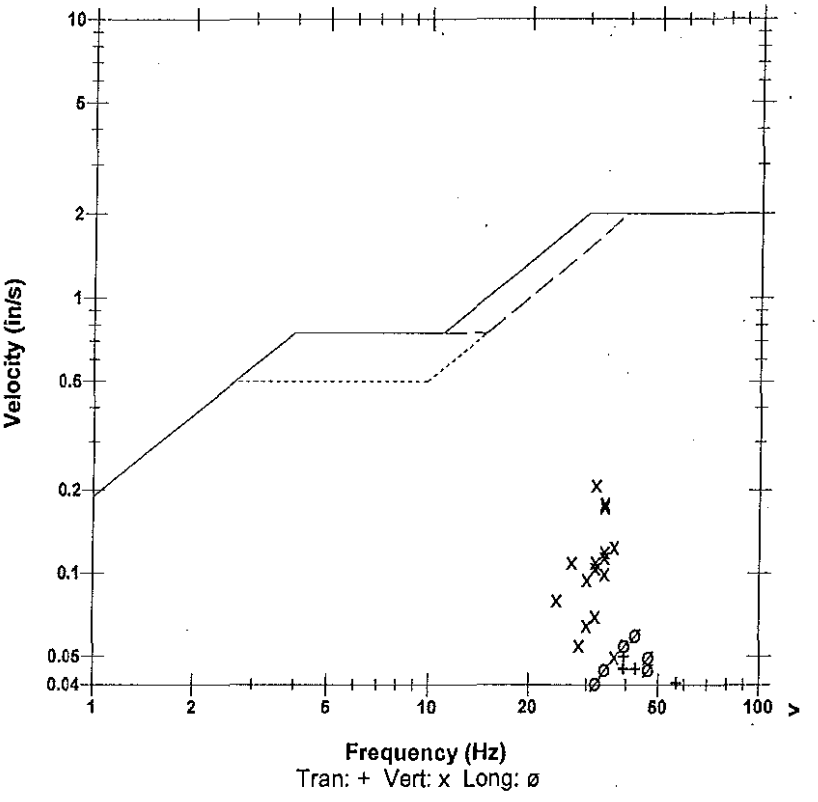
Extended Notes
Blast at stn 128

Post Event Notes

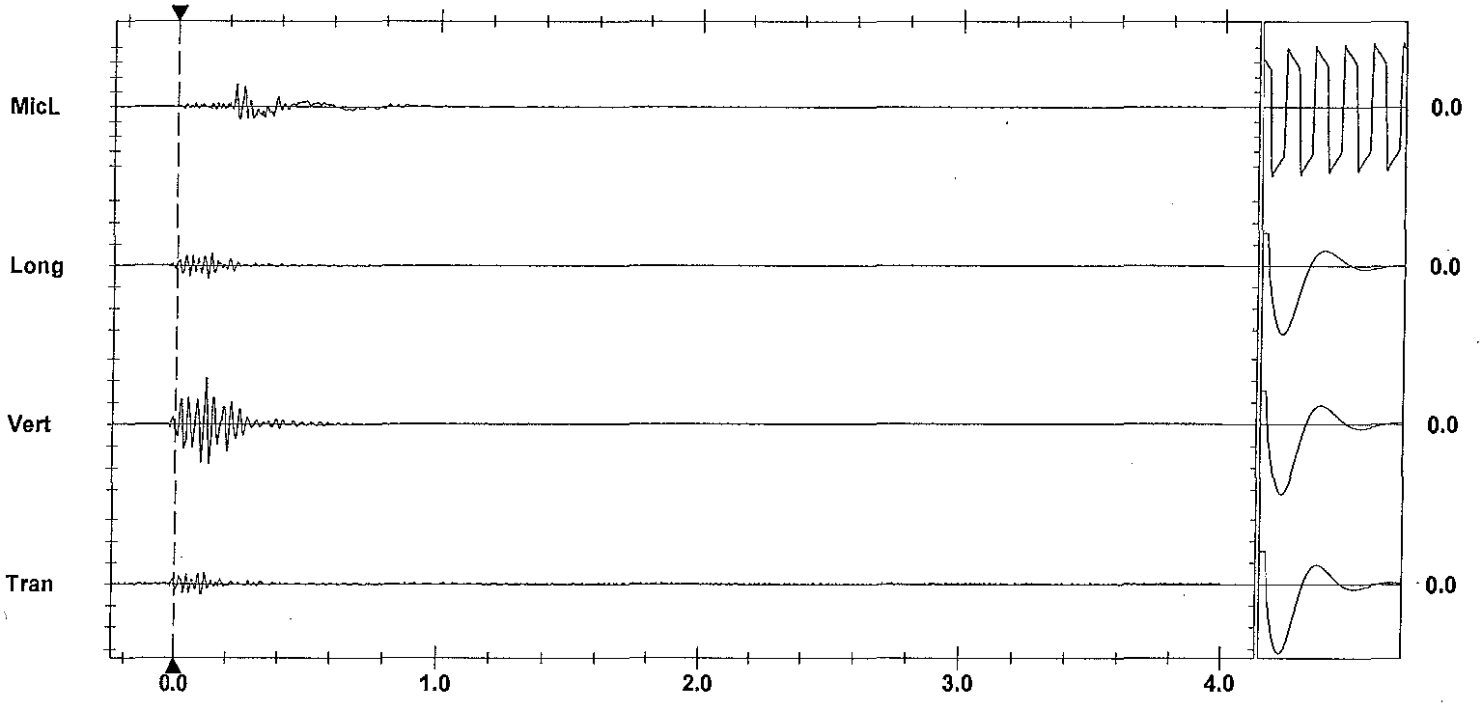
Microphone Linear Weighting
PSPL 0.00152 psi(L) at 0.227 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 667 mv)

	Tran	Vert	Long	
PPV	0.0500	0.210	0.0600	in/s
ZC Freq	39	32	43	Hz
Time (Rel. to Trig)	0.117	0.120	0.120	sec
Peak Acceleration	0.0398	0.119	0.0398	g
Peak Displacement	0.00021	0.00090	0.00022	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.9	7.5	7.2	Hz
Overswing Ratio	3.6	3.8	4.4	

USBM RI8507 And OSMRE



Peak Vector Sum 0.222 in/s at 0.120 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——————◀

Sensorcheck

Printed: August 5, 2012 07:8:01 - 8.01
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AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 6431

DATE PREPARED MARCH 23/12.
ACTUAL BLAST DATE MARCH 23/12. 9:30AM
BLAST # 252

HIGHWAY# 97
BLAST LOCATION AT: STN # [redacted] 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE Ø (°) SLOPE LENGTH Ø (m)
ROCK TYPE Altered GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Ø
AVERAGE DEPTH 2m (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3m (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 29 Holes.
HOLE DIAMETER 1 3/4" (mm)
HOLE SPACING 4' (ft) BURDEN 4' (ft)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" x 8" Dynamic
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS 18

EXPLOSIVE SIZE 1" by 8"
TOTAL WEIGHT 21 pds.
DELAY TYPE AND LENGTH 25 (ms)

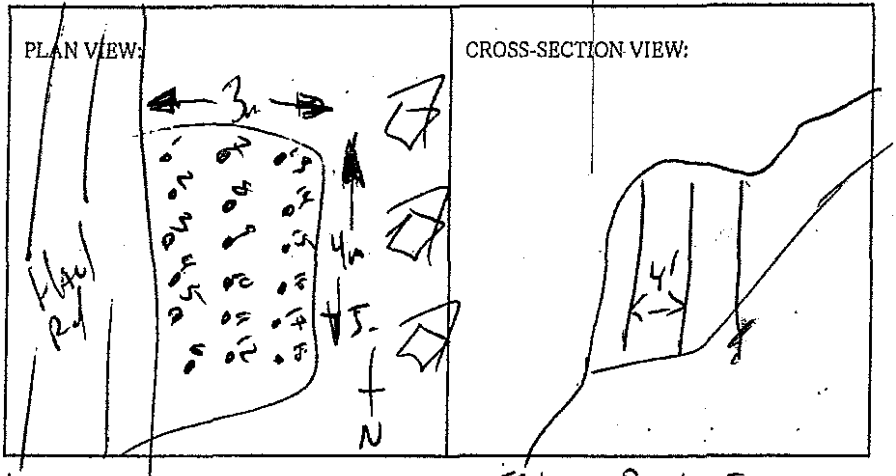
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Electric
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 24 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13117 Cliffstone Crt. No Problem (< 0.07 ips)

19 – blocking

70 – studs (4'8" long)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

DATE PREPARED March 27/12
ACTUAL BLAST DATE March 27/12
BLAST # 256 @ 9.15

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643

HIGHWAY# 97
BLAST LOCATION AT: STN # 129 +00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE / (°) SLOPE LENGTH / (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES /
AVERAGE DEPTH 6' (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 10' (m)
TOTAL DEPTH 36' (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 13/4" (mm)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 1" by 8"
TOTAL WEIGHT 5 lbs. (kg)
DELAY TYPE AND LENGTH 25 (ms)

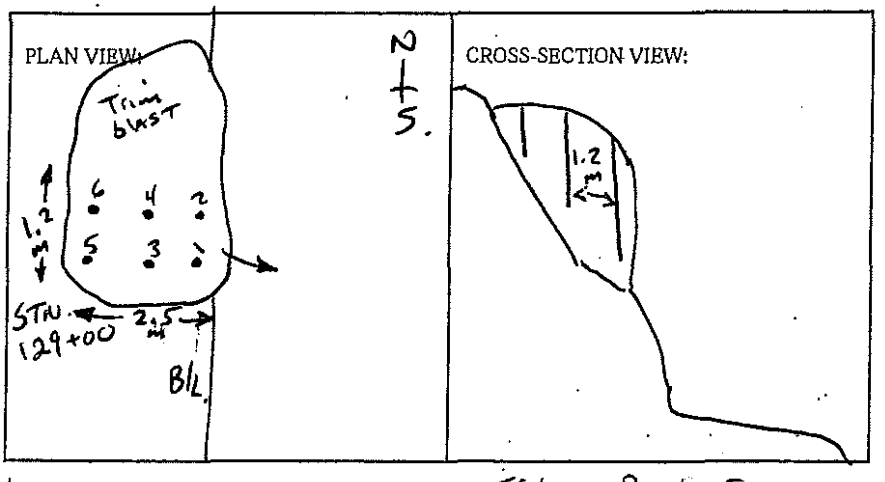
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 4.0 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE D. Fieber COMPANY Fieber Rock Eng.

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13/17 Cliffstone Ent — No Trigger (< 0.07ips)

6 - Electric decks.

15 sticks 1"x8" uniMax

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME James Mawhinney
BLASTER'S CERTIFICATE NUMBER 554 643 I

DATE PREPARED March 27/10
ACTUAL BLAST DATE March 27/10
BLAST # 258 @ 16:10

HIGHWAY# 97
BLAST LOCATION AT: STN # 129+00

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ___ (°) SLOPE LENGTH ___ (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 80 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES ___
AVERAGE DEPTH 6.5' (●)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10' (●)
TOTAL DEPTH 60' (●)

TOTAL NUMBER OF HOLES 20
HOLE DIAMETER 1 3/4" (●)
HOLE SPACING 1.2 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1"x8" Dynamite
TOTAL NUMBER OF CARTRIDGES (●) 60
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 1" (●) by 8" (●)
TOTAL WEIGHT 20 (●) lbs (●)
DELAY TYPE AND LENGTH 25 (ms)

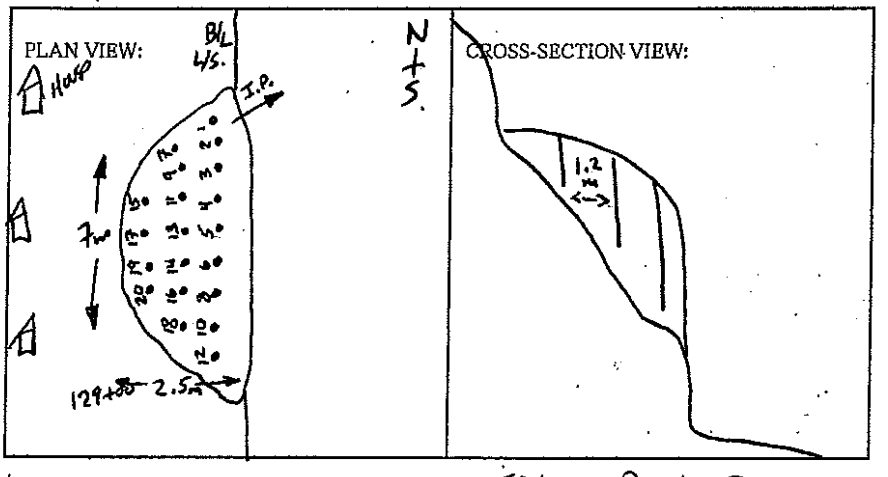
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80

VOLUME OF ROCK BLASTED 35 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE D. Fiebea COMPANY Fiebea Rock Eng.

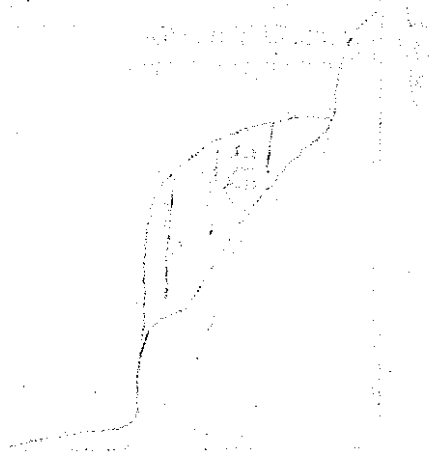
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13/17 cliffside cut - No trigger (<0.07 ips) DLW

20 - Electric dots

60 sticks 1x8



AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 11:44AM
BLAST # Nov-0017

HIGHWAY # 97
BLAST LOCATION AT: 129+900 LT

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) , SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10 5 1/4 + 5 Rear
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2m (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

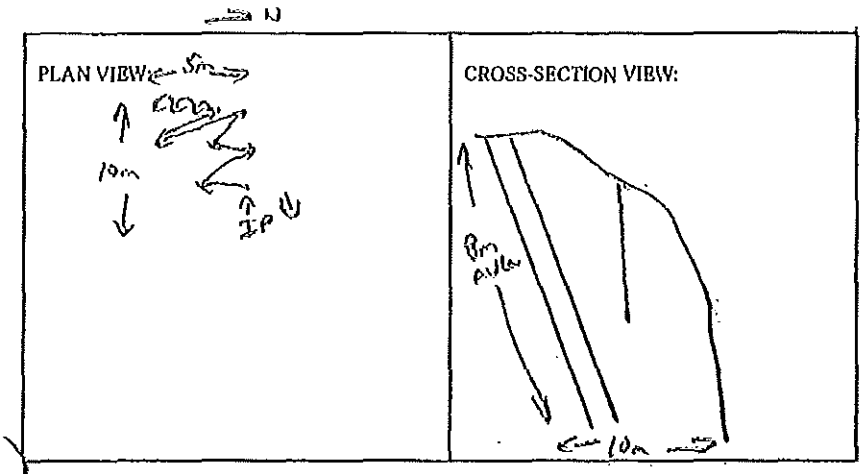
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13221 cliffstone crit. 0.11 ips / 32Hz
@ 13167 cliffstone crit. 0.11 ips / 32Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5833489

DATE PREPARED Nov 29/10
ACTUAL BLAST DATE Nov 29/10 1:23 PM
BLAST # MW-0018

HIGHWAY # 97
BLAST LOCATION AT: STN 1291 85

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ik std method

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Layered Sandstone
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/a
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.1 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 2.5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

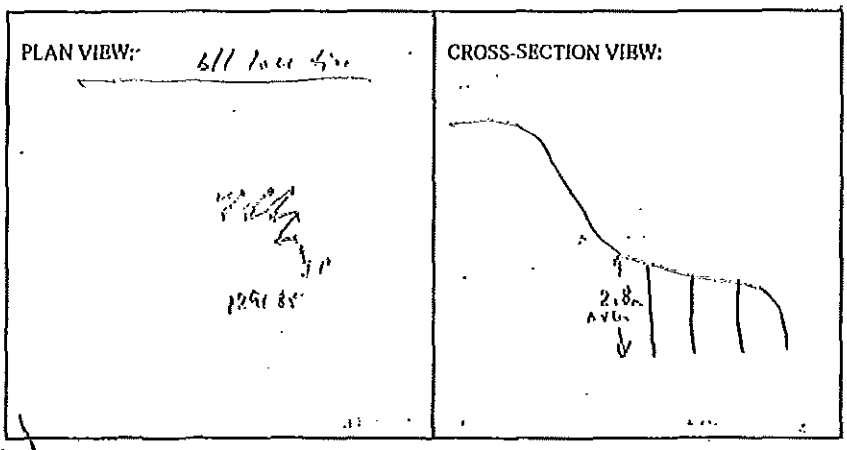
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 holes

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13224 cliffside ent. - 0.12in/s 47Hz
@ 13117 cliffside ent - 0.12in/s 43Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B34889

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 28/11
BLAST # MW-0019 2:27 pm

HIGHWAY # 97
BLAST LOCATION AT: Stn 1294 BY

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shotcrete

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5' (m)
ROCK TYPE Siltstone Greywacke
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 6.5 (m)

TOTAL NUMBER OF HOLES 8 RAD / 5 BL (3 loaded)
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

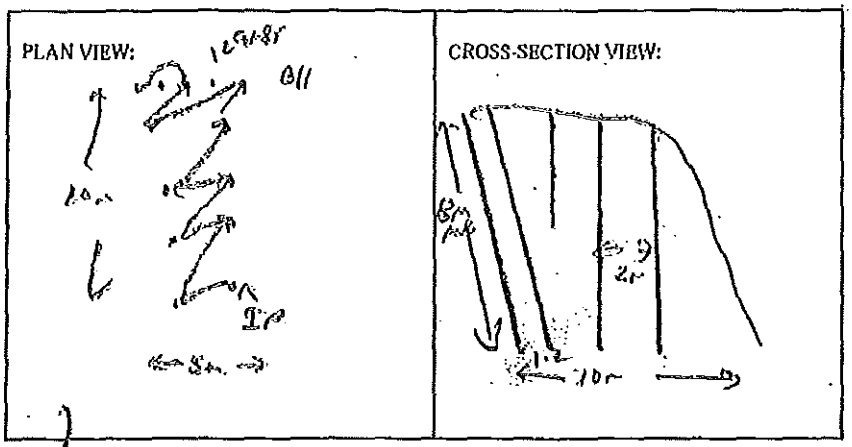
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 cars

VOLUME OF ROCK BLASTED 220 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1324 closest end - 0.24 ips / 39 Hz
@ 1317 closest end - 0.37 ips / 39 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 5133489

DATE PREPARED Nov 29/11
ACTUAL BLAST DATE Nov 29/11 3:38 PM
BLAST # MW-0010

HIGHWAY # 97
BLAST LOCATION AT: STN 129+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot material

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

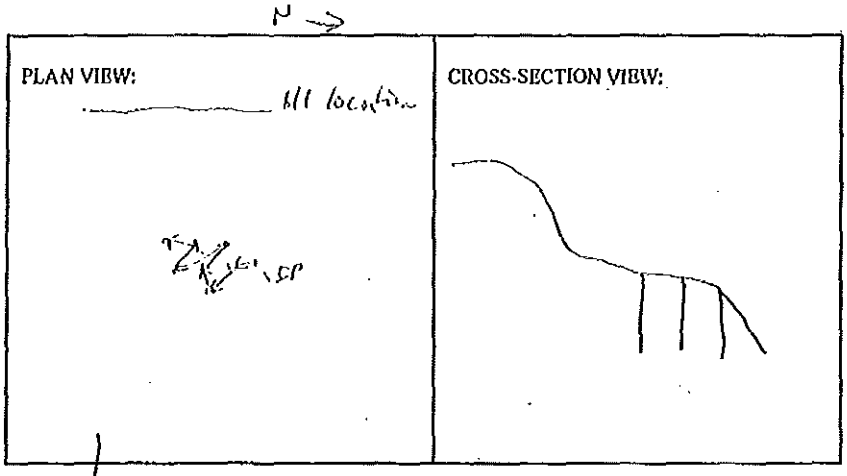
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 40 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN,
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY SIERRA DRILLING & BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

seismograph @ 1322 @ cliff base est. 0.070 in/sec
@ 1316 @ cliff base est. 0.10 in/sec

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 5134489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 10:53 AM
BLAST # MJ-0026

HIGHWAY # 97
BLAST LOCATION AT: SB 1291.65 - 1291.70 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) , SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 6.5 (m)

TOTAL NUMBER OF HOLES 66/11 Approx.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

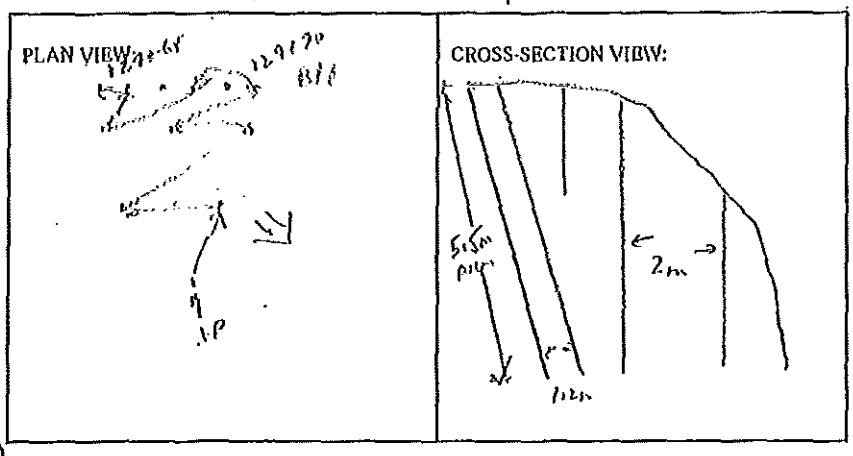
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Electronic detonating system
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 100 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

S-Cl monitored @ 13149 Cliffside Cut - 0.19 ips / 51 Hz
@ 13073 Cliffside Cut - 0.075 ips / 43 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Oct 6/11
ACTUAL BLAST DATE Oct 6/11 11:44 AM
BLAST # MUS-0029

HIGHWAY # 97
BLAST LOCATION AT: SW 129+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
No blast mat'l

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite (Volcanic)
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13 L
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.8 (m)
TOTAL DEPTH 44 (m)

TOTAL NUMBER OF HOLES 63
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

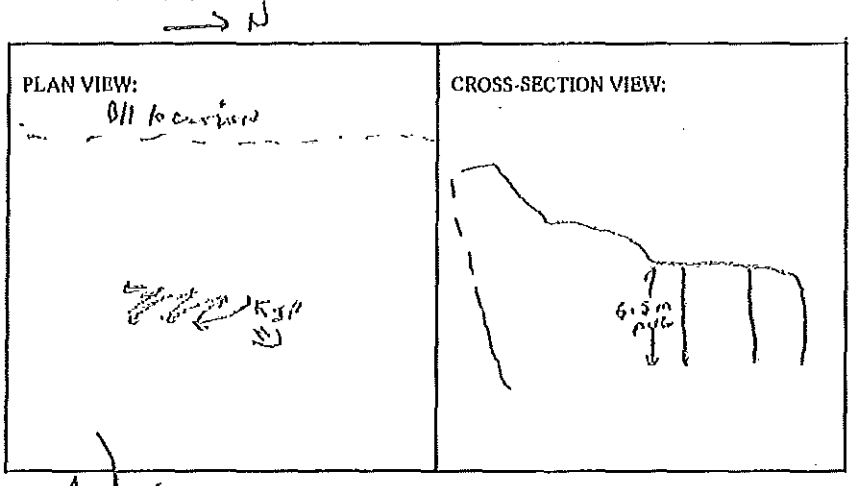
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESG Initiating Shock System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 decs

VOLUME OF ROCK BLASTED 180 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Ch: Radial comp = 0.43 in/s Blast
@ 13073 Ch: Radial comp = 0.18 in/s Blast

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 1:19 PM
BLAST # MW-0030

HIGHWAY # 97
BLAST LOCATION AT: Stn 129 + 65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: to be marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 56 (m)

DRILLING DETAILS: to be marked,

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 42 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

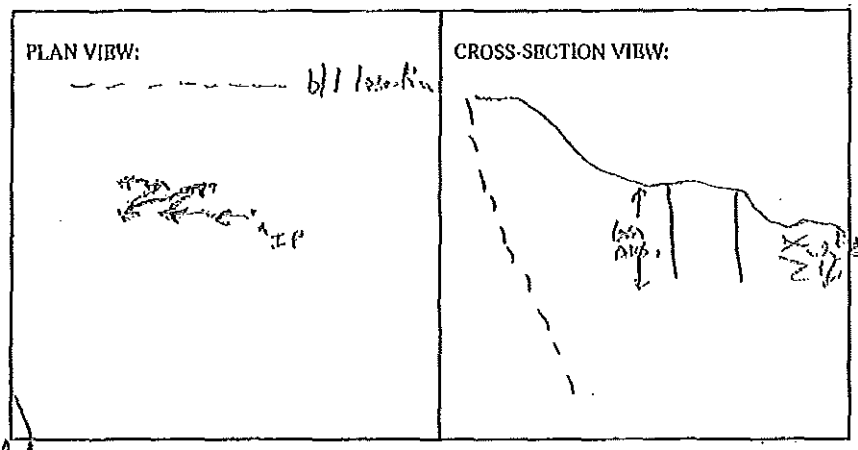
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC 17 Millisecond at nonel ends
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m³)

