

SECTION 582

CONCRETE CURB AND GUTTER AND STORM DRAINAGE

DESCRIPTION

582.01 Scope – This Section describes the requirements for construction of roadside curb and gutter and associated underground drainage systems. Such work shall consist of constructing and/or installing appurtenances shown or indicated on the drawings and Schedule of Approximate Quantities and Unit Prices.

MATERIALS

582.11 Drain Pipe – All drain pipe shall be of first quality, sound, true in form and free from defects of all kinds.

582.12 Salt Glazed Clay Sewer Pipe – Salt glazed clay sewer pipe shall be in accordance with the current ASTM Specifications.

582.13 Concrete Pipe

582.13.01 Reinforced Concrete Pipe – Reinforced concrete pipe shall have joints of the tongue and groove type and shall meet the requirements of the current specification ASTM C 76 Series.

582.13.02 Plain Concrete Pipe – Plain concrete pipe shall meet the requirements of the current specification ASTM C 14 Series.

582.13.03 Requirements – Pipe shall be legibly marked with the date of manufacture, the name or trademark of the manufacturer and by marks denoting plain concrete pipe, reinforced concrete pipe or extra strength reinforced concrete pipe as the case may be. Pipe containing elliptically placed reinforcement shall be marked on the inside of the pipe with the words "Top" or "Bottom" at the correct place to indicate the proper position when laid.

Upon request, the Contractor shall furnish at the Contractor's expense such test and other information as may be required regarding the concrete pipe proposed to be used.

582.14 Corrugated Steel Pipe – Corrugated metal pipe shall conform to the requirements of SS 320.

582.15 Catch Basin and Manhole Lids – Catch basin and manhole lids shall withstand HS 20 loading in accordance with AASHTO Standard Specification for Drainage, Sewer, Utility, and Related Castings (AASHTO Designation: M 306-07)

CONSTRUCTION

582.31 Portland Cement Concrete Curb and Gutter – Combined Portland cement concrete curb and gutter shall be constructed to the line and grade shown on the Drawings or as otherwise directed by the Ministry Representative and will include returns at the intersections if so directed.

The combined curb and gutter shall be constructed to the standard cross-section shown on Drawing SP582-01.01 and to such layout plans as are attached, except where the face of the curb varies and at lanes and driveways where drop curbs are ordered.

Expansion joints 13 mm in thickness cut to the cross-section of the combined curb and gutter, composed of premoulded joint filler shall be installed at approximately 15 m intervals as directed by the Ministry Representative.

582.32 Catch Basins – Catch basins shall be constructed, where shown and as required in the Drawings or as the Ministry Representative may direct, in accordance with the intent of Drawings SP582-02.01 through SP582-02.05.

582.33 Manholes – Manholes shall be constructed at the locations and to invert levels shown in Drawings or as the Ministry Representative may direct in accordance with the intent of Drawings SP582-03.01 through SP582-03.08.

582.34 Storm Drains – Storm drains shall be constructed where shown on Drawings, or as directed by the Ministry Representative, and in accordance with the Drawings and specifications covering the various types and as attached herewith. The trench and other preparatory work shall be approved by the Ministry Representative before actual placing starts.

582.35 Placing

582.35.01 Spigot and Bell Pipe – Spigot and bell pipe shall be laid beginning at the lower end with the bell end pointing up-grade. Suitable excavation or bedding must be provided to accommodate the bell so that the pipe is supported along its full length and not at the ends alone.

582.35.02 Concrete Pipe – Concrete pipe shall be laid beginning at the lower end with the groove end pointing up-grade. Pipe with elliptical reinforcement shall be laid with the minor axis of the reinforcement as marked by the manufacturer in a vertical position.

When jointing salt glazed clay and concrete pipes, the trench shall be in a dry condition and the joints shall be cleaned and wetted before sealing with mortar. The mortar shall consist of one part of Portland cement to two parts of fine sand, mixed to the proper consistency. Sealing shall be neatly and thoroughly done and the interior of the pipe cleaned of all surplus mortar. Joints shall be kept damp with burlap or earth for at least three days after sealing.

582.35.03 Corrugated Steel Pipe – Corrugated steel pipe shall be laid beginning at the lower end with the outside laps pointing up-grade and the longitudinal joint on the side. The separate sections shall be firmly jointed together

and any metal in joints which is not thoroughly protected by galvanizing shall be coated with suitable asphaltum paint.

582.35.04 General – The Contractor shall provide and fix at such points, as may be directed, properly painted substantial sight rails set to correct levels. At least three sight rails shall be in position for each length of sewer. Pipes shall be accurately set and laid to even gradients, concentric and in straight lines between manholes.

582.36 Special Jointing Material – Where pipe trenches are necessarily restricted in width or where unavoidable wet conditions exist, which would prevent proper normal jointing of pipes with Portland cement mortar, special prefabricated joints may be authorized to be used. In such a case, the Ministry will pay the Contractor for providing such jointing material at net cost after deducting all trade discounting and commissions. The Contractor shall install the prefabricated jointing material instead of cement mortar jointing at no extra cost.

582.37 Bedding and Backfilling – The bedding of all concrete pipes shall consist of 19 mm or 25 mm crushed gravel to a minimum depth of 150 mm below the pipe. The backfill shall consist of 19 mm or 25 mm crushed gravel with a minimum cover of 150 mm and in the remainder of the trench shall consist of the natural excavated material unless such material is considered unsuitable by the Ministry Representative. Such natural material shall have a maximum size of 75 mm. All materials shall be compacted in horizontal layers not more than 200 mm.

582.38 Concrete End Walls – See SS 303.06.

MEASUREMENT

582.81 Portland Cement Concrete Curb and Gutter – Portland Cement Concrete Curb and Gutter will be measured by the METRE.

582.82 Catch Basins – Catch Basins will be measured per EACH.

582.83 Manholes – Manholes will be measured per EACH.

The Contractor shall allow in the bid price for the construction of manholes having an overall depth of concrete section of 2 m (see dimensions marked "variable"). In addition, the Contractor shall bid a price per 0.3 m of depth of manhole, which shall be added to or subtracted from the bid price for the manhole depending on the actual depth of the manhole to be constructed.

582.84 Storm Drains – Storm drains will be measured by the METRE in place.

582.85 Bedding and Backfill – Bedding and backfill will be measured by the CUBIC METRE in place.

582.86 Concrete End Walls – See SS 303.07.02.

PAYMENT

582.91 Portland Cement Concrete Curb and Gutter – Payment for combined Portland cement CONCRETE CURB AND GUTTER will be at the Contract Unit Price per metre. The Contract Unit Price shall include everything furnished and done in connection with form setting, supply and placing of air entrained concrete; supply and installation of expansion joints; finishing, curing, protection and superintendence.

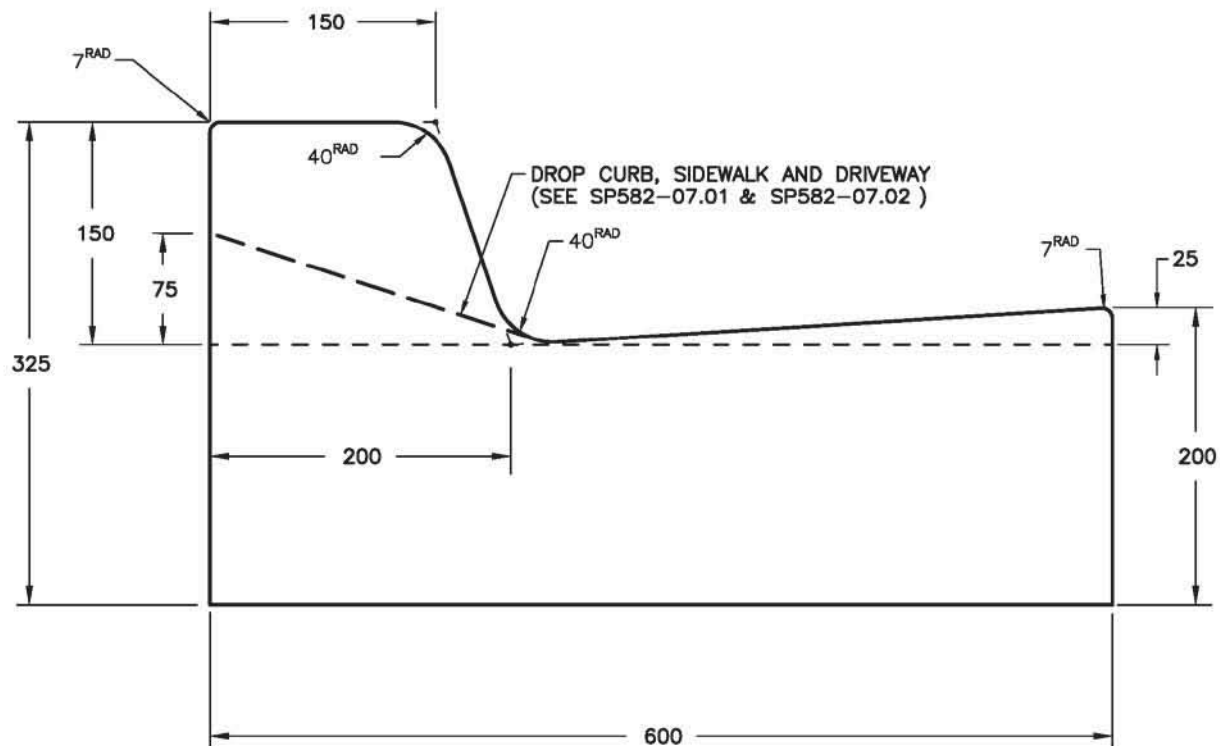
582.92 Catch Basins – Payment for CATCH BASINS will be at the Contract Unit Price per each. The Contract Unit Price shall include everything furnished and done; excavation, backfilling and tamping around catch basins, formwork, concreting, setting in of pipe drains, setting and securing of cast iron catch basin frames and gratings, steel baffles, reinstatement of surface, cleaning out, protection and superintendence and, all other things necessary.

582.93 Manholes – Payment for MANHOLES will be at the Contract Unit Price per standard 2 m manhole with appropriate depth correction as described in SS 582.83. The Contract Unit Price shall include everything furnished and done; formwork, concreting, setting in of storm drains, construction of smooth invert sections, cement mortar settings, steel ladder rungs, brick construction, setting of manhole frames and covers, cleaning out, protection and superintendence, and all other things necessary.

582.94 Storm Drains – Payment for STORM DRAINS will be at the Contract Unit Price per metre in place. The Contract Unit Price shall be accepted as full compensation for everything furnished and everything done in connection herewith, but shall not include payment for excavation, riprap, paving, concrete cradles, end walls, bedding and backfill. These shall be paid for at their respective prices in the Schedule of Approximate Quantities and Unit Prices.

582.95 Bedding and Backfill – Payment for BEDDING and BACKFILL will be at the Contract Unit Price per cubic metre in place.

582.96 Concrete End Walls – See SS 303.08.02.



NOTES:

- THE CONCRETE INCORPORATED IN THE CURB SHALL HAVE:
 - MINIMUM COMPRESSIVE STRENGTH OF 30 MPa AT 28 DAYS;
 - COARSE AGGREGATE OF MAXIMUM PARTICLE SIZE NOT EXCEEDING 25 mm;
 - MINIMUM CEMENT CONTENT OF 350 kg/m³ ;
 - ENTRAINED AIR OF 6 - 8%;
 - SLUMP: BETWEEN 10 mm AND 25 mm FOR EXTRUDED
MAXIMUM 65 mm FOR POURED IN PLACE;
 - MAXIMUM WATER - CEMENT RATIO OF 0.45.
- CONTRACTION JOINTS SHALL BE CUT AND TOOLED INTO THE CONCRETE TO A DEPTH 60% OF THE THICKNESS OF THE CONCRETE AT INTERVALS OF 3 m.
- EXPANSION JOINTS 13 mm IN THICKNESS CUT TO THE CROSS-SECTION OF THE COMBINED CURB AND GUTTER, COMPOSED OF PREMOULDED JOINT FILLER SHALL BE INSTALLED AT APPROXIMATELY 15 m INTERVALS AS WELL AS AT CURB RETURNS, EITHER SIDE OF DRIVEWAYS AND OTHER LOCATIONS AS DIRECTED BY THE MINISTRY REPRESENTATIVE.

NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

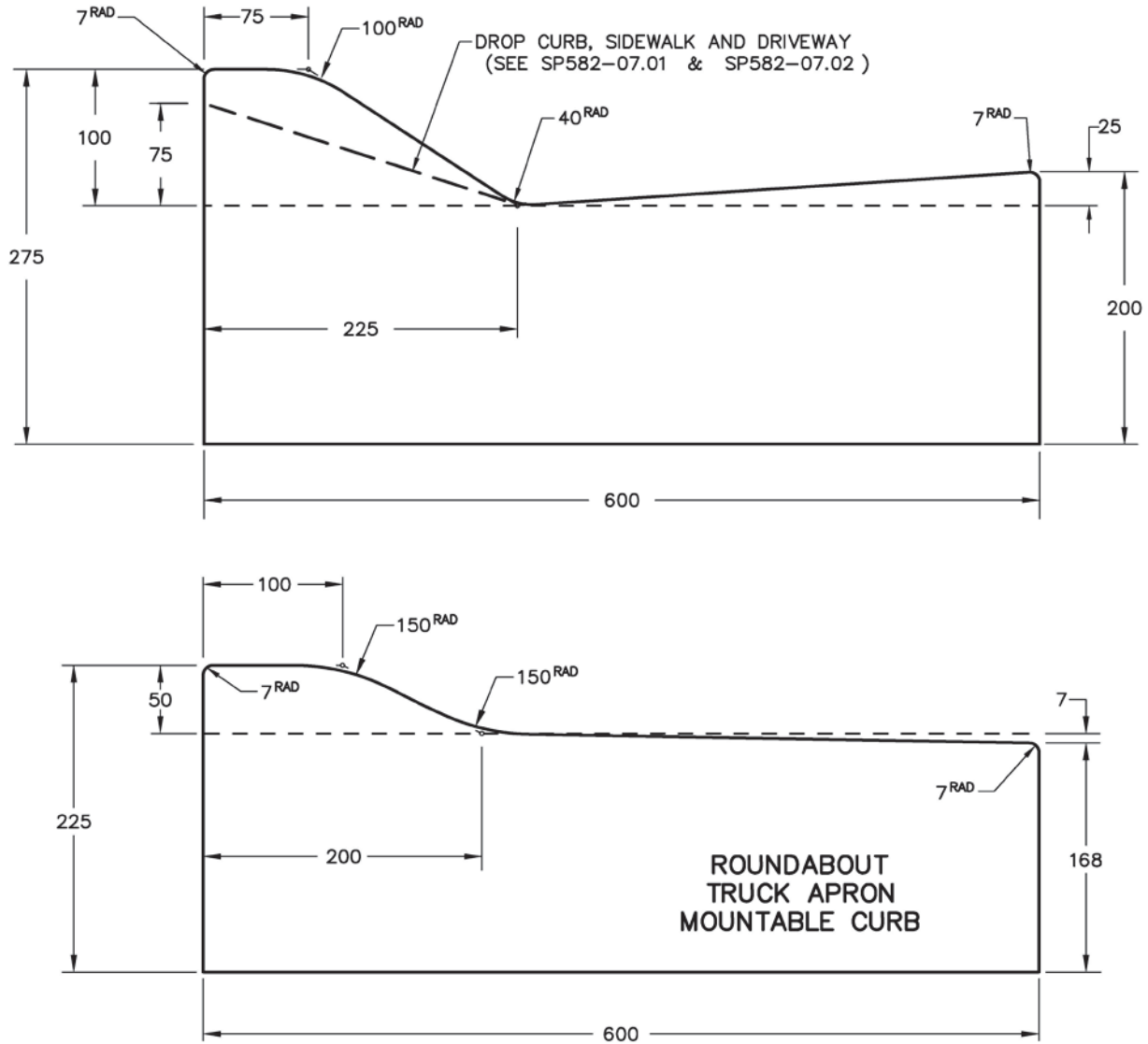


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MOUNTABLE CURB AND GUTTER

SP582-01.02



NOTES:

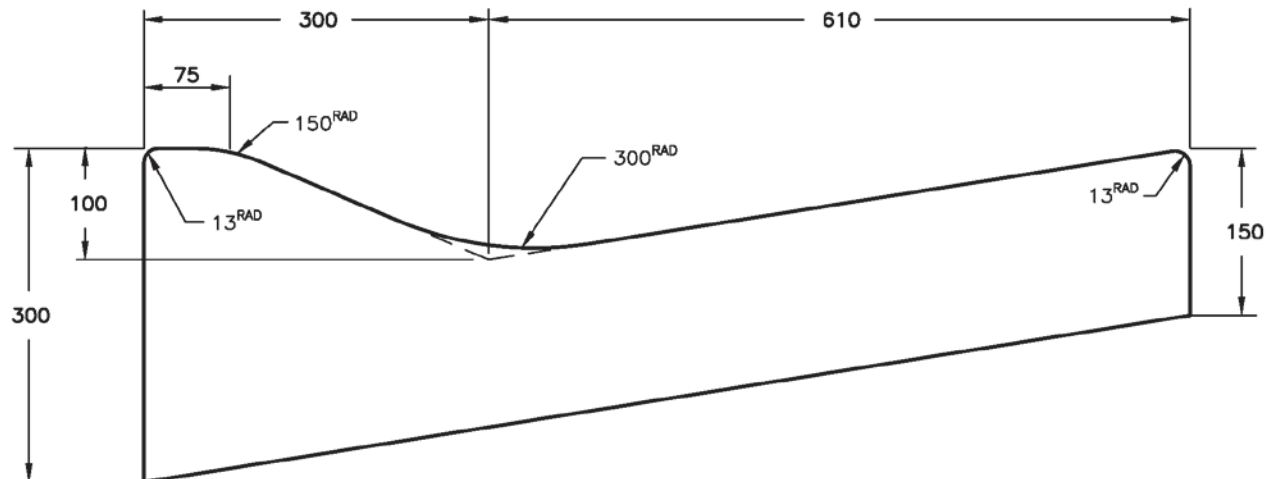
1. THE CONCRETE INCORPORATED IN THE CURB SHALL HAVE:
 - MINIMUM COMPRESSIVE STRENGTH OF 30 MPa AT 28 DAYS;
 - COARSE AGGREGATE OF MAXIMUM PARTICLE SIZE NOT EXCEEDING 25 mm;
 - MINIMUM CEMENT CONTENT OF 350 kg/m³;
 - ENTRAINED AIR OF 6% to 8%;
 - SLUMP: BETWEEN 10 mm AND 25 mm FOR EXTRUDED, MAXIMUM 65 mm FOR POURED IN PLACE;
 - MAXIMUM WATER/CEMENT RATIO OF 0.45.
2. CONTRACTION JOINTS SHALL BE CUT AND TOOLED INTO THE CONCRETE TO A DEPTH 60% OF THE THICKNESS OF THE CONCRETE AT INTERVALS OF 3 m.
3. EXPANSION JOINTS 13 mm IN THICKNESS CUT TO THE CROSS-SECTION OF THE COMBINED CURB AND GUTTER, COMPOSED OF PREMOULDED JOINT FILLER SHALL BE INSTALLED AT APPROXIMATELY 15 m INTERVALS AS WELL AS AT CURB RETURNS, EITHER SIDE OF DRIVEWAYS AND OTHER LOCATIONS AS DIRECTED BY THE MINISTRY REPRESENTATIVE.

