Province of British Columbia

Ministry of Transportation and Highways

MEMORANDUM

December 22, 1994

To All Ministry Staff

Re: Demise of the Ministry Manual of Policy and Procedures

As a result of extensive policy review and policy reform within the Ministry, the old Ministry Manual of Policy and Procedure should no longer be used as a policy and procedure reference. The material contained in this Manual is either outdated, redundant, inaccurate or contained in other more recent publications. The Manuals may be recycled or used as a reference for informational purposes only.

Questions regarding the demise of this Manual or of Ministry policy in general, may be directed to the Ministry's Policy Managers listed at the bottom of this memo.

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MEMORANDUM

All Holders of the
Ministry Manual of Policy and Procedure

April 15, 1993

RE: MINISTRY MANUAL OF POLICY AND PROCEDURE

The purpose of this memorandum is to update you on the status of the Ministry Manual of Policy and Procedure.

The Ministry is presently in the midst of conducting a review of all its policy. As part of this review, the material contained within this Manual has been reviewed and measured against certain criteria to determine, among other things, its relevance and accuracy given the Ministry's current business practices.

The "fate" of this Manual has not been determined at this time. Certain sections of the Manual are now out of date due to a number of factors, such as the advent of privatization and the implementation of several Ministry program specific manuals that address policy topics housed in this Manual. Unfortunately, until now, there has never been any corresponding notification to advise holders of this Manual that certain sections are no longer relevant or that they have been rewritten for other manuals.

In spite of the fact that this Manual has not been amended for six years, there are numerous sections within the Manual that are still current and relevant. This memo represents the first of several notices that will be issued over the next few months in an attempt to update the Manual by deleting certain sections. The sections to be deleted at this time are set out as follows:

1.04; 1.05; 1.06; 1.10; 1.13; 1.14; 1.16 to 1.20 inclusive; 1.23 to 1.26 inclusive; 1.31; all of Chapter 5 - Subdivisions; 13.37 to 13.53 inclusive; 13.56; 13.57; 18.08; 18.09 (including Appendices A to O); and 19.01.

If you have any questions or concerns with respect to this issue, please contact me via WANG Office, or by phone at 387-3104.

W. Ransford

Wm. W. Ransford
Manager
Financial Policy and Procedures

cc: Ollie King, Project Manager, Policy Review
Mark Langstaff, Manager, Operations Policy

RECORD OF REVISIONS

Circular Letter No.	Date Revised	Subject	Section No.
G 5/72	July 1973	Long Distance Telephone Calls	2.02
G 15/72	Sept. 1979	Buoyancy Equipment	3.07
G 23/72	Sept. 1979	Ministry Vehicles - Daylight Use of Headlights	3.08
G 4/73	July 1973	Out-of-Province Telephone Calls	2.02
G 10/73	Sept. 1979	Leg Protection	3.07
G 11/73	Sept. 1979	Hearing Protection	3.07
G 26/73	July 1973	Classified Highways	6.01-6.08
G 27/73	Sept. 1979	Decals on Safety Hats	3.23
G 31/73	June 1975	Permanent Closure of Railway Crossings, Bridges and Ferry Routes	4.01
G 32/73	June 1975	Ministry Operations in Agricultural Land Reserves	1.28
G 33/73	June 1975	Design Procedure - Environmental Agencies	10.01
G 35/73	June 1975	Construction of Off-Highway Facilities	10.01
G 41/73	June 1975	Soil Conservation Act	1.28
P 8/73	Sept. 1979	Personal Protective Equipment	3.07

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Circular Letter No.	Date Revised	Subject	Section No.
P 9/73	June 1975	Spouses Travelling with Employees	17.06
P 22/73	Sept. 1979	Flagging Operations	3.10
G 7/74	Sept. 1974	Chemical Control of Vegetation	13.01
G 15/74	June 1975	Ministry Vehicles - Insurance and Repairs	1.24
G 44/74	June 1975	Highway Electrical Installations	9.13, 9.16
P 28/74	Sept. 1979	Safety Headgear	3.07
G 9/75	June 1975	Photologs as Evidence	1.29
G 29/75	Sept. 1975	Signs - Explosives Magazines	11.02
P 3/75	Sept. 1979	Safety Footwear	3.07
G 45/75	Dec. 1977	Relocation of Utilities	8.41
G 46/75 & G 52/75	Dec. 1977	Temporary Closure of Main Highways	9.05
P 54/75	Dec. 1977	Motor Vehicle Accidents	1.24
G 4/76	July 1976	Railway and Pipeline Crossings	5.09, 8.44, 8.45, 8.48, 8.54, 18.05
G 5/76	Dec. 1977	Advertising	1.13

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Circular Letter No.	Date Revised	Subject	Section No.
G 6/76	Sept. 1979	Accident Prevention Policy	3.01
G 8/76 & G 9/76	Dec. 1977	Motor Vehicle Accidents	1.24
G 15/76	Dec. 1977	Right-of-Way	4.04, 4.05
G 24/76	Dec. 1977	Entry on Private Property	1.15
P 6/76	July 1976	Use of Private Aircraft	1.26
P 29/76	Sept. 1979	Parking and Backing Vehicles	3.08
P 41/76	Sept. 1979	Employees Working Near Vehicles	3.08
P 57/76	Sept. 1979	Communication of Information Concerning Work Accidents	3.04
P 58/76	Sept. 1979	Annual Safety Award Competitions	3.23
G 8/77	Dec. 1977	Sanding/Salting Claims	13.56
G 13/77	June 1979	Accommodation for Conferences	1.32
G 16/77	Dec. 1977	Drive-In Theatres	8.63
G 18/77	Dec. 1977	Power Lines - Section 4 Roads	4.03
G 26/77	Dec. 1977	Right-of-Way Purchases	4.24
G 31/77	Sept. 1979	Operation of Pavement Brooms	3.19

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G 36/77	Dec. 1977	Government Purchasing Policy	1.30
G 51/77	Dec. 1977	Seal-Coating Claims	13.56
G 53/77	Dec. 1977	Hit and Run Claims	1.24, 13.57
G 57/77	June 1979	Improvements and Repairs to Ministry Buildings	1.31
P 8/77	Sept. 1979	Maximum Seating - Front Seat of Trucks	3.08
P 13/77	Sept. 1979	Safety Footwear Policy	3.07
P 19/77	Sept. 1979	First Aid Attendant Policy	3.12
P 23/77	Sept. 1979	Safety Footwear-Ferries Personnel	3.07
G 9/78	June 1979	Renting of Transportation Vehicles	17.03
G 10/78	April 1978	Visual Identity Program	1.13
G 10/78	June 1979	Highway Tender Advertisements	18.08
G 16/78	June 1981	Permits - Electrical Installations Crown Lands	8.16
G 19/78	April 1980	Highway Fencing	4.25
G 20/78	June 1981	Exceptions to Seasonal Weight Restrictions	9.06

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G 24/78	June 1979	Property Management	1.31
G 26/78	June 1981	Working Relationship - R.C.M.P. and Ministry	9.08
G 39/78	April 1980	Fences Along Arterial or Urban Highways	4.28
G 45/78	Sept. 1979	Fire Prevention	3.11
G 48/78	April 1980	Arterial Highway Beautification Community Participation	13.60
G 49/78	June 1981	Signs - Tourist Services - Arterial Highways	8.34
P 16/78	May 1983	Mobile Cranes	17.01
P 73/78	June 1979	Ministry Conferences and Seminars	1.32
P 78/78	Sept. 1979	Branch & Other Crews Working in Districts	3.17
P 82/78	June 1979	Ministry Name Badges	1.34
G 1/79	June 1979	Hired Equipment	17.01
G 3/79	June 1979	Technical Papers	1.33
G 6/79	Sept. 1979	Oil or Chemical Spills	3.21
G 9/79	June 1979	Travel by Vehicle to Conferences	1.32
G 14/79	June 1979	Hired Equipment	17.01

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G 22/79	April 1980	Entry for Construction	4.20
G 26/79	April 1980	Audio Visual Equipment - Loan and Repair Service	1.23
G 27/79	April 1980	Bare - Rented Equipment	17.01
G 29/79	April 1980	Citizen Band Radios in Vehicles	17.05
G 30/79	June 1981	Utility Pole Locations	8.29
G 31/79	Sept. 1979	Federal Dangerous Goods Emergency Centre	3.21
G 32/79	April 1980	Ministry Transportation Vehicles	17.03
G 35/79	April 1980	Refuse Disposal Sites	13.59
G 41/79	April 1980	Completion of Hired Equipment Invoices	17.01
G 50/79	April 1980	Photographic & Audio Visual Equipment	1.23
G 56/79	April 1980	Landscape Design	13.60
P 2/79	April 1980	Aircraft Insurance	1.26
P 24/79	April 1980	Firearms in Government Vehicles	17.05

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P 31/79	April 1980	Report on Attendance - Conferences Course or Seminar	1.32
G 2/80	April 1980	Out of Canada Travel	1.32
G 7/80	April 1980	Contracts and Commitments	1.10
G 8/80	April 1980	Photographs of Ministry Operaions	1.22
G 16/80	June 1981	Provincial Park Directional Signs	8.33
G 18/80	June 1981	Power Saws	17.08
G 19/80	Dec. 1980	Vehicle Mirrors	17.07
G 20/80	June 1981	Ministry Radios	2.03
G 22/80	Dec. 1980	Hired Equipment	17.01
G 28/80	Dec. 1980	Right-of-Way in Agricultural Land Reserves	4.39
G 29/80	June 1981	Signing Engineering Drawings	2.06
G 30/80	Dec. 1980	Advertising Work	18.08
P 4/80	April 1980	Workers Compensation Procedures	3.14
P 9/80	April 1980	First Aid Policy	3.12
P 54/80	June 1981	Position Titles	1.04

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G 6/81	June 1981	Correspondence Dating System	2.01
G 7/81	June 1981	Vehicle Mirrors	17.07
G 13/81	June 1981	Funeral Wreaths	1.35
G 20/81	June 1981	Bus Shelters	8.37
G 22/81	Jan 1982	Pole Line Moves	8.42
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G 2/82	July 1982	Illuminated Signs in Urban Bus Shelters	8.37
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C 10/82	July 1982	Directives from Sources Outside the Ministry	1.37
G 12/82	July 1982	Transport of Horses on Ferries	16.09
G 14/82	May 1983	Use of Government Vehicles	17.03

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G 16/82	May 1983	Offsite Road Improvements-Subdivisions	5.09
G 23/82	May 1983	Agricultural Land Commission - General Order	4.39
P 7/82	July 1982	Photograhic and Audio-Visual Equipment	1.23
G 37/82	May 1983	Public Servants - Other Employment	1.05
G 7/83	May 1983	Use of Government Vehicles	17.03
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P 25/83	Oct 1983	Out of Province Travel	1.34
G 4/84	Feb 1984	Agricultural Land Commission - General Order	4.39
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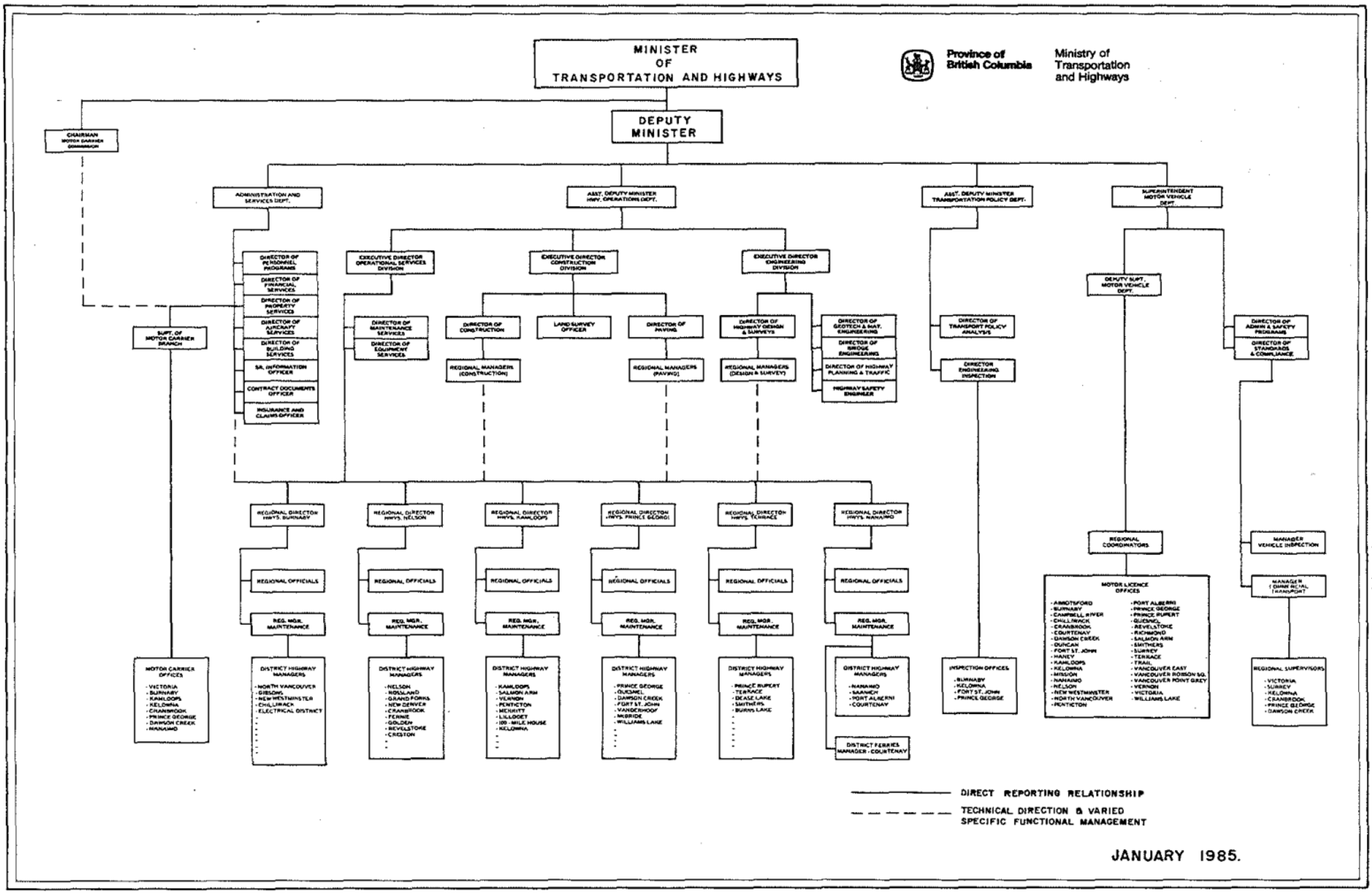
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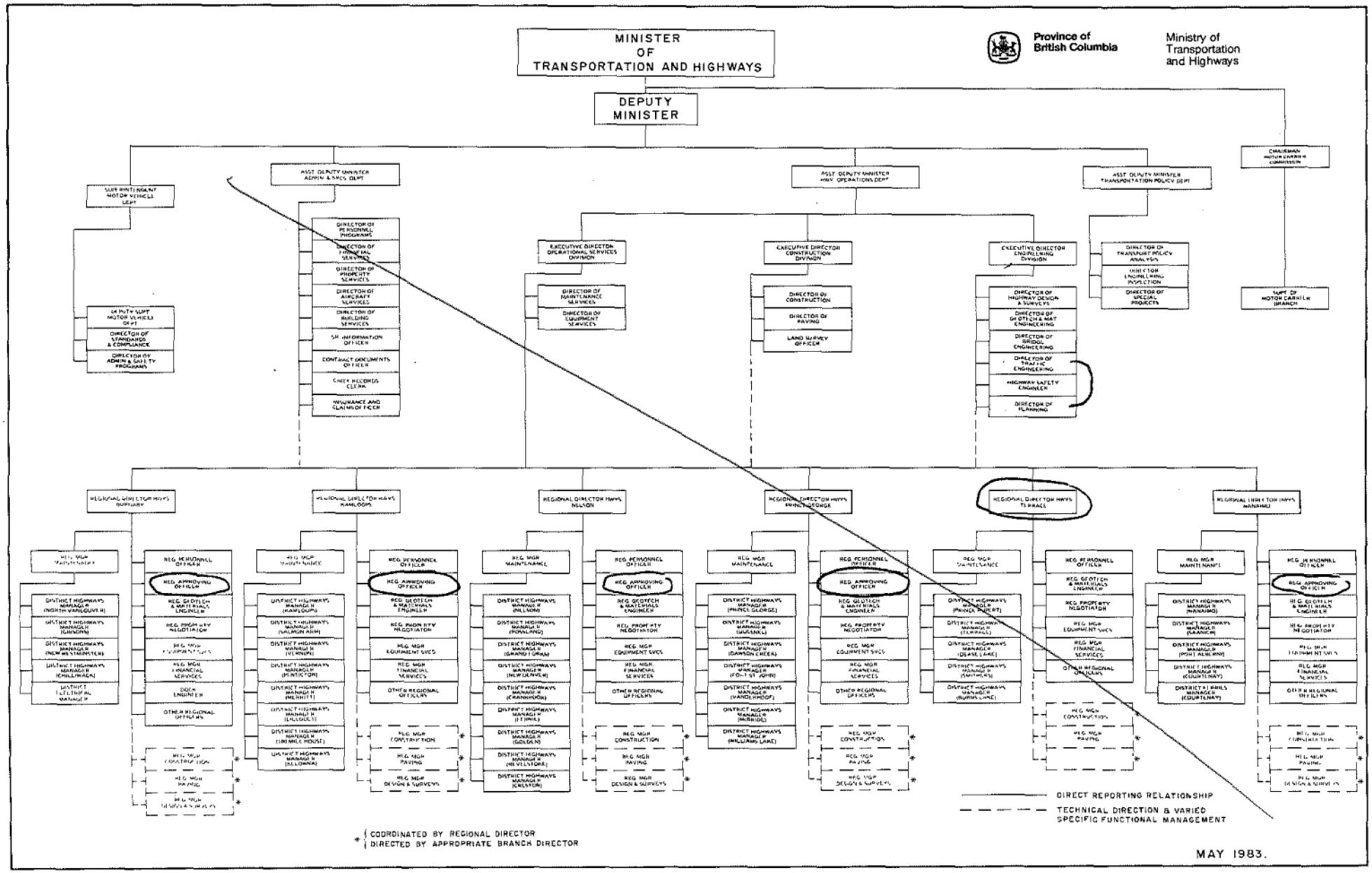
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MINISTER OF TRANSPORTATION AND HIGHWAYS
Province of British Columbia
Ministry of Transportation and Highways
DEPUTY MINISTER
CHAIRMAN MOTOR CARRIER COMMISSION
ADMINISTRATION AND SERVICES DEPT.
ASST. DEPUTY MINISTER HWY. OPERATIONS DEPT.
ASST. DEPUTY MINISTER TRANSPORTATION POLICY DEPT.
SUPERINTENDENT MOTOR VEHICLE DEPT.
DIRECTOR OF PERSONNEL PROGRAMS
DIRECTOR OF FINANCIAL SERVICES
DIRECTOR OF PROPERTY SERVICES
DIRECTOR OF AIRCRAFT SERVICES
DIRECTOR OF BUILDING SERVICES
SR. INFORMATION OFFICER
CONTRACT DOCUMENTS OFFICER
INSURANCE AND CLAIMS OFFICER
EXECUTIVE DIRECTOR OPERATIONAL SERVICES DIVISION
EXECUTIVE DIRECTOR CONSTRUCTION DIVISION
EXECUTIVE DIRECTOR ENGINEERING DIVISION
DIRECTOR OF MAINTENANCE SERVICES
DIRECTOR OF EQUIPMENT SERVICES
DIRECTOR OF CONSTRUCTION
LAND SURVEY OFFICER
DIRECTOR OF PAVING
DIRECTOR OF HIGHWAY DESIGN & SURVEYS
DIRECTOR OF GEOTECH & MAT. ENGINEERING
DIRECTOR OF BRIDGE ENGINEERING
DIRECTOR OF HIGHWAY PLANNING & TRAFFIC
HIGHWAY SAFETY ENGINEER
REGIONAL MANAGERS (CONSTRUCTION)
REGIONAL MANAGERS (PAVING)
REGIONAL MANAGERS (DESIGN & SURVEY)
DIRECTOR OF TRANSPORT POLICY ANALYSIS
DIRECTOR ENGINEERING INSPECTION
DEPUTY SUPT. MOTOR VEHICLE DEPT.
DIRECTOR OF ADMIN & SAFETY PROGRAMS
DIRECTOR OF STANDARDS & COMPLIANCE
SUPT. OF MOTOR CARRIER BRANCH
REGIONAL DIRECTOR HWYS. BURNABY
REGIONAL DIRECTOR HWYS. NELSON
REGIONAL DIRECTOR HWYS. KAMLOOPS
REGIONAL DIRECTOR HWYS. PRINCE GEORGE
REGIONAL DIRECTOR HWYS. TERRACE
REGIONAL DIRECTOR HWYS. NANAIMO
REGIONAL COORDINATORS
MANAGER VEHICLE INSPECTION
MANAGER (CHANNEL TRANSPORT)
REGIONAL OFFICIALS
REG. MGR. MAINTENANCE
MOTOR LICENCE OFFICES
- ABBOTSFORD
- BURNABY
- CAMPBELL RIVER
- CHILLIWACK
- CRANBROOK
- COURTENAY
- DAWSON CREEK
- DUNCAN
- FORT ST. JOHN
- HANEY
- KAMLOOPS
- KELOWNA
- MISSION
- NANAIMO
- NELSON
- NEW WESTMINSTER
- NORTH VANCOUVER
- PENTICTON
- PORT ALBERNI
- PRINCE GEORGE
- PRINCE RUPERT
- QUESNEL
- REVELSTOKE
- RICHMOND
- SALMON ARM
- SMITHERS
- SURREY
- TERRACE
- TRAIL
- VANCOUVER EAST
- VANCOUVER ROBSON SQ.
- VANCOUVER POINT GREY
- VERNON
- VICTORIA
- WILLIAMS LAKE
MOTOR CARRIER OFFICES
- VICTORIA
- BURNABY
- KAMLOOPS
- KELOWNA
- CRANBROOK
- PRINCE GEORGE
- DAWSON CREEK
- NANAIMO
DISTRICT HIGHWAY MANAGERS
- NORTH VANCOUVER
- GIBSONS
- NEW WESTMINSTER
- CHILLIWACK
- ELECTORAL DISTRICT
DISTRICT HIGHWAY MANAGERS
- NELSON
- NOSLAND
- GRAND FORKS
- NEW DENVER
- CRANBROOK
- FERNIE
- GOLDEN
- REVELSTOKE
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DISTRICT HIGHWAY MANAGERS
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- WILLIAMS LAKE
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- PRINCE RUPERT
- TERRACE
- DEASE LAKE
- SMITHERS
- BURNS LAKE
DISTRICT HIGHWAY MANAGERS
- NANAIMO
- SAANICH
- PORT ALBERNI
- COURTENAY
DISTRICT FERRIES MANAGER - COURTENAY
INSPECTION OFFICES
- BURNABY
- KELOWNA
- FORT ST. JOHN
- PRINCE GEORGE
REGIONAL SUPERVISORS
- VICTORIA
- SURREY
- KELOWNA
- CRANBROOK
- PRINCE GEORGE
- DAWSON CREEK
DIRECT REPORTING RELATIONSHIP
TECHNICAL DIRECTION & VARIED SPECIFIC FUNCTIONAL MANAGEMENT
JANUARY 1985.


MINISTER OF TRANSPORTATION AND HIGHWAYS
Province of British Columbia
Ministry of Transportation and Highways
DEPUTY MINISTER
ASST DEPUTY MINISTER ADMIN & SVCS DEPT
ASST DEPUTY MINISTER HWY OPERATIONS DEPT
ASST DEPUTY MINISTER TRANSPORTATION POLICY DEPT
CHAIRMAN MOTOR CARRIER COMMISSION
SUPT MOTOR CARRIER BRANCH
DIRECTOR OF PERSONNEL PROGRAMS
DIRECTOR OF FINANCIAL SERVICES
DIRECTOR OF PROPERTY SERVICES
DIRECTOR OF AIRCRAFT SERVICES
DIRECTOR OF BUILDING SERVICES
SR INFORMATION OFFICER
CONTRACT DOCUMENTS OFFICER
CHIEF RECORDS CLERK
INSURANCE AND CLAIMS OFFICER
EXECUTIVE DIRECTOR OPERATIONAL SERVICES DIVISION
DIRECTOR OF MAINTENANCE SERVICES
DIRECTOR OF EQUIPMENT SERVICES
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DIRECTOR OF GEOTECH & MAT ENGINEERING
DIRECTOR OF BRIDGE ENGINEERING
DIRECTOR OF TRAFFIC ENGINEERING
HIGHWAY SAFETY ENGINEER
DIRECTOR OF PLANNING
DIRECTOR OF TRANSPORT POLICY ANALYSIS
DIRECTOR ENGINEERING INSPECTION
DIRECTOR OF SPECIAL PROJECTS
REGIONAL DIRECTOR HWYS NELSON
REGIONAL DIRECTOR HWYS PRINCE GEORGE
REGIONAL DIRECTOR HWYS TERRACE
REG PERSONNEL OFFICER
REG APPROVING OFFICER
REG GEOTECH & MATERIALS ENGINEER
REG PROPERTY NEGOTIATOR
REG MGR EQUIPMENT SVCS
REG MGR FINANCIAL SERVICES
OTHER REGIONAL OFFICERS
REG MGR CONSTRUCTION
REG MGR PAVING
REG MGR DESIGN & SURVEYS
REG MGR MAINTENANCE
DISTRICT HIGHWAYS MANAGER
DIRECT REPORTING RELATIONSHIP
TECHNICAL DIRECTION & VARIED SPECIFIC FUNCTIONAL MANAGEMENT
* COORDINATED BY REGIONAL DIRECTOR
DIRECTED BY APPROPRIATE BRANCH DIRECTOR
MAY 1983.

CHAPTER 1

PERSONNEL MANAGEMENT

1.01 GENERAL

The function of the Ministry of Transportation and Highways is to plan, design, construct and maintain a provincial highway system to the required standard with the maximum of economy and efficiency. In so doing the Ministry utilizes materials, equipment and, most important of all, men and women.

Personnel management or administration within the Ministry is the successful employment of men and women so that the Ministry functions in the most economical and efficient manner. The importance of applying sound principles of personnel management at all levels must be recognized if an efficient administration is to be maintained.

Fundamental principles on which the efficient operation of the Ministry are based are:

1. Planning
2. Organization
3. Control

The Honourable the Minister conveys the policy and plans of Government for the Ministry to the Executive. These are then co-ordinated and organized within the various Branches by the Executive. Thereafter, by statute and regulation, the Executive controls the step by step process of fulfillment.

1.02 ORGANIZATION

1. HEADQUARTERS

1. Sound organization plan is fundamental to effective management. This Ministry is organized to provide:

    1. Planning at Executive level.
    2. Technical direction from Branch Heads, Victoria.
    3. Practical application of planning and technical standards at the Regional or Field level.

2. Personnel Management enters these three fields:

    1. By being informed of the overall plan.

2. By assisting in and investigating the organization of Headquarters Branches to ensure manpower is working in the most efficient manner and is providing the most effective communication in the field consistent with Ministry policy.

3. By assisting in and investigating the organization of Field Management.

3. Headquarters is composed of Senior Executive, technical specialists and staff advisers. As the managerial process becomes complex, the time, ability and comprehension of single executives must be supplemented by staff agencies able to furnish specialized assistance and advice. The prime purpose of Headquarters Branches is therefore:

1. To determine needs and formulate appropriate plans, objectives and controls.

2. To review, co-ordinate, digest and pass expert opinion upon proposals, and

3. to keep executives informed of significant developments.

2. REGIONAL

The Ministry operates under a "Regional Plan of Organization" which affords an effective basis for decentralization of management. Regional officials located near the job and invested with wide responsibility and authority, but guided by sound general policies and technical advice, can take prompt and effective action knowing local needs and conditions. Major matters only need by referred to Headquarters.

1.03 EMPLOYEE RELATIONS

Good personnel relations at all levels can only prevail if the following fundamental principles are maintained:

1. Selection by merit, such being determined by education, skills, knowledge, experience, years of continuous employment, and by consistency with the classification standards.

2. Explicit assignment of tasks with full instruction and proper job evaluation with mutual agreement of all parties.

3. Fair and equal treatment of employees with an effective working relationship being established at all levels in a framework of orderly collective bargaining procedures.

The comprehensive Personnel Manuals, which cover the various procedures and policies, are based on three fundamental rules of fair treatment.

The first rule is that an employee must always be given an opportunity to correct his defects by counsel, training and discussion.

The second rule is that an employee should always know how he stands in the organization. He should be told what the Ministry thinks of him - both good points and bad points - and he should be told in writing, with all rights of appeal and discussion.

The third rule is to understand the viewpoint of others. Probably the most important aspect of this is to understand that all men and women have different sense of proportion and value, and not to judge others by our own selves.

Points to Note in Good Personnel Management

1. Definite and cleancut responsibilities should be assigned to each employee.

2. Responsibility must always be coupled with the corresponding authority.

3. No change should be made in the scope of responsibility of a position without a definite understanding to the effect on the part of all persons concerned.

4. No employee occupying a single position in the organization should be subject to definite orders from more than one source.

5. Orders should never be given to employees bypassing that employee's supervisor when available.

6. No difference between employees on authority or responsibility should be considered too trivial for prompt and careful discussion and adjudication.

7. Any employee whose work is subject to regular inspection should, whenever practicable, be given the assistance and facilities necessary to enable him to maintain an independent check of the quality of his work.

1.04 POSITION TITLES
**

In order that an appropriate degree of relativity can be maintained within the Ministry, the Director of Personnel Programs is charged with responsibility for reviewing proposed position title changes and advising the Assistant Deputy Minister - Administration regarding the implications of such proposals.

The Assistant Deputy Minister - Administration will, in turn, consult with the Executive Officers concerned and take action as follows:

(a) For Management positions and other official positions having a sensitive public involvement, the proposed titles will be referred to the Deputy Minister for approval.

(b) For other positions, the proposed position title shall be considered and if warranted, approved by the Assistant Deputy Minister - Administration.

** Amendment

No changes may be made to position titles without the approval of either the Deputy Minister or Assistant Deputy Minister - Administration.

Any proposed position title changes must be referred to the Director of Personnel Programs.

1.05 PUBLIC SERVANTS - OTHER EMPLOYMENT
**

Following is Section 50 of the Public Service Act relating to other employment:

> "An employee shall not engage in remunerative employment with another employer or carry on a business, except with the Commission's approval."

Violations of this statutory provision will be dealt with severely and all supervisors are charged with the responsibility of ensuring that each and every employee is made aware that prior approval of the Public Service Commission is necessary without exception if the employee plans to become involved in financial ventures of these types. This does not preclude investments in public corporations as normally listed on the stock markets.

Supervisors must impress upon all employees under their jurisdiction that failure to comply with the provisions of the Public Service Act will result in severe penalties including probable dismissal.

All applications for approval must be submitted through the Supervisor to the Director of Personnel Programs.

1.06 DISMISSALS AND SUSPENSIONS

The following officials are delegated the authority to suspend from the performance of his/her duties any employee for just cause.

Executive Directors
Superintendent and Deputy Superintendent of Motor Vehicles
Branch Directors
Chief Inspection Engineer
Superintendent of Motor Carriers
Regional Highways Directors
Regional Branch Heads
District Highways Managers

In the case of District Highways Manager and Regional Branch Heads, a full report must be immediately telephoned to the Regional Highways Director who will determine the length of the suspension. A confirming letter outlining the details is to be forwarded to the Regional Highways Director.

If it is the intent to recommend dismissal following suspension, a full written report should immediately be forwarded to the Deputy Minister marked to the attention of the Director of Personnel Programs.

** Amendment

1. General

Ministry officials should read and familiarize themselves with the applicable sections of the following Acts:

Commercial Transport Act
Crown Proceedings Act
Drainage, Ditch and Dyke Act
Ferry Act
Highway Act
Highway (Industrial) Act
Highway Scenic Improvement Act
Land Act
Litter Act
Ministry of Transportation and Highways Act
Motor Carrier Act
Motor Vehicle Act
Motor Vehicle Transportation Act (Canada)
Navigable Waters Protection Act (Canada)
Pipeline Act
Pollution Control Act
Public Service Act
Public Service Labour Relations Act
Railway Act
Riverbank Protection Act
Soil Conservation Act
Water Act
Weed Control Act
Workers Compensation Act

** 2. Ordering Statutes and Regulations

Individual statutes and regulations are ordered by each office direct from the Queen's Printer.

New orders and revisions to complete sets of statutes and regulations are co-ordinated through the Ministry Library, 940 Blanshard Street, Victoria, phone local 5512. Regular revisions for these sets will be ordered from the Queen's Printer by the Library for distribution to various offices in accordance with a master list maintained by the Library.

PUBLIC ADMINISTRATION

1.08 LEGAL ADVICE

Under no circumstances should an employee of the Ministry give a legal ruling, express an opinion on a point of law, or interpret the statutes to anyone. The Attorney General is the official Legal Advisor to the Government and all questions of law are referred to his Ministry. Such advice as the Attorney General may give from time to time is for the guidance of the Ministry only and is not to be quoted as the opinion of the Attorney General in dealing with the public.

** Amendment

1.09 LIABILITY AND POWERS OF EMPLOYEES

Employees of the Ministry are personally liable for their own actions. Unless specially appointed, they have no police powers.

1.10 CONTRACTS AND COMMITMENTS

A British Columbia Supreme Court decision ruled that the Crown can be bound by a contract, oral or written, made by agents or servants of the Crown acting within the scope of their apparent authority, and regardless of their actual authority. This could cover matters such as contracts for service, purchases of goods, or hiring of equipment.

Since there are often various internal procedures and approvals required prior to concluding a government contract, it is important for those employees involved in contract negotiations to clearly determine the boundaries of their authority prior to any commitments being made.

A public servant who appears to have the authority to bind the Crown to a contract, but who in fact does not actually have that authority, may still bind the Crown because the Courts will not allow the Crown to later assert a limitation on the authority of the servant unknown to the other part when the contract was made, in order to avoid contractual responsibility. In this context "contract" means a legally binding agreement.

It is therefore imperative that an employee be absolutely certain of the authority vested in him or her, and any confusion or lack of clear understanding of the boundaries of an employee's authority should be removed by the employee seeking further instruction or advice from a superior or other appropriate source.

1.11 AGREEMENTS

Every agreement must be in writing and must be signed by the other parties and a Ministry representative. In a few instances, an exchange or reciprocal undertaking may be the basis of a transaction. In every case all the terms or conditions must be set forth and, where no compensation is involved, insert in the agreement the nominal sum of $1.00 is to be paid by the Ministry.

1.12 PROPOSALS

When verbal enquiries or proposals are made, request a written submission. This is particularly important for clarity when the enquiry deals with the lease, rental, or purchase of Crown property or chattels.

1.13 PUBLIC NOTICES AND NEWSPAPER ADVERTISING

Many of the Acts (Section 1.07) governing the operation of this Ministry, stipulate that certain "Public Notices and Newspaper Advertisements", herein referred to as advertisements, are mandatory.

To ensure uniformity in all government advertising, the "Province of British Columbia Visual Identity Program" has been established to which this Ministry shall conform.

1.13.1 General Information

Advertisements in Newspapers appear under the heading of "Legal Notices". Space to accommodate such advertisements is measured by the vertical inch, which normally contains 14 lines, and by the column. (e.g. 42 lines or 3 inches x 2 columns = 6 inches.)

Single column advertisements are excellent for short messages but double, triple or quadruple columns not only make the advertisement more prominent but are also economical in that the content will contain on an average, six more letters per each additional column thus reducing the overall lineage. It is for this reason together with that of eliminating duplication of content, that the "Highways-Tender" advertisement, previously "Notice to Contractors", is of three column width.

Types of Advertisement Headings

1.13.1.1 Single Column (see Appendix "A")
1.13.1.2 Double Column (see Appendix "A")
1.13.1.3 Triple Column (see Appendix "B")
1.13.1.4 Quadruple Column (see Appendix "B")

All such advertisements shall appear in the "Journal of Commerce" (2000 West 12th Avenue, Vancouver, B.C. V6J 2G2, phone 731-1171) to ensure reaching Commercial business and in the local daily or weekly newspaper (all, if more than one) in the immediate vicinity to, or serving the area in which the subject of the advertisement is located. Such advertisements shall comply with the appropriate Acts as to regularity or time period coverage and content.

1.13.2 Accounting

All advertisements will be processed through the Branch, Region or District with the exception of "Highways-Tender" advertisements placed in the Journal of Commerce which will be processed through Headquarters.

1.13.3 Highways - Tenders

** All formal Highways-Tenders will be advertised in the Journal of Commerce and in the local paper as aforementioned. Informal tenders may be advertised in the Journal of Commerce if deemed necessary or desirable. Such advertisements shall be submitted on Form H465 (see Chapter 18.08.3) with a copy to the Contract Documents Officer who will later be advised by the submission of a listing of Tenderers, bids and award when the contract has been awarded. (This information required for contract statistics in the Annual Report to the Legislature).

Any queries on Advertising should be directed to the Contract Documents Officer or to the Senior Information Officer.

1.14 PUBLIC MEETINGS

Officials of the Ministry shall not attend public meetings of public bodies to discuss the activities of the Ministry unless advised by the Deputy Minister to do so. If an official feels that a meeting should be

** Amendment

attended, the Deputy Minister is to be fully advised of the circumstances and reasons. The matter will then be discussed with the Minister, and the official will be advised of the Minister's wishes.

1.15 PUBLIC RELATIONS

1. General

It is essential that all Ministry employees maintain good public relations by courtesy, helpfulness and patience. There is no other Ministry whose work and workmen are under closer scrutiny, and every employee should carry out his or her work in an efficient and expeditious manner.

Discussion with the public or press must be restricted to specific information, such as road conditions, etc. Policy must not be discussed except insofar as to explain the established Ministerial policy.

Refer the press to the Ministry's Information Officers.

2. Entry on Private Property

During normal operations all owners and residents must be advised before entry is made on private property. Advise all registered owners by letter and all residents by personal contact of the purpose of the work being undertaken.

All communications shall be made with courtesy and consideration for the owner's concern for the property and no cutting, marking, staking or disturbance of any kind shall be done without fully explaining the procedure involved.

The Project Supervisor shall renew this contact whenever it is necessary to re-enter a property after a prolonged period of absence. Each Project Supervisor shall inform the owner accordingly regardless of whether another Ministry crew has preceeded him.

In case of emergencies such as floods, etc., the District Highways Manager will use his own judgment to decide if immediate entry is to be made. In such cases, the owner should be advised as soon as possible.

FOREST PROTECTION AND FIRE-FIGHTING

1.16 OBSERVANCE OF REQUIREMENTS OF THE FOREST ACT

Employees of the Ministry must observe all the requirements of the Forest Act to the fullest extent. Particular reference is made to Part 10 Forest Protection, Sections 108 - 129.

1.17 CLEARING

Undertake clearing only when slash and other refuse can be safely burned. If slash cannot be safely destroyed at the time of clearing, place it in small piles clear of other inflammable material and burn at

the earliest opportunity. The practice of leaving slash broadcast upon the ground or in windrows close to standing timber is forbidden. Before burning is undertaken during fire season, the local Forest Officer is to be notified, a permit obtained, and the work carried out to his satisfaction.

1.18 FIRE - FIGHTING
**

The Ministry requires the fullest co-operation with the Forest Service. Highways crews, tools and vehicles at all times are to be available for fire-fighting, on request of the local Forest Officer. Foremen are expected to proceed at once, with their crews, to fight any fire observed in their neighbourhood, advising the nearest Forestry official of the fire as quickly as possible.

1.19 TIME-KEEPING AND ACCOUNTING
**

Methods of time-keeping and accounting for fire-fighting are outlined in Accounting Instruction A-5-11 of the Ministry's Standing Accounting Instructions, and they should be followed closely.

1.20 FOREST PROTECTION MANUAL
**

The following is a copy of Section 5.252 of the Forest Service Protection Manual. Since both Ministries must work closely, it is repeated so that you are aware of their instructions:

"5.252 Use of Highway Crews

These crews form a handy and effective fire-fighting force and should be used when available. They are already organized, with a foreman in charge, and most often with suitable equipment. They are instructed to co-operate, and are also liable for fire duty under Section 124 of the Act. Particular note should be taken of the following procedure:

(a) Summoning the Crew - Written instructions on Form F.S. 242 should be given to the foreman, embodying the name, date and location of the fire, the foreman's name, and the name of those in his crew who are summoned to assist. A separate statement showing Highways tools and equipment taken to the fire should be made. These should be signed by the Forest Officer and the foreman, a copy being given to the foreman. At the end of the fire, or release of men, a check should made of tools and equipment returned to the Highway crew, a list of losses being retained by the Forest Officer and the Highways Foreman, and signed by both.

(b) Payment for Fire-Fighting Services - Employees called on to fight fire will be paid by Highways in this usual manner.

** (c) Accounting Instructions - The time for the employees concerned will be shown separately on the foremen's Time Book sheet under the heading "Fire Fighting". The time sheet must be certified by the Highways foreman and countersigned by the Forest Officer in

** Amendment

charge. The Forest Service Timekeeper must keep a separate fire payroll for all Highways employees, showing each individual by name and their number of hours worked each day. This is necessary for the Forest Officer in order for him to certify the Highways Time Book sheet as required above. This separate payroll should be retained on the Forest Officer's fire file.

(d) Meals - Meals served by the Forest Service to Highways employees will not be charged for, either to the men or to Highways.

(e) Adjustments - Any adjustments in Highways fire-fighting costs will be made at Victoria."

1.21 MINING ROADS AND TRAILS

The Minister of Energy, Mines & Petroleum Resources may, with the approval of the Lieutenant-Governor in Council, authorize the expenditure of public moneys for the construction, reconstruction, or repair of trails, roads and bridges in and to any mining district for the purpose of facilitating the exploration of the mineral resources, including coal, of the district.

The Minister may also, with the approval of the Lieutenant-Governor in Council, authorize the expenditure of public moneys for the construction, reconstruction, or repair of trails, roads and bridges to facilitate the operation and development of any mining property, including coal-mining property. The expenditure under this subsection shall not exceed fifty per centum of the cost of such construction, reconstruction, or repair.

The Ministry of Transportation & Highways is occasionally responsible for the carrying out of the actual work or supervision of the work of construction, reconstruction, or repair.

Before undertaking or authorizing the expenditure of any public money, determine the status of the right-of-way.

The owner of any mining property has certain rights to take a right-of-way for the development of the property. These rights, together with the procedure to obtain the right-of-way, are outlined in the Mines Right-of-Way Act.

Where an official is asked to report on a proposed mineral right-of-way, even though public funds are not involved at the time, deal with the matter on the basis that at some future time the road or trail may become a public highway.

The Ministry of Transportation & Highways has agreed to co-operate with the Ministry of Energy, Mines & Petroleum Resources by carrying out inspections of works in connection with mining roads and trails, where such inspections cannot conveniently be undertaken by that Ministry.

** Amendment

District officials are therefore requested to carry out any inspections upon request of the Ministry of Energy, Mines & Petroleum Resources. Where the Ministry of Transportation and Highways is responsible for the actual carrying out of the work, either in whole or in part, the inspection is carried out by the District official concerned, or by his representative.

If the Ministry of Transportation & Highways does work for the Ministry of Energy, Mines and Petroleum Resources at their request, account will be kept according to Accounting Instruction A-115-1.

1.22 PHOTOGRAPHS

1. The Ministry requires professional quality photographs and color slides for the Annual Report, for Ministerial and Provincial publications, for Ministerial exhibits at trade fairs, and other similar events, for distribution to newspapers, trade publications, TV stations, and for other public relations purposes.

2.1 The following will be required for all major works completed annually:

(1) At least one 8" x 10" (20cm x 25cm) glossy black & white print.

(2) At least one 5" x 7" (13cm x 18cm) color print.

(3) At least one 35 mm color slide.

(4) The negatives of prints (1) and (2).

2.2 Generally, "major works" will include:

(1) Bridges or other structures constructed under contract or by District forces.

(2) New docks, terminals, buildings, yard sites, ships and ferries.

(3) Important grade construction projects completed either by contract or Day Labour.

(4) Major paving projects completed and centrelined.

(5) Serious disasters, slides, washouts, or other such unusual conditions.

(6) Limited before-and-after pictures of projects may be arranged where the comparison might be valuable.

Photos of (3) and (4) should be as scenic as possible, preferably from a level higher than the road grade.

3. We also require operational pictures such as:

** Amendment

(1) Equipment (particularly new equipment) working on winter or summer maintenance and construction.

(2) Crews working under unusual conditions such as rock scaling, etc.

(3) Ferries in operation or loading and new accomodation or facilities available.

(4) The Regional Highway Engineer will co-ordinate all photography in the Region. All requests for the taking of photographs will be directed to the Regional Highway Engineer by Branch officials. Normally, these will be referred to the District official for the area concerned and he will engage the services of a local professional photographer.

Costs can be held to a minimum by arranging Ministerial transportation for the photographer and by covering a number of subjects in one day. The photographer should charge a fee for time, equipment, material and processing. Any arrangement must result in ownership of the negatives by the Ministry.

(5) All photographs, negatives, and slides will be submitted to the Senior Information Officer by the Regional Highway Engineer. Do not submit substandard photographs or slides. If a District or Branch wishes extra prints for their own use, these may be ordered before submission to the Region.

** (6) All photographs, negatives, and slides will be catalogued at Headquarters for future use and reference. A guideline of subjects in the Headquarters catalogue is listed in Appendix "C".

(7) Photography costs should be charged to the project or work being photographed.

(8) Photographs and slides should be submitted as available and not at year's end.

(9) All photographs must be identified, particularly road sections - mileages from nearest large community, together with adjacent waterways or landmarks.

(10) Generally, angles and composition should be left to the professional photographer. Roads and structures should be photographed from their "best side" with scenic surroundings and backgrounds and from as high a level as possible. Low aerial photography is excellent, but of course normally too expensive. If flying is being done for other reasons and it is feasible or practical to carry a photographer, every effort should be made to get some aerials of finished highways and bridges. Pictures should feature the finished product - new sections of highways with centrelines applied and shoulders completed, and bridges fully painted with approaches paved and lined.

** Amendment

(11) While we all fancy ourselves as good amateur photographers, generally our products do not come up to the standards of professionals, partly because be do not have the equipment and are usually limited to one camera. However, there are exceptions and there are some good amateur photographers in the Ministry who can turn out professional quality pictures. Districts are free to make use of such people but we cannot pay them for pictures. Where these people are used, we can buy the film and other material and allow them time away from their regular jobs to take the pictures and process the films.

(12) In addition to the major photography outlined above, the District officials and others issued Ministerial cameras throughout the Province will continue to use these for:

1. Regular progress pictures of work.

2. Before and after pictures.

3. Pictures to illustrate reports.

4. Pictures for use at a later date, e.g. photos of houses and trees which are removed before arbitration hearings are held, residential areas before major construction is done, etc.

5. Other pictures of interesting or unusual phases of work.

6. Photos of accident scenes.

Negatives need not accompany prints attached to illustrate letters or reports forwarded to Regions or Headquarters. However, if these prints are close to professional quality and therefore qualify under Paragraph 2, please forward the best of them to the Senior Information Officer for cataloguing. The negatives should be held in the originating office unless these are specifically requested by the Public Information Officer. In the case of color slides, please arrange for either the originals or duplicates of the best to be forwarded.

Any of the pictures in either Paragraph 2 or 12 can be used in accompanying material submitted to the Road Runner.

(13) We have a standing request with the Photographic Branch of the Ministry of Tourism for scenic highway, bridge and ferry pictures where their photographers are on the road shooting material for the Beautiful British Columbia magazine and other publications.

We have no control over their itinerary and this could result in some duplication. However, the pictures usually will be slightly different and will increase our stock of material.

** Amendment

1.23 PHOTOGRAPHIC AND AUDIO-VISUAL EQUIPMENT

** 1. General

The Personnel Programs, Manpower Planning and Staff Development Section is responsible for the selection, purchase, distribution and use of all audio-visual equipment and specialized still cameras used by the Ministry.

All requests for audio/visual equipment and specialized still cameras are to be submitted by memo to the Manpower Planning and Staff Development Section for attention of the Photo Arts Technician who will consider such things as quality, need, availability of repair facilities, and suitability to support the audio-visual program. Upon approval, a Purchasing Commission requisition will be prepared by the Photo Arts Technician and a copy sent to the office originating the request. Purchase of this equipment will be processed under the audio-visual budget of the Manpower Planning and Staff Development Section.

** 2. Cameras

The Ministry's Technical Stores at Langley will supply either a standard type of 35 mm camera or "Polaroid" type cameras as stocked. All offices requiring one type or the other of these cameras must submit a separate request using the Technical Stores order form signed by the authorized official to the Director of Equipment Services.

Any other type of special camera and/or associated accessory required must be requested by memo to Personnel Programs, Manpower Planning and Staff Development who will analyze the request and prepare the Purchasing Commission requisition. These will be recorded and shipped from Technical Stores.

3. Audio-Visual Equipment - Loan and Repair Service

The Purchasing Commission provides loan, repair and maintenance service for audio-visual equipment to all Ministries. They operate an Audio-Visual Equipment Library at 3285 Oak Street, Victoria, B.C. (telephone 387-6625).

Equipment available for loan includes the following:

Projectors:	35 mm film strip
	35 mm slide
	16 mm
	Overhead
	Opaque
Tape Recorders:	Reel to Reel - Mono and Stereo Cassette

Projector Screens

Slide Presentation and Synchronization Units

Accessories for all the above mentioned units.

** Amendment

There will be no charge for the loan of such equipment. However, if in the opinion of their technician, equipment has been abused and repairs beyond normal wear and tear are necessary, the Ministry will be expected to meet the cost of parts and shipping charges only. The Ministry office is to make its own arrangements regarding obtaining and returning such equipment.

The repair and maintenance service is also available for Ministry owned equipment. Shipping is to be arranged and paid for by the Ministry as well as the cost of major parts. Minor parts and labour costs will be absorbed by the Purchasing Commission. Service calls to the home location will NOT be made. Equipment falling within the category for repair service is listed below:

Audio cassette recorders, other than office dictating equipment presently serviced by the Business Machines Division

8 track cartridge recorders

Reel to reel recorder

Cassette Recorders

Record Players

Microphones

Amplifiers

Speakers

Headsets

Slide Synd. records

Public address systems (portable)

Projectors

Projection Screens

All accessories for above equipment.

1.24 VEHICLE ACCIDENTS

1. Render Assistance

The operator of a motor vehicle which is directly or indirectly involved in an accident, shall render all reasonable assistance, state his name and address, and produce the licence/insurance certificate issued for the vehicle. UNDER NO CIRCUMSTANCES MUST AN ADMISSION OF LIABILITY BE MADE. The driver of a Government owned (or leased) vehicle shall not voluntarily assume any liability nor settle any claim.

** 2. Reporting Accidents

If an accident occurs within a city or municipality and results in death or injury to any person, or, if property damage is sustained to either or both cars in a total amount apparently exceeding

** Amendment

$400.00, the person(s) in charge of the motor vehicle(s) MUST make a report of the accident within 24 hours to the Chief of Police of the said City or Municipality. (If the accident occurs in unorganized territory a report MUST be made to the nearest R.C.M.P. Officer within 48 hours).

In addition to reporting to the police as required, a further report, on the prescribed "blue" H-13 form, covering all motor vehicle accidents, must be completed and forwarded to the District Official or Regional Branch official in charge, within 24 hours from the time of accident.

All accidents which involve a Government-owned (or leased) vehicle and a private vehicle, or which result in bodily injury or property damage, must also be reported as soon as possible, to the nearest Claims Centre of the Insurance Corporation of British Columbia. Operators and Supervisors are expected to assist Claims Centre personnel in fulfilling any reasonable request for information.

It is of the utmost importance that accident reports be made out as soon as possible after the accident occurs, preferably at the scene of the accident, so that no detail will be over-looked, and forwarded by first mail. Make measurements of road width, etc., if possible, and state speeds of vehicles involved, as this information is extremely important in determining liability.

** Summary of Reports Required

The following reports are prepared for vehicle accidents:

Police Accident Report (if death or injury, or damage over $400.00).

1. Report of Motor Vehicle Accident H-13 (used by all Ministries of Government). See Accounting Instruction A-1-1. Four copies to be completed and forwarded to the District or Regional Branch official in charge.

2. Supervisor's Report H-13A. See Accounting Instruction A-1-1. Four copies to be completed by unit operator's immediate supervisor and a Mechanic Foreman and forwarded to the District or Regional Branch official in charge, within 24 hours from the time of accident.