BLAST SKETCH: N

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffside Creek - 0.19 ips / 43 Hz
@ 13073 Cliffside Creek - 0.097 ips / 64 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 6/11
ACTUAL BLAST DATE Dec 6/11 2:37 PM
BLAST # MJ-1203-1

HIGHWAY # 97
BLAST LOCATION AT: SNS 119+60

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot underwater

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 100 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 27 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

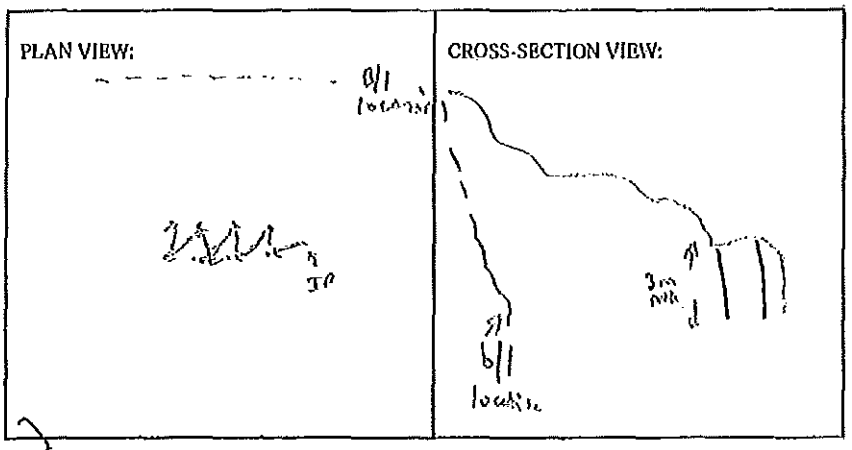
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 26 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) Lead in primacord w/ non-el surface
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 60 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffside crt = 0.131 psi / 51 Hz
@ 13073 cliffside crt = 0.111 psi / 57 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 8/11
ACTUAL BLAST DATE Dec 8/11 12:18 PM
BLAST # MW-0032

HIGHWAY# 97
BLAST LOCATION AT: Stn 1291.40 - 1291.50

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Crest marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 4 (m) BURDEN 3 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

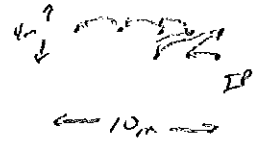
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiated DetaNet System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 240 (m^3)

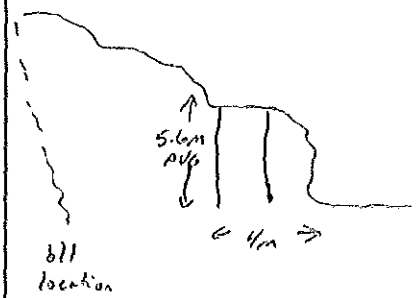
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: B/I location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 diffalom = 0.14 ips / 32Hz
@ 13093 diffalom = 0.27 ips / 39Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-10001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 533489

DATE PREPARED Dec 8/11
ACTUAL BLAST DATE Dec 8/11 1:20 PM
BLAST # MW-0033

HIGHWAY# 97
BLAST LOCATION AT: STN 129+50 - 129+55 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 12 Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 66 1/7 Proto.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

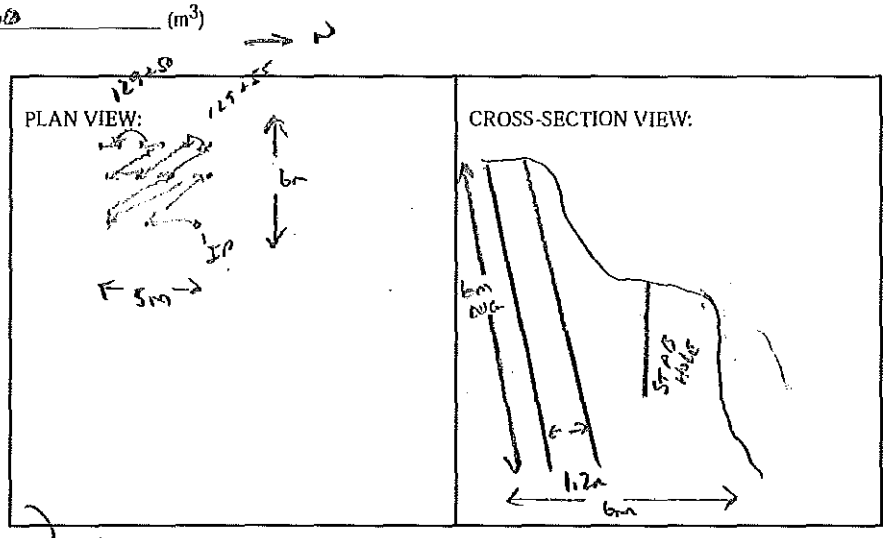
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Anfo System
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 cliffside ext - 0.11in/s 93Hz
@ 13098 cliffside ext - 0.21in/s 32Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0021

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sicasa Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 9/11
ACTUAL BLAST DATE Dec 9/11 2:45 PM
BLAST # MW-0034

HIGHWAY# 97
BLAST LOCATION AT: STN: 1284 45 LS (2nd Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 10.3 (m)
TOTAL DEPTH 60 (m)

TOTAL NUMBER OF HOLES 66 /// 4 Pads
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite & ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

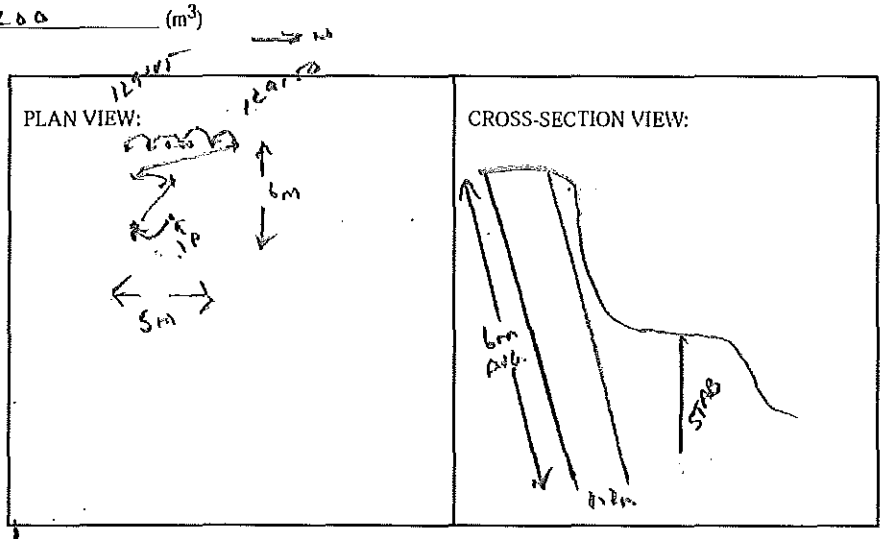
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC Initiation of Nonel 5/5mm
BLASTING MACHINE: TYPE MS 320 CAPACITY 80 holes

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sicasa Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Sicamous @ 19167 cliff face ext = 0.096 ipf / 47m²
@ 13093 cliff face ext = 0.15 ipf / 51m²

AS-BUILT Record

~~PROPOSED~~ BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 8/11
PROPOSED BLAST DATE Dec 8/11 3:2 & PM
BLAST # MW-0038

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS: * Env marked

HEIGHT ABOVE HWY N/A (m). SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 5.5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 27.5 (m)

PROPOSED APPROX. NO. OF HOLES 5 /row.
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 5
PROPOSED NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

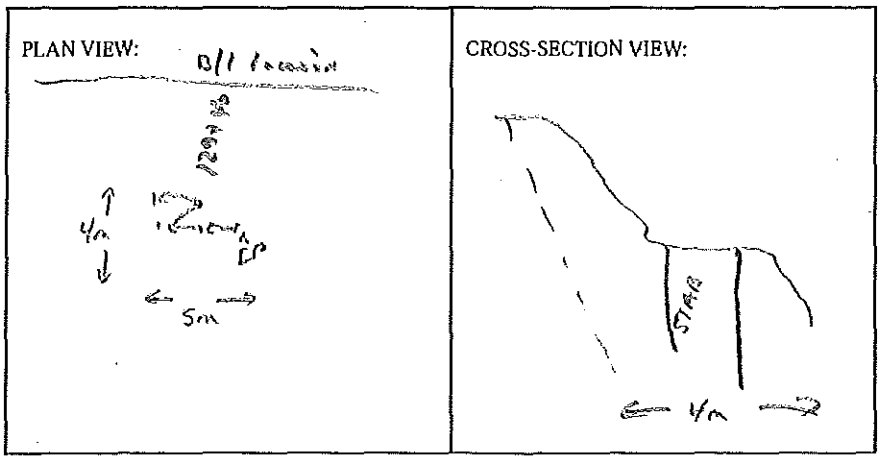
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERC Initiation of Nonel System
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13169 @ cliff face end = 0.100 ips / 43 Hz
@ 13093 @ cliff face end = 0.241 ips / 30 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 12/11
ACTUAL BLAST DATE Dec 12/11
BLAST # MW-0036 10:23 am

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: of cut marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 13
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

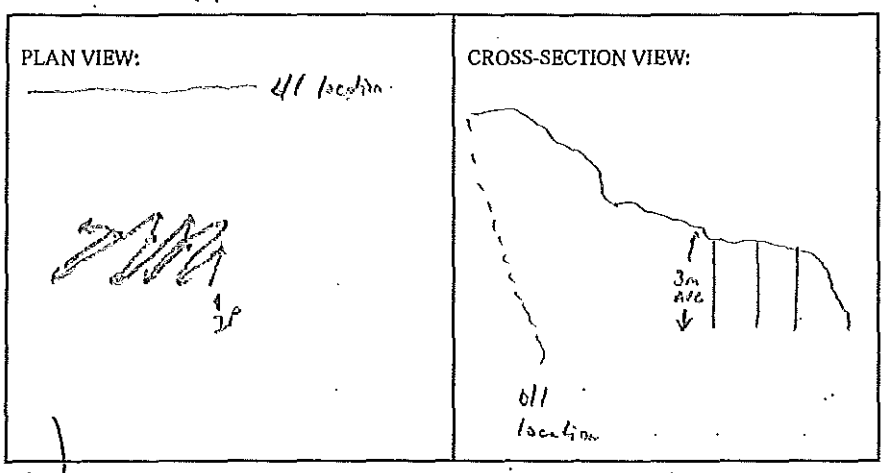
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ext. - 0.191 ips / 51 Hz
@ 13093 cliffstone ext. - 0.097 ips / 47 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Dec 12/11
ACTUAL BLAST DATE Dec 12/11 12:40 PM
BLAST # HW-0037

HIGHWAY # 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Chat noted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 14
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

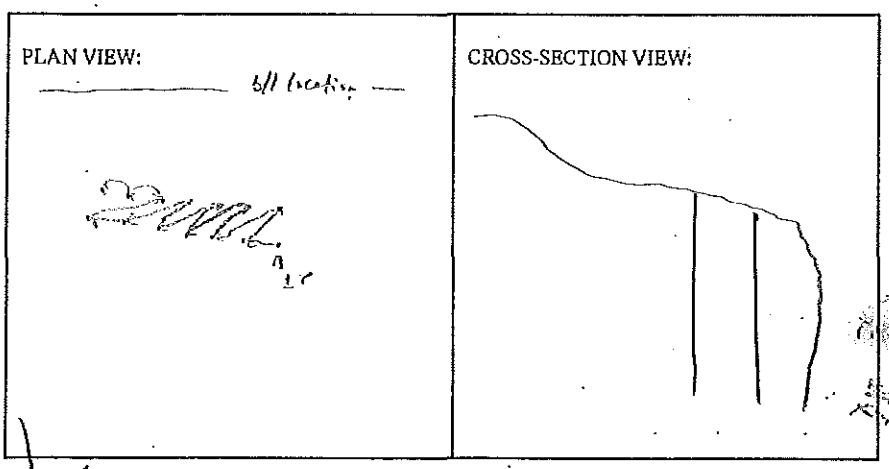
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ERX INITIATION OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 @ Cliffstone est - 0.24 ips/30Hz
@ 13093 Cliffstone est - 0.12 ips/28Hz

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11
BLAST # MW-0039

HIGHWAY# 97
BLAST LOCATION AT: 129+30 - 129+40 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot marked.

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 45 (m)

TOTAL NUMBER OF HOLES 15
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

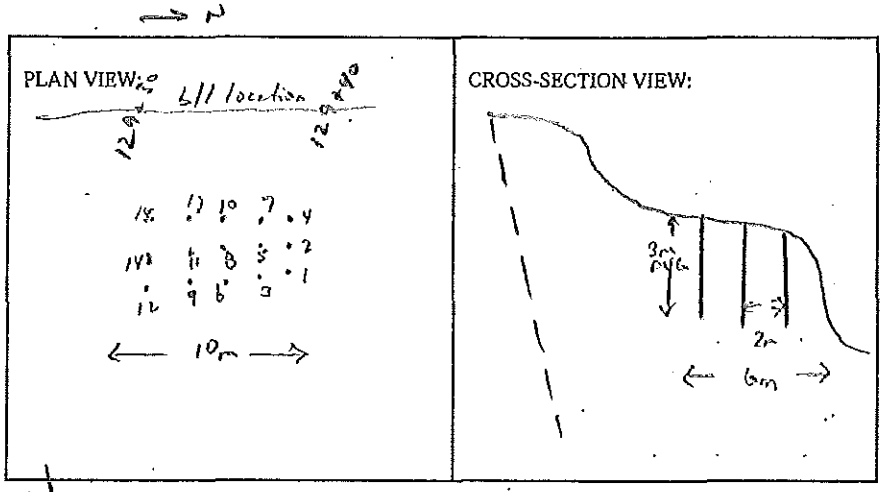
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13169 cliffside ext - 0.061 ips / 37 Hz
Seismograph @ 13093 cliffside ext - 0.151 ips / 21 Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 13/11
ACTUAL BLAST DATE Dec 13/11 1:50 PM
BLAST # MW-0010

HIGHWAY# 97
BLAST LOCATION AT: STA 1291.3m - 1291.45 (measured)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shotmaker

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 146 1/2 (10 tonded) / 7 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1 1/2" DYNAMITE FANFO
TOTAL NUMBER OF CARTRIDGES 1
TOTAL NUMBER OF DELAYS

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

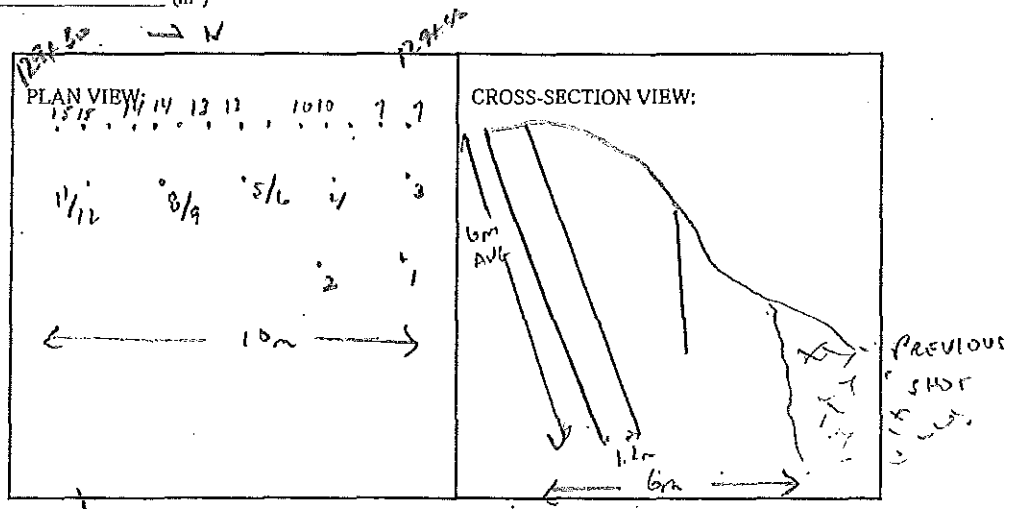
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HF5320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone e-t - 0.061 ips / 43Hz
@ 13093 cliffstone e-t - 0.18 ips / 57Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 18/11
ACTUAL BLAST DATE Dec 13/11 2:21 PM
BLAST # MW-0041

HIGHWAY# 97
BLAST LOCATION AT: STN 1294+20 - 1294+30 (Approach)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Blast matting

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 55 (m)

TOTAL NUMBER OF HOLES 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

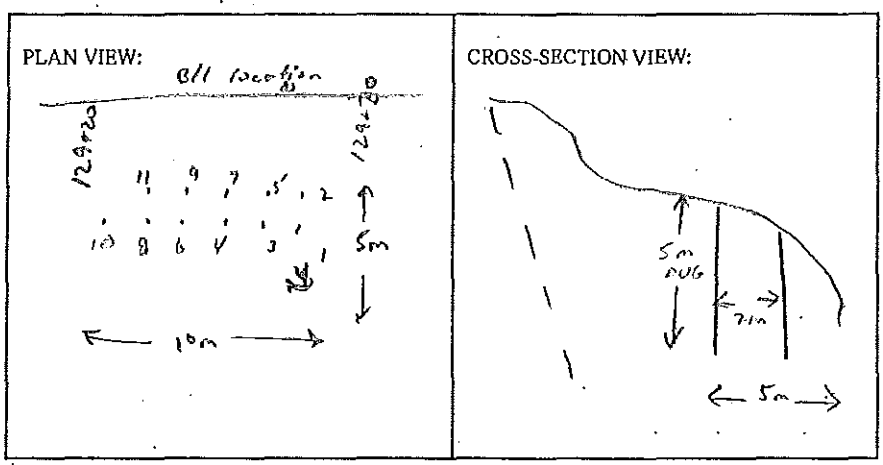
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13107 diffraction cnt - 0.092 ips / 39Hz
@ 13093 diffraction cnt - 0.241 ips / 43Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 12h05PM
BLAST # MW-0042

HIGHWAY# 97
BLAST LOCATION AT: 129+20 - 129+30 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY 11/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Altered granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14 (10/more) TOTAL NUMBER OF HOLES 24/14 8 prod.
AVERAGE DEPTH 6 (m) HOLE DIAMETER 76 (mm)
NUMBER OF ROWS 3 HOLE SPACING 2 (m) BURDEN 2 (m)
MAXIMUM DEPTH 6.2 (m) HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE
TOTAL DEPTH 130 (m)

BLAST DETAILS:

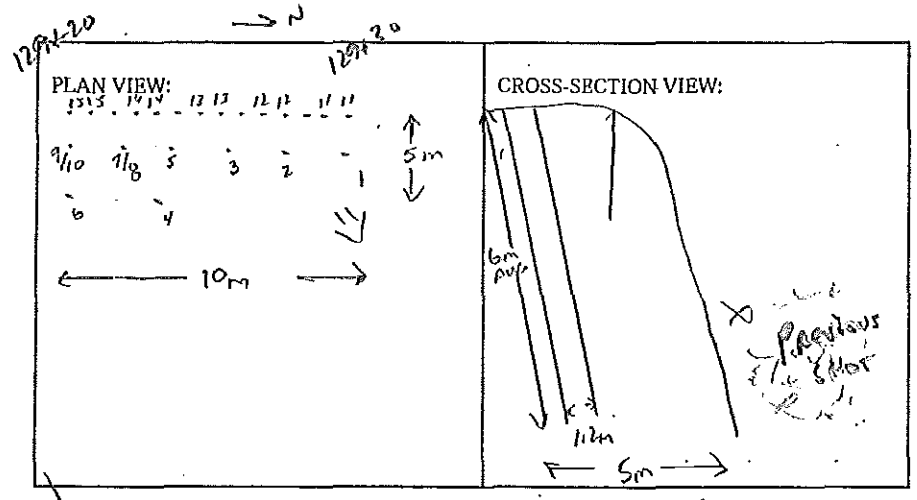
EXPLOSIVE TYPE 1" DYNAMITE + ANFO EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL NUMBER OF CARTRIDGES 15 TOTAL WEIGHT 30 (kg)
TOTAL NUMBER OF DELAYS 15 DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.093 ips/47 Hz
@ 13093 Cliffstone Cut - 0.173 ips/47 Hz

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11
BLAST # MW-0043

1320PM

HIGHWAY # 97
BLAST LOCATION AT: STN 1294-0 - 1294-20 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 52 (m)

TOTAL NUMBER OF HOLES 13
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMEX HANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

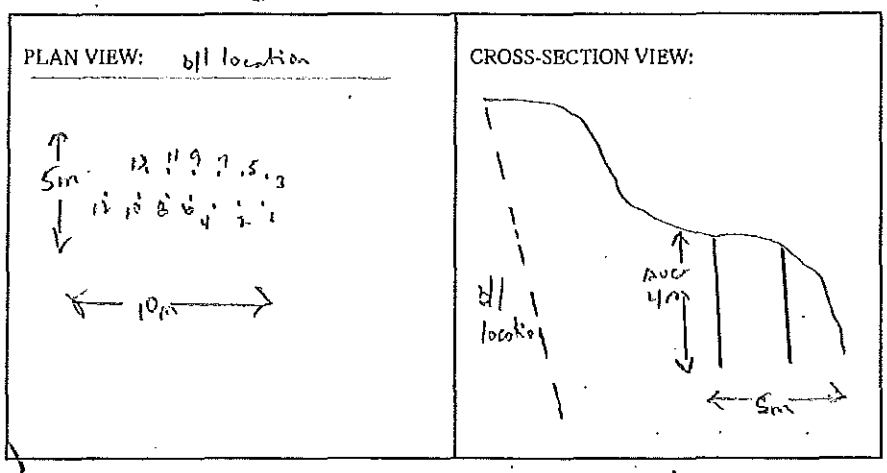
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE 1415320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone c.l - 0.099ips/ 39Hz
@ 13093 cliffstone c.l - 0.12ips/ 73Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/10
ACTUAL BLAST DATE Dec 14/10 2359 PM
BLAST # MW-0044

HIGHWAY# 97
BLAST LOCATION AT: STN 129+13 - 129+20 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slot melted

HEIGHT ABOVE HWY 10 (m), SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Andesite Greenish
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12 (8 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 12 bll / 3 pre
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 9

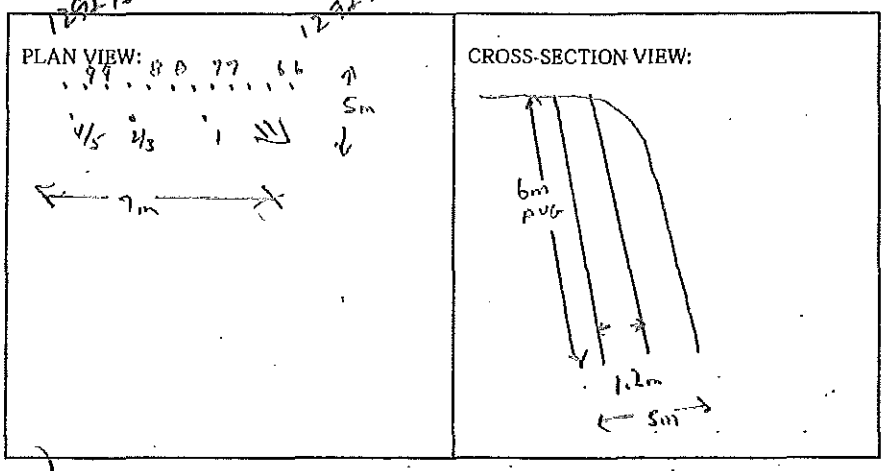
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 el; Alston cert. 0.059 ips / 47 Hz
@ 13093 el; Alston cert. 0.13 ips / 51 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 14/11 3:54 p.m.
BLAST # MW-BR4E

HIGHWAY# 97
BLAST LOCATION AT: Sta 1291+00 - 1294+10 (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Basement
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 9

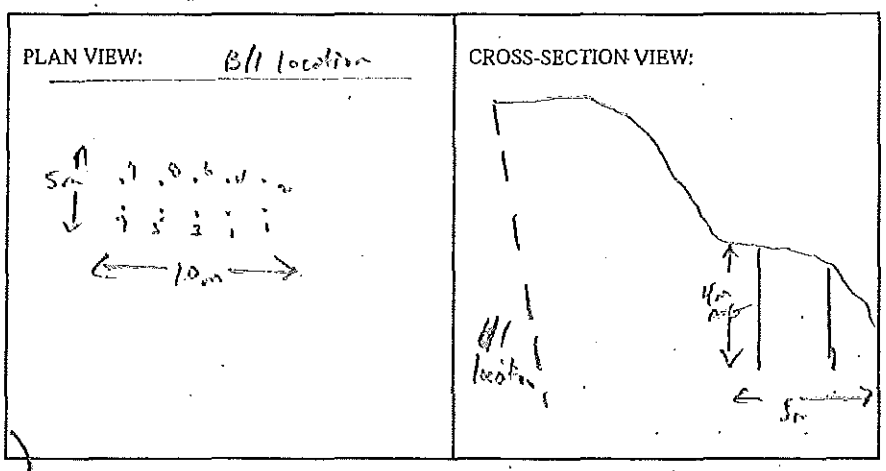
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 36 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1286.7 01: Easton Cut - 0.067 ips/ 39 Hz
@ 1289.2 01: Easton Cut - 0.21 ips/ 57 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Jeanes
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 10:21 AM
BLAST # MW-0046