NOT TO SCALE

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VALLEY CURB AND GUTTER

SP582-01.03

**NOTES:**

1. THE CONCRETE INCORPORATED IN THE CURB SHALL HAVE:
 - MINIMUM COMPRESSIVE STRENGTH OF 30 MPa AT 28 DAYS;
 - COARSE AGGREGATE OF MAXIMUM PARTICLE SIZE NOT EXCEEDING 25 mm;
 - MINIMUM CEMENT CONTENT OF 350 kg/m³;
 - ENTRAINED AIR OF 6 – 8%;
 - SLUMP: BETWEEN 10 mm AND 25 mm FOR EXTRUDED
MAXIMUM 65 mm FOR POURED IN PLACE;
 - MAXIMUM WATER – CEMENT RATIO OF 0.45.
2. CONTRACTION JOINTS SHALL BE CUT AND TOOLED INTO THE CONCRETE TO A DEPTH 60% OF THE THICKNESS OF THE CONCRETE AT INTERVALS OF 3 m.
3. EXPANSION JOINTS 13 mm IN THICKNESS CUT TO THE CROSS-SECTION OF THE COMBINED CURB AND GUTTER, COMPOSED OF PREMOULDED JOINT FILLER SHALL BE INSTALLED AT APPROXIMATELY 15 m INTERVALS AS WELL AS AT CURB RETURNS, EITHER SIDE OF DRIVEWAYS AND OTHER LOCATIONS AS DIRECTED BY THE MINISTRY REPRESENTATIVE.

NOT TO SCALE
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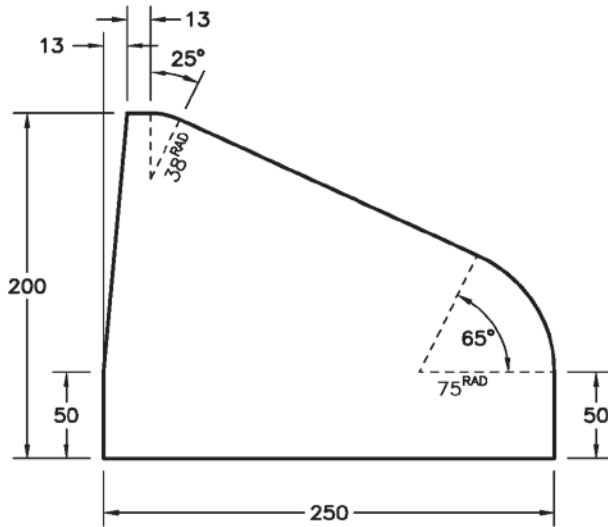


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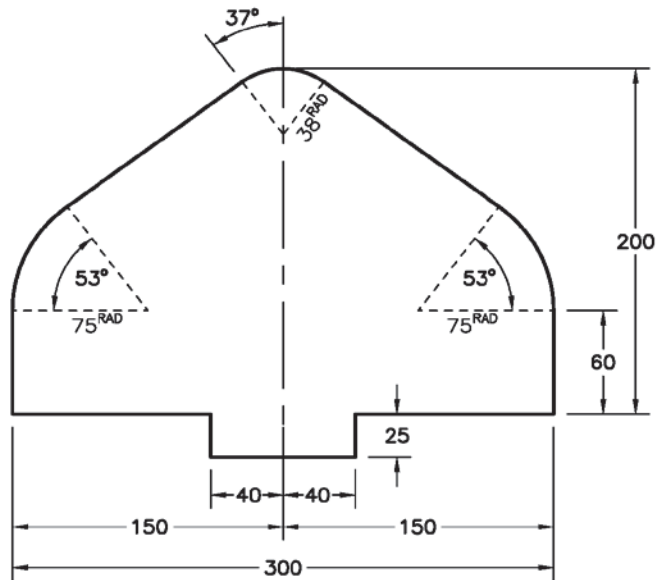
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ISLAND OR MEDIAN CURB

SP582-01.04

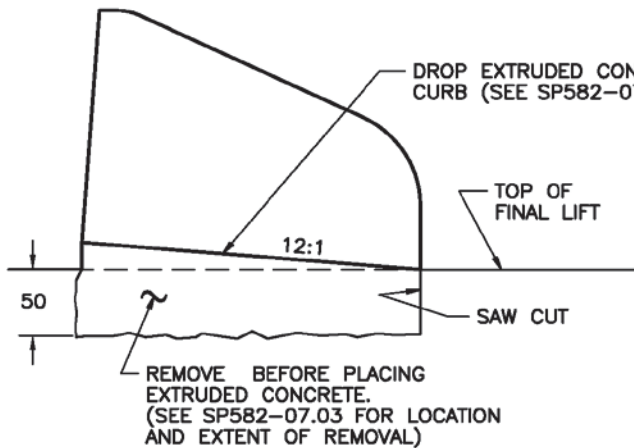


EXTRUDED CONCRETE CURB
FOR ISLANDS & MEDIANS

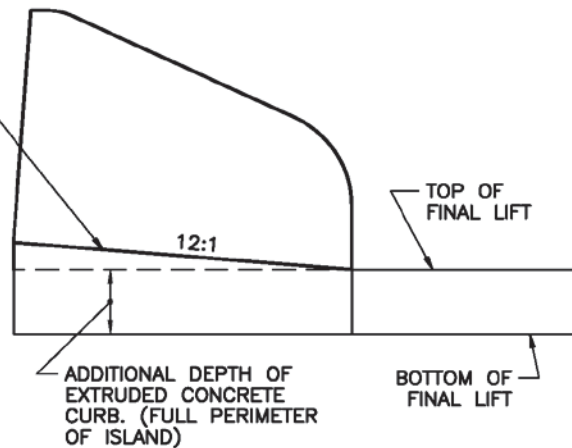


EXTRUDED CONCRETE CURB
CENTER DIVIDER

TYPICAL SECTIONS



FINAL LIFT IN PLACE



FINAL LIFT NOT IN PLACE

SECTIONS THRU ISLAND RAMP CURBS

NOTES:

1. THE CONCRETE INCORPORATED IN THE CURB SHALL HAVE:
 - MINIMUM COMPRESSIVE STRENGTH OF 30 MPa AT 28 DAYS;
 - COARSE AGGREGATE OF MAXIMUM PARTICLE SIZE NOT EXCEEDING 25 mm;
 - MINIMUM CEMENT CONTENT OF 350 kg/m³ ;
 - ENTRAINED AIR OF 6 - 8%;
 - SLUMP: BETWEEN 10 mm AND 25 mm;
 - MAXIMUM WATER - CEMENT RATIO OF 0.45.

2. CONTRACTION JOINTS SHALL BE CUT AND TOOLED INTO THE CONCRETE TO A DEPTH 60% OF THE THICKNESS OF THE CONCRETE AT INTERVALS OF 3 m.

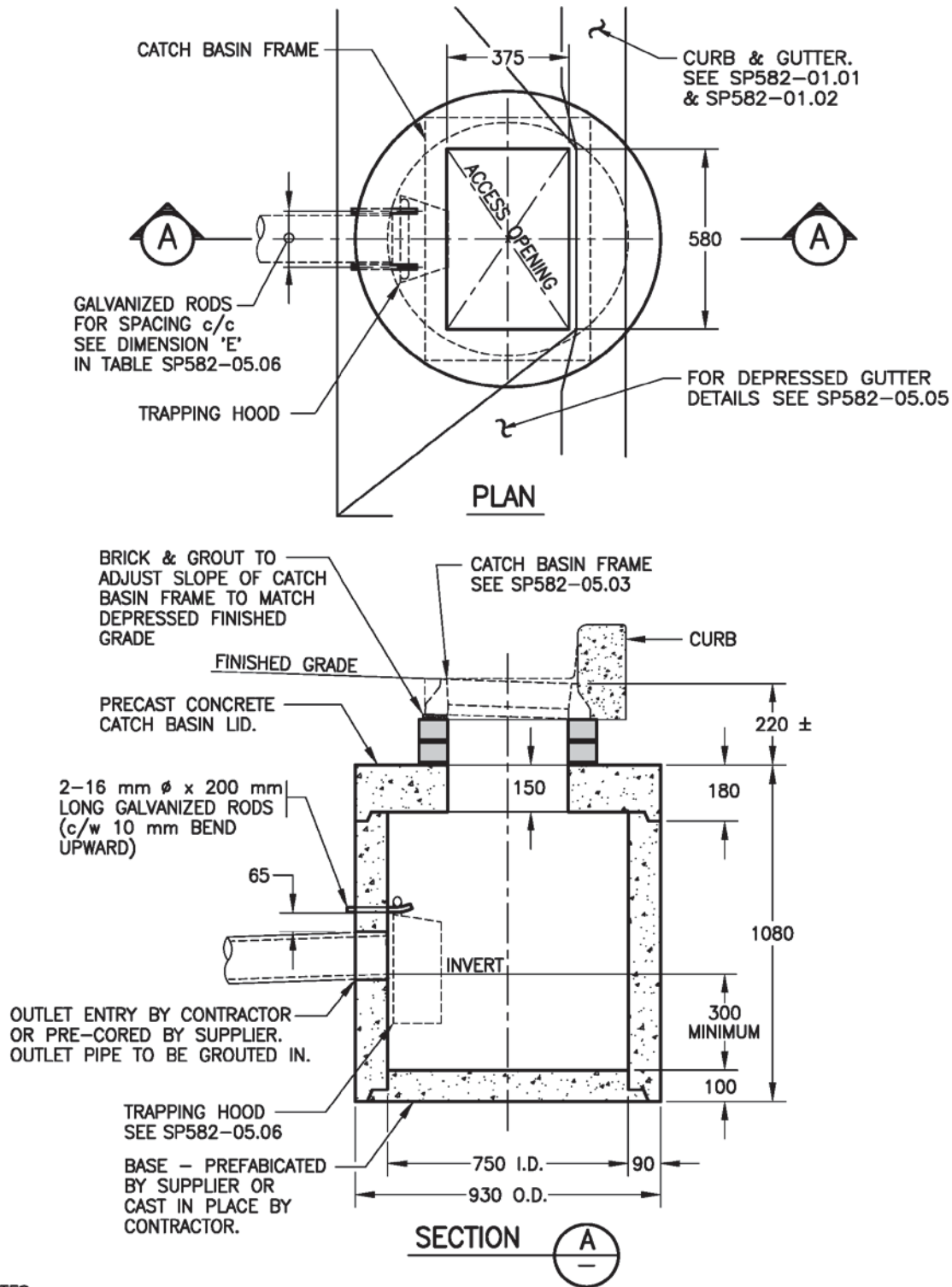
NOT TO SCALE

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PRECAST REINFORCED CONCRETE CATCH BASIN

SP582-02.01

**NOTES:**

1. ALL CAST IN PLACE CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
2. ALL PRECAST WORK TO CONFORM TO ASTM C 478M.
3. CATCH BASIN LID TO WITHSTAND HS 20 LOADING.

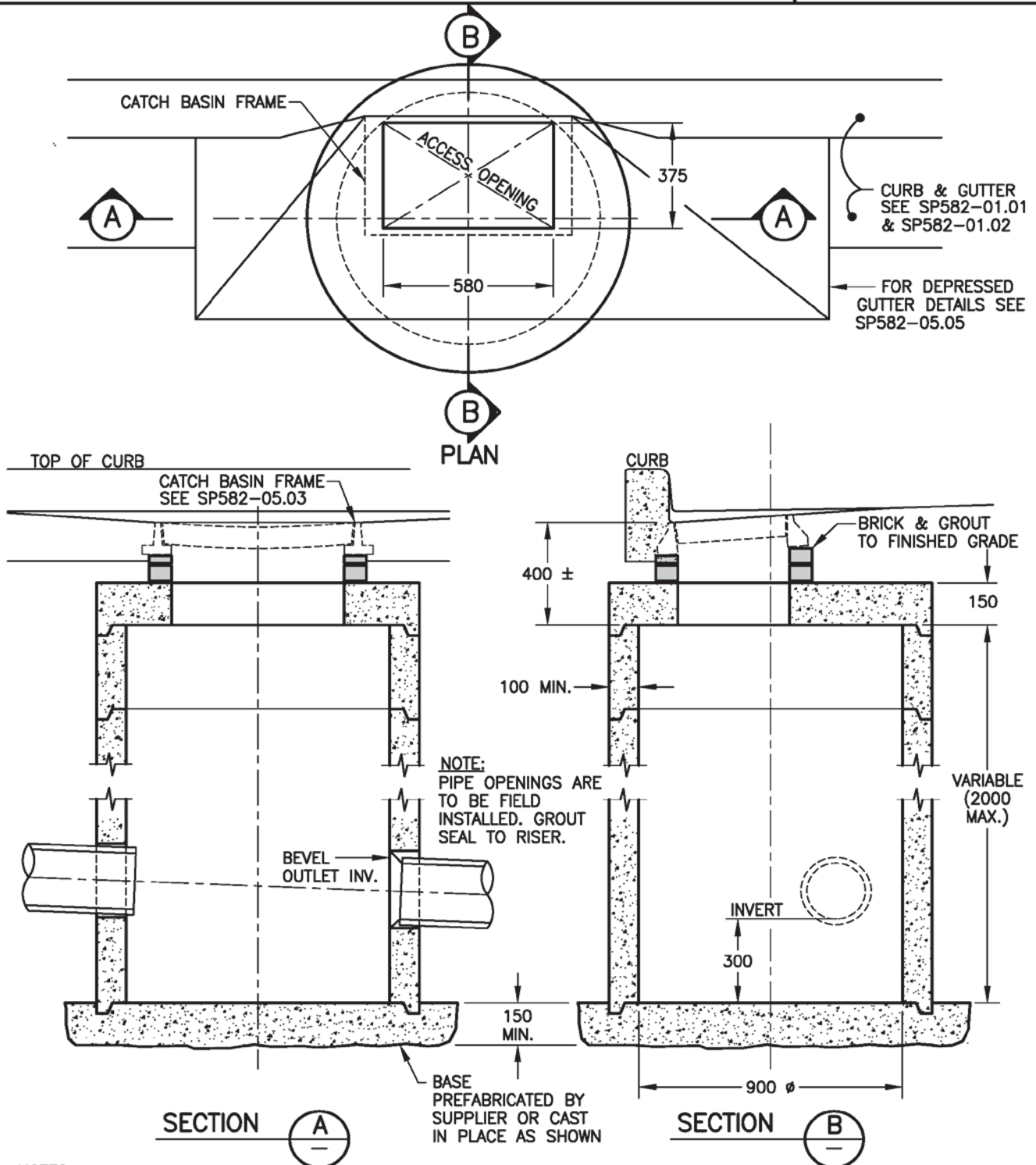
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PRECAST REINFORCED CONCRETE VARIABLE DEPTH CATCH BASIN

SP582-02.02



NOTES:

1. ALL CAST IN PLACE CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
2. ALL PRECAST WORK TO CONFORM TO ASTM C 478M.
3. CATCH BASIN LID TO WITHSTAND HS 20 LOADING.

NOT TO SCALE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

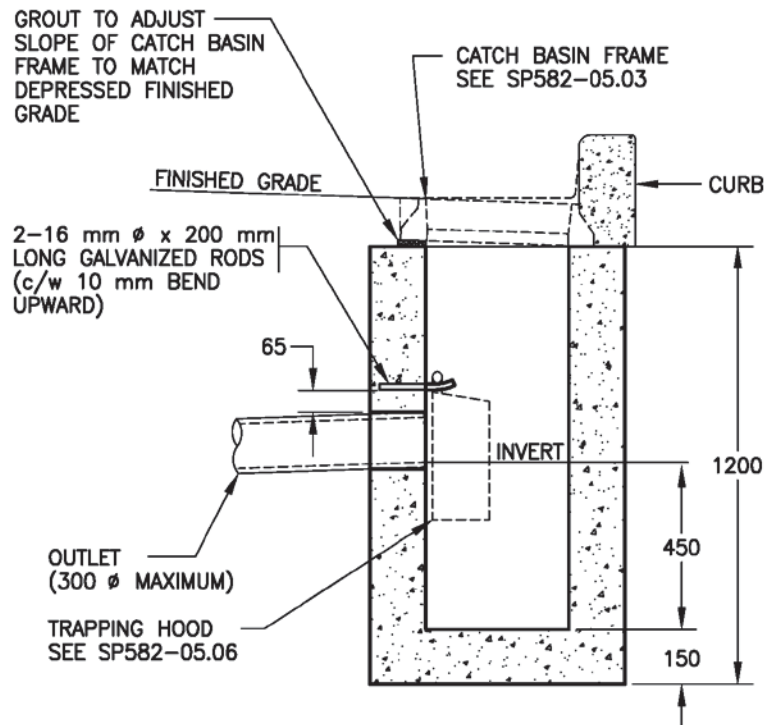
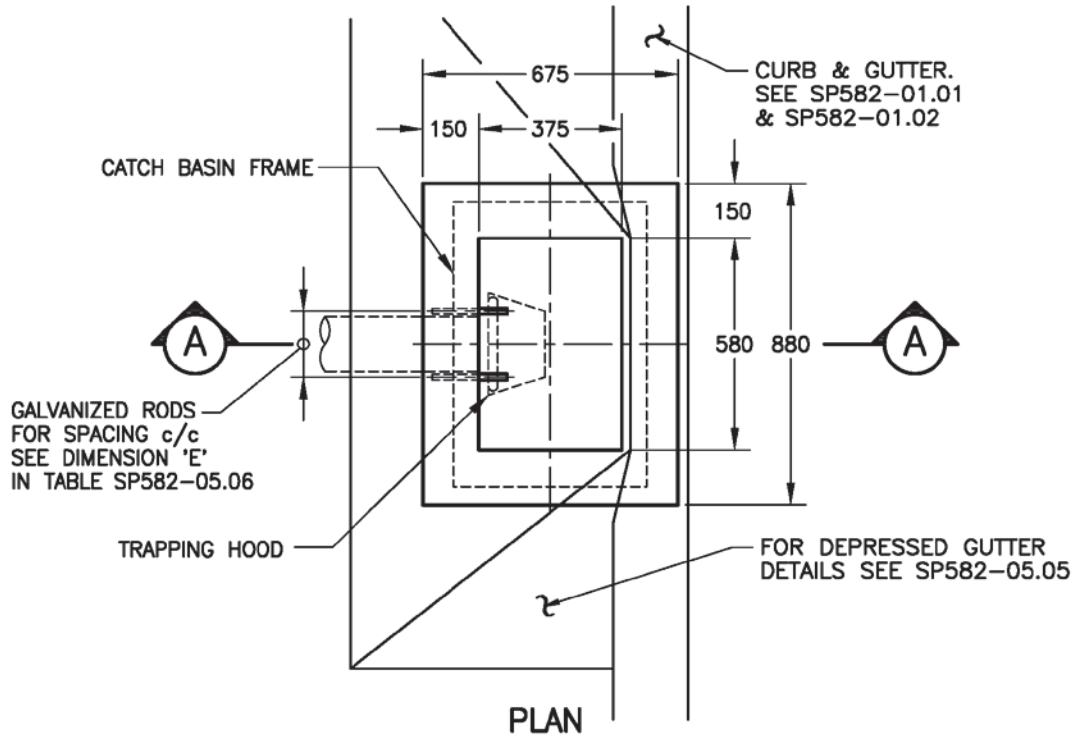


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CAST IN PLACE CONCRETE CATCH BASIN

SP582-02.03



NOTE:
ALL CONCRETE TO BE CLASS 'A'
(SEE SECTION 218).

NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

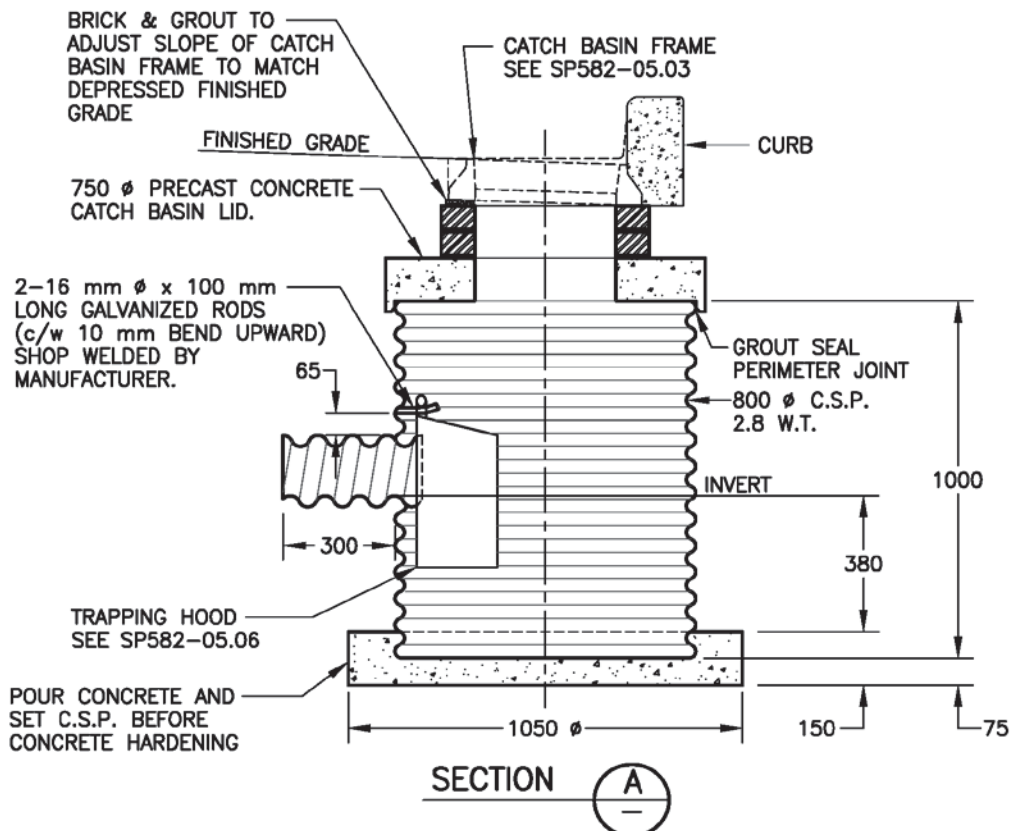
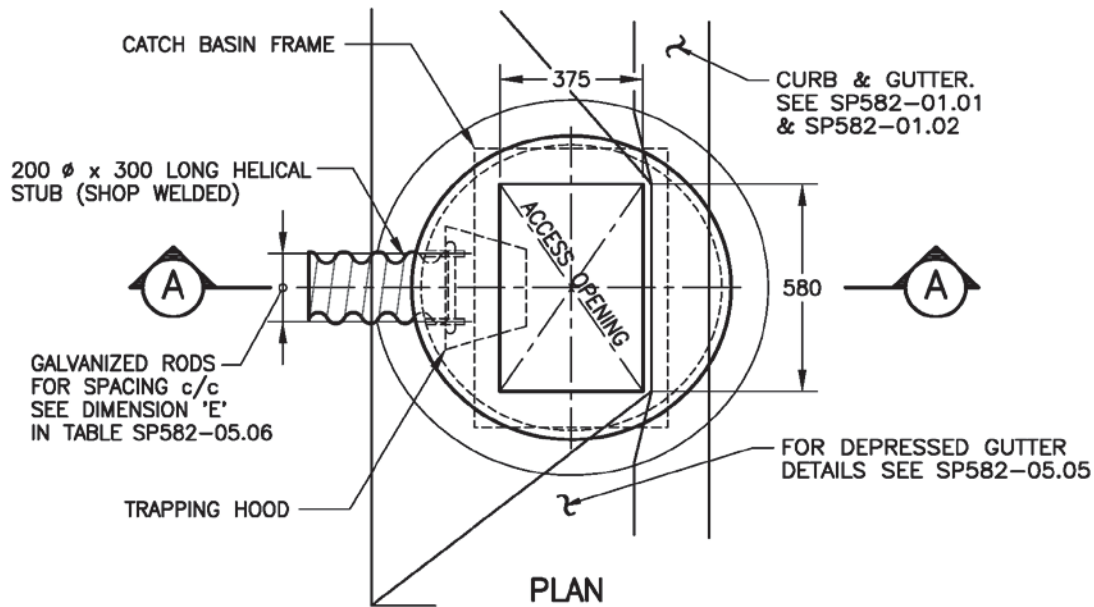


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CORRUGATED STEEL CATCH BASIN

SP582-02.04

**NOTES:**

1. ALL CAST IN PLACE CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
2. ALL PRECAST WORK TO CONFORM TO ASTM C 478M.
3. CATCH BASIN LID TO WITHSTAND HS 20 LOADING.

NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

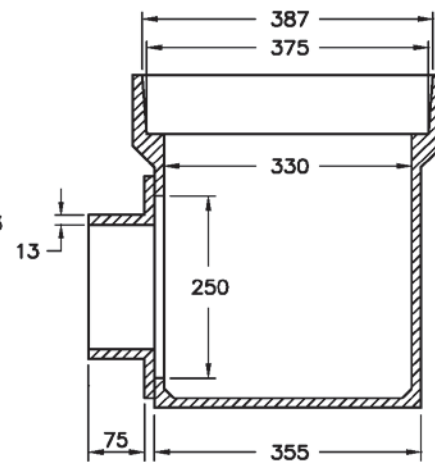
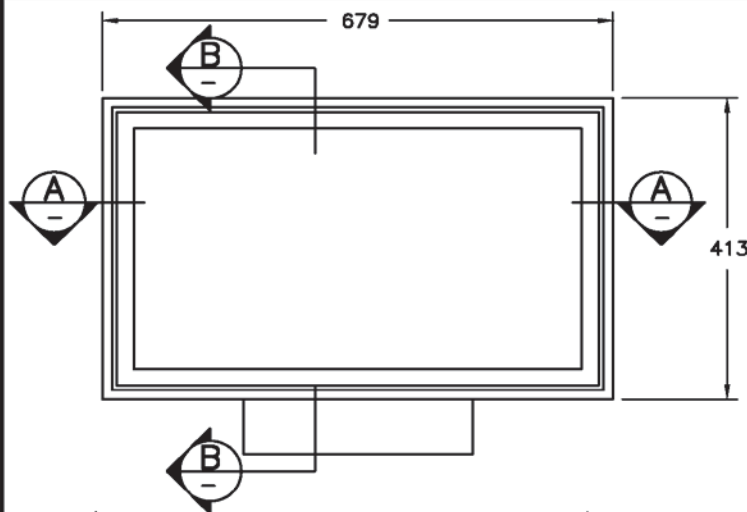


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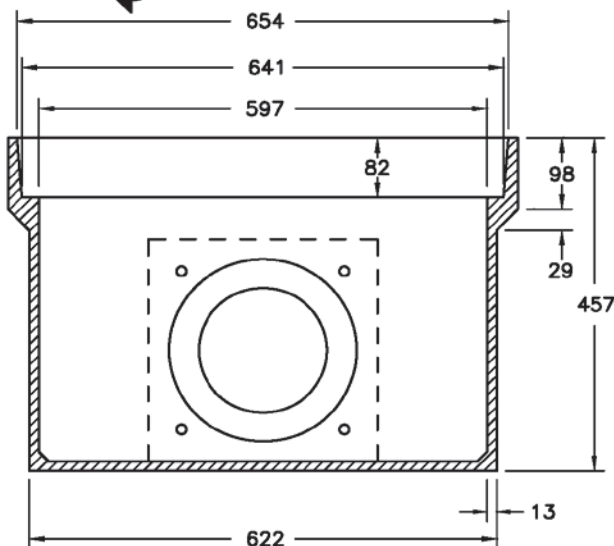
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CAST IRON CATCH BASIN BOX AND ADAPTOR PLATE

SP582-02.05



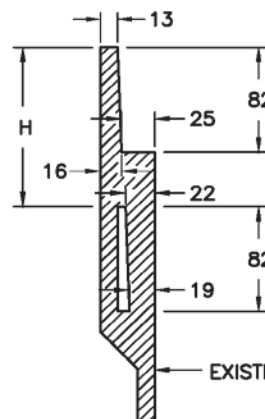
SECTION B



SECTION A

NOTE:

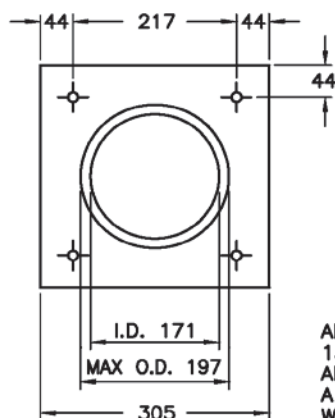
THIS CATCH BASIN BOX IS TO BE USED IN CONJUNCTION WITH A STANDARD CATCH BASIN GRATE (SEE SP582-05.01 OR SP582-05.02). MATERIAL TO BE CAST STEEL OR CAST IRON AS ORDERED. APPROXIMATE WEIGHT 136 kg



HEIGHT H TYPE A....100
TYPE B....125
TYPE C....150

OUTSIDE DIMENSIONS OF CAST IRON EXTENSION ARE 679 x 413

EXISTING CAST IRON CATCH BASIN BOX

EXTENSION FOR CAST IRON CATCH BASIN BOX**ADAPTOR PLATE**

ADAPTOR PLATE TO BE DRILLED TO CLEAR 13 mm STUDS. THE FACE OF THE BOX AND PLATE TO BE GROUND SMOOTH, AND A RUBBER GASKET USED TO ENSURE A WATER TIGHT JOINT.

NOT TO SCALE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

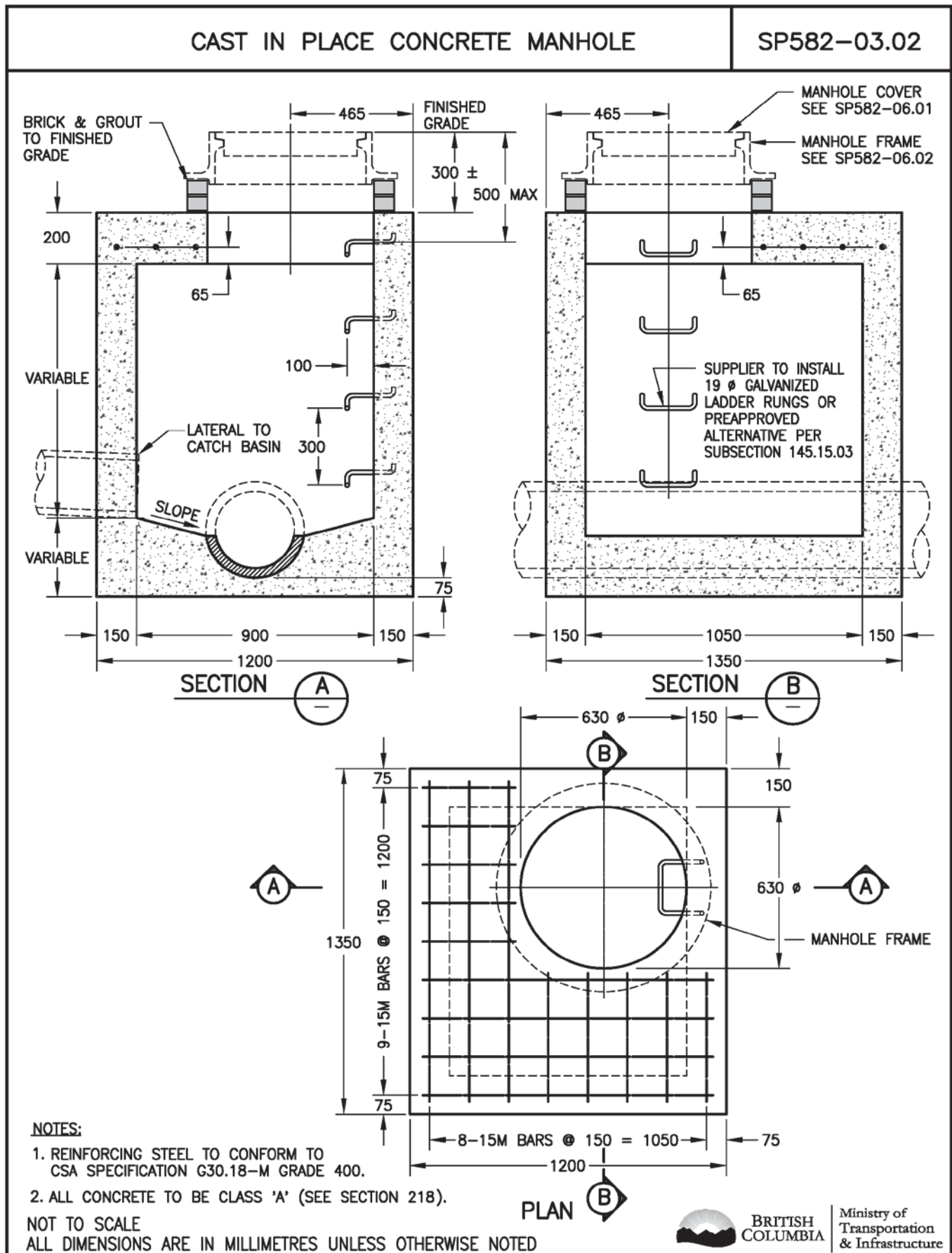


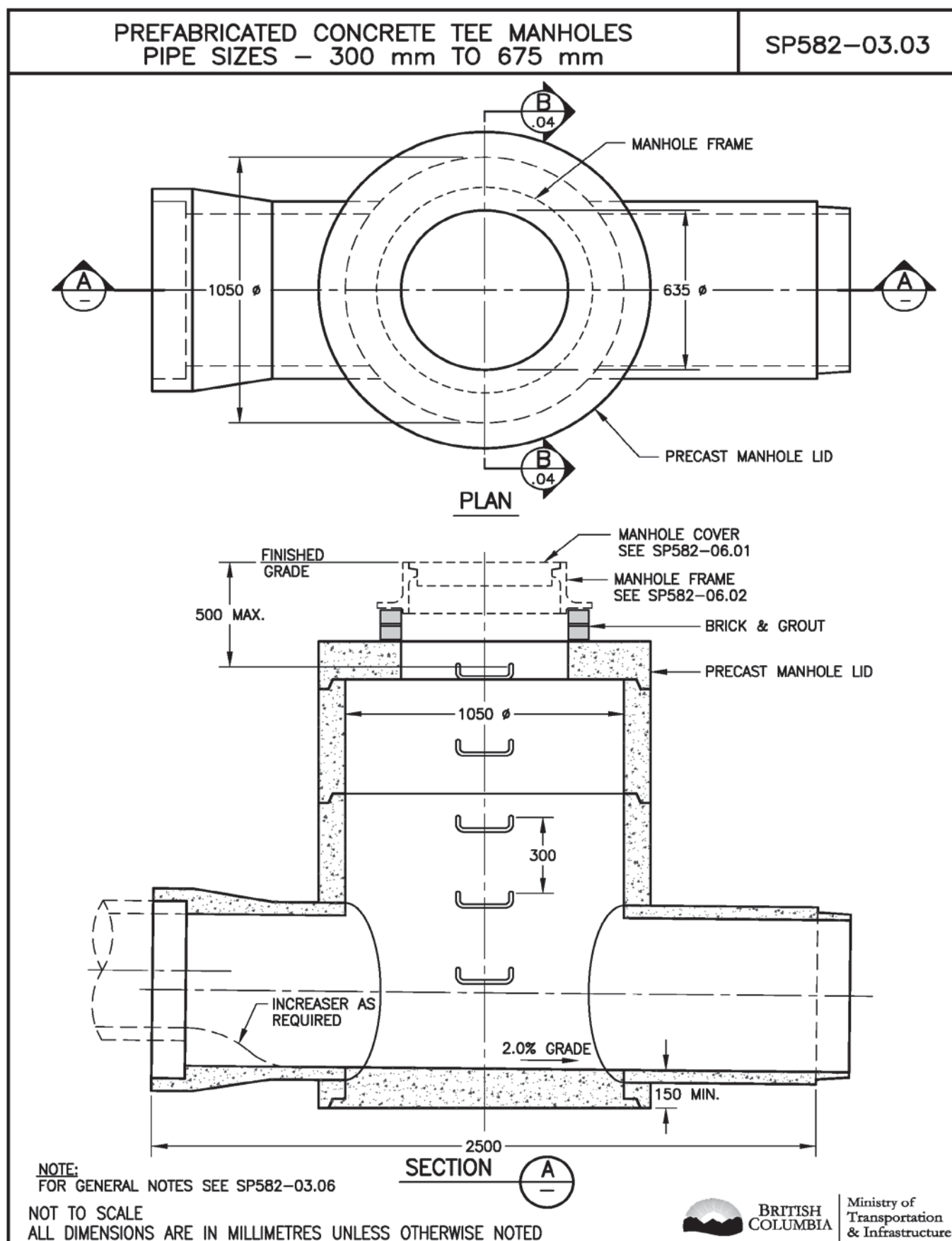
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SP582-03.01