   Each copy of the H-13A will be attached to the corresponding H-13 form and distributed as sets by the District or Regional Branch official as follows:

   Original H-13 & H-13A - Insurance & Claims Officer
   Second copy H-13 & H-13A - Regional Director, Highways
   Third copy H-13 & H-13A - Regional Manager, Equipment Services
   Fourth copy H-13 & H-13A - Retained by District or Regional Branch Office.

** Amendment

** 3. Regional Director to report by telex to Headquarters prior to 12:00 noon each Monday, pertinent details of all accidents occurring during previous week. See Accounting Instruction A-1-1.

4. W.C.B. Form 7 if operator or other employee injured in motor vehicle accident.

5. Unit repair statement H.84 listing details of accident repairs necessary. See Accounting Instruction A-60-3.

Copy to: 1. Insurance & Claims Officer
2. Director of Equipment Services
3. Mechanic Foreman

3. Repair Procedure

1. The operator must immediately report an accident to his Supervisor and the Mechanic Foreman. If a third party vehicle was involved, and the Government vehicle sustained damage, the Mechanic Foreman will contact the nearest I.C.B.C. Claim Centre to determine whether an appraiser will come out to view the vehicle, or if it is to be moved to the Claim Centre for appraisal of damages. See Accounting Instruction A-1-1, Vehicle Accidents Repairs.

2. After the damages have been appraised, the Mechanic Foreman is to contact the Regional Manager, Equipment Services with his recommendation as to whether he considers repairs should be made in a Ministry garage or a private garage.

3. Repairs by Ministry Garage - A separate H-84 Unit Work Order, detailing parts and labour is to be forwarded to the Insurance and Claims Officer. Should a Vendors Payment Request Form have been issued by I.C.B.C., all copies of this are to be submitted with the final H-84. Include copies of all invoices pertaining to parts purchased; as well as for towing charges which have not been paid by the Insurance Corporation of British Columbia.

4. Repairs by Private Garage - After completion of repairs, a copy of the Vendors Payment Request Form, as completed by the repairing garage, is to be passed to the Insurance and Claims Officer. If any portion of the costs is to be paid by the Ministry, attach a copy of the garage invoice indicating these. If a portion of repairs made by a private garage, include a copy of their invoice, as well as for towing charges which have not been paid by the Insurance Corporation of British Columbia.

** Amendment

5. Repairs to vehicle damaged by unidentified motor-vehicle - I.C.B.C. will make re-imbursement for all repair costs in excess of $150.00. The damage must be reported immediately to the appropriate police authorities and an I.C.B.C. Claim Centre. Repairs will then be carried out per the preceding paragraphs. The usual accident report forms will be submitted.

4. Negligence of Operators

If there is evidence that the Government employee was responsible for the accident because of wilful negligence or impairment of his driving abilities, the employee may be required to bear all or part of the costs incurred.

5. Settling Claims

No employee will enter into negotiations for settlement on behalf of the Government, of any claims resulting from an accident involving a Government-owned vehicle, nor will he or she execute any release or discharge form in settlement, except by express instruction from the head of the Ministry concerned, or the Insurance and Claims Officer, Ministry of Transportation and Highways.

If an employeee is served with a Writ claiming damages resulting from an accident involving a Government vehicle, he or his supervisor shall communicate by fastest means to the Insurance and Claims Officer, the number of the Court Action, the place at which the Writ was issued, the date it was served on the employee, and the name of the claimant's solicitor, following which the District or Branch, will be informed as to the proper future procedure to be followed.

1.25 PRIVATE FATAL ACCIDENTS ON HIGHWAYS
**

Advise Headquarters, through the Region, of any fatal accidents occurring on the Highway system.

District officials are to establish direct communication with the local police forces within the District, in order to receive reports from them of all fatal traffic accidents which occur on roads within our jurisdiction. The circumstances and details of the accident are to be passed to Headquarters, specifically the Highway Safety Engineer, by use of the report form H.208. The Police should not complete the report. This must be done by the District Official. In completing this form certain actions will be required at the District level:

Obtain the Accident Cast Number from Police M.V.A. Form, together with dates, times and the name(s) of the deceased.

Ascertain the precise position of the accident site to the first decimal, and report the Location Code using the Kilometre Reference system for main and trunk highways.

** Amendment

Obtain details of the road surface, weather and light conditions at the time of the accident, concentrating on temporary and transient conditions.

Inspect the location, reporting any highway factors which may have contributed to the accident or affected its severity.

In consultation with local police, ascertain from their records or experience if the location is showing any pattern of similar accidents.

In the case of a fatal accident occurring within or close to road works, a scale drawing is to be prepared showing the exact position and type of all signs, lights, traffic barriers, etc., present at the time of the accident, and a copy of this drawing is to be sent to the Highways Safety Engineer in Victoria.

1.26 USE OF AIRCRAFT
**

1. Insurance

The Government of the Province of British Columbia carries blanket insurance policies which cover all government employees while travelling by aircraft on Government business.

The Air Travel Insurance Plan covers all employees of the Province of British Columbia whose salaries are paid from revenue within the meaning defined in the British Columbia Revenue Act.

Classifications

Group 2 — A group 2 employee is one whose salary is equivalent to that for a position evaluated at 1300 points or more under the Executive Job Evaluation Plan. It also includes Deputy Ministers, Assistant Deputy Ministers and their equivalents.

Group 4 — A group 4 employee is one whose salary is equivalent to that for a position evaluated between 600 and 1300 points under the Executive Job Evaluation Plan.

Group 5 — A group 5 employee is any employee not already included in either Group 2 or Group 4.

Benefits

Coverage is provided for employees in accordance with the following schedule:

** Amendment

Benefits	Amount of Insurance Group 2	Group 4	Group 5
Loss of Life	$200,000	$125,000	$75,000
Dismemberment and or loss of Sight	$200,000	$125,000	$75,000
Permanent and Total Disability	$200,000	$125,000	$75,000
Blanket Medical	$2,500	$2,500	$2,500

The aggregate limit for all employees as a result of a single accident is $1,000,000.

The insurance provides protection for an employee while travelling by air on government business, including limited ground travel to and from the airport.

Beneficiary

Any benefit under the policy will be made to the beneficiary designated under the Group Life Insurance Plan at the date of the employee's death. If no designation has been made, then the benefit will be paid to the employee's estate.

Exclusions

The policy does not cover an employee piloting an aircraft in the course of his duties unless the employee is employed as a pilot or unless the employee has been authorized to pilot the aircraft.

Notice of Injury or Death

The supervisor of an employee who is injured or killed while flying in an aircraft on government business must notify the Director of Personnel Programs in Victoria as quickly as possible by telephone and confirm in writing.

2. Private Aircraft

Employees are not authorized to pilot their own private aircraft, or rented aircraft, while on Government business. If an employee flies a private or rented aircraft there will be no coverage under the Air Travel Insurance plan and no claims for rental charges or travel expenses will be approved in these cases.

** 3. Commercial Aircraft

Ministerial operations requiring the use of aircraft must ensure the use of recognized commercial or licensed charter companies and that employees fly only in aircraft used in commercial aviation, or piloted by individuals employed as professional pilots.

** Amendment

The Director of Air Services should be contacted when aircraft charter is required and there is doubt as to the legality of the carrier to be used.

1.27 RENTAL OF B.C.B.C. OR MINISTRY-OWNED HOUSES TO GOVERNMENT EMPLOYEES

In all cases where a B.C.B.C or Ministry-owned house is available for rent and an employee makes it known that he wishes to rent the premises, the following procedure is to be followed:

The employee must submit his bid in competition with all other bidders and without guarantee of preference.

The employee may bid as high as he wishes, but in no case shall he submit a tender at a figure lower than that arrived at by the application of the rental formula.

1.28 MINISTRY OPERATIONS IN AGRICULTURAL LAND RESERVES

1. Agricultural Land Commission Act

The Agricultural Land Commission Act requires the consent of the British Columbia Land Commission before undertaking non-farming works in Agricultural Land Reserves.

In addition to the construction of new highways this includes realignments of existing routes, construction or improvement of drainage works, opening of gravel pits, and construction of camps, shops offices, yards, etc.

It is not desired at this stage to approach the Commission with trifles. Matters like deepening an offtake ditch, easing one curve in a section of road, working an existing gravel pit, etc., need not be brought forward. However, substantive matters such as building a new offtake ditch, easing several curves in a section, purhcasing or reserving additional property to extend an existing gravel pit and of course construction of new alignments, substantial widening of RW beyond 20 metres, extending yard sites, opening new gravel pits, etc., do require prior Commission consent.

It will be necessary to apply to the Commission in all cases within existing road allowance limits where no road now exists.

It will be necessary to apply to the Commission in all cases where additional right-of-way is to be acquired where that RW exceeds .4 ha per 1.6 km of road.

In addition to proposed gravel pits it will be necessary to apply to the Commission in cases of existing developed pits where the parcel on which the pit is located exceeds 1 hectare in area or the area worked exceeds 1 hectare.

1.28 - Cont'd

It will not be necessary to apply to the Commission for permission to survey or to prospect for gravel or to undertake soil surveys but the Commission expects dozer cuts, trenches, etc., to be restored to natural ground line and top soil replaced.

Notwithstanding any of the above exceptions, wherever it is known that local controversy exists and it is anticipated persons may object of a project or an aspect of it on the grounds of preserving farmland, that project should be the subject of an application to the Commission.

Applications for new alignments designed by Highway Design and Surveys Branch are to be made by the Director of Highway Design and Surveys. All other applications are to be made by the Regional Highway Engineer. When the Ministry is only acting as contractor to another Ministry (i.e. building a park road, etc.) the application is to be made by that other Ministry as owner.

The Commission has not at this time adopted a standard form of application. Application should therefore be in the form of a letter to the Chairman, British Columbia Land Commission, 4333 Ledger Street, Burnaby, requesting permission to construct whatever works are proposed and giving reasons why the works are necessary together with a statement of what alternatives are available to us and what social and dollar costs they have. Application should be made as soon as possible in the design process to minimize expenditure on engineering costs on non-approved projects but the design process will have to be sufficiently far advanced (i.e. feasibility stage) to provide the Commission with reasonable fact on which to base its decision.

It may be argued that Section 44 of the Laws Declaratory Act exempts this Ministry. However, it is policy that Land Commission rulings are to be observed and Section 44 is never to be used anywhere without the prior consent of the Deputy Minister.

2. Soil Conservation Act

The Soil Conservation Act requires all persons removing topsoil in Agricultural Land Reserves to have a permit from the municipality or (in unorganized territory) the regional district.

Removing in this sense and in our operations means placing it outside our RW. Excavating top soil and placing it in our RW is not removing but placing it on private property is considered as removing.

The regulations exempt us from this requirement to get permits. No application will, therefore, be necessary and you may proceed where necessary with removing topsoil.

However, the principles of preserving topsoil and agricultural land are to be followed. Top soil should be considered a resource not to be wasted and it should not be buried in waste dumps, push outs,

etc., but placed where it can be easily recovered for use as top soil when required. This includes placing it on farmers' fields, etc. and placing it in piles on or off RW so that it can be hauled away later as and when required to put on the land.

Refer to Chapter 5 for information on subdivision in A.L.R.

1.29 INVESTIGATION OF NATURAL HAZARDS
**

1. It is not Ministry policy to set ourselves up in competition with private consultants who are in the business of investigating natural hazards and are competent in the field. Our function is to investigate on our own behalf natural hazards as they may affect our highways in respect to our responsibilities in the maintenance of these highways.

2. With respect to subdivision applications in those cases where the Approving Officer has some evidence that a natural hazard may exist, he will require the subdivider to produce evidence of safety in the form of a report by a professional engineer. Initial evidence may be a reconnaissance level report and followed if necessary with a full report defining areas of hazard, recommended remedial works, etc. (Refer to Section 5.09.46 for complete procedure in subdivisions).

3. When the Ministry of Municipal Affairs, or a regional district or municipality, seeks assistance in the preparation of some form of plan, our assistance would normally be in the way of providing information on already known hazards from previous Geotechnical Branch, Avalanche Section and consultant work known to us, and of course any known published papers.

4. When any person, corporation or public body approaches us and enquires whether an existing property is subject to hazard or to what extent a hazard affects it, etc., (whether or not the subdivision was originally approved by us) that enquiry should be handled in the following manner: If it is an enquiry received in a district or in a branch office subsidiary to a region the person enquiring should be referred to the regional office. When the enquiry is received in the regional office, the Regional Director or a person specifically designated by him shall handle the enquiry. In the event that we have in our possession a written report on a hazard which includes the property under enquiry the Regional Director or his designate shall decide whether and in what form any information we may have will be released. If the person or authority enquiring wishes further investigation or elaboration to the information we have, which will normally be made available to him, then he will be advised to contact a consultant competent in the field.

5. Any person needing assistance in finding a suitable consultant should be given the names of several consultants and no preference for any one name should be expressed. However where it is known that a certain consultant has previously done work on this or adjacent property that fact may be mentioned.

** Amendment

6. Notwithstanding section 4 above, when the public body is another Ministry that has a perceived problem with its own directly operated property e.g., Parks Branch campsite, the Ministry may consult to that public body subject to prior approval of Form H514, Request for Services.

1.30 PHOTOLOG INVENTORY

An annual film inventory is made of selected roads and highways, generally covering Trunk, Main and Arterial Highways and some Minor and Secondary Highways. A complete set of film is retained in Victoria. Copies of the respective roads are sent to each Region.

The film is available for viewing for general and technical background information on request. Viewing requires special equipment.

The use of the film inventory as legal evidence is not to be encouraged. If asked, their existence is to be conceded but note that the small frame size, limited view, probability of operational breakdown, and non-availability of photographer make them poor as evidence. If pressed, refer applicants to the Ministerial Legal Officer who will negotiate to have a copy introduced in evidence rather than possibly losing the original for several months. Copies of all correspondence should be sent to the Systems Planning Engineer for his information.

1.31 PURCHASING POLICY

Following is the Provincial Government purchasing policy:

1. The Government of British Columbia recognises public purchasing as an important tool for economic development and direct public buying agencies to use their purchasing power to assist in the strengthening of our economic base.

2. The Government of British Columbia's policy is that British Columbia manufacturers be given first consideration in all public purchases providing suitability to the end user and delivery terms are satisfactory.

3. A price preference shall be given to British Columbia manufacturers on a sliding scale to reflect the actual value added within the Province up to a maximum level of ten per cent.

   (N.B. - the sliding will be applied by the Purchasing Commission based on B.C. content).

4. A price preference shall be given to Canadian manufacturers on a sliding scale to reflect the actual value added within Canada up to a maximum level of five per cent. This preference will apply when no British Columbia supply capability exists and where Canadaian firms are competing against non-Canadian suppliers.

5. Public tenders shall not specify an out-of-Province product or "equivalent" where British Columbia supply capabilities are known to exist.

6. Where British Columbia manufacturers are consistently unable to meet product specifications, these specifications are to be reviewed to ensure they are not overly restrictive.

7. It is the responsibility of the Ministry of Economic Development, in co-operation with the British Columbia Purchasing Commission and other public buying agencies, to periodically review out-ofProvince purchases based on information provided by the buying groups with a view to encouraging expansion in British Columbia supply capabilities.

8. This policy applies to all Government Ministries, the British Columbia Purchasing Commission, Crown Corporations and contractors to whom public purchasing authority has been delegated.

9. The intent of this policy is to be conveyed at the highest level to School Boards, Hospitals, Universities, Municipalities, Cities and Regional Districts.

1.32 MINISTRY BUILDINGS ** MAY 1983

1. GENERAL

The British Columbia Buildings Corporation is the agency responsible for the construction, operation and maintenance of all Government buildings, including highway garages and equipment buildings, laboratories, oil sheds, fuel pumps and miscellaneous storage buildings throughout the Province. Exceptions are all weigh scale stations, Highways ferries docks and facilities, rest area buildings, and salt sheds located on property which is not owned by British Columbia Buildings Corporation. These are designed, tendered, and contracts awarded by staff of the Ministry.

The Corporation will not initiate action in connection with buildings or services. All requests are to be initiated by Regional Highway Directors and forwarded to the Director, Building Services, using British Columbia Buildings Corporation 1.1 form. B.C.B.C. forms "A" and "B" are also to be completed for office space and submitted with the 1.1 form.

The Ministry's Building Services Branch collects all requests, establishes budget priorities and programmes, provides technical input and liason with British Columbia Buildings Corporation, and controls the Building Occupancy Vote.

2. SURPLUS SPACE

Since the Ministry is paying rent to the British Columbia Buildings Corporation, it is imperative that the Director, Building Services be advised immediately of any reduction that can be made in area occupied, buildings vacated and storage space or land no longer required.

** Amendment

1.33 USE OF MINISTERIAL FACILITIES

Ministerial employees and facilities may not be used in any work for a private individual, company, or organization. Ministry premises are to be used solely for Ministry work.

Ministerial equipment, material and tools may not be given or sold to any person, company or organization. Disposal must be arranged through the Purchasing Commission. Equipment or tools loaned to other Government Ministries must be recorded by means of the stores withdrawal form.

The only exception to this general Ministerial policy would apply in genuine emergencies during floods, forest fires, disasters, or where life is in danger, as well as approved private snowplowing, assistance to motorists on the road, work for other Provincial Ministries, and work done under agreement with other levels of government.

It will be the responsibility of each Executive Director, Branch Director, Regional and District Official, and supervisors to ensure that each employee is familiar with this section. Enforcement and discipline are partially contingent on employees being aware of Ministry policy.

1.34 ** STAFF DEVELOPMENT AND TRAINING PROGRAMMES, CONFERENCES, WORKSHOPS AND SEMINARS

1. Policy

In order to maintain a skilled workforce within the Ministry of Transportation and Highways and the Public Service of British Columbia, the Ministry will provide opportunities for all Regular Employees to:-

1. improve or enhance their present job knowledge and skills.

2. build new knowledge and skills where current job requirements are changing, or are forecast to change.

3. build additional knowledge and skills to prepare them for changing or increasing responsibilities.

2. Definitions

Unless otherwise noted in the text, the terms "training" and "development", when used generally, are intended to encompass all of the various training, development and education activities defined below.

1. Job Related Training: Training required for Employees in order to ensure that they are able to continue to perform in their present positions at an acceptable level of performance.

2. State of the Art Training: Training given to Employees to ensure that they retain their currency of knowledge and skills in the face of changing political, economic, social and technological conditions.

** Amendment

3. Occupational Health and Safety Training: Training to ensure that Employees know how to work safely, and how to meet essential Safety and Occupational Health requirements in the work place.

4. Retraining: Training to assist redundant or supernumerary Employees to acquire skills for different positions in order that they may continue, where possible, to pursue personal careers within the Ministry and the Public Service of British Columbia.

5. Remedial Training: Training given to Employees whose performance does not meet position standards (identified by an effective performance appraisal process) to assist them improve their performance.

6. Development: Any training intended to provide an Employee with additional knowledge and skills to prepare them for changing or increasing responsibilities.

7. Education Assignment: An assignment made by Management for an Employee to attend any training or development programme, inside or outside Government, for which all expenses incurred are borne by the Employer.

8. Education Leave: Leave, applied for by an Employee and approved by Management, for attendance at any educational programme during scheduled working hours. This leave will enable an Employee to pursue studies which may relate to the Employee's current position or career aspirations within the Ministry or Public Service of British Columbia, but which may not relate directly to current Ministry or Government requirements.

9. Education Incentive: Tuition reimbursement approved for an Employee to pursue a course of studies at an accredited Educational Institution outside scheduled hours of work. Such studies, when approved, are undertaken entirely at the Employee's discretion, and should be job related or related to an Employee's longer term career goal, within the Ministry or Public Service of British Columbia.

3. Application of Policy

This policy is applicable to all Employees of the Ministry of Transportation and Highways.

4. Process

The objective of establishing and maintaining a skilled workforce within the Ministry and the Public Service of British Columbia can be achieved by one or more of the following processes:

** Amendment

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1. completion of thorough, effective and constructive Performance Appraisals on every Employee by their immediate Supervisor or Manager.

2. on-the-job training by an Employee's immediate Supervisor or a designated individual who possesses the essential training and job skills.

3. formal off-the-job training or study at a local College, Institute or University.

4. attendance at appropriate local Public Service Commission Seminars and Workshops.

5. individual study of courses offered by the Ministry Manpower Development Programme, the Open Learning Institute of British Columbia and the Knowledge Network of the West (K.N.O.W.).

6. participation in the off-the-job courses and programmes offered by the Ministry's Staff Development Section.

7. attendance at appropriate Conferences, Seminars and Workshops offered by Professional Associations.

8. attendance at approved Ministry Conferences.

9. other appropriate correspondence courses.

Additional opportunities may be provided for individual career development, subject to Ministry needs, operational requirements and the availability of funds.

5. Auxiliary Employees

Auxiliary Employees will be provided with basic, essential job skills and knowledge upon appointment. This training will form part of the Orientation Programme and will normally be completed by the Employee's immediate Supervisor.

6. Funding of Major Programmes

The Manager, Manpower Planning and Staff Development is responsible for the effective administration and control of the Staff Development Programmes throughout the Ministry, including financial control of the Staff Development budget.

This responsibility does not include the on-the-job training given to Employees by their immediate Supervisor as this function is a required duty of every Supervisor and Manager

Funding of development and instructional costs, for major programmes offered by the Ministry's Staff Development Section, will be directly controlled by the Manager, Manpower Planning and Staff Development.

** Amendment

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Typical programmes are:

1. Executive, Managerial and Supervisory Development
2. Manpower Planning Analysis
3. Office Manager's Development
4. K.N.O.W. Television Delivery
5. Engineers-in-Training
6. Manpower Development Courses
7. Open Learning Institute Courses
8. Apprenticeship Programmes
9. Dedicated Public Service Commission Courses
10. Equipment Operator Training
11. Trades Training
12. Computer User Training and Management Information Systems
13. Educational Leave
14. New programmes that are identified from Operational Surveys, in co-operation with Line Managers
15. Ministry-wide Safety Training

7. Funding and Approval of Individual Training Requests

Funding for individual training requests will be met by an annual budget allocation to each Region, Motor Vehicle Department, Transport Policy Department, Motor Carrier Commission and Headquarters Staff. This budget allocation will be reviewed annually with the Senior Regional or Department Official responsible for its administration.

Individual training requests will be approved on Form H-564 (revised 1983), at the local (Regional or Department) level as will individual requests for Public Service Commission courses.

Approval of course fees, materials and time away from duty for individual Ministry Employees to attend training events or courses (College, Public Service Commission, etc.) is under the direct control of the Senior Regional or Department Official or his Delegate, except as stated elsewhere in this policy.

** Amendment

Form H-564 is to be submitted to the Manager, Manpower Planning and Staff Development only for requests to attend: - Conferences, Apprenticeship Courses (other than those sponsored by the Ministry), Government Financial Management Programmes and Educational Leave.

Approval by the Manager, Manpower Planning and Staff Development is also required on an H-564 for any expenditure over $300.00 (all course fees and materials) for any one individual request. These requests will be assessed for benefits to the Ministry and, if approved, will be funded out of the central Staff Development budget.

8. Funding Guidelines

A maximum limit of $300.00 (total course fees and materials) may be approved by the Senior Regional or Department Official or his Delegate, for any single Employee request for job/career related training (see above).

Ministry Employees who attend a training course or programme to improve or enhance their present job skills and knowledge will be reimbursed 100% of course fees and materials.

Ministry Employees who attend a training course or programme in order to enhance their career opportunities, within the Ministry or Public Service of British Columbia, will be reimbursed 50% of course fees and materials.

Ministry Employees who attend courses or programmes of a general interest nature, i.e., not designed to improve their present job skills or enhance career growth, will not be reimbursed.

9. Exceptional Circumstances

The final decision for level of reimbursement of costs for course fees and materials to any individual Ministry Employee who has approval to attend a training course or programme, rests with the Senior Regional or Department Official, or his Delegate.

10. Reimbursement of Course Fees

Reimbursement of course fees and materials will only be paid to Ministry Employees who have:-

1. written approval from their Senior Official to attend the course, including the level of reimbursement, prior to attendance.

2. successfully completed the course work, assignments and any final exams.

3. submitted a brief, concise report of the course to their Approving Officer.

** Amendment

11. Headquarters Staff

Headquarters staff, including the Motor Carrier Commission and Regional Managers of Construction, Paving, Design and Surveys, and Apprentices will be funded in Victoria, under the direct control of the Manager, Manpower Planning and Staff Development or the Headquarters Regional Personnel Officer.

12. Ministry Conferences

The approval and co-ordination of dates of all Ministry Conferences is the responsibility of the Assistant Deputy Minister, Administration, or his Delegate.

All requests must include the following information and be submitted through the Senior Regional, Department or Branch Official to the Manager of Manpower Planning and Staff Development.

1. Proposed inclusive dates of Conference.

2. Type of Conference - District Officials, Branch Project Supervisors, District Office Managers, etc.

3. Names of all Attendees.

4. Who is to be invited from Headquarters, other Departments, Branches, or Regions.

5. Location of Conference.

6. The objectives of the Conference, listing the benefits to the Ministry.

7. Accommodation - Training Programmes, Conferences and Workshops must be held in Government meeting rooms as far as possible. If Government meeting rooms are not available, provide the cost of hotel or motel meeting rooms. If meeting rooms are supplied as part of the package, provide the rates which have been negotiated.

8. Submissions must be received in Headquarters at least three months before start date.

If approved, the Assistant Deputy Minister, Administration, will advise other Regions, Departments, and Branches the type and date of the Conferences for reference in their tentative planning of similar events.

13. Report on Attendance Conferences, Seminars, Training Courses, etc.

In order to evaluate the effectiveness of Conferences, Seminars, Training Courses, etc., and to identify the benefits to Attendees and the Ministry, the following process has been established.

** Amendment

1. After each attendance at a course, seminar, etc., a brief, concise report is to be submitted to the approving Official by a nominated Attendee, within fifteen days of return to work.

2. A copy of this report and any course handouts, papers, etc., must be submitted to the office of the Manager, Manpower Planning and Staff Development, 5C - 940 Blanshard St., Victoria, B.C., V8W 3E6. From there, appropriate reports will be forwarded to the Assistant Deputy Minister, Administration, for his review.

3. The report should include comments on the course objectives, standards of delivery and instruction, quality of handouts, materials and training accommodation and, finally, whether the course should be repeated.

This process is to be followed with the following exceptions:-

1. All formal training programmes provided by the Ministry's Staff Development Section, as these will be formally evaluated after each session.

2. The Roads and Transportation Association of Canada Conferences.

3. The Western Association of Canadian Highway Officials Conferences.

4. All Apprenticeship programmes.

14. Out of Province Training Programmes and Conferences

Attendance at Out of Province Training Programmes, Conferences, Seminars etc., requires the prior approval of the Minister of Transportation and Highways and the Minister of Finance (except where an individual agrees to use his/her own time and pay all travel expenses).

Applications for out of province travel must be made on form FIN 99 Province of British Columbia Travel Authorization, and must be submitted for approval well in advance of the proposed time of travel. Post travel approval will not be considered and failure to comply could cause the approval to be withheld resulting in non-payment of expenses.

Following is the routing for the completed form FIN 99:

1. Copies 1 and 2 to be forwarded to employee's supervisor who will consider and if warranted will arrange or apply Spending Authority signature.

2. Employee's Supervisor or Spending Authority Officer will forward the two copies to the appropriate Regional Director/ Director/Executive Director who will indicate approval if applicable and forward application to the appropriate Assistant Deputy Minister.

** Amendment

3. Upon recommendation of approval by the appropriate Assistant Deputy Minister, the application will then be forwarded to the Assistant Deputy Minister - Administration & Services Department who will arrange final consideration of the application.

4. If then approved by the Minister of Finance, copies of the FIN 99 will be returned through the above routing and a copy will be provided to the employee concerned, who must attach a copy of same to each pertinent Travel Expense Voucher submitted for reimbursement.

15. Travel by Government Vehicle to Conferences

Ministry Employees attending Conferences must not travel by Government vehicle. Approvals for car distance allowance will be granted on a limited basis to individuals who require use of a vehicle for their specific purpose.

16. Records of Attendance & Expenditure

Records of attendance at all locally funded (see item 7) courses, seminars, etc., as well as a financial statement of expenditure on course fees and materials must be submitted quarterly to the office of the Manager, Manpower Planning and Staff Development, by the Senior Regional or Department Official or his Delegate.

1.35 TECHNICAL PAPERS

No firm commitments to write or present technical papers are to be made unless the proposal has first been approved by the Deputy Minister. Requests to the Deputy Minister should give an outline of about 150 - 200 words.

After receiving this approval and before submitting to the receiving organization, the draft paper is to be sent to the Assistant Deputy Minister, Operations, for approval in detail.

NOTE: This does not apply to in-house papers that are not to be published in any sense, nor to lectures in continuing education, night school, etc.

1.36 BROCHURES AND PUBLICATIONS

All brochures and publications financed by the Ministry must be forwarded to the Deputy Minister for advance approval of the Minister.

1.37 DIRECTIVES FROM SOURCES OUTSIDE THE MINISTRY

Directives and instructions received from sources outside the Ministry must be clarified from within the Ministry before any action is taken. Examples of such instructions would be "Postal Service Branch Information Bulletins, Office of the Comptroller-General Instructions, Purchasing Commission Instructions, Government Employee Relations Bureau Bulletins, Public Service Commission Circulars, Treasury Board Directives, Queen's Printer Bulletins," etc.

** Amendment

Instructions which affect Ministry procedure will be clarified by circular or as amendment to appropriate manuals. In the event that an explanation is not received from within the Ministry, clarification of the correct procedure should be obtained through the immediate supervisor.

1.38 MINISTRY NAME BADGES

The Ministry supplies name badges to assist with visual identification of personnel who are regularly representing the Ministry at group meetings.

Following is the criteria for obtaining these name badges:

> To be issued for identification of Ministry personnel who are regularly attending Group meetings with Municipal, Federal and other Provincial Ministries, public meetings and other agencies outside the Ministry.
>
> This does not apply to personnel attending meetings within the Ministry, with the exception of personnel who are regularly involved in attending training seminars as instructors.

A form H.123, Application for Name Badge, must be completed and forwarded to the Branch Director or Regional Director, Highways for recommendation. If recommended, the form is forwarded to the Assistant Deputy Minister, Administration and Services, for approval. If approved, the name badge will subsequently be supplied by Headquarters.

1.39 FUNERAL WREATHS

Provincial Government policy does not provide for Ministries to provide funeral wreaths or charitable donations in lieu for employees deceased while in the Government service. The Legislative Assembly does not vote public funds for this type of expenditure.

Recognition by fellow employees traditionally are paid through voluntary contributions from colleagues and friends.

** Amendment

Province of
British Columbia
Ministry of
Transportation,
and Highways

Single
Column
Advertisement

SIGNATURE
Position

Province of
British Columbia
Ministry of
Transportation,
and Highways

Double
Column
Advertisement

SIGNATURE
Position

Triple
Column
Advertisement

SIGNATURE
Position

Province of British Columbia
Ministry of Transportation, and Highways

Quadruple
Column
Advertisement

SIGNATURE
Position

HEADQUARTERS PHOTOGRAPHIC CATALOGUE

AIR SERVICES

AIRPORTS

AVALANCHES

BUILDINGS

BRIDGES - (Both finished and under construction)

CENTRELINE MARKING

CULVERTS - PIPES

DOCKS

EQUIPMENT

FENCING - GUARD RAILS

FERRIES

HIGHWAYS - (Both finished new sections and under construction)

HIGHWAY SAFETY

HISTORIC

LANDSCAPING

LANDSLIDES

MAINTENANCE

MOTOR VEHICLE FACILITIES

PAVING

RAILWAYS

REST AREAS

SCENERY

SIGNING

SNOW REMOVAL

TRANSPORTATION

TRAFFIC

WEIGH SCALES

CHAPTER 2

COMMUNICATIONS

2.01 CORRESPONDENCE

1. INTERNAL

Make it brief, to the point, and self-explanatory. Deal with a single subject in each letter.

2. EXTERNAL

This correspondence should be more detailed, reinforcing the feeling that full consideration has been given. The subjects may cover the range of the original communication.

3. PROCEDURE

Address correspondence clearly, giving the subject and references. Letters to an individual in an organization or branch are sent to it, "Attention of.....".

To assist the addressee in contacting the originator of the correspondence, show applicable telephone number together with the full return address when not printed on the letterhead.

File numbers and the date are to be included when the letter is typed. It is Provincial Government policy that all correspondence emanating from a ministry must conform to the standard British and Canadian alphabetic format of month/day/year i.e. June 25, 1982. This would include any reference to date in the body of the letter. The same format is also to be used for internal ministry correspondence. However, where a numerical date is required for forms, the international dating system of year/month/day is to be used i.e. 1982 06 25.

Show "c.c. to" (carbon copy to) at the foot of the letter if a copy or copies have been sent to other offices or officials.

** 4. REGION AND DISTRICT CORRESPONDENCE

It is not necessary to submit letters in duplicate. Photocopy the original if an extra copy is required.

Only when the Region is in no way concerned or interested in the subject matter, or when otherwise instructed, will a District Office correspond directly with Headquarters. The District Highways Manager or District Office Manager will normally address all ministerial correspondence to the Regional Director, Highways. If the Regional Director, Highways considers that the matter should be referred to Headquarters, he will add his remarks to the original and submit to Headquarters. Please note that District Offices should be careful not to bypass the Region. Let the Region decide whether they are interested or not.

** Amendment

When District Offices correspond with Headquarters direct, the original only of such correspondence is required at Headquarters. If specified by the Region, then a copy of such correspondence and reply is to be sent to the Region.

When the Regional Office corresponds with Headquarters, only the original is required at Headquarters. If other Regional offices or a District Office is affected, a copy should be forwarded to such office.

** 5. HEADQUARTERS CORRESPONDENCE

Only the original of mail emanating from Headquarters will be sent to the Regional Office. If a District Office is involved the Region will insert comments or instructions on the original and forward a photocopy to the office concerned.

Correspondence from Headquarters must be answered or acknowledged, and progress indicated, within two weeks. Districts must, within three days, answer Headquarters mail received via the Region.

Where a deadline is given it must be followed, or a reason given why it cannot be followed.

** 6. MINISTER'S CORRESPONDENCE

The Minister's correspondence must receive top priority. An acknowledgement or reply must be prepared within ten days of receiving incoming letters.

Requests for reports in connection with the Minister's correspondence must be given immediate attention. The reports should be sent to the office of origin and not to the Minister's Office.

** 7. MAILING

The Provincial Postal Services Branch offers many services for faster, more efficient, and less costly delivery of provincial government mail. These services are outlined in "The Provincial Mail Service Guide" and "Information Bulletins" issued by the Postal Services Branch. All offices must follow these guidelines as much as possible in order to take advantage of Canada Post incentive rates. Any enquiries regarding these services should be directed through the supervisor to the Ministry's Postal Co-ordinator, the Administrative Assistant to the Deputy Minister.

All signed letters, contracts, vouchers and monthly reports must be forwarded by first class mail. Offices must send all letters to a single destination under the same cover. Mail is opened at a central location at Headquarters, Regional and District Offices and therefore envelopes addressed to individuals are not necessary unless personal.

** Amendment

Plans should be rolled on a stick and providing a letter is not enclosed the "Printed Matter" rate may be used. These may be registered if required. Large plans attached to letters must be folded as shown at the end of this Chapter to ensure proper filing.

8. FOLLOW-UP LETTERS

Keep copies of outgoing letters requiring an answer in an outstanding file, which is checked daily. If the number warrants, assignment slips are attached with a copy to a "brought forward" box for daily checking.

If an answer is late send a reminder form (H.151). If convenient, the reminder form may be typed with the letter and placed in the "brought forward" box. It is sent if an answer is overdue or destroyed if one arrives.

9. RECORD OF CALL

Record of Call Form H-266 is to be used when a message is received by phone or visit. The request or complaint is to be followed up and kept current till such complaint or request has been handled or completed to the satisfaction of the District official, and, as far as possible, to the party concerned. Such form can also be made out with instructions to the Foreman who will receive the duplicate copy and report on action taken to the District official who can advise the party concerned.

10. CORRESPONDENCE FORMS

H-118 H-118A	(8 1/2" x 11") (8 1/2" x 7")	Memorandum Forms used for general correspondence within and between ministries.
H-118B		Memorandum forms used for all correspondence pertaining to personnel.
Letterhead		Used for correspondence to firms and persons outside the Ministry.
Memogram		Used for short handwritten correspondence requiring a reply. Carbons provide a copy of the original message and the reply on sheets for both writers.
H-6		Used when telex messages are taken over the phone or written. It reminds the writer to show references.
H-9		Radiogram. Used to copy or write a radio message.
H-124		Used to send invoices, forms, plans, etc., where no official letter is required for file purposes.
H-151		Correspondence reminder used as follow up on letters.
H-266		Record of Call. Used for recording messages received by phone or visit.

11. MAIL FROM FIELD TO HEADQUARTERS
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In all instances, mail will be addressed to a member of the Executive or Branch Head, and if necessary, attention of an employee or position under the Branch head, as follows:

DEPUTY MINISTER OF TRANSPORTATION AND HIGHWAYS
- Administrative Assistant

ASSISTANT DEPUTY MINISTER - ADMINISTRATION AND SERVICES DEPARTMENT
- Administrative Assistant
- Director of Personnel Programs
  - Manager, Manpower Planning & Staff Development
  - Manager, Regional Personnel Operations
  - Manager, Employee Relations
  - Manager, Organization & Classification Services
  - Manager, Administration Support Services
  - Senior Health & Safety Programs Officer
  - Regional Personnel Officer, Blanshard Street Office
  - Regional Personnel Officer, Douglas Street Office
- Director of Financial Services
  - Manager, Operations
  - Manager, Planning and Development
  - Manager, Financial Services - Transportation (Douglas Street Office
- Director of Aircraft Services
  - Chief of Maintenance
  - Operations Manager
  - Chief Pilot
  - Supervisor - Travel Recording Centre
- Director of Property Services
  - Assistant Director of Property Services
- Director of Building Services
- Senior Information Officer
  - Information Officers
- Contract Documents Officer
- Insurance and Claims Officer
- Chief Records Clerk

ASSISTANT DEPUTY MINISTER - HIGHWAY OPERATIONS DEPARTMENT
- Executive Director, Engineering Division
- Director of Highway Design and Surveys
  - Senior Supervisor, Functional & Preliminary Planning
  - Senior Design Engineer
  - Senior Design Engineer, Special Projects

** Amendment

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Director of Geotechnical and Materials Engineering
Supervising Geotechnical Engineers
Supervising Operations Geotechnical Engineer

Director of Bridge Engineering
Bridge Design Engineer
Bridge Construction Engineer

Director of Traffic Engineering
Traffic Engineer
Electrical Engineer

Director of Highway Planning
Special Projects Engineer
Senior Highway Planning Engineer
Municipal Programs Engineer
Headquarters Approving Officer

Highway Safety Engineer

Executive Director, Construction Division
Director of Construction
Assistant to Director of Construction

Director of Paving
Design and Contracts Engineer
Surfacing Operations Superintendent

Lands Survey Officer

Executive Director, Operational Services Division
Director of Maintenance Services
Maintenance Systems Engineer
Senior Landscape Supervisor
Senior Avalanche Coordinator

Director of Equipment Services
** Marine Manager
** Equipment Manager
Communications Engineer
Sign Shop Manager

ASSISTANT DEPUTY MINISTER - TRANSPORTATION POLICY DEPARTMENT
Director, Transportation Policy Analysis
Manager, Aviation Policy
Manager, Rail Policy
Manager, Analytical Services
Program Manager, Air Transport Assistance Program

Director, Engineering Inspection
Assistant Chief Inspecting Engineer
Senior Inspector - Aerial Tramways
Senior Inspector - Pipelines
Senior Inspector - Railways

** Amendment

Director of Special Projects

Director, Information Systems Branch (Highways)
Manager, Administrative Systems Development
Manager, Engineering Systems Development
Manager, Systems Services

Director, Information Systems Branch (Transportation)
Manager, Data Administration and Planning
Manager, Systems Development

SUPERINTENDENT OF MOTOR VEHICLE DEPARTMENT
Deputy Superintendent
Manager, Vehicle Licence Division
Manager, Driver Licence Division
Director of Standards and Compliance
Manager, Commercial Transport Division
Manager, Vehicle Inspection Division

Director of Administration and Safety Programs

12. MAIL TO REGIONAL OFFICE

All mail and telexes to the Regional Office will be addressed to the Regional Branch official who is to receive the message as follows:

Regional Manager, Maintenance
Regional Personnel Officer
Regional Manager, Construction
Regional Approving Officer
Regional Manager, Design & Surveys
Regional Geotechnical & Materials Engineer
Regional Manager, Paving
Regional Property Negotiator
Regional Manager, Equipment Services
Regional Landscape Supervisor
Regional Maintenance Systems Technician
Regional Manager, Financial Services
Regional Health and Safety Officer
Regional Driver Trainer
Regional Bridge Maintenance and Works Technician

13. MAIL FROM THE REGIONAL OFFICE - MINISTRY

All Ministry mail emanating from the Regional Office written by other than the Regional Director, Highways will be sent out over the title of the official writing the letter.

** Amendment

** 14. MAIL FROM REGIONAL OFFICE TO OUTSIDE PARTIES

All mail to parties outside the Ministry emanating from the Regional Office will be sent out over the title of official writing the letter and signed by originator.

Members of the Professional Engineers Association of British Columbia will show "P. Eng." after their name on such correspondence to outside parties.

Where protocol requires that the Regional Director's rank be used, the regional official will prepare the letter for the Regional Director's signature. File copy should have "Prepared by ...." typed at bottom.

** 15. MAIL TO OR FROM DISTRICT OFFICES

Address District letters to the District Official (Attention, name or position if necessary). The District official signs letters over his own title. At his discretion, some District letters may go signed by other writers.

2.02 TELEPHONES

1. ANSWERING

1. Be business-like, answering promptly, politely and pleasantly.

2. Identify by:

(a) Ministry
(b) Branch
(c) Name

3. Speak distinctly and to the mouthpiece.

4. Be brief (do not hold a line while searching for information, call back).

5. Do not give the public the "run around" by transferring calls blindly to another Branch. If the matter at hand is not your responsibility, take the number, locate the correct official, and phone back to the person advising of the number and name of the official they should contact.

6. End calls clearly.

2. PLACING CALLS

1. If your party is out leave your name, number and local.

2. On a switchboard, placing long distance calls, give your name and local number.

** Amendment

3. On an outside phone give your name, phone number and the number paying for the call.

4. Be brief.

5. Cancel uncompleted long distance calls if leaving your phone.

3. LONG DISTANCE CALLS

1. Use EMail, PROVNET or Ministry radio instead of long distance to centres having these facilities.

2. When it is necessary to make long distance calls, they are to be short and must be in connection with essential Government business.

3. Station to Station service is to be used when placing all long distance calls. Do not use Person to Person service.

4. Do not ask the Telephone Company Operator for a particular local or extension number. This practice increases the cost from between 50 to 100% as such calls are classified as Person to Person rather than Station to Station.

5. Prior approval is not necessary to place Out-Of-Province calls providing they are for Government business.

6. Personal calls are not to be charged to a Government telephone number.

7. No long distance calls are to be charged to the Parliament Buildings number, or any switchboard number, or to any PROVNET number. Any necessary long distance calls, collect or otherwise should be charged to either:-

** 1. Telephone Credit Card
** 2. Paid for and submitted on a travel expense voucher

4. ORDERING TELEPHONE SERVICES

** All Ministry requests for new installations, deletions, reprogramming, additions, changes, takeouts and moves of telephone or intercom systems, must be submitted on the "Request for Telecommunications Service" form to the Regional Director or Branch Head. If approved, they will be forwarded with recommendations to the Director, Information Systems Branch.

No contact is to be made with the telephone company or the Telecommunications Service Branch of the Ministry of International Trade, Science and Investment to request changes or alterations. Repairs or services may be requested directly from the telephone company where no cost is involved.

** Amendment

The following information must be included on a "Request for Telecommunications Service" form:

1. Ministry.
2. Branch
3. date required

(Block A) 4. Location (include street address, postal code, building, floor, room number as applicable).

(Block D) 5. Complete description of required service.

(Block C) 6. Name of an on-site contact (a person with whom Telecommunications Services Branch personnel can discuss the request and whom the Telephone Company installers can contact for precise instrument placement instructions).

** (Block B) 7. The telephone numbers/call sign/circuit numbers (include locals).

(Block E) 8. Provide complete substantiation. This together with the description (e) above, will assist the Ministry of International Trade, Science and Investment, Telecommunications Service Branch personnel to fully assess the requirements and ensure that the service provided will in fact meet the requirements.

(Block D) 9. Where practical, a simple sketch of the office areas involved, showing location of existing telephones and indicating desired location for requested facilities.

(Block F) 10. Complete listings as it should appear in the B.C. Telephone Company Directory, or indicate no change or not required.

2.03 DATA COMMUNICATION SERVICES

** All ministry requests for moves, additions, deletions, or changes to data terminal equipment or associated data communication equipment must be submitted to the Regional Director or Branch Head. If approved, the request will then be forwarded to the Director, Information Systems Branch for appropriate action.

No contact for alterations is to be made with the B.C. Telephone Company, B.C. Systems Corporation, B.C. Building Corporation, Ministry of International Trade,Sciences and Investment or any vendor of the hardware involved.

** Operational problems may be reported as follows:

a) For data communications on Provnet lines see the "trouble" numbers in the beginning of the Government Telephone Directory;

b) For BCSC data lines, either SNA or DNET networks, call the Customer Service Centre at 389-3686;

c) For DATAPAC and all other data lines call the Information Centre in the Information Systems Branch (Highways) at 387-0142.

** Amendment

The following information must be included on a memorandum:

1. Branch or Region
2. Date of request
3. Date service required for use
4. Address and present location of equipment (if any) (include street address, building, floor, room number, as applicable)
5. Proposed address and location of equipment
6. Existing data line phone number (if dial-up) or Node address (if dedicated line)
7. Line speed (BPS) required, if known
8. Description of required service (with before and after sketches where appropriate) including computer and/or data network to which access is desired
9. Explanation of why the service is required and reasons for the data requested
10. Originator of request and contact person at the site (if different)
11. Branch Head/Regional Director approval.

Upon receipt, the Director, Information Systems Branch, or designate, will contact the appropriate agencies to effect the requested service change (if approved), or respond to the originator if delay in approval is anticipated.

2.04 RADIO

1. GENERAL

The Ministry operates a Province-wide mobile radio system. A Radio Call Book is available at most offices in the Province which provides all necessary procedures and related information. The Radio Call Book is revised annually.

2. PROCEDURE

In order to properly maintain and inventory the mobile radios in the system it is essential that the following procedures are followed:

1. All requests for radios to be transferred, or new requirements, are to be made to the Regional Manager, Equipment Services in which the vehicle is "Home Garaged". This includes Headquarters' crews and all Branches.

2. No person is to remove, transfer or repair a Ministry radio unless specifically and individually authorized to do so by a Communications Technician.

3. Problems with radio operations should be reported as soon as possible to the delegated person in each District, so that Communications Technicians can schedule the necessary work.

4. Travelling crews should contact the nearest Ministry garage. All other crews should arrange repairs through their foreman or project supervisors.

2.05 TELEX
**

Policy: There are only two offices in the Ministry of Transportation and Highways (Highways) where telex machines are still used. They are the Headquarters General Office and the Maintenance Services Garage at Cloverdale. No new telex services will be purchased by the Ministry except under special circumstances. The electronic mail system (EMail) has a telex interface and can be used both to send and receive telex messages. Contact the EMail operator at the Headquarters General Office or the EMail system supervisor in the Information Systems Branch.

2.06 ELECTRONIC MAIL (EMail)
**

Policy: The Ministry employs an electronic mail service for the distribution and collection of regional and district information exchange, daily road reports, and general document transfer. Each electronic mail box within the Ministry is a subscriber or user of CN/CP telecommunications common carrier Electronic Office Service system that resides on a computer at CN/CP head office in Toronto. Electronic mail boxes are issued to region, district and branch offices. Requests for new boxes are made through the Director, Information Systems Branch.

The computer equipment required to access an electronic mail box consists of a personal computer, a telecommunications line and modem, and the appropriate electronic mail software. All required equipment is coordinated through the Information Systems Branch.

Messages sent on electronic mail are to be kept as short as possible as the Ministry pays for this service on a per character basis.

2.07 FACSIMILE
**

Policy: Facsimile machines are installed and maintained in Ministry offices by the Telecommunications Services Branch of the Ministry of International Trade, Sciences and Investment. Facsimile machines should be ordered only where EMail or regular mail does not meet the specific needs of the office, an example is where there is urgent need to transfer drawings or documents with signature. All requests for facsimile machines must be submitted to the Regional Director or Branch Head. If approved, the request will then be forwarded to the Director, Information Systems Branch for appropriate action.

** Amendment

2.08 PLAN STANDARDS AND FOLDING INSTRUCTIONS

The Ministry has adopted the following standard drawing sheet:

ISO size A1 (841 x 594 mm trimmed lines)

The following drawing sheet is to be used for special purposes only:

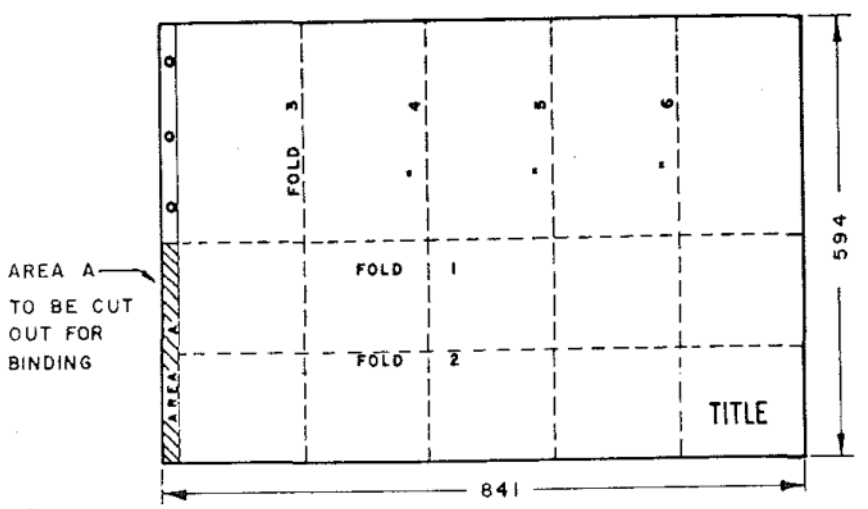
ISO size A2 (594 x 420 mm trimmed lines)

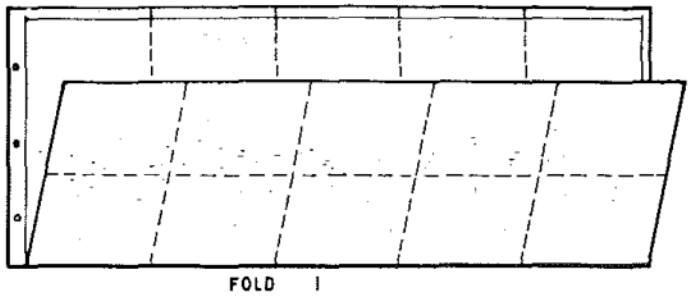
If a drawing or plan is likely to be placed on file, please follow the the folding instructions as shown in illustrations.

By using folding lines, no measuring is required. Area "A" is to be cut out when placing drawing in file.

When mailing, please use standard envelopes (32 x 23 cm) in order to avoid further creasing.