HIGHWAY# 97
BLAST LOCATION AT: 129+08 - 129+13 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: ~ old material

HEIGHT ABOVE HWY 5m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 10 (7 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 10 #1 / 2 Buffers
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Primex Pwr-Load 60
TOTAL NUMBER OF CARTRIDGES 48
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

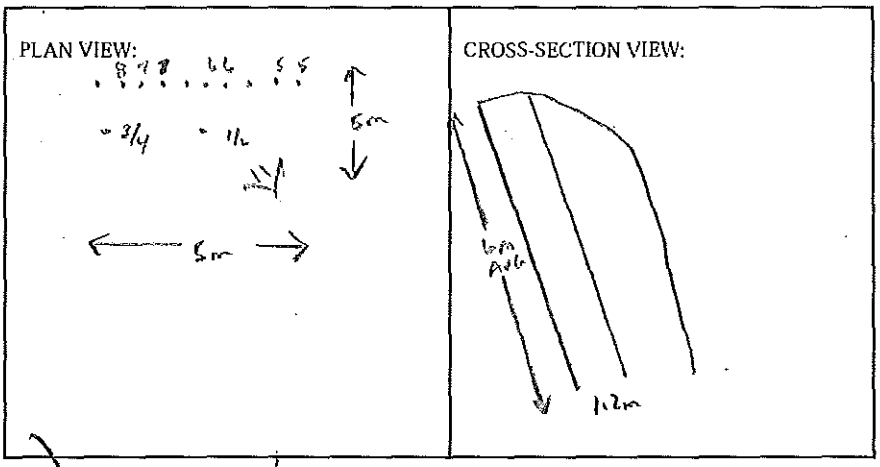
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE DB 320 CAPACITY 8 Decks

VOLUME OF ROCK BLASTED 160 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Jeanes COMPANY Sierra D+B

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 elevation ed. - 0.037 IPI / 57 Hz
@ 13093 elevation ed. - 0.181 IPI / 47 Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 11:30 AM
BLAST # MW-0047

HIGHWAY# 97
BLAST LOCATION AT: SYM 129+05 - 129+08 (Toboggan)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: + Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Diorite Gneiss
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5 (3 loaded)
AVERAGE DEPTH 16.5' (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 16.7 (m)
TOTAL DEPTH 73 (m)

TOTAL NUMBER OF HOLES 56/11/6 Rand
HOLE DIAMETER 76 (mm)
HOLE SPACING 2m (m) BURDEN 2m (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

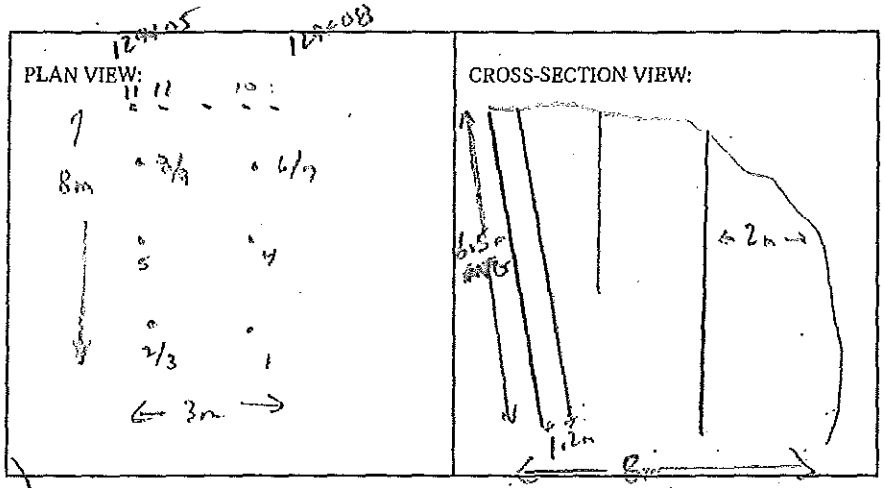
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 1816 elevation ext. 0.052 ipt/ 47Hz
@ 1303 elevation ext. 0.14 ipt/ 43Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15/11
ACTUAL BLAST DATE Dec 15/11 12:20 PM
BLAST # Mud-0048

HIGHWAY# 97
BLAST LOCATION AT: 128+95 - 129+05 (Cross Street)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE ANFO
TOTAL NUMBER OF CARTRIDGES
TOTAL NUMBER OF DELAYS

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH (ms)

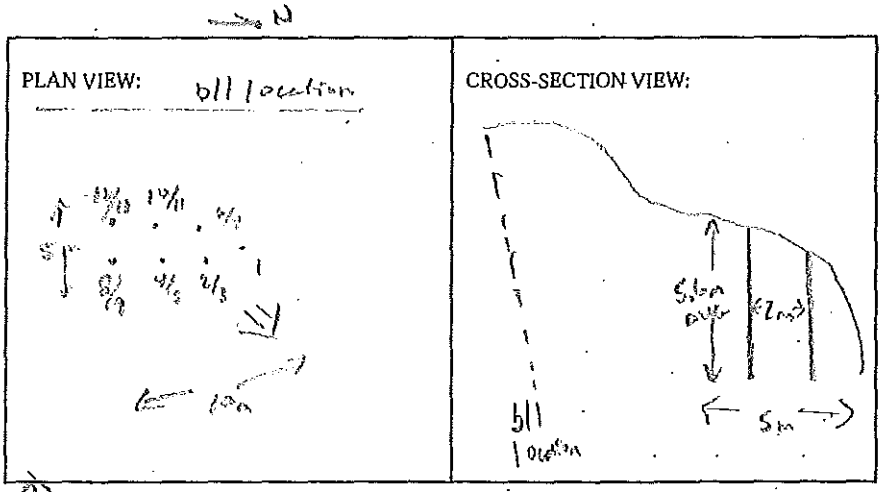
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 220 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 12867 Cliffside apt. 0.080 in/s 43Hz
@ 13093 Cliffside apt - Ground Shake

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 15th
ACTUAL BLAST DATE Dec 15th 2:01 PM
BLAST # MoT-0049

HIGHWAY# 97 4e shot method
BLAST LOCATION AT: 128+95 - 129+05 CS (Toll Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 4e shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 13 (in 1 row)
AVERAGE DEPTH 6.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 13/11/4 buffer / 1 stmg
HOLE DIAMETER 216 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 160 (kg)
DELAY TYPE AND LENGTH 25 (ms)

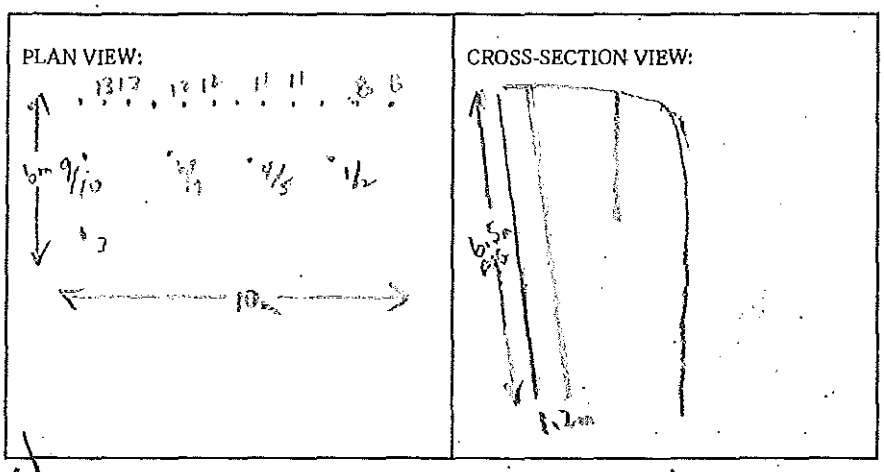
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1317 elevation ppv = 0.0691 in/sec
@ 13093 elevation ppv = 0.2035 in/sec

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 16/11
ACTUAL BLAST DATE Dec 16/11 11:35 AM
BLAST # MW-0051

HIGHWAY # 97
BLAST LOCATION AT: 128+95 - 129+00 LS (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 6 11 / 360 Pkg / 2 Shot / 2 Decks
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 14
TOTAL NUMBER OF DELAYS 14

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

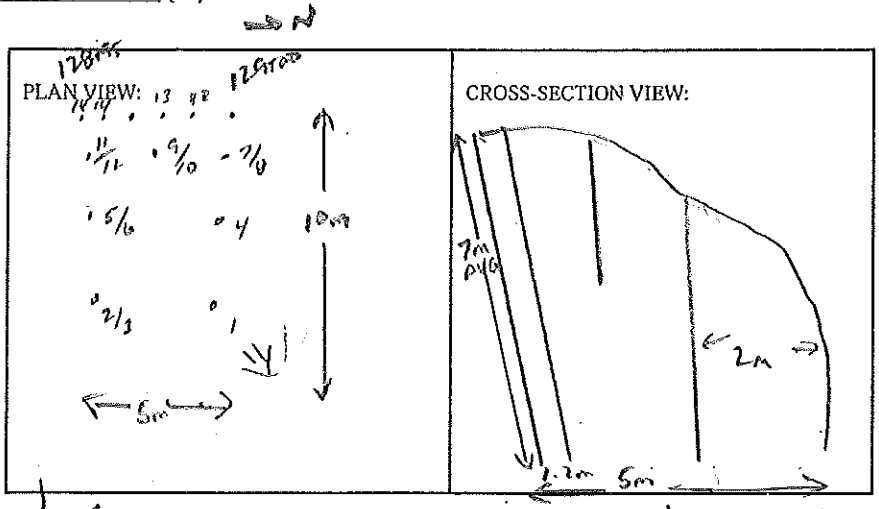
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone ext - 0.084 ips / 43Hz
@ 13098 Cliffstone ext - 0.241 ips / 23Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 16/11
ACTUAL BLAST DATE Dec 16/11 12:56 PM
BLAST # MW-0082

HIGHWAY # 97
BLAST LOCATION AT: STN 128+90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Old method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 46 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamex Hanfo
TOTAL NUMBER OF CARTRIDGES 85
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 82 mm by 300 mm
TOTAL WEIGHT 400 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

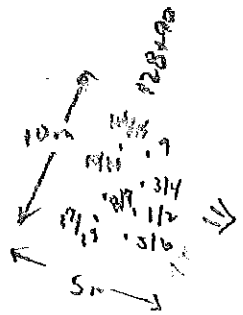
VOLUME OF ROCK BLASTED 280 (m^3)

BLAST SKETCH:

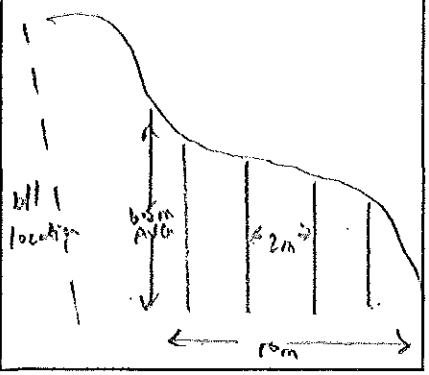
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: bll location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 diffuse ext. = 0.0973 ips / 47Hz
@ 13093 diffuse ext. = 0.263 ips / 43Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Dec 14/11
ACTUAL BLAST DATE Dec 16/11 2:45pm
BLAST # MW-0023

HIGHWAY# 97
BLAST LOCATION AT: 128.88

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 25 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.3 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 18
TOTAL NUMBER OF DELAYS 18

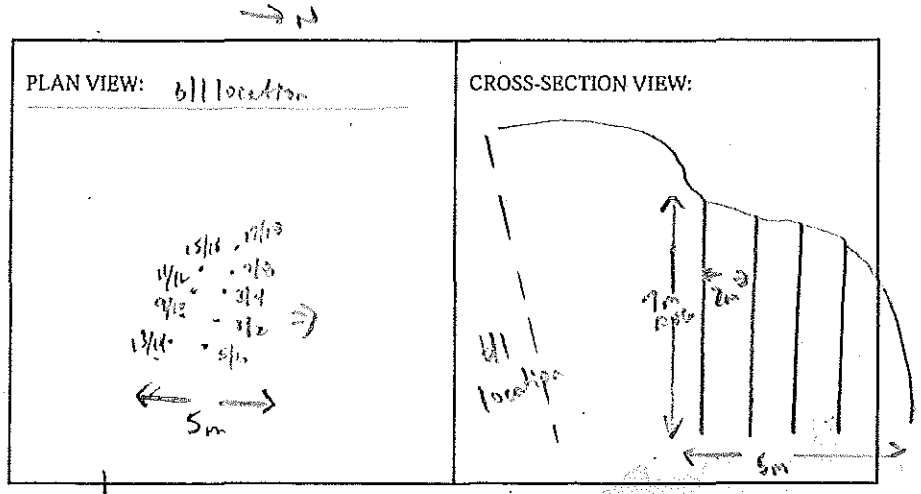
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 90 Caps

VOLUME OF ROCK BLASTED 360 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone crt. - 0.096ips/43mm
@ 13093 cliffstone crt - 0.40ips 157mm

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11 11:37AM
BLAST # MW-12054

HIGHWAY# 97
BLAST LOCATION AT: STN 1281+90 - 1281+95 LS (TIP Berm)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 82 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Alberta Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6 (4 loaded)
AVERAGE DEPTH 6.1 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 54 (m)

TOTAL NUMBER OF HOLES 6 1/11 / 26 / 15 mm
HOLE DIAMETER 216 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE HANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

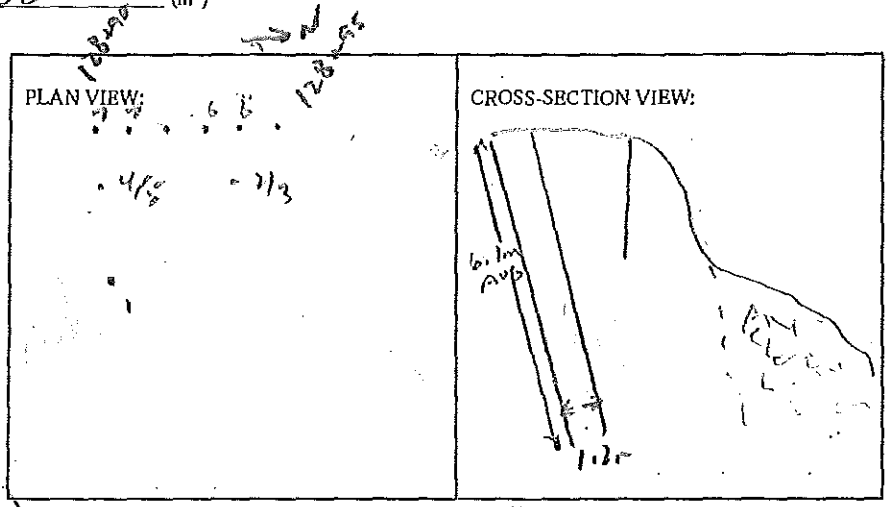
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 150 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffshore c.l. - 0.058 ips / 30Hz
@ 13093 cliffshore end - 0.35 ips / 47Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11
BLAST # MW - 0055 12:46pm

HIGHWAY# 97
BLAST LOCATION AT: STN 1281.85 - 1281.90

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE granite boulders
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 8.0 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 48 (m)

TOTAL NUMBER OF HOLES 6
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMEX + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

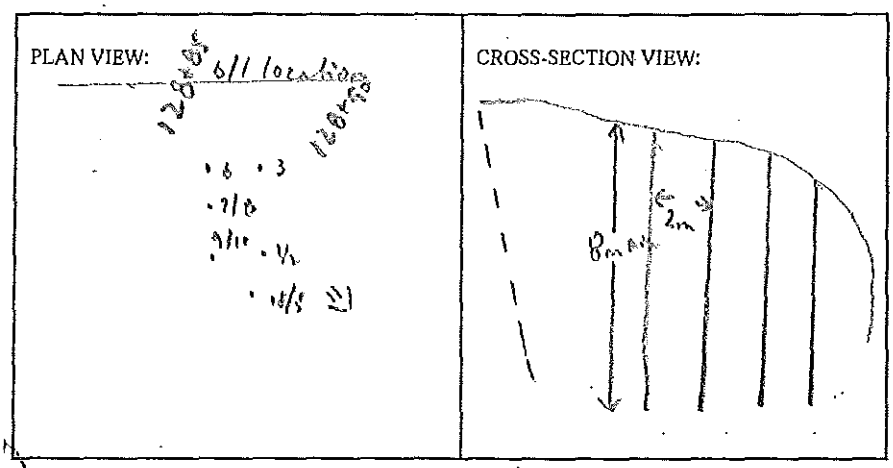
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffside Ct. - 0.11 ips/ 43Hz
@ 12892 cliffside ct. - 0.41 ips/ 5Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorwerk
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 19/11
ACTUAL BLAST DATE Dec 19/11 2:53 PM
BLAST # MW-0056

HIGHWAY# 97
BLAST LOCATION AT: Sta 1284.85 - 1284.90 LS (NB Acc)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: No shots marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Alberta Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 2 (3 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.5 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 26 / 18 loaded / 1056 ft drilled
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: → N
7 6 5

CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Vorwerk COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1316? e/1 Peak Vert. 0.061 ips/47 Hz
@ 1309? e/1 Peak Vert. 0.39 ips/51 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 11:22am
BLAST # MW-0057

HIGHWAY# 97
BLAST LOCATION AT: STN 128+80 - 129+85 (TOP Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

* Shot mitted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES PIL
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 5
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

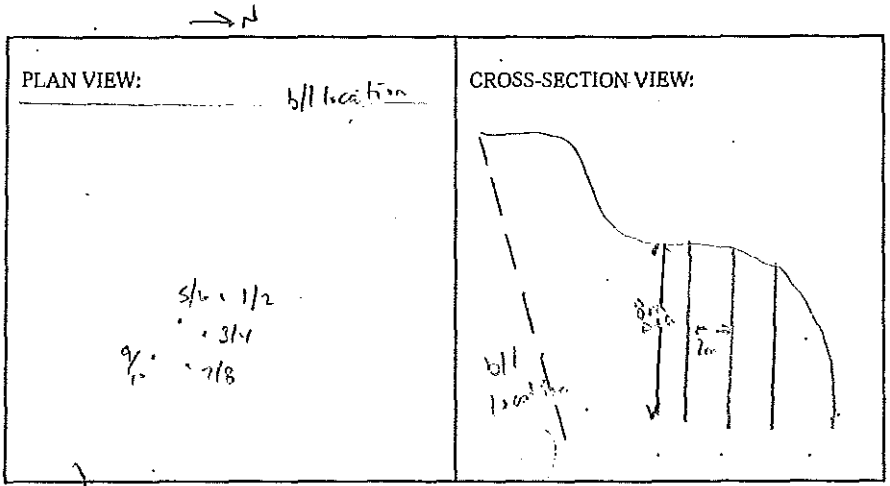
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: bill location



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1317 cliffside c.l. - 0.041 ips / 39 Hz
@ 1309 cliffside c.l. - 0.30 ips / 34 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 1:09 PM
BLAST # MW-0058

HIGHWAY# 97
BLAST LOCATION AT: 1284+80

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot modified

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 2.5 mm by 200 mm
TOTAL WEIGHT 45 (kg)
DELAY TYPE AND LENGTH 25 (ms)

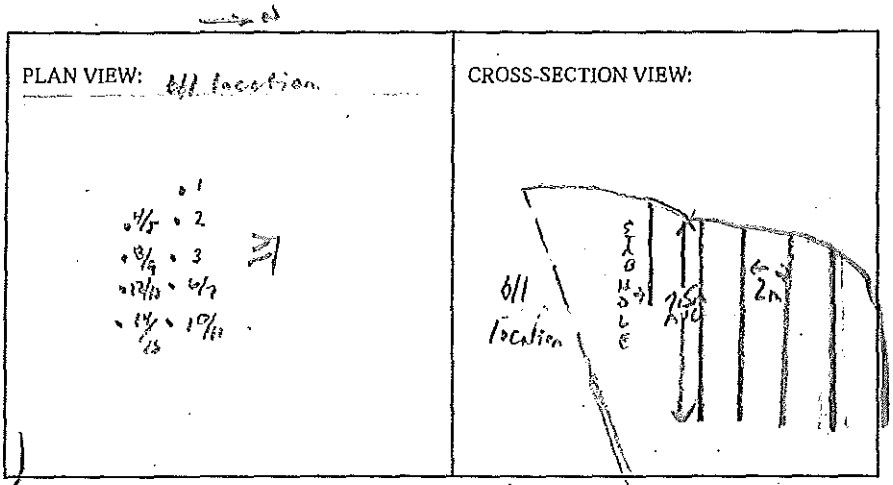
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: Nil location



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13867 Cliffstone Crt - 0.66ips/ 57Hz
@ 13093 Cliffstone Crt - 0.49ips/ 57Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 20/11
ACTUAL BLAST DATE Dec 20/11 3:36 AM
BLAST # Multi-Shot #9

HIGHWAY# 97
BLAST LOCATION AT: SW 128+70 (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

4 shot-matrix

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 65 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.6 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE EMPO
TOTAL NUMBER OF CARTRIDGES 20
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 55 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

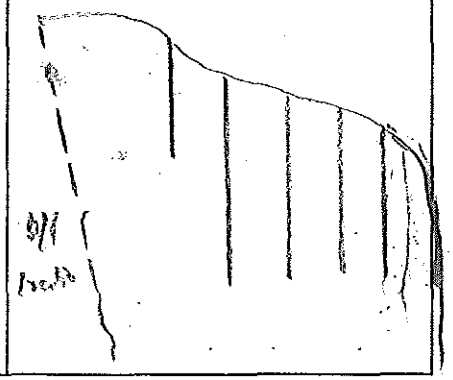
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: S/I locations

19/20 , 13/14
17/18 , 9/10
15/16 , 5/6
11/12 , 3/4
7/8 , 1/2

CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ct - 0.055ips / 37Hz
@ 13093 cliffstone ct - 0.37ips / 23Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vedoy
BLASTER'S CERTIFICATE NUMBER 5B2489

DATE PREPARED Dec 20/11
PROPOSED BLAST DATE Dec 21/11
BLAST # 143

HIGHWAY# 97
BLAST LOCATION AT: Sta 148+10 - 148+53 LS (2nd bench)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 11m (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 43 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 375 (m)

ANTICIPATED DRILLING DETAILS: * every 2nd drill hole to be loaded w/100 grain det. cord.

PROPOSED NO. OF BACKLINE HOLES 58
PROPOSED AVG. DEPTH 7.5 (m)
PROPOSED NO. OF ROWS 12
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED TOTAL DEPTH 1020 (m)

PROPOSED APPROX. NO. OF HOLES 58 backline / 80 prod.
HOLE DIA. 100 (mm)
APPROX. HOLE SPACING 3 (m) BURDEN 3 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Quantum Cartridge
APPROX. NUMBER OF CARTRIDGES _____
PROPOSED NUMBER OF DELAYS _____

EXPLOSIVE SIZE 52 mm by 400 mm
APPROX. TOTAL WEIGHT 3,000 (kg)
DELAY TYPE AND LENGTH 25 / 42 (ms)

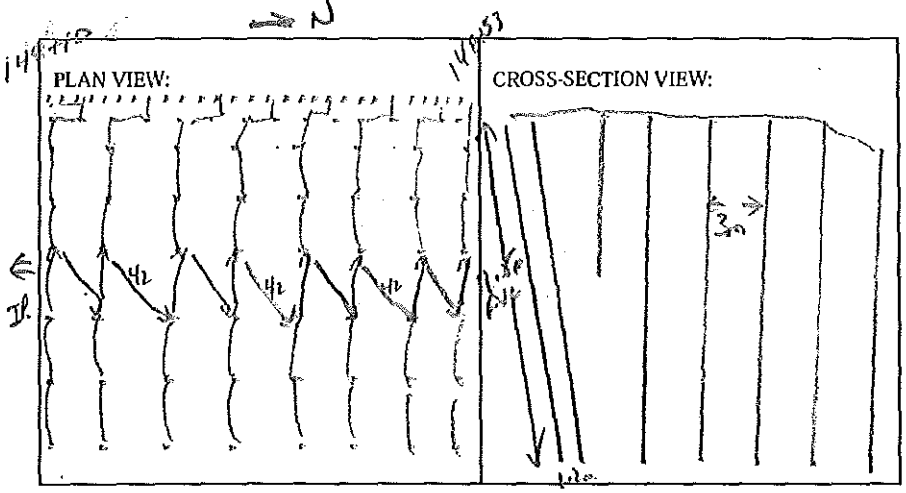
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) ESC Initiation of Nonel System
BLASTING MACHINE: TYPE HB 310 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 6,000 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME D Fleeton SIGNATURE _____ COMPANY Fleeton Rock Eng.