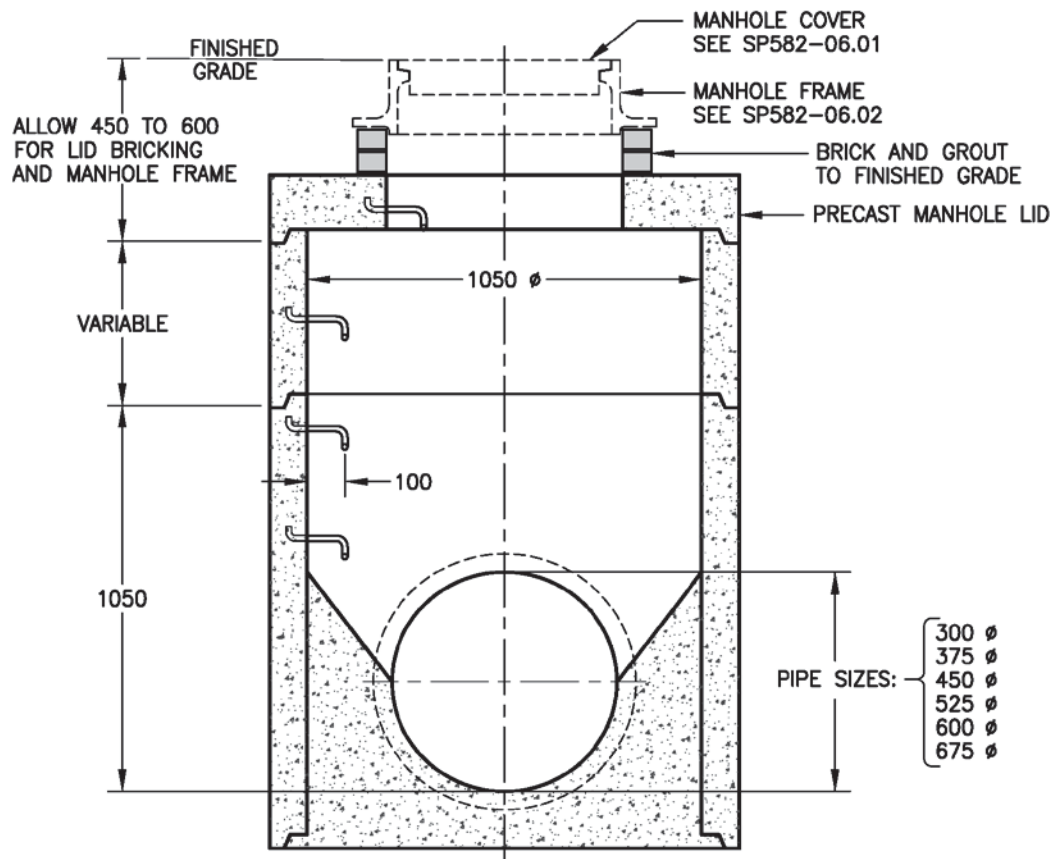






PREFABRICATED CONCRETE TEE MANHOLES
PIPE SIZES – 300 mm TO 675 mm

SP582–03.04



SECTION B
.03

NOTE: FOR LOCATION OF SECTION
SEE SP582–03.03

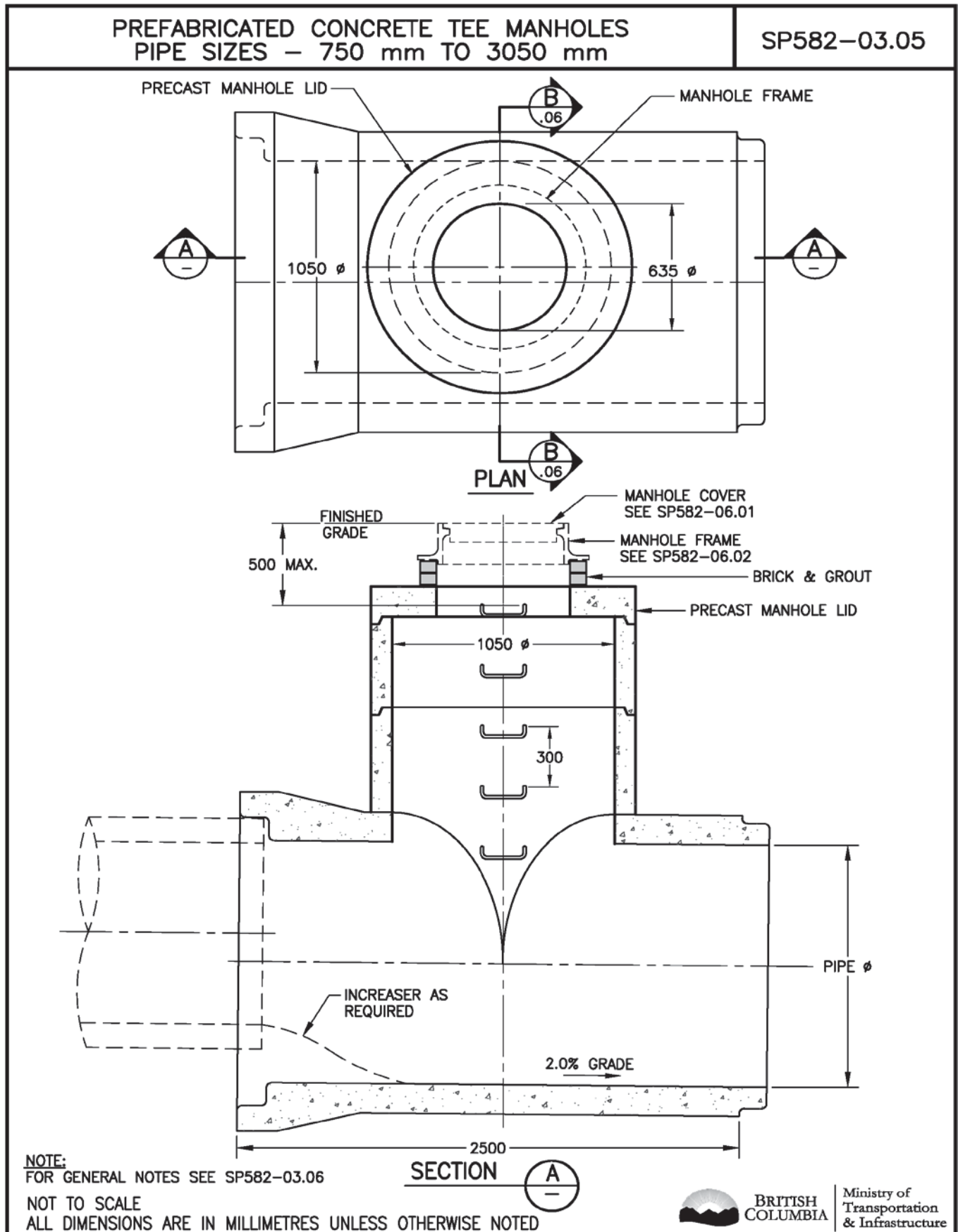
NOTE:
FOR GENERAL NOTES SEE SP582–03.06

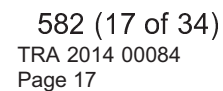
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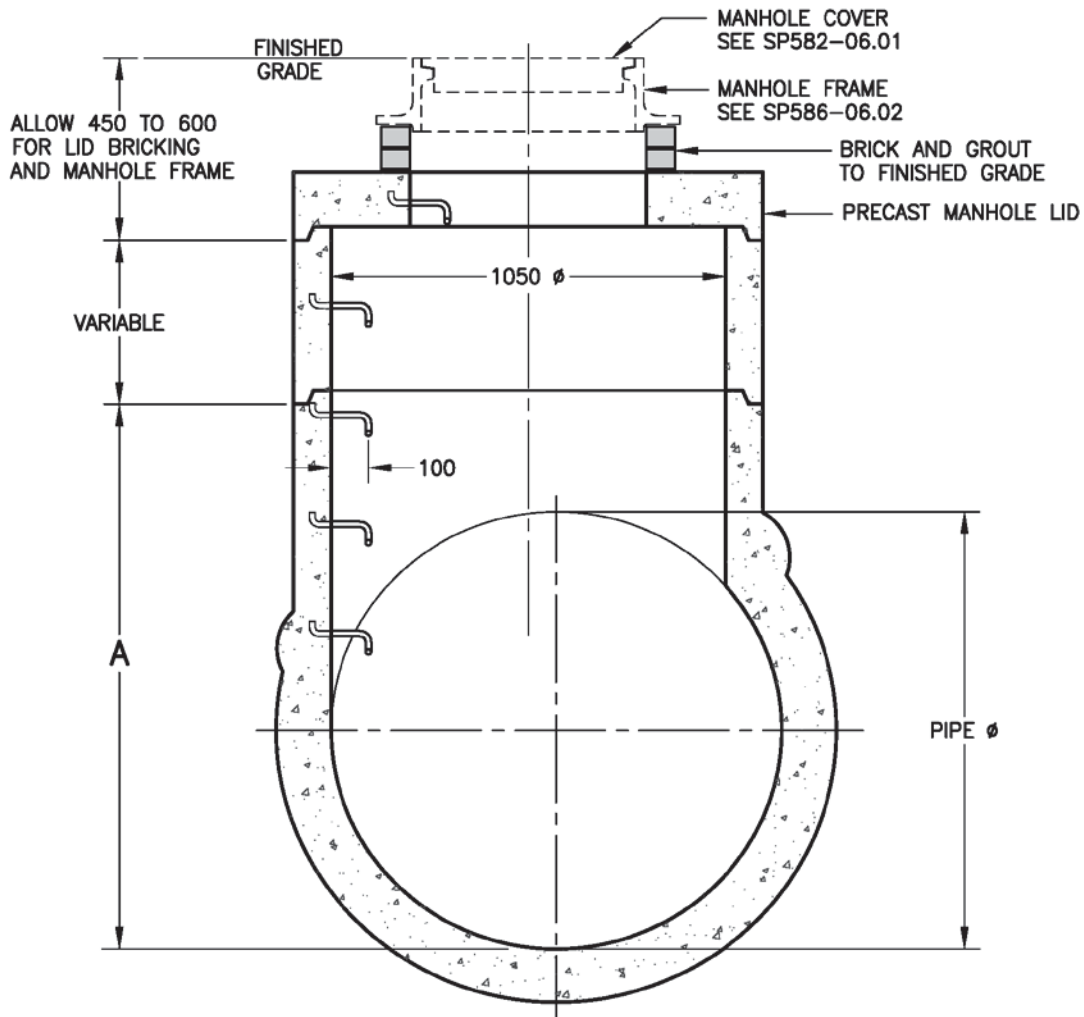
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PREFABRICATED CONCRETE TEE MANHOLES PIPE SIZES – 750 mm TO 3050

SP582–03.06



SECTION

B
.05

NOTE: FOR LOCATION OF SECTION
SEE SP582–03.05

NOTE:

1. SUPPLIER TO INSTALL 19 Ø GALVANIZED LADDER RUNGS OR PREAPPROVED ALTERNATIVE AS PER SUBSECTION 145.15.03
2. CONCRETE PIPE TO CONFORM TO ASTM C 76.
3. ALL PRECAST WORK TO CONFORM TO ASTM C 478 M.
4. MANHOLE LID TO WITHSTAND HS 20 LOADING.
5. MANHOLE TEE SECTION SHALL BE BEDDED AS PER SUBSECTION 582.37.
6. MANHOLE TEE SECTIONS MAY BE ORDERED AS INCREASERS ON THE UPSTREAM END TO ALLOW FOR PIPE SIZE CHANGES.

PIPE Ø	A
750	1270
900	1400
1050	1550
1200	1720
1350	1880
1500	1970
1800	2210

NOT TO SCALE
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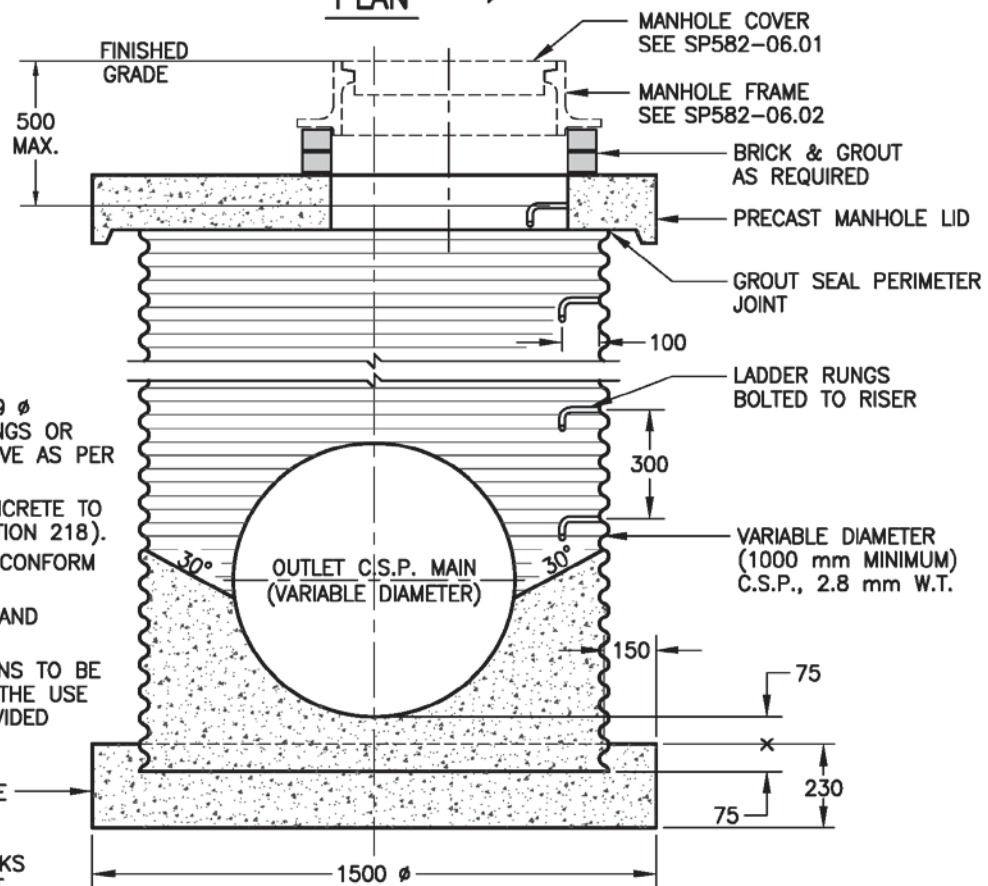
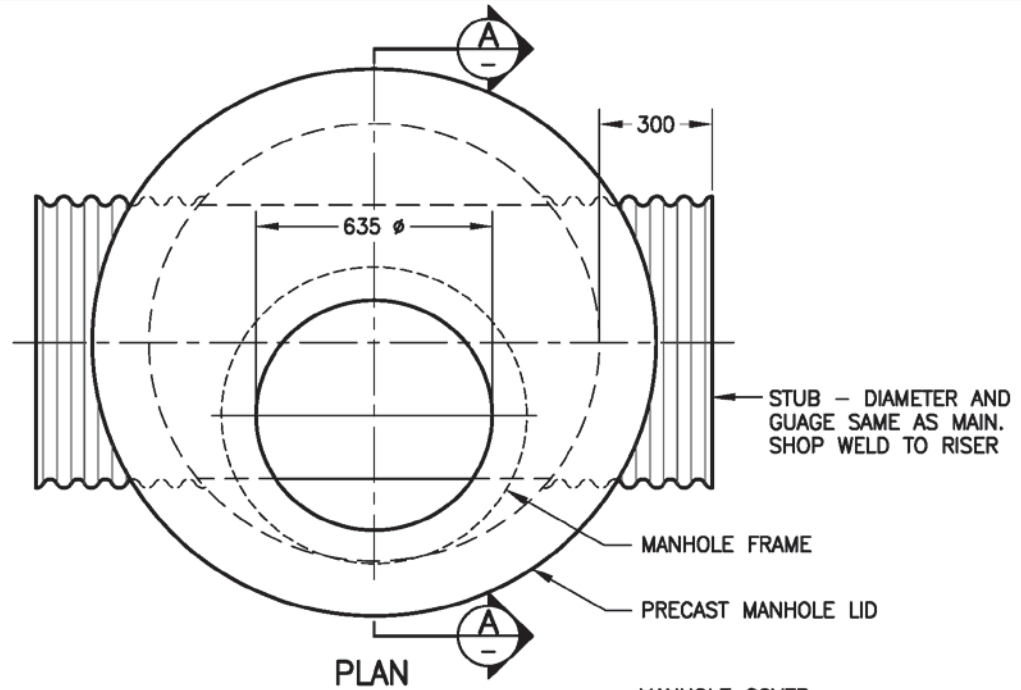


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CORRUGATED STEEL MANHOLE MAIN SMALLER THAN RISER

SP582-03.07

**NOTES:**

1. SUPPLIER TO INSTALL 19 ϕ GALVANIZED LADDER RUNGS OR PREAPPROVED ALTERNATIVE AS PER SUBSECTION 145.15.03
2. ALL CAST IN PLACE CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
3. ALL PRECAST WORK TO CONFORM TO ASTM C 478 M.
4. MANHOLE LID TO WITHSTAND HS 20 LOADING.
5. ALL LATERAL CONNECTIONS TO BE MADE IN THE FIELD BY THE USE OF APPROPRIATELY PROVIDED SADDLES.

REINFORCED CONC. BASE TO BE POURED DURING THE INSTALLATION. USE BRICKS OR CONC. BLOCKS AS TEMPORARY SUPPORT FOR VERTICAL BARREL.

SECTION

NOT TO SCALE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

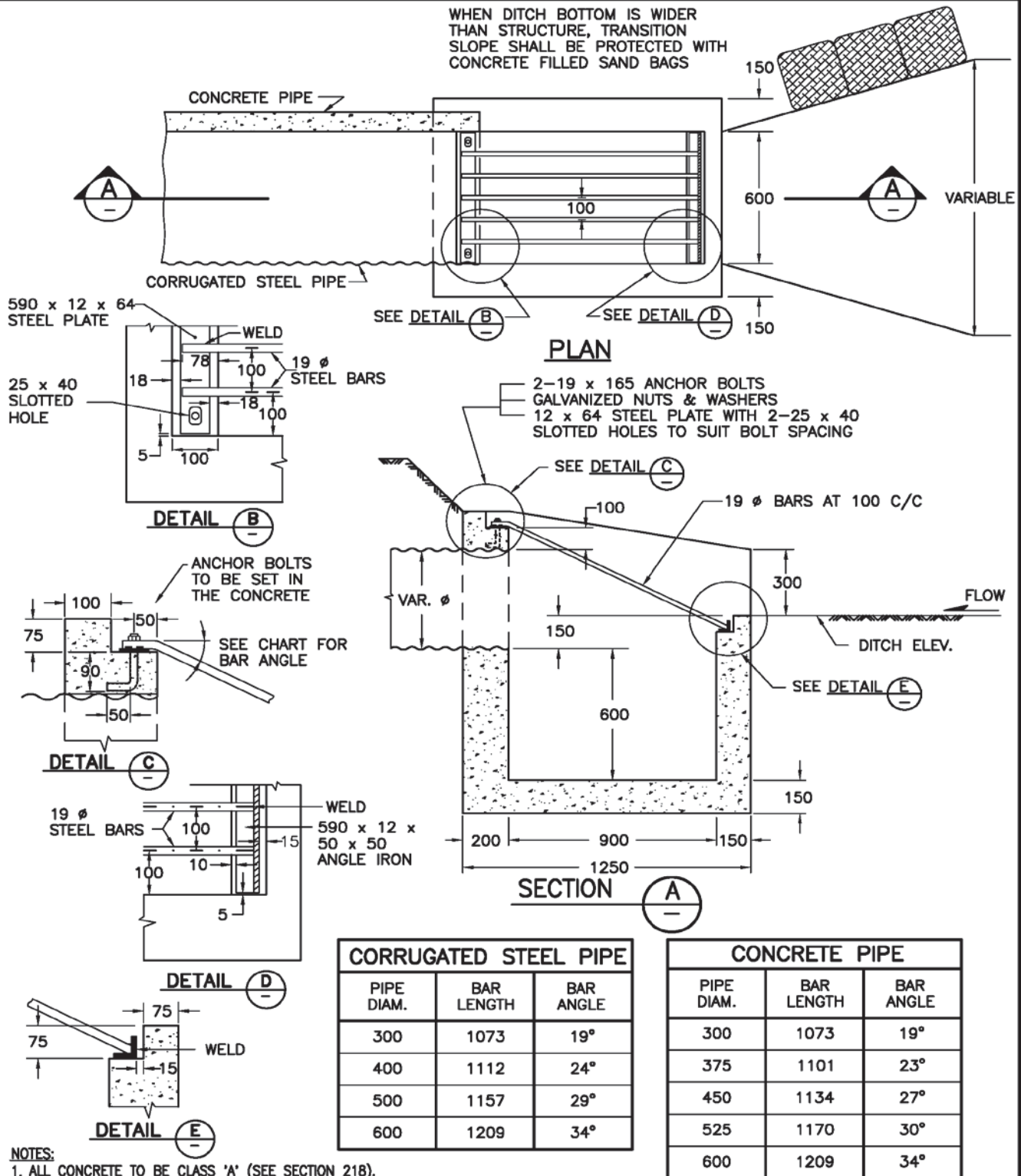


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CAST IN PLACE INLET STRUCTURE

SP582-04.01



NOTES:

1. ALL CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
2. ALL STEELWORK TO CONFORM TO CSA SPECIFICATION CAN3-G40.21M GRADE 300W.
3. ALL STEELWORK TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH CSA SPECIFICATION G164 TABLE 1.