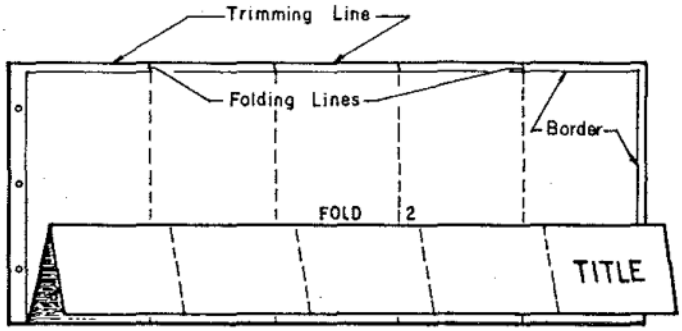
ISO size A1

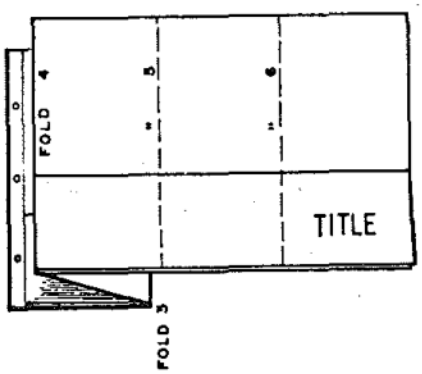


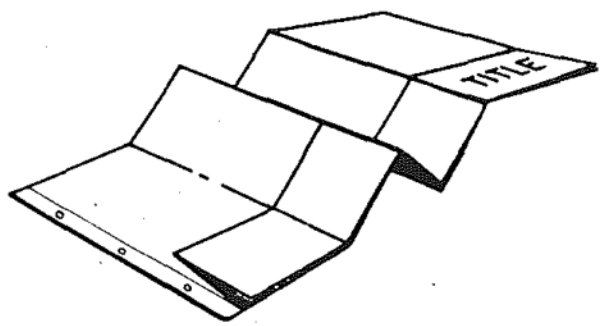


ISO size A1

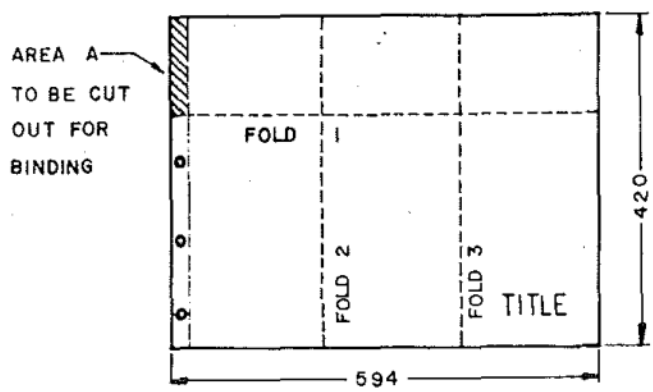
Folding Instructions

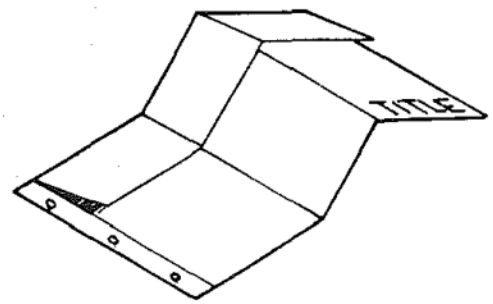






ISO size A2





2.09 SIGNING ENGINEERING DRAWINGS

Engineering drawings are to be signed as follows:

1. HEADQUARTERS

    1. "Prepared under the direction of" - Signature and title of the Design Supervisor (Dock Engineer, Senior Highways Design Engineer, Electrical Engineer, Senior Bridge Design Engineer, Consultant, etc.)

    2. "Approved for use in construction" - Signature and title of the Branch Head.

    3. "Examined and accepted" - Signature and title of the Executive Director.

2. REGIONS AND DISTRICTS

    1. "Prepared under the direction of" - Signature and title of the appropriate Regional or District official.

    2. "Examined and accepted" - Signature and title of Regional Director, Highways or District Highways Manager.

3. SEALING

    Engineers, Consultants or Ministry officials will seal drawings as appropriate.

2.10 TELEPHONE ANSWERING MACHINES **

Policy: Telephone answering machines may be installed in ministry offices if there is a requirement to distribute information to the public where the information can be recorded on the machine and monitored as required. Answering machines are not to be used to take messages from the public where the public is expecting action on a situation or road condition.

Answering machines can be installed in special cases where telephones cannot be forwarded to a manned reception point or where messages have to be received after normal working hours.

Procedure: All requests for telephone answering machines must be submitted to the Regional Director or Branch Head. If approved, the request will then be forwarded to the Director, Information Systems Branch for appropriate action.

Service: All service and maintenance can be arranged for locally after the warranty period is passed. Contact the Information Systems Branch, Manager of System Services for the name of the nearest local service depot.

** Amendment

2.11 TELEPHONE CREDIT CARDS
**

Policy: The Telecommunications Services Branch of the Ministry of International, Trade, Sciences and Investment are responsible for the issuing of "calling cards" telephone credit cards. The ministry may approve requests for calling cards in special cases where warranted.

Procedure: All requests for telephone credit cards must be submitted to the Regional Director or Branch Head and must describe circumstances and provide a justification. If approved, the request will then be forwarded to the Director, Information Systems Branch for appropriate action. The request should be in memo form with the following information:

a) Users name
b) Users work address and branch
c) A telephone number that the charges can be billed to (this cannot be a common answer point telephone number)

2.12 AUTOTEL OR CELULAR TELEPHONE
**

Policy: In special situations, service can be arranged through the Director, Information Systems Branch.

2.13 RADIOPHONE
**

Policy: All Highway's Radio's have the ability to patch into the telephone network with regional operator assistance.

** Amendment

CHAPTER 3

OCCUPATIONAL HEALTH AND SAFETY

* 3.01 Policy

1. Minister's Statement

"I believe that we, in the Ministry of Transportation and Highways, have the ability to prevent all accidents and injuries on the job, and to eliminate preventable damage to property and equipment, if we fully develop the desire to do so.

Supervisors and workers must accept a joint responsibility to work efficiently and safely to prevent accidents; the workers to control their own actions, to work safely, and to report unsafe practices and conditions no matter whom it involves, and the supervisors to organize and undertake job supervision in a way such as to minimize accident hazard, and to maintain at all times safety training as a part of personnel Job Training. All employees must assist their Supervisors and the Ministry in the prevention of accidents and injuries.

In order to achieve the highest standard of occupational safety throughout the Ministry's many and varied work processes, Management shall be responsible for the execution of measures necessary wherever possible to support this policy and to ensure there is an active, effective and decentralized Accident Prevention Program in being at all times, and I pledge my own personal continuing interest and support to this end."

* Amendment

* 3.01 (Cont'd.)

2. Policy Directive

1. Purpose: To establish a formal written policy that will govern the efforts to prevent accidents to Ministry of Transportation and Highways' equipment and to control the health and safety of employees, and curtail resulting financial losses to the Province of British Columbia.

2. Authority: Public Service Act; Part I Section 4, Sub-section (d) and Part IV Section 72, Sub-section (3).

3. Applicability: This directive applies to Province of British Columbia, Ministry of Transportation and Highways, including all administrations, divisions, regions, distr'cts and branches thereof.

4. Policy: The Ministry declares that occupational safety and health of all employees is a matter of province-wide concern.

To meet this concern the following objectives are established:

1. The Ministry shall ensure places of employment are as free as possible from recognized and controllable hazards that may cause accidents, physical harm or death.
2. The Ministry shall comply with the established safety and health standards, rules and regulations promulgated by the authority having jurisdiction.
3. The Ministry shall maintain such records as required by statutes, standards and regulations.
4. The Ministry shall notify employees of their duties, rights and responsibilities by such means as posting prescribed information, and make available for review such standards, rules and regulations.
5. Employees shall be held responsible for complying with the accepted standards, rules and regulations prescribed for the protection and health of the employee in the workplace. Willful failure to comply with rules and regulations shall be deemed contrary to established policies and subject to such actions as may be provided by the personnel rules and regulations.

R. G. Harvey, Deputy Minister

A. E. Rhodes, Assistant Deputy Minister, Administration
Senior Officer Responsible

* Amendment

3.02 Responsibility and Authority - Accident Prevention

The Headquarters Safety and Health Committee in Victoria is the senior policy committee of the Ministry composed entirely of management repre-
* sentatives. Each committee member carries the responsibility for immediate action if unsafe conditions and unsafe actions are reported or observed. Correspondence for this committee should be addressed to the Secretary, Headquarters Safety and Health Committee. Various positions in the Ministry with responsibility and authority in the field of Safety and Health are:

1. Deputy Minister and Assistant Deputy Ministers - direct action and authority over all employees.

2. Branch and Assistant Branch Heads - direct action and authority over their employees and must report infractions to other Branch Heads, Regional or District Officials, OR Safety Committees, if observed anywhere outside their Branch.

3. Regional Highway Engineers - direct action and authority over all employees in their Region and must report infractions to other Regions if observed anywhere outside their Region.

* 4. Regional Health and Safety Officers - under the Regional Highway Engineers, reporting responsibilities to senior officials and supervisors. Observation of infractions with serious potential, and in absence of supervisor, direct action and authority.

5. Other Regional Officials - direct action and authority over their own employees and must report infractions to other Regional Officials and District Officials in their Region. Infractions observed outside their Region must be reported to the appropriate official.

6. District Officials - direct action and authority over their employees and must report infractions of other employees in their District under Regional jurisdiction, to the appropriate Regional Official.

7. All Other Supervisory Personnel - direct action and authority over their own employees and if infractions observed outside their authority, report it to their own supervisor.

8. All Employees are expected to exercise care and good judgement with a view to preventing accidents to themselves and other employees. Any potential hazard is to be reported to their foreman or immediate supervisor. All recommendations for safety improvements should be communicated to the local Safety and Health Committee, through the Safety Committee representatives.

3.03 Regulations and Penalties for Non-Compliance

It is the duty of every employee to conduct himself in a manner to prevent injury to himself or others. He will always observe safe practices.

He will advise his immediate superior of any unsafe condition or practice. It is then the responsibility of supervisors to take any immediate action necessary, proceeding further if the complaint is unreasonable or if additional action is required.

* Amendment

3.03 (Cont'd.)

Physically impaired workmen must not be assigned to duties endangering themselves or others.

Employees must make use of all personal protective equipment provided for their protection. In cases where the Ministry and W. C. B. directives are not followed by employees through a careless or thoughtless attitude, the employee is to be:

1st offence - given a verbal warning.
2nd offence - given a written remand.
3rd offence - suspended and/or demoted.
4th offence - suspended with intent to dismissal.

If an employee refuses to comply with the regulations, he is to be suspended immediately. The normal procedure after suspension would then be followed. All action taken must be properly documented on the employee's file, including the verbal warning.

These regulations are not designed to penalize employees, rather to prevent human misery and suffering and to prevent the careless employee from creating an unsafe work environment for himself and others.

3.04 Communication of Information Concerning Accidents That Result in Serious Injury

It is of the utmost importance that information concerning very serious injuries to employees or public resulting from on-the-job accidents be communicated to the Assistant Deputy Minister (Administration), and to the Senior Training and Safety Officer, as quickly as is possible. Regional, Branch, and District Officials may already have their own arrangements, and this directive is not intended to interfere with such arrangements. This instruction concerns itself with the need for a Fail-Proof method of communicting this type of information to the two Headquarters offices mentioned above.

Regional Highway Engineers are to co-ordinate with District and Branch Officials, a means whereby information concerning very serious accidents and injuries is passed immediately to the Regional Safety and Health Officers, and to ensure that the information reaches the office of the Assistant Deputy Minister and that of the Senior Training and Safety Officer with a minimum of delay. The information is to be as complete as possible at the time, but is not to be withheld or delayed for purposes of being more complete.

In complying with this instruction, the quickest means of communication is to be used, either land line telephone, radio telephone, telex or word of mouth.

Regional Highway Engineers should establish and maintain these requirements as a matter of urgency.

3.05 Assistance to the Public

Following an accident, Ministry personnel will render whatever assistance they can and, if equipped, radio the District Office concerning police, ambulance, doctor, or other emergency services required. If a privately owned vehicle is stalled on the roadway, it must be towed or pushed far enough only to remove it as an obstruction to the normal flow of traffic. Other assistance can be obtained by radio to the District Office, but under no circumstances will the employee tow or push a disabled private vehicle to a place for repair. If construction is in progress, and traffic has difficulty without assistance, a vehicle in trouble should be towed, but great care must be exercised to prevent damage.

* 3.06 Safety and Health Committees

A safety and health committee structure has been established throughout the Ministry in accordance with the provisions of the Union Agreement and the WCB Industrial Health and Safety Regulations. This structure provides for joint local level, joint second level, Permanent Joint Committee and a Final Ministry Level.

1. The local level Safety and Health Committee is structured and operates in accordance with WCB Industrial Health and Safety Regulations, Section 4.02, 4.04 and 4.06 and Master Agreement, Appendix 5, Section 1.06 (a).

2. The Joint Second Level Committees will be responsible for the local level committees within their Region boundaries. They will review the operation and reports of local level committees and will be responsible for the application of all relevant provisions of Article 22 of the Master Agreement.

3. The Permanent Joint Committee operates in accordance with appendix 5 of the Master Agreement and makes recommendations to the Final Ministry Level.

4. The Final Ministry Level for the Ministry of Transportation and Highways is the Headquarters Safety and Health Committee, which is the senior authority for control and overall direction of the Health and Safety Program. The terms of reference are as follows:

" The Committee shall be composed of permanent members and temporary branch members as appointed by the Assistant Deputy Minister. The temporary branch representatives shall be rotated every six months and serve a term of eighteen months. During the latter twelve months of the term, temporary members may be called upon to serve as Chairman or Vice-Chairman.

Membership will be appointed by position and not by individuals.

Permanent Secretary shall be the Administrative Assistant to the Deputy Minister or other position as appointed by the Assistant Deputy Minister.

* Amendment

3.06 (Cont'd.)

Regular Committee meetings shall be held at least once each month. An agenda shall be circulated prior to the meeting and minutes distributed to all members, Executive Directors, Branch Directors and Regional Highway Engineers."

Each committee member carries the responsibility for immediate action if unsafe conditions and unsafe actions are reported or observed. Correspondence for this committee should be addressed to the Secretary, Headquarters Health and Safety Committee.

3.07 Personal Protective Equipment

1. Safety Headgear

The Ministry complies with the Workers' Compensation Board Industrial Health and Safety Regulation 14.12 which states in part that Safety Headgear shall be worn by all workers in all work areas in which a potential hazard exists from falling, flying or thrown objects, or from other harmful contacts. The Ministry interpret this as applying also to all visitors to Ministry work sites.

The above is not interpreted as making it mandatory for Safety Headgear to be worn at all times in Ministry premises such as yards, camps, garages, etc., however, it is mandatory in such premises that safety headgear shall be worn when the individual is engaged in or is attending in close proximity to an operation in which a potential hazard exists as described in the previous paragraph such as loading or stacking materials, or gravel crushing, mixing, or loading, etc.

For OUTSIDE OPERATIONS on highways, streets, bridges, new highway construction and on all survey and exploration work, etc., SAFETY HEADGEAR MUST BE WORN BY ALL PERSONNEL AT ALL TIMES during the work period. Safety headgear need not be worn whilst inside an enclosed vehicle cab, unless specifically required.

The above also applies to all Headquarters, Region, District or other personnel in Ministry employment without exception, whilst visiting or accompanying these crews during the work period.

All crew headquarters, detachments, camps and other Ministry installations will maintain sufficient supplies of safety headgear to equip visitors, etc., as required. Such headgear shall bear the Ministry decal.

Any employee who refuses to wear a hard hat, when required to do so, is to be automatically suspended.

The supervisor will be held responsible for any abuse of these instructions.

3.07.1 (Cont'd.)

All hard hats of approved type will be supplied by the Ministry. These are on personal charge to each employee. Employees are expected to pay for hard hats lost or destroyed through neglect. The colour of hard hats is to be high visibility orange, with a limited supply of white hard hats being available for high heat conditions only.

2. Safety Footwear

The Ministry complies with the Workers' Compensation Board Industrial Health and Safety Regulation 14.08 which states in part that substantial footwear made of leather or other material appropriate to the protection required shall be worn by workers in all industrial occupations and safety footwear to C. S. A. Standard Z195 where there is a hazard of injury to the toes, metatarsal area, or the soles of the feet.

In keeping with the above it is the Minist y's understanding that these Regulations will apply to the great majority of Highway operations. Only situations that are consistently hazard free, such as office work environments, shall be exempted. Except for employees so exempted, all others must wear safety-toed footwear, the ownership of which is a condition of employment.

For Ministry personnel not regularly employed on outside operations crews, including Senior Officials visiting outside Ministry yard and work sites, where a hazard to the toes exists, the wearing of safety-toed footwear is also mandatory.

First line Supervisors are responsible for the implementation of the foregoing and should ensure that Safety-Toed Footwear is worn when required, but also that the Workers' Compensation Board Regulations are not unnecessarily exceeded.

The foregoing conditions shall apply to seasonal employees, summer students, and others of short term employment. It will be in order for the new employee to use safety-toe caps but only until appropriate safety-toed footwear has been procured at the first opportunity.

Personnel employed on board the Ministry's ferries must comply with regulation 14.08 as outlined above, ensuring that their footwear is made of adequately substantial material and that the soles and heels are of a good quality non-slip material. The ownership of this footwear is a condition of employment.

When ferries personnel are engaged in unusual work activities, such as the handling of steel wheeled dollies, carrying ships stores and heavy equipment, ranging anchor cable, dismantling and reassembling main and auxiliary machinery, or other work such as that associated with refits and drydockings, when the nature of such work presents a hazard of injury to the toes, then footguards or toeguards are to be worn. These guards will be supplied to vessels by the Ministry.

3. Fluorescent Safety Vests

The following policy is to be adhered to with respect to the wearing of Fluorescent Safety Vests:

1. All employees working on foot frequently or continuously on a travelled roadway including adjacent shoulders must wear Fluorescent Safety Vests of a type approved by the Ministry.
2. All survey and other crews working in hunting areas off the highway during hunting season must wear Fluorescent Safety Vests approved by the Ministry.
3. All employees acting as flagpersons on a travelled highway must wear Fluorescent Safety Vests of a type approved by the Ministry for flagpersons only.

4. Safety Sleeves - Ferry Personnel

Ferry personnel may wear safety sleeves in place of safety vests in confined areas.

5. Use of Buoyancy Devices

When a workman is employed under conditions which expose him to any risk of drowning, he shall be supplied with, and shall wear, a device having enough buoyancy to maintain his head above water without any effort on his part. The device must not require manual manipulation to secure the buoyant effect.

6. Leg Protection

Workers operating power saws shall wear effective leg protection devices of types approved by the Ministry.

The Ministry will supply such devices as:

1. Where a power saw is a regular item of crew equipment, yet its use is not continuous, each power saw kit will be provided with one pair of leg (thigh-knee) protectors, attachable to the belt and fastened by leg straps.
2. Where a power saw is being used continuously such as land clearing, or line cutting, chain saw pads will be provided to each operator.

7. Hearing Protection

All Ministry employees exposed to excessive noise shall wear suitable devices to protect their hearing. Depending on noise level and extent of exposure, protection may range from ear plugs to ear muffs. Only hearing protection approved by the Ministry may be purchased and supplied for use.

8. Safety Belts

Supplied life lines and safety belts must be used by workers in hazardous locations where no other protection can be provided.

9. Eye Protection

Safety glasses or goggles must be worn by all employees at all times when exposed to possible eye damage from flying particles.

10. Personal Protective Equipment Catalogue

The Ministry maintains an up-to-date catalogue of approved personal protective equipment for most purposes, including:

Safety Headwear and Accessories
Face Protection
Eye Protection
Respiratory Equipment
Hearing Protection
Fluorescent Safety Vests
Reflective Cuffs
Buoyancy Equipment

This Catalogue of Personal Protective Equipment lists the only equipment that is authorized for purchase and use within the Ministry. The entire content results from a careful examination of all similar products available from commercial outlets in British Columbia, together with recommendations received from Regional field representatives.

Users are encouraged to submit proposals for amendments to this catalogue. Proposed additions or deletions must be submitted to the Regional Safety and Health Officers for processing through the Regional Safety and Health Committees, to the Headquarters Safety and Health Committee in Victoria.

3.08 Vehicle Safety

1. Responsibility of Operators

It is the responsibility of equipment operators to handle machines safely and to drive defensively at all times. In addition to reports to the police, report forms H.13 and H.13A must be completed for accidents involving Government-owned vehicles. (See Section 1.24.2). If a fatality occurs, the Assistant Deputy Minister is to be advised immediately by phone or telex.

2. Backing

This type of accident is common and in most cases preventable. The following rules shall be strictly observed:

Avoid reverse movement whenever possible. This can be partially accomplished by parking in such a manner that the first subsequent move does not require backing.

Before backing a stopped or parked vehicle, the operator must check to the rear and both sides by WALKING AROUND THE VEHICLE.

Before reversing, the operator must sound two short horn blasts to warn nearby personnel.

Passengers must assist the operator as lookouts and guides during reverse movements when requested.

Operators backing a vehicle under guidance must stop the unit immediately if he loses sight of the guides.

All unguided reverse movements must be at a slow speed not greater than 3 km per hour.

3. Parking of Vehicles

Runaway vehicles create a major hazard to life and property and are completely preventable. The following procedures must be followed:

No operator shall leave his vehicle unattended until he has taken all necessary action to ensure that it will not run away.

All vehicles must be parked with the engine stopped and standard transmissions engaged in low (vehicle pointed uphill) or reverse (vehicle pointed downhill). Automatic transmissions should be engaged in "Park". Parking brakes must be securely applied and tested and must never be solely relied upon.

When parking trucks on any grade, or when otherwise considered necessary by the operator, rear wheels must be blocked and, where applicable, front wheels turned in to a curb.

Parked vehicles must be left securely locked at all times to prevent theft.

4. Loading Heavy Equipment on Lowbeds

Lowbed operators are not to load inoperative heavy equipment (dead engines) on to lowbeds single handed. When dead engine equipment is to be loaded on lowbeds, a second operator is to be at the controls of the inoperative unit to steer and to operate the brakes.

5. Daylight Use of Headlights on Ministry Vehicles

All Ministry vehicles will operate with low beam headlights on during daylight hours through the period October 1st to March 31st, and at other times during periods of poor visibility. The daylight use of headlights is considered a more positive indication to oncoming traffic and a good reminder to drive defensively and carefully.

Headlights should be turned off during daylight hours:

When vehicle is parked.
When vehicle is parked with engine idling.
When the type of operation results in slow engine speed which will not maintain an adequate battery charge.

6. Use of Seat Belts

Seat belts are provided in Ministry units and under legislation must be worn. Any employee authorized to use his private car on a car distance allowance must wear a seat belt and have the same provision for passengers who are on Ministry business and are being transported in the private car. Employees responsible for the operation of a Ministry unit must immediately arrange for replacement of seat belts which become worn or fail. Authorized privately owned cars will be subject to check by immediate supervisors and at any time during the course of business. "U" Drive units may be rented only if properly equipped with seat belts.

The Regional Mechanical Superintendent will be responsible to the Regional Highway Engineer for the scrutiny of all units operating in the Region and must report to him on any failure to comply with these regulations. The Regional Highway Engineer will work in close communication with the Regional representative, District Official and, in the case of Headquarters units, the Branch Head, as to the procedure and recording of punitive action.

7. Maximum Seating Capacity - Front Seat of Trucks

Seating in Ministry vehicles is to be limited as follows in order to ensure safe operation and the maximum driver control:

The maximum seating in the front seat of trucks will be limited to three (3) - when the vehicle is of standard size and equipped with full bench seat.

Vehicles of compact size, or vehicles equipped with bucket seats will be limited to two (2).

Notwithstanding the normal seating capacity, consideration must be given to bulk of winter clothing and the location of vehicle and/or hydraulic controls.

In addition to the above, the number of persons that may be seated must be governed by the number of seat belts fitted in the vehicle.

8. Safety of Employees Working Near Parked or Moving Vehicles

Where employees are working in close proximity to parked (or moving) vehicles while engaged in survey or other work, when their concentration on the task in hand may preclude constant knowledge and awareness of the movements of adjacent vehicles, a second employee (who can be a Flagperson) is to be assigned to keep an effective look-out and maintain vigilance for the purpose of forewarning the hazarded employee of possible danger.

In such circumstances, and as already required by other regulations, both employees must be dressed in approved Safety Vests and orange coloured hard hats.

3.09 Hearing Conservation Program

1. Program Concept

The principal aim of the Ministry's Hearing Conservation Program is to prevent industrial noise induced hearing loss. There are associated objectives that include the following:

1. the conservation of hearing, generally.

2. to prevent hearing loss in Government employees and the impairment of their performance and morale.

3. to prevent economic loss to the Government and the employees, as a result of hearing loss and the possible loss of skilled workmen, and

4. to establish the state of a workman's hearing prior to his acceptance into the Public Service.

The program has five basic elements and responsibility assignments as follows:

1. Sound Level Survey

The measuring of the noise at the various work sites and work stations throughout the Ministry, establishing what kind of noise there is, how intensive (loudness) it is, how long it lasts, who is subjected to it, and for how long. This work is conducted by personnel authorized by the Ministry.

2. Noise Control (Abatement)

The reducing of noise at source or the containment of the noise, away form the worker, noise reduction through the use of sound proofing, or for instance the location of controls away from the noise so that the worker is isolated from the noise. This work is the responsibility of the Director of Equipment Services. (In ferries, the Superintendent of Ferries.)

3. Hearing Protection

The last resort is to use hearing protection. This is the most inefficient and ineffective way to prevent hearing loss and of course achieves nothing whatever in the battle against noise pollution. However when NOISE CONTROL AND ABATEMENT are not possible or practical, the worker must be supplied with and must wear hearing protection devices when exposed to sound levels in excess of the specified criteria. The Supervisor is responsible for this part of the program and the hearing protection to be used is listed in the Ministry's Personal Protective Equipment Catalogue.

4. Audiometric Testing

This procedure provides for the testing of the employee's hearing and determines whether there is a hearing loss or not. Through successive tests it may also be established whether the NOISE CONTROL and/or HEARING PROTECTION elements of the Hearing Conservation Program are adequately effective. This work is the responsibility of the Occupational Health Service of the Ministry of Health who use the Audiometric Testing Booths and technicians already available in their own service, and also in the Speech and Hearing Branch of the Ministry of Health. Where these Provincial Government facilities are not available, the resources of Acoustical Consultants are engaged from industry, by the Occupational Health Service, but at our Ministry's expense. The Personnel Branch of the Ministry is responsible for the scheduling of our employees for audiometric testing.

5. Documentation

Each responsible authority as outlined above is required to keep records as necessary for an ongoing efficient program. The Training & Safety Section keeps records in the form of Sound Level Certificates for work sites and equipment, including ferry engine rooms; the Equipment Services Branch of measures taken to reduce noise; the Training & Safety Section of current and future developments in types of hearing protection, and the Occupational Health Service and Personnel Branch keep records of the personnel that have had audiometric testing together with copies of the audiograms themselves.

2. Noise Induced Hearing Loss

The importance of an efficient and effective Hearing Conservation Program is best understood when it is appreciated that noise induced hearing loss is irrepairable. Exposure for too long a period to excessive noise levels results in the permanent destruction of the hair cells, each attached to nerve endings, in the cochlea within the inner ear. This damage is permanent and there is no hearing aid or surgical procedure that can restore the hearing ability that has been lost. Failure to take effective action to protect one's hearing results in further loss, and in the end deafness is inevitable.

3. Noise Level Criteria, Regulations, and Policy

The current Workers' Compensation Board Industrial Health and Safety Regulations provide, in general summary form, for the following:

1. When steady state noise exceeds 90 dBA then the employer must take effective measures to reduce the noise at source to permitted levels.

2. When 1. above cannot be achieved then the worker must be isolated from the noise.

3. If either 1. and 2. cannot be satisfactorily achieved then the employer must provide, and the worker must wear, approved hearing protective devices.

4. However, the employer is required to make inquiries and take steps as are feasible, on a continuing basis, to reduce noise at source, because the wearing of hearing protection is an unsatisfactory solution to the problem.

5. If hearing protective devices are to be used, they must meet the W. C. B. criteria for Class "A", Class "B" or Class "C" protectors, which cover sound levels commencing at 85 dBA (Class "C") to those in excess of 105 dBA, (Class "A").

6. When workers are routinely exposed to sound levels in excess of 85 dBA, the employer must establish and maintain an audiometric testing program. This program must meet W. C. B. standards with respect to intervals between tests, type of audiometric testing devices used, and the qualifications of the technician.

7. When the loss of hearing found between tests is classified as greater than an established criteria, ("normal change"), then hearing protection has to be worn at lesser noise levels than those already referred to.

In addition to the W. C. B. Regulations, the Provincial Government's Safety Policy states, among other things, that "Every level of management and supervision in the Public Service has the prime responsibility to formulate and carry out continuing effective safety programs suited to the conditions and hazards of departmental operations, where necessary adopting standards and practices in excess of legal and regulatory requirements". The W. C. B. Regulations are accepted as providing for "minimum standards", and the Occupational Health Service has also recommended a benchmark of 85 dBA. For these reasons the Ministry has adopted the policy that 85 dBA shall be the level at which all hearing conservation measures are to commence.

3.10 Flagging Operations

All personnel employed in Flagging duties must be holders of a current and validated Flagperson Certificate.

The general policy governing Flagging Operations are as follows:

1. When is a Flagperson Required?

The need for a flagperson is determined by the local engineer,

highway manager, or crew foreman on the project. In general, it may be said that a flagperson is required wherever adequate protection for workmen, working equipment, or the travelling public is not provided by existing traffic-control devices. Such situations are outlined in the Workers' Compensation Board Industrial Health and Safety Regulations.

2. The Duties and Responsibilities of a Flagperson

The prime duties and responsibilities of a flagperson are:

(1) to guide traffic safely through work area;
(2) to protect the lives of fellow employees working on the highway;
(3) to answer courteously and intelligently all reasonable questions which are asked by the motorist; and
(4) to ensure that all flagging equipment and personal protective equipment is maintained in a first class condition.

A flagperson should be familiar with the Ministry's Manual of Construction and Maintenance Signs, although he is not responsible for the entire placement of signs protecting a work site. It is the duty of the flagperson, however, to ensure that the C-28 TRAFFIC CONTROL AHEAD signs are properly positioned and that they are removed whenever they are not required.

A close call or sudden hazardous movement of traffic usually indicates that the traffic control is ineffective or improperly set up. The Flagperson must report such a condition to the supervisor in charge promptly, so that adjustments may be made.

3. Equipment

The following is a list of equipment which a Flagperson will use and ensure is in top condition:

(1) The STOP and SLOW PADDLE. A red flag or rag is not acceptable as a substitute. Make sure that the paddle is reflectorized for both day and night use.

(2) The PADDLE STAFF fits into the paddle handle and should only be removed if there is some physical obstruction to its use.

(3) The FLASHLIGHT WAND is a flashlight fitted with a red signalling baton. These are for use during hours of darkness, or under conditions of poor visibility. Make sure that the batteries are in good shape before hand.

(4) The WALKIE-TALKIE radios are for use when two flag stations are not intervisible.

There may occur extraordinary circumstances which result in temporary or permanent loss of flagging equipment. It is for this possibility that there are EMERGENCY KITS located in or near assembly rooms. These kits are not to be used for daily operations.

4. Dress, Manner, and Bearing

It is necessary for a Flagperson to be able to draw the attention of all motorists. This is accomplished through proper dress, manner, and bearing.

The following articles must always be worn by Ministry flagpersons:

(1) Clean and neat working clothes. No employee functioning as a flagperson shall appear on duty naked to the waist; a shirt must always be worn.

(2) A Ministry orange hard hat with reflectorized stripes on the crown (in clean and good condition).

* (3) Approved reflectorized sleeves.

(4) An approved, blaze-orange flagpersons traffic vest with lime green reflectorized stripes.

(5) Hard-toed footwear.

(6) A high visibility yellow raincoat. (To be used in wet weather with the traffic vest worn on the outside.)

Proper manner and bearing requires a courteous but firm attitude, and a pleasing personality. Flagpersons should be prepared to briefly inform the motorist of the situation ahead and the approximate duration of any delay.

If a driver refuses to obey instructions, the vehicle licence and a general description of the car and driver, must be reported to the supervisor as soon as possible. A Flagperson may not leave his post until relieved by another qualified Flagperson.

The full detailed requirements for Flagpersons are contained in the Ministry's Flagging Course Manual, copies of which are held by all Regional Safety and Health Officers.

3.11 Fire Prevention

1. POLICY

A Committee has reviewed the fire prevention facilities within the buildings, equipment and other properties under charge of the Ministry, using as a guide the requirements of the Provincial Fire Commissioner's Office. Their findings and recommendations have been approved and forwarded to all Branch and District Establish-

* Ammendment

ments, to be put into effect. The Ministry's current policy in this matter is as follows:

To avoid complication of application, operation and purchasing, the multi-purpose dry chemical extinguisher only (not standard dry chemical) shall be installed, unless otherwise specified and with an Underwriter's rated capacity at least equivalent to the suggested minimum requirement listed herein.

The multi-purpose type is effective in the following classes of fire:

Class A - Ordinary combustible material such as wood, cloth, paper, rubber and many plastics.

Class B - Flammable liquids, gases and greases.

Class C - Energized electrical equipment where the electrical non-conductivity of the extinguishing media is of importance.

NOTE:

Class D - Fire in combustible metals, such as magnesium, tetanium, sirconium sodium and potassium.

REQUIRES SPECIAL PURPOSE EXTINGUISHERS

Submit an account of the combustible metal, naming type, approximate quantities and method of use, to the Provincial Fire Marshall's Office, 2780 East Broadway, Vancouver, B. C., V5M 1Y8 and obtain from that office information concerning the appropriate fire extinguisher to be used.

2. INSTALLATIONS:

BUILDINGS -

Buildings used by the Ministry are the responsibility of the British Columbia Buildings Corporation and all requests for installation and servicing of extinguishers should be submitted to them.

MOBILE EQUIPMENT -

(1) Every vehicle transporting any explosive must be equipped with:
- 2 only 1 kg multi-purpose dry chemical extinguishers. (Ref. Motor-Vehicle Act Section 196)

(2) All vehicles used for transportation of fuel or gasoline powered tools:

Under 45 litres - 1 only 2 kg. multi-purpose extinguisher.
Over 45 litres - 2 only 2 kg. multi-purpose extinguisher.
- 1 only 1500 mm x 1800 mm heavy wool fire blanket.

(3) All vehicles used for transport or personnel of 8 or more passengers exclusive of driver:
- 2 only 1 kg multi-purpose dry chemical extinguishers mounted at extremities of vehicle.

3.11.2 (Cont.)

- 2 only 1 kg multi-purpose dry chemical extinguishers mounted at extremities of vehicle.

(4) Trucks with G.V.W. between 1500 kg and 12 200 kg.
- 1 only 1 kg multi-purpose dry chemical extinguisher.

(5) Trucks over 12 200 kg G.V.W., Tractor Units with Semi-Trailers:
- 1 only 2 kg multi-purpose dry chemical extinguisher.

(6) All Crawlers, Mobile Shovels, Gradalls, 4 x 4 Loaders and Graders:
- 1 only 2 kg multi-purpose dry chemical extinguisher.

(7) Ashphalt Burning Vehicles:
- 1 only 10 kg multi-purpose dry chemical extinguisher.

(8) All Asphalt Distributor Trucks:
- 1 only 1 kg multi-purpose dry chemical extinguisher.
* - 1 only 10 kg multi-purpose dry chemical extinguisher.

(9) All vehicles operating with Tar Kettles:
- 1 only 2 kg mulit-purpose dry chemical extinguisher.

(10) All Asphalt Mixing Plants:
- 1 only 3 kg multi-purpose dry chemical extinguisher.
- 1 only 1500 mm x 1800 mm heavy wool fire blanket.

(11) Vehicles with Manual Spray Painting Equipment:
- 1 only 2 kg multi-purpose dry chemical extinguisher.

(12) All Centreline Painting Trucks:
- 1 only 5 kg multi-purpose dry chemical extinguisher.
- 1 only 10 kg mulit-purpose dry chemical extinguisher.
- 1 only 1500 mm x 1800 mm heavy wool fire blanket.

(13) All vehicles and trailers with Power Generating Units, larger than 150 K.W.
- 1 only 2 kg multi-purpose dry chemical extinguisher.

(14) All cart mounted Oxy-Acetylene Welding Outfits:
- 1 only 1 kg multi-purpose dry chemical extinguisher.

(15) Any equipment mentioned in above, 9 through 14, that is a permanent installation rather than attached to a parent unit.

(16) All sleeping, laboratory, office, kitchen and assembly room trailers:

Kitchen: - 1 only 1 kg multi-purpose dry chemical extinguisher at each doorway, minimum of two extinguishers.

Laboratory: - 1 only 1 kg multi-purpose dry chemical extinguisher at each doorway.

Sleeping: - 1 only 1 kg multi-purpose dry chemical extinguisher in each room occupied by workers.

3.11.2 (Cont.)

Office and
Assembly Room: * - 2 only 1 kg multi-purpose dry chemical extinguishers if trailer is 9.0 metres or longer.
- 1 only 1 kg multi-purpose dry chemical extinguisher if trailer is under 9.0 metres long.

Tool: - 1 only 1 kg multi-purpose dry chemical extinguisher.

3. MAINTENANCE OF EXTINGUISHERS:

The recommended practices for the "maintenance and use of portable fire extinguishers" are contained in the Canadian Underwriters' Association Handbook, dated 1970 - Publication No. 10A. These books are available from the Fire Marshall's Office in Vancouver.

The Operator of any vehicle that carries an extinguisher is responsible for the day to day condition of the extinguisher, and to report the need for reservicing or replacing to the Mechanic Foreman.

The Mechanic Foreman is responsible for the checking of all major P.M. extinguishers when equipment is in the shop for 16 000 km checks, or six month interval, and to arrange for servicing every six months by a qualified company if the condition of units suggests it.

4. Bi-Annual Check:

Remove extinguisher from vehicle; vigorously shake cannister; check pressure gauge (if not "charged" position, submit for inspection and/or servicing); inspect shell for corrosion; enter inspection date on card and return extinguisher to vehicle's holder.

Dry chemical extinguisher with stainless steel, aluminum or brass shell -- require hydrostatic testing at 5-year intervals. If shell is of mild steel, dispose of extinguisher after 12 years.

5. IDENTIFICATION:

All extinguishers to be identified with reference to assigned parent unit number and marked "B. C. Ministry of Transportation and Highways".

* Amendment

* 3.12 First Aid

1. Objectives

1. To provide adequately for life saving and First Aid Treatment for those who may suffer injury.

2. To develop a reasonable level of First Aid knowledge and competency throughout the Ministry.

3. To comply with the Industrial First Aid Regulations as issued by Workers' Compensation Board in September 1979 and as they may be amended.

2. Hazard Ratings

For purposes of determining first aid requirements the Ministry is divided into HAZARD CLASSIFICATIONS.

"A" HAZARD - Where a crew is involved in new road construction, widening a present highway, bridge or dock construction, first aid facilities must be provided as per Tables 1 and 2 of Industrial First Aid Regulations. On day labour projects, the total number of workers shall determine the number of workers per shift as required by Tables 1 and 2. Where Ministry crews are working with contractors, the principle contractor shall ensure that first aid services, equipment and supplies are provided and maintained.

"B" HAZARD - This applies generally to all other Ministry operations except those in Class "C". First Aid facilities must be provided as per Tables 3 and 4 of Industrial First Aid Regulations.

"C" HAZARD - This applies to offices where clerical, draughting and administration functions are performed provided they are separate from "A" or "B" Hazard classifications. First Aid facilities must be provided as per Tables 5 and 6 of Industrial First Aid Regulations.

3. Formula

At an assembly point in a foreman area, for purposes of applying the aforementioned Tables, 100% of the fixed crew is counted and 25% of the mobile crews who come and go throughout the day.

Example

1. 8 Mechanics, 1 Supervisor, 1 Stockman, 1 Clerk, for a total of 11.

2. 30 on Road Maintenance Crew, 6 on Bridge Repair and 4 on Survey Crew for a total of 40.

3. Work Force would be determined as 11 + 10 = 21.

* Amendment

3.12 (Cont'd.)

4. Industrial First Aid Attendants

The minimum coverage by Industrial First Aid Attendants throughout the Ministry shall be:

1. An attendant and back up at all assembly locations where an Industrial First Aid Certificate is required in Tables 1 to 6.

2. An attendant and back up where a crew, although small, is in a very isolated area & medical or hospital facilities are not available.

The Ministry will pay course costs for the attendant and back up mentioned in 1. and 2. above as per Article 22.08 (b) of the Master Agreement.

The Ministry will pay the wage supplement for the attendant and back up as per Article 22.08 (c) of the Master Agreement in the following manner.

1. Where an Industrial First Aid Attendant is required and the first aid room and place of employment is located less than two hours surface time to a hospital, the attendant shall be paid for a "C" certificate.

2. Where an Industrial First Aid attendant is required by the Industrial First Aid Regulations and the first aid room and place of employment is located more than two hours surface time to a hospital, the first aid attendant shall be the holder of not less than a valid "B" certificate and will be paid for a "B" certificate. Authority for this is Section 1.130 of the Industrial First Aid Regulations.

3. The Ministry will pay for an "A" certificate for instructors in Industrial First Aid. The reasons for this is that W.C.B. requires that an instructor must be an "A" certificate holder.

4. The Ministry will pay Instructors in Survival First Aid and St. John's Ambulance Safety Oriented First Aid for the certificate they hold. W. C. B. requires that an instructor in S. F. A. hold a minimum Class "B" certificate and Instructors Certificate. St. John's Ambulance requires the instructor hold a minimum St. John's Standard First Aid Certificate or Class "C" Certificate plus the S.O.F.A. Instructors Certificate.

5. Where an employee has become certified but is not required, the Ministry may reimburse for the course fees only.

5. Transportation of the Injured Worker

The Ministry shall furnish to any worker injured in his employment, when necessary, immediate conveyance and transportation to a hospital or physician or qualified practitioner for initial treatment.

3.12.5 (Cont'd.)

Where an EMERGENCY TRANSPORTATION VEHICLE is required as per Tables 1 - 3 and 5, it shall meet the requirements of Section 1.64 of the Industrial First Aid Regulations.

Where an industrial ambulance is required as per Tables 1 - 3 of the Industrial First Aid Regulations, it shall meet the requirements of Section 1.66 of the Regulations.

6. First Aid Kits

Effective January 1, 1981, all licenced Ministry vehicles with a capacity of 1 - 6 persons will have a minimum of a No. 1 Unit First Aid Kit. Replacement kits will be available from Langford Warehouse.

Vehicles of a capacity of 7 or more persons will require a No. 2 Unit First Aid Kit.

At work sites, the size of the first aid kit and other first aid supplies will be in accordance with Tables 1 - 6 of the Industrial First Aid Regulations.

Foremen shall carry an additional No. 2 First Aid Kit in their vehicles which could be left with a crew where required.

7. First Aid Courses

It is the desire of the Ministry that the majority of personnel be trained in either of the first aid courses, Survival First Aid or St. John's Ambulance Safety Oriented First Aid and that there be a S.F.A. or S.O.F.A. certificate holder on each crew as per Tables 1 - 6 of the First Aid Regulations. To achieve this, the Ministry conducts an on-going employee training program.

3.13 Hired Equipment

When the Ministry is to hire either owner-operated or bare trucks or other equipment, the Equipment Rental Agreement is to include in its content, the following provisions for safety:

1. It is expressly understood that the owner-driver under this Agreement shall comply with all safety requirements and regulations of the Ministry of Transportation and Highways.
2. In signing this Agreement, an owner-driver of a hired truck or other equipment certifies that he is currently registered with the Workers' Compensation Board, either as employer or an employee, and is entitled to the benefits provided under the Workers' Compensation Act.
3. All equipment rented to the Ministry of Transportation and Highways must conform with the requirements of the current Workers' Compensation Board Industrial Health and Safety Regulations including the maintenance of required log books.

* 3.14 Accident Investigations

Regional Health and Safety Officers are required to carry out Accident Investigations in cases of serious accidents or injuries, fatal accidents and those that have the full potential of such. These reports are to be comprehensive in content and in narrative form. The objective is to arrive at "cause", and the recommendations are to prevent a recurrence.

When an accident involves one or more Highways trucks, or other mobile equipment, and there is employee injury or death, then the Regional Safety and Health Officer and the Regional Driver Trainer are to jointly carry out the Accident Investigation and jointly prepare a narrative report, which is to be signed by them both.

1. Workers' Compensation Reports Required in Following Situations

A Workers' Compensation Board Form 7 (Employers' Report of Injury or Industrial Disease) is to be initiated by the injured employee's supervisor in the following situations:

- Where injury to an employee required treatment by, or a visitation to, a doctor or other medical practitioner.
- Where injury to an employee results in time loss beyond the date of injury.

N.B. In situations where a First Aid Record Book is not being kept and the supervisor is aware of an injury having occurred where outside treatment was not deemed to be necessary then a Form 7 should be initiated to provide documentation should later medical treatment be required.

Treatment by a first aid attendant need only be logged in the First Aid Record Book if no other treatment or time loss is involved. In the event that an injury later required medical treatment then a Form 7 will be required and must be cross-referenced to the information logged in the First Aid Record Book.

2. Distribution of Forms by Employee's Supervisor

Upon completion by the investigating supervisor of the W.C.B. Form 7, the W.C.B. Form 7A (First Aid Report) if applicable, and Ministry form H-90 (Report of an Accident or Personal Injury), the ORIGINAL COPY OF EACH is to be forwarded immediately to the appropriate official as follows:

- Those for District employees to the District Highways Manager.

In the case of a District employee who is working in another District under their supervision the forms would be submitted to the Highways Manager of the District for whom the employee was working. If an employee is injured while travelling in another District the injury would be reported to the Home District. Similarly, employees who travel and work in various Districts, e.g. Centreline, Dock District crews, but who are not normally supervised by the local District, would report injuries to their Home District.

* Amendment

3.14.2 (Cont'd.)

- Those for Regional employees, and for those Branch employees who report to a Regional Branch Official, to the applicable Regional Branch Head in the Region in which they were working at the time of injury.
- Those for employees in Branches who do not report to a Regional Branch Head to their respective Headquarters Branch Head.

Employees who work at Headquarters would be reported directly to their Headquarters Branch Head.

NOTE: W.C.B. Forms 7, 7A and 9 are available from W.C.B. regional or area offices.

3. Distribution of Forms by Highways Manager, Regional or Branch Head

After the appropriate District Highways Manager, Regional Branch Head, or Headquarters Branch Head has reviewed the Form 7, the Form 7A (if applicable), and the H-90 and has completed the relevant section on the H-90, the following distribution is to be made:

- ORIGINAL Form 7, 7A and H-90 to nearest W.C.B. Office in proximity to location where worker injured. (List of area offices attached)
- Copy of Form 7, 7A and H-90 to the Local Safety Committee representing worker. (Check with Regional Safety and Health Officer where necessary).
- Copy of Form 7, 7A and H-90 to Regional Safety and Health Officer responsible for the area where the crew reports.
- Copy of Form 7 and H-90 to Senior Training and Safety Officer,Headquarters.
- Copy of Form 7 and H-90 to Pay Office representing worker.

Note that the Workers' Compensation Act requires that Form 7 reports be submitted within 3 days of the injury. Reports are therefore to be promptly completed and expedited at all handling points.

3.15 Safety Training

Supervisors are responsible for the on-the-job safety training of the personnel under their supervision. To support this policy, the Ministry will arrange for formal courses in Accident Prevention on a continuing basis. In addition to the B.C.I.T. Accident Prevention Course, those offered by the W.C.B. and B. C. Safety Council will be made available to appropriate personnel throughout the province. These include the "Supervisors Correspondence Course in Accident Prevention" and the "Industrial Accident Prevention Course" at U. B. C. Selected seminars in related subjects are also made available to Ministry employees.

All supervisors shall participate in a supervision course including safety content within six months of appointment to a supervisory position. This shall not prevent an employee from participating in this course prior to such appointment.

3.16. Safety Inspections

It is the duty of all local joint Safety and Health Committees to ensure that thorough safety inspections of the places of work are carried out.

3.17 Branch and Other Crews Working in Districts

There have been occasions when headquarters has received complaints that Branch Crews operating in Districts have not conformed to existing Workers' Compensation Board Regulations or Ministry Safety Policy, such as the wearing of hard hats, safety footwear, fluorescent safety vests, etc.

The Ministry policy is that if Workers' Compensation Board Regulations or Ministry Safety Policy is not being followed, the District Highways Manager must immediately advise the Supervisor of the Crew concerned. If an immediate response is not obtained, this is to be reported to the Regional Highway Engineer. The Regional Highway Engineer will be expected to direct the Branch concerned to take remedial action and follow-up to ensure the directive has been complied with.

The same general policy applies to all Headquarters and Regional Officials who observe non-compliance with the Workers' Compensation Board Regulations or Ministry Safety Policy when travelling throughout the Province.

3.18 Survey Operations

All Ministry survey instrument tripod legs are to be marked in such a manner that they become more conspicuous to the drivers of motor vehicles and equipment, both on the Highway and in Work Areas.

1. For tripods with solid legs, fluorescent orange or red tape shall be wrapped around the legs at fifteen cm intervals.
2. For tripods with adjustable legs, fluorescent orange or red tape may be placed on the outside for the length of the leg.
3. An alternate procedure to 1. and 2. is to paint the legs fluorescent red and white alternately in fifteen cm bands.
4. When set up on the road surface, a further device is the attachment of .5 metre lengths of red flagging tape to the tripod which, with benefit of any wind action, will draw attention to the instrument.

* A minimum of three orange Traffic Cones are to be placed either side of the set-up in line with traffic. The Instrument Man and crew must wear protective apparel; orange hard hat and fluorescent safety vest. Where traffic conditions are severe the Instrument man should haye a spotter to watch for vehicles out of control.

3.19 Operation of Pavement Brooms on Highways

Because of the special hazard created by the operation of pavement brooms, these operations are to be carried out in accordance with the following rules:

1. All mechanical pavement brooms must be equipped with a rotating flashing light, and must not be operated on any highway unless the light is functioning. In the case of trailer type brooms, the rotating beacon must be mounted on the towing vehicle.

* Amendment

3.19.1 (Cont.)

2. Wherever possible, sweeping operations should be scheduled to avoid heavy traffic periods. Early morning operations should be considered, not only to avoid heavy traffic, but also to take advantage of possible higher moisture content in the air to reduce dust.

3. Where alignment and grade are such as to reduce sight distance below a minimum of 90 metres, a pilot car is to be used behind brooms. On extremely winding and narrow roads, pilot cars ahead and behind brooms are to be used. Pilot cars to be equipped with flashing lights and display signs front or rear, as the case may be, reading "Caution, Watch for Equipment".

4. If wind and dust conditions are such as to cause a cloud of dust which prevents traffic from safely passing broom, operations are to be discontinued until conditions are favourable.

5. On two-lane highways (i.e. one-lane in each direction) brooms are to be operated in right-hand lane with the traffic. On hill sections where a passing lane is provided, a properly equipped pilot car following the brooms are to be employed when brooms are operating in the centre lane.

6. On highways having more than one lane continuous in one direction (i.e. freeways, etc.) where brooms may be operating in left-hand or high speed lane for extended periods of time, C-37 "Sweeper Ahead" sign is to be erected at start of section being swept advising motorists that brooms are in operation ahead. Brooms are also to be followed by properly equipped pilot cars. Wherever possible, the pilot cars should be equipped with a changeable message type of traffic control sign system.

7. In built-up areas where curb and gutters exist, or on highways with paved shoulders, the use of a "flush truck" should be considered.

All operators of brooms must be supplied with goggles and respirators of an approved type.

3.20 Transporting Workers

In Boats

Do not overload.
Supply adequate life saving equipment.
Supply fire fighting equipment.
Supply an approved life jacket for each person.
Supply a life buoy with line attached.
Larger boats require dinghy, lifeboat or other buoyant equipment.

In Trucks or Cars

Provide suitable seating fastened to the floor or walls.
Workmen must not sit on the floor with legs over the sides.
Ventilate all closed vehicles.
Provide seat belts in all vehicles, including private cars on a car distance allowance on Ministry business.
Provide racks for small tools.
Erect a steel divider between the driver's seat and the cargo area of panels.

3.21 Hazardous Materials - Cleanup Procedure

The Ministry's agreement with the Ministry of the Environment regarding procedures and responsibilities to be undertaken in the event of a spillage of hazardous materials is as follows:-

1. The Provincial Emergency Program (PEP) agrees to be the lead agency in oil or chemical spills occurring within the jurisdiction of the Province of British Columbia and to provide the necessary liaison with Provincial Ministries and the Environmental Protection Service of Environment Canada, the Canadian Coast Guard and other Federal agencies having responsibilities in pollution incidents.
2. PEP will ensure assessment of the spill and will initiate clean-up and restorative action as, and if, necessary.
3. In spill incidents, PEP works with close association with the Pollution Control Branch (PCB). PCB provides technical advice and, at the request of PEP, may assume control of spill incidents requiring specialized knowledge, e.g. - chemical spills.
4. PEP will maintain a 24 hour, 7 day a week pollution incident reporting system. Such a system will be prepared to advise other Ministries and Departments, as required, of spill incidents.
5. Highways undertakes to report all spill incidents coming to their attention to the appropriate PEP Regional office (listed hereunder).

   (Copies of all such reports shall be made by telex to the Executive Director, Operations, Victoria.)