BLASTER'S SIGNATURE Wayne Vedoy COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 9:34 am
BLAST # M1W-0060

HIGHWAY # 97
BLAST LOCATION AT: STN 128+73 - 128+80 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Alaska Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9
AVERAGE DEPTH 7.4 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 68 (m)

TOTAL NUMBER OF HOLES 9 of 11
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.75 (m) BURDEN — (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 8" DYNAMITE 200grain det.cord
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

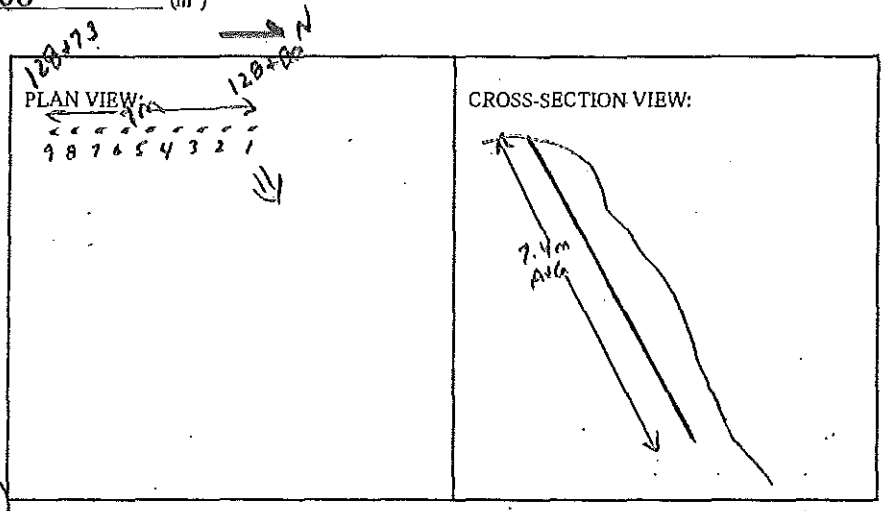
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 13 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffside exit - No data @ 0.04 ips
@ 13093 Cliffside exit - 0.24 ips / 57Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489
DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 10:45 AM
BLAST # MW-0061
HIGHWAY # 97
BLAST LOCATION AT: 128+68-128+72 ES (no Barrow)
UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 9.3 (m)
TOTAL DEPTH 30 (m)
TOTAL NUMBER OF HOLES 4
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 4
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB-320 CAPACITY 80 CAPS

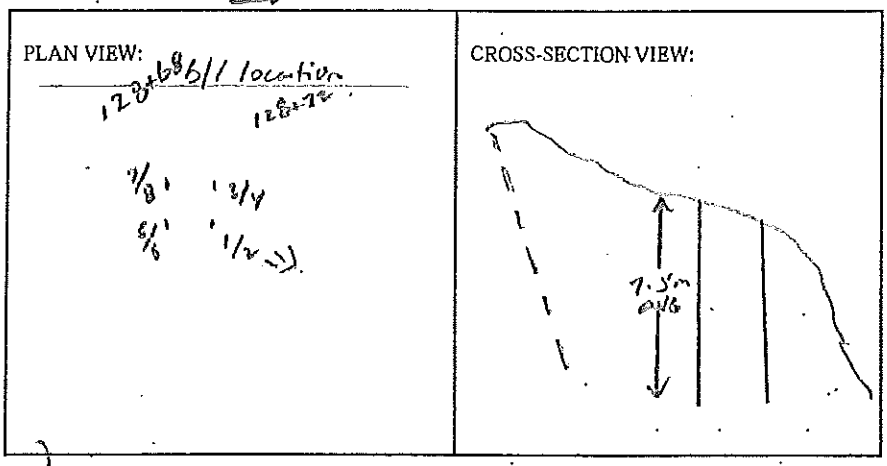
VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 128+68 6/1 location 128+72



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13147 cliff face est - 0.12 in/sec 37Hz
@ 13093 cliff face est - 0.58 in/sec 137Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 21/11
ACTUAL BLAST DATE Dec 21/11 12:37 PM
BLAST # M.W.-0062

HIGHWAY# 97
BLAST LOCATION AT: Stn 12.8+60 to 12.8+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shot method

HEIGHT ABOVE HWY 10 (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/a
AVERAGE DEPTH 6.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 7.5 (m)
TOTAL DEPTH (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE ANFO
TOTAL NUMBER OF CARTRIDGES 180
TOTAL NUMBER OF DELAYS 18

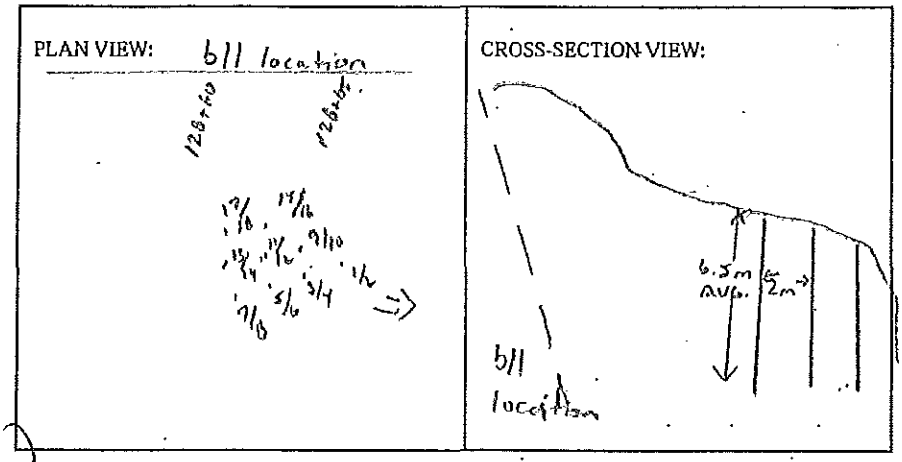
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ext. - 0.093 ips / 87 Hz
@ 13093 cliffstone ext. - 0.411 ips / 64 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 1/11
ACTUAL BLAST DATE Oct 26/11 2:02 PM
BLAST # MW-0063

HIGHWAY # 97
BLAST LOCATION AT: 128+60 - 128+67

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 500-0/3 stems
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 46 (kg)
DELAY TYPE AND LENGTH 25 (ms)

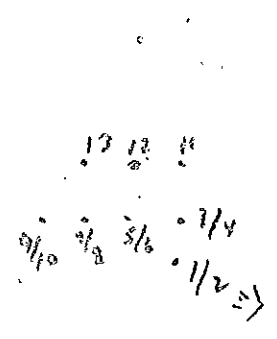
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 186 (m^3)

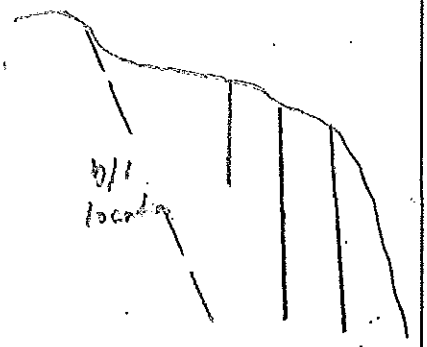
BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: Bll location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone elev. - 0.091 ips/ 34Hz
@ 13098 cliffstone elev. - 0.44 ips/ 93Hz

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
DATE PREPARED Dec 21/11
BLASTER'S NAME Wayne Vernon
ACTUAL BLAST DATE Dec 21/11 3:31 PM
BLASTER'S CERTIFICATE NUMBER 583489
BLAST # Mud-010 64
HIGHWAY # 97
BLAST LOCATION AT: STN 128+60 - 128+70 LS (Top Bench)
UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 10 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 14
AVERAGE DEPTH 6.3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 100 (m)

TOTAL NUMBER OF HOLES 14 6 11 / 3 Bottom
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 20

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

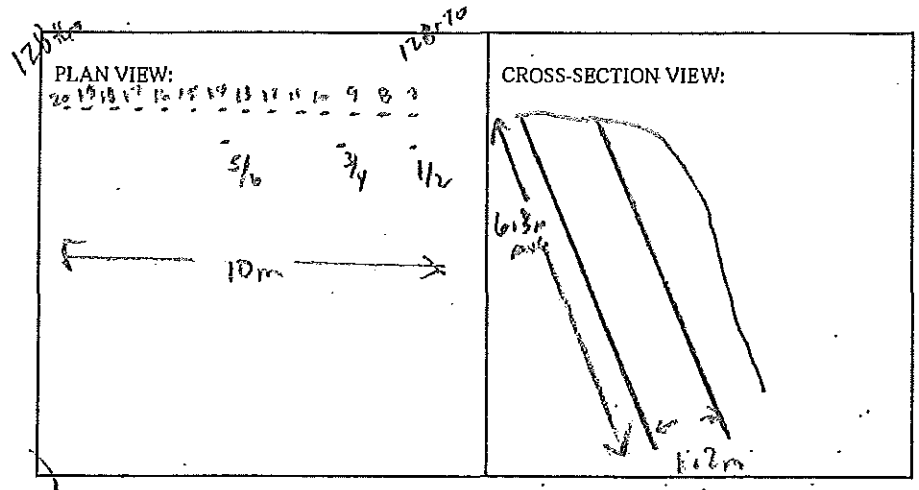
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3) → N

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cres. - Notes 0.04 ips
@ 13098 Cliffstone Cres. - 0.33 ips / 73m

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 22/11
ACTUAL BLAST DATE Dec 22/11 11:01 AM
BLAST # MW-0065

HIGHWAY# 97
BLAST LOCATION AT: STN 128+60 - 128+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Blast material

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE N/a (°) SLOPE LENGTH N/a (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8.3 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 9 8 pass/1 stage
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 17
TOTAL NUMBER OF DELAYS 17

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

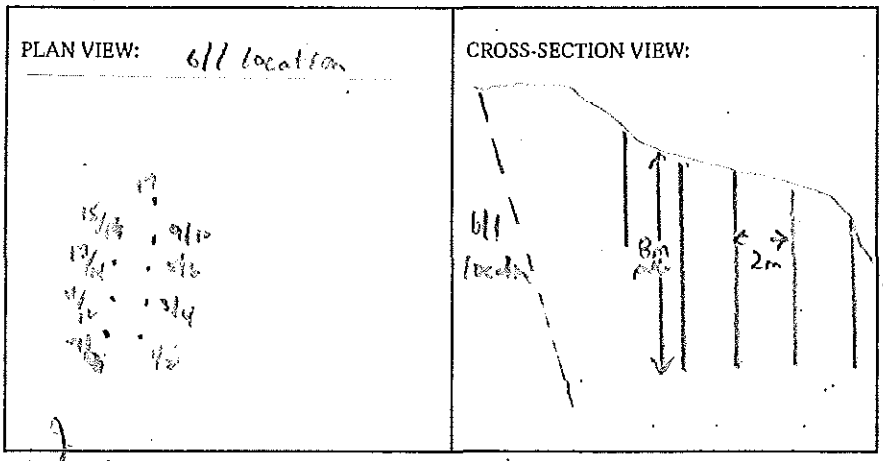
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED _____ (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 611 location



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffstone Ext - 0.060 ips/27Hz
e 13093 Cliffstone Crit - 0.129 ips/51Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Dec 22/11
ACTUAL BLAST DATE Dec 22/11 12:30pm
BLAST # mw-cc06

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+70 to 128+75

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot mottled

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5m (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8 (6 Loaded)
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 80 (m)

TOTAL NUMBER OF HOLES 86 // / 36 buffer // 5 shrub
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS _____

2½" x 16" Blastex emulsion in buffer holes - 20 decks/hole
EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

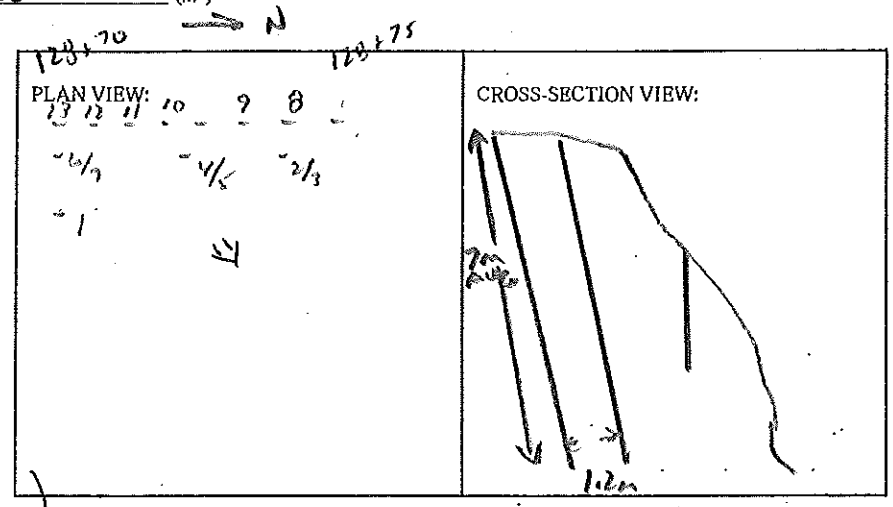
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ext. - no trigger (< 0.04 ips)
@ 13093 cliffstone ext - 0.26 ips / 43 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 5/12
ACTUAL BLAST DATE Jan 5/12 10:45 AM
BLAST # MW-0067

HIGHWAY# 97
BLAST LOCATION AT: 128+55 - 128+60 (top bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: see chat marked

HEIGHT ABOVE HWY N/A (m) . SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 6.6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 110 (m)

TOTAL NUMBER OF HOLES 8 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

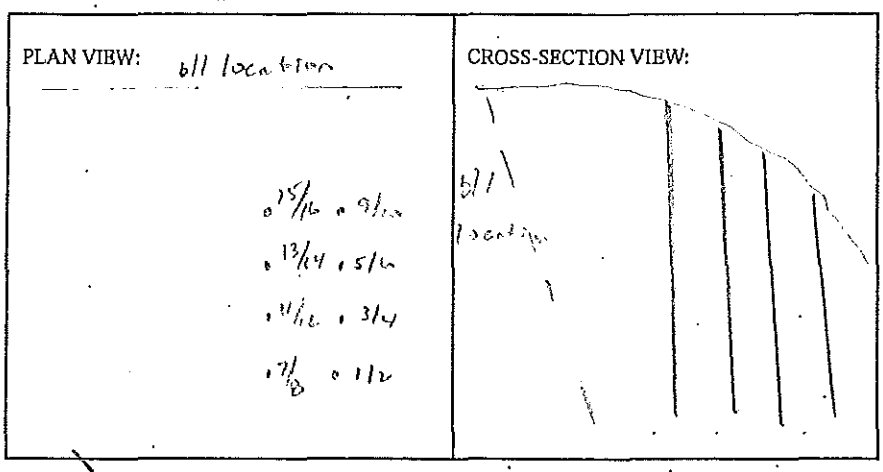
EXPLOSIVE SIZE 4/3 mm by 4/00 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 effective ppv = 0.044 in/s / 21Hz
@ 13073 effective ppv = 0.39 in/s / 47Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3429

DATE PREPARED Jan 8/12
ACTUAL BLAST DATE Jan 5/12 12:12 PM
BLAST # MW-0068

HIGHWAY# 97
BLAST LOCATION AT: STA 120+50-120+55 Boston Creek

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: VF Shot Instead

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) >> (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES n/a
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.6 (m)
TOTAL DEPTH 37 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 16
TOTAL NUMBER OF DELAYS 16

EXPLOSIVE SIZE ½ mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

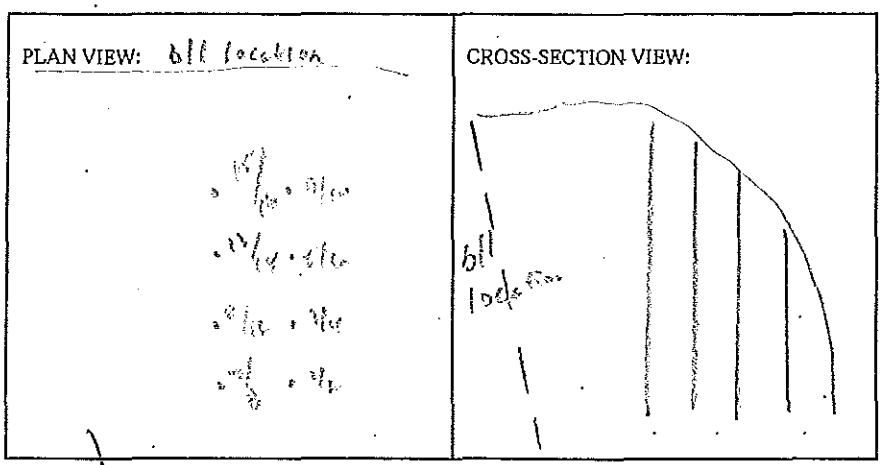
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Chiddarton Ent. 0.042 ips/23Hz
@ 13078 Chiddarton Ent. 0.30 ips/43Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 5/12
ACTUAL BLAST DATE Jan 5/12 2:21 PM
BLAST # MW-0069

HIGHWAY# 97
BLAST LOCATION AT: SBN 128/60 - 128+60 LS (7Dz Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: + shotcrete

HEIGHT ABOVE HWY 11/2 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 16 (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 12
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.0 (m)
TOTAL DEPTH 14.6 (m)

TOTAL NUMBER OF HOLES 12/11/5 6 shot/ 3 m
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 25
TOTAL NUMBER OF DELAYS 19

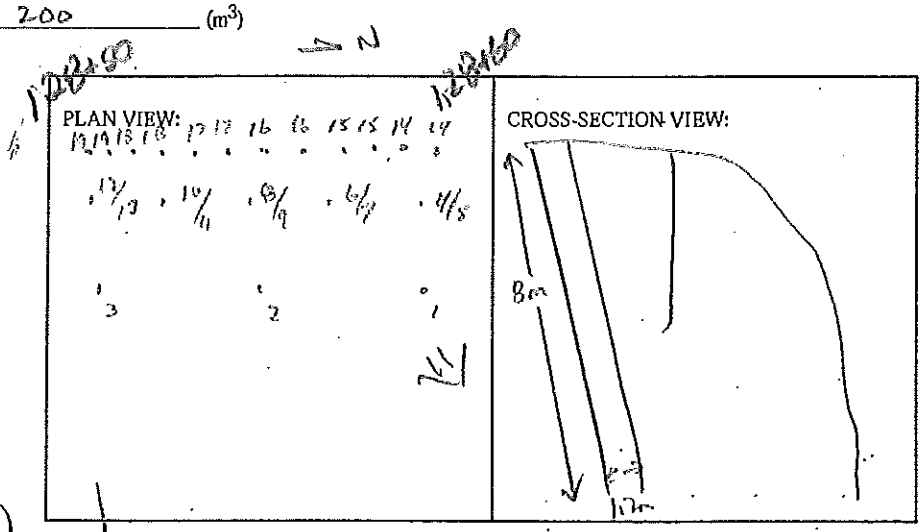
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HF 5320 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE [signature] COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13169 ali Blast Const. 0.043 in/s 37Hz
@ 13193 ali Blast Const. 0.18 in/s 47Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12 10:52 AM
BLAST # MJ-0070

HIGHWAY# 97
BLAST LOCATION AT: 128+45 - 128+50 (Eastbound)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slash matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.2 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

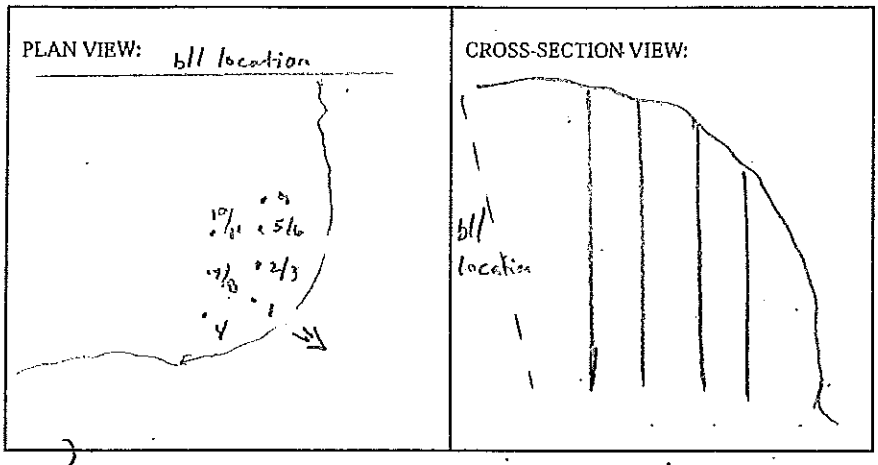
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 cliffstone ctr. 0.051 ips/ 28Hz
@ 13078 cliffstone ctr. 0.491 ips/ 39Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 6/12
ACTUAL BLAST DATE JAN 6/12 11:54 AM
BLAST # NW-0071

HIGHWAY # 97
BLAST LOCATION AT: 12.8+45 - 12.8+50 LT (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: N/A Not marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Basalt
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 5 bll / 16 bffrs / 1 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 6

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

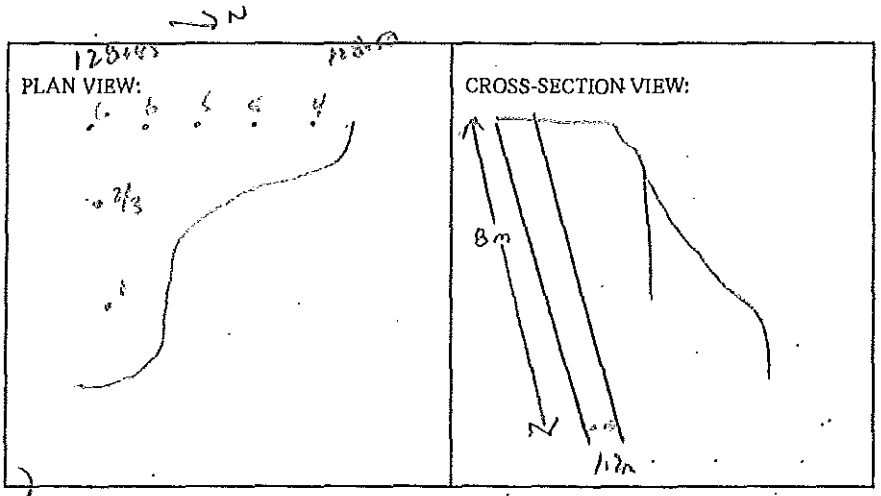
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 140 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Cut smooth @ 13.17 cl: Effective o.b. = Notified (@ 0.04 ips)
@ 13.22 cl: Effective o.b. = 0.24 ips / 5/1/12

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12 1:15 PM
BLAST # MJ-0002

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+42 - 128+45 (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 4 Prod / 1 Shot
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamex Anfo
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 6

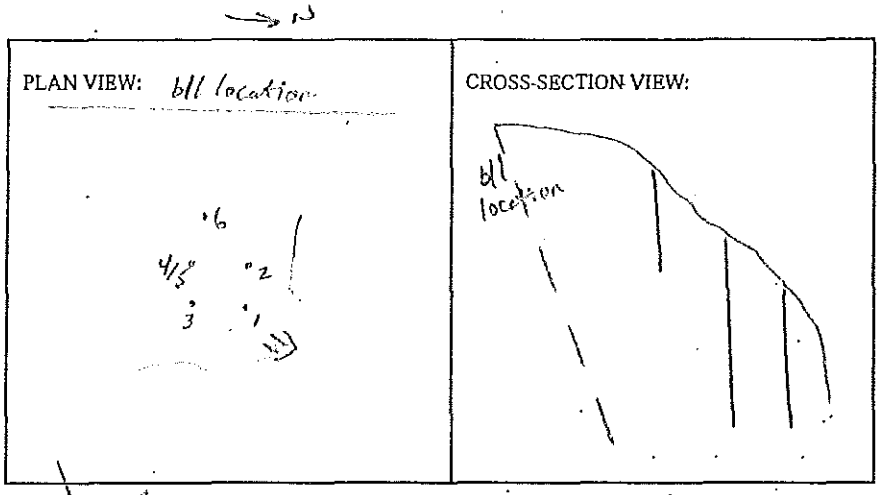
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 12442 Offset 6m - No reading (<0.04 ips)
@ 12373 Offset 6m - 0.401ps / 43Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12
BLAST # HWY-0073

2:04 pm

HIGHWAY# 97
BLAST LOCATION AT: SB 1180.42 - 1180.45 LS (Toe Area)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: 4" Slot drilled

HEIGHT ABOVE HWY 30 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 4.7 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.9 (m)
TOTAL DEPTH 40 (m)

TOTAL NUMBER OF HOLES 56 / 16 holes
HOLE DIAMETER 76 (mm)
HOLE SPACING _____ (m) BURDEN _____ (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