NOT TO SCALE
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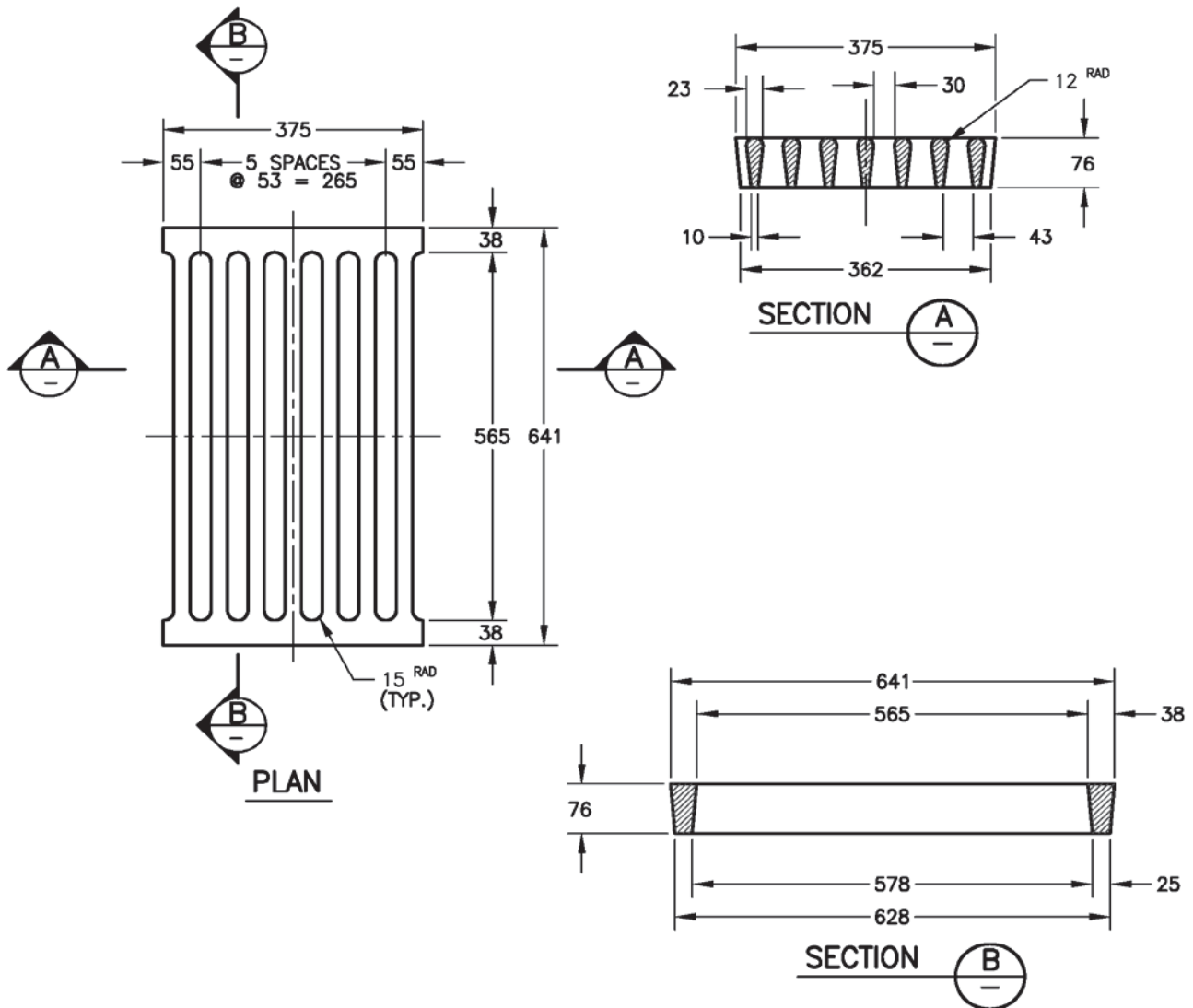


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TYPE 'A' CATCH BASIN GRATE (FREEWAY GRATE)

SP582-05.01

**NOTE:**

1. GRATES TO FIT CATCH BASIN FRAMES (SEE SP582-05.03 & SP582-05.04).
2. ALL MATERIAL TO BE CAST IRON.

NOT TO SCALE
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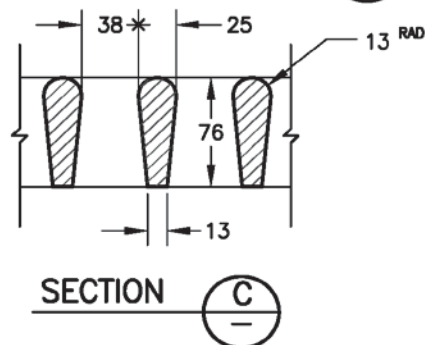
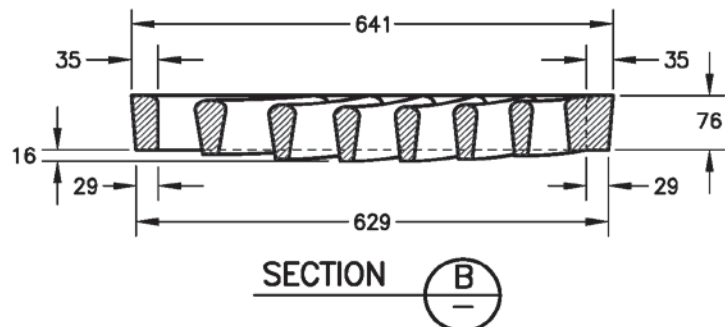
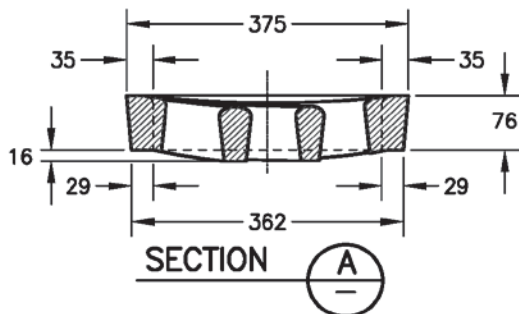
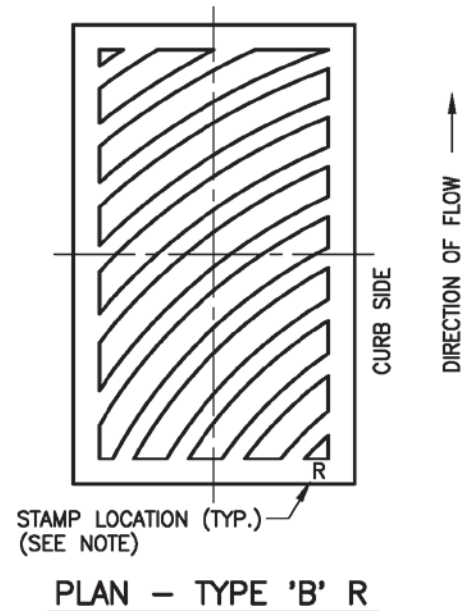
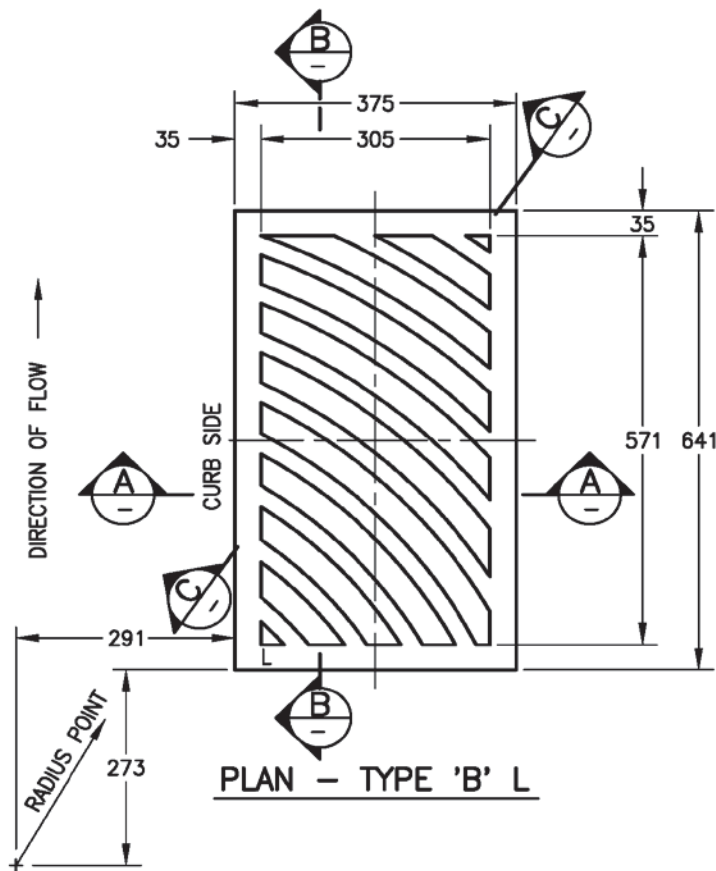


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TYPE 'B' CATCH BASIN GRATE (BICYCLE SAFE GRATE)

SP582-05.02

**NOTES:**

1. GRATES TO FIT CATCH BASIN FRAMES (SEE SP582-05.03 & SP582-05.04).
2. ALL MATERIAL TO BE CAST IRON.
3. GRATES TO BE STAMPED 'L' OR 'R' AS APPLICABLE, AT TIME OF MANUFACTURE.

NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

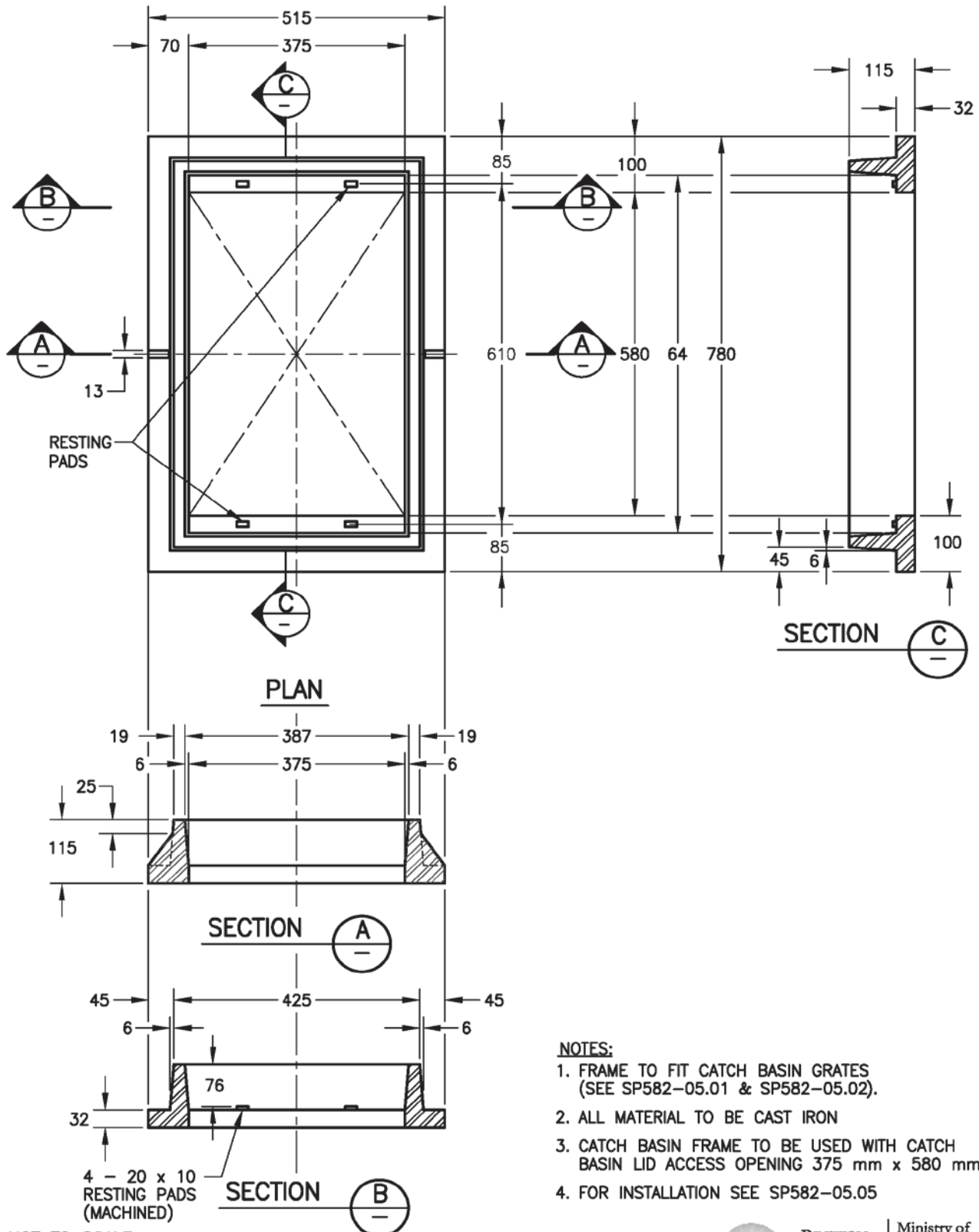


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SINGLE INLET CATCH BASIN FRAME

SP582-05.03

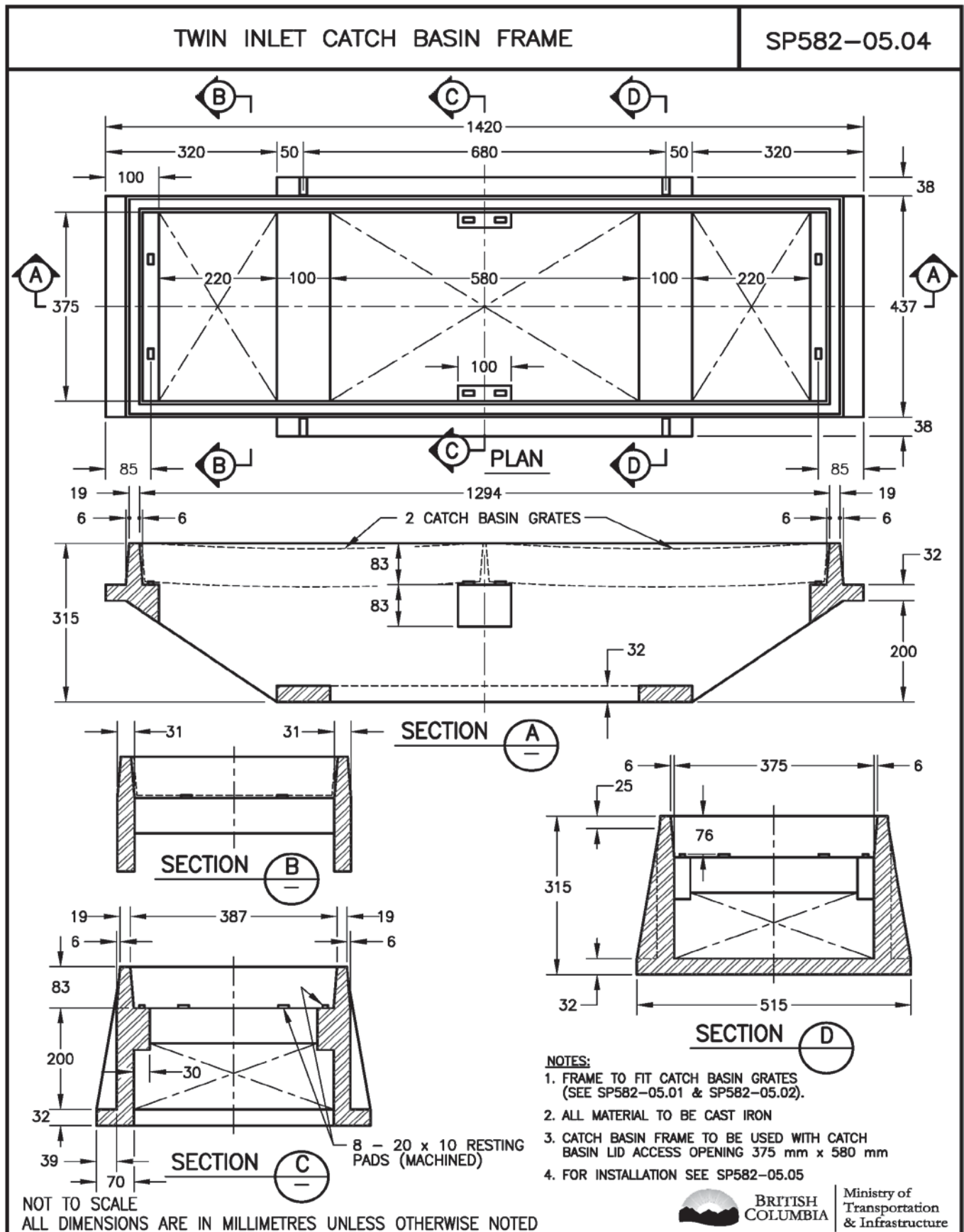


NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED



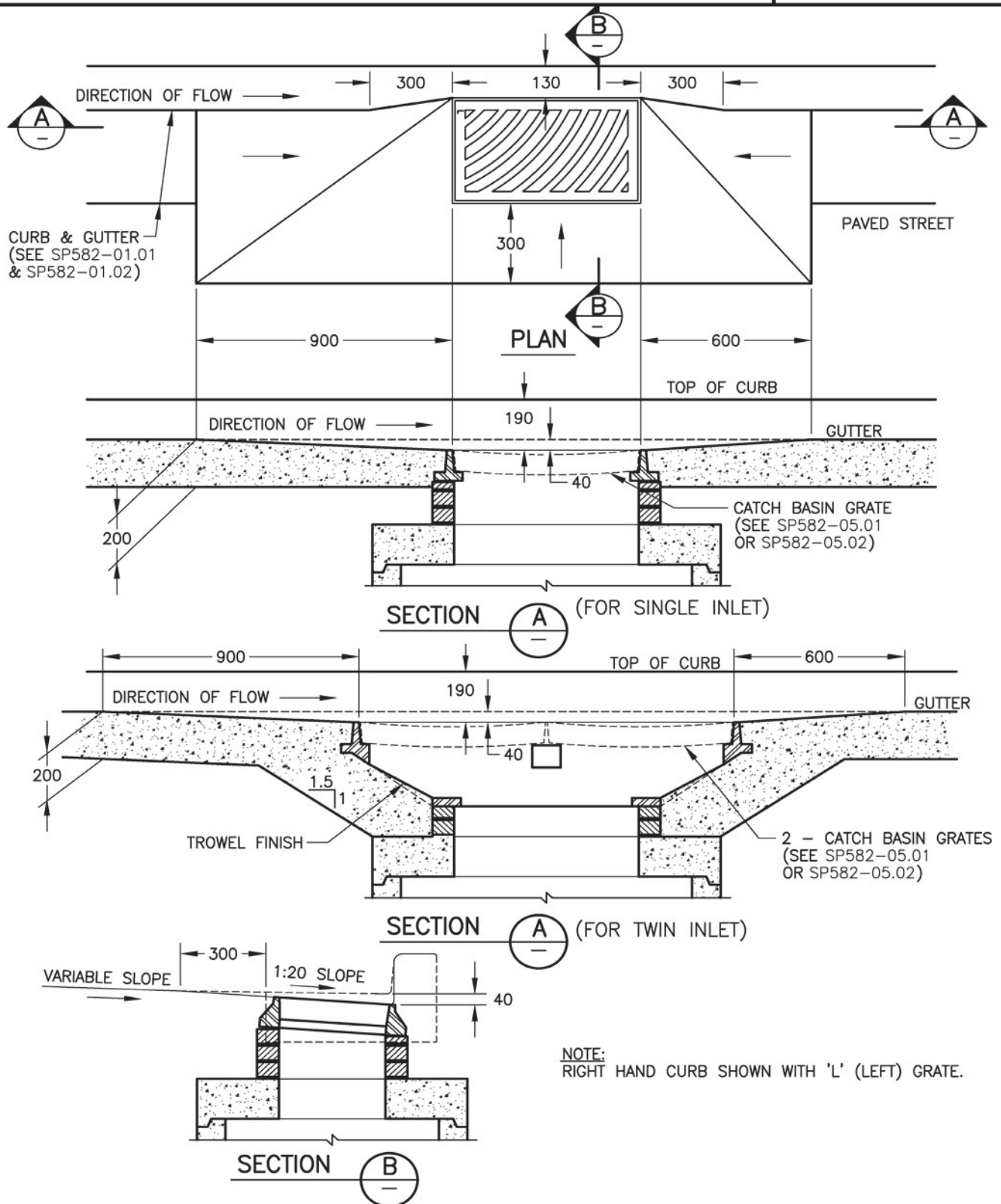
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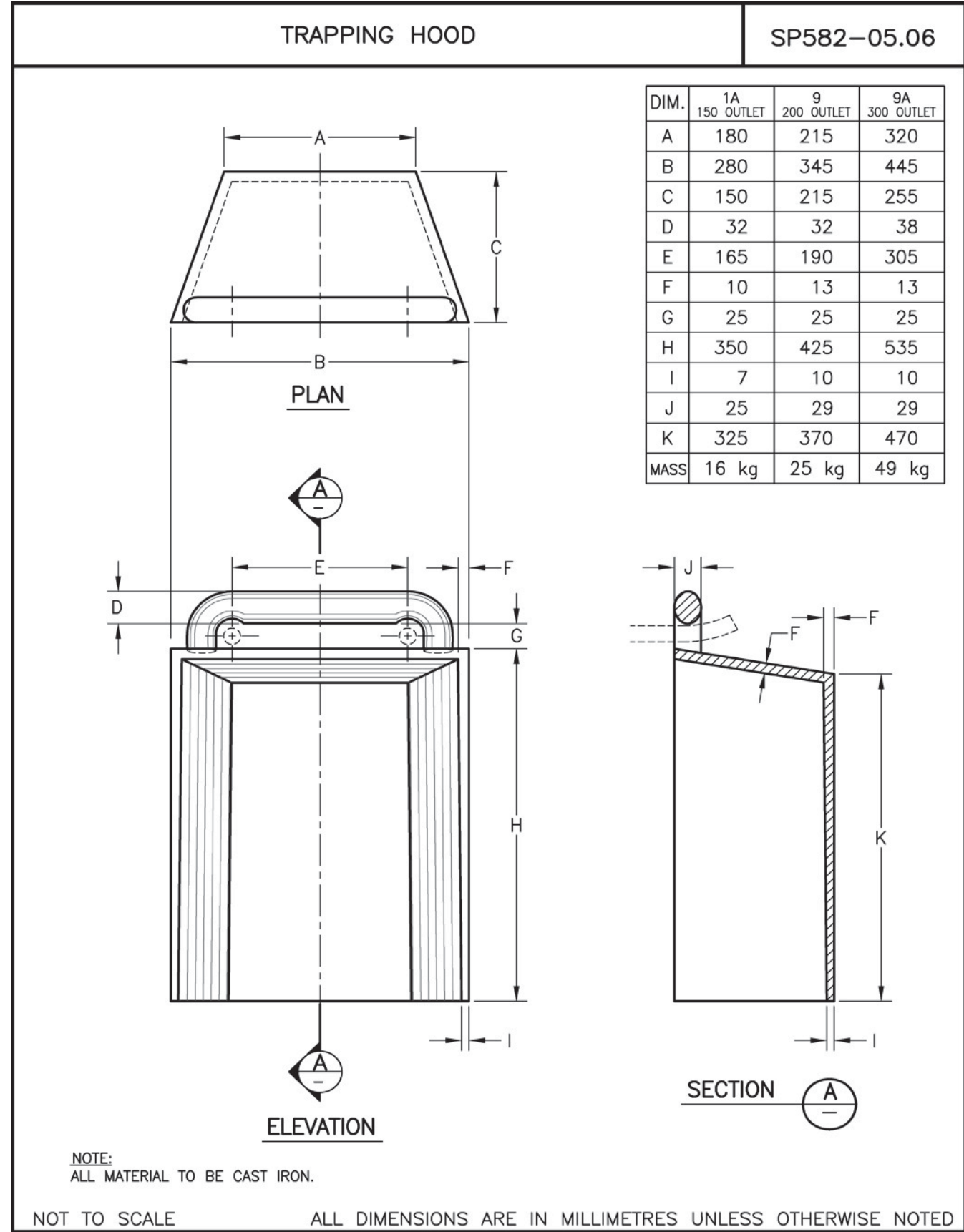
GRATE INSTALLATION – DEPRESSED GUTTER