PEP Regional Office	Telephone Number
Vancouver Island	387-3458 (24 hours)
Lower Mainland	530-1210 (24 hours)
Prince Rupert	624-2121 (Local 237/282) 624-2126 (After working hrs.)
Prince George	562-8131 (Local 283/337) 562-8139 (After working hrs.)
Nelson	352-2131 (24 hours)
Kamloops	372-3213 (24 hours)

6. PEP undertakes to provide training to Provincial staffs in handling oil and hazardous material incidents, with assistance from PCB.
7. Highways will, wherever possible, in an emergency, upon request of PEP, assist in providing manpower, equipment and communication facilities to deal with a pollution incident.
8. Where such services have been provided, Highways will maintain records of costs involved for submission to and payment by the pollutor.

9. PEP may recommend legal action against a pollutor to PCB. PCB will be responsible for the investigation and prosecution if such action is considered warranted. Where a possibility exists for legal action by PCB, PEP will be notified and will undertake to forward this advice to other agencies who may be involved.

10. When a pollution incident requires that a Provincial highway be closed, such closure will be requested by PEP from Highways, in consultation with the appropriate police authority.

11. In significant pollution incidents PEP will endeavour to ensure timely and correct information is passed to the media and public, unless agreed otherwise on specific situations.

12. PCB will be responsible for ensuring adequate disposal of hazardous materials and wastes from clean-up operations and from industry, institutions and the general public.

13. PEP undertakes to establish and maintain a response system with other Provincial and Federal agencies and will ensure Highways is informed of arrangements and procedures.

14. Transport Canada also operates a Dangerous Goods Information and Emergency Centre in Ottawa which will accept emergency calls on a 24 hour a day basis at the toll free number (613) 996-6666. The centre is specifically geared to helping people cope with dangerous goods emergencies or who require immediate information on an urgent basis.

    Routine information may be obtained by writing to Transport Canada Information and Emergency Centre, Tower B, Place de Ville, 3rd Floor, Ottawa, K1A ON5 or phoning (613) 992-4624 (collect calls are not accepted at this number).

3.22 Records and Statistics Circular Letter P 1/86

1. General

The Accident Prevention Programme includes the keeping of records and statistics so that high frequency and high severity areas may be pin-pointed, in order that effective Accident Prevention measures may be taken. These records will also provide input for the Safety Award Competitions. Statistics to be prepared include Disabling Accidents, Medical Aid Accidents, Manhours Report, Monthly Personnel Accident Frequency Summary from each Region, Quarterly Personnel Accident Frequency Summary from Headquarters, and Weekly Telex Report. Periodically, Headquarters may request special reports on various aspects of the Accident Prevention Programme.

2. Accident Statistics

Each District will designate an employee to maintain records of man hours worked and countable accidents on crew accident record Form H-136. Separate accident record sheets are to be maintained for road, bridge, garage, administration, ferry crews and Regional Service Crews (Mixing Plant, Crusher, Carpenter, Electrician, Painter and any other trades employed on a Regional basis). All employees in the District are to be covered. Road maintenance and Day Labour construction crews may be combined on the road crew sheet. A separate record will be maintained at Headquarters for each Headquarters Branch paid from Victoria.

Accident record forms will be recorded by the calendar year from January 1st to December 31st and new records will be set up commencing each year.

3.22.2(Cont.)

1. Posting Hours - at month end the timekeeper or designated employee will total all hours on the payroll with the exception of sick, vacation, and other leave periods, and post the total hours for each crew to the applicable crew accident record Form H-136.

2. Posting Accidents - As W. C. B. Forms 7 are received, these are to be posted to the accident record Form H-136 showing date of accident, employee's name, type of accident, date of lay-off, date of return, and working days lost. As the Ministry is not at present calculating severity rates, for the purpose of these statistics, the types of injuries will be listed as fatal, D. A. - Disabling Accident (involving one or more working days time loss), M. A. - Medical Aid (all reported accidents up to one day lay-off) and C. A. - Countable Accidents (Combined total of D. A. and M. A. accidents).

3. Definitions - The following definitions apply in the preparation of statistical reports within the Ministry.

    1. Countable Accidents - all accidents requiring submission of W. C. B. Form 7. This includes both disabling accidents and medical aid accidents.

    2. Disabling Accidents - are those resulting in injuries (or occupational diseases) arising out of, or in the course of employment resulting in death, permanent total disability, permanent partial disability or temporary total disability.

    Permanent total disability is an injury which permanently and totally incapacitates an employee from following a gainful occupation.

    Permanent partial disability is an injury (other than death and permanent total disability) which involves 1. the loss of or 2. the permanent impairment of any function of any member of the body or part thereof. Every permanent disability will be counted even though the injured person does not lose time. (Workers' Compensation Board settlement or pension award shall be indicative of a permanent partial disability.)

    Temporary total disability is an injury not involving permanent disability but which in the opinion of the attending physician, renders the injured person unable to return to a regular established job in the plant or operation where he is injured and he is eligible to receive time loss compensation, i.e. - off one or more working days following the day of injury or at some later date. A regularly established job is one which has not been set up especially to accommodate the injured person, even for therapeutic reasons or to avoid counting the case as temporary total disability.

    Accidents that involve only medical aid payments normally are not considered disabling accidents.

The term "Reportable Accident" used by the B. C. Safety Council for award purposes has an identical definition to the above.

3. Medical Aid Accidents - are those accidents which do not qualify as a disabling accident but require the services of a doctor. Time loss cases of less than one working day are included as medical aid accidents.

4. Minor Accidents - those incidents which are of a minor nature and are attended by a First Aid Attendant. These must be fully recorded in the First Aid Record Book. If for any reason such an injury would later require medical treatment, then a Form 7 would be generated and referenced to the information logged in the First Aid Record book.

4. H-136 Audit - The Regional Office Manager will audit the accuracy of H-136 records at least yearly and submit a statement confirming all district records have been audited with the year end report used for award purposes as per paragraph 7.

5. Frequency Rate - Frequency rates are used by the Ministry as a yardstick to judge the effectiveness of its safety program and to make comparisons between crews, branches and departments. Frequency rates are calculated as follows:

$$\text{Frequency} - \frac{\text{Accident Points} \times 1{,}000{,}000}{\text{Number of Man-hours Worked}}$$

- Where Medical Aid equals ½ point and Disabling equals one point.

$$\text{Example} - \frac{10 \times 1{,}000{,}000}{750{,}000} = 13.3 \text{ frequency rate}$$

6. Man-hours Report - A monthly report of total man-hours worked in each District including all crews and administrative staff is to be forwarded to the Regional Office each month. The Regional Office and Headquarters Pay Office will summarize and forward a Telex report to the Senior Training and Safety Officer by the 12th of the following month. One total is all that is required per Region and the report need not be broken down by crew or district.

7. Quarterly W. C. B. Accident Frequency Summary - Each Region and Headquarters pay office will compile a summary report of countable and disabling accident frequency rates as at March 31st, June 30th, September 30th and December 31st of each year. The Regional summary will list Districts, Branches, and all Regional Groups in the Region. Headquarters Pay Office will prepare the summary for the various branches paid through Victoria. Regions may submit this report on a monthly basis.

The quarterly report will be forwarded to the Senior Training and Safety Officer by the 15th of the month following.

3.22.2.7 (Cont.)

The December 31st report is used for determination of safety trophy awards and must be accompanied by an audit statement as per paragraph 4.

8. Weekly Telex Report - Detailed requirements are as follows:

1. For the purpose of this report, a week will start at 12:00 a.m. Sunday morning and finish at midnight the following Saturday night.

2. Every Monday morning, each District will report to the Regional office by radio or teletype advising if any disabling accidents have occurred during the previous week.

3. Headquarters branch crews in the field will, for the purpose of this report only, advise the nearest district office of any disabling accidents and this will be included in the District report to the Region.

4. The only Ministrial employees not included in the Regional Summary will be those employees at Headquarters in Victoria.

   Disabling accidents in the precinct must be reported directly to Headquarters pay office who will phone the necessary information to the Senior Training and Safety Officer each Monday morning.

5. The Regional Office will forward a summary of the information to the Assistant Deputy Minister by Telex each Monday and the report is to include the following:

   1. Name of District or Headquarters branch.
   2. Name of crew, i.e. - Road Maintenance Crew, Bridge Crew, Ferry Crew, Survey Crew, etc.
   3. Date of accident.
   4. Date of second working day off work following the day of the accident.
   5. Brief description of accident.

6. Vehicle accidents will be reported on the same Telex report. All accidents involving Ministrial units will be reported regardless of the extent of damage or who is at fault. Information required is:

   1. Regional accident file no. - Accident Date
   2. Name of District or Branch
   3. Operator's Name
   4. Unit number - vehicle type
   5. Brief description of accident.

7. The Senior Training and Safety Officer at Headquarters will summarize reports for presentation to the Assistant Deputy Minister.

8. Summary details covering the Ministry will be returned to each Region quarterly.

3.23 Safety Award Program

1. Annual Safety Award Competitions

The method of determining trophy winners will be subject to review each year by the Headquarters Health and Safety Committee.

Competitions for the annual safety awards are currently based on the following:

1. MINISTER'S AWARD

1. The Region with the lowest countable accident frequency rate, when compared to the other Regions, will be declared the winner of the Honourable Minister's Trophy.
2. In the event of a tie between two or more Regions, that Region with the lowest disabling accident frequency rate will be declared the winner.
3. If a further tie breaker is required, the best percentage improvement in the countable accident frequency rate over the previous year will be used.

2. REGIONAL SAFETY AWARDS

The same procedure as above will be followed in awarding the Regional Safety Awards to the winning District in each of the six Regions.

3. REGIONAL SAFETY ACHIEVEMENT AWARDS

1. Each Region shall have an Award For Safety Achievement, to be presented to the District in each Region with the highest percentage improvement in the countable accident frequency rate over the previous year.
2. In the event of a tie between two or more Districts in the same Region for this trophy, the District with the highest percentage improvement in the disabling accident frequency rate over the previous year, will be declared winner.
3. If a further tie breaker is required to establish the winner then the percentage improvement over the last two year period will be used.
4. The members of the Health and Safety Committee of the District winning the Award for Safety Achievement, and their wives, shall be invited to attend the annual Safety Award Banquets, in each Region.

4. Regional Service Crews - Regional Branch Safety Awards

1. In each Region there shall be a Safety Award for an annual competition between the Regional Service Crews and the Branch Crews, the entity with the lowest countable accident frequency rate being the winner.
2. In the event of a tie between two or more competitors, the one with the lowest disabling accident frequency rate will be the winner.

3. If a further tie breaker is required the best percentage improvement in the countable accident frequency rate over the previous year will be used.

5. Highways Ferries Safety Awards

1. In the Ministry there shall be two Safety Awards for an annual competition between the Highways' Ferry Fleet as determined each year by the Headquarters Health and Safety Committee.
2. The competing unit with the lowest countable accident frequency rate shall be the winner of the ferries safety award and in the event of a tie between two or more units, the one with the lowest disabling accident frequency rate will be the winner.
3. The competing unit with the highest percentage improvement in the countable accident frequency rate over the previous year shall be the winner of the Ferries Safety Achievement Award.
4. In the event of a tie between two or more units, that unit with the highest percentage improvement in the disabling accident frequency rate over the previous year shall be the winner.
5. If a further tie breaker is required then the best percentage improvement over the previous two year period will be used.

6. Other Local Awards

Where other local awards are in competition on a regular basis, the procedure shall be the same as for those mentioned above.

2. Safety Award Banquets See P 6/52

1. One annual banquet shall be held in each Region including presentation of all safety awards, except that where excessive travel of Ministry staff is involved, in which case it may be more economical to hold additional local banquets for specific crews.
2. All members and spouses of winning Districts, Branch Crews, Regional Service Crews, or Ferry Crews receiving an award, shall be eligible to attend the banquets.
3. The following guests may be invited to attend the Safety Award Banquets:
   1. Representatives of the Headquarters Health and Safety Committee.
   2. Co-ordinator of Accident Prevention or his representative.
   3. Regional Highway Engineer, Regional Health and Safety Officer and two other officials from within the Region.
   4. Local Workers' Compensation Board Accident Prevention Officer.
   5. One prominent person from the area is desired, who is known to be interested in accident prevention, or other good and sufficient reason.

3.23.2 (Cont.)

4. The Ministry will be responsible for all travelling expenses of employees attending safety banquets which are held at a location away from their normal Headquarters. However, the Ministry will not be responsible for any travelling expenses incurred by spouses.

5. The reference to awards in this section shall mean the Regional Safety Award with respect to a winning District and also the awards for which the Branch Crews, Regional Service Crews, and Ferry Crews compete.

6. When a District, other than that which wins the Regional Safety Award (lowest countable accident frequency rate), wins the Regional Safety Achievement Award (highest percentage improvement in the countable accident frequency rate), only the members of the Health and Safety Committee and their spouses of that District may be invited to attend.

7. Special permission by Headquarters must be granted for attendance associated with awards other than those specified above.

3. British Columbia Safety Council Awards

1. The B. C. Safety Council has established a series of Awards that are granted to industrial and government departments for accident-free performance. These include the Bronze, Silver and Gold Awards and also the Awards of Honour, Distinction and Excellence. All Districts and Branches are encouraged to apply for these awards, through the Regional Health and Safety Officers. When submitting the applications to the Senior Training and Safety Officer in Victoria, the Regional Safety Officers must certify the content of the applications to be correct.

2. All applications for these awards are subject to the Workers' Compensation Board Requirements - Regulations - Acts - applicable in the Province of British Columbia, or otherwise corroborated to the satisfaction of the Awards Committee of the B. C. Safety Council. Industrial Section Awards are open to Companies, Divisions, Departments or Supervisory Units of companies, or other organizations which qualify under W. C. B. requirements. For a Company, Division, Department or Supervisory Unit of a company which has less than 10 employees to be eligible for an award, the minimum number of hours for 10 employees will apply in the respective accident rating groups. A supervisory unit shall embrace all employees under (and including) one Supervisor regardless of whether shift work is involved.

3. The application forms and award qualifications literature may be obtained direct from the B. C. Safety Council, 200 - 3316 Kingsway, Vancouver, B. C., V5R 5K7.

4. When applying for awards, the necessary statistical information may be obtained from the accident record form H-136. All disabling accidents are reportable accidents for B. C. Safety Council Award purposes.

3.23 (Cont'd.)

4. Safety Decals for Hard Hats

The Work Safely - Drive Safely decal is to be mounted on the centre of the left side just above the brim of the Government hard hat. Decals and overlays are available from the Regional Health and Safety Officers.

These decals are in recognition of individual good safety records. Overlays will be provided to go over "WORK SAFELY" indicating accident free periods at intervals of five years, i.e. - 5, 10, 15, 20 (Silver) and 25 (Gold). An accident free period will constitute the time an employee has not suffered a time loss injury.

An employee must accumulate five consecutive accident free years before getting his five year award, thereafter if injury occurs he will not have to start over but will lose credit for the year of injury. For example, a man has an accident in his seventh year, then goes four more years accident free, he would qualify for the ten year award at the end of the eleventh year.

To avoid voluminous office work in checking personal records, the policy shall be made well known among the employees who will request and receive their awards on the honour system, from the Regional Health and Safety Officer.

Safe Driving on an individual basis is to be recognized in a similar manner.

The B. C. G. E. U. Union Decals are blue and gold for General member and red for Steward identification. The Ministry has authorized the mounting of one of these on the centre of the right side just above the brim of Government hard hats. The Union will supply these decals to members.

CHAPTER 4

RIGHT-OF-WAY

4.01 PERMANENT CLOSURE OF RAILWAY CROSSINGS, BRIDGES & FERRY ROUTES

Periodically a railway crossing is closed for various reasons including replacement by an overpass or underpass. Where grade crossings are eliminated, the Ministry usually benefits financially by contributions from the Canadian Transport Commission. The Ministry should assess the effect on any community in the vicinity including disruption of the business element before applying to the Canadian Transport Commission.

The effects of closing bridges and ferry routes on communities should be considered and reported on before the act of closure takes place, even though an alternate new route has been provided.

The intention to close railway crossings, bridges and ferry routes should be advertised well in advance to conform with requirements of Section 9 of the Highway Act.

ESTABLISHMENT AND CLOSURE OF HIGHWAY

4.02 DEFINITION OF HIGHWAY

A highway is a public road, street, lane, trail, bridge, tunnel, ferry landing or approach, etc. Highways under the Minister are all those in unorganized areas and all highways classified as arterial.

4.03 ESTABLISHMENT OF HIGHWAYS **

1. Gazette Notice

    1. Notice in the Gazette referring to a metes bounds description or a plan, declares and records the establishment of a highway.

    2. "Entry" by the Minister (or agents) extinguishes owner's title of the right-of-way.

2. Subdivision Plan

    The deposit of a subdivision plan in the Land Title Office establishes areas marked as highways within the heavy outline.

    Public roads not dedicated by a subdivision plan deposited between March 24, 1949 and March 27, 1961 (inclusive) were extinguished by the deposition of the subdivision plan. A road so extinguished can be section 4 still but all the proofs will again have to postdate the subdivision plan, i.e., the road is re-established section 4 again after the subdivision.

** Amendment

3. Section 2 Roads

Persons enquiring whether a road is section 2 should be told the Ministry has no position on the question and that if the person wants to pursue it further by enquiring of Lands, court action or whatever, the Ministry will cooperate by provision of any documentation in its possession.

Evidence for the courts is exception of existing roads in the Crown Grant and, in addition, some evidence that the road in dispute is in the exact location described in the Crown Grant (if described) or that it has existed in its present location since before the Crown Grant. With Crown Grants older than about 30 years, this last item can be very difficult to prove.

4. Section 4 Roads

1. General

If public money has been spent on a travelled road not otherwise established, it is deemed to be a public highway. Proof is required that:

1. funds were expended on the road.

2. the funds were expended in some reasonable distribution over the whole route in dispute.

3. the funds were expended lawfully, i.e., authorized to be expended by some reasonably senior official (probably at least District Highway Manager).

4. the expenditure was with the express or implied consent of the landowners (implied meaning that at the very least they knew it was going in and did not object).

5. the present road is indeed exactly the same one, without deviation or revision, on which the funds were spent.

6. the road was travelled by vehicles before the maintenance expenditure, i.e., at least wagons (horse riders, driven cattle, etc., are not vehicles), and that the travel was by a wider public than just that associated with access to the affected properties, i.e., a measure (at least) of "through" travel.

7. if the expenditure was after April 5, 1968, it was on work other than plowing or ice control.

By and large these proofs should not be too difficult on regularly maintained section 4 roads and indeed for that very reason disputes are less likely to arise. However, for those roads maintained infrequently or not maintained at all for several years, these proofs can be very difficult and in these cases District Highway Managers should be very careful to check before advising persons enquiring whether a road is

** Amendment

section 4. The practise of checking the Road Register is not enough. In these cases the District Highway Manager should carefully consider the facts (and in some cases have research undertaken) before taking the position that a road is section 4 or before saying that in his opinion it is section 4. The District Highway Manager should not delegate this. Other officials can of course receive information over the counter, telephone, etc., but should not express an opinion to the enquirer until instructed by the District Highway Manager. Where any doubt exists the District Highway Manager can refer to Region or Headquarters via Region for advice.

** When a District Highways Manager writes to a person advising that in the Ministry's view, a road is public or not public by virtue of Section 2 or Section 4, copies must be sent to other affected property owners on the road and other known interested persons.

2. Power Line Installations

To assist with the rural electrification program, the Ministry should endeavour to survey and gazette as many Section 4 roads as possible where power lines are likely to be installed. Ministry officials should be in close liaison with B.C. Hydro and co-operate by having the right of way surveys done and roads gazetted when staff is available.

In instances where B.C. Hydro has an urgent requirement to supply power to properties along a Section 4 road and Ministry surveying staff is not available, B.C. Hydro may give favourable consideration to an arrangement whereby they undertake the right-of-way survey, subject to direction and approval from the District Highways Manager. The Ministry would then be responsible for any right of way acquisition and gazetting of the plan.

5. Trails

Both section 2 and section 4 refer to roads and not trails. While a trail may have some status by exception in the Crown Grant section 2 does not operate to declare it public. A trail maintained by public funds does not become public by section 4. If widened, etc., to carry vehicles it can then be a section 4 road. Proofs of expenditures, etc., must then postdate its use by vehicles.

6. Gazetted But Unbuilt Road Allowances

Some cases arise where disputes over access to property involve old gazettes where the road was not subsequently built. The problem is proof of the right of way to the satisfaction of the courts. If there is a $1 or other right of way agreement, the case for the right of way is strong. However, the passage of time and failure of the Ministry to develop the right of way will weaken the case as one or more innocent purchasers may have acquired the land, paid

** Amendment

taxes on it and perhaps occupied it with buildings, gardens, etc. It has been held that the gazette notice by itself does not extinguish the title and that there must also be a taking of possession. If the road is built the Minister has clearly taken possession. However, if the road is not built, possession can often be very difficult to prove especially after a long period of time. Thus the courts are likely in many cases to conclude the right of way has never existed.

As with Section 2 and Section 4 roads the practice of quickly checking gazette notice files, etc., is not enough. The District Highways Manager should carefully consider all the facts (and have research undertaken as appropriate) before committing himself to any course of action involving an unbuilt right of way of long standing. The District Highways Manager should not delegate this. Other officials should not express an opinion until instructed by the District Highways Manager. Where doubt exists the District Highways Manager can refer to Region, or to Headquarters via Region, for advice.

In the event that the District Highways Manager concludes that he is unlikely to be able to prove to the courts that the right-of-way exists he should say to the applicant or enquirer that, while the gazette notice of long standing exists it in itself cannot be taken as a guarantee of access using it or that a road can be built upon it. If an enquirer wishes to pursue the matter through the courts, the Ministry will assist with documentation files, etc., but not be a party to any action.

Note that subdivision plans deposited between March 24, 1949 and March 27, 1961 inclusive did not dedicate the right of way but in fact extinguished it.

4.04 GAZETTING

1. General

All highways in use or under construction should be gazetted.

District or Highway Design and Surveys plans are used for gazette notices; a second notice should be published on deposit of a legal survey plan in the Land Title Office.

A notice in the Gazette does not deprive the owner of his property. It must be combined with actual "entry" and the right of way should be staked.

Compensation arises from these actions and funds must be available to cover. Right of way negotiations must be undertaken with the approval of the Regional Property Negotiator. Lacking extreme emergency, do not establish highways without at least one contact with every owner, occupier, etc. Contact absentee owners by registered mail and make an earnest endeavour to reach an agreement for purchase of all rights of way. Write (or confirm in writing) every agreement (Form H 179).

** Amendment

2. Gazette Notices

When requesting a Gazette notice, provide the following so that the full case history is available to officials at Headquarters, who recommend or approve the Gazette Notices:

1. A draft of a clear and specific notice giving bearing, width and length of the highway to be established; bearings and lengths of boundaries, or referring to a red outlined area on the plan.

2. A statement why the Gazette is required, e.g. - to legally establish right of way on purchased or Crown land; to establish or define existing, dedicated or donated road allowance; to establish right of way where amicable settlement was not possible, etc. (the names of these owners should be listed). Give a brief outline of negotiations where claimants refuse to settle.

3. Confirmation that all owners have been contacted or that it is unnecessary. Where Crown Land is involved confirmation that the Legal Surveys Branch has been notified of our intent to gazette.

4. In the case of some absentee owners, contact may be impossible. However, every effort should be made to contact such owners by registered mail. The address of an absentee owner can usually be obtained through the Assessor or Collector of the appropriate taxation district.

5. Recommendations by Regional Director, Highways and Regional Property Negotiator favoring publication.

6. A linen tracing or paper transparency plus two paper prints showing the area to be established outlined in red. On contract projects, plans of the R/W series are to be used when available. Where Crown land is involved an extra paper print is required.

** Immediately after publication, advise each unsettled owner by letter (copy to the Director of Property Services).

7. Subsequent to Gazetting, a Notice is forwarded to the Registrar of the respective Land Title Office to effect an endorsation regarding same on the face of the property title. This procedure was initiated in mid-1968 as a measure to disclose the existence of highway right of way as and when a title search is made of the property.

** Amendment

4.05 DISCONTINUING AND CLOSING A HIGHWAY

1. Closure of Highways

Highways are generally closed under Section 9 of the Highway Act by notice published in the gazette. In some cases they may be cancelled by plans cancellation under the Land Title Act, however, those cases will be rare as this procedure is lengthy and costly to the applicant.

1. Closure under Section 9 of the Highway Act:

   The provisions of Section 9(1) of the Highway Act should be used to close a road declared to be a public highway. If closure is recommended, Notice of Intent must be given as per Section 9(4) of the Highway Act in cases where the highway is in public use (see samples, Appendices C and D). At the District Highways Manager's discretion, steps should be taken to ensure that all users may be aware of the Notice of Intent, including the sending of copies of the published advertisement to nearby property owners. In cases other than currently travelled roads a letter should also be forwarded to nearby property owners describing the proposed closure and saying "If you have any comments please write to me before_____", giving a date three weeks after the date of the letter. In all cases where the road proposed to be closed is to be replaced by an alternate serving the same function, include in the notice or letter a short statement saying the road to be closed is to be replaced by a new road and describing the location of the new road.

   If objections are received, copies are to be forwarded to Headquarters with reasons as to why they should be disregarded.

2. Following Completion of the Procedure Outlined in Section 1, the completed and signed H-222, plan of closure, draft gazette, letter of application, title searches of all adjoining properties, letters of objection (if any), statement concerning the status of the road (i.e. Section 4, dedicated or gazetted), and explanation concerning what the closed road is to be in exchange for are to be forwarded from District to Region, then to Headquarters. In cases where a subdivision is involved the Regional Approving Officer will be co-ordinating the closure.

   A District plan is not essential when closing a Section 4 road but is advisable so as to avoid any possible confusion, and the draft gazette should be worded to reflect the Section 4 status.

3. Headquarters initiates publication of the gazette notice upon the Minister's approval.

2. Transfer of Closed Highways

Section 9 (2) (a), (c) and (d) of the Highway Act deal with transferring closed right-of-way under the authority granted to the Lieutenant Governor in Council. Applicants are to be advised that a favourable decision may not be received and that if the decision is favourable the closure process is time consuming (several months) and is subject to approval by the Lieutenant Governor in Council.

1. In situations where no money is to be exchanged for the closed highway and the highway has been closed by gazette:

    1. Section 4 roads: If there is common ownership on both sides, and the closed highway is within unorganized territory, then no O.I.C. is required if a subdivision is involved as transfer can be accomplished under Section 109 of the Land Title Act.

        If no subdivision is involved, an O.I.C. is required as per Section 9 (2) (a) of the Highway Act.

    2. Right of way established by gazette or dedicated:

        If the closed highway was originally established by gazette or dedicated, has common ownership on both sides and is within unorganized territory, transfer can be accomplished by O.I.C. as per section 9 (2) (a) of the Highway Act.

        If the road allowance is to be transferred by Section 9 (2) (a) of the Highway Act to the owner of Lot A (and involves no money) he must either:

        (See illustration in appendix "E")

        I. be the owner of the land of which it originally formed part (need not be the original owner) or

        2. be the owner of the land and the person who originally dedicated the right-of-way.

        If neither of the above conditions can be met the Minister may transfer this closed road to both owners A and B, as tenants in common, and leave them to make their own agreement for dividing the closed road

        OR

        proceed with the transfer as per Section 9 (2) (c) of the Highway Act.

Ensure the applicant is advised in writing that he is to supply a legal survey plan acceptable to the Land Title Office consolidating the closed road with his property prior to submitting the request for an Order in Council as per Section 9 (2) (a) of the Highway Act.

2. In situations where money is to be submitted by the applicant in exchange for closed highway, the highway has been closed by gazette and the road is Section 4, gazetted, or dedicated right-of-way, an Order in Council is required as per Section 9 (2) (c) of the Highway Act.

District is to prepare a plan suitable for the closure gazette.

Regional Property Negotiator furnishes appraised value for closed road.

Region forwards draft gazette to Headquarters requesting closure notice be published.

Once Region receives notice of publication of closure gazette from Approvals-Planning, Region is to prepare the standard Notice of Tender ensuring the following stipulations are included:

1. the closed road allowance must be joined to and become part of an adjoining parcel, and

2. successful purchaser responsible for all costs necessary to consolidate closed road to adjoining parcel, and

3. any or all tenders not necessarily accepted.

Region is to forward the draft Notice of Tender to District with the request that it be inserted in the appropriate papers.

Region to ensure District forwards copies of the published Notice of Tender to all adjoining owners.

Headquarters receives bids. (When H-222 has been used to approve a road closure, H-357 is not necessary to approve a bid). H-162 is to be prepared by Financial Services listing the tenders received by closing date.

H-162 is then forwarded from the Director of Financial Services to the Director of Property Services.

Telex to be sent from the Director of Property Services to Region advising of tenders received.

** Amendment

Region to send telex to the Director of Property Services stating the tender they are recommending to be accepted.

Assistant Deputy Minister, Administration and Services to approve tender.

The Director of Property Services is to advise the Director of Financial Services (forward H-162 with this memo) of successful tenderer. The Director of Financial Services is then to advise the successful tenderer of acceptance and to forward balance of funds prior to vesting Order being drafted. The Director of Financial Services is to advise the Director of Property Services when balance of funds received so that vesting Order can be requested from Approvals-Planning. Prior to Approvals-Planning drafting an Order in Council, a sepia of the legal survey plan acceptable to the Land Title Office, consolidating the closed road allowance to an adjoining parcel is to be forwarded by the applicant to Region. Region is to forward the plan to Approvals-Planning.

If more than one bid is received the Director of Financial Services is to advise all unsuccessful tenderers and return the 10% deposits.

Once Order in Council has been approved, Headquarters will send copies to Region and the Land Title Office. Plan acceptable to the Land Title Office may then be deposited by the applicant.

4.06 TRANSFER OF SURPLUS PROPERTIES
**

1. Transfer to Ministry of Lands, Parks and Housing

It is policy to transfer surplus properties to the Ministry of Lands, Parks and Housing by Order in Council under the authority of Section 101 (2) of the Land Act.

Region is to proceed with this type of transfer ensuring the following is accomplished before requesting Headquarters to prepare an Order in Council.

1. Obtain approval for transfer on H-357.

2. Research all previous gazettes affecting the subject area and act accordingly when dealing with the following steps.

3. If subject area was acquired as a severance:

    1. Establish as highway right-of-way by gazette.

    2. Prepare Certificate of Vesting and forward to Headquarters for the Minister's signature.

** Amendment

3. When Certificate of Vesting is returned signed, raise title.

4. Close by gazette.

4. If subject area was purchased as an entire lot, check to see if surplus was established as highway right-of-way by gazette. If true, raise Certificate of Vesting, raise title and close the surplus area by gazette.

5. Ensure a legal survey plan showing our highway right-of-way (and additional requirements as determined by Planning Branch) has been deposited in the local Land Title Office and gazetted.

6. Request Headquarters to prepare an Order in Council and include in the covering letter:

1. Which Municipality, District, City, Township, etc. ..... subject area is within. Ensure these are correct. They will be used in the Order in Council.

2. Copies of all pertinent gazette notices as discussed in 4.06.1.2.

3. State legal which has been approved by the Land Title Office. Ensure the Land Title Office is aware of the highway requirements (if any) which are to be protected.

7. If Highways has title to a lot from which it is intended to only transfer half, a subdivision plan is required, thus creating two titles. Gazetting the portion to be retained is stretching the intent of the Highway Act.

2. Transfer to Municipalities

Under the authority of Section 57 (1) of the Ministry of Transportation and Highways Act our Ministry may recommend transfer of property surplus to our requirements to a municipality, with or without compensation.

When proceeding with this type of transfer please follow the guidelines given under Section 4.06.1.

You will note there are stipulations contained in Section 57 which will have to be reviewed before it can be determined if this type of transfer may proceed.

4.07 RIGHT-OF-WAY SURVEYS AND PLANS

1. If reasonable, tie in more than two posts of each property, as experience shows many out of position.

2. Use a scale of 1:1000 on linen.

** Amendment

3. If convenient, place the title in the lower right corner with 'north' at the upper edge, conforming with Land Title practice. Insert "Subject to a survey by B.C.L.S.".

4. Plot "tied in" posts by latitudes and departures, circling them on the plan.

5. Scale other corners to the nearest half metre, leaving them uncircled.

6. Show centre line stationing of boundary line crossings scaled to the nearest half metre.

7. Show the following areas for each property:

    1. Area of each part of final right-of-way.
    2. Area of each part of old right-of-way retained.
    3. Area of each part of old right-of-way abandoned.

4.08 LEASE OF PART OF HIGHWAY
**

1. This Ministry may lease either surplus property or highway right-of-way under Sections 57 (4) and (5) of the Ministry of Transportation and Highways Act.

    1. Obtain approval for lease of H-357.

    2. Forward the lease agreement in triplicate and signed by the lessee to Headquarters for approval as to form by solicitor. At this time, if an Order in Council is required, the request will be made. If the property to be leased is in the name of the Crown (Highways) and the lease is for a period of three years or more, then an Order in Council is necessary. If the property to be leased is a severance and not in the name of the Crown (Highways) then it will have to be gazetted as highway right-of-way. A lease which is within highway right-of-way does not require an Order in Council since it cannot be registered in the Land Title Office.

    3. Once the Order in Council is approved by Cabinet, if applicable, the lease will be forwarded to the Minister for signature.

    4. Copies of the signed lease agreement will be returned to Region for their attention.

2. If there is any possibility of criticism of the lease, details are to be forwarded with the H-357. Under certain circumstances, Headquarters may advise the lease is to be accomplished under Section 15 of the Highway Act.

** Amendment

4.09 WIDTH OF RIGHT-OF-WAY

Right-of-way may have any width adequate to enclose all works; however, future requirements must be considered to avoid expensive piecemeal acquisitions.

The right-of-way of highways established by construction extends only to the limits set out or taken possession of (cleared or otherwise worked upon). A public highway not established by Gazette or by dedicated plan in the Land Registry can claim a width no greater than the "travelled way". The land beyond is either 'Private" or "Crown" and the owner (Minister of Lands for Crown) may dispose of timber or use the land as he chooses.

If right-of-way is required for improvement, relocation or widening, clearly stake the new boundaries and settle all questions of compensation before Gazetting.

4.10 RESERVATIONS FOR ROADS IN CROWN GRANTS
**

Generally the Crown Grant of lands, alienated from the Crown Provincial, provides that the Crown may, without compensation, resume up to one-twentieth of the parcel, excepting improved lands.

Titles are issued subject to provisions of the original Crown Grant and to provincial Statutes (Highway Act, etc.). Under the Highway Act compensation is paid only for land resumed in excess of one-twentieth, plus improvements. (See Compensation).

Patents to land in the Railway Belt sold by the Dominion prior to 1930 vary and provisions for highways must be determined from each document.

** Amendment

4.11 RESERVES FOR ROADS EXISTING WHEN LAND IS ALIENATED

Lands have been alienated since 1913 with the proviso "All highways within the meaning of the Highway Act, existing over and through said lands at the date hereof shall be exempted from the grant". Previous to 1913 exemptions were not always made.

Crown Dominion Patents or Grants vary, requiring an individual check.

4.12 THE RIGHTS OF PRE-EMPTORS AND PURCHASERS

The rights of pre-emptors or purchasers of land are subject to the same provisos as the Crown Grant which will be issued, unless otherwise expressly provided. The rights until the Crown Grant is issued are subject to all private rights-of-way and all travelled road, trails, over or through the land. (See Sec. 64 of the Land Act, Chap. 206, RSBC 1960).

4.13 RIGHT-OF-WAY IN CROWN PROVINCIAL LANDS

The Chief Forester administers unalienated and reverted Crown Lands within Provincial Forest Reserves. The remainder, including foreshore lands, is administered by the Director of Lands.

Establish right-of-way through Crown land and obtain blanket reserves from these administrations when roads or works are planned.

Rights-of-way are gazetted and, after construction is complete, the reserve is reduced to the limits of the gazette or area required by other works.

Vacant Crown lands may be subject to grazing or timber leases, Special Permits, reserves, Certificates of Purchase, etc., hence their status must be investigated before gazetting or entry.

4.14 RIGHTS-OF-WAY FEDERAL LANDS

Dominion land cannot be expropriated by the Province.

Contact with local officers is desirable, but official negotiations are with the headquarters of the Ministry controlling the land.

Gazette notices are not published until the lands have been transferred to the Province, and entry is made only with permission.

4.15 RIGHT-OF-WAY THROUGH V.L.A. LANDS

The title is held by the Director of Veterans' Land Act and both the veteran and the local V.L.A. office should be contacted in initial stages. Aside from this dual interest, acquisition is carried out normally. Cheques are made to the Director, Veterans' Land Act.

4.16 RIGHT-OF-WAY INDIAN RESERVES **

1. Classification of Indian Reserves

Indian Reserves are administered by Indian and Northern Affairs, Canada. They are located within three geographical areas namely:

1. Within the former Railway Belt of British Columbia and the former Peace River Block.

2. Within the Province excluding areas described in "1" and "3".

3. Within that part of the Province lying between the Rocky Mountains and the 60th parallel of North Latitude and the 120th degree of Longitude.

Within area "1" the Indian Reserves, pursuant to Privy Council Order in Council 208, approved February 3, 1930, continued to be vested in Canada in Trust for the Indians subject to the terms and conditions set forth therein. The right to exercise these terms and conditions was passed to the Province by proclamation of "The British North America Act, 1930" 1st August, 1930.

Within area "2", the conveyance from the Province to Canada is pursuant to Order in Council 1036 approved July 29, 1938.

Within area "3", the conveyance from the Province to Canada is pursuant to Order in Council 2995, approved November 28, 1961. The effective date of the conveyance is the date the plan of survey of each of the six parcels was deposited in the Land Registry Office.

There are certain lands held in fee simple by Canada for the use and benefit of the Indians of British Columbia which are to be treated in a manner as if they were Indian Reserves.

2. Provisions and Reservations

Each conveyance contains reservations in favour of the Province providing for the resumption of land, the taking of gravel, sand and other specific materials for public works upon compliance with the procedures incorporated therein. Compensation is payable in specific instances. Also, all travelled streets, roads, trails and other highways existing over or through said lands on the effective date is excepted from the grant.

** Amendment

Enquiries relating to the right of the Province within a particular Indian Reserve are to be referred to the Regional Director, attention Regional Property Negotiator, for direction.

3. Acquisition Procedure

Acquisition of right-of-way within Indian Reserves requires unique procedures:

1. As most proposals are taken under advisement, allow substantial time in any programme anticipating entry upon Indian lands.

2. Property Services Branch will notify Indian and Northern Affairs by letter.

3. 1. Support the letter with copies of the plan and relevant data. (A standard Design and Survey plan is adequate in preliminary steps).

   2. If a tribal subdivision is affected its boundaries are to be superimposed on the Ministry plan.

4. Property Services Branch and/or Indian and Northern Affairs will arrange necessary meetings with the Indian Band through the Band Council. The Property negotiator and other qualified authorities of the Ministry should be available to give further information sought by the Superintendent on behalf of the Indian Band.

5. No attempt to enter shall be made until notification has been received in writing from Indian and Northern Affairs that a transfer/surrender has been assented to by the Band in accordance with the Indian Act.

6. On completion of negotiation a plan of survey by a B.C. Land Surveyor is required. Adjust compensation when defined area exceeds that described in transfer/surrender.

7. Transfer of land by Privy Council Order is usually required for right-of-way. Areas required for any other purpose are usually obtained by lease or rental agreement.

8. Compensation cheques are payable to the Receiver General of Canada for land or materials, unless Indian Affairs direct otherwise.

9. Internal disbursement of funds, irrespective of tribal interests, is the responsibility of Indian and Northern Affairs.

4. Indian Reserves exist in British Columbia within the framework of very special land law. If any question whatsoever exists as to the status of existing roads or the acquisition of new roads, contact the Regional Property Negotiator who will institute the research necessary. No contact should be made with an Indian Band while any doubt exists.

** Amendment

4.17 NAMING HIGHWAYS AND BRIDGES

1. Major Highways

Names will be assigned by Headquarters. Preference will be given to names incorporating terminal points, e.g. Vancouver Blaine Freeway. Changes of names will also be dealt with at Headquarters.

2. Minor Highways

Names will be assigned by District. Local custom and usage should be honoured. For roads of some length, terminal points should be considered, e.g. Enderby Mabel Lake Road should be preferred over Mabel Lake Road. Subdividers may name their own roads after checking with the local Post Office for their views. Duplication in a geographic area should be avoided, e.g. it is not desired to have a Douglas Street and a Douglas Crescent in the same area. Names should be in good taste, e.g. names like Essobee should not be allowed. Names should not be too long. Names of persons can be freely used but names of prominent persons should generally not be used before their deaths (non controversial sporting figures, etc. could be an exception).

3. Changing Names on Minor Highways

Persons requesting a name change should be advised that the Minister will not consider a change unless at least one half of the property owners on the road petition for a change. If applicant has secured one half signatures (it is usually not necessary to check validity) he should be advised that the Ministry will undertake the process of public notice to receive objections and that the Ministry expects the applicant to satisfactorily deal with reasonable objections before it is recommended to the Minister.

** The District Highways Manager should then arrange for publication (generally at Ministry expense) in a local newspaper (plus Sun and Province if in the lower Fraser Valley area or Times-Colonist if in Victoria area) once a week for three successive weeks.

Photocopies of the first advertising should be mailed to local agencies who may be concerned e.g. Post Office, Fire Department, Water District, Regional District. At the District Highways Manager's discretion, depending on known local controversy, etc. photocopies may also be mailed to all property owners on the road. District Highways Managers should cull objections, rejecting frivolous ones. The content of reasonable objections should be transmitted to the applicant. District Highways Managers should use discretion about revealing the names of the objectors depending on the circumstances. If names are given, the applicant should be advised that the Ministry is not prepared to proceed further unless the objections are satisfactorily disposed of. If names are not given, the applicant should simply be advised the ministry is not prepared to proceed further.

** Amendment

Example of notice as follows:

Province of British Columbia

Ministry of Transportation and Highways

PUBLIC NOTICE

REQUEST FOR CHANGE OF ROAD NAME

A request has been received for change of name from Smith Road to Lakeview Drive in the Silverton area. Persons who have any objection to the proposed change of name are requested to write giving reasons to (District Office) before June 30, 1982 (show a date about three weeks from date of last publication of notice).

District Highways Manager

for: Minister of Transportation and Highways

When objections are disposed of, District Highways Manager reports to Region with recommendation. Region transmits, with recommendation, to Headquarters Approving Office which will prepare appropriate gazette notice for Minister's approval. When gazette is published District Highways Manager will change street signs and notify agencies concerned including Land Titles, Post Office, Water District, etc.

4. Bridges

Names for bridges of total length longer than 50 m will be assigned by Headquarters; of total length of 50 m or less will be assigned by Region. In general, names of persons should not be used and it is preferred that the name incorporate the name of the feature being crossed, e.g. Lytton Fraser River Bridge, Clinton BCR underpass, etc.

4.18 RAILWAY ENCROACHMENTS APRIL 1980

The Province cannot expropriate right-of-way of railroads under Dominion charter. Gazette notices are not published and entry must follow permission from the Railway officials. Contact with local officers is desirable but negotiations are with the railway Head Office within the Province.

4.19 RAILWAY CROSSINGS

See Permits, Chapter 8.

4.20 NEGOTIATIONS WITH PROPERTY OWNERS

1. POLICY

Ministry staff must ensure that all property owners affected by any right-of-way are dealt with fairly and competently. Before any land is "entered" or taken possession of, compensation for land and improvements must be settled or at least a fair offer made to the registered owner (holder of Agreement for Scale, trustee, executor, etc.).

Adequate time for acquisition must be allowed and the Regional Property Negotiator must make every effort to obtain the property required before entry. If entry is necessary before acquisition, authority must be obtained from the Regional Highway Engineer through the Regional Property negotiator and the Deputy Minister must be informed.

Unregistered Crown land is to be considered as owned by the Lands Branch.

** Amendment

2. PREPARATORY DATA

Study the plan
Ascertain access points and grades
Arrange the ground layout
Determine title status by Land Registry searches
Obtain tax status and assessed values from the Assessor.

The owner may then be contacted, and -

The ownership vertified
The property carefully inspected
The rights to be acquired thoroughly explained
Discuss in detail the appraisal process and the comparable sales data whereby the value was determined.

Every endeavour must be made to provide technical and engineering information requested by the owner at this initial meeting. Unnecessary visits, telephone calls or letters must be avoided in the interests of public relations. The personal contact must be maintained where possible. If it is not possible to complete negotiations in one meeting, set a date for a future meeting. It is the responsiblility of the Regional Property Negotiator to ensure continuity in negotiations.

The foregoing directives regarding procedure in negotiations do not encompass every type of claim that may arise. Circumstances vary, and a competent authority will take suitable action.

4.21 COMPENSATION UNDER THE HIGHWAY ACT

The "Highway Act" gives the Minister wide powers. The exercise of these creates an obligation, particularly in compensation, and they must be used discreetly.

4.22 PAYMENT OF COMPENSATION

** 1. Highway Right-of-Way

Court rulings are that damages such as severance, proximity, etc., are inherent in the work "compensation" and the interpretation of the Act is enlarged accordingly. Application of the term "injurious affection" should be made with caution and even more discrimination.

2. Land for Other Works (Refer to Ministry of Transportation and Highways Act).

4.23 EXAMINATION OF TITLE

Examine the title of each parcel, ensuring that all equity holders are included on the compensation cheque. (A holder signing a waiver may be omitted).

** Amendment

Since arrears in taxes, water rates, land clearing charges, etc., cloud the title, the cheque is held until the title is cleared. This applies where the whole title will be extinguished.

The cheque for non-Crown Granted provincial lands is made to the Minister of Finance unless the Ministry of Lands, Parks and Housing has waived the participation of the Minister.

Owners represented by a solicitor are paid through him.

The payee for V.L.A. lands is the Director, The Veterans' Land Act. The payee for the Crown Dominion lands is the Receiver General of Canada.

For title transfers, state in the agreement that part of the compensation will be withheld until the title is cleared of all encumbrances.

If, at the time of agreement, vacant possession is not possible, the Ministry retains part of the compensation until clear possession is attained.

An owner with a claim against the Ministry may sell but compensation is still paid to him. The new owner presumably pays a price adjusted for the damage originating the claim.

4.24 RECOMMENDATIONS FOR COMPENSATION

Complete right-of-way compensation recommendations on Form H. 120, taking care to cover all details adequately.

The Regions should ensure that the applicable Highway District/Electoral District and Project Number, if applicable, is indicated on the H. 120 form along with Headquarters Project Number.

Under section "A" give full details of improvements covered by the compensation, such as: size of buildings, type of construction, length and width of roads, area cleared or graded, area cultivated or planted, nature of crop, etc.

Under "Remarks", clearly tabulate all conditions of the settlement, giving an explanation for any departure from the general pattern of values. Settlements for nominal award of one dollar require a full explanation.

4.25 FENCING
**

1. GENERAL

The Ministry is concerned with the erection and maintenance of fences for several reasons. The principal reason is to keep livestock off the highway and thus prevent potential accidents.

Where existing fences are altered or disturbed and where fences are required in new construction, usually an existing enclosed area, the Ministry is responsible for all construction costs. On completion, fence maintenance falls to the land owner unless otherwise provided by Order-in-Council.

** Amendment

No domestic animals, such as cattle, are permitted upon any highway named in Schedule 2 of the Motor Vehicle Act Regulations. It is the animal owner's responsbility to ensure that this regulation is adhered to. This requirement means that on a Schedule 2 highway the land owner or lessee is responsible for the maintenance of the fences. (See Motor Vehicle Act, Section ~~199~~ 211 (1) (0) and Schedule 2, Division 19 of the Regulations).

Maintenance of a fence means the day to day repairs as well as the provision and installation of replacement materials (posts, wire, etc.). The fence should be placed on the property line unless extraordinary conditions require that the fence be placed within the highway right-of-way. Care should be taken in the location of fence posts to ensure that survey pins are not harmed and that a transit can be set up over the iron pin, if necessary.

No fence should be constructed wholly within highway right-of-way unless:

1. Ordered by Order in Council.

2. Allowed by permit.

3. Topographical or extraordinary conditions require the placement of fences on the right-of-way for short distances.

4. The Ministry's policy requires the construction of and maintenance of the fence by the Ministry in which case a minimum one foot inset from the right-of-way line is required.

All fences and cattle guards constructed by the Ministry must be to the General Specification requirements. Materials for sub-standard and non-conforming fences can be supplied to private land owners if they wish to erect them at their own expense.

2. ENCLOSED LANDS (NEW CONSTRUCTION)

If enclosed land is entered for construction, it is the duty of the Ministry, until proper fences are erected, to maintain the integrity of the enclosure, excluding animals or unauthorized persons so no trepass or damage is committed.

Only land with adequately constructed barriers (walls, hedges, fences, etc.), or natural obstacles (impenetrable brush, cliffs, unforable water, etc.), preventing passage of animals, is a fenced enclosure.

3. OPEN PRIVATE LANDS (NEW CONSTRUCTION)

If a new right-of-way cuts unfenced private lands, the Ministry may, on application by the owner, contribute all or portion of the costs of the fencing required along the right-of-way. The amount the Ministry will pay is set by the Regional Highway Engineer before a commitment is made.

Funds must be available in the construction work order and are paid progressively or on completion. Fences may be to Highway Specifications or lower. Consider aesthetics and use convenient natural barriers to cut length. This policy is not for minor roads with light traffic.

4. PRIVATE RANGE LAND AND UNALIENATED CROWN LAND UNDER GRAZING PERMIT

1. Minor Roads

All costs, construction and maintenance are the responsibility of the land owner.

2. Lands Adjacent to Schedule 2 Highways

1. Construction

Where an application has been made by a rancher, landowner or livestock association to the District Highways Manager, the Ministry will provide all materials and arrange for erection of the fence where there is a requirement for:

1. Any original fencing along the highway;

2. The upgrading and repairs of any substandard fencing; and,

3. Renewal, reposting or rewiring of deteriorated sections of existing fences.

2. Maintenance

1. The Ministry will provide assistance to ranchers and farmers by supplying all materials and arranging for the installation of any section of damaged or inadequate fencing which is the direct result of:

1. Motor vehicle accidents,

2. Acts of vandalism,

3. Faulty materials or workmanship by Ministry installation crews,

4. Frequent game crossings of the highway.

2. The repair or renewal of any damaged or deteriorated fencing which can be attributed to poor range management practise will be the responsibility of the rancher.

3. Ranchers and farmers will be responsible for instituting any patrol necessary to ensure that fences are in good repair. This will include the cost of annual spring inspection and associated minor maintenance.

4. Ranchers and farmers will be expected to co-operate with the Ministry by reporting any fence damage as soon as it has been discovered. The rancher is expected to arrange for temporary repairs to the fence or take other measures to prevent livestock from being at large on the highway until more permanent repairs are arranged for by the Ministry.

5. The liability of a rancher or farmer for his animals straying onto a scheduled highway and causing an accident is determined by the ordinary rules of negligence. This means that the owner of the animal must take reasonable care to control the animal so that it will not cause an accident. A major factor to consider in any particular case is the possiblity or foreseeability of the animal escaping onto a highway and causing damage and what care is taken, in the circumstances, to prevent such a happening.

   Insurance against such a liability is available to most ranchers from private insurance agencies generally at a reasonable cost.

3. General

1. Fences to be constructed with posts spaced approximately 7 metres, and not more than 9 metres apart, employing 5 lines of barbed wire. Wire or wood droppers to be spaced not more than 1.8 metres apart. Wire is to be stapled to side of posts away from the highway. Wherever possible, driven round sharpened posts are to be used. Posts to be peeled lodge pole pine or similar, 100 mm x 1.8 m minimum, pressure treated with 5% (95-5) pentachlorophenol to standard of not less than 5 lbs. oil per cubic foot of wood.

   Wire is to be 12.5 ga. double strand barbed wire, or single strand barbed wire conforming to Section 203.2 in the General Specifications, Staples to be galvanized, #9, 3/4 ga., 1 1/2 inches long.

   The above standards for materials and construction may be subject to local adjustment of wire spacing and top wire height to accommodate wild animal crossings. Where wild animal crossings can be indentified, standards should be discussed with local Wildlife Branch Officials before undertaking installation.

2. Fences are to be erected, in general, along right-of-way boundaries; except where a section of range-land is broken by a block of unfenced private land consisting of one or more adjoining lots fronting the highway, the Ministry will provide for fencing around the perimeter of the block.

3. Where unalienated Crown land under grazing permit adjoins Crown land not under permit, the Ministry will extend the fence beyond the boundary to a natural barrier.

4. The Ministry will provide gates where required, but not more than one gate per 1.6 km where parcel frontage is greater than 1.6 km, or one gate per parcel where parcel frontage is less than 1.6 km. Any additional gates, if required, must be supplied by the owner or permittee.