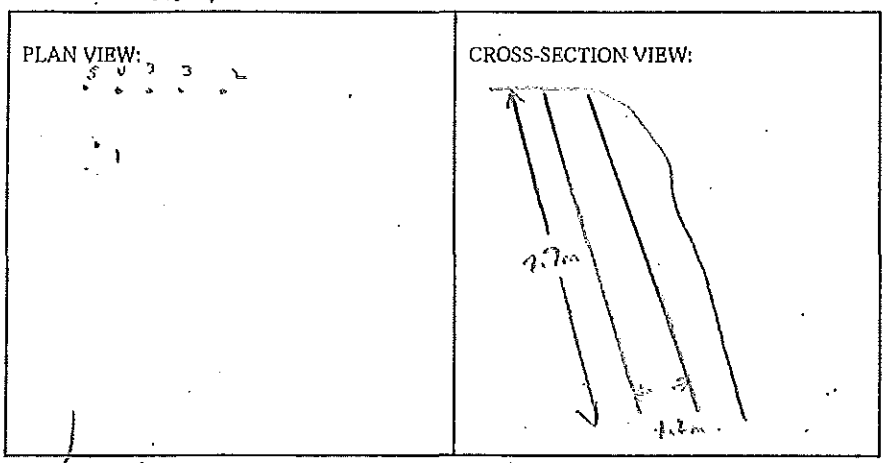
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13067 Oil Refinery Rd - No Reading (< 0.04 ips)
@ 13093 Oil Refinery Rd - 0.21 ips / 39 Hz

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 6/12
ACTUAL BLAST DATE Jan 6/12 3:10 PM
BLAST # Mud-0054

HIGHWAY# 97
BLAST LOCATION AT: Stn 128+37 — 128+52

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE N/a (°) SLOPE LENGTH N/A (m)
ROCK TYPE Blasted Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/L
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 35 (m)

TOTAL NUMBER OF HOLES 5 Prod / 2 Stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

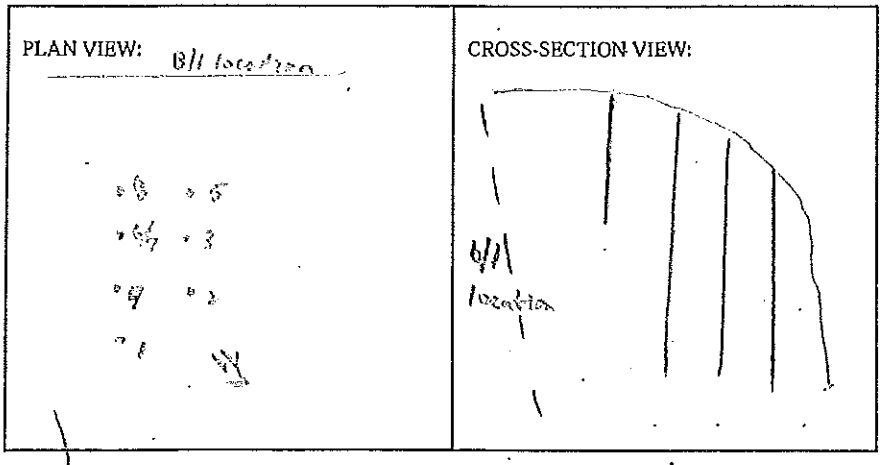
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 180 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffside Ave. - Northbound (2 0.04 in/s)
@ 13073 Cliffside Ave. 0.19 in/s / 39 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 7/2012
ACTUAL BLAST DATE JAN 7/2012 2:35 PM
BLAST # 152

HIGHWAY # 97
BLAST LOCATION AT: 1+1400 SW 1402+78 - 1403+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 72 (°) SLOPE LENGTH 50 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 300 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 107 (58 loaded) TOTAL NUMBER OF HOLES 107 bll / 81 Pool
AVERAGE DEPTH 7 (m) HOLE DIAMETER 100 (mm)
NUMBER OF ROWS 15 HOLE SPACING 3 (m) BURDEN 3 (m)
MAXIMUM DEPTH 10 (m) HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
TOTAL DEPTH 1300 (m)

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO EXPLOSIVE SIZE 50 mm by 410 mm
TOTAL NUMBER OF CARTRIDGES 139 TOTAL WEIGHT 1880 (kg)
TOTAL NUMBER OF DELAYS 105 DELAY TYPE AND LENGTH 25 + 42 (ms)

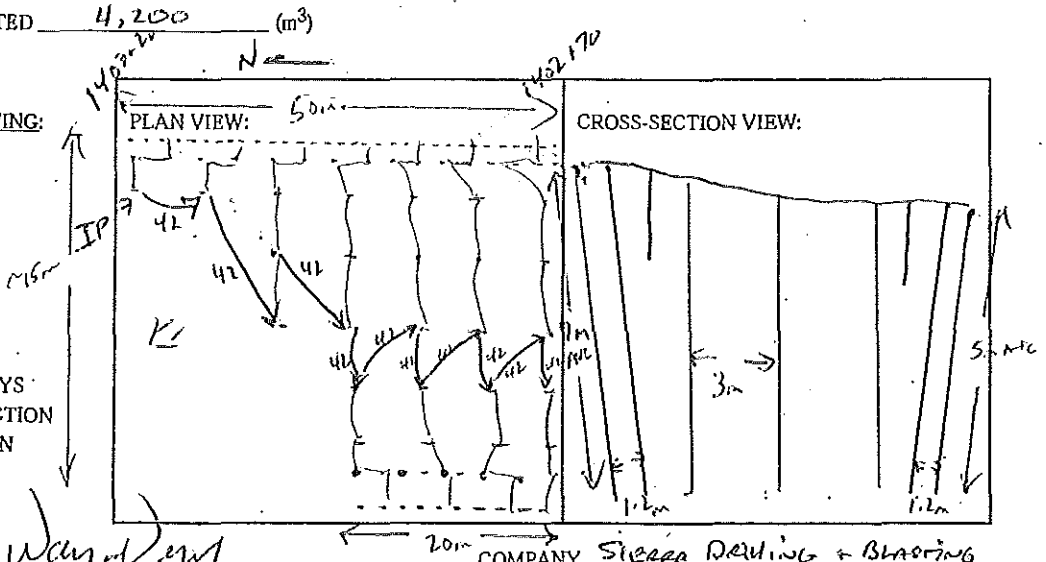
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) EBC IN LIEU OF NONEL SYSTEM
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 4,200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Jan 9/12
ACTUAL BLAST DATE Jan 9/12 10:06 AM
BLAST # Mw. 0075

HIGHWAY# 97
BLAST LOCATION AT: SW 1251+34 - 1261+34 (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: de Shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 (blocked)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7.3 (m)
TOTAL DEPTH 70 (m)

TOTAL NUMBER OF HOLES 76/1 / 3 buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Hanfo
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

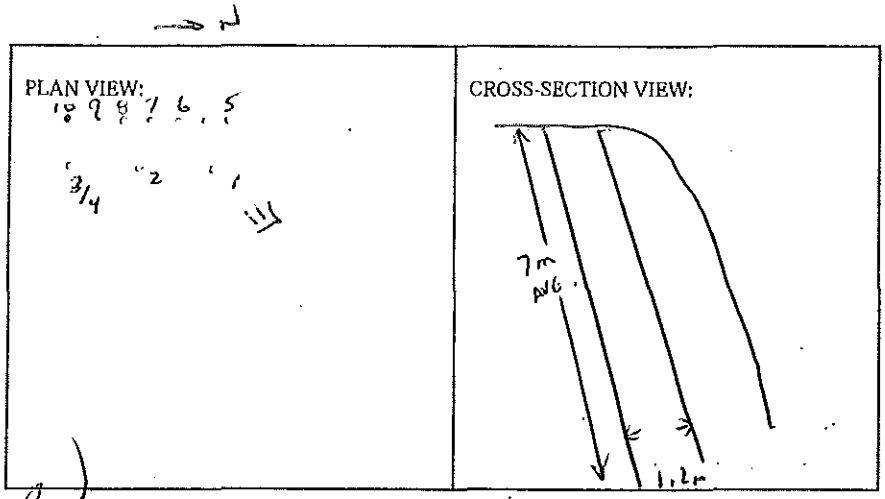
EXPLOSIVE SIZE 4/6 mm by 4/65 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 cliffstone ext - No trace (<0.01 ips)
@ 13093 cliffstone ext - 0.087 ips / 47Hz

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12 11:23 am
BLAST # MW-0076

HIGHWAY# 97
BLAST LOCATION AT: STN 128+34 - 128+38 (Two Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: 4 shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 26 (m)

TOTAL NUMBER OF HOLES 4
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) . BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE HANFO
TOTAL NUMBER OF CARTRIDGES 6
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

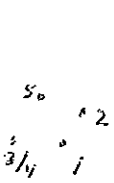
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 100 (m^3)

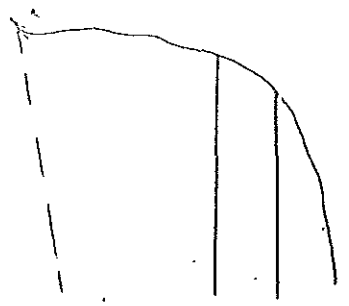
BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 6// location



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffshore Est. - No trigger (< 0.01 ips)
@ 13093 Cliffshore Est. - 0.11 ips / 37 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12
BLAST # MW-0077

12:52 PM

HIGHWAY# 97
BLAST LOCATION AT: SW 12B; 22 - 12B/34 LS (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 6 (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES 76/11/30 Shot / 12 Row
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

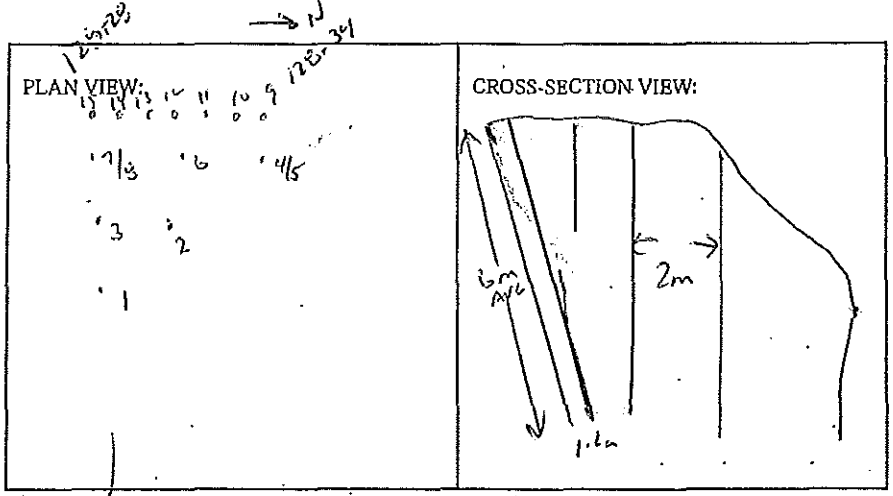
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffside ext - no trigger (0.04 ips)
@ 13093 Cliffside ext - 0.13 ips / 34 HL

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER SB3489
DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12
BLAST # MW-00-28
2:23 PM
HIGHWAY# 97 * shot notified
BLAST LOCATION AT: 120+23 - 120+245 (mm 129 N.)
UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS:

HEIGHT ABOVE HWY 21A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 7 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 75 (m)
TOTAL NUMBER OF HOLES 7&11 / 3 belts / 1 Row
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 13
TOTAL NUMBER OF DELAYS 13
EXPLOSIVE SIZE 75 mm by 200 mm
TOTAL WEIGHT 13 (kg)
DELAY TYPE AND LENGTH 25 (ms)

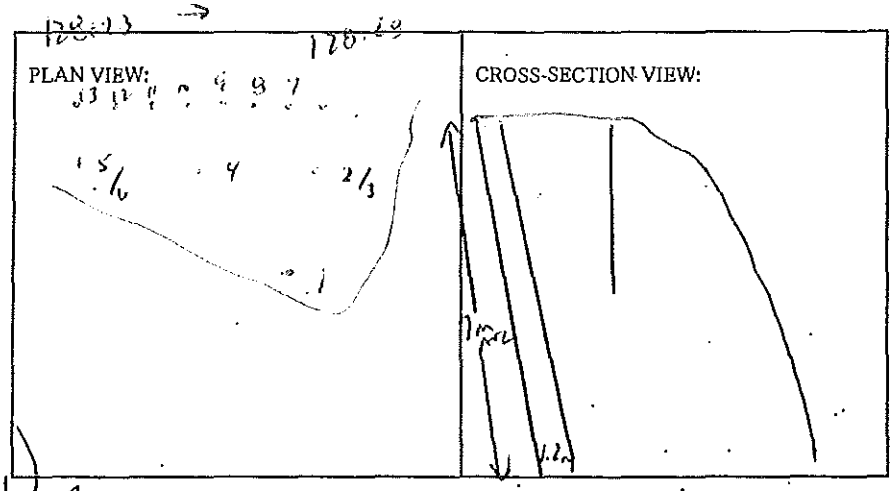
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 160 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verwey COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph 13073 Cliffstone Crt - No Trigger (20.0 mm/s)
@ 13093 Cliffstone Crt - ~~0.11 in/s~~ 0.11 in/s / 64 Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED JAN 9/12
ACTUAL BLAST DATE JAN 9/12 3:24 PM
BLAST # NW-0079

HIGHWAY# 97
BLAST LOCATION AT: STN 128+20 - 128+23 LS (TOP BENCH)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 5.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5.5 (m)
TOTAL DEPTH 27.5 (m)

TOTAL NUMBER OF HOLES 5611
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.77 (m) BURDEN 1.5m (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 20 sp/det.cord

EXPLOSIVE TYPE 1½" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 6 (kg)
DELAY TYPE AND LENGTH 25 (ms)

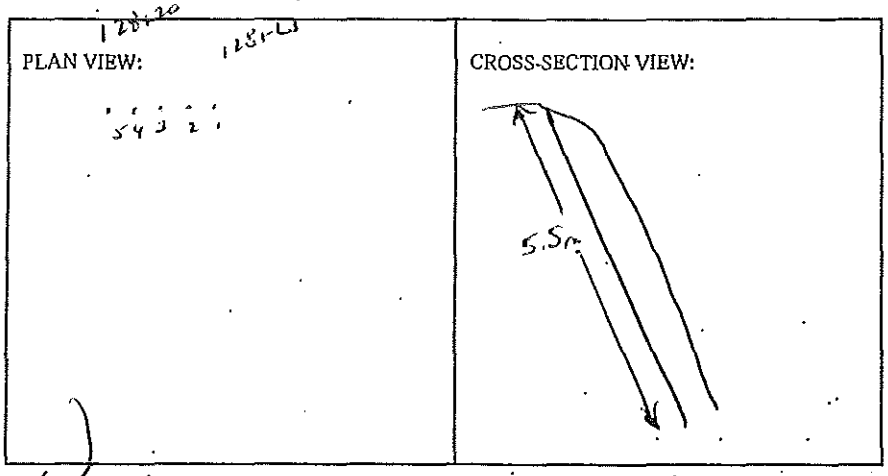
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 25 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vernon COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Ent - No trigger (< 0.04 ins)
@ 13093 Cliffstone Ent - 0.089 ins / 43 1/2

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Jan 9/12
ACTUAL BLAST DATE Jan 9/12 3:51 PM
BLAST # MW-0080

HIGHWAY# 97
BLAST LOCATION AT: Sta 128+10 - 128+20 Lt. (Top Bench)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: Shot marked

HEIGHT ABOVE HWY 5/0 (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 4 (3 loaded)
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 46/1
HOLE DIAMETER 76 (mm)
HOLE SPACING 0.77 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 200g/m det. cord

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 3
TOTAL NUMBER OF DELAYS 3

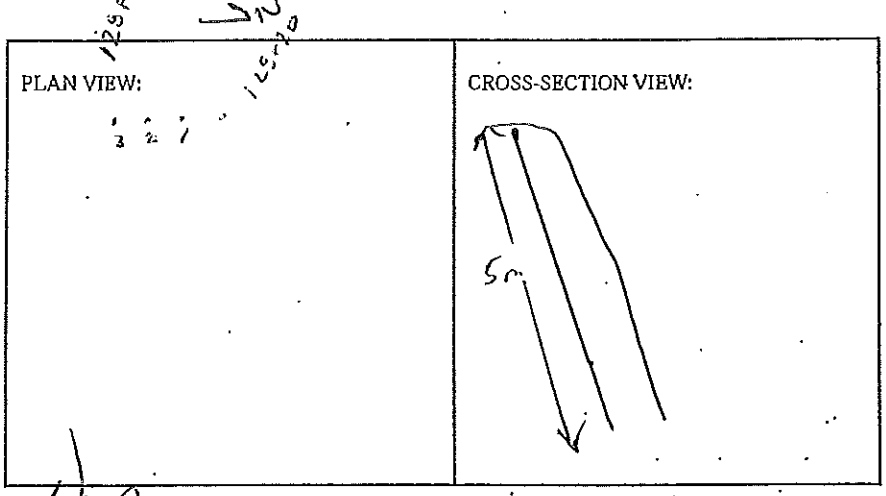
EXPLOSIVE SIZE 42 mm by 400 mm
TOTAL WEIGHT 3.0kg (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 15 m^3 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13073 Cliffstone Crt - No record (< 0.01 ips)
@ 13093 Cliffstone Crt - No record (< 0.01 ips)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Jan 24/11
ACTUAL BLAST DATE Jan 14/11 10:46 AM
BLAST # Mud-0019

HIGHWAY # 97
BLAST LOCATION AT: STN 1271.36 - 1274.50 RS (TO SUBGRADE)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 14 (m)
ROCK TYPE Andesite Conglomerate
DISTANCE TO NEAREST STRUCTURE (UTILITY) 150 (m)

DRILLING DETAILS: @ 2 magazine det cord in 6/1 holes

NUMBER OF BACKLINE HOLES 15
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 7 (m)
TOTAL DEPTH 12.8 (m)

TOTAL NUMBER OF HOLES 15/11/5 buffer
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS: 1.5" Dynamite + 2.5" Blaster Emulsion

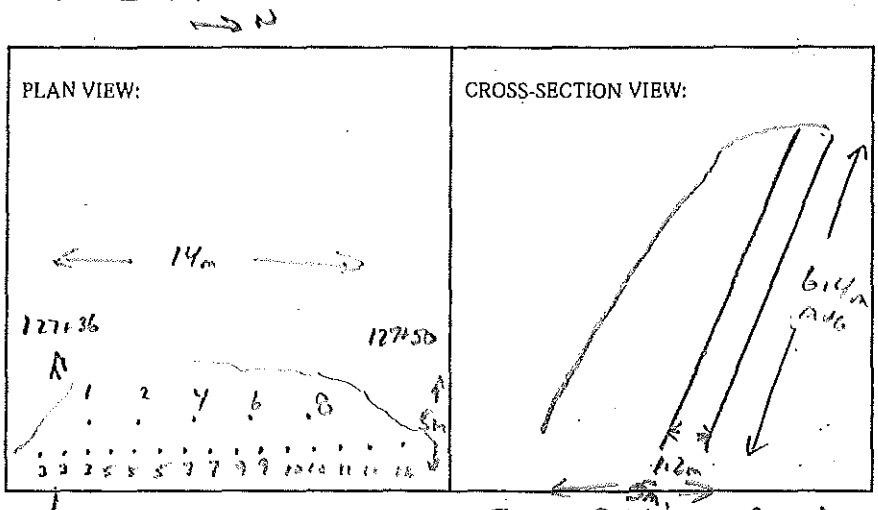
EXPLOSIVE TYPE Dynamite/Blaster
EXPLOSIVE SIZE 65 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES _____
TOTAL WEIGHT 60 (kg)
TOTAL NUMBER OF DELAYS 15
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 500 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13072 Cliffstone C.A. - 0.080ips/ 32Hz
@ 13050 Old Mission Rd - 0.25 ips/ 39Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED JAN 24/12
ACTUAL BLAST DATE JAN 24/12 12:22 pm
BLAST # MW-0092

HIGHWAY# 97
BLAST LOCATION AT: STN 1271.60 - 1271.65 RS (To Subgrade)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES NO TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 135 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 9 (6 loaded)
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.3 (m)
TOTAL DEPTH 90 (m)

TOTAL NUMBER OF HOLES 9611 / 36 Hrs / 3 Rows
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 15
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

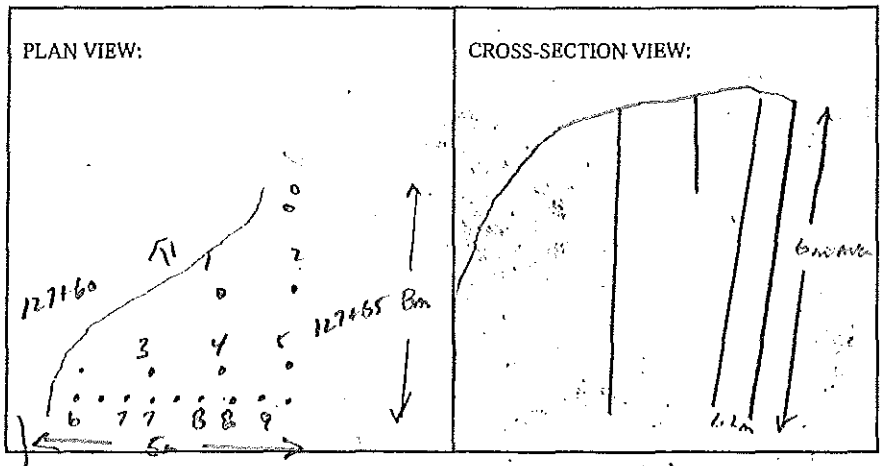
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 250 (m³)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 1307J Cliffside Rd - 0.060 ips/ 34Hz
@ 1306D Old Mission Rd - 0.12 ips/ 51Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER SB3489

DATE PREPARED Jan 24/12
ACTUAL BLAST DATE Jan 24/12 1:39 PM
BLAST # MW-0091

HIGHWAY# 97
BLAST LOCATION AT: Stn 127+65 - 127+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Diorite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 130 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 6 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.2 (m)
TOTAL DEPTH _____ (m)

TOTAL NUMBER OF HOLES _____
HOLE DIAMETER 89 (mm)
HOLE SPACING 2.7 (m) BURDEN 2.7 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite Fanfo
TOTAL NUMBER OF CARTRIDGES _____
TOTAL NUMBER OF DELAYS _____

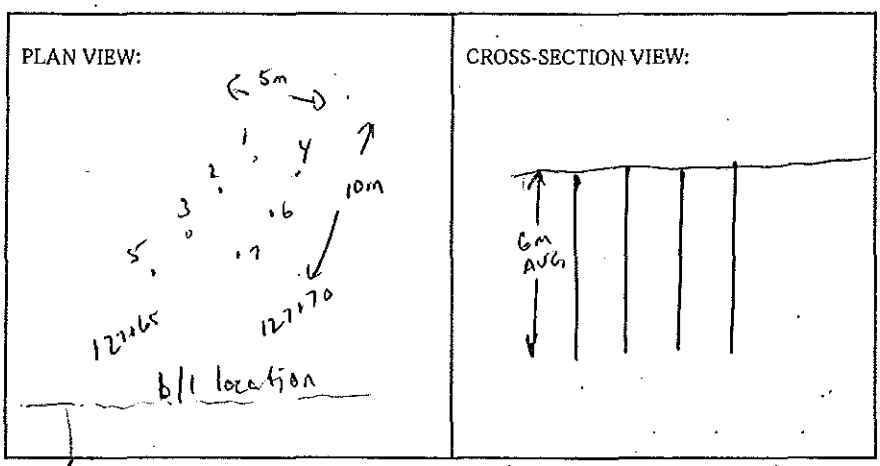
EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 Caps

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13073 Cliffstone Crt - 0.13 ips/ 37Hz
@ 13050 Dog Mission Rd. 0.15 ips/ 34Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5934 89

DATE PREPARED FEB 16/12
PROPOSED BLAST DATE FEB 16/12
BLAST # MW-0115

HIGHWAY# 97
BLAST LOCATION AT: STN 129+77 - 129+83

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY NA (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 2
PROPOSED AVG. DEPTH 2.2 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 2.7 (m)
PROPOSED TOTAL DEPTH 24 (m)

PROPOSED APPROX. NO. OF HOLES 2 6/1/9 8 10
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 55
PROPOSED NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

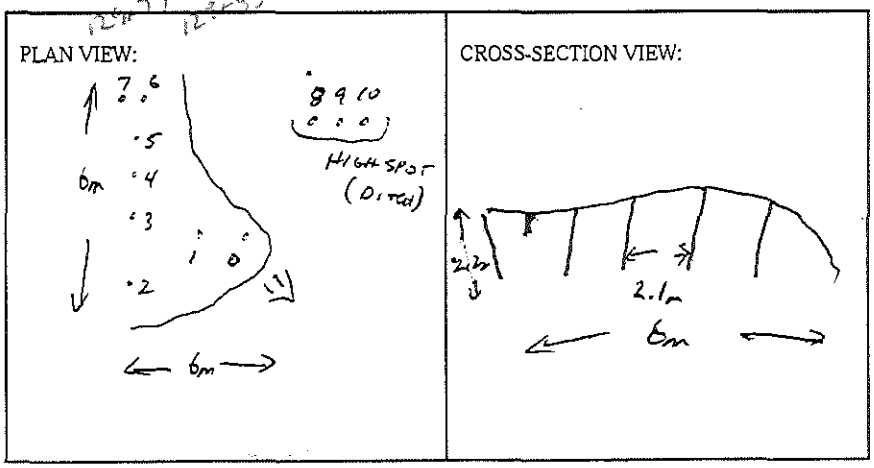
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 60 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5934589

DATE PREPARED Feb 16/12
ACTUAL BLAST DATE Feb 16/12 11:34 AM
BLAST # MW-0115

HIGHWAY# 97
BLAST LOCATION AT: STN 129+77 ⇒ 129+83

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * dirt matted

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 2 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 2
AVERAGE DEPTH 2.2 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 11 - 9 Pass / 2 Bll
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 5.5
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