SP582–05.05



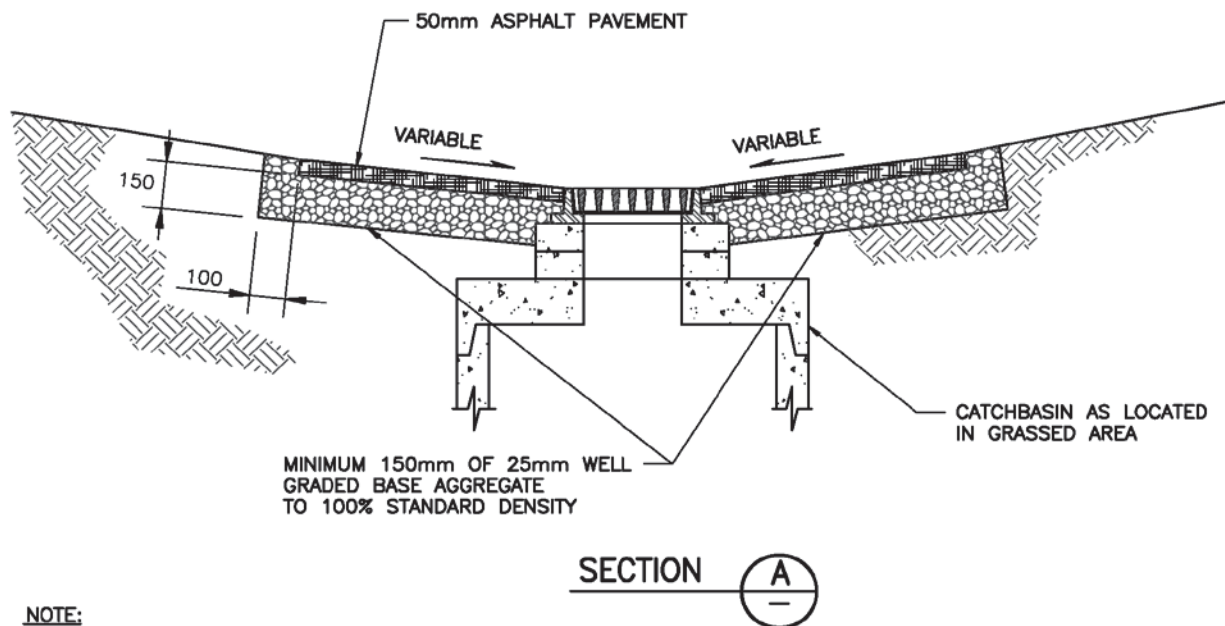
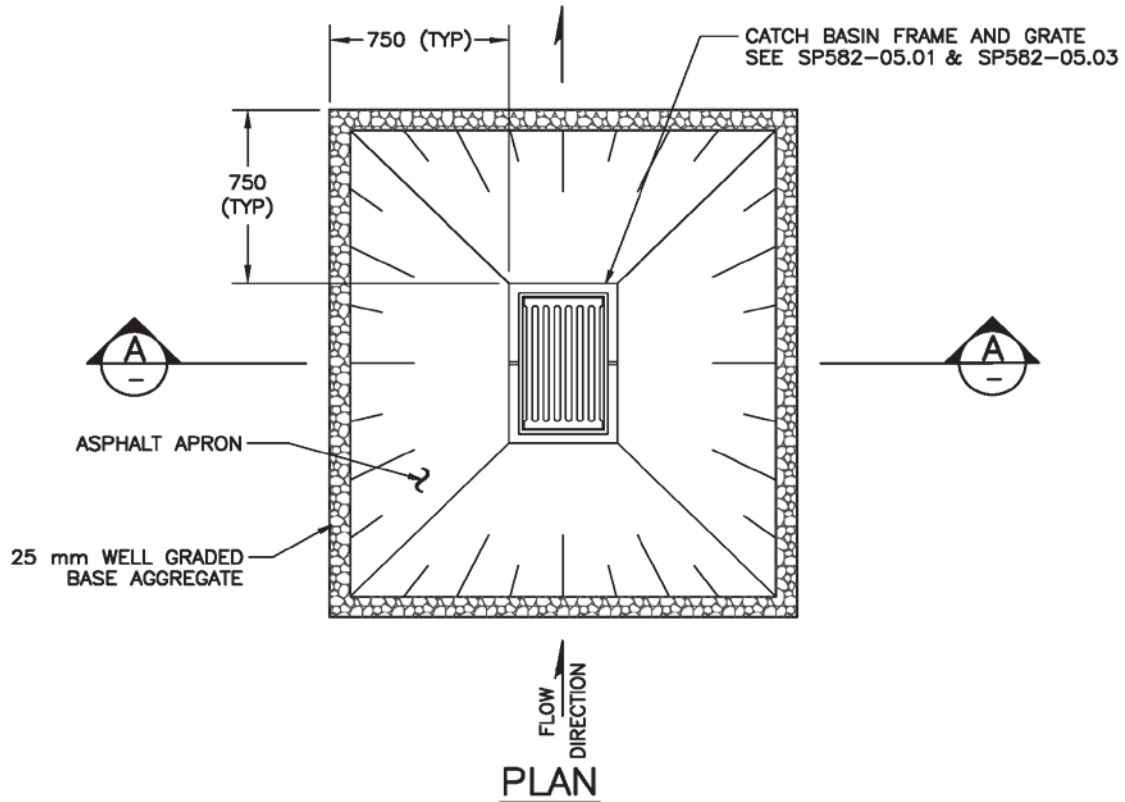
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ASPHALT APRON

SP582-05.07



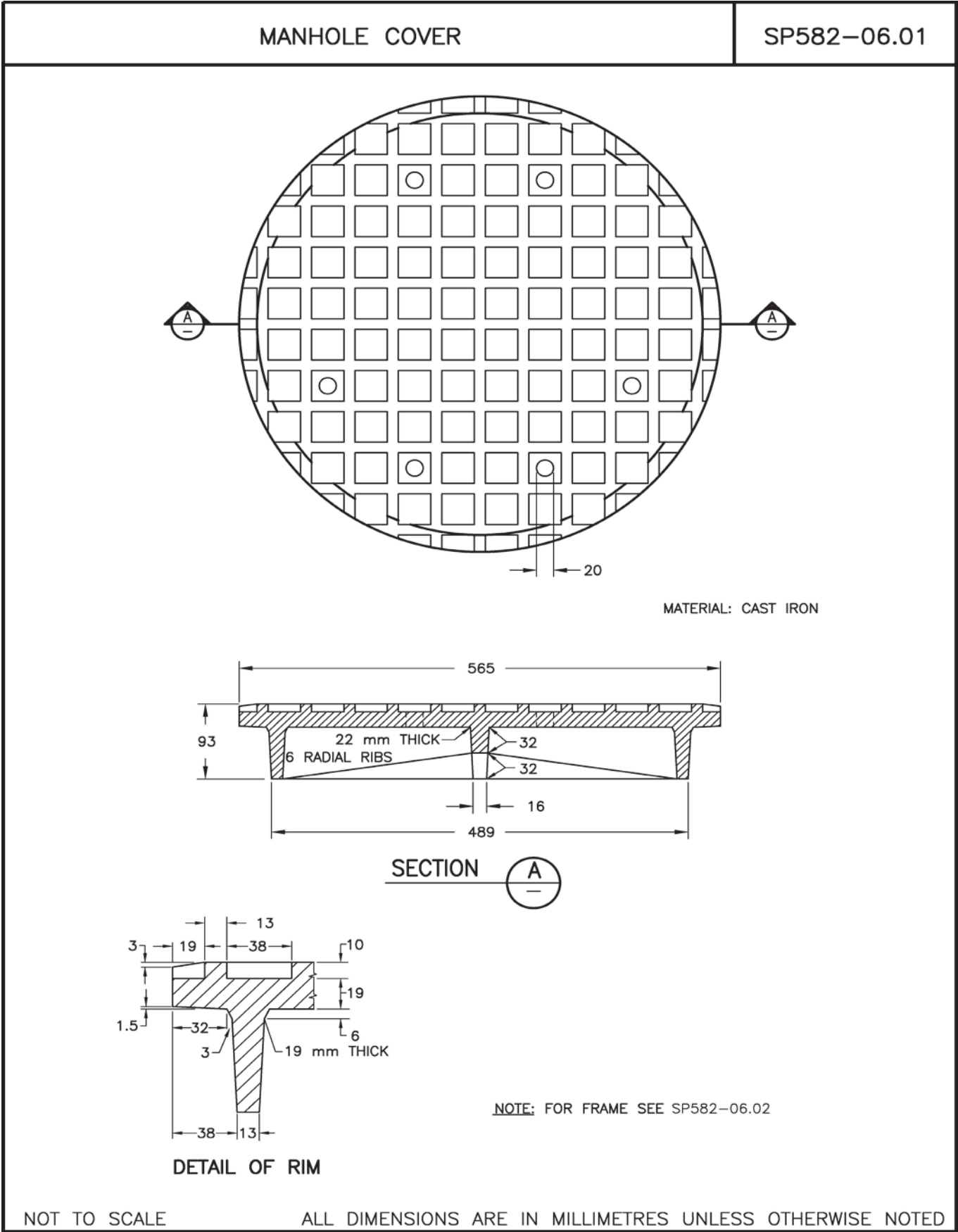
NOTE:
FOR DETAILS OF CATCH BASIN
SEE SP582-02.01 THROUGH SP582-02.05.

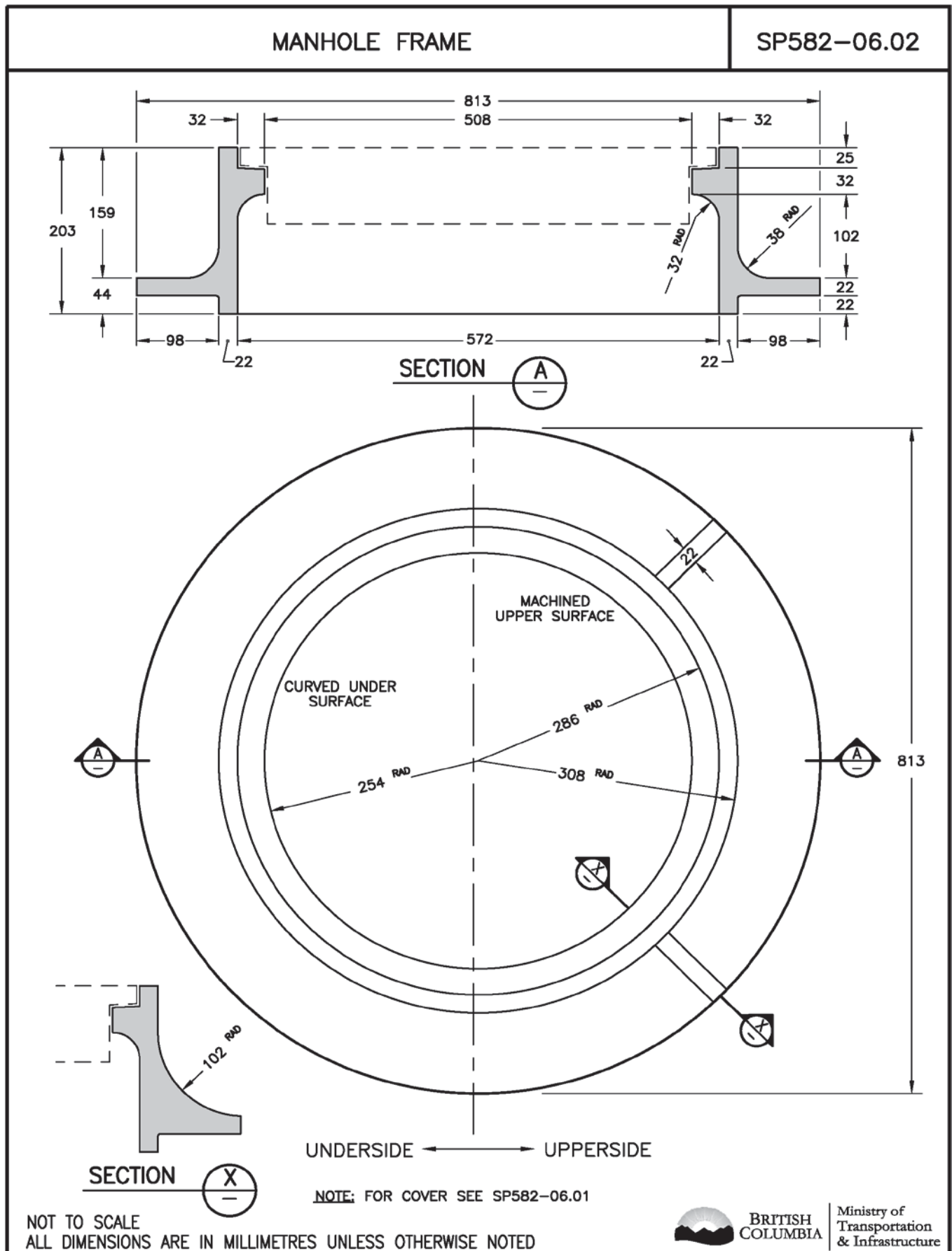
NOT TO SCALE
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED



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CONCRETE SIDEWALK & DRIVEWAY ENTRANCE

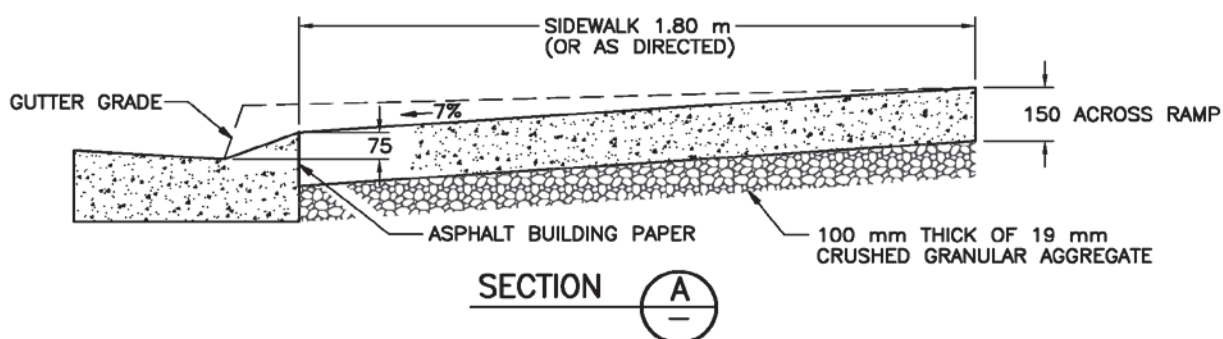
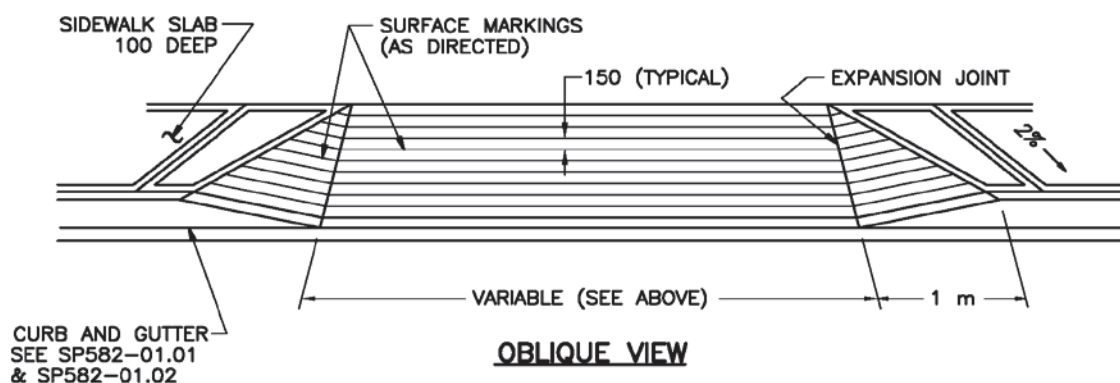
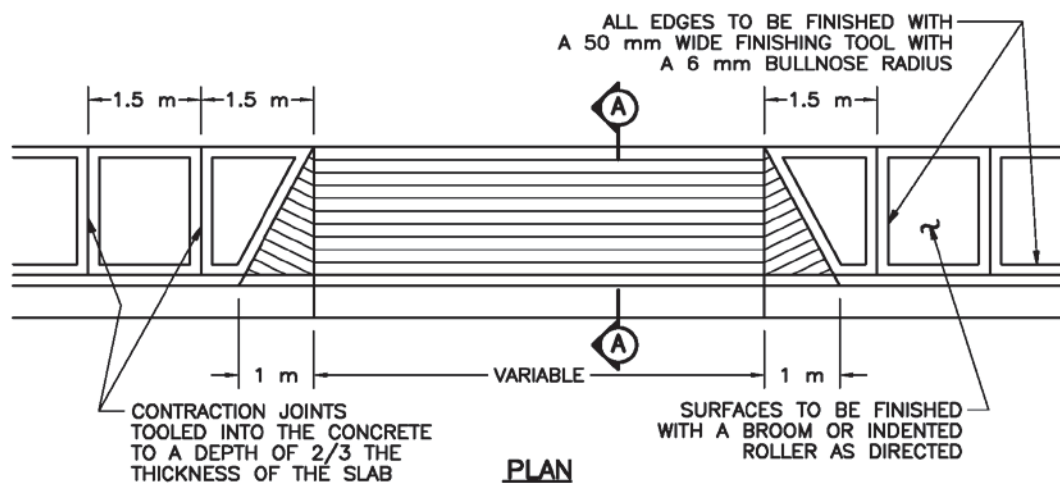
SP582-07.01

EXPANSION JOINTS

- CAPASION JOINTS**
- AT 6 m INTERVALS ACROSS SIDEWALK.
 - AROUND UTILITY POLES, CONCRETE STRUCTURES AND BUILDINGS.
 - AT EACH END OF THICKENED SIDEWALK SECTION AND AT MID-SPAN WHEN THE LENGTH IS GREATER THAN 6 m.