   Gates must be installed so as to provide at least 9 metres between the edge of the pavement and the arc of the gate if the gate opens outwards.

5. The Ministry will supply materials, install and maintain cattleguards, if required, where fence crosses any public road tributary to the Schedule 2 highway, or where considered necessary by the District Official to allow public entry on to unalienated Crown land. Cattleguards desired on private roads will be the responsibility of the owner.

6. Private industrial and logging road entrance permits shall include a provision requiring the applicant to install and maintain a standard cattleguard.

7. This policy will only apply to Schedule 2 highways and those highways which have been proposed for Schedule 2 designation and which will require fencing to be completed over a period of several years.

4.26 CATTLEGUARDS ON PUBLIC ROADS
**

1. New Installations

1. The rancher, farmer or landowner will be required to obtain a permit from the District Highways Manager for any new cattleguard installation on a public road. Approval for any installation will consider the public good with respect to the class of road, the volume of traffic, and the design and location for the installation. Cattleguards on public roads are to be constructed to Ministerial General Specifications or better. The applicant may be a livestock range permit holder in combination with Range Branch, Forest Service, seeking a cattleguard installation on behalf of a range management fence or rancher wishing to cross fencing or private range for better pasture management.

2. Applicant shall assume all costs of supply and installation to meet ministry specifications.

3. The Ministry will be responsible for cleanout and maintenance costs. Cleanout requests by landowners must allow for reasonable lead time to permit efficient deployment of Ministry work crews.

** Amendment

2. Existing Installations

1. Landowners or ranchers will be expected to apply for permits to cover any existing installations on public roads. Permits will be granted only for installations that meet Ministerial General Specifications for cattleguards. (A time extension may be allowed before a permit is required where existing installations do not meet Ministry specifications and traffic is very light. However, in the meantime, paragraph 3 will apply).

2. Wherever industrial traffic precipitates damage or deterioration to the cattleguard, the Ministry will be responsible for co-ordinating the upgrading of existing inadequate installations with the Forest Service or logging company.

3. The Ministry will be responsible for cleanout and maintenance costs of existing installations on public roads covered by permit. Cleanout requests by landowners must allow for reasonable lead time to permit efficient deployment of Ministry work crews.

4.27 LIVESTOCK UNDERPASSES
**

1. Warrants

The Ministry is prepared to install cattle underpasses where the following conditions exist at the time of a highway improvement:

1. There is common ownership of land on both sides of the highway or the owner on one side has legal control by way of agreement of sale, lease for a period of 20 years, etc., of the land he does not own.

2. The herd exceeds fifty mature animals excluding bulls.

3. There is a need to cross the highway at least six times a year.

The following warrant will apply covering a machinery underpass installation for the combined purpose of a cattle and machinery underpass:

1. Warrant for a cattle underpass must be met as above.

2. There must be a need to cross the highway with implements of husbandry weekly.

3. The average daily highway traffic for a two-lane highway must be at least 4,000 vehicles per day.

** Amendment

**

2. Cost Sharing

Cattle Underpasses

Owner or rancher - 10% of the cost of a particular installation up to a maximum of $2,500.

Combined Cattle and Machinery Underpasses

Owner or rancher - 10% of the cost of a particular installation up to a maximum of $6,000.

For a two lane highway the owner's share will be based on the cost of the installation at the particular location.

In the case of multiple lane crossings the owner's share will be based on what the cost would be for a two lane highway installation at the particular location, a two lane highway being a highway with a 36 foot top (11 metres) with side slopes applicable to construction standards in the area and with a fill height as indicated.

If the highway improvement eliminates existing free access between feeding and watering areas (new severances), then the Ministry will install the cattle pass at no cost to the owner.

4.28 FENCES ALONG ARTERIAL OR URBAN HIGHWAYS APRIL 1980

1. General

The Ministry will be responsible for the supply, erection and maintenance of fences along freeways and certain four or two-lane arterial highways where major reconstruction or new construction was routed through a residential or agricultural environment and where it is recognized that the primary purpose of the fence under this policy is to restrict access to the highway. Generally, under such circumstances, there would be no municipal responsibilities within the right-of-way of the arterial highway.

The type of fence to be erected on the boundary of the right-of-way will be in accordance with Section 203 of the General Specifications for Highway Construction subject to the following exceptions:

1. Non-standard or ornamental type fences will be considered only:

    1. as condition of a right-of-way settlement, and

    2. where sound suppression is necessary and has been proved to be effective.

2. Where residential streets dead-end or terminate at the freeway and where an obvious potential hazard exists because it might be possible for domestic animals or small children to climb over or under the fence on to the freeway right-of-way; 1.8 metres high chain link fence with no overhang shall be installed across the ends of all such road allowances and extended 8 metres on either side of the road allowance on Highway #1 and #99.

** Amendment

4.29 GRAVEL AND TIMBER

1. Indian Reserves

Initiate negotiations for gravel on Indian Lands early, as much time is required. Gravel must not be taken from Indian Reserves under any circumstances without a firm price, confirmed in writing, from the Department of Indian Affairs.

It may be possible to obtain gravel for roads within the reserve without charge, but compensation is paid for gravel used on roads outside reserve boundaries. (See Indian Reserves Classification).

2. Gravel Reserves on Crown Land

Make substantial efforts to detect and reserve gravel deposits on Crown Lands. As these deposits have high potential values, reserve sufficient area with the Superintendent of Lands to protect the Ministry while deposits are proven.

The Superintendent of Lands may accept reserves on large areas but frequently insists on closer definition in a reasonable time.

District Officials request reserves from the Region. The Region forwards the request to the Superintendent of Lands. The reserve, when granted, is entered in the District Gravel Pit Register. Reserves made with local assessors, etc., are not reliable as the land may be sold without reference to them.

3. Removal of Gravel from Crown Granted Lands

The Highway Act states that gravel for highways may be removed from titled or Crown Granted Lands without notice to or consent of the owner. Most Crown Grants contain a similar proviso but each individual grant must be checked. In particular, land sold by the Dominion in the "Railway Belt" prior to 1930 carried out no provision for gravel removal.

Gravel for public works is taken under the Ministry of Highways and Public Works Act. Despite these powers, the Ministry invariably gives notice to the owner and comes to some satisfactory arrangement, such as a lease (Form H.387), with him before land is entered and gravel or timber removed.

Ministry employees must ensure maintenance of fences and gates when removing gravel from enclosed private property or partially alienated Crown Lands (leased, etc.), to prevent loss or entry of animals.

4.30 COMPENSATION FOR GRAVEL

The "Highway Act" provides no compensation for gravel taken from unimproved lands. If the land is improved the Ministry may pay compensation. Note the payment is optional and in no way mandatory. Lands are regarded as improved if the owner has opened the pit by stripping, etc., or has constructed a road to it.

Despite the strength of the Act, because of changed conditions requiring large removals from single sites, the Ministry endeavours to purchase or lease an area from the owner.

Ensure that pits are kept neat and tidy. All inflammable material must be burned, and the operation of the pit must not provide or leave hazards to men or animals.

4.31 REMOVAL OF TIMBER

(Within highway right-of-way. See Permits, Chapter 8).

Timber for highways is not cut or removed without the property owner's consent. If timber is taken all debris and slash must be piled for burning safely, in the following fire season, leaving the site in a neat and tidy condition.

4.32 WEIGH SCALE SITES
**

The Ministry assists the Weigh Scale Branch in selection and acquisition of weigh scale sites. The Ministry constructs approach roads and bases for the scale and scale house.

4.33 GRAVEL PIT AND STOCK PILE SITES - Borrow Pit Sites
(See Removal of Gravel)

These areas are acquired under the Ministry of Highways and Public Works Act and right-of-way is not widened merely to obtain or store gravel.

The Ministry obtains title (Form H.179 signed by the vendor), or a lease (Form H.387 signed by the vendor). Forward the complete form, with a recommendation for compensation (Form H.286), to the Regional Property Negotiator.

An Order in Council is required before taking title.

Include required surveys in cost of acquisition.

Before testing and drilling investigations are begun, an option to purchase the property must first be negotiated with the owner by the Regional Property Negotiator.

4.34 DISPOSAL OF SURPLUS PROPERTY BY PUBLIC TENDER OR AUCTION

Obtain approval from Headquarters before instituting a sale.

Surplus right-of-way real property is disposed of under the Highway Act or under the Ministry of Highways and Public Works Act.

All personal property (chattels or goods) of the Ministry is disposed of through the Purchasing Commission.

Tenders for real property are receivable by the Deputy Minister or by the Minister, and bids for such at auction sales are subject to acceptance by the Minister, who is not bound to accept the highest of any tender or bid.

** Amendment

Place notices of the auction or tender in the press and post notices conspicuously on the property to be sold.

Insert all conditions of sale in the notices or have them explicitly stated by the auctioneer before calling for bids.

4.35 SALE OF CROWN LAND

Crown lands acquired by the Ministry may be sold as above. Only the Ministry of Lands, Parks and Housing may sell unalienated Crown land.

4.36 ESTABLISHING ACCESS TO PROPERTY NOT ADJOINING A PUBLIC ROAD

There is much property in British Columbia without access by road. Many property owners take their access by local agreement across other properties. People being what they are, disputes frequently arise and there are many cases of farmers cutting off access to their neighbours as a result.

The Ministry's policy in these cases is that it is not in the public interest to intervene and gazette or acquire rights-of-way for such purposes. The provision of access to lands beyond should be exercised when a subdivision occurs but otherwise these disputes are purely a private matter. If, however, both farmers involved should come to us and ask for a road to be gazetted, and at no cost to the Ministry, then it may be recommended to the Region. The acquiring of new roads by Gazette or by Section 6 requires the approval of the Deputy Minister and a sufficient report should be prepared for submission to the Region.

Before taking any action with an owner who prevents others from using a road or trail across his property, the original Crown Grant should be checked for any proviso to the effect that any existing roads or trails over the property shall be excepted from the Grant.

4.37 RIGHT-OF-WAY ACROSS MINING CLAIMS

When the Minister of Transportation and Highways takes land, either privately owned or Crown land, for highways purposes under the provisions of Section 8 of the Highway Act, and publishes notices thereof in the Gazette, Section 9 of that Act applies to extinguish every title and claim to the land so taken. This will result in the extinguishment of the mineral claim holder's interest in any minerals lying under the right-of-way, and after his title is extinguished he is not entitled to mine within the boundary lines of the right-of-way continued vertically downwards.

As to compensation, the holder of the mineral claim is entitled to compensation for his loss in the same way as any other person with an interest in land that has been taken for highway purposes, and this is so regardless of whether he owns the surface or not. These comments about compensation, of course, are subject to the right reserved to the Crown in any Crown grant of a mineral claim to retake for highway purposes up to 5% to the land granted without payment of compensation. These Crown Grants also usually reserve to the Crown the right to take, without compensation, any gravel, sand, stone, lime, timber or other materials which may be required in the construction, maintenance or repair of any roads, ferries, bridges or other public works. In the case of a mineral claim that has not been Crown Granted, the surface of which is still in the Crown, the right to take gravel, etc., still remains in the Crown.

4.38 ROAD WORK IN PROVINCIAL PARKS

The Ministry of Lands, Parks and Housing has stringent regulations regarding activities that may be carried out in the confines of Provincial Parks. For this reason, it is important that Transportation and Highways Ministry officials make contact with representatives of that Ministry before undertaking any work in the Parks, either adjacent to our highways, or in the development of gravel pits or borrow areas, etc.

4.39 RIGHT-OF-WAY IN AGRICULTURAL LAND RESERVES **

1. General

The British Columbia Agricultural Land Commission has passed the Certificate of General Order (Appendix "A") covering the establishing of right of way for an existing public road or for an existing private road and related widening, reconstruction, upgrading or improvement to such a road within the Argicultural Land Reserve. Ministry staff must make every attempt to adhere to the conditions.

Following are comments on the General Order by the Agricultural Land Commission:

"The General Order states that applications from the Ministry to the Commission are not required in certain instances provided that specific requirements are met. The majority of this General Order is self-explanatory. The Commission would however point out that in passing this Certificate of General Order, it would expect that the Ministry would continue to minimize the encroachment of new rights of way or road improvements within the Agricultural Land Reserve as much as possible, and to comply with the agreed policy between the Commission and Ministry as outlined under the following sections 2 and 3. Further, this General Order in no way will relieve the Ministry from conducting responsible negotiations with the property owners nor of the responsibility of adhering to all other legislation and decisions of responsible authorities which may apply to the land.

Should any of the specific requirements outlined in the General Order not be met by the Ministry (i.e. a property owner or a number of property owners not agreeing to a right of way or road proposal) then the proposal would have to be forwarded to the Commission for approval. This being the case, the Ministry should submit the standard application form used for this type of application along with a covering letter and supporting information clarifying which specific conditions contained within the General Order are not to be complied with and why. Upon receipt of this application the Commission will render its decision on the proposal.

It should be stressed that the Commission's decision will be based on agricultural considerations and will not involve the financial considerations or compensation involved in a proposal. In other words, the Commission will decide on whether or not the right of

** Amendment

** way dedication or road improvement should be proceeded with, whether it should be revised, what special conditions should be placed on its approval, etc. and not whether or not an owner should be compensated a certain financial amount.

Notwithstanding the General Order, the following proposals within the Agricultural Land Reserve will continue to require the approval of the Commission in the prescribed manner:

1. The construction of a new road or highway.

2. The dedication of a road which is not a Section 4 Road or is not a private road that the property owner(s) and Ministry have agreed to dedicate.

3. The widening or establishment of the road right of way for an existing 20 m public road beyond 4 m.

4. The dedication or widening of a former Section 4 Road beyond 4 m.

5. The physical upgrading or improvement to roads that are not Section 4 Roads.

6. The major realignment or relocation of any road including Section 4 Roads or private roads to be brought under the Ministry's jurisdiction.

7. The establishment of gravel pits or gravel reserves."

2. Closing and Vesting Of Old Roads

It is the Commission's position that any road or right of way outside of a new road or right of way under application should be closed, wherever possible, rehabilitated to an agricultural standard compatible with surrounding lands, and returned to the adjacent property unless this road or right of way is required for private access, utility, or other necessary purposes as determined by the Ministry.

3. Acquisition of Severed Parcels of Lands for Consolidation With an Adjacent Parcel

It is the Commission's position that any area less than two acres (.8094 hectares) in size remaining after severance by a new road or right of way under application must be consolidated or leased to an adjacent property by the Ministry or included within the new right of way. The Ministry would only be excused from this condition should the severed area contain any dwelling unit or accessory buildings and structures or should the acquisition of the severed area be rejected by an arbitration proceeding.

** Amendment

**

Any area greater than two acres (.8094 hectares) in size remaining after severance by a new road or right of way does not have to be consolidated or leased to an adjacent property nor included within the new right of way by the Ministry as a condition of the Commission's approval. In this case however, the Ministry is to notify the property owner affected by this severance that the severance is not to be construed as reason in itself or justification for subdivision of the subject parcel of land. Appendix "B" is a copy of the Commission's statement on this matter which is to be given to every property owner in which a new road or right of way severs a parcel creating an area of severance greater than two acres (.8094 hectares) in size.

CERTIFICATE OF GENERAL ORDER PURSUANT TO THE AGRICULTURAL LAND COMMISSION ACT

Re: The establishing of right of way for an existing public road or for an existing private road and related widening, reconstruction, upgrading or improvement to such a road within the Agricultural Land Reserve

WHEREAS Section 44(e) of B.C. Regulation 8/81 prescribes that the dedication or construction of new highway, road or railway rights-of-way is a special case use;

AND WHEREAS Section 44 of B.C. Regulation 8/81 prescribes that the above described special case use requires the approval of the Provincial Agricultural Land Commission;

AND WHEREAS the Commission recognizes that the establishment or dedication of existing Section 4 and private roads and related widening, reconstruction, upgrading or improvement of these roads which are within the Agricultural Land Reserve may be in the interest of the public and the agricultural community and is in the interest of the Ministry of Transportation and Highways fulfilling its responsibilities;

AND WHEREAS the Commission feels that requiring the Ministry to apply for the establishment of these existing roads and their related upgrading or improvements is causing excessive administrative work to both the Ministry and the Commission;

NOW THEREFORE I hereby certify that the Provincial Agricultural Land Commission by Resolution #1672/82 dated the 17th day of August 1982, made an Order of General Application to all lands within the Agricultural Land Reserve permitting the Ministry of Transportation and Highways to proceed with the following without requiring the approval of the Provincial Agricultural Land Commission:

1. The establishment or widening to a maximum width of 20 metres (66 feet) ** the right of way for an existing Public road established under the Highway Act.

2. The dedication of any existing private road, not established under the Highway Act, to a maximum width of 20 metres (66 feet) where the property owner(s) and Ministry have agreed to the said right-of-way dedication.

3. The additional establishment or widening of an existing road right of way of a 20 m public road provided that the additional establishment or widening does not exceed 4 m.

4. That reconstruction, upgrading or improvement of a road within that right of way established in accordance with 1, 2, or 3 above.

** Amendment

Appendix "A" Cont'd - 2

PROVIDED THAT, in each and every case:

A) Where the establishment, dedication, widening, reconstruction, upgrading or improvement has severe operational implications to the property owner(s) or the residual parcel is not viable for agriculture, the directly affected landowner may request the Provincial Agricultural Land Commission to review the proposal prior to the property owner's approval of the right of way agreement.

B) Where any road or right of way exists outside of a new road or right of way, the Ministry shall close the superfluous right of way and wherever possible, rehabilitate same to an agricultural standard compatible with surrounding lands and return same to an adjacent property unless this road or right of way is required for private access, utility or other necessary purposes as determined by the Ministry.

C) Where any area less than .8094 hectares (2 acres) in size remains after severance by a new road or right of way, the Ministry shall consolidate or lease the area to an adjacent property or include the area within the new right of way unless the severed area contains any dwelling unit or accessory buildings and structures or unless the acquisition of the severed area is rejected by an arbitration proceeding.

In the case where an area greater than .8094 hectares (2 acres) in size remains after severance by a new road or right of way the Ministry is not required to consolidate or lease the new right of way, but the Ministry shall notify the property owner affected by this severance that the severance is not to be construed as reason in itself or justification for subdivsion of the subject parcel of land.

D) Where any existing fences, gates, or cattleguards are affected by the establishment, dedication, widening, reconstruction, upgrading, or improvement, the Ministry shall replace or install new fences, gates or cattleguards as agreed to between the Ministry and the landowner who is affected.

E) Where the establishment, dedication, widening, reconstruction, upgrading, or improvement affects an area which may in the near future be irrigated or drained by an irrigation, drainage, or improvement district, or by a property owner, the Ministry shall obtain the views of and co-operate with the district or the owner and shall install whatever is necessary (i.e. sleeves, piping, etc.) to protect and facilitate the irrigation or drainage of the area with the district or the property owner bearing the cost of materials. Where existing irrigation and/or drainage systems are affected, the Ministry shall make provisions for the protection or replacement of same.

Appendix "A" Cont'd - 3

F) Where the establishment, dedication, widening, reconstruction, upgrading, or improvement will result in the removal of agricultural crops the Ministry must compensate the affected property owner for the loss of that agricultural product in addition to the acquisition of the actual land. Similarly, where the establishment, dedication, widening, reconstruction, upgrading, or improvement will affect a farm building or facility, the Ministry is to be responsible for the replacement of or payment of compensation for that building or facility.

AND FURTHER PROVIDED THAT, nothing in this order relieves the Ministry from

(i) conducting responsible negotiations with property owners.

(ii) agreeing to works, prices, terms or conditions beyond those specified in this order;

(iii) the responsibility of adhering to all other legislation and decisions of responsible authorities which may apply to the land.

Dated at Burnaby, British Columbia, this 6th day of December, 1983.

PROVINCIAL AGRICULTURAL LAND COMMISSION

"Signature"

M. F. Clarke, Chairman

CHAPTER 4
APPENDIX "B"
FEBRUARY 1984

TO THE PROPERTY OWNER:

Whereas the Provincial Agricultural Land Commission has granted it's approval to the upgrading/construction of an existing or new road and/or the dedication of new or additional right of way, and the Commission recognized that this approval severs a parcel(s) of land within the Agricultural Land Reserve in which the area remaining after the severance is greater than 2 acres (.8094 hectares) in size, the Commission wishes to notify the affected property owner that the said severance and approval of the Commission is not to be construed as reason in itself or justification for the subdivision of the subject property or severed area along this road or right of way.

"Signature"

M. F. Clarke
Chairman
PROVINCIAL AGRICULTURAL LAND COMMISSION

NOTICE OF INTENT

_____ HIGHWAY DISTRICT

NOTICE is given, pursuant to Section 9 (4) of the Highway Act, that the Ministry has received an application to discontinue and close a portion of road allowance (state approximate location i.e. in Kamloops .....25 km east of Smithers, etc.....) (state legal description i.e. adjacent to Lots 4 and 5, Plan 15894, D.L. 126, KDYD).

And that such closed road allowance be vested, pursuant to Section 9 (2) (c) of the Highway Act.

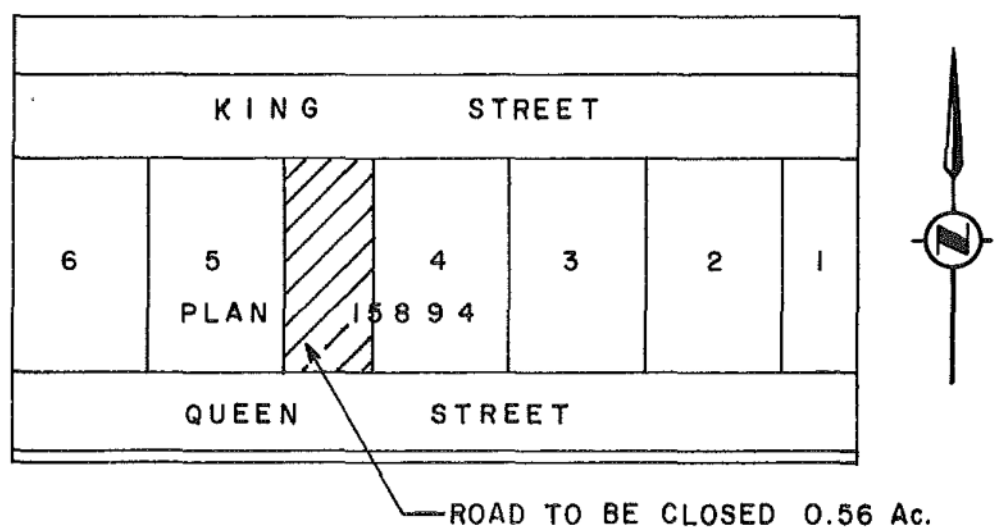
A plan showing the proposed road closure may be viewed at:

(state office and location)

during office hours. Any person having an objection to this application for road closure should do so in writing not later than (insert appropriate date).

_____

District Highways Manager
For: MINISTER OF TRANSPORTATION
AND HIGHWAYS



NOTICE OF INTENT

_____ HIGHWAY DISTRICT

NOTICE is given, pursuant to Section 9 (4) of the Highway Act, that the Ministry has received an application to discontinue and close a portion of road allowance (state approximate location i.e. in Kamloops or 25 km east of Smithers, etc.) (state legal description i.e. adjacent to Lots 4 and 5, Plan 15894, D.L. 126, KDYD) which is to be in exchange for another road that (has been/will be constructed).

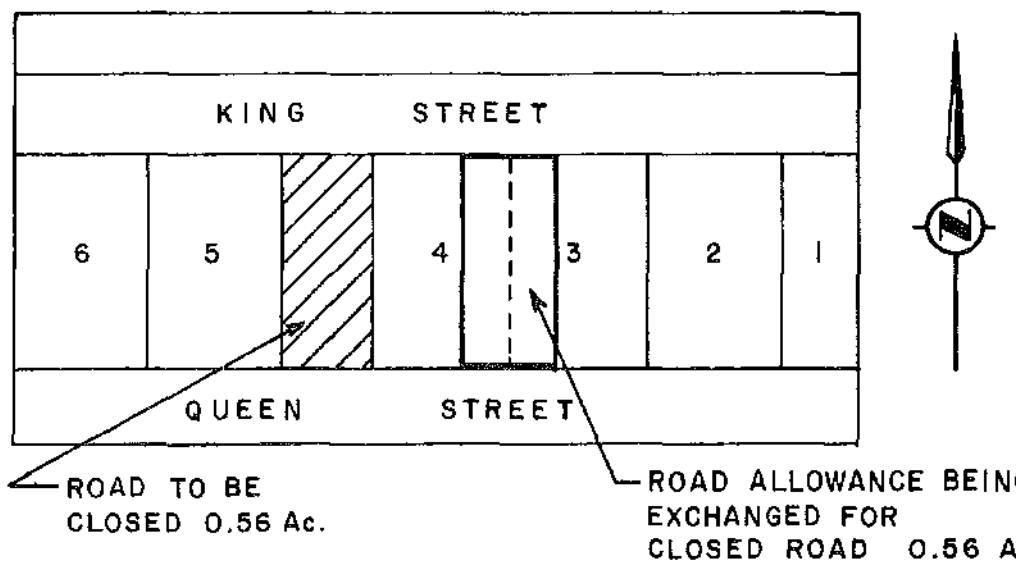
And that such closed road allowance be vested, pursuant to Section 9 (2) (a) of the Highway Act.

A plan showing the proposed road closure and alternate road allowance may be viewed at:

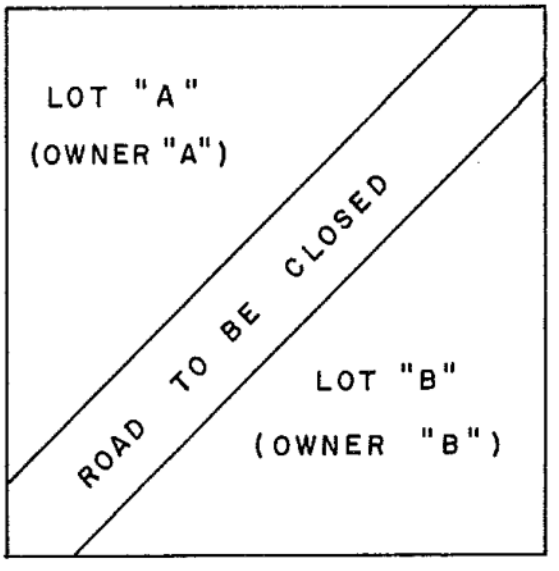
(state office and location)

during office hours. Any person having an objection to this application for road closure should do so in writing not later than (insert appropriate date).

_____
District Highways Manager
For: MINISTER OF TRANSPORTATION
AND HIGHWAYS



COMMON ROAD CLOSURE



CHAPTER 5

SUBDIVISIONS

5.01 AUTHORITY

Approving Officers are designated by the Land Title Act or appointed by Order in Council, Regional District Boards or Municipal Councils. All subdivision plans require an approval by one or two approving officers as the case may be:

(a) In a municipality where the subdivision (including remainder) adjoins the Right of Way of a Controlled Access Highway.

(b) In a municipality in all cases not included in (a).

(c) In unorganized territory where the approving officer is not a member of the Ministry of Transportation and Highways.

(d) In unorganized territory in all cases not included in (c).

For each of these approval is required by:

(a) Ministry of Transportation and Highways Approving Officer and Municipal Approving Officer.

(b) Municipal Approving Officer.

(c) Ministry of Transportation and Highways Approving Officer and non-Ministry Approving Officer.

(d) Ministry of Transportation and Highways Approving Officer.

5.02 APPROVING OFFICERS

Municipal Approving Officers are appointed by their Councils. Ministry of Transportation and Highways Approving Officers are the Deputy Minister, Regional Approving Officers and the Regional Directors, Highways. Regions deal with all subdivision plans in Ministry jurisdiction in their Regions.

5.03 SUBDIVISION REQUIREMENTS

All subdivisions must conform with any applicable laws, regulations and bylaws. A subdivision that does not conform may not be approved. Cases where it appears desirable to approve, that cannot be approved, are to be referred to the Executive Director, for consideration of amendments to the Regulations, etc. In this procedure no hope should be held out to the applicant as very few will warrant amendments or special procedures.

5.04 SUBDIVISION REGULATIONS AND OTHER BYLAWS

In unorganized territory where a Regional District Subdivision Bylaw exists, that Bylaw governs standards and its provisions must be followed except that Appendix A of the Provincial Regulations is to govern in all cases regardless of Bylaw provisions on road standard. In some cases a Regional District Subdivision Bylaw may not cover all the features covered in the Provincial Regulations. In those cases the absent features are to follow the standards of the Provincial Regulations - not as a regulation, but as a policy requirement.

Where no zoning or subdivision bylaw exists the Provincial Regulations are to be followed in full except that where the Regional District has an official Plan which has parcel size requirements, then the official Plan parcel size requirements should be followed.

Where a bylaw has standards lower than the Provincial Regulations, then the bylaw rules (except for road standards). However, subdividors should be encouraged to meet the Provincial Regulations standards.

When a Regional District adopts a bylaw which supercedes all or part of the Provincial Regulations a letter is to be sent to all applicants who have current valid tentative approval advising them that they must comply with the bylaw.

The bylaw is law the day it is adopted regardless of tentative approvals. Any grace or transition period can only be exercised by the Regional District. On the adoption of a bylaw the Regional Approving Officer should approach the Regional District and suggest a formula for allowing in-process subdivisions to complete under the previous rules. The standard formula is that all subdivisions which had a valid tentative approval before the date of the bylaw may be approved under the old rules provided the approvable final plans are received by the Approving Officer within the six months following the date of adoption of the bylaw. Any subdivision not in this class must follow the bylaw. Other formulae may, however, be agreed to by the Regional District.

Where a Regional District has adopted an Official Settlement Plan and the parcel size requirements differ from an adopted zoning bylaw, the parcel size requirements should satisfy the worst case. Thus if the bylaw says 2 ha parcel size and Settlement Plan says 4 ha then 4 ha rules. Where the plan speaks unquantitatively (large parcels etc) then it should be ignored.

5.05 REGULATIONS

LOCAL SERVICES ACT

B.C. Reg.: 262/70

Regulations made November 5, 1970, Pursuant to Order-in-Council No. 1171, Approved June 1, 1959.

SUBDIVISION REGULATIONS

APPLICATION

1.01 In accordance with the provisions of the Local Services Act, being Chapter 224 of the Revised Statutes of British Columbia 1960, and Order-in-Council 1171/59, these regulations apply to the subdivision of all land in the Province of British Columbia, except those lands within a municipality and except those lands regulated by a Regional District bylaw pursuant to the Municipal Act governing the subdivision of land, and except those lands within Community Planning Area Number 24.

1.02 Where any site area requirement for an intended use in an applicable zoning bylaw adopted pursuant to the Municipal Act or in a zoning regulation adopted pursuant to the Local Services Act conflicts with the minimum parcel area requirements of these Regulations, the site area requirement shall apply, provided that the requirements of Sections 6.04, 6.05, 6.06 and 6.07 are met.

PURPOSE

2.01 The purpose of these Regulations is to assist in assuring the safe, healthful, equitable, efficient, economical and attractive subdivision of land for the benefit of the community as a whole.

INTERPRETATION

3.01 In these Regulations unless the context otherwise requires:

"approval" means approval in writing from the authority having jurisdiction;

"Approving Officer" means Approving Officer designated as such pursuant to the Land Registry Act;

"building regulations" means regulation of construction of buildings by a building code adopted pursuant to the Local Services Act or to the Building Regulations Division of the Municipal Act;

"community sewer systems" means a common sewer, or system of sewerage or sewage disposal which serves two or more parcels;

"community water system" means a system of waterworks which serves two or more parcels and which is owned, operated and maintained by an Improvement District under the Water Act or the Municipal Act, or a Regional District, or which is regulated under the Public Utilities Act;

"cul-de-sac" means a length of local highway made for vehicular use, the end of which is designed to be permanently closed by the pattern of subdivision; or which is terminated by a natural feature such as inaccessible terrain, so that there is no alternative vehicular route to another highway;

"frontage" means that length of a parcel boundary which immediately adjoins a highway other than a lane or a walkway;

"frontage road" means that length of a highway which on one side adjoins a highway designated as a Controlled Access Highway and over which access is permitted to parcels on the other side;

"highway" includes a street, road, lane, bridge, viaduct and any other way open to the use of the public, but does not include a private right-of-way on private property;

"improvement district" means an improvement district pursuant to the Water Act or the Municipal Act, and for the purposes of these Regulations includes "The Greater Nanaimo Water District" and the "Greater Victoria Water District";

"lane" means a narrow highway which provides secondary vehicular access to any abutting parcel so that the parcel may be serviced or reached by vehicles using that highway, but a lane is not a half road;

"leg" means a parcel created pursuant to Clause (b) of Section 4 of B.C. Regulation 199/70 and that part of a highway at an intersection which radiates out from the point of intersection;

"Medical Health Officer" means the Medical Health Officer appointed under the Health Act who has jurisdiction over the area in which a subdivision is located;

"owner" means a person who is entitled to subdivide land or his duly appointed representative;

"parcel" means any lot, block, or other area in which land is held or into which land is subdivided or any remaining portion of the land being subdivided;

"potable water" means water which is approved for drinking purposes by the Medical Health Officer in accordance with the Health Act;

"Professional Engineer" means a person who is registered or duly licensed as such under the provisions of the Engineering Profession Act;

"Regulations Governing Sewage Disposal" means those regulations contained in B.C. Regulation 202/67 as amended by B.C. Regulation 45/68;

"serves" means actually serves, or a commitment by the owner to provide the community water system or the community sewer system in order to serve any parcel, and which commitment is a condition of approval;

"site area" means an area of site required in a subsisting zoning bylaw adopted pursuant to the Municipal Act;

"slip" means the downward and outward movement of slope forming materials composed of natural rock, soils, artificial fills or combinations of these materials, which movement may proceed by any one of three principal types of movement: falling, sliding or flowing, or by their combinations;

"subdivision" means the division of land into two or more parcels, whether by plan or by metes and bounds description or otherwise; except that the words "subdivision plan" shall also be deemed to include a plan consolidating two or more parcels into a single parcel;

"walkway" means a narrow highway for the use of the walking public only;

"zone" means a zone established under the Zoning Division of the Municipal Act;

"zoning regulation" means a regulation governing the use of land adopted pursuant to the Local Services Act or a bylaw governing the use of land adopted pursuant to the Municipal Act.

GENERAL

4.01 Suitability

No subdivision shall be approved

(a) unless it is suited to the configuration of the land being subdivided;

(b) unless it is suited to the use to which it is intended;

(c) if it makes impracticable the further subdivision of any land within the proposed subdivision or of any adjacent parcel;

(d) if it does not comply with these regulations.

4.02 Other Regulations

Nothing contained in these regulations shall relieve the owner of a subdivision from the responsibility to seek out, and comply with the legislation applicable to his undertaking.

4.03 Intended Use

The owner of any land being subdivided may be required to state in writing the intended use of any parcel being created or of any remaining portion of the land being subdivided.

4.04 Characteristics Not Approvable

Without limiting the generality of Section 4.01, approval of any subdivision may be refused if it:

(a) (i) contains land which is subject to erosion; or
(ii) contains a parcel which is divided by land subject to erosion into areas not suited to the use to which it is intended; or

(b) (i) contains land which may slip when developed, used, or occupied; or
(ii) contains land which when developed, used or occupied may cause land on an adjacent parcel to slip; or
(iii) contains land which may be inundated by a land slip if land above on another parcel slips; or

(c) contains land which is subject to flooding so as to render it unsuitable for the use to which it is intended; or

(d) contains land which because of inadequate drainage is not suitable for the use to which it is intended.

4.05 Covenant

Notwithstanding the requirements of Section 4.04, the subdivision of land which is subject to any of the conditions described in Section 4.04 may be approved, provided that the owner agrees in writing to registering a condition or covenant pursuant to Section 24A of the Land Registry Act in favour of the Crown at the time of subdivision. Such condition or covenant shall be satisfactory to the Approving Officer and shall restrict or prohibit the construction of buildings or structures on, and/or the use of any parcel or part of such parcel which is subject to any of the conditions described in Section 4.04.

4.06 Information Required

In order that any proposed subdivision may be properly considered by the Approving Officer, the owner of any land being subdivided may be required to provide any of the following:

(a) topographic survey where the terrain is steep, irregular or otherwise difficult to appraise in respect of the subdivision suiting the configuration of the land being subdivided;

(b) spot elevations;

(c) a Professional Engineer's report on:

(i) the effect on soil stability of disturbing natural grades or natural growth, or changing the moisture content of the soil by developing, using, or occupying the land;

(ii) ground water levels and conditions for as much of the year as is considered necessary;

(iii) the depth and extent of flooding and the likely frequency of its occurring.

4.07 Flagging

The corners of any proposed parcel for which approval is being sought or the location of places where any tests required for approval are taken shall be clearly flagged if required by the Approving Officer.

4.08 Highways

The clearing, construction, grading and surfacing of all highways and all drainage shall be in accordance with Appendix "A" attached to and forming part of these regulations.

4.09 Community Water Systems

(1) The design of any community water system to serve the subdivision shall be in accordance with the requirements of any authority having jurisdiction over the system pursuant to:

(a) the Health Act, the Energy Act, the Water Utilities Act, or, Utilities Commission Act

(b) the Health Act and the Water Act when an Improvement District has an applicable subdivision bylaw pursuant to the Water Act; or,

(c) the Health Act and the Municipal Act when a Regional District has an applicable bylaw setting out the terms and conditions of any extension to its community water system,

as the case may be.

(2) The community water system approved pursuant to Subsection (1) of Section 4.09 shall be installed as approved before the subdivision is approved.

(3) Notwithstanding the requirements of Subsection (2) of Section 4.09, a subdivision may be approved prior to the construction of the community water system provided that an arrangement securing performance of such construction satisfactory to the Approving Officer has been made with:

(a) an Improvement District having an applicable subdivision bylaw adopted pursuant to the Water Act; or,

(b) a Regional District having an applicable bylaw setting out the terms and conditions of any extension to its community water system, as the case may be, but in no case shall the subdivision be approved before the plans for the community water system have been approved.

4.10 Community Sewer System

(1) The design of any community sewer system to serve the subdivision shall be in accordance with the requirements of any authority having jurisdiction over the system pursuant to the Health Act and the Pollution Control Act and where applicable in accordance with either:

(a) the Water Act when an Improvement District has an applicable subdivision bylaw pursuant to the Water Act or
(b) the Municipal Act when a Regional District has an applicable bylaw setting out the terms and conditions of any extension of its community sewer system.

(2) The community sewer system approved pursuant to Subsection (1) of Section 4.10 shall be installed as approved before the subdivision is approved.

(3) Notwithstanding the requirements of subsection (2) of Section 4.10, a subdivision may be approved prior to the construction of the community sewer system provided that an arrangement securing performance of such construction which is satisfactory to the Approving Officer has been made with:

(a) an Improvement District having an applicable subdivision bylaw adopted pursuant to the Water Act; or,
(b) a Regional District having an applicable bylaw setting out the terms and conditions of any extension to its community sewer system,

as the case may be, but in no case shall the subdivision be approved before the plans for the community sewer system have been approved.

4.11 Water Supply

Where a community water system is to be installed in a subdivision a supply of potable water adequate to serve the subdivision shall be proven before the subdivision is approved.

4.12 Water Licence

Where the owner is establishing a community water system using a water source which comes within the terms of the Water Act, a licence to divert and use the amount of water required to serve the subdivision shall be held by the owner prior to the approval of the subdivision.

4.13 Discharge Permits

Where a discharge of sewage from or within a proposed subdivision is within the terms of the Pollution Control Act, a provisional permit for that discharge shall be obtained before the subdivision is approved.

4.14 Contravention of Other Regulations

Except where a setback in respect of a highway is concerned, no subdivision shall be approved which would cause any existing building or structure or sewage disposal installation or used source of potable water to contravene any building, zoning or other regulation in force on the parcel under consideration.

4.15 Vehicle Parking

(1) Vehicular access shall be provided from the travelled portion of the highway onto any parcel in a proposed subdivision and adjoining this access there shall be an area on the parcel suitable for the parking of two automobiles, unless the Approving Officer exempts the subdivider from this requirement because of the terrain.

(2) Notwithstanding the requirements of Subsection (1) where a subdivision is pursuant to Section 4 of B.C. Regulation 199/70 and where local snow and terrain conditions as determined by the Approving Officer preclude year round vehicular access to any parcel, the parcel pursuant to Clause (b) of Section (4) of B. C. Regulation 199/70 shall have a configuration and location which is sufficient in the opinion of the Approving Officer to accommodate the vehicles otherwise required to be parked on each parcel. repealed

HIGHWAYS

5.01 In Sections 5.01 to 5.11 inclusive:

(a) The meaning of "highway" does not include "walkways"; and
(b) the meaning of "intersection" includes the intersection of highways and the intersection with a highway of a parcel created pursuant to Clause (b) of Section (4) of B.C. Regulation 199/70. repealed

5.02 Highway Widths

The minimum width of any highway in any proposed subdivision shall be twenty (20) metres except:

(a) where the Approving Officer deems a lesser minimum width better suited to use or to local conditions; or,
(b) where a highway is a frontage road, when it shall have a minimum width of fifteen (15) metres unless the Approving Officer deems a lesser minimum width better suited to use or to local conditions; or,
(c) where a highway is a lane, when it shall have a minimum width of six (6) metres.

5.03 Lanes

Lanes shall be provided where terrain and natural features render vehicular access practicable and where:

(a) they form an extension of any existing system of lanes; or

(b) the Approving Officer deems it necessary to provide secondary access in order that reasonable traffic flow can be assured on the main highway.

5.04 Pursuant to the Controlled Access Highways Act, roads shall be provided to give access to parcels adjoining controlled access highways.

5.05 Intersecting Highways

Subject to the Controlled Access Highways Act and to the Land Registry Act where any subdivision contains parcels less than thirty (30) metres in width, intersecting highways shall be dedicated at intervals not greater than four hundred (400) metres and on the same side of the highway and beginning at any existing lateral highway except:

(a) where the parcel being created is pursuant to Section 6.11 or,

(b) where difficult terrain or other natural features render vehicle access impracticable; or,

(c) where the pattern of existing subdivision precludes the necessity of providing access.

5.06 When a subdivision borders on the shore of navigable waters, access shall be given in accordance with the requirements of the Land Registry Act.

5.07 Turn-around

In any proposed subdivision a highway which is cul-de-sac shall have a terminal area for a turn-around the size of which shall be determined by the Approving Officer, having regard to the local snow, terrain, and soil conditions, provided that any such area shall be large enough to contain a circle with a radius of fifteen (15) metres.

5.08 Intersections

The number of highway intersections within a subdivision shall be kept to a minimum, and, where practicable:

(a) "Y" shaped intersections shall be avoided;

(b) "T" shaped intersections shall be used when the intersecting highway is to carry a small amount of local traffic;

(c) intersections with more than four (4) legs shall be avoided;

(d) intersections shall not be located in or near sharp curves or near the crest of any rise or hill.

5.09 Intersection Offset

Wherever practicable no intersection shall be less than forty (40) metres from any other intersection or likely future intersection. Measurement shall be made along the centre line of the intersected highway.

5.10 Intersection Angle

Unless extremely difficult terrain or the pattern of existing subdivision precludes it, a minimum of fifteen (15) metres intersecting leg shall be as close to right angles as practicable with the intersected highway. This distance shall be measured at the boundary of the intersecting leg on the side of the contained angle.

5.11 Walkways

The minimum width of any walkway in any subdivision shall be three (3) metres.

PARCELS

6.01 Minimum Parcel Size - Water & Sewer

Where both a community water system and a community sewer system serve a parcel, and

(a) where both building and zoning regulations are in force, that parcel shall not be smaller than Four Hundred and sixty (460) square metres, except that a parcel may be decreased in area by as much as ten (10) per centum provided that the Approving Officer is satisfied with the validity of the owner's written claim that because of unusual terrain or the size or the configuration of his land, Four Hundred and sixty (460) square metre parcels cannot be achieved and therefore subdivision is precluded, but as many parcels as the Approving Officer considered practicable shall be not smaller than Four Hundred and sixty (460) square metres; and,

(b) where both building and zoning regulations are in force, and where a lane provides secondary access to that parcel, there shall be no minimum parcel size; and,

(c) where building or zoning regulations pursuant to the Municipal Act are not in force, that parcel shall not be smaller than Five Hundred and fifty-five (555) square metres.

6.02 Minimum Parcel Size - Water Only

Subject to the provisions of Sections 6.04 and 6.05 as the case may be, where a parcel is served by a community water system but not a community sewer system, that parcel shall not be smaller than Six Hundred and ninety-five (695) square metres, except that a parcel may be decreased in area by as much as ten (10) per centum

provided that the Approving Officer is satisfied with the validity of the owner's written claim that because of unusual terrain, or the size of the configuration of his land, Six Hundred and ninety-five (695) square metre lots cannot be achieved and therefore subdivision is precluded and that at the decreased size all requirements of Section 6.04 can be met, but as many parcels as the Approving Officer considered practicable shall not be smaller than Six Hundred and ninety-five (695) square metres.

6.03 Minimum Parcel Size - No Services

Subject to the provisions of Sections 6.04 and 6.05 as the case may be, where a parcel is not served by a community water system nor a community sewer system, the parcel shall not be less than Sixteen Hundred and seventy (1670) square metres.

6.04 Conditions to be Met when Parcel Less than 20 000 square metres

Where a parcel is less than twenty thousand (20 000) square metres and is not served by a community sewer:

(a) it shall meet the requirements of Appendix "B" which is attached to and forms part of these regulations; or,

(b) where the requirements of Clause (a) of Section 6.04 cannot be met consideration shall be given to alternate designs which will dispose of the liquid in the minimum size septic tank for a three (3) bedroom single family house, and which designs are in accordance with the requirements for alternate methods of disposal contained in the Regulations Governing Sewage Disposal and for which acceptable alternate designs an adequate area of appropriate soil is available for disposal and the parcel shall be sized accordingly; except that where, in extraordinary and infrequent instances, the owner of the parcel does not wish to make the installation necessary for an acceptable alternate design in accordance with the fore - going, the subdivision may be approved provided that the owner agrees in writing to registering a condition or covenant pursuant to Section 24A of the Land Registry Act in favour of the Crown at the time the subdivision is registered. Such condition or covenant shall be satisfactory to the Approving Officer and shall restrict or prohibit the construction of buildings or structures on, and/or use of any parcel until the necessary installations have been made; and, copies of the results of all tests shall contain the signature, occupation and permanent address of the person undertaking the tests and shall accompany the plans of the proposed subdivision when it is submitted to the authority having jurisdiction to receive subdivision applications.

6.05 Design of Larger Disposal System

Except where the Pollution Control Act is applicable, where a parcel is less than twenty thousand (20 000) square metres and is not served by a community sewer system and where the intended use has a greater design sewage flow per day than the minimum capacity septic tank for a three (3) bedroom, single family house in accordance with the Regulations Governing Sewage Disposal, the design sewage flow of the intended use shall be used in accordance with the Regulations Governing Sewage Disposal to determine the area of soil required in Clause (a) of Section 6.04 and all other requirements of Section 6.04 shall be met.

6.06 Test Results

Where any parcel in a proposed subdivision is less than twenty thousand (20 000) square metres and is not served by a community sewer system, a copy of the plans and test results and measurements required in Appendix "B" as applicable to that parcel shall be submitted by the Approving Officer to the Medical Health Officer or to the Director of Pollution Control, as the case may be, for written reasons why he would or would not recommend approval of a subdivision based on the waste disposal capabilities of the soil on that parcel to meet with the requirements of these Regulations or of the Pollution Control Act, as the case may be.

6.07 Old Subdivisions

Notwithstanding the requirements of Section 6.01 and 6.02 and 6.03, existing parcels which are smaller than permitted in these regulations may be consolidated and resubdivided into new parcels provided that:

(a) all parts of all new parcels are contiguous;
(b) as many new parcels as the Approving Officer considers practicable shall meet the area requirements of these regulations;
(c) the degree of compliance with the area requirements of these regulations is not lessened on any new parcel;
(d) the Medical Health Officer states in writing that the requirements of Section 6.04 can be met.

6.08 Minimum Frontage

The minimum frontage of a parcel shall be ten (10) per centum of the perimeter of that parcel except where the Minister of Municipal Affairs and Housing, upon application by the owner, exempts him from this requirement. update

Application by an owner for exemption shall be in writing and shall state the ground on which the exemption is sought and shall be accompanied by two copies of a plan showing the proposed subdivision.

6.09 Panhandle Lots

Without limiting the generalities of Section 4.01 and notwithstanding the requirements of Section 6.08, where a parcel is a panhandle lot capable of further subdivision, the Approving Officer shall be satisfied that the panhandle is adequate to provide a future highway.

6.10 Notwithstanding the requirements of Sections 6.01 to 6.05, inclusive, where a parcel is a panhandle lot, the access strip or panhandle shall not be calculated as part of the minimum parcel area.

6.11 Where Minimum does not Apply

The requirements of Sections 6.01, 6.02, 6.03 and 6.04 shall not apply:

(a) where the parcel being created is to be used solely for the unattended equipment necessary for the operation of,

(i) a community water system;
(ii) a community sewer system;
(iii) a community gas distribution system;
(iv) a community radio or television receiving antenna;
(v) a radio or television broadcasting antenna;
(vi) a tele-communication relay station;
(vii) an automatic telephone exchange;
(viii) an air or marine navigational aid;
(ix) electrical substations or generating stations;
(x) any other similar public service or quasi-public service facility or utility; or

(b) where the parcel is pursuant to Clause (b) of Section (4) of B.C. Regulations 199/70;

(c) to churches, chapels and parks; and

(d) where no sewage is generated; and,

(e) where the owner agrees in writing to registering a condition or covenant pursuant to Section 24A of the Land Registry Act in favour of the Crown at the time the subdivision is registered and such condition or covenant shall be satisfactory to the Approving Officer and shall restrict or prohibit the construction of buildings or structures on, and/or the use of any parcel.

SEVERABILITY

7.01 If any provision of this regulation is found invalid, such provision is severable.

(Section 4.08)

Appendix "A"

1. In this appendix unless the context shows otherwise requires:

"arterial" means a highway intended to carry large volumes of traffic at medium and high speeds primarily between major traffic generatory and it is not intended to directly serve adjacent land;

"collector" means a highway located within an area of major traffic generation and which is used primarily for the collection and distribution of traffic between arterials and locals as well as to some adjacent land;

"K Value" means the distance required in metres to effect a one percent change in gradient on a vertical curve;

"local" means a highway located within an area of major traffic generation and used primarily to provide access to adjacent land.

2. The likely or intended use of the land, the climate prevailing in the area, the relation of the subdivision to the surrounding highway system, the topography and the necessity for on-street parking shall be taken into account and design speed and finished grade width of roadway set accordingly as in Sections 3 and 4 of this Appendix.

3. Parameters for various design speeds shall be as follows:

Design Speed	30 km/h	50 km/h	70 km/h
Maximum curvature radius in metres	30	80	160
Minimum stopping sight distance - metres	30	60	90
K value crest vertical curves	2	7	15
K value sag vertical curves	4	11	19
Overhead clearance - metres	4.5	4.5	4.5
Maximum grade - %	12	8	8
Maximum superelevation - %	10	8	8

Maximum grades are to be reduced by 1% of grade for each 30 metres of radius below 150 m radius curve.

4. Finished road grade width shall be ten (10) metres for local roads with parking and also for arterials and collectors and seven and one-half (7.5) metres for other roads. A finished grade width of six (6) metres may be approved in special circumstances by the Approving Officer. Side slopes in surfacing and subgrade are not to be steeper than 2:1.

5. Drainage is to be adequate in the opinion of the Approving Officer and all ditches, pipes, etc., are to be carried to natural drainage features as far as possible.

6. All ditch inverts are to be minimum one (1) metre below centre-line elevation of roadway.

7. All drainage facilities, including culverts are to be designed for thirty (30) year flood in urban areas, suburban areas and rural areas likely to grow into suburban areas and in all other areas to be designed for ten (10) year flood.

8. Any drainage appurtenances shall conform to CSA or ASTM specifications for the purpose of which it is intended.

9. All bridges and span or box culverts are to be designed by a professional engineer to AASHO H20S16 loading for local roads, and to AASHO H25S20 loading for collectors and arterials.

10. With the exception of those trees and shrubs the District Highways Manager of the Ministry of Highways and Public Works approved as worthy of preservation and which are located close to the edge of a highway allowance intended for vehicular use, the full width of all highways shall be cleared and grubbed. Brush, debris, stumps and roots shall be disposed of to the satisfaction of the District Highways Manager, Ministry of Highways and Public Works.