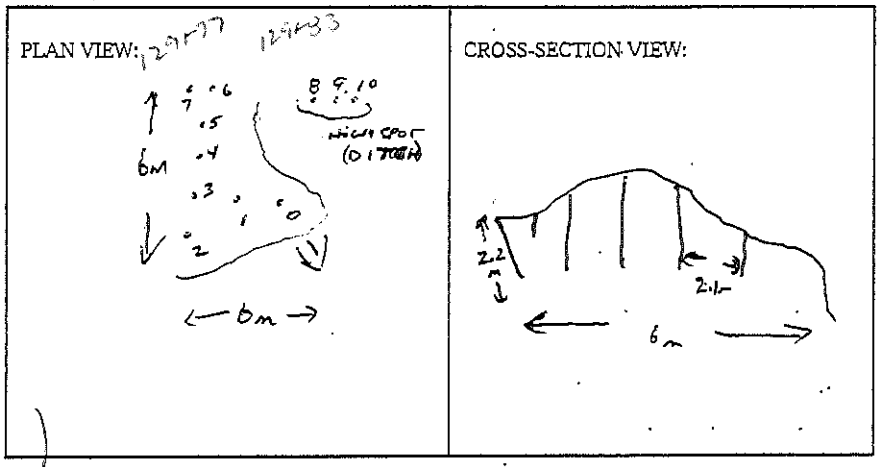
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 cliffstone Crt - 0.084 ips / 34 Hz
@ 13117 cliffstone Crt - 0.13 ips / 57 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 16/12
PROPOSED BLAST DATE Feb 16/12
BLAST # MW-0116

HIGHWAY# 97
BLAST LOCATION AT: STN 129+68 - 129+80

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3.7 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3.6 (m)
PROPOSED TOTAL DEPTH 30 (m)

PROPOSED APPROX. NO. OF HOLES 9
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

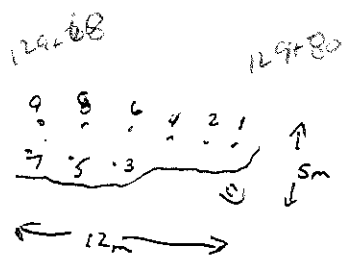
APPROX. VOLUME OF ROCK TO BE BLASTED 110 (m^3)

PROPOSED BLAST SKETCH:

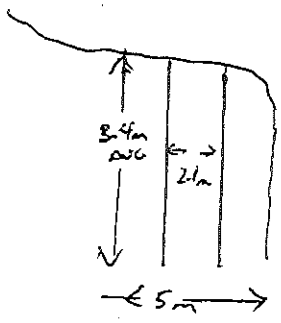
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vickery
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 16/12
ACTUAL BLAST DATE Feb 16/12
BLAST # MW-0116

HIGHWAY# 97
BLAST LOCATION AT: STN

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/C
AVERAGE DEPTH 3.4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 30 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamex + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 90 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

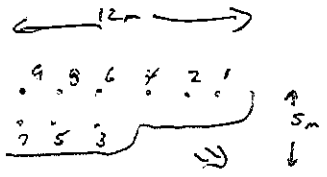
VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH: → N

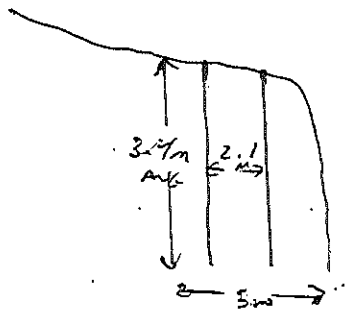
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vickery COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.14 ips / 37 Hz
" @ 13117 Cliffstone Crt - 0.17 ips / 51 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA DRILLING & BLASTING
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 16/12
PROPOSED BLAST DATE FEB 16/12
BLAST # MJ-0117

HIGHWAY# 97
BLAST LOCATION AT: STN 129+70 - 129+77

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH _____ (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 4.2 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 50 (m)

PROPOSED APPROX. NO. OF HOLES 76 11/30 Dia/25 Stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 15
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

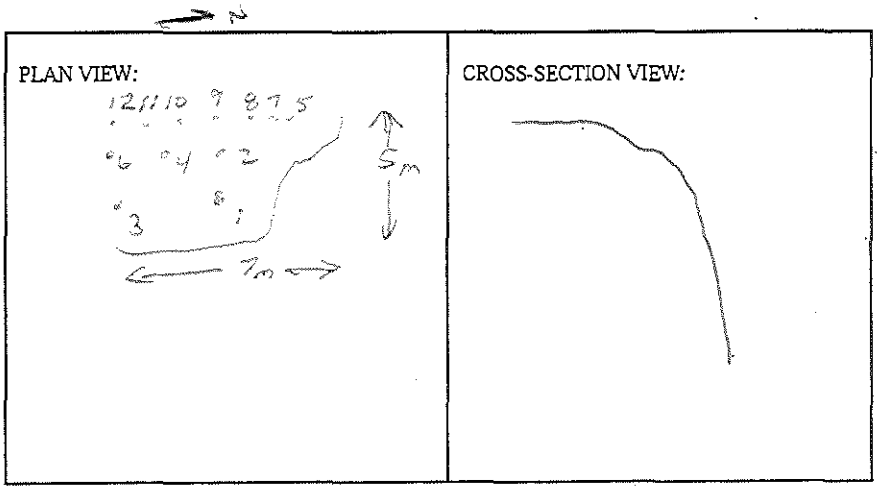
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 80 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesey
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED Feb 16/12
ACTUAL BLAST DATE Feb 16/12 2:14PM
BLAST # MW-0117

HIGHWAY# 97
BLAST LOCATION AT: STN 129+70 - 129+77

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: 2nd Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 7 (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7 (6 loaded)
AVERAGE DEPTH 4.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 5 (m)
TOTAL DEPTH 50 (m)

TOTAL NUMBER OF HOLES 7 blast / 3 buffer / 2 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO + 65mm x 400mm Blastex
TOTAL NUMBER OF CARTRIDGES 11
TOTAL NUMBER OF DELAYS 11

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 30 (kg)
DELAY TYPE AND LENGTH 25 (ms)

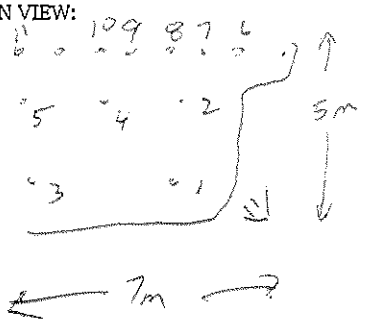
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE Hasco CAPACITY 80 caps

VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH: → N

SHOW THE FOLLOWING:
SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Vesey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffside est - 0.21 ips/ 47Hz
" @ 13117 Cliffside est - 0.14 ips/ 51Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED _____
PROPOSED BLAST DATE _____
BLAST # _____

HIGHWAY# 97
BLAST LOCATION AT: _____

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY _____ (m) SLOPE ANGLE _____ (°) SLOPE LENGTH _____ (m)
ROCK TYPE _____
DISTANCE TO NEAREST STRUCTURE (UTILITY) _____ (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES _____ PROPOSED APPROX. NO. OF HOLES _____
PROPOSED AVG. DEPTH _____ (m) HOLE DIA. _____ (mm)
PROPOSED NO. OF ROWS _____ APPROX. HOLE SPACING _____ (m) BURDEN _____ (m)
PROPOSED MAXIMUM DEPTH _____ (m) PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH _____ (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE Dynamite & ANFO EXPLOSIVE SIZE _____ mm by _____ mm
APPROX. NUMBER OF CARTRIDGES _____ APPROX. TOTAL WEIGHT _____ (kg)
PROPOSED NUMBER OF DELAYS _____ DELAY TYPE AND LENGTH _____ (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED _____ (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:	CROSS-SECTION VIEW:

BLASTING CONSULTANT NAME Daryl Fieger SIGNATURE _____ COMPANY Fieger Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5934 89

DATE PREPARED Feb 7/12
PROPOSED BLAST DATE Feb 17/12
BLAST # MW-018

HIGHWAY# 97
BLAST LOCATION AT: 129+65 - 129+70

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Lava
DISTANCE TO NEAREST STRUCTURE (UTILITY) 30 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 12
PROPOSED AVG. DEPTH 6.2 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6.7 (m)
PROPOSED TOTAL DEPTH 117 (m)

PROPOSED APPROX. NO. OF HOLES 11 6/1 / 5 backfer / 3 stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

Foam 2" Dynamite + 200 grain det cord in oil

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 19
PROPOSED NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

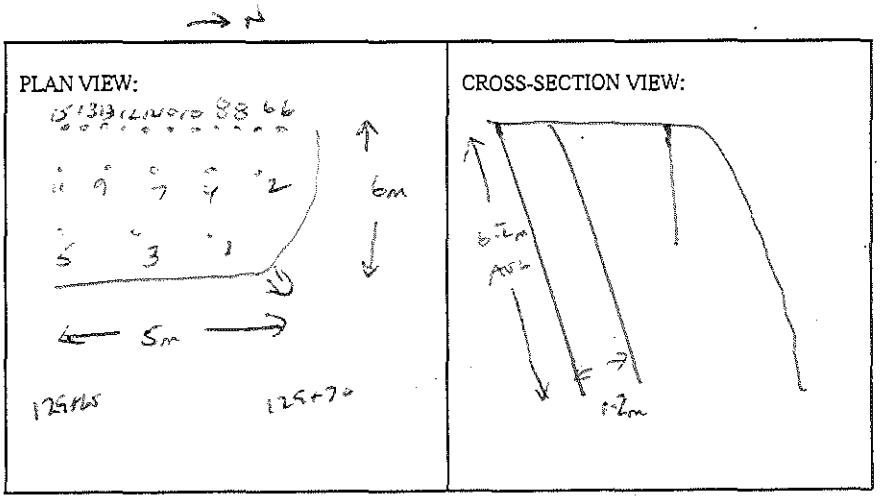
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME WAYNE VERNEY
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Feb 12/16
ACTUAL BLAST DATE Feb 11/16 11:17am
BLAST # MW-011B

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+65 - 129+70

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALTERED GABBRO
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 11
AVERAGE DEPTH 6.2 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.4 (m)
TOTAL DEPTH 11.7 (m)

TOTAL NUMBER OF HOLES 11 bll / 5 buffer / 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

Placed 2"x16" dynamite @ 200g/m det. cord in bll holes
4-8 count 2½"x16" Blastrite in buffer holes

BLAST DETAILS:

EXPLOSIVE TYPE 1" dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 8 (ive)
TOTAL NUMBER OF DELAYS 15

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 60 (kg)
DELAY TYPE AND LENGTH 25 (ms)

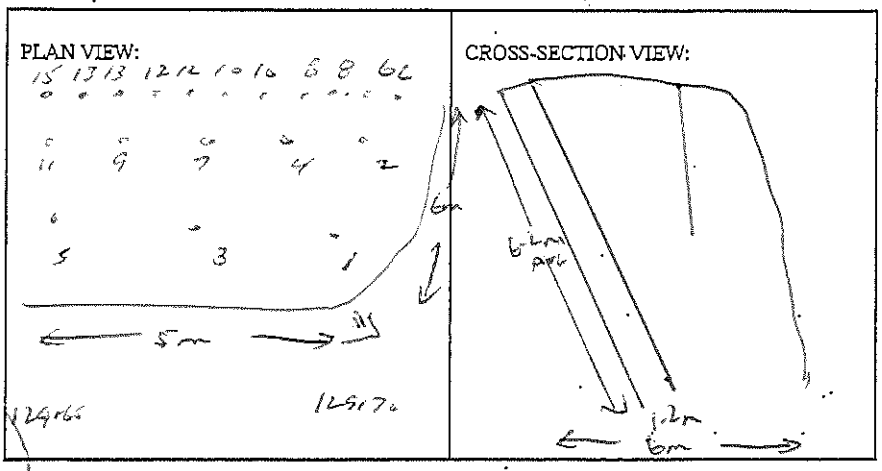
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HASCO CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.19 IPS/ 39Hz
@ 13117 Cliffstone Crt. 0.33 IPS/ 47Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED FEB 17/12
PROPOSED BLAST DATE FEB 17/12
BLAST # MW-0119

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER SB34089

HIGHWAY# 97
BLAST LOCATION AT: STN 129+60 - 129+65

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY 6m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE ALBERT GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 0
PROPOSED AVG. DEPTH 6.4 (m)
PROPOSED NO. OF ROWS 5
PROPOSED MAXIMUM DEPTH 6.6 (m)
PROPOSED TOTAL DEPTH 64 (m)

PROPOSED APPROX. NO. OF HOLES 60ll / 36 bottom 1 row
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2-1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

2x16 DYNAMITE + 200 gm detcord in 5ll holes

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

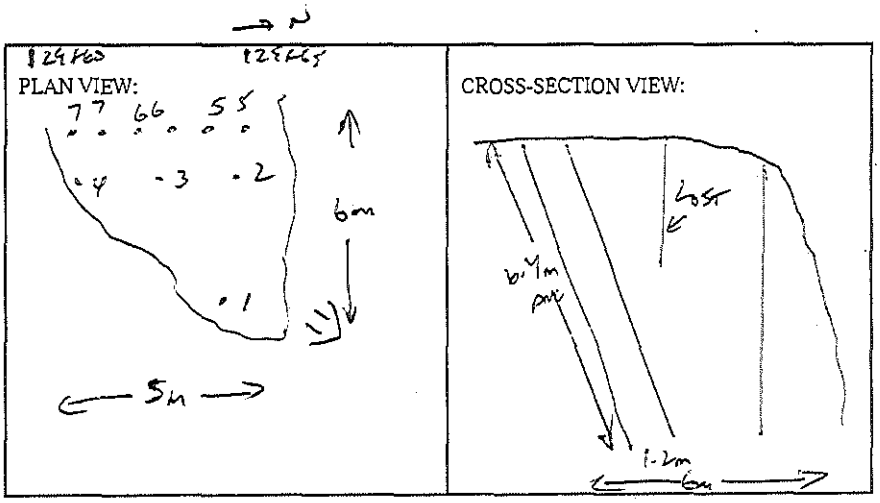
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 120 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE Wayne Verwey COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 17/12
ACTUAL BLAST DATE Feb 17/12 12:56 PM
BLAST # MW-0119

HIGHWAY# 97
BLAST LOCATION AT: STA 129+60 - 129+65

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
no shot noticed

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 65 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 6.4 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6.6 (m)
TOTAL DEPTH 64 (m)

TOTAL NUMBER OF HOLES 65 11 / 36 shot / 1 Pred
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.4 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

1 per 2x16 Dynamite + 200 g det cord in 6 11 hole
5-7 cartridges 65x400 mm Blastrite in Buffer

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 40
TOTAL NUMBER OF DELAYS _____

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 75 (kg)
DELAY TYPE AND LENGTH 25 (ms)

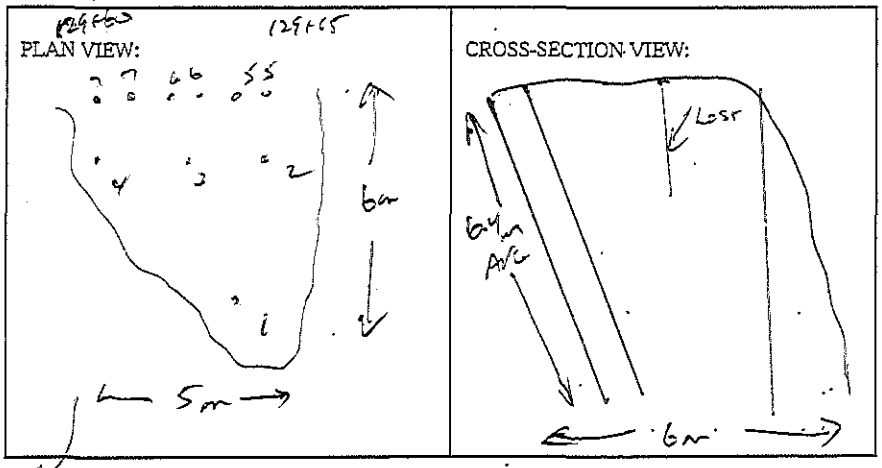
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 120 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Ct + 0.23 ips / 26 Hz
& @ 13117 Cliffstone Ct - 0.29 ips / 49 Hz

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vergeer
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 17/12
ACTUAL BLAST DATE Feb 17/12 11:33 Am
BLAST # M3-0120

HIGHWAY# 97
BLAST LOCATION AT: STN 124+60 Trim

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: Shot netted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 3 (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.6 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 2.6 (m)
TOTAL DEPTH 5.2 (m)

TOTAL NUMBER OF HOLES 2 Trim
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + 2½" Blasting
TOTAL NUMBER OF CARTRIDGES 4
TOTAL NUMBER OF DELAYS 2

EXPLOSIVE SIZE 65 mm by 400 mm
TOTAL WEIGHT 5 (kg)
DELAY TYPE AND LENGTH 25 (ms)

NITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB3020 CAPACITY 80 CAPS

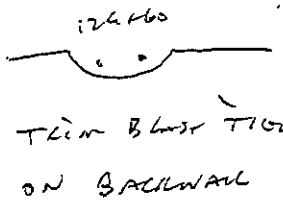
VOLUME OF ROCK BLASTED 10 (Trim) (m^3)

BLAST SKETCH:

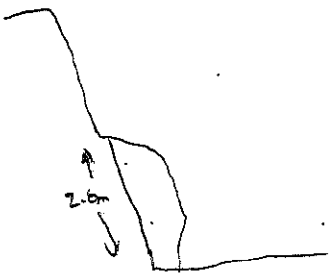
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vergeer COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Cot. 0.061 ips/5/1Hz
@ 13117 Cliffstone Cot - 0.075 ips/5/1Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 29/12
PROPOSED BLAST DATE FEB 29/12
BLAST # MW-0131

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES n/c
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 35 (m)
PROPOSED APPROX. NO. OF HOLES 7
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: 129+35 129+40 ← 5m → 5:2 3:1 1:1 1:6 1:1 10m

CROSS-SECTION VIEW: 5m Avg. 2.1m ← 10m →

BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Feb 29/12
ACTUAL BLAST DATE Feb 29/12
BLAST # MW-0131 11:14 AM

HIGHWAY# 97
BLAST LOCATION AT: 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * slot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 7
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

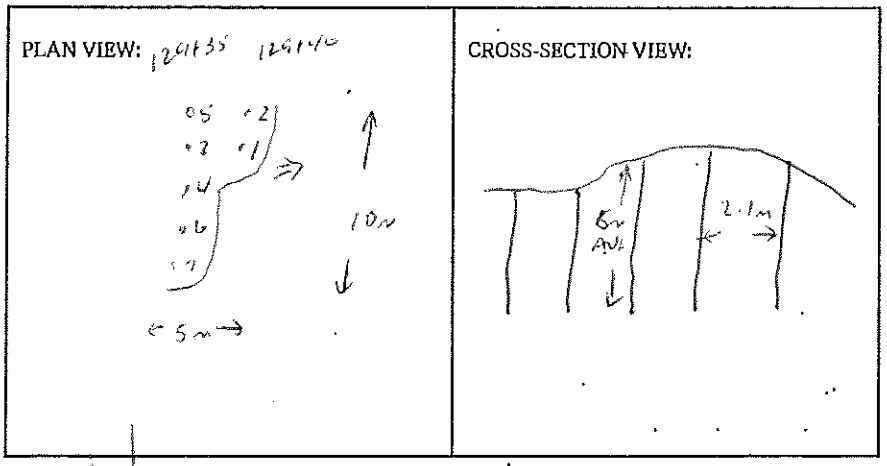
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Diffaster Cnt - 0.052 ips / 51 Hz
" 10117 Diffaster Cnt - 0.12 ips / 39 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
DATE PREPARED FEB 28/12
BLASTER'S NAME Wayne Verweg
PROPOSED BLAST DATE FEB 29/12
BLASTER'S CERTIFICATE NUMBER 583489
BLAST # MW-0132

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+35 - 129+45

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 35 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED APPROX. NO. OF HOLES 3
PROPOSED AVG. DEPTH 7.5 (m)
HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 2
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED MAXIMUM DEPTH 8 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 22.5 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Blastex
EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. NUMBER OF CARTRIDGES 22
APPROX. TOTAL WEIGHT 35 (kg)
PROPOSED NUMBER OF DELAYS 5
DELAY TYPE AND LENGTH 25 (ms)

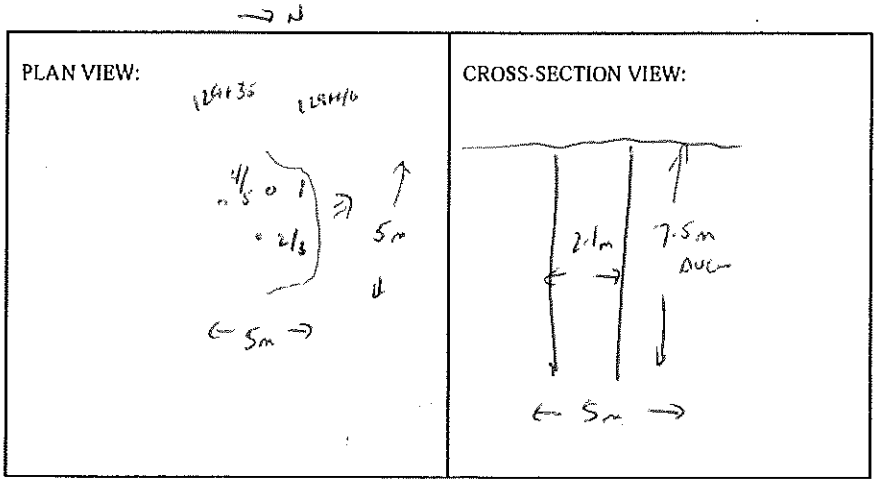
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 60 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 110 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vessey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 29/12
ACTUAL BLAST DATE FEB 29/12 12:54 PM
BLAST # MW-0132

HIGHWAY# 97
BLAST LOCATION AT: STA 129+35 - 129+40

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot melted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Massive Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 7.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 22.5 (m)

TOTAL NUMBER OF HOLES 3
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 2" Dynamite + Blaster
TOTAL NUMBER OF CARTRIDGES 22
TOTAL NUMBER OF DELAYS 3

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

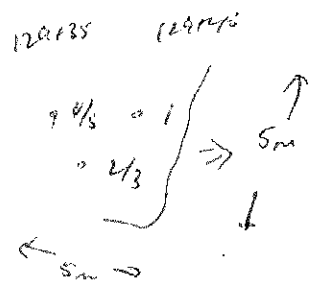
VOLUME OF ROCK BLASTED 110 (m^3)

BLAST SKETCH:

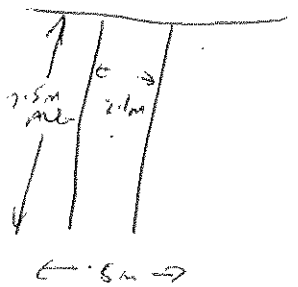
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Chainstone cut - 0.12 ips/ 32 mm
" @ 13117 Chainstone cut - 0.21 ips/ 37.42

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED Feb 29/12
PROPOSED BLAST DATE Feb 29/12
BLAST # MW-0133

HIGHWAY# 97
BLAST LOCATION AT: SB 129+37 - 129+35

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 2.7 (m)
PROPOSED TOTAL DEPTH 23 (m)

PROPOSED APPROX. NO. OF HOLES 9
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m), BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 203 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

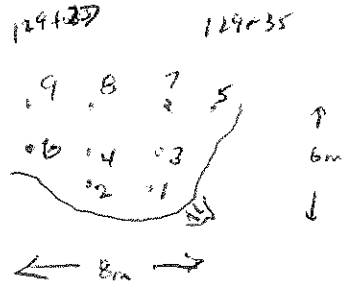
APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

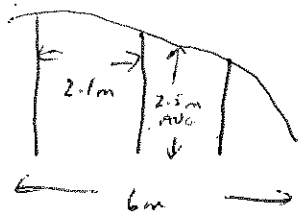
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fieger SIGNATURE _____ COMPANY Fieger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED FEB 29/12
ACTUAL BLAST DATE FEB 29/12 2:23 PM
BLAST # MW-0133

HIGHWAY# 97
BLAST LOCATION AT: STN 129+27 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 2.7 (m)
TOTAL DEPTH 23 (m)

TOTAL NUMBER OF HOLES 9
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

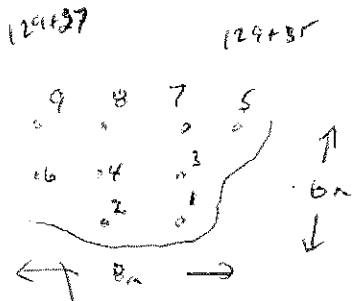
VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

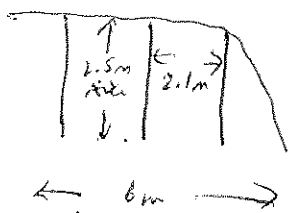
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Crt 0.046 ips/ 37 mm
" @ 13117 Cliffstone Crt. 0.095 ips/ 51 mm