DRIVEWAY WIDTHS

- COMMERCIAL 2 WAY TRAFFIC 7.5 - 15 m
- COMMERCIAL 1 WAY TRAFFIC 6 - 10 m
- RESIDENTIAL.....6 m



NOTES:

1. FOR OPEN SHOULDER DRIVEWAY DETAIL SEE B.C. SUPPLEMENT TO TAC.
2. ADD 150 mm TO WIDTH WHEN SIDEWALK FENCE IS REQUIRED.
3. ALL CONCRETE TO BE CLASS 'A' (SEE SECTION 218).

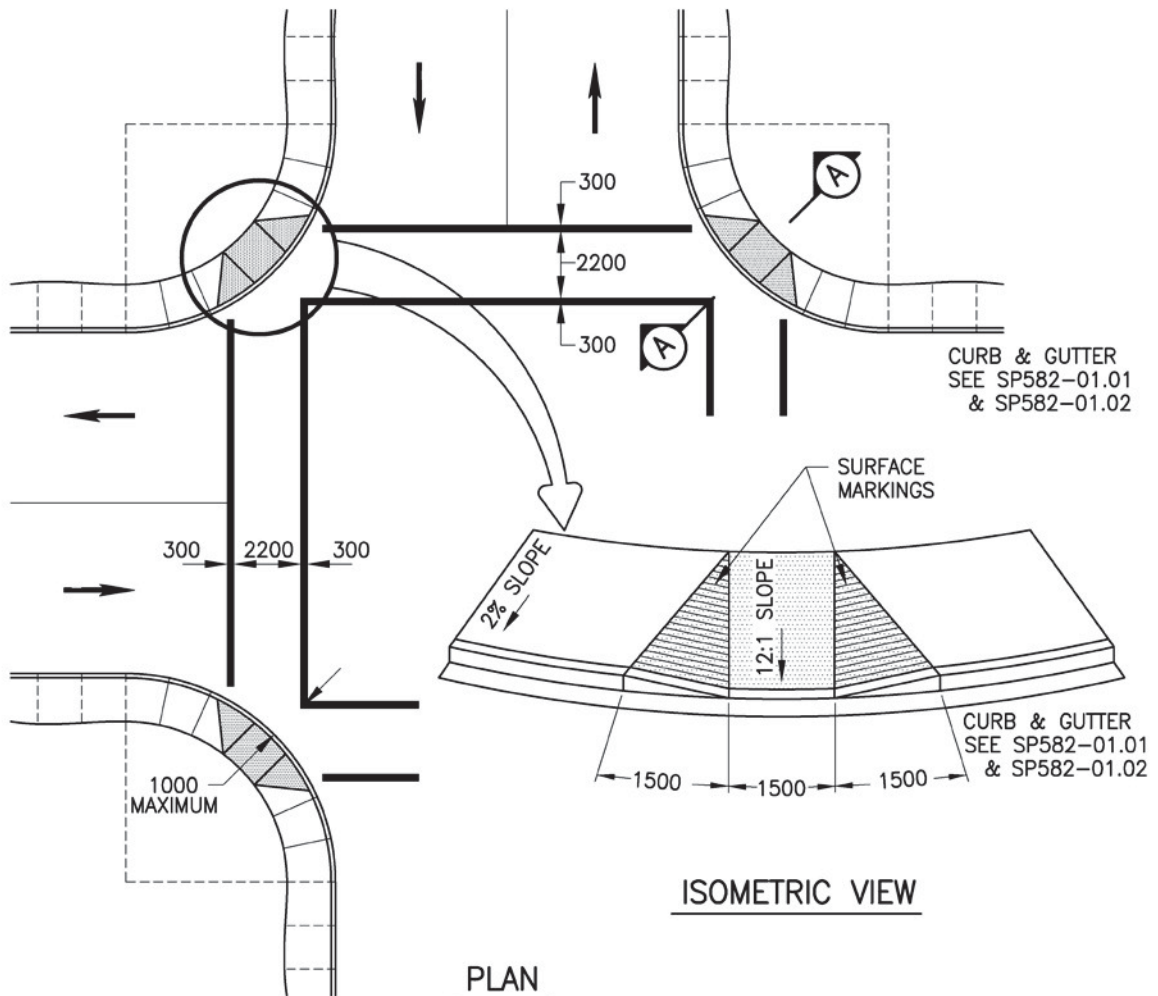
NOT TO SCALE
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SIDEWALK RAMP

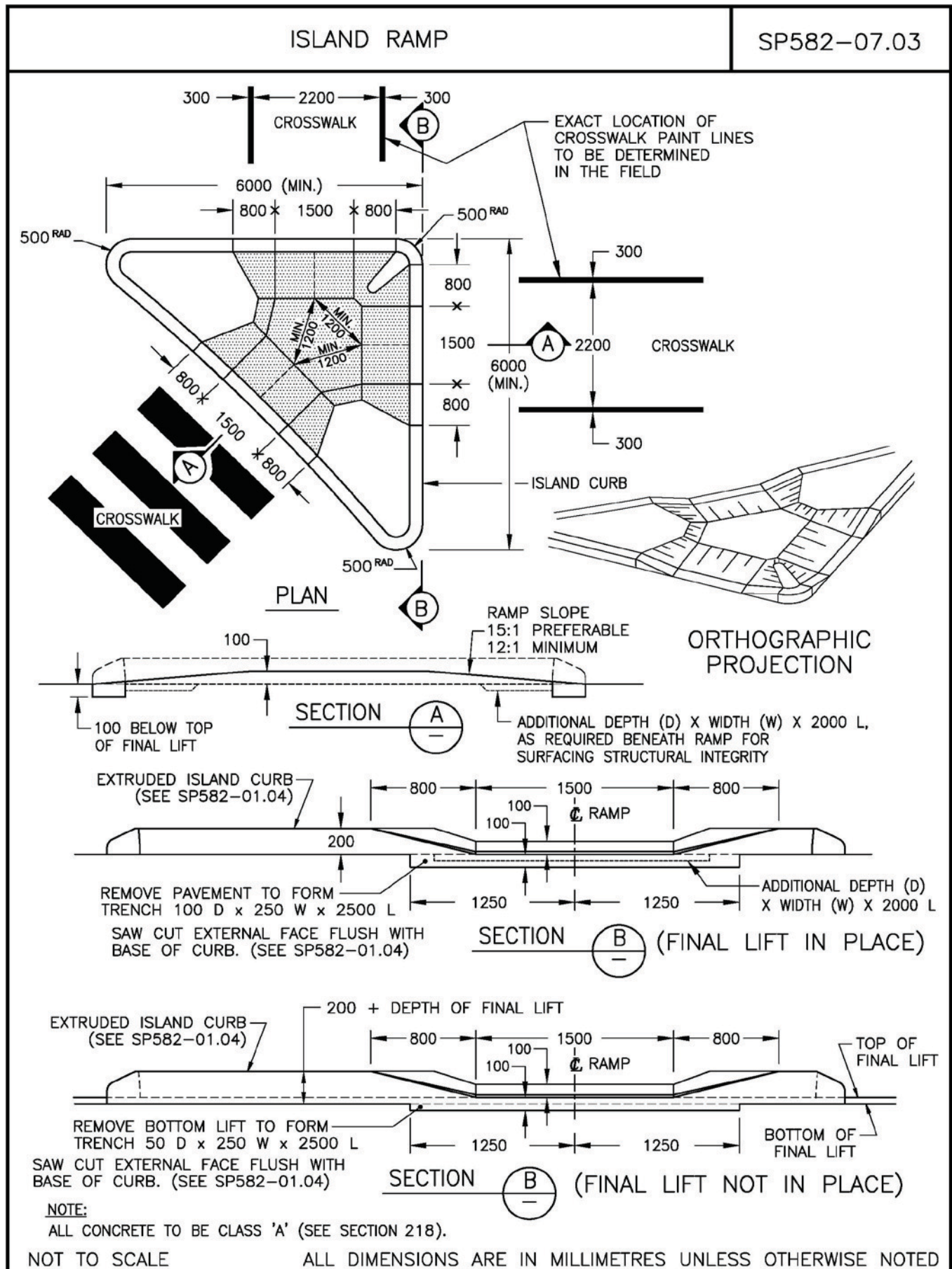
SP582-07.02

**NOTE:**

ALL CONCRETE TO BE CLASS 'A' (SEE SECTION 218).

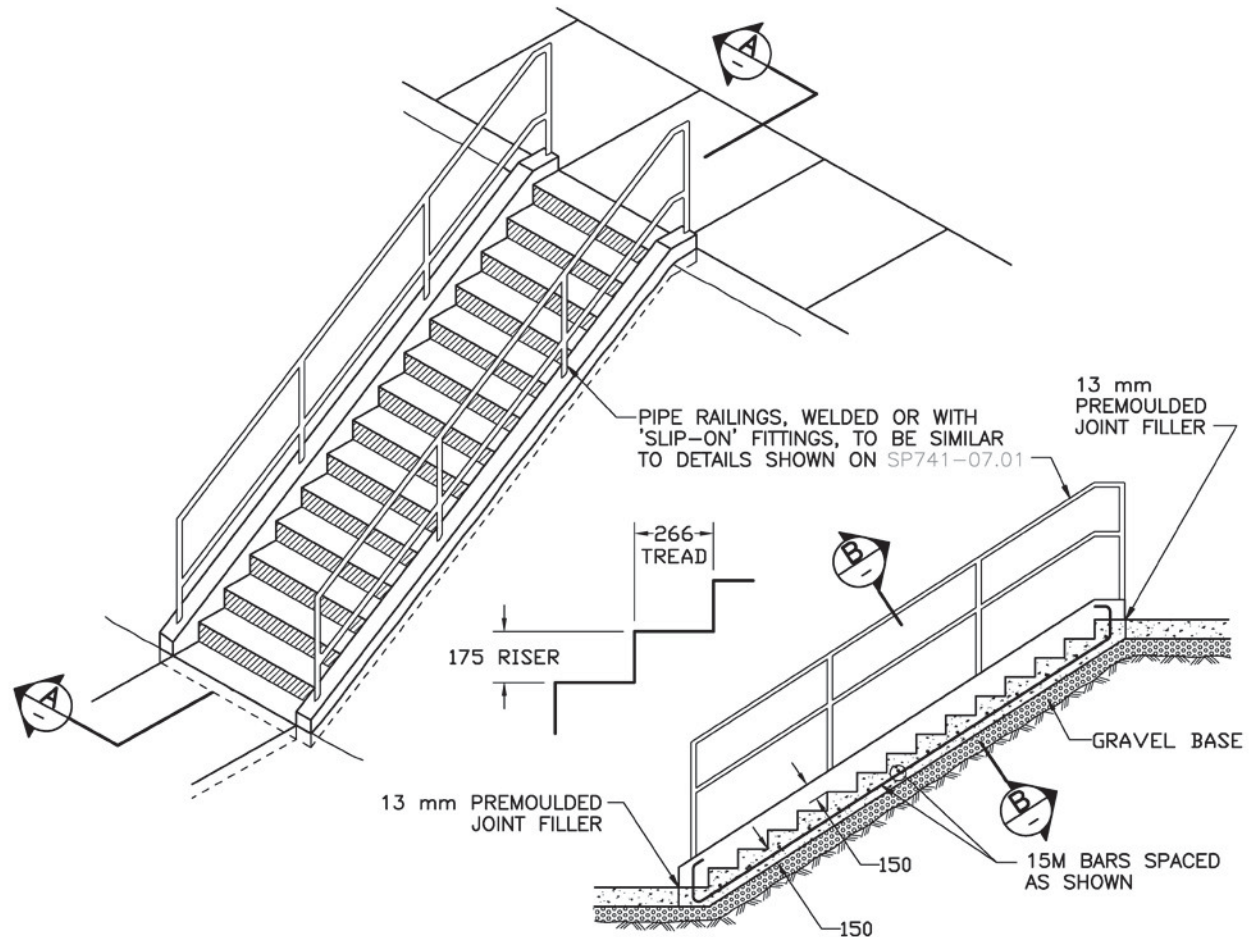
NOT TO SCALE

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REINFORCED CONCRETE STEPS

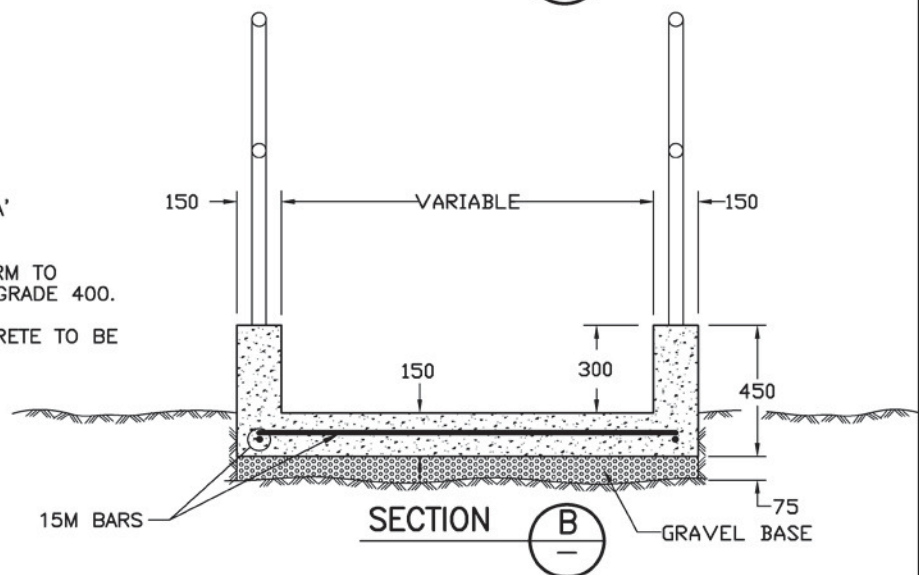
SP582-08.01



SECTION A

NOTES:

1. ALL CONCRETE TO BE CLASS 'A' (SEE SECTION 218).
2. REINFORCING STEEL TO CONFORM TO CSA SPECIFICATION G30.18-M GRADE 400.
3. ALL EXPOSED EDGES OF CONCRETE TO BE ROUNDED TO 13 mm RADIUS.



SECTION B



NOT TO SCALE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

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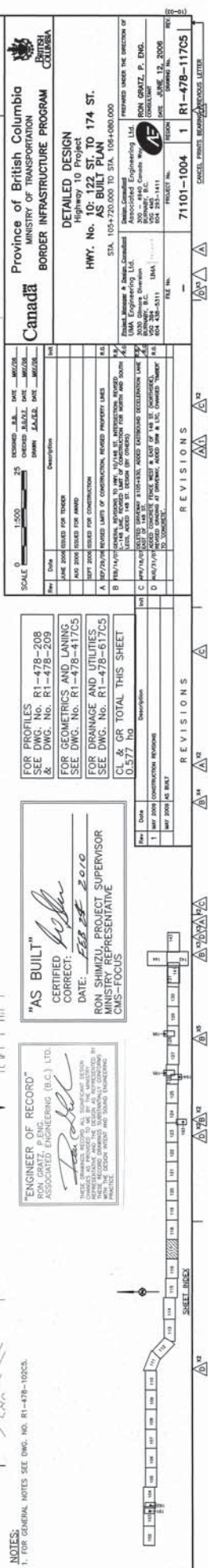
RESPONSIBILITY FOR WORKS ON CLASSIFIED HIGHWAYS AND PROVINCIAL/MUNICIPAL DIVISION OF COST

Works Item	Secondary		Arterial (Non-Freeway)		Arterial (Freeway)	
	Construction	Maintenance	Construction	Maintenance	Construction	Maintenance
Retaining Walls	Municipal P/M 50/50	Municipal P/M 40/60	Provincial P/M 100/0	Provincial P/M 100/0	Provincial P/M 100/0	Provincial P/M 100/0
Right-of-Way Acquisition	Municipal P/M 0/100	N/A	Provincial P/M 100/0	N/A	Provincial P/M 100/0	N/A
Seal Coat and other surface treatment	Municipal P/M 50/50	N/A	Provincial P/M 100/0 (See Section 6.03.5 for works limit on the intersecting municipal roads)	N/A	Provincial P/M 100/0 (See Section 6.03.5 for works limit on the intersecting municipal roads)	N/A
Sidewalks (on grade)	Municipal P/M 0/100	Municipal P/M 0/100	Municipal P/M 0/100 under permit from the Ministry. (See Section 6.03.9 for exception)	Municipal P/M 0/100	N/A	N/A
Sidewalks (on structures)	Municipal P/M 50/50	Municipal P/M 40/60	Provincial P/M 100/0	See Section 6.03.10 for responsibility and share of costs.	Provincial P/M 100/0	Provincial P/M 100/0
Signals (fire)	Municipal P/M 0/100	Municipal P/M 0/100	Municipal P/M 0/100 (or Fire District) under permit from the Ministry. (See Section 6.03.11 for exception)	Municipal P/M 0/100 (or Fire District)	N/A	N/A

Key: Provincial (or Municipal) = Works responsibility

P/M = % Division of costs

N/A = Not Applicable



FOR GENERAL NOTES SEE DWG. NO. R1-478-102C5.



DESIGN SPEED 80 km/h																									
1. ELEVATIONS SHOWN ARE FINISHED GRADE AT CONTROL LINES.																									
2. SUPERELEVATION AT INTERSECTIONS.																									
<table border="1"> <thead> <tr> <th>Year</th><th>Total</th><th>Description</th></tr> </thead> <tbody> <tr> <td>June 2008</td><td></td><td>ISSUED FOR TENDER</td></tr> <tr> <td>July 2008</td><td></td><td></td></tr> <tr> <td>Aug 2008</td><td></td><td>ISSUED FOR #4400</td></tr> </tbody> </table>	Year	Total	Description	June 2008		ISSUED FOR TENDER	July 2008			Aug 2008		ISSUED FOR #4400	<table border="1"> <thead> <tr> <th>Year</th><th>Total</th><th>Description</th></tr> </thead> <tbody> <tr> <td>June 2008</td><td></td><td>ISSUED FOR TENDER</td></tr> <tr> <td>July 2008</td><td></td><td></td></tr> <tr> <td>Aug 2008</td><td></td><td>ISSUED FOR #4400</td></tr> </tbody> </table>	Year	Total	Description	June 2008		ISSUED FOR TENDER	July 2008			Aug 2008		ISSUED FOR #4400
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Aug 2008		ISSUED FOR #4400																							
DETAILED DESIGN Highway 10 Project																									
COURTESY																									

THREE DRAWING RECORD ALL SIGNIFICANT DESIGN CHANGES TO THE PROJECT. THE DESIGNER, ENGINEER, ARCHITECT, CONSULTANT AND THE OWNER AS REPRESENTED BY THE PROJECT SUPERVISOR SHALL SIGN AND DATE THE RECORD.