11. Road shall be surfaced in two courses:

(a) a lower course composed of select granular material passing seven and one half (7.5) centimetres mesh as per Ministry of Highways and Public Works specification #202:7; and, 202.6

update req'd

(b) an upper course composed of a minimum of seven and one half (7.5) centimetres of two (2) cm crushed or screened aggregate as per Ministry of Highways and Public Works specification ~~#202:4;~~ 202.5

and the minimum depth of the two courses shall be fifteen (15) cm. Where more material is required to build a sound and uniform roadway, the lower course shall be increased in depth.

12. The Approving Officer may also require asphaltic or Portland cement concrete surfacing as per Ministry of Highways and Public Works specification, Sections 220, 222 and 223 to a width not less than one and one-quarter (1.25) metres narrower than the finished road grade width (See Section 4).

update req'd

13 All construction practice and procedure shall be generally to the standard of the Ministry of Highways and ~~Public Works~~ General Specifications.

SUBDIVISION REGULATIONS
(Clause (a) of Section 6.04 and Section 6.06)
Appendix "B"

1. A percolation test shall be made and depending on the resulting percolation rate no less area than given below shall be added to the minimum parcel size in Section 6.02 and 6.03, as the case may be, of the Subdivision Regulations:

Percolation Rate Min/cm	Less than 2	2 & more but less than 4	4 & more but less than 6	6 & more but less than 8	8 & more but less than 10	10 & more but less than 12
Minimum Area added to Parcel in square metres	0	50	100	150	200	250

When the percolation rate is 12 minutes or more see Clause (b) of Section 6.04 of the Subdivision Regulations.

Percolation tests shall be carried out in accordance with Section 6 below.

2. Depending on the slope measured from the uppermost point on the parcel to the lowest point on the parcel, the results obtained in Section 1 above shall be increased in accordance with the following:

Steepest Slope in percent	Less than 10	for each 5 percent or part thereof for 10 percent and over
** Minimum area to be added to parcel in square metres	0	50

3. Regardless of the smallest parcel size permitted in accordance with Section 1 and 2 above, the parcel shall contain an area of soil suitable for sewage disposal not smaller than the following as determined by the percolation rate:

Percolation Rate Min/cm	Less than 2	2 & more but less than 4	4 & more but less than 6	6 & more but less than 8	8 & more but less than 10	10 & more but less than 12
** Minimum size of area of soil in square metres	100	150	200	250	300	350

** Amendment

4. There shall be a minimum of 1.25 m of natural porous top soil above the ground water table in the area of soil referred to in Section 3 above and a representative number of test holes shall be dug in that area to a minimum depth of 1.25 m to demonstrate this.

5. The area of soil required for sewage disposal in Section 3 above shall be capable of meeting the siting requirements for absorption fields in the Regulations Governing Sewage Disposal.

6. Percolation tests shall be undertaken as follows:

   (a) Percolation test holes shall be made at points and elevations selected as typical in the area of the proposed disposal field.

   (b) One of these test holes shall be dug at each end of the area of the disposal field. Further holes may be required depending on the nature of the ground and the results of the first test and the size of the proposed field.

   (c) Test holes are usually drilled using an auger and to the depth of the proposed absorption trench. The standard depth is 0.6 m but the public health inspector may approve or require holes varying from 0.45 to 0.8 metres in depth.

   (d) The soil should be examined as it is removed from the test hole for some indication of its composition and likely percolation rate.

   (e) To make the percolation test more accurate, any smeared soil should be removed from the walls of the test hole.

   (f) If the soil contains considerable amounts of silt and/or clay, the test hole should be presoaked before proceeding with the test. To do this, keep the hole as fully filled with water as possible for 4 hours. Proceed with the test immediately after presoaking.

   (g) To undertake the test, fill the test hole with water. When the water level is 15 cm or less from the bottom of the hole, refill the hole to a depth of 60 cm or to the top.

   No recording of time need be done for these two fillings.

   (h) When the water level after the second filling (step (g)) is 15 cm or less from the bottom of the hole, add enough water to bring the depth of water to 20 cm or more.

   (i) Observe the water level until it drops to the 20 cm depth. At precisely 20 cm commence timing. When the water level reached precisely 15 cm depth, stop timing.

   (j) The time in minutes for the water level to drop 5 cm is divided by 5, the percolation rate for that hole and is recorded in minutes per cm. The percolation rate of the absorption field is the average rate of all the percolation tests made for that field.

(k) Backfill the holes with excavated soil and repeat the test in other locations. Record the results and submit to the local authorities.

(l) See Section 4.07 of the Subdivision Regulations.

NOTE on Section 6: A percolation test is used to measure the permeability of the soil at the depth of the proposed drainage field. The percolation test will determine the "rate" which is a measure of the time in minutes for the water level in a hole to drop 1 centimetre and is recorded in "minutes per centimetre".

AGRICULTURAL LAND COMMISSION SUBDIVISION AND LAND USE REGULATION

B.C. Regulation 7/81

Subdivision

1.(1) An Approving Officer under the Land Title Act or an approving officer or Board of Variance under the Municipal Act may authorize or approve a plan of subdivision, all or part of which consists of agricultural land in an agricultural land reserve, where

(a) the proposed subdivision

(i) does not result in an increase in the number of land registry parcels for the land concerned when compared with the situation existing at the time the application for subdivision was made,

(ii) involves boundary adjustments that, in the opinion of the approving officer or Board of Variance, will allow for the more efficient use of agricultural land or the better utilization of farm buildings for farm purposes, and

(iii) creates no land registry parcel less than 8093.5 m^2 in area, or

(b) the proposed subdivision consolidates 2 or more land registry parcels into a single land registry parcel by elimination of common lot lines.

2. Where an approval is granted pursuant to subsection (1), the approving officer or Board shall endorse on the plan a certificate substantially in the form of Schedule A and, in that case, a registrar of titles under the Land Title Act may accept the plan for deposit.

3. Nothing in this section shall be construed as relieving an applicant, an approving officer, or a Board of Variance from complying with the requirements of the Land Title Act, the Municipal Act, the Condominium Act, the Real Estate Act or the regulations or by-laws enacted under any of them.

Land Use

2.(1) The following land uses are permitted in an agricultural land reserve:

(a) storage and sale of agricultural products produced on the individual farm on which the storage or sale is taking place;

(b) construction of buildings or structures necessary for a purpose referred to in paragraph (a);

(c) construction of one single family dwelling unit and accessory buildings and structures including ancillary service and utility installations and connections, per land registry parcel;

(d) harvesting of trees and the carrying out of all silvicultural and forest protection practices;

(e) ecological reserves established under the Ecological Reserve Act;

(f) a reserve or area of land or habitat set apart for wildlife, providing the surface of the land is not subject to substantial works and, for the purposes of this paragraph, burning or thinning of the natural growth from time to time is not a substantial work;

(g) parks and recreation reserves, whether established by the Province, a regional district or a municipality, that are left or kept in their natural state except to the extent necessary to facilitate outdoor recreation by modifying the site to provide public access; but developed facilities for access, including roads and parking, shall not exceed, where the park is

(i) less than 2 ha, 1 000 m^2, or
(ii) 2 ha or more, 4 000 m^2

(h) fish farms.

(i) minor highway, road and railway operations and construction including the following:

(i) minor improvement of drainage works, including cleaning and deepening of ditches.

(ii) easing one curve.

(iii) widening, dedication or construction of highway, road or railway rights of way provided that the area involved in widening, dedication or construction is less than 2 500 m^2/km of road.

(j) expanding the workings of an existing gravel pit to a maximum of 8097.5 m^2 in area including the areas already excavated.

(k) construction and maintenance of dykes and related pumphouses and ancillary works, including construction and maintenance of access roads and facilities made necessary by the threat of flooding.

(l) land development works including clearing, draining, irrigating and construction of reservoirs and ancillary works, where the works are required for farm use of the property on which the works are located.

2 Nothing in this section relieves an applicant from complying with all other Legislation, bylaws and decisions of responsible authorities that may apply, including zoning, subdivision and any other land use legislation.

SCHEDULE A

Certificate of Subdivision Under the

Agricultural Land Commission Act

I hereby certify that this subdivision plan is approved pursuant to section _____ of B.C. Regulation _____.

_____
Approving Authority

LAND TITLE ACT

B.C. Reg. 334/79

Regulation made by Order in Council No. 2103, effective October 31, 1979, pursuant to Section 75 (1) (a).

Part 2 - General Regulations

Relief from Access Requirements - General

8. Where a proposed subdivision is consistent with good land use planning, and, having regard to the type of development, is not contrary to the public interest and it

(a) affects land outside an established system of highways,

(b) affects land having access only by air or water,

(c) affects land where the only connection with the general highway system of the Province is by tram line, cable car, gondola lift, or a forest service road established under the Forest Act, or

(d) is tendered by or at the request of the Crown or by a statutory agent of the Crown,

an approving officer may grant relief from the requirements of section 75 (1) (a) in accordance with sections 9 to 15.

Where There is No Connection with a Highway

9. (1) Where a subdivision creates a single parcel that does not abut a highway, and the subdivider

(a) proposes to grant, appurtenant to the new parcel, an easement of access to a highway, or, where there is no established system of highways, a private road or way, and

(b) submits to an approving officer a subdivision plan showing the new parcel, and, outlined in a colour other than red,
(i) the easement areas, or
(ii) the private road or way,

an approving officer may approve the subdivision plan.

Access by Air or Water

10. Where the subdivision affects land that has practical access only by air or water the approving officer shall include in his written approval a statement to that effect, and the registrar shall endorse the certificate of title to the newly created parcel, after the description thereof, with the following note: ("See plan as to limited access").

Where One of the Lots is Contiguous With a Highway

11. (1) Where a subdivision plan tendered under section 83 of the Act shows

(a) two or more lots that do not abut a highway (including a highway proposed to be dedicated by the plan), and

(b) a lot that is contiguous to both that highway and to each of the other lots,

the approving officer may approve the subdivision plan in accordance with this section.

(2) An undivided share in the fee-simple of the lot referred to in subsection (1)(b) shall be combined on the same certificate of title with each one of the lots referred to in subsection (1)(a) and there shall be no unallotted share.

(3) If any part of the land subdivided is subject to a charge that does or may under any circumstances entitle the holder or his successors to possession, that charge must be extended to include the lands proposed to be combined with the charged land.

(4) The plan presented to the approving officer shall contain a table listing serially in the left column the lots referred to in subsection (1)(a), and opposite each of them in the right column the undivided share of the lot referred to in subsection (1)(b) that is to be combined with each of the lots listed in the left column.

(5) Upon approval, the approving officer shall sign the plan in the manner provided by Section 88 of the Act, but using the words "approved under the Land Title Act, see B.C. Regulation 334/79".

(6) Before approving the plan, the approving officer may require that the lot referred to in subsection (1)(b) be designated both as a lot and as a private road, and that the private road be constructed so as to provide sufficient access to each of the lots referred to in subsection (1)(a).

(7) Having regard to the nature of the subdivision and the purpose for which the private road is intended, an approving officer may require

(a) that the standards in Part VII of the Act apply, and
(b) that an existing subdivision control by-law or a development permit be complied with in whole or in part.

(8) An approving officer may require the subdivider to enter into one or more covenants registerable under Section 215 of the Act with respect to the lot referred to in subsection (1)(b), and, in doing so, shall take into consideration whether that lot is to be used

(a) solely as a private road, including a utility right-of-way, or
(b) in a designated part as a private road, including a utility right-of-way, with the balance as a private park, garden, recreational area, parking or service area, or for another use having common benefit or utility to purchasers of parcels in the subdivision.

(9) An approving officer may require the granting of a statutory right-of-way as defined in the Act over the lot referred to in subsection (1)(b) for municipal or public utility purposes.

(10) On the deposit of the plan, the certificate of title issued under Section 98 of the Act shall describe the lands in this style: "Lot 1 and an undivided 1/50th share in Lot 51 (etc.)" and together they shall constitute a single parcel.

(11) Land included within a subdivision plan approved under this section may be further subdivided, provided that the subdivider's undivided share in the land referred to in subsection (1)(b) shall be completely allocated to the new lots shown on the resubdivision plan.

Access Via Shared Interest in Common Lot

12. Subject to this regulation, an approving officer may approve a subdivision where the subdivider is a registered owner in fee-simple of an existing parcel together with an undivided share or share in one or more parcels that individually or collectively are contiguous to the existing parcel and he submits a subdivision plan showing

(a) the existing parcel divided into lots, and
(b) a table drawn in the manner prescribed by section 11 (4), completely allotting to those lots the subdivider's share or shares in the lands which are contiguous to the existing parcel.

Amendments to Section 155 of the Act

13. (1) A person who is the registered owner in fee-simple of an existing parcel together with an undivided share or shares in one or more parcels that individually or collectively are contiguous to the existing parcel may, with the approval of

(a) the municipality, if the lands are situated in a muncipality, or
(b) The Ministry of Transportation and Highways, if the lands are situated in unorganized territory, apply to the registrar for a new certificate of title to his lands.

(2) An application under subsection (1) shall be made pursuant to the appropriate provisions of Section 188 of the Act.

(3) The lands shall be described in the certificate of title in the manner set out in section 11 (10) and together they shall constitute a single parcel.

(4) Where the parcels are shown on different subdivision plans, the registrar may require the applicant to deposit an explanatory plan.

Further Amendments to Section 155

14. For the purpose of Sections 11 to 13, parcels shown under different subdivision plans may be included in a single application and in a single certificate of title.

Access by a Forest Service Road

15. (1) Where a subdivision plan tendered under Section 83 of the Act affects land where the only connection with such land to the general highway system of the Province is by a forest service road established under the Forest Act, an approving officer may approve the subdivision plan where

(a) if the road is not less than 9 m wide, the Deputy Minister of Forests certifies in writing to the approving officer that the load limits restrict the maximum width of vehicle to 8.2.7 m, or

(b) if the road is between 7.5 m and 9 m wide ~~and the intended land use in the subdivision is residential or agricultural~~ only, the Deputy Minister of Forests certifies in writing to the approving officer that the load limits restrict the maximum width of vehicles to 3.05 m.

(2) The approving officer shall not approve a plan referred to in subsection (1) unless the plan has been endorses with the consent of the Deputy Minister of Forests in the following form:

LAND TITLE ACT (s.73 (5)) no such sect

CONSENT

Pursuant to Section 15 (2) of B.C. Regulation 334/79, consent is given to this plan of subdivision. The giving to this consent shall not imply an obligation of the Crown in right of the Province in improve, or repair the forest service road shown on this plan.

Deputy Minister of Forests

5.06 PROCEDURE FOR PROCESSING SUBDIVISIONS IN UNORGANIZED TERRITORY WHERE THE MINISTRY OF TRANSPORTATION AND HIGHWAYS IS PRIME APPROVING OFFICER

(a) The subdivider visits or writes to the Ministry District office and enquires how to subdivide. He is given a copy of Form H.237 as applicable to the area in which his proposed subdivision is located and is given direction as to the process to follow. Applicant then decides his layout, etc., and makes an application.

(b) Applicant submits to the District Highways Manager a sketch of the proposed layout, one copy of the Certificate of Encumbrance or a photostat of a Certificate of Indefeasible Title, one copy of percolation test (where required) and one copy of water table elevation test (where required). District Highways Manager checks to see that documents have adequate information and, if larger than legal size, are on tracing paper to be reproducible. He also checks sketch to see that it:

(i) shows all proposed lots and remainder, with approximate dimensions and areas;
(ii) shows all proposed and existing roads, with widths;
(iii) shows all bodies of water;
(iv) shows surrounding properties;
(v) give legal descriptions;
(vi) is scalable (and scale is shown);
(vii) has North point;
(viii) shows jurisdictional boundaries;

(ix) shows intended land use;
(x) shows location of percolation and water table tests;
(xi) shows red outline;
(xii) has Land Use Contract or Development Permit attached where applicable.

(c) The District Highways Manager then reviews the application to see what agencies may be involved and prepares necessary number of photocopies or prints for distribution. He retains originals for his file. He assigns each proposed subdivision a consecutive log number which is to be used in conjunction with the standard file number in all correspondence with all agencies and applicant to facilitate reference. These numbers are not cut off and returned to zero at any time.

(d) Agencies involved include: for

A. Roads - Ministry of Transportation and Highways
B. Parcel size less than 20 000 m^2 and no sewer - Medical Health Officer
C. Regional District - Regional District Planner (if no Planner, then Secretary-Treasurer)
D. Water District - Secretary of the Water District
E. Improvement District - Secretary of the Improvement District
F. Specified Area - Regional District Planner (if no Planner, then Secretary-Treasurer)
G. Water system (not in Water District of Specified) serving five or more - Community Water Supply Section Technician of the Local Water Management Branch
H. Water system serving five or more - Regional Public Health Engineer, Ministry of Environment
J. Water License - Regional Manager - Water Management Branch, Ministry of Environment
K. Changes to a watercourse - Regional Manager, Water Management Branch, Ministry of Environment
L. Sewer system - Regional Manager, Waste Management Branch, Ministry of Environment
M. Sewage discharge into ground, air or water (except:

(a) discharge of domestic sewage emanating from a single or double unit dwelling.

(b) discharge of domestic sewage totaling less than 25 000 litres per day emanating from structures interconnected by sewage collection facilities and not discharging into a surface watercourse or surface body of water.

(c) discharge of plant and animal waste emanating from traditional farming operations which are managed and applied in a reasonable manner as organic fertilizers to promote crop production, and all discharges or emissions into the air from traditional farming operations).

- Regional Manager of the Waste Management Branch, Ministry of Environment

N. Near or abutting on a municipality - Clerk of the Municipality

P. Impact on wildlife habitat - Regional Manager, Fish and Wildlife Branch, Ministry of Environment

Q. B.C. Hydro - Local Manager.

R. B.C. Telephone - Local Manager.

S. School District - Secretary-Treasurer.

T. Gas Company - Local Manager.

U. British Columbia Agricultural Land Commission - General Manager.

V. Islands Trust - Manager.

W. Flooding, erosion and stream concerns - Regional Manager, Water Management Branch, Ministry of Environment

X. Ministry of Forests - District Manager

Y. Ministry of Provincial Secretary - Archaeology Division

(e) District Highways Manager sends one copy of the sketch plan as applicable to: C, D, F, N, P, W, requesting comments as per standard letter Clause (f) of Section 5.10, copy to applicant and Regional Approving Officer.

(f) District Highways Manager sends 2 copies of sketch plan, percolation tests and water table elevation tests, as applicable, to the Medical Health Officer, requesting recommendations as per standard letter Clause (f) of Section 5.10, copy to applicant and Regional Approving Officer.

(g) District Highways Manager sends 1 copy of the sketch as applicable to: E, G, H, J, K, L, M, Q, R, S, T, for information only as per standard letter Clause (g) of Section 5.10, copy to applicant and Regional Approving Officer.

** (h) Reporting agencies review the proposal and give their recommendations to the District Highways Manager with a copy to the applicant.

In the event that any of these agencies wishes additional information they will contact applicant to furnish the information. Copies of any correspondence should be sent to the District Highways Manager.

1. If agency does not respond within 30 working days, District Highway Manager will send a followup letter with copy to Regional Approving Officer.

2. If response still not received by 60 calendar days District Highway Manager will send all material to Regional Approving

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** Officer in the usual manner, with a notation that agency X had not responded. Regional Approving Officer will review material to see if he can approve without the agency response and, if he can, will do so. If he cannot, Regional Approving Officer will send reminder to agency.

3. If response still not received by 90 calendar days, Regional Approving Officer will advise Regional Director, Highways. Regional Director, Highways, will personnaly phone or visit agency X (and conform phone/visit with a letter).

4. If response still not received by 120 calendar days Regional Director, Highways, will report to Headquarters Approving Officer.

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(j) When comments are received from the reporting agencies, the District Highways Manager prepares his report on Form H.235P and submits to Regional Approving Officer.

(k) Regional Approving Officer reviews the material and gives it preliminary layout approval with conditions (or refusal with reasons) except:

(1) Subdivisions involving waiver of the 10% perimeter rule only in cases where the Regional District does not have a bylaw regulating same, where the matter is controversial or the Ministry of Transportation and Highways and the Regional District Planner do not agree; these are sent to the Executive Director who seeks the Minister of Municipal Affairs ruling.

(2) Subdivisions involving new location lines; these are sent to the Regional Superintendent of Design and Surveys for comments.

In these cases he awaits rulings and then advises the District Highways Manager the proposal has preliminary layout approval with conditions (or refusal with reasons).

(l) District Highway Manager then sends Form H.343 to applicant, with copy to all affected agencies, saying the proposal has preliminary layout approval and giving the conditions necessary for approval.

(m) The Applicant now makes his own direct approach for permits, etc., to affected agencies and receives such permits, etc., before commencing any works.

(n) Applicant undertakes all necessary road building, drainage, utilities and other required works and arranges for any necessary B.C.Land Surveyor Survey.

(o) Applicant submits final plans (or metes and bounds), fee, TX55, Section 75(1)(b) petition and photocopies of all necessary required permits, certificates, licences, approvals, orders, easements, leases, covenants, etc., to the District Highways Manager who will check satisfaction of all field aspects. The District Highways Manager then sends plans documents, and Form H235F to the Regional Approving Officer who approves or rejects plans.

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(p) If a final plan or metes and bounds is submitted that has not gone through preliminary layout approval it is treated as a tentative and goes through the whole process. If plan is for reapproval and there has been no change in policy or regulations, then the District Highways Manager only processes from step (o).

NOTE that short circuiting by applicants dissatisfied with time of process is to be strongly discouraged as it only increases delay for other applicants.

5.07 PROCEDURE FOR PROCESSING CONTROLLED ACCESS SUBDIVISIONS IN MUNICIPALITIES

(a) Municipality submits sketch to the District Highways Manager who inspects, reports on H.235M and forwards to Regional Approving Officer who replies with his ruling to District Highways Manager, who advises Municipality. Municipality then submits final plans (no fee or T.X.55 required) to District Highways Manager, who inspects and reports on H.235F to Regional Approving Officer. If compatible with tentative approval Regional Approving Officer approves the plan, and returns approved plans to District Highways Manager who takes paper print and returns plans to municipality.

(b) If subdivider sends plans direct to the District Highways Manager and they have no consent of the municipality indicated, then the District Highways Manager returns the plans to the subdivider advising him to submit them to the municipality. If municipality has already approved them, District Highways Manager will process as in (a) and when approved will return them to the municipality.

5.08 PROCEDURE FOR PROCESSING SUBDIVISION IN UNORGANIZED TERRITORY WHERE THE MINISTRY OF TRANSPORTATION AND HIGHWAYS IS NOT PRIME APPROVING OFFICER (Section 79(1) of the Land Title Act)

(a) Regional district submits sketch etc. to the District Highways Manager who inspects, reports on H235R and forwards to Regional Approving Officer who replies with his ruling to District Highways Manager who advises the Regional district. The Regional District submits the final plan (notice on TX55 required) to the District Highways Manager who inspects and reports on H235 F to Regional Approving Officer who approves. The Regional Approving Officer returns approved plans to the District Highways Manager who takes paper print and returns plans to Regional District.

(b) For procedure where subdivider sends plans direct to the District Highways Manager, see 5.07 (b) with necessary changes from "municipality" to "Regional District".

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1. Access by Air

Access by air is to be used for public and quasi-public purposes only, as for example a B.C. Telephone mountain top repeater site. It is not to be used for residential subdivisions and is not to be used as access to a lake so that access by water subdivision can be allowed on the shore.

2. Access by Easement

Access by easement under Land Title Act Regulations 334/79 is to be used sparingly for public and quasi-public purposes. For example, access into a B.C.R. microwave site could be by easement; or access to a reservoir for a Water District could be by easement. This provision may only be used to access one lot. It is not to be used for access to residential lots.

The easement is to be shown on the subdivision plan in broken lines with a space for the easement plan number to be entered on. When signing the plan the Approving Officer adds the notation "Access by Easement Only".

Under some circumstances plans may be approved where legal access is to a highway but vehicular access is by easement because of topographic reasons. These are not subdivisions under Land Title Act Regulations 334/79 so that we are not faced with demands for direct access. These cases will be rare as frontage or service road is generally required.

3. Access by Tramline

Pursuant to B.C. Regulation 334/79 of the Land Title Act Regulations, a subdivision connected to the highway system only by a tramline may be approved under certain circumstances. The lower tramline terminal must have access to a public road, the tramline must have an easement for its way across all properties and the upper terminal must give access to all proposed subdivision lots by a common lot private road. The purpose of this policy is to allow private ownership of cabins etc. on winter recreational mountains without involving us in road maintenance on the mountain. There must be adequate parking at the lower tramline terminal to the amount of one stall per subdivision lot plus one stall per 2 person hourly capacity of the tramline.

4. Access by Water Only

In certain circumstances a subdivision may be approved with access by water only. In these cases the subdivision will usually be remote from the public road system at large.

Subject to local conditions or location, the following conditions must be met:

Update

(a) all lots must be waterfront lots.

(b) the requirements of Section 75(1)(b) of the Land Title Act must be met and such roads shall extend for the depth of the adjoining lots and shall meet the "upland common lot" described in (c) below. Such road allowances shall be located and cleared to such a degree as to make them useable for boat landing and haul-up and pedestrian access.

(c) There shall be an "upland common lot" of 40 m minimum width connecting all upland boundaries of the waterfront lots which common lot must be cleared and maintained cleared. It shall be in common ownership of all the lot owners with a common responsibility to all. It shall act as a fire break in either direction and as a means of pedestrian access between lots and between road allowances dedicated under Section 75(1)(b). In consideration of the eventual creation of such common lot into a public road allowance if outside road access reaches the subdivision the approving officer shall consider the nature of the terrain involved and if natural obstacles to such eventual use are extreme then the subdivision may not be approved for such reason. If any part of the parent parcel remains upland from the common lot it must be hooked to a waterfront line lot to meet (a) above..

(d) If considered necessary by the Approving Officer the developer shall be required to provide a waterfront lot with public road access across the lake or inlet and such lot shall contain a boat launching ramp and parking facility for all owners to launch and park one boat and trailer and such lot shall be in common ownership to all the lot owners in the "water access only" subdivision.

(e) Each lot in the subdivision shall have a Restrictive Covenant placed upon it, worded to indicate that the land shall not be put to such use as to require access by other than water. Such "use as to require access by other than water" shall include use of the land to require outside services such as any commercial services, power, water sewer, telephone, schools, fire service or public roads.

In some cases the subdivision may clearly be against public interest because excessive public costs may follow (e.g. history of demand to extend public road system to area of subdivision, possible demand for ferry service, etc.). These cases should be referred to Headquarters for direction.

5. Access to Body of Water

A. Access General

Access to a body of water is a statutory requirement under Section 75(1)(b) and 75(1)(c) of Land Title Act Regulations. If the bed is owned by a person other than the Crown access to a body of water is not required where:

1. In the case of a lake or pond, the surface of the body of water at mean annual high water is less than 1.5 ha and the mean depth at mean annual high water is less than 0.6 m, or;

2. In the case of a river, creek or watercourse, where the average width at mean annual high water is less than 6 m and the average depth at mean annual high water is less than 0.6 m or;

3. In the case of a reservoir or pond where the bed is owned by a public body other than the Crown and used for the purpose of domestic or industrial water supply;

Access spacing is 200 m except where the lots are equal to or greater than 0.5 ha on rural areas where the spacing is 400 m. Where one or more of the waterfront lots is less than 0.5 ha then the 200 m applies to the whole waterfront in the subdivision. Where the layout of the proposed lots is to take advantage of and follow the contour of the waterfront, then the length of waterfront for determining number and location of accesses, etc., is to be measured as a series of 15 metre traverse legs along the waterfront. Where the layout does not follow the contour of the waterfront the length is to be measured along the general trend of the waterfront as a series of 200 metres traverse legs.

Where an access already exists in the vicinity of the subdivision the access points required are to be located at 200 (400) metre intervals. Where no access exists a suitable location is to be chosen for one within the Lands being subdivided and the others may then be located at 200 (400) metre intervals. Road allowance width for an access is 20 m. This may be reduced where the waterfront is less than 200 (400) metres long.

A remainder shown on a subdivision or reference plan is considered as a lot in the subdivision when its size is such that it cannot or is not likely to further subdivide. Access to water at 200 (400) metre intervals may be required in the remainder.

Park dedication is not acceptable for access to water; there must be public road dedication.

A ferry landing or bridge head is not an access to water unless it was originally dedicated by a subdivision or reference plan.

Where a Municipal Official is the Approving Officer, the building of such roads is to be to his bylaws and standards and the Ministry will not be concerned whether or not a road is built. Where an access road does not serve as access to any lots and topography is difficult, the 12% maximum grade may be reduced to 25%.

B. Partial Relief

The Approving Officer will consider granting partial relief (from the strict provisions) to vary the strict spacing of 200 (400) metres and to allow consolidation of the required allowances where desirable.

The normal 200 (400) metres can be freely varied to meet topography, beach quality, etc., but the spacing should generally not exceed 300 (600) metres, unless consolidating. This requires partial relief.

Consolidation may not be demanded but may be suggested to the subdivider and recommended to the Approving Officer. Normally not more than three accesses should be consolidated into one. The width of each access to be consolidated is 20 metres regardless of slope grade at the point at which the access would be if it were not consolidated. When consolidation is proposed the number of accesses to be consolidated is calculated by dividing the waterfront length by 200 (400) and rounding the answer to the next higher integer. Where accesses exist in adjoining properties closer than 200 (400) metres to the boundary of the subdivision the waterfront length is to be reduced accordingly. For example, where a subdivision has a waterfront length of X metres and an access exists in adjoining property Y metres from the boundary of the subdivision and Y is less than 200 (400) metres then the number of accesses required is (X + Y - 200) : 200 or 400 rule. The consolidation width of number of accesses multiplied by 20 metres is to be carried at this width from the waterfront to the next cross street, or for 100 metres from high water mark, whichever is the lesser length. The point of location of a consolidation must be where the waterfront has representative quality compared with the rest of the accessible waterfront.

In the case of creeks that are not navigable but are in the Crown's title, it is necessary to have access in order to get equipment such as dozers, etc., in to the creek to work in it. So that there

are no claims for trespass and in order to satisfy the need for access to what is Crown property, it will be sufficient in these cases to have subdivider create a 6 metre wide lane from the road to the creek at a suitable place. This requires partial relief.

C. Absolute Relief

The Approving Officer will consider granting absolute relief when:

(a) a parcel is being conveyed to the Crown Provincial or an agency thereof, or;

(b) a subdivision is solely to adjust a boundary and does not create any additional lots;

(c) a non-development subdivision in which property is in Agricultural Land Reserve.

Before granting relief the Approving Officer will require in all cases the statutory declaration of the subdivider or his agent as provided for in Section 76(1) of the Land Title Act, and the recommendation of the District Highways Manager. For subdivisions where a Ministry of Transportation and Highways official is the Approving Officer the subdivider may submit his declaration with the subdivision tendered for approval to the District Official, Ministry of Transportation and Highways. For subdivisions where a Municipal official is the Approving Officer the subdivision plan, statutory declaration and the Regional Approving Officer's recommendation should be mailed by registered mail to the Regional Approving Officer.

The Statutory Declaration should be that of the surveyor, subdivider, or his solicitor, and should contain:

(1) The deponent's full name, address, occupation, and a statement to the effect that he is personally familiar with the Land in question. Also reference should be made as to the owner of the Land.

(2) That the Land to which the Declaration pertains is that described on the plan attached thereto.

(3) The reasons for which it is desired Section 75(1)(b) or (c) should be waived or not strictly complied with.

(4) Where alternative accesses or facilities are being provided in lieu of those in compliance with Section 75(1)(b) or (c) then these should be described.

(5) The distance from the border of the subdivided land of the nearest public access within 10 or 20 chains of the subdivided land, together with the width of the access.

(6) If the entire area of the subdivided land or the location of any access within 200 or 400 metres is not shown on the attached plan, then a sketch to scale is to be provided showing this entire area together with the access.

(7) The intended purpose for which the subdivision is being made, i.e. residential, farming, resort, industrial, etc.

6. Access to Subdivisions Off Maintained Section 4 Roads

We have had several difficult problems where we approve subdivision or development of property whose access is by an unmaintained section 4 road. While we are certain in our own minds that a road is section 4 the standard of proof required by the courts can seldom be met. The courts tend to require all of:

- statements by workers that they worked on all of the road in question
- statements by senior officials that the expenditures were authorized
- some survey proof of location of the road
- file evidence of the expenditure
- evidence of continuity in time.

In dealing with recently (and more frequently) maintained roads this is not difficult to meet. But in older unmaintained roads this is usually very difficult to meet.

In those cases where development is to be off an unmaintained Section 4 road please arrange to confirm the status (and width) of the road by gazette, H Plan (or whatever) before giving PLA.

In addition in those cases where there is no difficulty about the section 4 status but there is some doubt about the right of way width, the width shoud be confirmed before PLA.

7. Accreted Land

The Land Title Act Section 95 allows owners to gain title to accretions by subdivision plan where the Minister of Lands, Parks and Housing consents. This is a simpler procedure than the Land Titles Inquiry Act which, of course, is still used where the Minister opposes. Under common law the owner owns the accretion and the process is to get title. Adding accretion to one existing lot by consolidation does not require our approval. If a subdivision into two or more lots is proposed at the same time, it is treated as an ordinary subdivision. Note that accreted lands often flood. The Minister of Lands, Parks and Housing certifies the accretion after the plan has gone to the Registrar.

8. Air Space Titles

Part 9 (Sections 135 to 143 inclusive) of the Land Title Act allows for the raising of separate title to property in the air in three dimensions. The Minster may create air space parcels above highways. Use of this will be rare and will be confined to cases

where a commercial or public building is proposed over a highway right-of-way. Creation of separate title allows leasing of the parcel, which makes financing the building less complicated and clears up any doubt about the ability to tax the building. The Crown will not sell such parcels as the long term position is not clear. Requests should be investigated and a report sent to the Executive Director.

9. Common Lot Subdivision (4.15; 5.01(b))

In rare cases a subdivision with a common lot instead of a road may be allowed pursuant to Land Title Act Regulations 334/79. Since anything less than a public road is not considered full access, this procedure should be used very sparingly and for a handful of lots only. It may be used in cases where it is not desirable to involve Government in expensive road maintenance such as ski developments, remote small islands, etc., where costs of road maintenance would be unreasonably excessive. It should not be used in places where drainage and erosion maintenance is difficult or snow plowing required. Experience indicates the owners do not maintain and consequently damage from diverted drainage and erosion takes place. Furthermore, they do not plow and merely leave their autos on the nearest plowed public road. The road built on the common lot should not be less than 3.5 metres wide, nor steeper than 25%. Curve radius should not be less than 15 metres. Drainage and erosion must be very closely watched. Paving may be required on steep grades. Right-of-way width for the common lot should be 15 m or the cross section plus 3 metres, whichever is greater. There must be vehicular access to all lots. Road construction must be completed before plan approval and no bond may be taken in any circumstances. All such subdivisions must still satisfy Section 75(1)(a) and (b) in other respects. Access to water and lands beyond must be by public road to standard. If these standard requirements cannot be satisfied the proposal is not approvable. The common lot does not have to satisfy parcel size requirements. Note that it cannot access a remainder.

10. Company and Lease Evasions

Some persons attempt to evade Land Title Act and various other regulations by dividing up their land with shares in a company or by unregistered leases. These schemes are usually legal. The company share method is defined as a "cooperative corporation". The cooperative cooperation must be registered under the Company Act and if shares are not offered for sale or lease no approvals are required. If shares are to be offered for sale or lease Section 50 of the Real Estate Act comes into effect and the approval of the Approving Officer is necessary. In such a case the requirements of Part 6 of the Land Title Act plus the requirements of regulations and policy respecting conventional subdivision should be met.

Applicants considering these approaches should be advised of the disadvantages such as the difficulty of obtaining mortgages, etc.

11. Cost of Inspection

Where the cost of inspecting a subdivision is excessive it is permissible to charge the subdivider for the cost. However, he is to be told before inspecting that it is necessary to charter an aircraft (or whatever) at estimated cost of $X. If he objects his proposal is not approved. If he consents his money should be obtained before the trip is made. Effort should be made to contact others involved, such as Health Inspector, etc., so all proceed on the same trip.

12. Covenant under Section 215 of the Land Title Act

In cases where a parcel cannot satisfy sanitary regulations, where the Deputy Minister of Environment conditionally consents to the subdivision under Section 82(1) of the Land Title Act, where part of the lands to be subdivided are subject to hazard or landslip or erosion, or where approval is based on specific land-uses only or denying specific land uses; a covenant may be required as a condition of approval. The impart of the convenant is to be given to subdivider, e.g., "no building except boat houses may be erected between the road and the waterfront", "no dwellings may be erected", "the land is to be used only for an unattended telephone exchange", etc. The subdivider or his lawyer then draws up the covenant. If the wording is satisfactory to the District Highways Manager he forwards the original and one copy with the final plans to the Approving Officer, who will then endorse on the covenant these words:

> "This is the instrument creating the condition or covenant entered into under Section 215 of the Land Title Act by the registered owner(s) referred to herein and shown on the print of the plan annexed hereto and initialled by me."

_____
Approving Officer,
Ministry of Transportation & Highways

He will also have written on the plan by the subdivider:

> "The registered owner(s) designated herein hereby declare that they have entered into a condition or covenant with her Majesty the Queen in right of the Province of British Columbia as represented by the Minister of Transportation and Highways under Section 215 of the Land Title Act."

Subdivider is to produce a Certificate of Encumbrance and this is to be checked against the convenant document to see that all persons with an interest in the land have signed.

In the specific cases where the convenant is required by the Deputy Minister of Environment under Section 82(1) of the convenant must be in favour of the Ministry of Environment and the Regional District. The notation on the plan must also be worded to reflect this.

In some areas covenants have been used indiscriminately in the case of rock ground to allow subdivision without first hauling in 1.2 m of porous soil. It is desirable to de-emphasize this as a matter of public policy. Therefore the covenant approach should be used when only a few lots are involved; as for example a subdivision of 4 lots or less, or a larger subdivision where only a handful of lots do not perc. In other cases the covenant approach for alternate sewage disposal (i.e. fill) should be declined.

Care should be taken to ensure that the wording is no more restrictive than necessary to achieve our objective. We will not accept a covenant which requires our signature unless we covenant to do something other than simply releasing the covenant as in Example 2 of the sample covenants.

Where a covenant is required to prohibit something until something else is done it should be written as shown in Example 2 of the sample covenants. The Minister is not required to sign a covenant to create the condition, but must sign and seal to release a covenant where required.

When a property owner desires to be released from a covenant he must forward a written request with release form, Form R, and a copy of the covenant to the District Highway Manager, who will obtain a written statement from the authority having jurisdiction that the requirements for release have been fulfilled. The District Highways Manager will then forward copies of all submissions to the Regional Approving Officer.

13. Creek Protection

The Fish and Wildlife Branch will often recommend protection of a creek's banks to maintain wildlife equilibrium. In such cases the subdivider should be required to return to Crown a 7 m wide strip back from the High Water Mark under Section 729(11) of the Revised (1985) Municipal Act. Only 5% of the land being developed can be required without compensation. This dedication cannot be insisted on for subdivision less than 3 lots or where the smallest lot being created is larger than 2 ha or to consolidation of existing subdivision parcels.

In cases where we cannot insist on dedication the subdivider should be asked if he will return to Crown the 7 m strip (plus the creek bed if he owns it). If he declines we will require a covenant on the creek and strip requiring no building construction or clearing of vegetation without the prior consent in writing of the Regional Manager, Fish and Wildlife Branch, Ministry of Environment. All contact must be with Provincial officials - not officials of Canada Department of Environment, or Canada Department of Fisheries and Oceans.

Where the creek is not already a defined boundary of some sort the Registrar will likely require a traverse to tie the covenant to. The traverse should generally follow the course of the creek. The covenant is best worded in relation to the traverse rather than the bank or centreline of the creek. If traverse runs down approximate centreline, wording should be "x metres (7 metres plus one-half creek width) from the traverse".

14. Dedication of Road by Gazette

In those cases where dedication of road is by gazette it is necessary to obtain a $1.00 right-of-way agreement. The applicant prepares a Statutory right-of-way plan and Property Services will obtain the $1.00 agreement. Property Services will deposit the Statutory right-of-way plan to effect the legal survey and then the Statutory right-of-way plan is gazetted.

15. Deposits for Road Construction and Paving

Deposits may not be accepted for road construction. They may, however, be accepted freely for paving, especially where it is desired to have underground utilities installed prior to paving. Where roads are substantially completed (i.e. subgrade built, base gravel applied and drainage operative) and weather is adverse, deposits may be accepted up to $50,000. If value of work to be done exceeds this, the plan should not be approved and no deposit taken. There is no limit on paving deposit. Where a deposit is received the Ministry is responsible for all surface and drainage maintenance from the time the plan is registered.

The amount of work to be done should be estimated by the District Highway Manager, using full outside rental rates. He should add a small percentage to allow for inflation and to act as an incentive for the subdivider not to renege because of a favourable price, but his figure should not be unreasonably high.

Certified cheques made payable to the Minister of Finance & Corp Relations submitted by the applicant only, are to be accepted. Form H353 is to be used when letters of credit used. Refunds will be made to the applicant as the Ministry will not be involved in third party dealings. If the cheque is submitted by a person not the applicant it is to be declined and applicant told it must come in his name. The usual interim receipt is to be issued and the cheque forwarded to the Comptroller of Expenditure with a covering letter explaining the purpose of the deposit, the name and address of the applicant and also the legal description of the subdivision.

Director, F & A

If applicant wishes to submit cash or parity bonds they are not to be accepted locally for security reasons. Parity bonds will be accepted provided the applicant or his banker forwards them direct to the Registrar, Ministry of Finance, Victoria, with a covering letter giving his name and address, the purpose of the deposit and the legal copy description of the subdivision. Applicant must be told to send a copy of this letter to the Comptroller of Expenditure so that we can know the deposit is made. Deposits are not to be accepted for water, sewer or dike construction.

Difficulty and confusion has arisen from the fact the District Officials have been accepting deposits from various firms or individuals to guarantee the completion of work required within subdivisions, in order to meet ministerial requirements.

The party to whom the deposit should be refunded is not always clear due to:

- the number of interested parties involved.
- the source from which the funds were originally obtained.
- the work remaining to be done.

All deposits for such work are to be obtained from, and refunded to, the party who makes application for the subdivision approval. This is in fact the only party with whom we should have direct dealings.

If, for financial reasons, money is advanced by anyone other than the applicant, then the mechanics involved must be worked out and resolved between the two or more parties. The Ministry will not become involved with second and third party arrangements.

Also ensure that the complete legal description of the subdivision is given in the letter accompanying the deposit.

16. Disapproval of Plans

Approving Officers disapproving plans should give the cause for disapproval and, where possible, what the subdivider could undertake in order to make his plan approvable. Letters of disapproval should be carefully written and use as much of the relevant wording in the Land Title Act as possible. Applicant should be told "the Ministry of Transportation and Highways does not approve...", rather than "the Approving Officer does not...", etc. if final plan.

17. Discussion with Applicants

It is most important that all persons in the Ministry be most careful what they say to applicants. Many applicants interpret casual statements as gospel and make extensive investment on the basis of off the cuff remarks from officials. They will also interpret silence as approval or as no need to get approval. Two recent examples will illustrate the problems.

(1) A developer who proposed a major hotel approached one of our Property Negotiators to acquire from the Ministry some surplus property to add to his site. He did not get the property. Later when we refused rezoning for the hotel he argued he had put substantial investment into the land and plan design believing he would get rezoning because the Property Negotiator had not told him he could not.

(2) A developer proposed a large residential subdivision and concluded he did not need preliminary layout approval. He commenced construction of his roads. Our alert Foreman, noticing this, began dropping by the work to check on construction standards. Later when the subdivision was presented it was rejected fo several reasons. Applicant argued on several grounds, one of which was that our Foreman had inspected the subdivision several times and raised no objection (the roads were well built) and that this therefore constituted preliminary layout approval.

Fortunately we were able successfully to resist both cases. They do illustrate, however, a fairly common attitude on the part of applicants and one that has dangers for the Ministry. It has been held, in some cases, where an applicant has dealt with an official and not been told something contrary that that official is in a position to know, that the official has "held out" an approval and judges have ordered permits to be issued, plans approved etc. In neither of the two cases above could the official be classed as one in a position to know. However, it would have been better had the Property Negotiator told the applicant that his development might need Ministry approval and he should check with District Highways Manager. Similarily it would have been better if the Foreman had told the subdivider he was only inspecting road construction standards and all other features of the subdivision required approval in the usual manner. (No emphasis is intended here on Property Negotiators or Foremen -- this problem goes through most of the classifications and ranks in the Ministry and it is not intended here to point the finger at anyone).

It is most important that field personnel NOT give applicants encouragement of approval or attempt in any way to predict the decision of the appropriate approving officer. It is important that they not reveal what they are recommending -- we have several difficult cases where applicants have invested substantial money in works, etc. following encouraging verbal statements by District personnel that were not borne out by the Approving Officer's decision.

18. Disposal of Subdivision Records

All correspondence and plans for approved and unapproved, tentative and final, Controlled Access and ordinary subdivisions are to be kept on file at Regional and District offices for 10 years from date of application, except that in the case of subdivisions with conditions or covenants records are to be kept at District offices until those conditions or covenants are discharged. Registered plans may, of course, be extracted and kept in drafting offices indefinitely for road records, composites, etc.

19. Easements for Road Drainage

Easements for road drainages may be required as a condition of approval where necessary. They should be located in places where they will have a minimum effect on property values. The easement should be wide enough to get equipment in to maintain the drain where necessary, which probably means a minimum of 6 metres.

Note that any diversions of watercourses, or improvements to watercourses, require a Water Licence from the Comptroller of Water Rights.

The easement documents are prepared by the subdivider following the standard in 5.09(1) and submitted with the subdivision plan. There is to be a notation on the plan:

"The registered owner(s) designated herein hereby declare that they have entered into a right-of-way agreement with her Majesty the Queen in right of the Province of British Columbia as represented by the Minister of Transportation and Highways under Section 214 of the Land Title Act."

and on the easement document:

"This is the instrument creating the right-of-way entered into under Section 214 of the Land Title Act by the registered owner(s) referred to herein and shown on the print of the plan annexed hereto and initialled by me."

_____
Approving Officer
Ministry of Transportation
& Highways

Subdivider is to produce a Certificate of Encumbrance and this is to be checked against the easement document to see that all persons with an interest in the land have signed. The subdivider deposits the easement documents at the Land Title Office at the same time as his plan.

20. Erosion (4.04 - 4.06)

A subdivision subject to erosion should be refused. However, where intended land use is compatible (i.e. grazing, logging) the plan may be approved subject to a covenant under Section 215 limiting the land use.

21. Evaluation of a Proposed Plan

A proposal should be viewed as a total development, not just as a paper plan or splitting of title. The subdivision enables a development to take place and this development should be evaluated. There are four main aspects to evaluate: Traffic, esthetics, environment, safety.

Traffic: See chapter 7

Esthetics: This is of course a most subjective area and should be approached with caution. The natural beauty of the area should be appraised -- skyline, view, streams, cliffs etc., and then the development visualized in the setting to see what impact it may have. In many cases the mere existence of any development may well destroy the esthetics completely and there is little that can be done in these cases unless the natural beauty is very strong in which case it may be refused as not in the public interest. In other cases it may be possible to ameliorate the impact by judicious lot siting etc. to put dwellings below a skyline, leave tree screens, increase clearances from streams, etc.

Environment: Strictly the environment is anything that the proposal will interact with. It can probably be best evaluated in terms of consequences in various areas of concern such as:

effect on adjoining property
impact on school needs
social consequences
servicing needs - water, sewer, mail, ambulance, fire, police, school bus, storm drainage, gas, phone, power etc.
impact on wildlife

Safety: This includes landslip, rockfall, flood, erosion, snowslide, etc. These factors should be evaluated in every case and taken into account in relation to land use. Areas of little human activity (such as grazing pasture for example) or areas of light visiting activity that is controllable (such as day use parks for example) may be compatible still with inadequate safety features. However areas of intense human activity, especially dwellings and places of employment, are not compatible with inadequate safety features and should in the first instance be refused. It may be that applicant can offer remedial or protection works to satisfy in which case if these are done and if they are guaranteed to be maintained by a public body with taxing powers and, of course, if believed efficacious by experts in the appropriate field, they may then be allowed. In borderline cases the applicant should not be given the benefit of the doubt -- public safety must be paramount.

22. Existing Buildings (4.14)

no mortgage

Existing buildings may be left on the right-of-way in exceptional circumstances. A permit may be issued with endorsements to the effect that no additions or major alterations are permitted and the buildings must be moved off at owner's cost on receipt of 90 day written notice. No gas pumps or gas station may remain on the right-of-way. New lot lines may be located so that buildings do not conform to the 4.5 metre setback (if this is compatible with our interests, especially sight distance), but may not be located so that sewage disposal regulations are not satisfied. Thus no lot line may be within 0.9 m of a septic tank or 3 m of a tile field.

23. Farmland

A subdivision in Agricultural Land Reserve shall not be permitted without the permission of the Agricultural Land Commission except as noted in paragraph 2. Such subdivisions are to be refused due to being in Agricultural Land Reserve (and all other reasons) as per form H343C.

Under certain circumstances, B.C. Regulation 7/81, clauses 1(1)(a) and (b) allows subdivisions to be approved without permission from the Agricultural Land Commission. Final plans require a notation in the form outlined in Schedule A of B.C. Regulation 7/81.

If the Agricultural Land Commission allows the subdivision, the Agricultural Land Commission will send District Highways Manager a letter, giving conditions. If the final differs significantly from the sketch approved by Agricultural Land Commission it is to be refused, with a copy of the letter and plan to Agricultural Land Commission.

In cases where the subdivision is for farm purposes or hiving off dwelling etc., and not developmental, we are agreeable to satisfaction of access to lands beyond by easement in those cases where there is no foreseen need for public road as an extension of the network to serve the area. Location and width of easement can be left to the parties to agree although width should not be less than 6 m and line should be within driveway standards. Applicants should be reminded the easement may need to allow power, phone etc., as well as roadway.

Where the Commission sets forth conditions that are not within our own interests the covenant should be in favour of "Provincial Land Commission".

(Example:

1. Property to be used only for spray irrigation from sewage of existing trailer park.

2. No expansion of existing trailer park on to new property.

Neither affects our interest).

24. Flagging (4.07)

Flagging may be requested but it is anticipated it should be required only rarely and principally to assist Health Inspectors. It is assumed that Ministry personnel can generally find themselves on the ground from a plan, although in the case of large subdivisions flagging may be needed to assist, particularly if there are geotechnical concerns.

25. Flooding (4.04 - 4.06)

Land subject to flooding should not be allowed to subdivide without prior consent of Deputy Minister of Environment (Section 82 of Land Title Act). However, under some circumstances where land use is low intensity (pasture, etc.) it may be recommended by Region to check with Deputy Minister of Environment subject to a no-building covenant or fill to a specified elevation or both. Note that Water Resources may refer to filling dwellings' sites only. This does not protect the land as required in Land Title Act. This Ministry therefore requires fill for the whole subdivision. This may be relaxed where parcel size is 2000 m^2 or greater. Fill for road will still be required in these cases.

Identification of land subject to flooding is not always easy. For the major streams (such as Fraser River, etc), where records are available an indication of hazard levels may be obtained from the Regional Engineer, Water Resources, and subdivisions below these elevations refused. For smaller streams with inadequate records, arrangements should be made so that no building is constructed closer to the high water mark of a lake or swamp than 7.5 m or closer to the high water mark of a stream than 30 m and not less than 3 m higher in elevation of high water mark of lake, swamp or stream. Thus, were no records exist, the flooding is assumed to be 3 m higher than apparent high water mark and 7.5 m horizontal from high water mark for lake or swamp and 30 m horizontal fro stream, whichever gives the greater limits. This is for land subject to flooding by inundation. Flooding of the more erosive kind (flash floods, fans, creeks jumping banks, etc) is not so amenable to arbitrary measurements. In these cases judgment is necessary. In particular, most certainly the steeper fans and larger creeks should not be subdivided.

Land behind dikes is subject to flooding in this context. However, subdivisions in the Lower Mainland to the parcel size requirements of the Lower Mainland Regional Planning Board Plan may be allowed behind dikes (check for farmland). Land behind all other dikes must be considered as subject to flooding.

In the event a proposal is approved by the Deputy Minister of Environment subject to some protective works, those works must be owned and operated by some authority with taxing powers. This means an Improvement District, Regional District (Specified Area) or Municipality. If the applicant cannot form such an authority, or get one to assume the responsibility, the proposal is not to be approved.