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED March/12
PROPOSED BLAST DATE March/12
BLAST # MW-0134

HIGHWAY# 97
BLAST LOCATION AT: Sta 1251+40 - 1251+60 (High spots)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6 ea
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 1
PROPOSED MAXIMUM DEPTH 2.8 (m)
PROPOSED TOTAL DEPTH 20 (m)

PROPOSED APPROX. NO. OF HOLES 8
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

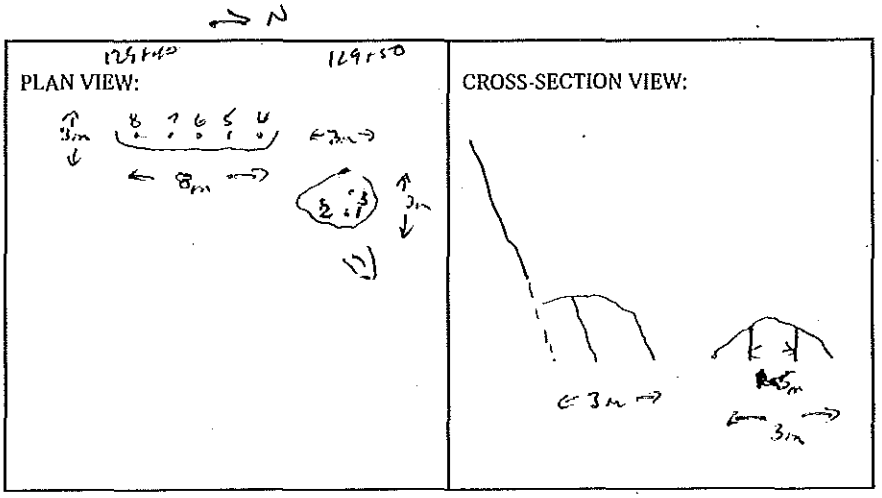
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED High spots (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Veasey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 11:02 AM
BLAST # MW-0134

HIGHWAY# 97
BLAST LOCATION AT: 5TH 129+40 - 129+50 (HIGH SPOTS)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * Shotmatted

HEIGHT ABOVE HWY N/a (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 1
MAXIMUM DEPTH 2.8 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 8
HOLE DIAMETER 76 (mm)
HOLE SPACING 1.5 (m) BURDEN 1.5 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

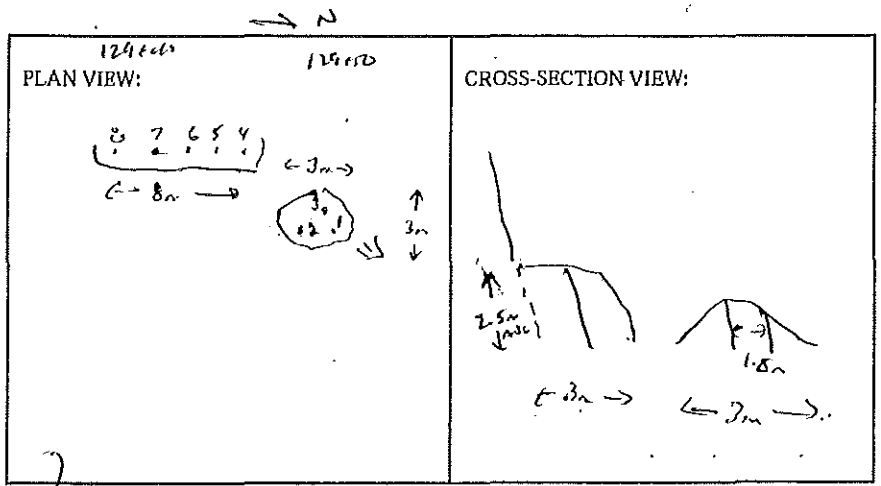
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED HIGH SPOTS (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Cut - 0.092 ips | 47 Hz
" @ 13117 Cliffstone Cut - 0.171 ips | 43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 1/12
PROPOSED BLAST DATE Mar 1/12
BLAST # MW-0135

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+35 - 129+40

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS: 5 bl / 3 Buffer / 2 Stab / 1 Prod

PROPOSED NO. OF BACKLINE HOLES 5
PROPOSED AVG. DEPTH 8 (m)
PROPOSED NO. OF ROWS 4
PROPOSED MAXIMUM DEPTH 8.5 (m)
PROPOSED TOTAL DEPTH 75 (m)

PROPOSED APPROX. NO. OF HOLES _____
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.0 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 320 CAPACITY 80 caps

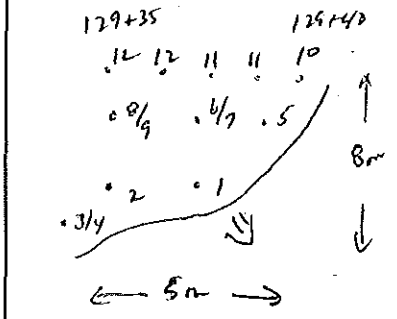
APPROX. VOLUME OF ROCK TO BE BLASTED 300 (m^3)

PROPOSED BLAST SKETCH:

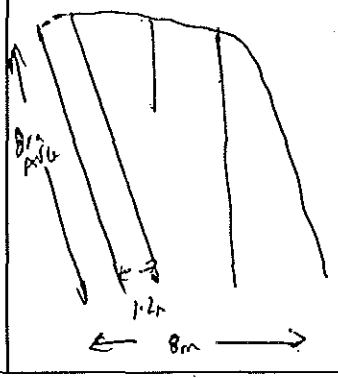
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.

BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834089

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 1:08pm
BLAST # MW-0135

HIGHWAY# 97
BLAST LOCATION AT: STN 129+35 - 129+40 LS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 4
MAXIMUM DEPTH 8.5 (m)
TOTAL DEPTH 75 (m)

TOTAL NUMBER OF HOLES 1 Reco / 2 Stnd / 3 Buffer = 6//
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS: * 200 grain cord + 2" dynamite in B1/ 50 mm x 400 mm Blaster in Buffer

EXPLOSIVE TYPE 1" DYNAMITE HANCO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 12

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 65 (kg)
DELAY TYPE AND LENGTH 25 (ms)

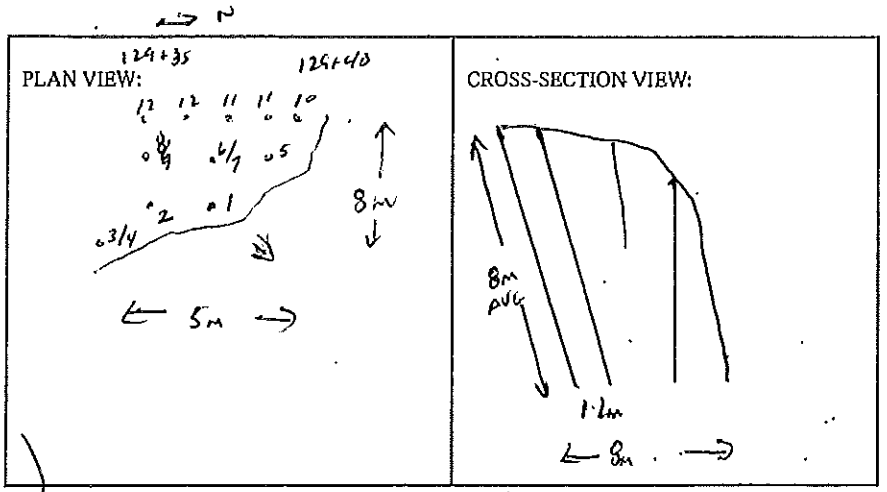
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 300 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.15 ips / 43 Hz
" @ 13117 Cliffstone Ct - 0.19 ips / 43 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED May 1/12
PROPOSED BLAST DATE May 1/12
BLAST # MW-0136

HIGHWAY# 97
BLAST LOCATION AT: 129+30 - 129+35

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 21 (m)
PROPOSED APPROX. NO. OF HOLES 7 ea
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB 380 CAPACITY 80 caps

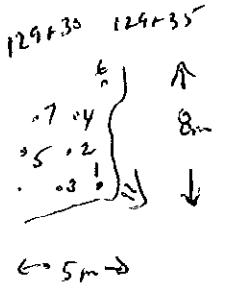
APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

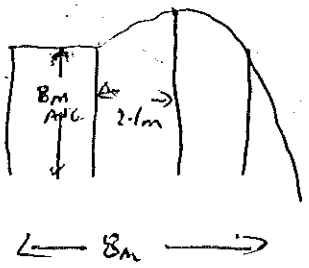
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fieber SIGNATURE _____ COMPANY Fieber Rock Eng.

BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vegas
BLASTER'S CERTIFICATE NUMBER 5B3409

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 2:26 PM
BLAST # MW-0136

HIGHWAY# 97
BLAST LOCATION AT: SW 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5PC
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 7 PROD
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

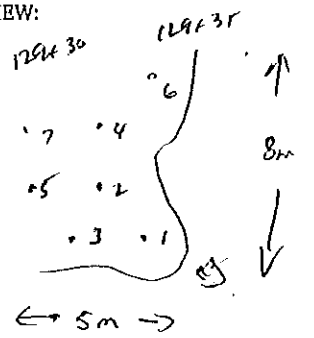
VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

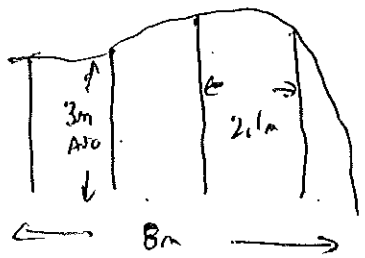
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vegas COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 Cliffstone Ct - 0.081 ips / 23Hz
" @ 13177 Cliffstone Ct. - 0.141 ips / 47Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweg
BLASTER'S CERTIFICATE NUMBER 5B34B9

DATE PREPARED Mar 1/12
PROPOSED BLAST DATE Mar 1/12
BLAST # MW-013

HIGHWAY# 97
BLAST LOCATION AT: STN 129+22 - 129+30

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES NO

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES n/a PROPOSED APPROX. NO. OF HOLES 9 Approx
PROPOSED AVG. DEPTH 3 (m) HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 3 APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED MAXIMUM DEPTH 3.3 (m) PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 28 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. NUMBER OF CARTRIDGES 9 APPROX. TOTAL WEIGHT 35 (kg)
PROPOSED NUMBER OF DELAYS 9 DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HP3280 CAPACITY 80 caps

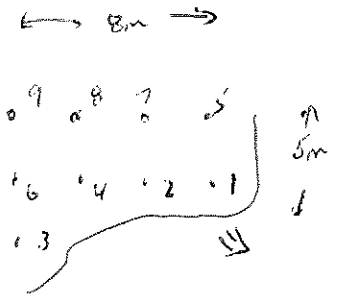
APPROX. VOLUME OF ROCK TO BE BLASTED 75 (m^3)

PROPOSED BLAST SKETCH:

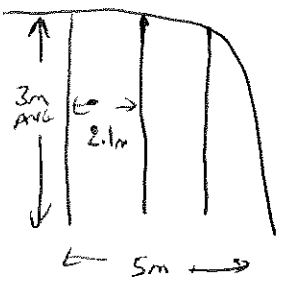
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fleger SIGNATURE _____ COMPANY Fleger Rock Eng.
BLASTER'S SIGNATURE Wayne Verweg COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vowsey
BLASTER'S CERTIFICATE NUMBER 5834087

DATE PREPARED Mar 1/12
ACTUAL BLAST DATE Mar 1/12 3:32PM
BLAST # MW-0134

HIGHWAY# 97
BLAST LOCATION AT: STA 129+00 - 129+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: *shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 28 (m)

TOTAL NUMBER OF HOLES 9 pcs
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 35 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HD320 CAPACITY 80 CAPS

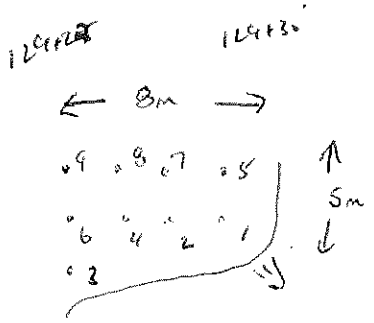
VOLUME OF ROCK BLASTED 75 (m^3)

BLAST SKETCH:

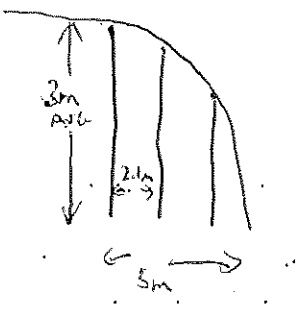
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph 13167 Cliffside ext : No Trig < 0.04 IPS
" @ 13167 Cliffside ext - 0.080 IPS / 64Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
PROPOSED BLAST DATE Mar 2/12
BLAST # MW-0138

HIGHWAY# 97
BLAST LOCATION AT: STN 129+80 - 129+35

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 21 (m)
PROPOSED APPROX. NO. OF HOLES 7 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2-1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 7
EXPLOSIVE SIZE 40 mm by 420 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HR320 CAPACITY 80 CAPS

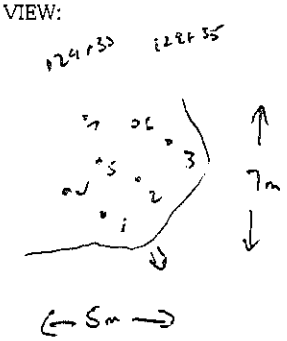
APPROX. VOLUME OF ROCK TO BE BLASTED 80 (m^3)

PROPOSED BLAST SKETCH:

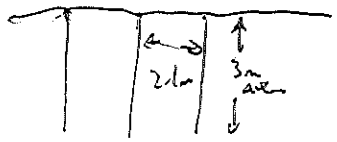
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Daryl Fieger SIGNATURE _____ COMPANY Fieger Rock Eng.
BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
ACTUAL BLAST DATE Mar 2/12 10:43 AM
BLAST # Mw-013E

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Slot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Andesite Breccia
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES N/A
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 21 (m)

TOTAL NUMBER OF HOLES 7 Proc.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 40 mm by 400 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HOZZO CAPACITY 80 Caps

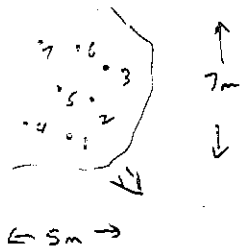
VOLUME OF ROCK BLASTED 80 (m³)

BLAST SKETCH:

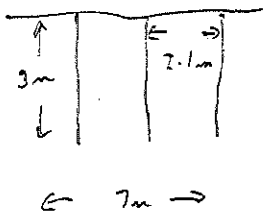
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 1316 Cliffstone Cut - 0.048 ips/39 Hz
" @ 1317 Cliffstone Cut - 0.090 ips/51 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verwey
BLASTER'S CERTIFICATE NUMBER 5934 89

DATE PREPARED Mar 2/12
PROPOSED BLAST DATE Mar 4/12
BLAST # MW-12139

HIGHWAY# 97
BLAST LOCATION AT: 129+30 - 129+355

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Andesite Granodiorite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 8
PROPOSED AVG. DEPTH 5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 5 (m)
PROPOSED TOTAL DEPTH 100 (m)

PROPOSED APPROX. NO. OF HOLES 86 / 45 Can / 3 Shots
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite ~~Magnum~~ 50mm Exydon Binary
APPROX. NUMBER OF CARTRIDGES 18
PROPOSED NUMBER OF DELAYS 13

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 50 (kg)
DELAY TYPE AND LENGTH 25 (ms)

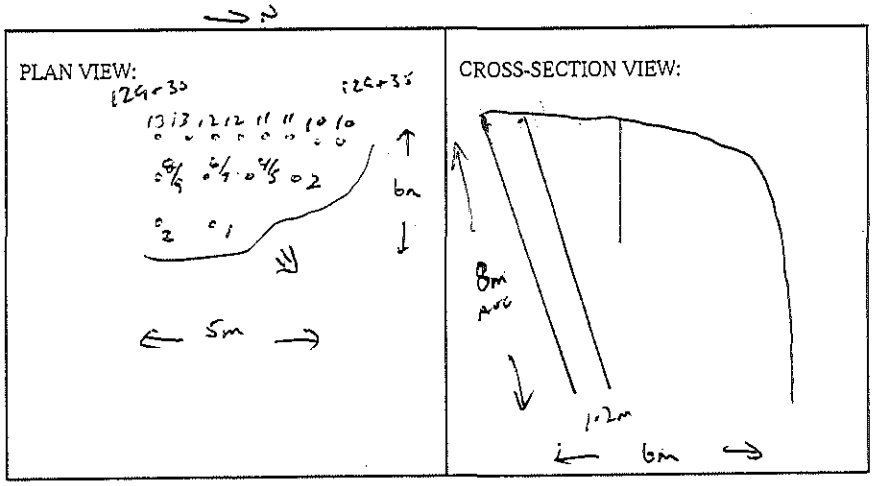
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 caps

APPROX. VOLUME OF ROCK TO BE BLASTED 250 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTING CONSULTANT NAME Daryl Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vickery
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
ACTUAL BLAST DATE Mar 2/12 12:36PM
BLAST # Mar-C139

HIGHWAY# 97
BLAST LOCATION AT: STN 129+30 - 129+35

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY 21m (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 5 (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 8
AVERAGE DEPTH 8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 8 (m)
TOTAL DEPTH 120 (m)

TOTAL NUMBER OF HOLES 8bl / 46 ctr / 2 stb
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite + 50mm x 400mm Blastex
EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 18
TOTAL WEIGHT 50 (kg)
TOTAL NUMBER OF DELAYS 13
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HOS220 CAPACITY 80 caps

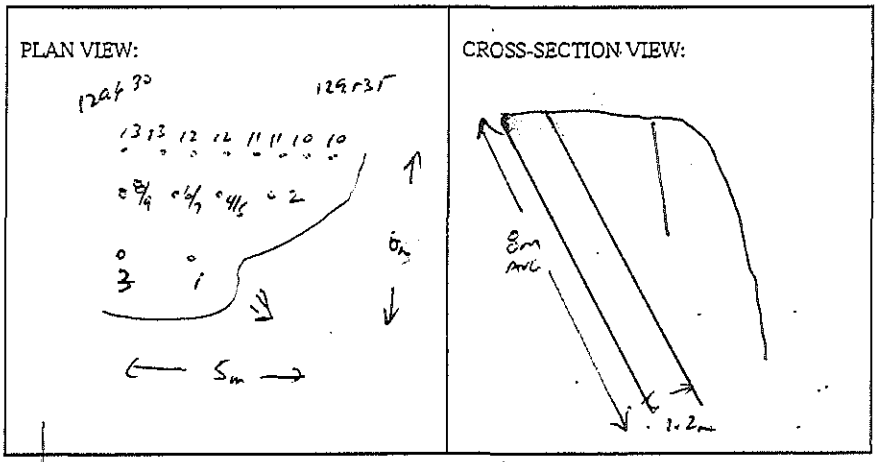
VOLUME OF ROCK BLASTED 250 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Vickery COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone ct. 0.12 ips/37Hz
@ 13117 Cliffstone ct. 0.15 ips/51Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
PROPOSED BLAST DATE Mar 2/12
BLAST # MW-0140

HIGHWAY# 97
BLAST LOCATION AT: STA 129+21 - 129+30

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9, (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 7
PROPOSED AVG. DEPTH 5.8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 6 (m)
PROPOSED TOTAL DEPTH 62 (m)

PROPOSED APPROX. NO. OF HOLES 74/35 Staggered/2 Rows
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1½" DYNAMITE + 2" BLASTRITE
APPROX. NUMBER OF CARTRIDGES 26
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 60 CAPS

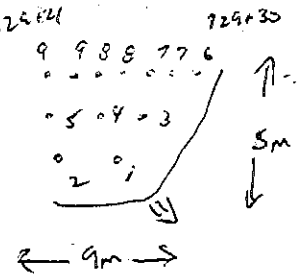
APPROX. VOLUME OF ROCK TO BE BLASTED 200 (m^3)

PROPOSED BLAST SKETCH:

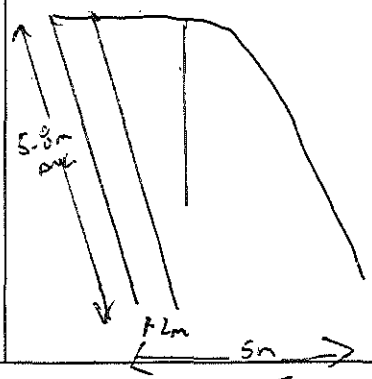
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FLEBER SIGNATURE _____ COMPANY FLEBER ROCK ENG.

BLASTER'S SIGNATURE _____ COMPANY SIERRA DRILLING + BLASTING

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 5834989

DATE PREPARED MAR 2/12
ACTUAL BLAST DATE MAR 2/12 2:09 PM
BLAST # MW-0140

HIGHWAY# 97
BLAST LOCATION AT: STN 129+21 - 129+30

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: no shot notes

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 9 (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 7
AVERAGE DEPTH 5.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 6 (m)
TOTAL DEPTH 62 (m)

TOTAL NUMBER OF HOLES 7 (1) / 36 buffer / 12 shots
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1½" Dynamite x 50mm Blasting Cap
TOTAL NUMBER OF CARTRIDGES 26
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

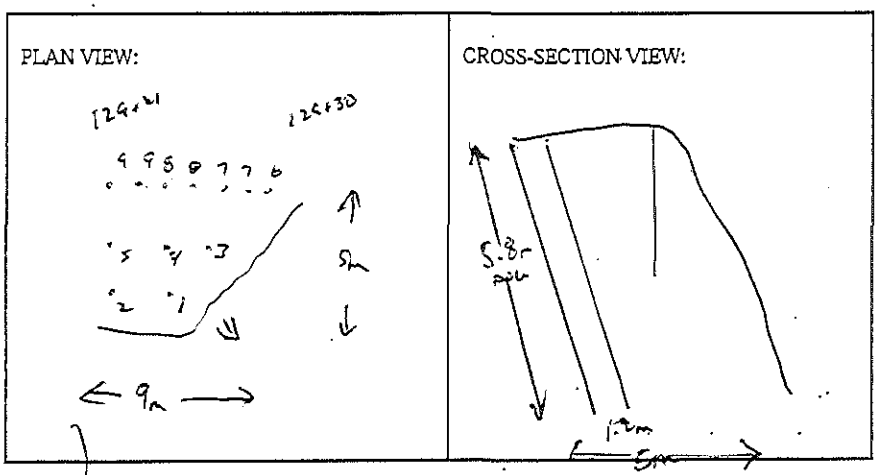
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSX20 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 200 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

Seismograph @ 13167 cliffstone ent. 0.12ips / 30Hz
@ 13117 Cliffstone ent, 0.22ips / 47Hz

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Verney
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 5/12
ACTUAL BLAST DATE MAR 5/12 2:18 PM
BLAST # MW-0141

HIGHWAY# 97
BLAST LOCATION AT: Sta 129+15 - 129+20

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * shot matted

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 4 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 4.2 (m)
TOTAL DEPTH 12 (m)

TOTAL NUMBER OF HOLES 8 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" emulsion + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

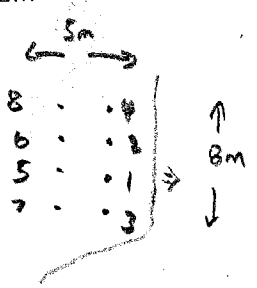
VOLUME OF ROCK BLASTED 150 (m^3)

BLAST SKETCH: → N 129+15 129+20

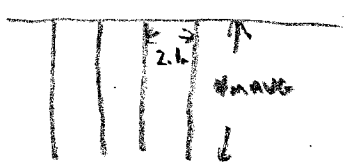
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- HOLE LOCATIONS
- HOLE DEPTH
- TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Verney COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Client Cont. 0.092 ips/37Hz
@ 13117 Client Cont. 0.17 ips/57Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Verweij
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 5/12
PROPOSED BLAST DATE Mar 9/12
BLAST # MW-0141

HIGHWAY# 97
BLAST LOCATION AT: SBD 129+15 - 129+20

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY n/a (m) SLOPE ANGLE n/a (°) SLOPE LENGTH n/a (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES N/A
PROPOSED APPROX. NO. OF HOLES 8 Pairs
PROPOSED AVG. DEPTH 4 (m)
HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 2
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED MAXIMUM DEPTH 4.2 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 32 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. NUMBER OF CARTRIDGES 8
APPROX. TOTAL WEIGHT 25 (kg)
PROPOSED NUMBER OF DELAYS 8
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

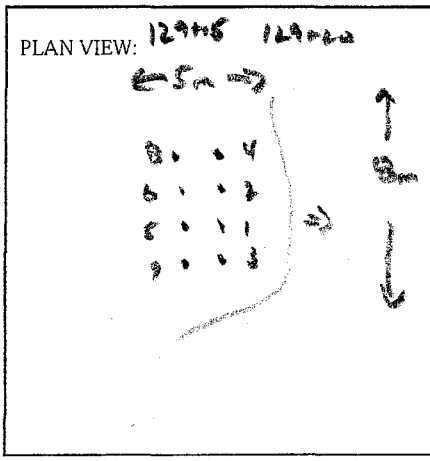
APPROX. VOLUME OF ROCK TO BE BLASTED 150 (m^3)