DATE: Feb 16 2010

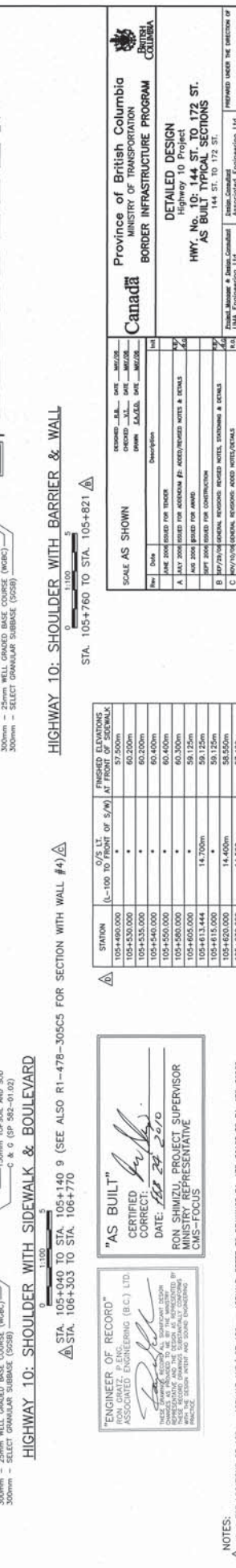
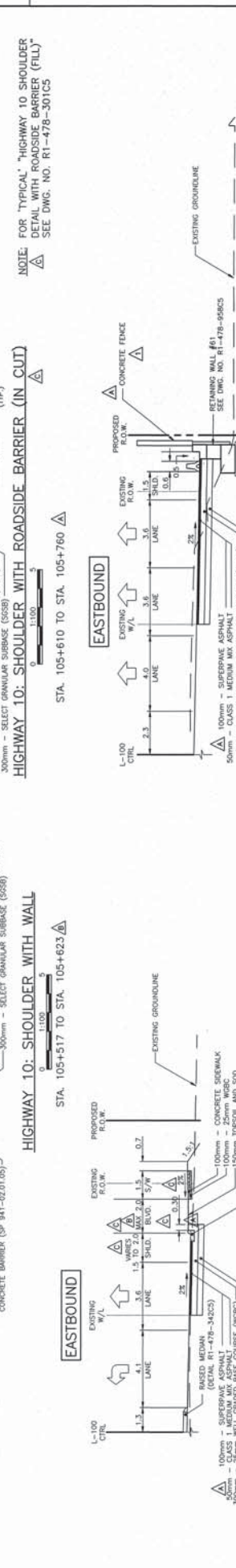
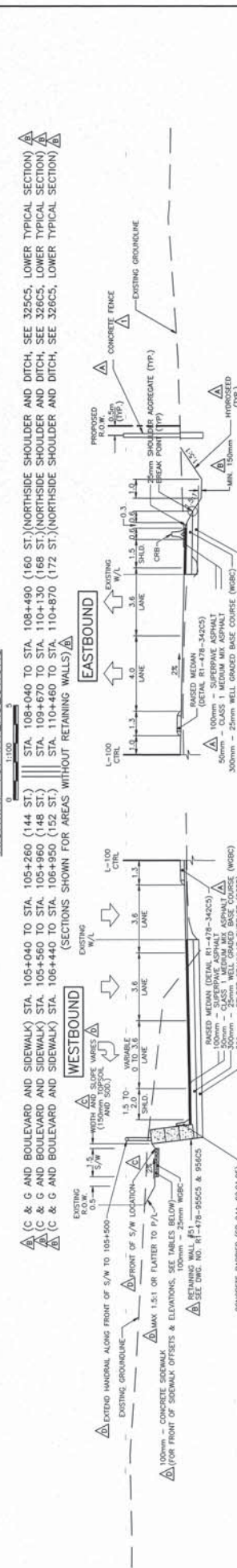
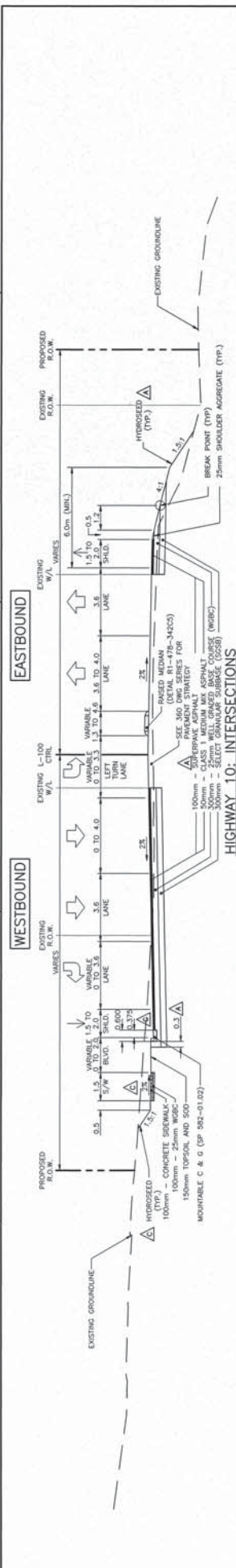
CURRENT: 2010

RON SHIMIZU, PROJECT SUPERVISOR

1	MR. JOE J. BART	10/1/09	UAA
2	MR. JAMES W. BART	10/1/09	UAA
3	MR. JAMES W. BART	10/1/09	UAA
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93	MR. JAMES W. BART	10/1/09	UAA

MINISTRY REPRESENTATIVE CMS-FOCUS		PROJECT NO. 71101-1004		REGION 1		PROJECT NO. R1-478-208C5			
FILE NO. -		REVISIONS		FILE NO. -		REGION 1		PROJECT NO. R1-478-208C5	

$$\frac{B}{A} \cdot \frac{A}{B} = 1 \quad \frac{A}{B} \cdot \frac{B}{A} = 1 \quad \frac{B}{A} \cdot \frac{A}{B} = 1 \quad \frac{A}{B} \cdot \frac{B}{A} = 1$$



NOTES:

1. * FOR LOCATIONS OF 100mm ASPHALT AND/OR 150mm ASPHALT, REFER TO DRAWINGS R1-478-301C5 TO R1-478-301C5.
2. * 100mm ASPHALT THICKNESS = 100mm SUPERPAVE ASPHALT.
3. * 150mm ASPHALT THICKNESS = 150mm SUPERPAVE ASPHALT + 50mm CLASS 1 MEDIUM MXX ASPHALT.
4. * SEE DRAWING R1-478-301C5 FOR DETAILS.

ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE

REVISIONS

Rev	Date	Description
1	2008-04-14	ISSUED FOR CONSTRUCTION
2	2008-04-14	ISSUED FOR CONSTRUCTION
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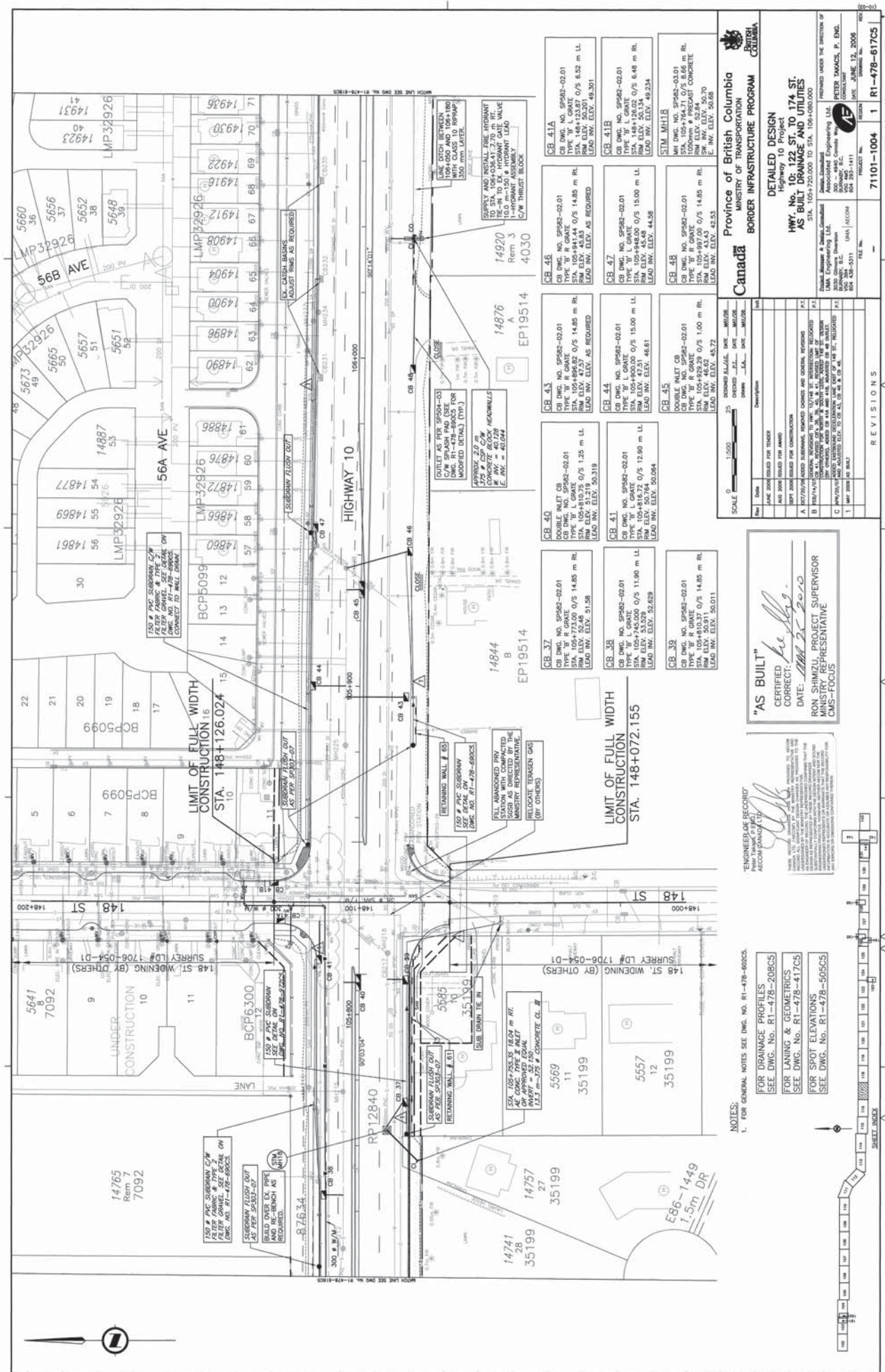
Province of British Columbia
MINISTRY OF TRANSPORTATION
BORDER INFRASTRUCTURE PROGRAM

Canada

DETAILED DESIGN
Highway 10 Project
AS BUILT TYPICAL SECTIONS
HWY. No. 10: 144 ST. TO 172 ST.

FORWARDED UNDER THE SIGNATURE OF
RON GRATZ, P. ENG.
DATE: 2008-04-14
FILE NO.: 71101-1004
PROJECT NO.: 1 R1-478-321C5

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RON GRATZ, P. ENG.
DATE: 2008-04-14
FILE NO.: 71101-1004
PROJECT NO.: 1 R1-478-321C5



[illegible]

REFER TO DRAWING NO. RI-478-70225 FOR GENERAL NOTES.

REGIONAL SPEED 80 $\frac{\text{km}}{\text{h}}$ LIMIT 10

SCALE 1:1000

DRAWN BY DATE

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION

DESIGN SPEED 80 KM/H - HW 1.10

DESIGN 8.2/8.5 DATE 30/1/2006

Calliandra

MINIMUM 10% OF COVER OF VARIATION

BARRED INTERACTED WITH THE PROOF

BRITISH

DESIGN VEHICLE WR-20		BORDER INFRASTRUCTURE PROGRAM		COLUMBIA	
Ref	Date	Description	Int		

DATE 2009 ISSUED FOR TENDER	
DESIGN ENGINEER NO. 20	

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐ 6. ☐ 7. ☐ 8. ☐ 9. ☐ 10. ☐ 11. ☐ 12. ☐ 13. ☐ 14. ☐ 15. ☐ 16. ☐ 17. ☐ 18. ☐ 19. ☐ 20. ☐ 21. ☐ 22. ☐ 23. ☐ 24. ☐ 25. ☐ 26. ☐ 27. ☐ 28. ☐ 29. ☐ 30. ☐ 31. ☐ 32. ☐ 33. ☐ 34. ☐ 35. ☐ 36. ☐ 37. ☐ 38. ☐ 39. ☐ 40. ☐ 41. ☐ 42. ☐ 43. ☐ 44. ☐ 45. ☐ 46. ☐ 47. ☐ 48. ☐ 49. ☐ 50. ☐ 51. ☐ 52. ☐ 53. ☐ 54. ☐ 55. ☐ 56. ☐ 57. ☐ 58. ☐ 59. ☐ 60. ☐ 61. ☐ 62. ☐ 63. ☐ 64. ☐ 65. ☐ 66. ☐ 67. ☐ 68. ☐ 69. ☐ 70. ☐ 71. ☐ 72. ☐ 73. ☐ 74. ☐ 75. ☐ 76. ☐ 77. ☐ 78. ☐ 79. ☐ 80. ☐ 81. ☐ 82. ☐ 83. ☐ 84. ☐ 85. ☐ 86. ☐ 87. ☐ 88. ☐ 89. ☐ 90. ☐ 91. ☐ 92. ☐ 93. ☐ 94. ☐ 95. ☐ 96. ☐ 97. ☐ 98. ☐ 99. ☐ 100. ☐ 101. ☐ 102. ☐ 103. ☐ 104. ☐ 105. ☐ 106. ☐ 107. ☐ 108. ☐ 109. ☐ 110. ☐ 111. ☐ 112. ☐ 113. ☐ 114. ☐ 115. ☐ 116. ☐ 117. ☐ 118. ☐ 119. ☐ 120. ☐ 121. ☐ 122. ☐ 123. ☐ 124. ☐ 125. ☐ 126. ☐ 127. ☐ 128. ☐ 129. ☐ 130. ☐ 131. ☐ 132. ☐ 133. ☐ 134. ☐ 135. ☐ 136. ☐ 137. ☐ 138. ☐ 139. ☐ 140. ☐ 141. ☐ 142. ☐ 143. ☐ 144. ☐ 145. ☐ 146. ☐ 147. ☐ 148. ☐ 149. ☐ 150. ☐ 151. ☐ 152. ☐ 153. ☐ 154. ☐ 155. ☐ 156. ☐ 157. ☐ 158. ☐ 159. ☐ 160. ☐ 161. ☐ 162. ☐ 163. ☐ 164. ☐ 165. ☐ 166. ☐ 167. ☐ 168. ☐ 169. ☐ 170. ☐ 171. ☐ 172. ☐ 173. ☐ 174. ☐ 175. ☐ 176. ☐ 177. ☐ 178. ☐ 179. ☐ 180. ☐ 181. ☐ 182. ☐ 183. ☐ 184. ☐ 185. ☐ 186. ☐ 187. ☐ 188. ☐ 189. ☐ 190. ☐ 191. ☐ 192. ☐ 193. ☐ 194. ☐ 195. ☐ 196. ☐ 197. ☐ 198. ☐ 199. ☐ 200. ☐ 201. ☐ 202. ☐ 203. ☐ 204. ☐ 205. ☐ 206. ☐ 207. ☐ 208. ☐ 209. ☐ 210. ☐ 211. ☐ 212. ☐ 213. ☐ 214. ☐ 215. ☐ 216. ☐ 217. ☐ 218. ☐ 219. ☐ 220. ☐ 221. ☐ 222. ☐ 223. ☐ 224. ☐ 225. ☐ 226. ☐ 227. ☐ 228. ☐ 229. ☐ 230. ☐ 231. ☐ 232. ☐ 233. ☐ 234. ☐ 235. ☐ 236. ☐ 237. ☐ 238. ☐ 239. ☐ 240. ☐ 241. ☐ 242. ☐ 243. ☐ 244. ☐ 245. ☐ 246. ☐ 247. ☐ 248. ☐ 249. ☐ 250. ☐ 251. ☐ 252. ☐ 253. ☐ 254. ☐ 255. ☐ 256. ☐ 257. ☐ 258. ☐ 259. ☐ 260. ☐ 261. ☐ 262. ☐ 263. ☐ 264. ☐ 265. ☐ 266. ☐ 267. ☐ 268. ☐ 269. ☐ 270. ☐ 271. ☐ 272. ☐ 273. ☐ 274. ☐ 275. ☐ 276. ☐ 277. ☐ 278. ☐ 279. ☐ 280. ☐ 281. ☐ 282. ☐ 283. ☐ 284. ☐ 285. ☐ 286. ☐ 287. ☐ 288. ☐ 289. ☐ 290. ☐ 291. ☐ 292. ☐ 293. ☐ 294. ☐ 295. ☐ 296. ☐ 297. ☐ 298. ☐ 299. ☐ 300. ☐ 301. ☐ 302. ☐ 303. ☐ 304. ☐ 305. ☐ 306. ☐ 307. ☐ 308. ☐ 309. ☐ 310. ☐ 311. ☐ 312. ☐ 313. ☐ 314. ☐ 315. ☐ 316. ☐ 317. ☐ 318. ☐ 319. ☐ 320. ☐ 321. ☐ 322. ☐ 323. ☐ 324. ☐ 325. ☐ 326. ☐ 327. ☐ 328. ☐ 329. ☐ 330. ☐ 331. ☐ 332. ☐ 333. ☐ 334. ☐ 335. ☐ 336. ☐ 337. ☐ 338. ☐ 339. ☐ 340. ☐ 341. ☐ 342. ☐ 343. ☐ 344. ☐ 345. ☐ 346. ☐ 347. ☐ 348. ☐ 349. ☐ 350. ☐ 351. ☐ 352. ☐ 353. ☐ 354. ☐ 355. ☐ 356. ☐ 357. ☐ 358. ☐ 359. ☐ 360. ☐ 361. ☐ 362. ☐ 363. ☐ 364. ☐ 365. ☐ 366. ☐ 367. ☐ 368. ☐ 369. ☐ 370. ☐ 371. ☐ 372. ☐ 373. ☐ 374.

"ENGINEER OF RECORD" Professional Seal		FOR PLANS	
		AUG 2006 ISSUED FOR AWARD	
		ULFELD DESIGN Highway 10 Project	

SEE DWG. No. R1-478-117C5
 R101 GRATE, P.E.M.
 ASSOCIATED ENGINEERING (R.C.) LTD
 DEPT 2006 ISSUED FOR CONSTRUCTION
 HWY. No. 10: 122 ST. TO 174 ST.
 PROJECT NO. 101-117C5

AS BUILT SIGNING AND PAVEMENT MARKINGS

	NO.
A SEP 29/06 ADDED 4 SIGNS, REVERSE OADE SIDE TRIP, ADDED NOTES	78
FOR ADDITIONAL INFO SEE L111111	

STATION 10+720.00 TO STA. 10+180.00	RECEIVED SIGNAL POLYMER LOCATIONS AT HWT 10/14/91	10/14/91
INTERSECTION		

CALL DTG:	170. 111 170. 11700
THESE DRAWING RECORD ALL SIGNIFICANT DESIGN CHANGES AS REQUESTED TO ME BY THE MASTERY	
C	2002 ROOST TURN LANE, ROOSTED RACKING 5000 NORTH 800 EAST OF 148 ST 11M, Envisionment 14 2002 ROOST TURN LANE, ROOSTED RACKING 5000 NORTH 800 EAST OF 148 ST 11M, Envisionment 14 Project Manager & Design Consultant Design Consultant

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Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

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