26. Forest Access Roads

Forest Service access roads are not public in the full sense, so subdivisions using them as access may generally not be allowed. Under special circumstances subdivisions may be allowed using a Forest Service road as access under the Highway Alternatives Access Regulations 334/79. These proposals must conform with the regulations as to width of road, size of bunks, and land use, and require the consent of the ~~Deputy Minister of Forests~~ Officer in charge of the Engineering Branch, MoT on the final plan. At the preliminary stage the local Forestry office should be contracted to see if the Forest Service Road meets the minimum standards set out in regulations.

In cases where the intended land use is forestry related or agricultural they may be recommended freely if consent is given by ~~Deputy Minister of Forests~~. For other land uses they should not be freely recommended. The foreseen long range problem is that other land uses, particularly residential, will not be satisfied for long that the road remains Forest Road, because of lack of maintenance (especially plowing), and will press for conversion to public highway. Thus, such applications should be viewed, not in the light of whether they are desirable on a Forest Road, but rather in the light of whether it is in the public interest to have the road convert to public status, bearing in mind total public needs including reduction in size of log loads to legal.

In special cases, it may be desirable to convert a Forest Service access road into a public highway to serve a proposed subdivision. In such cases the local forestry people should be contacted and if they have no objection the subdivision may proceed. There must be continuity of the public highway so this can only serve where the Forest access road connects from its intersection with the public road up to the subdivision. The procedure for conversion is for the Forest Service to gazette the road closed and then the Ministry establishes ~~gazettes~~ it as a public highway. Any survey costs are at the Ministry's cost.

27. Frontage of Lots (6.08, 6.09)

The 10% rule should not be lightly cast aside. The chief objective of this rule for small lots is to ensure they have a reasonable shape so they can be built on without undue restriction of layout, and for large lots to ensure they can be further subdivided with reasonable option of layout. Waiver recommendations should generally be confined to

(i) pie shaped lot on cul-de-sac where the lot is minimum 15 metres at the 7.5 metre setback line.
(ii) panhandles
(iii) where topography is such that parcel boundaries are predicated on physical divisions.
(iv) where further subdivision is known to be imminent and able to comply.

Application for waiver under the Provincial Subdivision Regulations, the Regional Director of Highways or Regional Approving Officer grants the waiver for the Minister of Municipal Affairs.

Application for waiver under a Regional District bylaw is made by subdivider writing to the Secretary of the Regional District. Waiver is granted or refused by the Board or an employee authorized by the Board.

28. Green Belts (Public Open Space)

In certain cases dedication of public open space required under Section 729(10) and (11) of Municipal Act may be considered in the form of a green belt. The total amount of land required under these sections should not exceed 5% of the land being developed. This cannot be insisted on for subdivisions of less than 3 lots or where the smallest lot being created is larger than 2 ha or consolidations of existing subdivided parcels.

Where land being subdivided adjoins a body of water a strip up to 7 metres wide may be required. This should only be required where protection of a resource is critical, such as to maintain wildlife equilibrium, where there is public demand for access such as for sports fishermen along rivers, or where the Regional Districts official plan shows as green belt. This green strip along a body of water should be shown as "Park" or "Return to Crown" on the subdivision plan.

Dedication of public open space for green belt purposes can be required under Section 729(10) of Municipal Act. These dedications should be considered where appropriate and generally left in their natural state. Dedications under Section 729(10) must be shown as "Park" on the plan of subdivision. The Regional District should be consulted prior to requiring such a dedication. Where they have the community park function, their comments should be supported.

29. Ground Water Table Elevation (4.06, "B" 4)

The ground water table elevation test is an important part of the Sewage Disposal Regulations. If the tile field is in water, aerobic bacteria do not function and the (already dubious) efficiency of the septic tank system is reduced. If the water is flowing it may well remove the effluent with it and carry it to a highway ditch or some other property's source of domestic water.

Care must be taken in interpreting the results, as a hole that is dry in summer may well be full of water in the winter. However, it is not generally desired to require all holes to be put down in the worst time because of time involved; nevertheless judgement and local knowledge will indicate whether a wet hole at some other time is probable and the test result in those cases declined on the grounds that the sample is not taken at the optimum time. Such action should only be taken with the full consent of the Medical Health Officer - if done unilaterally you may find yourself out on a limb.

30. Hardship

Approving Officers should recognize personal hardship and exercise discretion accordingly.

Hardship varies with circumstances and is impossible to define quantitatively. It is a matter of pure personal judgment.

No profit objective company can undergo hardship. Hardship must be a personal thing. It must occasion an actual loss to the owner -- not just an absence of anticipated profit. It will depend on the personal circumstances of the owner and his ability to absorb a financial loss. Generally the hardshipee will be in the lower quartile of income and the subdivision will create 4 lots or less.

31. Hydro Right-of-Way in Subdivisions

When the necessary roads are provided on Hydro Right-of-way the Hydro easements and its position with the costs of moving lines, etc. are extinguished.

There are two main cases:

(1) Where a subdivision road is to cross a Hydro right-of-way,

(2) Where a widening of a highway infringes on a Hydro right-of-way which parallels the highway.

Hydro loses its position in both cases. Its freedom to locate poles is constrained by the presence of the road and it can be put into the position where the Ministry of Transportation and Highways can order it to move its poles at Hydro's cost.

In case (1) - Hydro and the subdivider agree on cost arrangements and this Ministry would take no part except to consider how the road location may minimize cost and still be within standards.

In case (2) - The subdivider replace, where possible the portion of easement lost by a compatible amount so that full right-of-way width for Hydro still be maintained.

Where possible the Ministry look at getting all widening on the side away from the Hydro right-of-way. The Ministry agrees with Hydro to accept the cost of future pole moving arising out of the loss of Hydro right-of-way to highway widening subject to prior appropriation of funds.

32. Improvement Districts (4.09, 4.10)

There is an anomaly in law in that the Municipal Act gives the Improvement District authority to enact subdivision bylaws presumably binding on the Approving Officer, whereas the Land Title Act only requires the Ministry to notify the Improvement District that a subdivision is offered. In practice we wish to have the consent of an Improvement District that has water as a function and only notify those that do not have water as a function. Thus a subdivision should not be approved unless applicant presents written proof of the Water District's approval. Most require only that water pipes be installed or a deposit made. On occasion, however, a District may appear to be stepping outside its interests and jurisdiction, such as for example demanding a park dedication. In these cases the matter should be referred by the Regional Approving Officer to the Comptroller of Water Rights and his expressed position followed.

Consent of the Water District is always required and importantly so in the Okanagan and Creston areas where ARDA has an interest in water systems. Under the ARDA program Water Districts may get money from Canada and British Columbia towards construction of agricultural systems. If land is subsequently subdivided into smaller parcels, and especially if it converts to other land uses, the subsidies are to be paid back. These can amount to several thousand dollars per subdivision which the subdivider must pay to the Water District before we approve his plan. In many cases, also, an Improvement District tax certificate is required before the plans may be approved. Region is to keep a list of Improvement Districts where requiring tax certificates.

If Water Districts take an unreasonable time to review a proposal or persist in giving vague answers, the facts are to be reported by the Regional Approving Officer to the Comptroller of Water Rights.

The provisions in 4.10 and 4.11 of the Regulations point out that a water system must be designed and built to the standards of the Water District. The water system must be installed before the plan is approved, except that if the subdivider comes to an arrangement with the Water District (generally a deposit or bond) and the Water District provides a letter saying it is satisfied, then the system need not be installed before approval. Note that it still needs design approval from the Division of Environmental Engineering in the Ministry of Health.

33. Indian Reserves

In recent years the Indian and Northern Affairs Department has undertaken some subdivision on some Reserves, thereby formally recording tribal subdivision. These subdivisions may show some public roads but they are not our roads and these plans are not in any sense to be approved by us. The Surveyor General of Canada files these plans in the appropriate Land Title Plan. Any points of doubt in these cases should be referred to the Chief Property Negotiator.

Subdivision can, however, also be undertaken under the Land Title Act (Section 107(2)). Such proposals must conform with Provincial requirements in all cases. (It is appreciated there may be difficulty in getting some other Ministries to report). An OIC is required in each case. Senior Approving Officer can assist with drafting. It is necessary in all cases that there first be a CLSR plan to use as the description. This is also required by Canada since the Indians must first pass title to the Crown Canada as only the Crown Canada can enter into lease agreements, etc. on Indian Reserves. B.C.L.S. will know what is required for a CLSR plan.

34. Intended Use (4.03)

Where the intended use is intensive, the proposal may be referred to the Director of Planning for comment. Such uses as shopping centres, industrial plants, etc., may have a big impact on traffic flows and should be carefully evaluated. Note also that the Regulations (6.05) require the subdivisions to be considered in the light of intended use. Where known the use is evaluated for sewage requirements; where not known the use is assumed to be one 3-bedroom single family dwelling.

Proposals should be evaluated also in the light of services required to fit the intended use. For example, regardless of lot size a residential lot needs a water supply. If there is not a spring in the lot or if there is not a reasonable probability that a reasonably shallow well will be successful, then there ought to be a public piped water supply.

35. Iron Pins

Plans surveyed more than about a year prior to approval should be carefully reviewed for the requirement of reinspection of pins by the B.C.L.S., particularly if there has been much construction of utilities and buildings which might result in loss of pins. Location of pins is not in our jurisdiction, except that you may object to pins in the proposed right-of-way as road and utility operations are likely to remove them.

36. Islands Trust

To be announced.

37. Lands Branch and Housing Subdivisions Road Construction

Roads in Lands Branch housing subdivisions are to be designed and built to the standard required from public applicants, no less and no more. Care should be taken to see that equipment does not stray off the road allowance into the lots and knock down trees, etc.

If the roads are also to be located and designed by this Ministry, care must be taken to see that standards are street standards and not highway standards. Grades and alignments should fit the topography and quantities minimized within Appendix A standards.

Lands Branch is now reserving a strip along the water in waterfront subdivisions. This may be designated "Walkway" on the plans. No clearing or construction is required and the Ministry is not obligated to any maintenance.

38. Landslip (4.04)

See Erosion.

39. Land Use Contracts

Land Use Contracts are no longer allowed. Where a subdivision is governed by a Land Use Contract the Land Use Contract still applies. Where subdivision is governed by a Land Use Contract the applicant should be asked for a copy. Where a parcel is affected by a Land Use Contrat the developer may apply to the Regional District or Municipality to remove or amend the Land Use Contract. If a Land Use Contrat has been approved by the Ministry, the Land Use Contract can only be amended or removed with the consent of the Ministry.

40. Lanes (5.03)

Lanes (alleys) have not been fashionable in recent years and we have acquired very few, partly also because we do not maintain them. They do, however, have a place in the scheme of things and in some circumstances are very useful. They can provide secondary access to parcels and are therefore useful where direct access is not desired, as in business districts or on major streets where the

entrance conflicts would reduce level of service to through traffic or pedestrians. They are also useful for narrower lots as carports, garages, etc., can access from the lane. In local street systems offering lanes, the street right-of-way may be reduced to 15 metres as utilities use lanes. Minimum width of lanes should be 6 metres.

41. Subdivision by Description

Subdivision by description only or reference or explanatory plan may be allowed under Section 99 of the Land Title Act, at the discretion of the Registrar. They can only be used to create one new lot and a remainder or to consolidate existing surveyed parcels. They cannot dedicate roads. They cannot be used more than once in a legal description.

42. Mobile Home Parks

Where the intended or existing land use is mobile home park in unorganized territory, the subdivision may not be approved unless a development permit applies. This does not apply to individual mobile homes on separate lots.

It is appreciated that this requirement is objected to by some Regional Districts particularly those that do not have zoning. However, it is required by law S 225, Municipalities Enabling and Validating Act.

43. Municipal Jurisdiction

Subdivisions in organized territory whose lots or remainder do not abut on a Controlled Access highway are entirely in the jurisdiction of the municipality. Municipalities should be encouraged to notify us of proposals abutting arterials so we can advise on drainage, intersection location and design, etc., but this is not an approval. Subdivisions whose lots or remainder abut on a Controlled Access highway are in joint jurisdiction. Our part in the approval process should be confined to Highways interests: drainage, access, land use, etc. We are not concerned about other matters such as parcel size, servicing, etc., which are of municipal interest.

44. Municipal Expansion, etc.

Where a municipality expands (or is formed) to include previously unorganized territory, the municipality immediately takes responsibility for subdivision regardless of any agreements on road possession, etc. Prior to the expansion preliminary approvals should be dated to expire the day before the expansion date as it is not possible to predict municipal approval although it is anticipated most muncipalities will, in effect, honour the P.L.A. In the case of non Controlled Access subdivisions all outstanding files should be immediately transferred to the municipality. For controlled access subdivisions photocopies of files should be transferred to the municipality. All files should first be reviewed for any sensitive material and this must be removed before

transmittal. Districts should retain photocopy of all files prior to forwarding to municipality. Assistance in the form of advice should be offered to the municipality where the expansion is large and this may be continued for several months.

45. Natural Environment

It is desired to protect the values of the natural environment as much as reasonably can be done. The presence of man is inimical to many species of wildlife and the balance of nature is very easily disturbed by his works. In particular subdivisions adjoining bodies of water must be carefully reviewed, as also subdivisions in areas of the habitat of endangered species. Reference may be had freely to Fish and Wildlife personnel for their advice and knowledge. No contact should be made with Canada Department of Environment as sufficient expertise exists in the Provincial Service.

The identification of natural environment values is often very difficult for a layman and good liaison must be maintained with local Fish and Wildlife officials and their brains picked freely. Generally there will be five main impacts on wildlife:

(1) Displacement of habitat by the development, e.g. - skylark requires tall grass which is usually not available in residential development where lawns are short.

(2) Injurious affect on nearby lands, e.g. - dogs from a residential development killing nearby rabbits.

(3) Blocking wildlife trails, e.g. - obstruction by fences, housing, presence of man and dogs, etc. of a trail used by deer to get to water.

(4) Removal of food sources by cultivation of other species, e.g. - crops, lawns, etc.

(5) Addition of food sources (e.g. phosphates in sewage) which alter species abundance with consequent impact on predator populations.

Officials should make themselves as aware, as they can, of species likely to be endangered, e.g. - California Big Horn Sheep, etc. and where their general habitats and ranges are, so that formal reference can be made to Fish and Wildlife biologists.

46. Natural Hazards

It is most important that natural hazards such as landslip, erosion, rockfall, snowslide, etc., be identified.

It is anticipated that most natural hazards on subdivision will be identified by our District personnel and will not need to be viewed in the PLA stage by our Geotechnical personnel. Most of our subdivision inspectors now have good experience in field identification and all should have the excellent book Geological

Hazard Evaluation for Highway Personnel (Buchanan 1980) which should assist. Thus when the Approving Officer receives the District PLA report on a subdivision and it identifies a natural hazard to the subdivision it will not be necessary in most cases to refer it to Geotechnical Branch. Only borderline cases need be referred and Geotechnical Branch should be only requested to comment on the probability and type and general extent of the hazard, and not to do a detailed identification and study. If you wish you may request an opinion on the likelihood that a detailed study would reveal that parts of the land could be developed safely but this must be done at the reconnaissance.

If the subdivision proposal is in one of the areas on which the Geotechnical Branch has done an area report, e.g., Penticton West Bench, and the whole property is considered subject to the hazard, then your decision and the District's letter to the applicant should refer to the report and any zone system within it. If only part of the property is subject to the hazard or the report offers hope that a building line/covenant area could be defined after detailed study then our letter to the subdivider should also say:

> "It is possible that a building line/covenant area could be defined on at least part of the property, thus allowing some development, under conditions. If you wish to proceed further with this aspect you should engage a qualified Geotechnical or Geological Engineer to advise you. We would appreciate three copies of his report with any resubmission."

In those cases where no area report exists then our letter should say "the approving officer believes that a natural hazard exists and it does not appear, on the face of it, in the public interest to approve the proposal as submitted for the land use intended, because of the possible hazard to persons and/or property".

We should then go on to say:

> "The approving officer's belief that the land is subject to natural hazard is based on a reconnaissance only. If you wish to explore this aspect further you should engage a qualified Geotechnical or Geological Engineer to advise you. He may, or may not, be able to recommend portions of the land for development, subject in some cases to permanent protective works. You should note that in many cases works are not economic and indeed can often cost more than the total development is worth. A full study is itself a certain expense and, if you do decide to explore this further, it may be prudent to engage him to do a preliminary overview study first in order to see whether it is worth going to a fully study. Such a preliminary study would likely include a review of air photos, regional reports on surficial geology, contour maps, etc., and may not always need a site visit. If you then believe it is worth proceeding with a full study you should ask him to identify the nature, extend and probable frequency of the hazard or hazards, and to recommend permanent

protective works, or detailed building lines, etc. It is difficult sometimes to quantify the frequency of occurrence of hazards but he should be asked to think in terms of a 10% probability in 50 years except for avalanches where he should base his work on the international convention of red and blue zones. If he has questions regarding terms of reference please ask him to contact me to discuss".

Ask for three copies of any reports.

Remember to list all other problems with the subdivision so we do not lead him on.

47. Objections from Interested Persons

Section 86(1) of the Land Title Act says the Approving Officer may hear from all persons affected by the subdivision, etc. This means he can hold a public hearing if he wishes; however, it is generally not advisable to do so as a public hearing is very vulnerable to attack by lawyers. It can be used where a controversial emotional issue is involved. It is recommended the Approving Officer hear from affected persons or their agents in private.

** 48. Offsite Road Improvements

This policy applies to residential subdivisions off all weather maintainable roads, within commuter range of centres of employment where an aggregation of at least 100 lots of less than 1 ha is likely to be produced in the next three years within an area of 2 km^2 or less. The policy does not apply to residential subdivisions for ski developments, townsites, etc., associated with resource developments, or recreational cottages unlikely to convert to all year residential in the next decade.

At the zoning stage our position should be that the ministry does not recommend against the proposal but does not point out that the approach roads are seriously below standard and that it is unlikely the ministry will be able to invest in upgrading the road, to carry the generated traffic at a reasonable level of service and safety, for at least several years.

Where the development application exceeds 49 dwelling units and the approach road is seriously deficient and an investment in works of the order of $2500 per dwelling unit would make a significant and perceivable improvement to the approach road, then our procedure should be as follows. The developer should be advised that the position of the ministry initially is that the proposal is not in the public interest. The reason being that the anticipated development will render the approach road inadequate or unsafe. Further to this indicate that as a matter of policy it is unlikely the ministry will be able to invest to improve the road for at least several years.

** Amendment

Then say that this problem could possibly be overcome by the developer investing in work on the road at his own expense, under ministry direction, and he should contact the District Highways Manager for detailed discussion. The District Highways Manager should then review and suggest perceivable improvements up to about $2500 per dwelling unit. However, in no case should the developer be asked to work on the road beyond the proposal. Bonding should not be encouraged.

When the development is less than 50 dwelling units and the approach road is seriously deficient the proposal should be approved (if otherwise in order) and the developer advised that further development will overtax the capacity and safety of the approach road and further approval may require investment on his part on the approach road.

In respect to the above "seriously deficient" could be a road 4.5 m wide where 6 m width would be sufficient. When indicating road inadequacy also give detail and when indicating the ministry cannot invest in approach roads, but he can do so, be sure to give notice of all other possible reasons for refusal so that he is not led on in the belief that if he invests in roads, etc. he will otherwise attain automatic approval.

49. Panhandles

Panhandles for single lots that cannot be further subdivided are 6 metres minimum width. If the lot can be further subdivided into two lots the width is 12 metres and if into three or more lots, 20 metres. If the lot is further subdividable the panhandle must be of such standard that it can become a future public road. If not further subdividable it must be suitable for entrance roadway standards of 3.5 metres width and 25% maximum grade. In some areas panhandles may be used extensively to create more waterfront lots or reduce road to lot ratio. In these cases back to back panhandles may be 3 metres wide provided each lot has an easement over the abutting lot's panhandle.

Note that panhandle lots require a waiver from the 10% rule.

Note also that panhandles for lots capable of further subdivision must be examined for compatibility as a future street - intersection, grade requirements, etc. Corner cutoffs are required in these cases.

Note also that the area of the panhandle is not to be calculated into the area of the lot for the purpose of meeting minimum parcel size.

50. Parcel Size (1.02, 6.01-6.07, 6.10, 6.11, "B" 1-3, 5)

Parcel size is largely tied to water and sewage disposal capability and therefore where so keyed the service must be guaranteed before the plan can be approved. Outside of Water Districts and specified areas (in Regional Districts) the only guarantee of water is a pipe in the ground and water flowing in it. Therefore, it must be installed and operable before approval of the plan, and no bonds or deposits or letters of intent, etc., will be accepted by the Ministry in lieu. Water Districts and Regional Districts may make their own arrangements and advise, in which case a plan may be approved. The same is true of public piped sewer. However, in no case do we insist on a private on-lot sewage disposal system (septic tank or what) being installed before approval.

Parcel size is also tied to land use requirements in areas where zoning bylaws are in force and in those cases the larger parcel size is to be followed. Some Regional Districts have no bylaw but have a Regional Plan which specifies minimum parcel size. In these cases, the Regional Plan parcel size supersedes the Provincial Regulations. Exceptions to bylaw and plan requirements are:

(1) Where one new lot is to be created for a residence for a relative (father, mother, father-in-law, mother-in-law, son, daughter, son-in-law, daughter-in-law, or grandchild of the property owner), and property owner has owned the property for 5 years or more, it can be approved (Section 733 Municipal Act) provided lot or remainder are at least 8000 m^2 or, if Medical Health Officer approved, at least 1 ha or, if Medial Health Officer approves, at least 2500 m^2, except that if remainder is agricultural it must be 2 ha. This cannot be done in a property more than once each 5 years. In these cases an affidavit is required from the owner saying he is the owner, that he has owned it for at leat 5 years, that it is for the purpose of providing a residence for a relative and the relative is (full name and relationship). This is subject to the prior approval of the Land Commission in A.L.R.

(2) In the event that creation of a road or fee simple right-of-way at some time past has produced a small severance that cannot by itself meet minimum parcel size requirements, it may be in order to approve such a small parcel as it has, in effect, already been created by the road. Such a small parcel should still be able to meet the Sewage Disposal Regulations for approval.

(3) Where a Subdivider is consolidating two or more existing small parcels into a lesser number of larger parcels, the proposal may be approved even if the new lots are still too small provided that the Medical Health Officer is satisfied they can meet the Sewage Disposal Regulations.

Water can be insisted on regardless of parcel size where it is deemed essential. This should be used in residential subdivisions where ground water supply is known to be scarce. Where proof of a potable water supply is required by the Approving Officer the applicant should be advised to prove 2500 litres per day per dwelling unit and should prove potability.

Note that in the event the subdivision offers a new parcel split in two by a road (with curlicue across showing one title), both portions must separately satisfy the minimum parcel size requirements. One exception to this may be a case where a small lot exists between road and a body of water and the Medical Health officer will not allow septic tank systems on the lots because they cannot meet Sewage Disposal Regulations. It may then be in order to allow a portion of the lot smaller than the minimum allowable to be hooked across the road provided its use is restricted to septic disposal purposes only.

51. Parks

Section 729(10) of Municipal Act allows the Approving Officer to require up to 5% of the land being developed for Park purpose. This does not apply to subdivisions of less than 3 lots or where the smallest lot being created is larger than 2 ha or to consolidations of existing subdivided parcels.

In cases where the Regional District has the community park function, they should be consulted as to whether or not park dedication is desirable, and if so, in what location. Generally, their comments should be supported. The act only provides for dedication and any other form of compensation such as cash in lieu of dedication should not be considered.

In cases where the Regional District does not have the community park function we should accept park dedication in proper locations and be of reasonable size and proportion. Generally the land should be reasonably flat and be larger than 4000 m^2 depending on the local need.

In some cases it may be more appropriate to require park dedicaton for green belt purposes (public open space). See 5.09(28) in such cases.

52. Percolation and Ground Water Table Tests ("B" 1, 6)

The Sewage Disposal Regulations give the right to make this test to the owner. Therefore his word must not be lightly rejected. If, however, there is good cause to believe that some results may be suspect, it is in order for you to undertake such tests at Ministry cost as you feel necessary to check the subdivider's statements. The accuracy of these tests is not very fine so results must be interpreted carefully. Any tests undertaken along these lines should be done with the full knowledge of the Medical Health Officer and his Inspector invited. The subdivider need not be told about them at all unless they prove his own statements substantially wrong.

53. Pipe Line Crossings

(1) Under the Provincial Ministry of Energy, Mines and Petroleum Resources

(a) The developer shall submit a sketch plan to the pipeline company for approval in principle which, when signed, is then submitted to the Approving Officer for tentative approval.

(b) When tentative approval has thus been attained, the developer shall then complete a survey plan and make formal application to the Provincial Ministry of Energy, Mines and Petroleum Resources with copies to the pipeline company and the Director of Bridge Engineering. Only the original plan (linen or transparency) shall be submitted.

(c) On receipt of a Certificate, issued by the Minister of Energy, Mines and Petroleum Resources, authorizing the proposed crossing, the developer shall construct the crossing and all roads to the satisfaction of the Ministry of Transportation and Highways and the pipeline company. Forty-eight (48) hours notice, in writing, shall be given to the pipeline company prior to the commencement of any construction work on the pipeline crossing. When construction is complete the pipeline company shall issue a letter of releases. The cost and expense of all construction shall be borne and paid by the developer. (See Rules and Regulations Made Pursuant to the Provincial Pipe-Lines Act, Chapter 60, 1955 Section 9(a)).

(d) The developer shall submit 'As Constructed' plans together with the pipeline company's letter of release to the Approving Officer.

(e) When approved, the Approving Officer replaces the lease or certificate covering the rights of the pipeline company by a permit granting the original provisions.

(2) Under the National Energy Board, Ottawa

(a) The Developer shall submit a sketch plan for tentative approval to the pipeline company and Ministry Approving Officer.

(b) (1) The developer shall submit a formal letter of application for the dedication of a road allowance across a pipeline right-of-way for each crossing to the National Energy Board, together with seven (7) prints of the plan that shall provide sufficient geographic reference to be located on a map.

(2) The developer shall submit a formal letter of application for authorization to construct a road within the dedicated road allowance together with seven (7) prints of the plan, which shall be as prescribed in the National Energy Board General Order No. 2, to the National Energy Board.

(3) The developer may submit one application for both dedication and construction providing the developer contemplates immediate construction on receipt of authorization. Seven (7) prints of the plan must accompany the application.

(4) The Approving Officer shall not approve a subdivision unless he is in receipt of a National Energy Board Order through the developer, either authorizing dedication only or authorizing dedication and construction over any pipeline governed by the Board. All correspondence shall be addressed to the Secretary, National Energy Board, Ottawa, Ontario K1A 0E5.

(c) The developer shall construct the road at the crossing to satisfaction of the Ministry of Transportation and Highways and the pipeline company, who shall be given forty-eight (48) hours notice in writing prior to the commencement of any construction work at the crossing. When the work has been completed, the pipeline company shall issue a letter of release. The cost and expense of all construction shall be borne and paid by the developer (see National Energy Board General Order No. 2, Section 8(7)).

(d) The developer shall submit "As Constructed" plans together with the pipeline company's letter of release to the Approving Officer.

(e) When approved, the Approving Officer replaces the lease or Board Order covering the rights of the pipeline company by a permit granting the original provisions.

(f) The developer, having deposited the "Plan of Subdivision" with the Land Registry Office, shall inform the National Energy Board of the change in authority governing the now public road and submit a copy of the deposited plan.

(g) The Ministry shall then receive copies of all Board Orders and plans pertaining to the crossing from the National Energy Board in recognition of the change in authority governing the crossing. Copies of all such Board Orders and plans shall then be distributed to the Region and District concerned.

There is no communication between the Ministry and the National Energy Board until item (g); thus the developer has to provide the Approving Officer with the Board Orders for subdivision approval.

Roads in subdivisions should be located as far as possible to cross pipelines at right angles and should not be located to run along them.

54. Plan Examination Fees

Preliminary (tentative) submissions do not require a fee. (We appreciate the fact that most of the work probably occurs at the preliminary stage, and that a conforming final, then takes much less time. However, the charge is not a compensation for all our time, but rather only a final plan examination fee required under Section 83(2) of the Land Title Act. The fact that we encourage preliminary submissions is our own policy and is not called for by the Act.)

If a Regional District requires a fee through a subdivision bylaw we will not collect the fee for them, however, the final plan may be refused for non-compliance with their bylaw.

Final subdivision plans in unorganized territory require a fee of $25.00 plus $25.00 per lot created by the plan. Re-approvals also require $25.00 plus $25.00 per lot.

Subdivisions approved under Section 99 of Land Title Act such as a reference plan, explanatory plan or metes & bounds subdivision also require a fee prescribed by regulation.

The Municipality collects the fee for subdivisions along Controlled Access highways in municipalities in the normal manner as with their own subdivisions. Similarly where another agency is the primary Approving Officer in unorganized territory, the fee is payable to that agency.

55. Pollution Control (4.10, 4.13, 6.05, 6.06)

Where a sewer is intended or where on-site disposal (septic tank, etc.) is intended and the discharge is not domestic, or will exceed 25,000 litres per day, a permit from the Director of Waste Management Branch is required before the final plan may be approved.

In an Improvement District or a Regional District Specified Area the application will be made by that District, and this will be most of the sewer cases. There may be some cases, however, where the subdivider will install sewer and operate it as a private company, and in those cases the subdivider makes his own application and a copy of the permit must be produced prior to approving the plan. It will also be necessary for the subdivider to install the sewer system and provide a certificate from an Engineering stating the systems is designed and built to an acceptable standard prior to approval. An Improvement District or Regional District will not have to install if it has a satisfactory arrangement or guarantee (bond, etc.).

For on-site disposal where intended use is known, it should be checked to see if it falls in Waste Management Branch jurisdiction. If it does, then it requires a permit before the plan can be approved. The on-site disposal systems do not have to be constructed before plan approval. The discharge falls in Waste Management jurisdiction where it exceeds 25,000 litres per day or is not "domestic". Common figures of discharge volumes are (litres per day):

	Litres Per Day
Apartments and row housing	200 per person
Boarding Schools	160 per person
Campgrounds	450 per plot
Day schools, primary	25 per pupil
Day schools, secondary	45 per pupil
Hospitals without laundry	700 per bed
Hospitals with laundry	1200 per bed
Hotels and motels	200 per person
Mobile Home parks	700 per trailer
Offices	45 per worker
Restaurants	35 per seat
Service stations	1200 per double pump
Theaters	10 per seat
Theaters, drive-in	25 per auto
Work camps	160 per person

Single family dwelling is usually taken as 1200 per day.

If a development proposes, say, 40,000 litres per day, it is quite lawful to produce two separate septic tanks and fields at 20,000 litres each and thus not fall in the jurisdiction of the Water Management Branch.

The term "domestic" is harder to interpret. The definition is "domestic sewage means the sewage discharging from a residential building and sewage of a like nature discharging from other buildings". The interpretation of this is not always easy. An apartment house is obviously domestic so if the discharge is less than 25,000 litres per day it is exempt. A laundromat is considered not domestic. A motel is considered domestic, and if it has a laundromat in it for the guests only it is still domestic. However, if the laundromat is used by the general public it is not considered domestic. Thus you will note interpretation is not simple.

Some uses considered domestic are: cafe, hospital, gas station, motel, store, office, logging camp, and traditional type farming. Uses considered not domestic include: laundromat, car wash, mine, gravel process and intensive farming.

The difference between traditional and intensive farming is not easy. If a farmer has a flock of chickens, for example, and keeps them in the traditional henhouse with run, the discharge is domestic. However, if he keeps the birds in a cage plant with an array of cages with feed by conveyor belt, etc., it is not domestic. In cases of doubt, do not hesitate to refer to Headquarters who will seek a ruling from Waste Management Branch.

56. Private Easements

Private easement plans do not require our approval.

57. Property with Inadequate Access

Property without any access may not be subdivided, except that by prior arrangement with the Registrar it is allowable to approve a subdivision that creates a timber block only. Subdivider may, of course, acquire and construct a public road to give access.

When a road exists but is not a two lane (5.0 metres wide) with a maintainable and/or all weather surface, subdivision should be declined. Subdivider may improve the road to minimum maintainable all weather standard at his expense. Subdivision may then be approved if otherwise in order.

Where road exists and is two lane, maintainable all weather, but is inadequate in other respects (e.g. alignment) for the traffic the subdivision is approvable and the subdivider should be advised the Ministry will improve the road when funds are available which may, of course, be some years. Road is to take its appropriate place in the priority list.

All weather means road is passable all year except for short stretches for a few days due to flooding, spring break up, etc.

Minimum standards means 5 metre top and appropriate horizontal and vertical alignment.

Standards of roads approaching a subdivision (but not in a subdivision) should be as Appendix "A" except that widths of finished roadway are:

Serving 1 - 20 lots --- 6 metres wide
Serving 21 up lots --- 7 metres wide

58. Prospectus

We do not put much value in statements made in a prospectus as any guarantee that anything promised will be performed. At this time it seems to be the view that it is not up to the Crown to take action but up to the aggrieved purchaser. Purchasers are reluctant to sue because of cost and also because often the defendant holds their mortgage. Thus a promise in a prospectus that a developer will do something is not a sufficient guarantee that that thing will be done.

59. Railway Crossings

1. The developer shall submit plans that concur either with the General Orders of the Railway Transport Commission governed by the Railway Act, or the general instructions of the Provincial Ministry of Transportation & Highways governed by the Railway Act of British Columbia, to the Approving Officer.

2. When tentative approval has been given to the subdivision by the Approving Officer, the Ministry, on behalf of the developer, makes formal application to either the Railway Transport Commission or to the Provincial Ministry of Transportation & Highways, under the Deputy Minister's signature for authorization of a public road level grade crossing.

3. The Approving Officer shall not approve a subdivision until the Railway Transport Commission Board Order or the Provincial Ministry of Transportation & Highways Certificate has been received by the Ministry authorizing the level grade crossing, copies of which shall be made available to the developer for construction purposes.

4. The full cost of surveys, plans, construction and maintenance of all railway level grade crossings contained within a subdivision shall be the responsibility of the developer until accepted as a public road by this Ministry.

60. Reapprovals

Plans that are not deposited within 60 days of approval require reapproval before deposition. If there has been no change in bylaws, etc., since approval it is not necessary to go the full route of processing. Approving Officers receiving plans for reapproval direct from applicants are advised to check with Districts before reapproving in case there is any intervening event. Valid tax certificate is required unless in a municipality. Standard fee is also required for each reapproval.

61. Relatives

Under Section ~~733~~ 996 of the Municipal Act a subdivider may subdivide to produce a lot for providing a separate residence for a relative regardless of parcel size requirements of any bylaw. The owner must have owned the land for 5 years prior to the subdivision. Relative means himself, father, mother, father-in-law, mother-in-law, son, daughter, son-in-law, daughter-in-law or grandchild of the registered owner. The new parcel must be at least 1 ha except that it can go down to 2500 m^2 if the Medical Health Officer approves. The new parcel is restricted to residential for five years. Where the property is assessed as farmland the remainder may not be reduced below 2 ha.

Applicant is to provide a Certificate of Encumbrance and a sworn statement that the purpose is to provide a residence for (name), who is (relationship), and that he understands the new parcel may only be used for residential use for five years and the remainder may only be used for its current use for five years.

This can only be done once in five years.

The District Highways Manager should check the subdivision of the parent parcel, if created within the last five years, to determine if the parent parcel was created under Section ~~733~~ 996.

62. Remainders

The remainder must always be considered as if it were another lot in the subdivision and must conform in all respects even though it is outside the red outline. This also includes considering it for road requirements, including access to lands beyond and to body of water.

63. Reports from other Agencies

Reports from other agencies are not to be photocopied and given to subdividers. Nor is any internal Ministry correspondence. Letters to subdividers may paraphrase or quote parts but care must be taken to see that those parts are proper to shown subdividers.

64. Return Radii (unknown)

There are many old plans still around where the return was shown on the plan with value of radius given, but non-tangential, undimensioned and unpinned. The only thing that can be done to correct this former improper practise is to prepare a reference plan in each case and have it approved by Approving Officer (or municipality) as owners of the road involved. When these are submitted it is in order to approve them as no other interest is involved.

65. Right-of-Way Width (5.02)

The standard right-of-way width is 20 metres, or cross section plus 6 metres whichever is greater. 12 metre roads may be allowed along District lot boundaries to give access to lands beyond. 10 metre half roads may be allowed in areas where a partial system exists and extensions wider than 10 metres would produce undesired offsets.

Unless there is strong evidence that adjacent property will subdivide within about two years, the number of lots allowed off 12 metre and 10 metre allowances should be discouraged. For lands beyond a narrow road allowance the number of lots should be limited to 10. The subdivider, however, still has the option of privately buying to widen the narrow road.

Right-of-way widths for Trunk and Main highways are as set by the Highway Board and dedications to these widths insisted on. It is, however, not policy to require free dedication of new alignments - only widening of existing ones.

Subdivisions not compatible with proposed new Trunk and Main highways are referred by the Regional Approving Officer to the Executive Director of Engineering. If a design is pretty firm, then purchase may be recommended, but it must be borne in mind that one purchase may trigger a public demand from other property owners to buy the whole line. If the design is not too firm, or several years away from construction, the subdivider should be asked if he will (voluntarily) redesign to leave the proposed right-of-way as a remainder. This remainder should be protected by a suitable restrictive covenant. If the subdivider does not redesign the proposed right-of-way should still be protected by a restrictive convenant.

The standard frontage road right-of-way width is 15 metres. The frontage road is really not an ideal solution because of the high services to lot ratio and intersection traffic problems. The preferred way is a back road system. However, this is not desired by roadside business and is not as flexible in long range terms as it limits the choice of ultimate highway to frontage road connections. Although not the ideal solution it is still an acceptable solution and is widely used. It is a firm requirement along Trunk highways in rural areas.

Corner cutoffs of 6 metres, along each boundary, are required at all intersections.

In places where more intensive land use is indicated or ultimate connection points (800 metres?) can be forecast, or important cross streets intersect, then the frontage roads right-of-way is to be ballooned at the connection as per the standard drawings. In hilly country the standard local road widths of 20 metres, 15 metres, etc., may not be adequate, and in these cases the required right-of-way width is whatever is needed to encompass the cross section plus 3 metres each side. When lanes are offered the 20 metres right-of-way for local roads may be reduced to 15 metres. In areas of deep frost penetration and granular soils (such as Fort Nelson), and in areas of heavy snowfall, minimum right-of-way width is 25 metres for all roads.

There is often considerable emotional argument put up by developers, planners, surveyors, etc., that our 20 metre minimum right-of-way width is excessive for local streets. Reference is made to other jurisdictions that require lesser widths. Quotes are usually very selective and presume comparability. For example Los Angeles County widths are often quoted but the lack of snow requirements is not mentioned and the 100 foot right-of-way on the 1 mile grid with 80 foot right-of-way at the 1/2 mile is ignored. The main reasoning offered by proponents of narrow rights-of-way is that a narrower right-of-way consumes less land per unit and thus reduces development costs and utility lengths (and hence costs). This is of course true although it means lower prices to the purchaser only if sales levels are a function of development costs. The arguments for the 20 metre right-of-way are:

1. The width allows greater play of air wind and sun to the subgrade and thus reduces pavement thickness requirements and hence costs.

2. The width allows for future footpaths and/or cycle paths thus enhancing safety.

3. The width allows the sun greater play on the road surface thus reducing spot icing and enhancing safety.

4. The width allows normal storage of snow without intruding into property with consequent damage (notwithstanding the mild winters of the last three decades).

5. While horizon utilities can be crammed into a lesser width, their resulting closer proximity to each other increases their construction and operating costs.

6. While proposed land uses may generate light traffic that can be accommodated in a narrow roadway, second and third generation land uses may well be of much greater intensity with consequent heavy traffic needing a wider roadway.

7. The better clearance between roadway and property line gives an opportunity to minimize tree root damage to the pavement structure, where it is a problem.

8. The greater clearance between roadway and property line allows the placement of obstructions, such as power poles, further from the roadway and thus enhances safety for out of control vehicles.

In the areas where 25 metre right-of-way is required:

9. The width allows storage of heavy snow accumulation without the expense (and social reaction) of accidental intrusion of frozen windrow or blowings into private property with consequent damage. Alternately it does not require the very expensive loading out of snow.

10. Where frost penetration is greater than about 2 metres and subsoils are granular or watertables difficult, it allows utilities to work with greater spacing and hence without the considerably increased costs of support protection to other utilities.

66. Road Allowance in Crown Land

Following is S-G's circular #220:

Re: Section 75 of the Land Act

Section 75 - "Where the Minister considers it advisable, he may authorize the Surveyor-General to establish a public road allowance through Crown land for the purpose of giving access to privately owned land that is being subdivided. The Surveyor-General may sign the subdivision plan".

The procedure for an application under Section 75 will be as follows:

1. The subdivider, or his agent will make application to the Regional Manager, Financial Services, by letter accompanied by three copies of a preliminary plan of the proposed subdivision and route for access through Crown land, for permission to construct the required public road.

2. The application will be inspected and if authorized, the applicant will be so advised. The surveyor should then include the road within the boundaries of his subdivision plan without further instructions from the Surveyor-General. The legal description of the Crown land will be included in the plan title. The following certificate should be draughted on the plan:

> The public road through Crown land shown hereon is authorized under Section 75 - Land Act.
>
> Surveyor-General
> Victoria, B.C. ....., 19....

3. After the plan is approved by the relevant approving officer, who will have control of the standard of construction, the plans are to be forwarded to the Surveyor-General for his signature to the certificate as in (2) preceding.

4. The plans will be returned by this Ministry to the person submitting them for deposit in the Land Title Office. (Original signed by: , Surveyor-General).

67. Road Closures

All subdivisions involving road closures must be referred by the Regional Director of Highways to the Executive for tentative approval of the road closure. These must be presented to the subdivider as a tentative approval only and not a firm commitment because at this stage the Minister has not received public reaction. Tentative approval does not mean the closure does not have to be advertised.

68. Road Construction Standards ("A" 10-13)

Construction standards should be adhered to in all areas, particularly drainage and pavement thickness.

Paving is not required for non development subdivisions, residential and agricultural subdivisions creating less than 5 new lots, residential and agricultural subdivisions creating more than 4 new lots all of which exceed 20 000 square metre parcel size, and all subdivisions outside the area on the District paving map. Where roadmix performs adequately and can be made to reasonable standard it will suffice.

69. Road Design Standard ("A", 2,3,4)

Care must be taken to interpret the conditions and functional classification to arrive at the correct design standards. The standards are to be followed consistently except in some areas where the local public road network is of low standard and higher standard subdivision roads may only serve to spur local demand to

upgrade the local public roads which otherwise would be satisfactory. In these cases the standards may be reduced with discretion and judgement, but care should be taken to ensure that location is such that they could be upgraded at some future date. This may often mean picking the ultimate alignment and rolling the grades.

Basically the standards follow only two fundamental variables - design speed and finished grade width. There are 3 design speeds and 3 grade widths. These theoretically allow 9 standards, but in practise the choice will be limited to about 4 as the higher design speeds will not be associated with the narrower widths. Probably only two major factors need to be considered:

(a) Classification: local, collector, arterial.

(b) Topography: flat (cuts and fills up to 4 metres), hilly (cuts and fills exceeding 4 metres).

Judgment may be aided by the following table which is intended as a guide only:

Classification	Topography	Design Speed	Width
Local	Flat	50	7.5
	Hilly	35	7.5
Collector & Arterial	Flat	70	10
	Hilly	50	10

It will be noted that the table does not offer the 6 metre width. It is intended this be used only in special cases, such as half road allowances, access to navigable water (where not serving any lots) etc. Local streets intended for industrial or commercial development should be considered as collector.

Note the requirement to compensate grades for horizontal alignment - found necessary because of the universal demand for snowplowing.

The maximum grade of 12% may be relaxed to 25% in the case of an access road to water under Section 75(1)(b) or (c) that does not itself serve as access to any lots, or as access road from water to a water access subdivision.

Clearing is normally full width, however, the Ministry specifications for selective clearing and special species are to be kept in mind. In the Gulf Islands clearing is to be sufficient only to accommodate the roadway prism -- applicant may clear wider if he wishes to install utilities etc.

Pavement thickness is to be determined by reference to the Geotechnical Branch who may undertake specific design studies but will rather generally recommend based on knowledge of local area experience.

70. Road Drainage ("A" 5-8, 13)

Drainage is one of the most important features in road design and construction. Ditches should be carried to an obvious natural watercourse and easements used for offtakes, etc., where necessary. Culverts under the road should not be less than 46 cm - under driveways they may be 30 cm if waterway area adequate but a minimum of 38 cm culverts should be used where practical. Grades of ditches should be closely considered and ditch checks or other features installed where necessary to prevent erosion.

71. Road Layout (5.05, 5.06, 5.08 - 5.11)

It is most important in judging a subdivision application to consider carefully the future requirements of the whole network and judge the application accordingly. The changing nature of the area must also be considered carefully - a rural area may change into an urban one in the course of time, etc. The future conditions must be judged and allowed for as well as the present.

While topography and town planners may dictate the desirability of curvilinear, crescent, deadend layouts, etc., the facts are that the best layout for an ultimate urban or suburban area is a system of major roads (arterial and collector) on a grid (even if distorted by topography a little). The grid should be 800 m centers. If it can be obtained, the best is 30 m right-of-way every 1600 m with 20 m in between. Next best is 25 m on the 1600 m width with 20 m between, and last is 20 m on the 1600 m with 20 m between. Circuitous, curvilinear, etc., local roads may then be hung on this framework at will to fill in the detail, but the framework must be grid.

An ultimate system of major roads must be kept in view at all times. Local functional classification studies may assist in identifying the major network and the Transportation Planning Engineer may be asked to assist.

The principles used in Section 5 of the Provincial Subdivision Regulations are a good guide to layout of local streets. For major network streets cross intersections are essential for traffic flows and capacity. If block systems (however modified) are used for local streets, long blocks are to be encouraged as they reduce street inventory.

Pedestrian desire lines should be considered and walkways provided midblock, etc., where indicated.

No maximum length of cul-de-sac road is designated in the Provincial Subdivision Regulations; however it is desirable that as far as possible, consistent with topography, etc., cul-de-sacs not be longer than 150 metres. This is because one of the Central Mortgage and Housing Corporation rules for subdivisions they invest in is that cul-de-sacs not be longer than 150 metres. It is desired to follow this rule as much as practicable so there is no subsequent impediment to property owner's getting C.M.H.C. mortgages.

72. Road Profiles

The subdivider can be asked to provide profiles of proposed roads so they can be evaluated for standard. This is useful at the tentative stage in larger subdivisions on sidehill, etc., to ensure that grades and drainage can be constructed within standard.

73. Sketch of Further Subdivision

The Approving Officer may require a sketch from the subdivider showing how the proposed lots or remainder could be further subdivided. This is useful in the case of long narrow lots and in cases where the subdivider appears to be hacking up his land for short term returns but no long term benefit.

74. Storm Drainage (4.04 - 4.06)

Drainage is a most important feature. Drainage ways should be carried to a natural watercourse or approved storm drain capable of carrying the additional flow without adverse impact. Drainage must be assessed for all subdivisions and district report must include comments and sketching on plan. In complex cases applicant may be required to produce an engineered plan.

For small parcel subdivisions, design must be on the basis of 200 year flood -- rainstorm or snowmelt, whichever greater. For large parcel subdivisions design may be on the basis of 30 year flood - it must, however, be closely reviewed to see what life or structures may be exposed to hazard over the 30 year level and amended accordingly. Drainage of swamps should be discouraged - see "Flooding".

75. Strata Title Subdivisions

There are three basic types of Strata Title subdivisions. They are strata plans of existing buildings, strata plans of unoccupied buildings, and bare land strata plans. There may be combinations of bare land strata plans and building strata plans. For approval purposes these must meet both the requirements for bare land strata plans and for building strata plans.

A strata plan can only be accepted if the land included within the strata plan is shown on a surveyed plan deposited in the Land Title Office.

Phased Strata plans are dealt with in part (4) below.

(1) Unoccupied buildings strata plans

(a) A strata plan of a building not previously occupied does not need the approval of either the Approving Officer or the Approving Authority (usually the Regional District). See Section 8(1) of the Condominium Act.

(b) If the strata plan is a combination building strata and bare land strata, then the Approving Officer's approval as a bare land strata plan is required. This could happen if any part of the strata lot includes bare land (e.g., row housing with small front and rear yards) which is not common land. (See Section 6 of the Condominium Act).

(2) Existing Buildings - strata plans

(a) A strata plan of a building which has been previously occupied requires the approval of the Approving Authority which is defined under Section 9(4) of the Condominium Act.

(b) If the strata plan is a combination building strata and bare land strata then the Approving Officer's approval is also required. See Section 1(b) above.

(3) Bare Land Strata Plans

A bare land strata plan requires the approval of the Approving Officer by Section 8(3) of the Condominium Act, subject to B.C. Regulations 75/78.

The regulations are generally clear and must be followed. The bare land strata subdivision should be processed like a conventional subdivision.

Some sections of regulations which may require further explanation follows:

(i) Section 2(2) - This section deals with averaging. All zoning, subdivision, Official Settlement Plan and Official Regional Plan bylaws are defined as zoning bylaws for the purposes of these Regulations and thus averaging of parcel size requirements of any such bylaws is permitted.

If the Regional District has a subdivision bylaw in place then Section 2(3) does not apply and there is no minimum parcel size, other than as controlled by Section 2(2)(b). For subdivisions not fully serviced by both community water systems, and community sewage systems the minimum parcel size permitted should be as specified in B.C. Regulation 262/70. If both community water systems and community sewage systems are provided then the minimum parcel size shall be such that any development of the site for the use zoned will strictly comply with setback requirements, etc., of the zoning bylaw (Section 2(2)(b)).

(ii) Section 2(3) - Where the Regional District does not have a subdivision bylaw in place then the requirements of the Provincial Subdivision Regulations apply. In this instance averaging of the minimum parcel sizes of Regional District zoning bylaws is still possible and the minimum lot sizes permitted will be those set out in Provincial Regulations BC 262/70. These cannot be reduced or averaged.

(iii) Section 5 provides for public road dedications through to lands beyond, to a body of water, and to provide continuing of existing roads. (See Section 8(1) for access to water). Necessary widening of existing roads can also be required. Note - these dedications cannot be accomplished by the Strata Plan and then must be dedicated by a conventional subdivision plan prior to approval of the strata plan (See Section 10).

(iv) Access routes are the internal roads within the strata plan and thus are private roads.

The access route width (right-of-way width) must be sufficient to encompass the roadway, provide space for utilities and area for drainage works, snow removal, etc. Thus the construction of the bare land strata accesss route should be to the same standard as would be required for a conventional subdivision of the same scope. Some relaxation of the required top width and grades up to 12% may be possible but alignments, structures, drainage, etc., must not be compromised.

The Ministry cannot accept bonding or other guarantees for completion of road works. The access route construction must be complete prior to approval.

(v) Section 13 - community water systems, community sewage systems and storm drainage systems should be treated the same as in any conventional subdivision.

A community water system not within municipal/Regional District jurisdiction and not within an improvement district should be treated as a utility and all requirements of the Community Water Systems Division of Water Management Branch must be met.

A community sewage system outside a municipality or Regional District jurisdiction must be installed and certified as constructed to good engineering practice by an Engineer plus hold a permit from Waste Mangement Branch.

(vi) Section 16 - The Ministry and the Approving Officer cannot hold security to guarantee completion of services. If the agencies having jurisdiction or a public third party (e.g., Regional District) wish to hold the security the Approving Officer may approve the plan provided the agency or Regional District certifies they have sufficient security.

(4) Phased Strata Plans

Phased strata plans are dealt with under Sections 8(2) and 77 to 91 inclusive of the Condominium Act and should only be approved as to phasing or as to compliance with the Form E. (See page 53 of Condominium Act). If the Phased Strata Plan is also a Bare Land Strata Plan it should be approved both as to phasing under Section 8(2) and as a Bare Land Strata Plan under Section 8(3) of the Condominium Act.

The Form E which is in fact a declaration of intent to phase must be endorsed by the Approving Officer. There are no real requirements for approval of the Form E but it should be checked to ensure it reasonably reflects what is shown on the development plans submitted. The "date of commencement of construction or completion of construction for each phase" need only be estimated dates and the developer is not strictly committed to them.

The election to proceed dates are definite and should precede the estimated date of commencement of construction. The election to proceed date may be extended up to a period of one year by the Approving Officer. Extension of the election to proceed date beyond one year and changes to the Form E can only be accomplished by an "amendment to the Form" which must be approved by the Approving Officer (and the strata corporation if one or more phases have been approved and registered).