PROPOSED BLAST SKETCH:

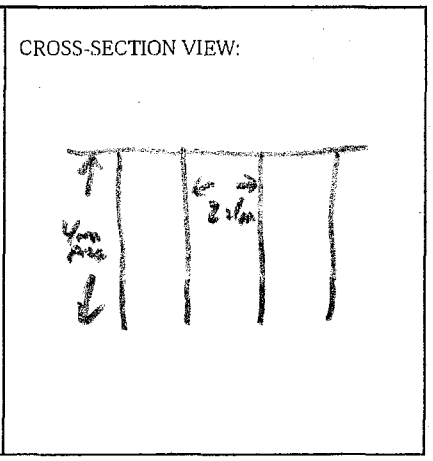
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW: 129+16 129+20



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME Darul Fleber SIGNATURE _____ COMPANY Fleber Rock Eng.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vesely
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 6/12
ACTUAL BLAST DATE Mar 6/12 11:08 AM
BLAST # MW-0142

HIGHWAY# 97
BLAST LOCATION AT: STA 129+40 (High spot)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: # shot method

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Alkaline Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 2.5 (m)
TOTAL DEPTH 12.5 (m)

TOTAL NUMBER OF HOLES 5 Pend.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1/4 Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 5
TOTAL NUMBER OF DELAYS 5

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 15 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

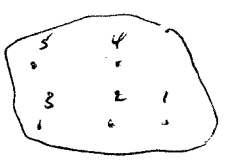
VOLUME OF ROCK BLASTED Nil (High spot) (m^3)

BLAST SKETCH:

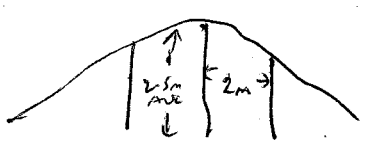
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 129+40 → N



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vesely COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.047 ips / 51 Hz
" @ 13117 Cliffstone Crt. 0.070 ips / 43 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

DATE PREPARED MAR 6/12
CONTRACTOR'S NAME SIERRA Drilling + Blasting
PROPOSED BLAST DATE MAR 6/12
BLASTER'S NAME WAYNE VERWEY
BLAST # MW-0142
BLASTER'S CERTIFICATE NUMBER 583489

HIGHWAY# 97
BLAST LOCATION AT: STN 122+40 (high spot)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE MIXED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED APPROX. NO. OF HOLES 5
PROPOSED AVG. DEPTH 2.5 (m)
HOLE DIA. 76 (mm)
PROPOSED NO. OF ROWS 2
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED MAXIMUM DEPTH 2.5 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE
PROPOSED TOTAL DEPTH 12.5 (m)

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. NUMBER OF CARTRIDGES 5
APPROX. TOTAL WEIGHT 15 (kg)
PROPOSED NUMBER OF DELAYS 5
DELAY TYPE AND LENGTH 5.5 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

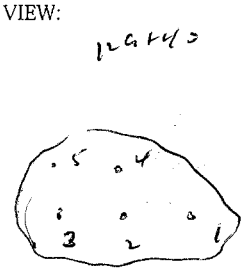
APPROX. VOLUME OF ROCK TO BE BLASTED Nil (High Spot) (m^3)

PROPOSED BLAST SKETCH:

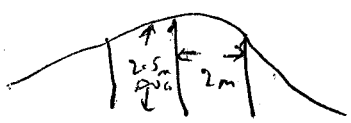
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #:
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 6/12
ACTUAL BLAST DATE Mar 6/12 1:12 PM
BLAST # MW-0143

HIGHWAY# 97
BLAST LOCATION AT: STN 129+16 - 129+20 CS

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION

SITE DETAILS: * slot notched

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Altered Granitic
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 6
AVERAGE DEPTH 3.3 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.6 (m)
TOTAL DEPTH 33 (m)

TOTAL NUMBER OF HOLES 6 bll / 36 buffer / 3 stab
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) VERTICAL HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2" Blaster EXPLOSIVE SIZE 50 mm by 400 mm
TOTAL NUMBER OF CARTRIDGES 24 TOTAL WEIGHT 40 (kg)
TOTAL NUMBER OF DELAYS 9 DELAY TYPE AND LENGTH 25 (ms)

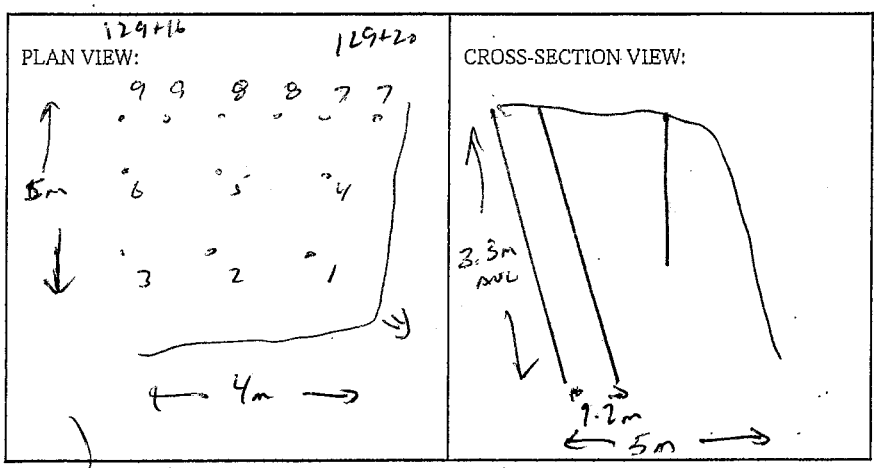
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY)
BLASTING MACHINE: TYPE HGS20 CAPACITY 80 caps

VOLUME OF ROCK BLASTED 60 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE Wayne Vorsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE)

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.13 ips / 5 Hz
" @ 13117 Cliffstone Crt - 0.18 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling & Blasting
BLASTER'S NAME Wayne Vernon
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 6/12
PROPOSED BLAST DATE Mar 6/12
BLAST # MW-0143

HIGHWAY# 97
BLAST LOCATION AT: STN 129+16 ~ 129+20 LS

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE ~~63~~ 63 (°) SLOPE LENGTH 4 (m)
ROCK TYPE Blocky Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 50 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES 6
PROPOSED AVG. DEPTH 3.3 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.6 (m)
PROPOSED TOTAL DEPTH 33 (m)

PROPOSED APPROX. NO. OF HOLES 6 6/1 / 3 Buffer / 3 Stab
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + 2" Blastex
APPROX. NUMBER OF CARTRIDGES 24
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 50 mm by 403 mm
APPROX. TOTAL WEIGHT 40 (kg)
DELAY TYPE AND LENGTH 25 (ms)

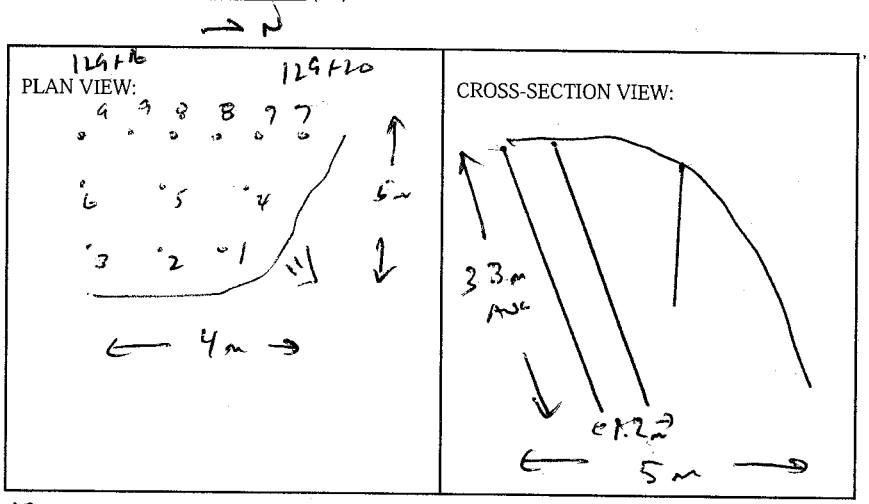
INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HS 320 CAPACITY 80 CAPS

APPROX. VOLUME OF ROCK TO BE BLASTED 60 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW



BLASTING CONSULTANT NAME D. Fraser SIGNATURE _____ COMPANY Fraser Rock Co.
BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling & Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____
(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vessey
BLASTER'S CERTIFICATE NUMBER 5834689

DATE PREPARED May 6/12
ACTUAL BLAST DATE May 6/12 2:15 PM
BLAST # MW-0144

HIGHWAY# 97
BLAST LOCATION AT: STN 129+40 (HIGH SPOT)

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

SITE DETAILS: * Shot marked

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITE
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES NIL
AVERAGE DEPTH 2.5 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3.0 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 10
HOLE DIAMETER 76 (mm)
HOLE SPACING 2 (m) BURDEN 2 (m)
HOLE INCLINATION: (CIRCLE) ~~VERTICAL~~ HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
TOTAL NUMBER OF CARTRIDGES 10
TOTAL NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

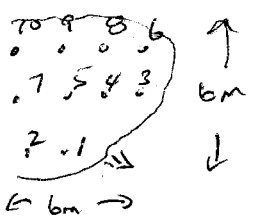
VOLUME OF ROCK BLASTED NIL (HIGH SPOT) (m^3)

BLAST SKETCH:

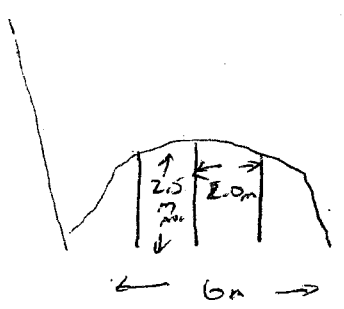
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW: 129+40



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vessey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt – 0.091 ips / 47 Hz
" @ 13117 Cliffstone Crt – 0.11 ips / 47 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 5B3489

DATE PREPARED MAR 6/12
PROPOSED BLAST DATE MAR 8/12
BLAST # MU-0144

HIGHWAY# 97
BLAST LOCATION AT: STA 129+40 (Light spot)

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 2.5 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3.0 (m)
PROPOSED TOTAL DEPTH 25 (m)

PROPOSED APPROX. NO. OF HOLES 10
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2 (m) BURDEN 2 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 10
PROPOSED NUMBER OF DELAYS 10

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

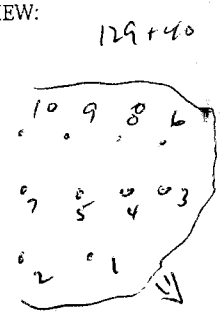
APPROX. VOLUME OF ROCK TO BE BLASTED NIL (LIGHT SPOT) (m^3)

PROPOSED BLAST SKETCH:

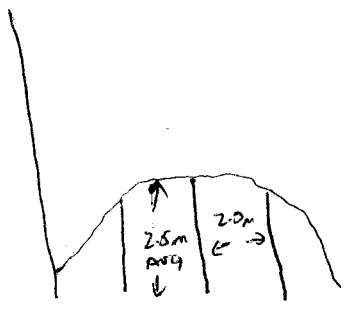
SHOW THE FOLLOWING:

- SCALE
- PLAN VIEW
- CROSS-SECTION
- ROCK GEOMETRY
- APPROX. HOLE LOCATIONS
- APPROX. HOLE DEPTH
- PROPOSED TIE-IN PATTERN
- ROW BY ROW DELAYS
- DETONATION DIRECTION
- HIGHWAY LOCATION
- UTILITY LOCATION
- NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FLEGER SIGNATURE _____ COMPANY FLEGER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vedsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 2/12
ACTUAL BLAST DATE Mar 2/12 12:46 PM
BLAST # MW-0145

HIGHWAY# 97
BLAST LOCATION AT: STN 129+10 - 129+15

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES 5ea
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 3
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 25 (m)

TOTAL NUMBER OF HOLES 9 Prod.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 9
TOTAL NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 Caps

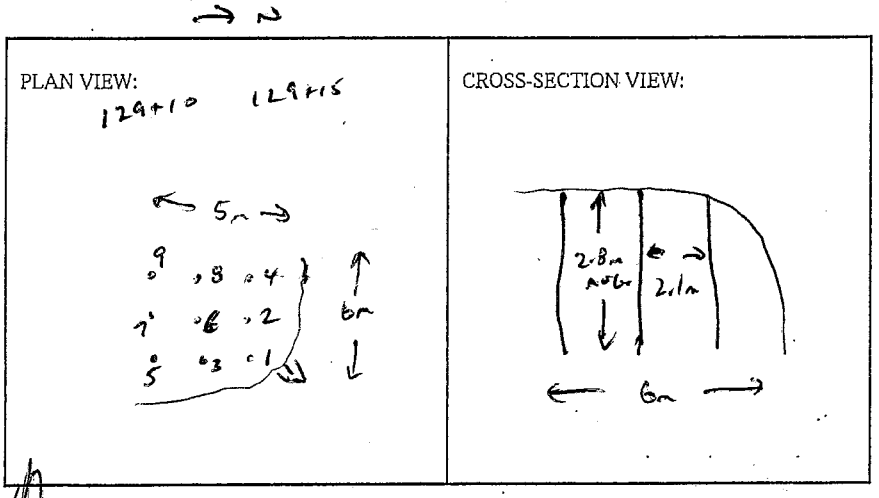
VOLUME OF ROCK BLASTED 80 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTER'S SIGNATURE Wayne Vedsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph 13167 Client Factor Cut - 0.049 ips/39 Hz
" @ 13117 Client Factor Cut - 0.090 ips/47 Hz

PROPOSED BLAST DESIGN

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 593489

DATE PREPARED MAR 7/12
PROPOSED BLAST DATE MAR 7/12
BLAST # MW-0145

HIGHWAY# 97
BLAST LOCATION AT: STN 129+10 - 129+15

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 60 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 2.8 (m)
PROPOSED NO. OF ROWS 3
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 25 (m)

PROPOSED APPROX. NO. OF HOLES 9 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 9
PROPOSED NUMBER OF DELAYS 9

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

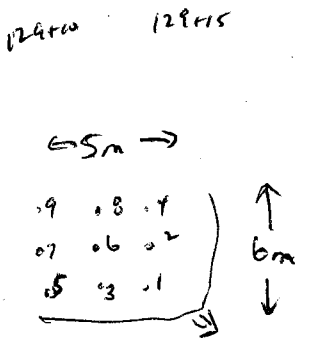
APPROX. VOLUME OF ROCK TO BE BLASTED 80 (m^3)

PROPOSED BLAST SKETCH:

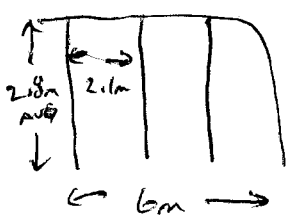
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.

BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorsey
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 7/12
ACTUAL BLAST DATE Mar 7/12 1:58 PM
BLAST # MW-0146

HIGHWAY# 97
BLAST LOCATION AT: STN 129+05 - 129+10

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____
* Shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 2.8 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3 (m)
TOTAL DEPTH 20 (m)

TOTAL NUMBER OF HOLES 7 Prod
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite + ANFO
TOTAL NUMBER OF CARTRIDGES 7
TOTAL NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HSB20 CAPACITY 80 CAPS

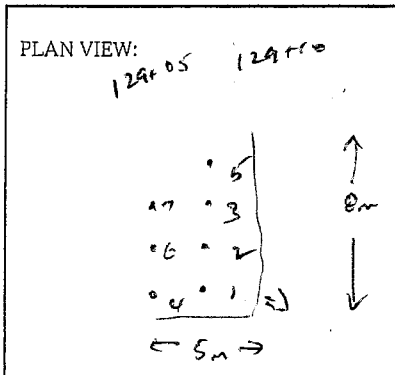
VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

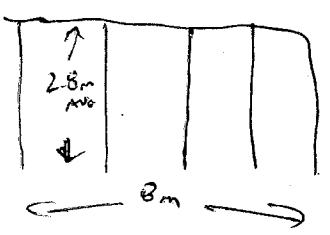
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTER'S SIGNATURE Wayne Vorsey COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt - 0.086 ips / 43 Hz
@ 13117 Cliffstone Crt. 0.20 ips / 51 Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling & Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED MAR 7/12
PROPOSED BLAST DATE MAR 7/12
BLAST # MW-0146

HIGHWAY# 97
BLAST LOCATION AT: SB 129+05 - 129+10

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES ~~NO~~

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES NIL
PROPOSED AVG. DEPTH 2.8 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3 (m)
PROPOSED TOTAL DEPTH 20 (m)

PROPOSED APPROX. NO. OF HOLES 7 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) VERTICAL HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 7
PROPOSED NUMBER OF DELAYS 7

EXPLOSIVE SIZE 25 mm by 25 mm
APPROX. TOTAL WEIGHT 20 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) E.B. CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

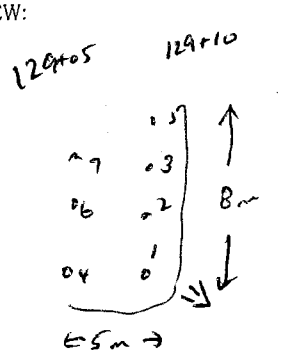
APPROX. VOLUME OF ROCK TO BE BLASTED 100 (m^3)

PROPOSED BLAST SKETCH:

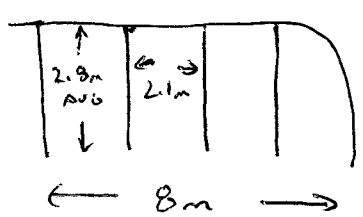
SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:



BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + Blasting
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)

AS-BUILT BLASTING RECORD

File #: _____

PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT MORE THAN 1 DAY AFTER EACH BLAST)

GENERAL:

CONTRACTOR'S NAME Sierra Drilling + Blasting
BLASTER'S NAME Wayne Vorsey
BLASTER'S CERTIFICATE NUMBER 5834-89

DATE PREPARED MAR 7/12
ACTUAL BLAST DATE MAR 7/12 3:22 PM
BLAST # MW-0147

HIGHWAY# 97
BLAST LOCATION AT: STN 129+05 - 129+15

UTILITY PROTECTION OR STANDBY USED: (CIRCLE) YES (NO) TYPE OF UTILITY PROTECTION _____

* shot matted

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE Altered Granite
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

DRILLING DETAILS:

NUMBER OF BACKLINE HOLES Nil
AVERAGE DEPTH 3 (m)
NUMBER OF ROWS 2
MAXIMUM DEPTH 3.3 (m)
TOTAL DEPTH 24 (m)

TOTAL NUMBER OF HOLES 8 PROD.
HOLE DIAMETER 76 (mm)
HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
HOLE INCLINATION: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

BLAST DETAILS:

EXPLOSIVE TYPE 1" Dynamite 1440
TOTAL NUMBER OF CARTRIDGES 8
TOTAL NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

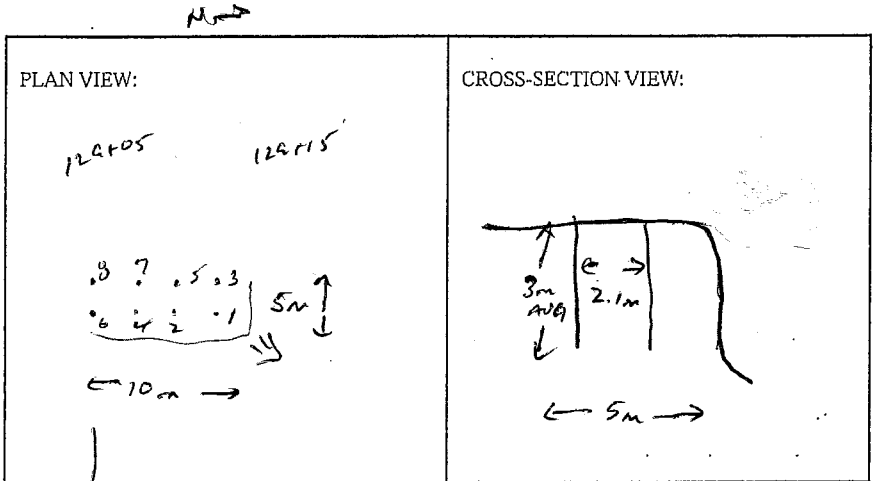
INITIATION DEVICE: (CIRCLE) (E.B. CAPS) SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB220 CAPACITY 80 CAPS

VOLUME OF ROCK BLASTED 100 (m^3)

BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
HOLE LOCATIONS
HOLE DEPTH
TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW



BLASTER'S SIGNATURE _____ COMPANY Sierra Drilling + Blasting

RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets if Necessary)

Seismograph @ 13167 Cliffstone Crt. 0.097 ips/37Hz
" @ 13117 Cliffstone Crt. 0.18 ips / 47Hz

PROPOSED BLAST DESIGN
File #: _____
PROJECT NO. 21347-0001

(TO BE SUBMITTED NOT LESS THAN 1 DAY BEFORE DRILLING)

GENERAL:

CONTRACTOR'S NAME SIERRA Drilling + Blasting
BLASTER'S NAME WAYNE VERWEY
BLASTER'S CERTIFICATE NUMBER 583489

DATE PREPARED Mar 7/12
PROPOSED BLAST DATE Mar 7/12
BLAST # MW-0147

HIGHWAY# 97
BLAST LOCATION AT: STN 129+05 - 129+15

UTILITY PROTECTION OR STANDBY REQUIRED: (CIRCLE) YES (NO)

SITE DETAILS:

HEIGHT ABOVE HWY N/A (m) SLOPE ANGLE N/A (°) SLOPE LENGTH N/A (m)
ROCK TYPE ALTERED GRANITIC
DISTANCE TO NEAREST STRUCTURE (UTILITY) 55 (m)

ANTICIPATED DRILLING DETAILS:

PROPOSED NO. OF BACKLINE HOLES Nil
PROPOSED AVG. DEPTH 3 (m)
PROPOSED NO. OF ROWS 2
PROPOSED MAXIMUM DEPTH 3.3 (m)
PROPOSED TOTAL DEPTH 24 (m)

PROPOSED APPROX. NO. OF HOLES 8 PROD
HOLE DIA. 76 (mm)
APPROX. HOLE SPACING 2.1 (m) BURDEN 2.1 (m)
PROPOSED HOLE INCL.: (CIRCLE) (VERTICAL) HORIZ. VARIABLE

PROPOSED BLAST DETAILS:

EXPLOSIVE TYPE 1" DYNAMITE + ANFO
APPROX. NUMBER OF CARTRIDGES 8
PROPOSED NUMBER OF DELAYS 8

EXPLOSIVE SIZE 25 mm by 200 mm
APPROX. TOTAL WEIGHT 25 (kg)
DELAY TYPE AND LENGTH 25 (ms)

INITIATION DEVICE: (CIRCLE) EB CAPS SAFETY FUSE OTHER (SPECIFY) _____
BLASTING MACHINE: TYPE HB320 CAPACITY 80 CAPS

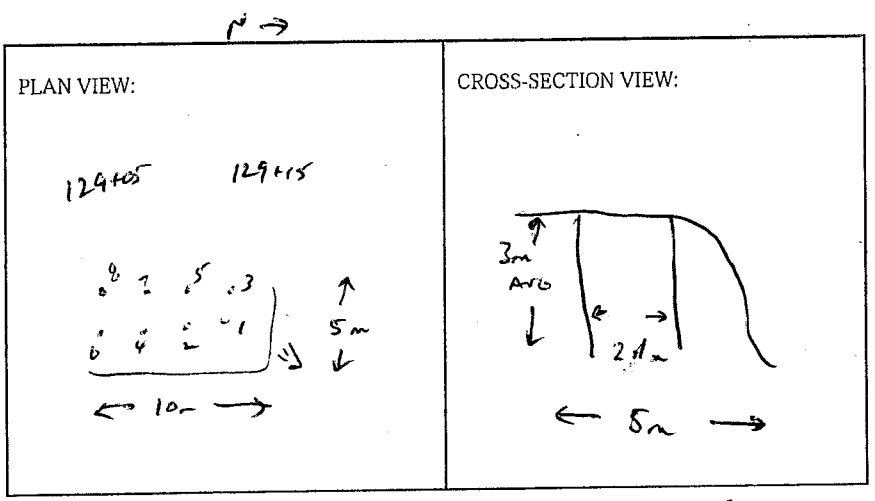
APPROX. VOLUME OF ROCK TO BE BLASTED 190 (m^3)

PROPOSED BLAST SKETCH:

SHOW THE FOLLOWING:

SCALE
PLAN VIEW
CROSS-SECTION
ROCK GEOMETRY
APPROX. HOLE LOCATIONS
APPROX. HOLE DEPTH
PROPOSED TIE-IN PATTERN
ROW BY ROW DELAYS
DETONATION DIRECTION
HIGHWAY LOCATION
UTILITY LOCATION
NORTH ARROW

PLAN VIEW:



CROSS-SECTION VIEW:

BLASTING CONSULTANT NAME DARYL FIEBER SIGNATURE _____ COMPANY FIEBER ROCK ENG.
BLASTER'S SIGNATURE _____ COMPANY SIERRA Drilling + BLASTING
RECEIVED BY MINISTRY REPRESENTATIVE (SIGNATURE) _____

(Use Additional Sheets If Necessary)