Sections 81 to 85 inclusive, of the Condominium Act deal with security for common facilities. Supposedly ensuring the requirements of these sections are met is the principal reason why the Approving Officer's approval of phased strata plans is required. The sections are quite clear and it is suggested the Regional District or some such other public body should hold the security, if required.

In certain types of development such as major base development on ski hills it may be desirable to ensure certain Ministry concerns such as an acceptable standard on the approach road and adequate parking within the development are addressed and dealt with through our approval of the phased strata plan.

76. Tax Form

Form TX 55 is required before a subdivision in unorganized territory may be approved. The form must be checked to see it covers the legal description being subdivided and to see that it was still valid on the date the final plans were received in the District Highways Manager's office.

77. Time Limits

The Approving Officer is given 60 days in which to consider a plan. It is hoped that most subdivisions will not take this length of time. The chief cause of long processing time will generally be the waiting for comments from other agencies. Subdividers should be told which agency is slow and why. They should not be told to complain at the agency involved but need not be prevented from doing so.

Complex and difficult subdivisions may well take much longer than 60 days. While the 60 days objective should be aimed at, the Approving Officer need not be concerned if a subdivision being handled in a reasonably expeditious manner takes longer than 60 days. It is interpreted that the intent of the 60 day limit is to give applicants a remedy at law for unreasonable delay.

Plans submitted for which the survey was completed more than three months before the submission of the plans may be returned for reinspection of pins by the B.C.L.S. This is not generally done, however, under one year's time unless there is reason to believe that clearing, pipelaying, etc., has removed pins.

Approved plans not deposited within 60 days require reapproval of the Approving Officer. Submissions for reapproval require another full fee and valid tax certificate unless in a municipality, etc.

78. Turnaround (5.07)

Required minimum size for a cul-de-sac turnaround is a size large enough to encompass a circle of 30 metres diameter. In deep snow country this requirement can be increased to 36 metres or greater to provide snow storage. In very infrequent cases in summer recreational subdivisions only, hammerheads may be allowed in difficult topography but should not be encouraged. Hammerhead should be 25 metres by 15 metres.

79. U.S. Border

In subdivisions adjoining the United States border ask for a 18 metre strip along the border to be returned to the Crown. If subdivider declines then insist on a no buildings covenant in the 18 metre strip and refuse approval of the subdivision if this is not agreed to.

80. Vehicular Access

If it is relatively easy to construct vehicular access we do not insist on its construction as it reduces the layouts available to the home builder. If it is likely to be expensive compared with the price of the lot, then it must be roughed in with grading only; no culvert or surfacing is required. It is not possible to give a threshold figure above which it is required but certainly any cut or fill slope exceeding 2 metres should be closely considered.

The term "vehicular access" includes the ability to park two automobiles on the lot on reasonably flat ground. The access itself should be no narrower than 3.5 metres and no steeper than 25%. The purpose of requiring vehicular access is to keep on-street parking to a minimum - streets are for moving traffic, not storing it. In exceptional country it is permissible to agree with the developer on a system whereby garages and carports are cut into the cut backslope, but they must be set back so that the structures themselves are off the right-of-way.

81. Walkways (5.01)

The provision of walkways is to be encouraged, particularly where long (over 200 metres) blocks exist. Pedestrian desire lines (to schools, beaches, commercial areas) should be checked against the street layout and walkways provided where deemed necessary. Width of a walkway is 3 metres. With grades less than 20% walkways should be cleared and rough graded. Steeper walkways need not be opened up as it is not desired the Ministry maintain any of them, particularly those with steps. Walkways are shown as "road" on the plan. Normal maximum grade of walkway is 30%, and for steps 75%.

82. Water and Sewer Systems

A Water User's Community system is not a community water system as defined. Nor is a public utility type operation serving 4 or less as it is not regulated by the Water Utilities Division. In these cases, therefore, minimum parcel size is at least 1700 sq. metres regardless of water. Note that a community water system must not be seasonal.

A subdivision involving a C.W.S.D. water system may not be approved until a letter is received from the C.W.S.D. saying it is satisfied with the installation. This may take the form of a copy of the as builts sent by C.W.S.D., not subdivider. A sewer system does not have a certificate of completion.

The provision of water can be required in subdivisions regardless of parcel size offered.

83. Waterfront Roads

Revision of waterfront roads near the waterfront to a location away from the waterfront to allow subdivision between road and water will not be approved, unless applicant is prepared to dedicate one-half of the waterfront to the Crown above that already enjoyed or that required by 75(1)(b) or (c).

(a) Controlled access in municipality - use Form H235 M.
Subdivision in area where prime approving officer is not Ministry of Transportation and Highways employee - use Form H235R.
All other territories - use Form H235 P.

(b) All finals - use Form H235 F.
Where final does not have P.L.A. - also use H235 M, R or P or appropriate.

(c) All reapprovals - use Form H235 F.

(d) Metes and bounds subdivision description uses Form H.236.

(e) Form H.237 is given to subdividers (see 5.06(a) and 5.12).

(f) Text of letter to agencies referring tentatives for comments should say:

"I enclose a copy of a sketch of a proposed subdivision of (legal description) which is located approximately (X) km (cardinal) of (community). I should be grateful if you would examine this from the viewpoint of your regulations and policies and give me your comments accordingly so I may advise the Approving Officer. In order to expedite the processing of the application I should be grateful if you would reply within ten days.

Please send a copy of your reply to the applicant .....
.....
Please contact him directly (with copy to this office) for any additional information you may require."

(g) Text of letter to agencies sent tentatives for information only should say:

"I enclose a copy of a sketch of a proposed subdivision of (legal description) which is located approximately (X) km (cardinal) of (community). It is likely that at a later stage some aspect of this proposal will fall in your jurisdiction, but at this time this is sent for your information only. Applicant's name and address is (name and address)."

(h) Letters to subdivider (or to agencies) giving or refusing preliminary layout approval are Form H.343. A, B, and C.

(i) Drainage easement should take this form:

GRANT OF DRAINAGE EASEMENT RIGHT-OF-WAY

THIS INDENTURE, made the _____ day of _____ 19_____

BETWEEN:

(herein called the Grantor)

AND

HER MAJESTY THE QUEEN, in the Right of the Province of British Columbia, as represented by the Minister of Transportation & Highways,

(herein called the Grantee)

WITNESSETH THAT, in consideration of the sum of One Dollar ($1.00) now paid by the Grantee to the Grantor, the receipt whereof is hereby acknowledged, the Grantor doth hereby grant, convey and confirm unto the Grantee, her heirs and assigns, forever, the right at any time to enter upon the lands hereinafter described for the purpose of laying down, constructing, ditching, excavating or installing sewers, drains, pipes, flumes or any form of installation deemed necessary, practical or expedient in, under and upon the said lands to carry drainage water on to, over, through or under the lands hereinafter described, and of keeping and maintaining them at all times in good condition and repair; and for every such purpose the Grantee shall have access to the said lands at all times by her servants, employees and workmen subject to the right of the Grantor to the free use of the surface of the lands hereinafter described.

It is mutually understood, agreed and declared by and between the parties hereto that this agreement shall be construed as running with the land, but that no part of the fee of the soil of the lands hereinafter described shall pass to or be vested in the Grantee under or by these presents.

The lands affected by this easement are more particularly described as follows:

THIS INDENTURE is subject to the encumbrances, liens and interests as are set out in the memorandum hereunder set forth.

THIS INDENTURE and everything herein contained shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the said parties have hereunto set their hands and seals on the date first shown written.

SIGNED, SEALED and DELIVERED
in the presence of:

_____

_____ _____

_____ _____
Owners

THE MEMORANDUM REFERRED TO HEREIN AS TO ENCUMBRANCES LIENS AND INTERESTS

Nature of Charge	Number in the office of the land Registration District	Particulars, if any

CONSENT

Each of the undersigned, being the holder of an encumbrance, or being entitled to a lien or interest referred to in the memorandum above written, for valuable consideration, hereby consents to the granting of the within easement and agrees that the same shall be binding upon, and take priority over, his, her or its interests in, or charge upon, the lands of the Grantor.

SIGNED, SEALED AND DELIVERED
in the presence of:

_____ _____

_____ _____
Witness

_____ _____
Address

_____ _____
Occupation

This is the instrument creating the right-of-way entered into under Section 24 of the Land Title Act by the registered owner(s) referred to herein and initialled by me.

_____
Approving Officer
Ministry of Transportation & Highways

Form 17

(j) Release of covenant should take this form:

APPLICATION FOR CANCELLATION OF RESTRICTIVE COVENANT

WHEREAS KENNETH MICHAEL KIRKBY, businessman, and KENNETH KIRKBY, businesman, both of 616 - 1030 West Georgia Street, in the City of Vancouver, in the Province of British Columbia as joint tenants (hereinafter called the Releasee) have subdivided Lot 11 of District Lot 5618 and portion of District Lot 2077 both in Group 1, NWD and by depositing the said subdivision plan have created Lot 11 of District Lot 2077, Plan 14180.

AND WHEREAS HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA and represented by the MINISTER OF HIGHWAYS AND PUBLIC WORKS (hereinafter referred to as the Releasor) imposed a condition for granting approval of the said subdivision plan by requiring the Releasee to enter into a covenant pursuant to Section 24(a) of the Land Title Act which was deposited under No. 537433M in the Land Registry Office at Vancouver, British Columbia.

AND WHEREAS the covenants contained in said Restrictive Covenant registered as No. 537433M have been complied with as attested to by Doctor Alistair Thores, Medical Health Officer.

NOW THEREFORE the Releasor hereby authorizes and directs the cancellation of Restrictive Covenant No. 537433M insofar as the said Restrictive Covenant charges Lot 11, District Lot 2077, Plan 14180.

IN WITNESS WHEREOF I have hereunto set my hand this 1st day of May, A.D. 1975.

Original signed by:

"Minister"

HER MAJESTY THE QUEEN IN RIGHT OF
THE PROVINCE OF BRITISH COLUMBIA
AND REPRESENTED BY THE MINISTER
OF TRANSPORTATION AND HIGHWAYS

FORM R 2

(Section 57(a))

AFFIDAVIT OF WITNESS

TO WIT:

I, _____ of the _____ in the Province of British Columbia, make oath and say:-

1. I was personally present and did see the within instrument duly signed and executed by _____ the party thereto, for the purposes named therein.

2. The said instrument was executed at _____.

3. I know the said party, and that _____ of the full age of nineteen years.

4. I am the subscribing witness to the said instrument and am of the full age of sixteen years.

Sworn before me at _____, in
the Province of British Columbia
this _____day of _____ 19____.

- - - - - - - - - - - - - - - -

_____

5.11 LEGISLATION

(a) Land Title Act - regulations made pursuant to Land Title Act, B.C. Regulation 334/79

(b) Municipal Act

(c) Condominium Act - Bare Land Strata Regulations (75/78)

(d) Local Services Act - regulations made pursuant to B.C. Regulation 262/70

(e) Agricultural Land Commission Act - regulations made pursuant to B.C. Regulation 7/81

(f) Real Estate Act

5.12 SAMPLES AS FOLLOWS:

(a) Improvement District Model Bylaw

(b) Section 215 Covenants

(a) Improvement District Bylaw

_____ DISTRICT

BY-LAW NO. _____

A by-law respecting the installation of water systems within subdivision of land in the area comprising the District.

1. The Trustees of the District ENACT AS FOLLOWS:

(a) Every owner of a proposed subdivision shall submit his plan of subdivision to the District for approval respecting a waterworks system to be installed therein prior to submission to the Ministry of Transportation & Highways for approval under the Land Title Act.

(b) Before the Trustees of the District approve the subdivision plan as hereinbefore submitted, they may require the owner or owners of the proposed subdivision to deposit a sum of money or Government of Canada bonds and their guarantees or Province of British Columbia bonds and their guarantees as a guarantee that a water system will be installed therein.

(c) Every owner of a subdivision and every owner of land who subdivides any parcel of land within the District shall install, at his own expense and at no cost to the District and under the supervision of the Trustees of the District, or their representative, all water mains, fire hydrants, meters and other fittings and appurtenances deemed necessary by the District to provide an adequate supply of water for domestic and commercial use and fire protection for the future growth or expansion of said subdivision, and shall pay for all engineering costs; the said water mains, hydrants, meters, fittings and appurtenances shall become the property of the District.

2. Every owner who disobeys or fails to comply with any provision of this Bylaw shall be guilty of an offence and liable on summary conviction to a penalty not exceeding Two Hundred Dollars and in default of payment thereof to imprisonment not exceeding thirty days.

3. This Bylaw may be cited as the "Subdivision Water Regulations Bylaw".

INTRODUCED and given first reading by the Trustees this

day of 19 ..

INTRODUCED and finally passed by the Trustees on the

day of 19 ..

_____
Chairman of the Trustees

_____
Secretary of the Trustees

I hereby certify under the seal of _____ District that this is a true copy of By-law No. _____ of _____ District, passed by the Trustees on the _____ day of _____ 19__

_____
Secretary of the Trustees

REGISTERED the day of , 19 ..

_____
Comptroller of Water Rights

(b) Section 215 Covenants

EXAMPLE 1 (not metricated)

THIS INDENTURE made the Seventh day of March, A.D. 1970,

BETWEEN:

(the "Grantor")

OF THE FIRST PART

AND:

HER MAJESTY, THE QUEEN, IN RIGHT OF
THE PROVINCE OF BRITISH COLUMBIA, as
represented by the Minister of Transportation
Highways AND
The Corp. of the City of Merritt
(the "Grantee")

OF THE SECOND PART

WHEREAS the Grantor is the registered owner of all and singular that certain parcel or tract of land and premises situate, lying and being in the Municipality of Burnaby, in the Province of British Columbia, and more particularly described as:

Lot Thirteen (13),
District Lot Two (2),
Group One (1),
New Westminster District, as shown on the
print or plan annexed hereto and sworn to by
, B.C.L.S.

AND WHEREAS it is enacted by Section 215 of the Land Title Act as Amended that there may be registered as annexed to any land that is being or has been registered a condition or covenant in favor of the Crown or of a municipality that the land or any specified portion thereof is not to be built on, or is to be or not to be used in a particular manner;

AND WHEREAS the Grantor has covenanted that it will not use the aforesaid lands and premises in the manner hereinafter described;

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the sum of One ($1.00) Dollar of lawful money of Canada now paid by the Grantee to the Grantor, and other good and valuable consideration, (the receipt whereof by the Grantor is hereby acknowledged), the Grantor for itself, its successors and assigns, covenants and agrees with the Grantee and her successors or assigns, the FOREVER HEREAFTER neither it nor its successors or assigns shall put the lands and premises referred to in the first recital hereof (hereinafter called "the said lands") or any part or parts thereof, or suffer or permit the same or any part or parts thereof to be put to any main use other than those uses set out and numbered in the Municipality of Burnaby's Zoning Bylaw as follows:

(6) Bank, not exceeding 2,000 square feet gross floor area.

(6B) Restaurant, having no more than 80 seats and no take-out window.

(7) Commercial Nursery and Greenhouse.

(14) Gasoline Service Station.

(15) Grocery Store, not exceeding 3,000 square feet gross floor area.

(21) Personal Service establishment, not exceeding 3,000 square feet gross floor area.

(25) Retail building supply establishment.

(30) Taxi office, handling a maximum fleet of 20 cabs and/or to any ancillary use other than those set out and numbered in the said Municipal Zoning Bylaw as follows:

(26) Retail sale of new automobile parts and accessories.

(27) Retail sale, rental and repair of tools and small equipment such as chain saws, hand and edge tools, lawn mowers, motorbikes, roto tillers and outboard motors.

ALL TO THE INTENT that the foregoing covenant shall be annexed to the said lands and shall bind the same and every part thereof and the owner or owners thereof for the time being, and all persons claiming through, under or in trust for him, her or them, and shall enure for the benefit and protection of the Grantee, her successors and assigns, but so that the said covenant shall be personally binding upon the Grantor, its successors and assigns, and any and all other persons the owner or owners thereof for the time being or claiming as aforesaid only during the time of his, her or their sole or joint ownership of the said lands or part or parts thereof and not after he, she, or they have parted with the said lands or part or parts thereof.

IN WITNESS WHEREOF the Grantor has executed these presents the day and year first before written.

THE CORPORATE SEAL OF THE GRANTOR was
hereunto affixed in the presence of:

_____
Director

_____
Secretary

This is the instrument creating the condition or covenant entered into under Section 215 of the Land Title Act by the registered owner(s) referred to herein and shown on the print of the plan annexed hereto and initialled by me.

_____
Approving Officer,
Ministry of Transportation & Highways

EXAMPLE 2

THIS INDENTURE made this 23rd day of October, A.D. 1968

BETWEEN:

, Retired Truck Driver,
and, His Wife, both of
Lantzville, in the Province of British Columbia,
as JOINT TENANTS, and , Dentist
and his Wife, both
of , in the City of
Nanaimo in the Province of British Columbia,

hereinafter called the Grantors
OF THE FIRST PART:

AND:

HER MAJESTY, THE QUEEN, IN RIGHT OF THE PROVINCE
OF BRITISH COLUMBIA, as represented by the
Minister of Transportation & Highways.

hereinafter called the Grantee
OF THE SECOND PART:

WHEREAS the Grantors have subdivided Lot Three (3), District Lot Thirty-seven (37), Wellington District, Plan 18617, into three lots according to a Plan of Subdivision sworn to by Morgan A.R. Stewart on October 2, 1968, a copy of which is attached hereto.

AND WHEREAS the Grantee, as a condition to granting its approval to the Subdivision, has requested the Grantors to enter into the covenant hereinafter contained, pursuant to Section 215 of the Land Title Act.

NOW THEREFORE THIS INDENTURE WITNESSETH that in consideration of the premises and the sum of One ($1.00) Dollar of lawful money of Canada paid by the Grantee to the Grantors (receipt whereof is hereby acknowledged), the Grantors do hereby covenant and agree with the Grantee not to build, construct or place any building, improvement or

other structure upon Lot One (1) of the proposed subdivision of Lot Three (3), District Lot Thirty-seven (37), Wellington District, Plan 18617, or any part of the said Lot One (1).

AND that the said Lot One (1) shall not be built upon nor shall any part thereof be built upon and that no building, improvement or other structure shall be built, constructed or placed upon the said property or any part thereof, and that the said Lot One (1) shall not nor shall any part of it be used to support any building, improvement or other structure and that the said Lot and all parts of it shall be used only as bare land.

THE COVENANT contained herein shall be released partially or wholly from the said lands upon the Grantors placing sufficient gravel fill upon the above described Lot One (1) to meet the requirements for sewage disposal in force in the area and to the satisfaction of the authority having jurisdiction.

AND it is understood and agreed by and between the parties hereto that the words "Grantors" and "Grantee" wherever used in this Agreement shall include the parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the Grantor has executed these presents the day and year first before written.

SIGNED, SEALED AND DELIVERED
in the presence of:

WITNESS: _____ GRANTOR: _____

ADDRESS: _____

This is the instrument creating the condition or covenant entered into under Section 215 of the Land Title Act by the registered owner(s) referred to herein and shown on the print of the plan annexed hereto and initialled by me.

_____
Approving Officer,
Ministry of Transportation & Highways

EXAMPLE 3

This INDENTURE made this day of A.D. 1969.

BETWEEN:

(Hereinafter called the Grantors)

OF THE FIRST PART

AND:

HER MAJESTY, THE QUEEN, IN RIGHT
OF THE PROVINCE OF BRITISH
COLUMBIA, as represented by the
Minister of Highways,

(Hereinafter called the Grantee)

OF THE SECOND PART

WHEREAS the Grantors have subdivided Lots 1, 2, 3 and 4, Plan 18218, and Parcels "A" (DD48717-I) and "C" (DD129270-I), Section 4, Galiano Island, Cowichan District, into four lots according to a plan of subdivision sworn to by John Doe, B.C.L.S., January 10, 1969, a copy of which is attached hereto.

AND WHEREAS the Grantee, as a condition to granting its approval to the subdivision, has requested the Grantors to enter into the Covenant hereinafter contained, pursuant to Section 215 of the Land Title Act.

NOW THEREFORE THIS INDENTURE WITNESSETH that in consideration of the premises and the sum of ONE DOLLAR ($1.00) of lawful money of Canada paid by the Grantee to the Grantors, receipt whereof is hereby acknowledged, the Grantors do hereby covenant and agree with the Grantee not to build, construct or place any building, improvement or other structure, except a boathouse, within twenty-five (25) feet of Sturdies Bay Road right-of-way upon those portions of Lots 1, 2, 3 and 4 lying to

the north-east of said Sturdies Bay Road right-of-way and fronting Whalers Bay of the Subdivision of Lots 1, 2, 3 and 4, Plan 18218, and Parcels "A" (DD48717-I) and "C" (DD129270-I) Section 4, Galiano Island, Cowichan District.

AND IT IS UNDERSTOOD AND AGREED, by and between the parties hereto, that the words "Grantors" and "Grantee" wherever used in this Agreement, shall include the parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the Grantor has executed these presents the day and year first before written.

SIGNED, SEALED AND DELIVERED)
in the presence of:)
)
)
)
)
WITNESS)
)
)

_____
GRANTOR

"This is the instrument creating the condition or covenant entered into under Section 215 of the Land Title Act by the registered owner(s) referred to herein and shown on the print of the plan annexed hereto and initialled by me.

_____
APPROVING OFFICER
MINISTRY OF TRANSPORTATION AND HIGHWAYS

5.13 FORM H.237

This form varies in content from place to place according to requirements. There are four main variants:

(a) Where no Regional District Subdivision Bylaw, Regional Plan or C.P.A. 24 Regulation exists (see also (d));

(b) Where C.P.A. 24 Regulation or partial Regional District Subdivision Bylaw exists;

(c) Where full Regional District Subdivision Bylaw exists;

(d) Where no Regional District Subdivision Bylaw exists but Regional Plan requires certain minimum parcel sizes.

The form package consists in each case of:

(a) H.237
Provincial Subdivision Regulations

(b) H.237
Copy of C.P.A Regulations or Regional District Subdivision Bylaw.
Locally produced Form H.237A consisting only of those portions of H.237A which are applicable.
Appendix A of Provincial Subdivision Regulations.

(c) H.237
Copy of Regional District Subdivision Bylaw.
Appendix A of Provincial Subdivision Regulations

(d) H.237
Provincial Subdivision Regulations
Locally produced sheet saying the minimum parcel sizes of the Regional Plan are to be followed.

District Highways Manager is to ascertain what case applies for what portions of his District and prepare H.237's accordingly. It is most important that whoever hands out or mails H.237's knows exactly where the subdivision proposal is located and what variants of H.237 apply so that subdividers receive the correct information.

Form H.237A in full is as follows:

FORM H.237A
BRITISH COLUMBIA MINISTRY OF HIGHWAYS AND PUBLIC WORKS
ADDITIONAL SUBDIVISION STANDARDS

GENERAL

Subdivision must be suited to the configuration of the land being subdivided.

Subdivision must be suited to the use to which it is intended.

Subdivision must not make impracticable the further subdivision of any land within the proposed subdivision or of any adjacent parcel.

HIGHWAYS

Minimum Width of local street right-of-way	20 metres
Minimum width of frontage road right-of-way	15 metres
Minimum width of lane right-of-way	6 metres
Minimum width of walkway right-of-way	3 metres
Maximum spacing of cross streets	400 metres
Minimum radius of turnarounds	15 metres

PARCELS

Each lot must have reasonable vehicular access and be able to park two autos on the lot.

All parcels smaller than 20 000 m^2 which do not have community sewer must be able to satisfy the Sewage Disposal Regulations.

Minimum frontage of any lot except panhandle lots is 10% of the perimeter.

Minimum width of panhandle is 6 metres except that if it can be further subdivided into two lots the minimum is to be 12 metres and if it can be further subdivided into three or more lots minimum width of panhandle is to be 20 metres.

PARCEL SIZE

Where community water and sewer are to be supplied and building and zoning bylaws are in force and lanes exist - no minimum size except that provided by the zoning bylaw.

Where community water and sewer are to be supplied and building and zoning bylaws are in force - 450 m^2

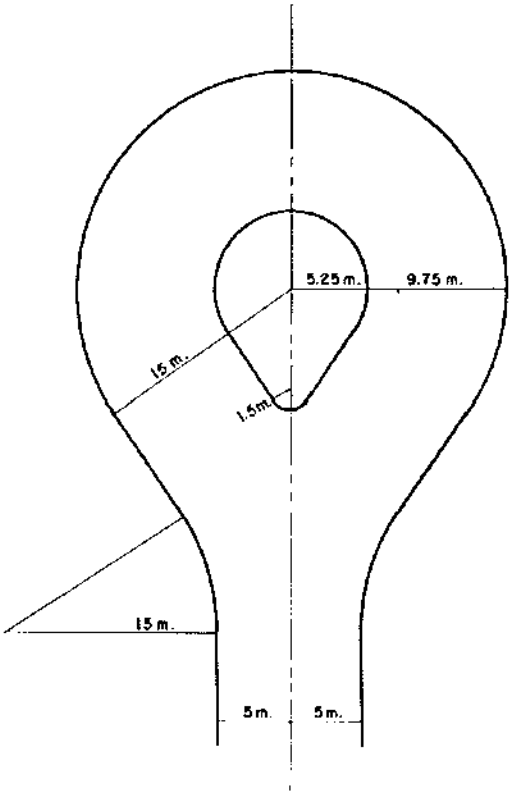
Where community water and sewer are to be supplied - 550 m^2

Where community water is to be supplied - 700 m^2 plus whatever Medical Health Officer requires to meet Sewage Disposal Regulations.

Where no services are to be supplied - 1700 m^2 plus whatever Medical Health Officer requires to meet Sewage Disposal Regulations.

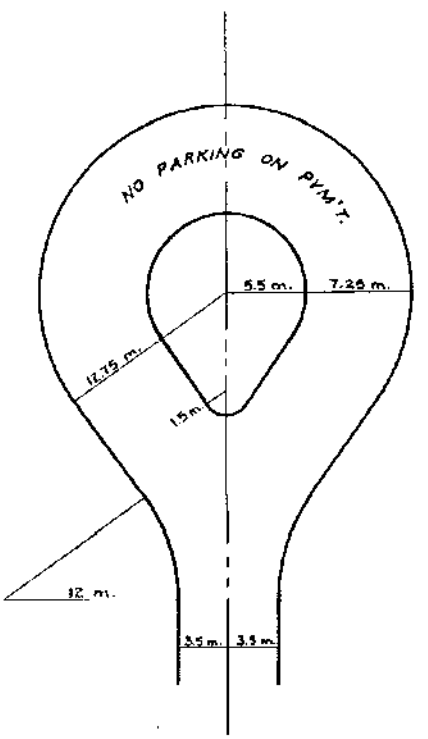
SERVICES

Where community water or community water and sewer are a condition of approval of a subdivision, the water or water and sewer systems must be approved and installed as approved before final approval of the subdivision.



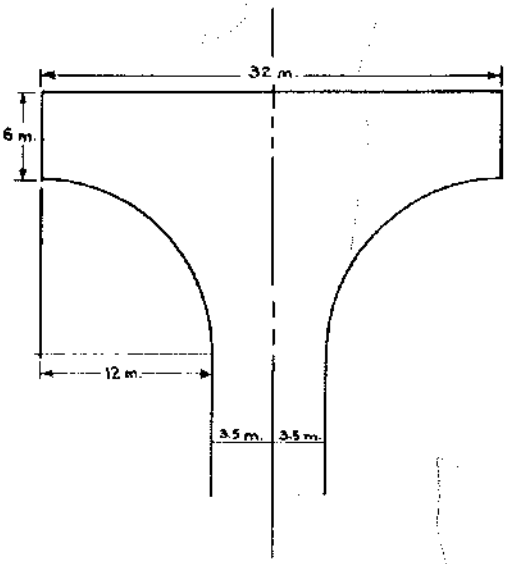
TYPICAL CUL-DE-SAC

CURB & GUTTER DESIGN
SCALE : 1 cm. = 5 m.
S.U. 9.144



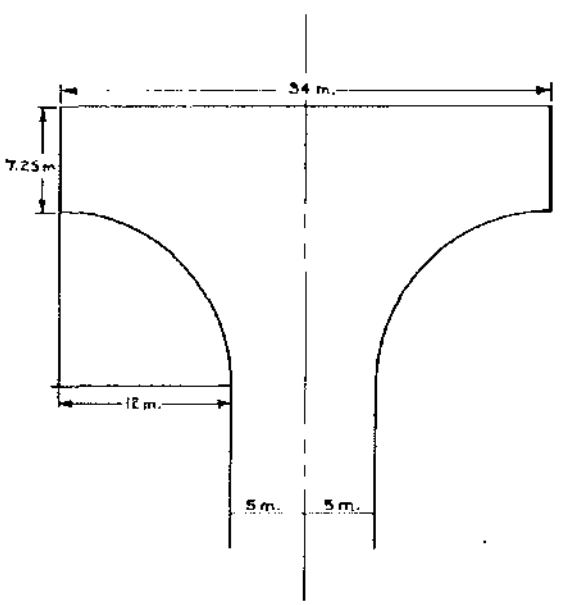
TYPICAL CUL-DE-SAC

OPEN SHOULDER DESIGN
SCALE : 1 cm. = 5 m.
S.U. 9.144

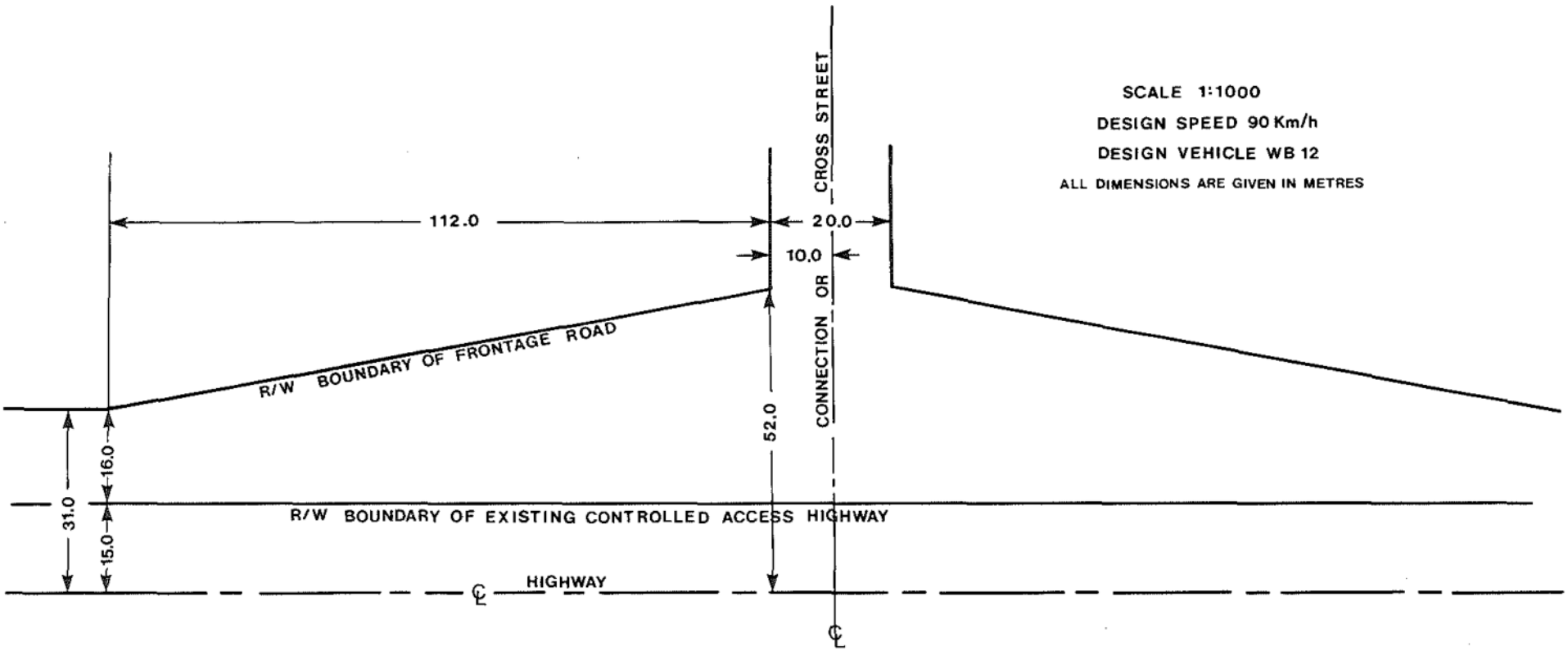


OPEN SHOULDER

SCALE : 1 cm. = 5 m.



CANDG DESIGN

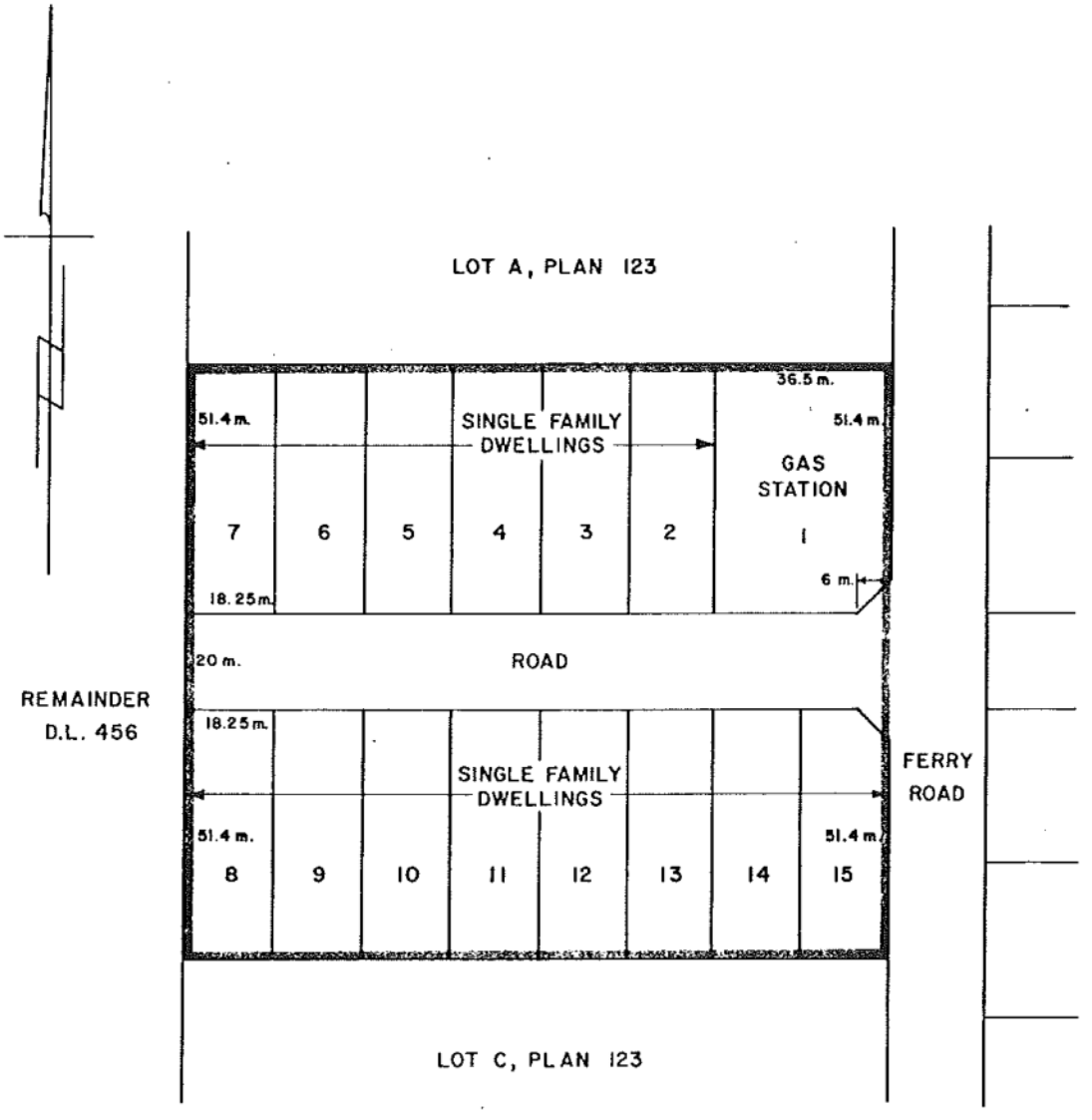


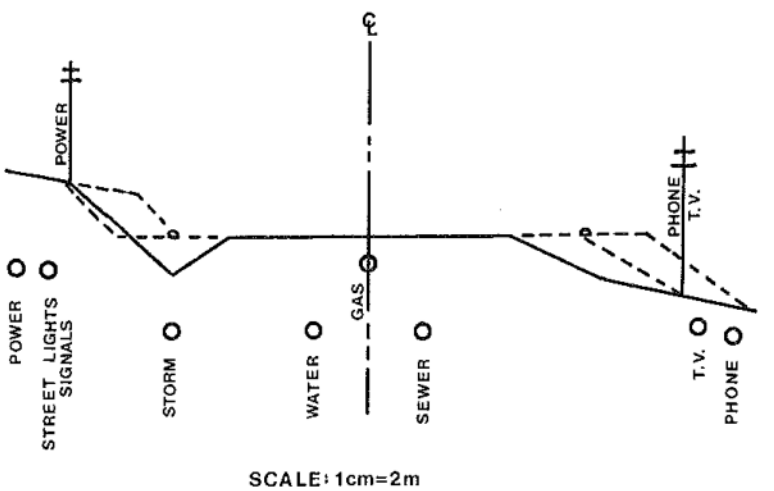
REFER TO DESIGN MANUAL
NO. C.I-2.7 FOR DETAIL DESIGN

FRONTAGE ROAD AT BALLOONED CONNECTION

PROPOSED SUBDIVISION OF LOT B, PLAN 123, D.L. 456, NOOTKA DISTRICT

SCALE : 1 cm. = 15 m.





SUGGESTED UTILITY OFFSETS FOR LOCAL STREETS

NOTES:

(1) Minimum cover .8 m below ground line or street grode - whichever lower.

(2) Shallow utilities minimum .6 m horizontal clearance.

(3) Deep utilities (water, sewer, storm) minimum 1.5 m horizontal clearance except that water and sewer must be 3 m minimum apart.

(4) Locations must be compatible with historical development from initial poles/ditch layout to horizon underground wires/storm cover layout.

CHAPTER 6

CLASSIFIED HIGHWAYS

A statement containing the following information has been sent to all municipalities defining the respective responsibilities of the Department of Highways and municipalities regarding classified highways.

6.01. GENERAL

1. A "classified" highway is a highway within a municipality which is classified as "arterial" or "secondary" under the provisions of Part III of the "Highway Act".

1.1 Arterial Highway

The Department of Highways is responsible generally for construction and maintenance but shares certain responsibilities with municipalities as outlined herein.

1.2 Secondary Highway

The municipality is responsible for construction and maintenance but the Department may share in approved maintenance and construction costs as outlined herein.

2. The Department may not incur any expenditure on any highway within a municipality until the highway has been duly classified as an arterial or secondary highway by order of the Lieutenant-Governor-in-Council. The "Highway Act" requires the classification of any highway to be published in the Gazette. A copy of the Gazette Notice together with a map showing the routes of the classified highway is forwarded to the municipality and to the District Official of the Department of Highways.

6.02. CHANGE OF ROUTE OF A CLASSIFIED HIGHWAY

1. The "Highway Act" requires that no change in route of an arterial or secondary highway shall be made except by order of the Lieutenant-Governor-in-Council. A notice of the approved change in route is published in the Gazette. A copy of the Gazette Notice together with a map is forwarded to the municipality and the District Official of the Department. In the case of secondary highway, the municipality must sign an agreement and must pass a by-law before it can be classified as a secondary highway.

6.03. MUNICIPAL RESPONSIBILITIES NON-FREEWAY TYPE ARTERIAL HIGHWAYS

1. Sidewalks, Footpaths, and Boulevards

Construction and maintenance is a municipal responsibility. Approval by permit must be obtained from the Department of Highways for new construction. Subject to the terms of the original permit, the Department may share the cost of replacing a sidewalk required by a grade change or widening of the arterial.

2. Sidewalks on Structures

Where there is a municipal sidewalk system leading to a sidewalk on a structure, winter maintenance of the sidewalk on the structure is a municipal responsibility.

3. Public, Municipal, and Private Utilities

Approval by permit must be obtained from the Department of Highways for construction, operation, and maintenance of utilities on, over, or under the arterial highway right-of-way. Where the utility is not owned by the municipality, application for a permit should first be approved by the municipality.

4. Cleaning of Streets and Storm Sewers

On sections of arterial highways where curbs and gutters have been installed, the municipality is responsible for cleaning of storm sewers and catch basins, streets, and areas between the curb and the right-of-way boundary. In case of inadequate cleaning, the Department reserves the right to carry out the work and charge it to the municipality.

5. Parking Signs, Meters, and Curb Painting

The municipality is responsible for erection and maintenance of all signs regulating or prohibiting parking and for painting of curbing where required. The Department reserves the right to erect such signs in the absence of appropriate municipally erected signs whenever it is deemed necessary to safeguard and expedite the movement of traffic. Municipal by-laws controlling parking must have the prior approval of the Department. See Paragraph 13. Parking meters may be installed only in locations approved by permit issued by the Regional Highways Engineer.

6.03 Cont'd.

6. Crosswalks

The municipality is responsible for painting of unsigned crosswalks subject to permit from the Department of Highways except as provided under the section headed Provincial Government Responsibilities.

7. Parking Stalls

The municipality is responsible for painting of parking stalls. A permit must be obtained from the Department of Highways.

8. Subdivisions

The municipality is responsible for approval of subdivisions adjacent to arterial highways (approval having first been obtained from the Department of Highways for "access"). In accordance with Section 91 (4) of the Land Registry Act where any subdivision deals with land in a municipality adjacent to a controlled access highway within the meaning of the "Controlled Access Highway Act", the Approving Officer of the municipality shall not approve the plan unless and until it has first been approved by the Approving Officer of the Department of Highways. See also Chapter 5.

9. Street Name Signs

Erection and maintenance of street name signs is a responsibility of the municipality.

10. Service or Frontage Roads

The municipality is responsible for maintenance of service or frontage roads adjacent to arterial highways.

11. Parades

Parades on arterial highways require the approval of both the municipality in accordance with any local by-laws and the Department of Highways. Application for Department of Highways approval must be submitted through the District Official to the Regional Highways Engineer before the parade is advertised and not less than seven days prior to the parade. Approval may be dependent on the availability of a good standard, well-signed detour route.

6.03. Cont'd

12. Zoning By-laws

In accordance with the "Controlled Access Highway Act", no zoning by-law of any municipality shall apply to land or improvements within a radius of one-half mile of the intersection of a controlled access highway with any other public road unless the by-law has been, before its adoption, approved in writing by the Minister of Highways. A zoning by-law should preferably be presented to the District Official of the Department of Highways prior to the public hearing.

13. Traffic By-laws

In accordance with Section 125 (6) of the "Motor Vehicle Act" a by-law of a municipality does not apply to regulation, control, or prohibition of traffic on an arterial highway unless application of the by-law to the arterial highway has been approved by the Minister of Highways. Application for approval of the by-law will be submitted to the District Official of the Department.

14. Fire Signals

These are the responsibility of the municipality or fire district concerned and may be erected on an arterial highway only under permit from the Senior Traffic Engineer of the Department of Highways. All costs are the responsibility of the municipality or fire district except where an installation is necessitated by construction of a new highway by the Department. Fire signal applications will be submitted to the District Official of the Department.

15. Snow Plowing and Snow Removal

The Department will plow and sand or salt arterial highways but removal of snow is a municipal responsibility. In case of inadequate snow removal, the Department reserves the right to carry out the work and charge it to the municipality.

6.04. JOINT PROVINCIAL-MUNICIPAL RESPONSIBILITIES NON-FREEWAY TYPE ARTERIAL HIGHWAYS

1. Street Lighting and Traffic Signals

Generally, the municipality will be responsible for half the cost of installation, operation and maintenance of street lighting and traffic signals at intersections. Between intersections, street lighting will be solely a municipal responsibility except where the Department has installed traffic islands and channelization. Where stop and go traffic signals or flashing beacons are to be installed by a municipality without a cost-sharing agreement being made, a permit must first be obtained from the Department. See 6.08 covering signals and lighting for full details.

2. Curbs, Gutters, and Underground Storm Drains

Subject to approval by the Department of Highways and availability of funds, installation of curbs, gutters, underground drainage, and outfalls on an arterial highway may be shared on a 50-50 basis with the municipality. In addition to the Department's share of curbs, gutters, and underground drainage, the Department will design and pay for any necessary base construction or reconstruction and paving. If the municipality feeds run-off from its underground drainage system into the Department's system, the municipality will be required to pay the extra cost of larger pipes necessary to carry the additional municipal run-off.

2.1 Written application from municipalities for curb and gutter projects on arterial highways in the municipality may be forwarded direct to the local District Official of the Department of Highways.

2.2 If the Department concurs with the request, the municipality will be advised that engineering surveys will be programmed. When engineering is sufficiently advanced, the municipality will be advised of its share of the estimated cost of the work.

2.3 On receipt of a letter from the municipality indicating that funds are available for their share of the project, the Department will program the work on the basis of overall provincial priorities and availability of funds. When a definite construction date can be established by the Department, the municipality will be so advised.

2.4 When work is complete, the municipality will be billed for its share of the actual final cost.

6.05. PROVINCIAL DEPARTMENT OF HIGHWAYS RESPONSIBILITIES NON-FREEWAY TYPE ARTERIAL HIGHWAYS

1. Roadways and Shoulders

   Construction or reconstruction, and paving.

2. Maintenance of Roadways, Shoulders and Parking Lanes

   Generally the responsibility of the Department except as detailed elsewhere in this chapter. Winter surface maintenance of sidewalks on structures will be the responsibility of the Department unless there is a municipal sidewalk system leading to the sidewalk on the structure.

3. Acquisition of Right-of-Way

   Normal highway right-of-way requirements will be acquired and paid for by the Department.

4. Snow Plowing and Sanding

   Not including removal of snow.

5. Street Cleaning

   The Department is responsible for street cleaning of arterial highways with the exception of curb and gutter sections.

6. Service or Frontage Roads

   Construction is generally the reaponsibility of the Department of Highways or subdivider but maintenance is the responsibility of the municipality.

7. Centreline, Channelization, and Lane Line Marking

8. Stop Signs

   Erection and maintenance on roads joining or crossing the arterial.

9. Provincial Route Markers, Directional, Warning and Regulatory Signs

   Departmental responsibility with the exception of parking signs - see Section 603.5.

6.05, Cont'd.

10. Other Signs

Control on or over the arterial right-of-way.

11. Crosswalks

Control of location and installation of pedestrian and school crosswalks marked by signs and painting of crosswalks at intersections where the Department has contributed to the cost of a traffic signal.

12. Access Permits

The Department is responsible for the issuing of access permits on arterial highways but will first refer such applications to the municipality. It is requested that development plans requiring specific entrances to an arterial highway be referred to the Department for access permits before a building permit is issued by the municipality. See also Chapter 7.

13. Traffic Control

Determination of the manner of operation of traffic control devices and the imposition of restrictions and regulations governing the loading, size, length and movement of vehicles is a Departmental responsibility. Overweight and oversize permits for travel on arterial highways must be obtained from the Department of Transport and Communications or Government Agent.

14. Utilities, Structures, etc.

Approval by permit must be obtained from the Department of Highways for the construction, operation, and maintenance of all works on, over, or under any arterial highway right-of-way.

15. Engineering

The Department is responsible for all highway engineering on arterials.

6.05 . Cont'd

16. Limits for Maintenance

The Department will maintain public roads connecting to an arterial highway as follows.

Winter Maintenance - to the shoulder of the arterial

Other Maintenance - to the rear of the ditch line of the arterial

6.06. PROVINCIAL-MUNICIPAL DIVISION OF RESPONSIBILITY FREEWAY TYPE ARTERIAL HIGHWAYS

1. General

The division of responsibility for each interchange, structure, ramp, access road, etc. that affects or are affected by municipal streets or roads will be considered separately and discussed with the municipality. A plan will be prepared showing the layout and a list of responsibilities in each case, and copies will be forwarded to the municipality concerned. Generally, the division of responsibility is listed below, but these may be varied slightly to meet the peculiarities of a particular interchange. The Department will be responsible for all works within the right-of-way except as follows.

2. Undercrossing

Where a structure carries a provincial highway over a municipal street, the Department of Highways is responsible for street cleaning, pavement marking and winter maintenance of the roadway and shoulders of the provincial highway, and for maintenance of the structure.

3. Overcrossing

Where a structure carries a municipal street over a provincial highway, street cleaning, pavement markings and winter maintenance of the roadway shoulders and sidewalks on the structure are a municipal responsibility. The Department of Highways is responsible for maintenance of the structure.

6.06. Cont'd

4. Drainage Maintenance

In 6.06.2 and 6.06.3 the drainage maintenance may be divided or varied depending on the drainage pattern. If the drainage enters the freeway system it will be the responsibility of the Department. If it enters the municipal system it will be the responsibility of the municipality.

5. Landscaping

In 6.06.2 and 6.06.3 the landscaping will be the responsibility of the Department to a point where the right-of-way of the municipal street has been widened to accommodate the ramps of a particular structure, or the Department will maintain the landscape to a reasonable point where a change in the maintenance procedure will not affect the appearance of the landscape.

6. Street Lighting

In 6.06.2 and 6.06.3 the street lighting maintenance will be the responsibility of the Department, except where there was street lighting on the municipal street prior to the freeway construction and this has not been materially increased by the construction of the freeway. Any lighting installed by the municipality will be their responsibility.

7. Load Limits

In 6.06.2 and 6.06.3 the Department will set the load limits allowed on the structure and it will be the responsibility of the municipality to enforce these load limits. The Department reserves the right to call upon the Department of Transport and Communications to check a load passing over the structure.

8. Service or Frontage Roads

The municipality is responsible for the maintenance of service or frontage roads adjacent to arterial highways.

6.07. SECONDARY HIGHWAYS

1. General

A secondary highway is a municipal road which has been classified under the "Highway Act". The municipality is entirely responsible for all design, maintenance, and construction work on secondary highways including bridges and structures. The municipality may regulate traffic as it sees fit.

2. Cost Sharing

The Department may contribute up to 50% of the cost of construction or reconstruction and up to 40% of the cost of maintenance of secondary highways depending on availability of funds.

3. Shareable Construction Costs

The Department may contribute up to 50% of the cost of approved municipal construction projects on secondary highways including:

3.1 Construction or reconstruction of highways and bridges including engineering costs but not including right-of-way costs or cost of sidewalks

3.2 Paving or re-paving.

3.3 Curb, gutter, and underground drainage

3.4 Installation of street lighting and traffic signals as outlined in Section 6.08.

3.5 Railway crossing signals.

4. Shareable Maintenance Costs

The Department may contribute up to 40% of the cost of municipal maintenance of secondary highways including:

4.1 Maintenance of roadway, shoulders, and bridges not including sidewalks

4.2 Maintenance of curbs and gutters.

6.07. Cont'd

4.3 Centreline, channelization, signed crosswalks, and lane line marking maintenance but not painting of curbs and parking stalls.

4.4 Snow plowing and sanding but not removal of snow.

4.5 Maintenance of provincial standard directional, warning, and regulatory signs with the exception of parking and street name signs.

4.6 Street cleaning except for curb and gutter sections where there is no participation.

4.7 Maintenance of street lighting and traffic signals as outlined in Section 6.08.

4.8 Maintenance and operation of railway crossing signals.

5. Application for Cost Sharing

In accordance with Section 37 of the "Highway Act", all municipalities shall submit to the local District Engineer or Superintendent of the Department before the first day of February, an estimate covering the proposed construction and/or maintenance of secondary highways for the fiscal year commencing the first of April following.

The estimate shall include the following information:

5.1 Estimate is to be headed with name and reference number of the secondary highway.

5.2 If there is more than one secondary highway within the municipality, separate estimates should be submitted for each.

5.3 Proposed maintenance work need not be detailed but construction estimates must be detailed and identify the location of the work on the secondary and the extent of the work.

6.07. Cont'd

6. Approved Cost Sharing

Each municipality and District Official will receive a letter from the Department's Municipal Programs Engineer outlining the cost sharing program approved for the fiscal year.

The municipality must notify the Department as to the scheduling of construction work to facilitate progress inspections. On completion of construction work, accounts are to be submitted to the local District Official of the Department. After final inspection and providing the work is in order, the account will be certified for payment. Payment for construction and maintenance work can only be made up to the amount approved by the Department.

All accounts are to be submitted to the Department not later than the 10th of March of each year to ensure that payment can be made out of allotted funds for that fiscal year.

6.08. SIGNAL AND LIGHTING INSTALLATIONS ON ARTERIAL AND SECONDARY HIGHWAYS

1. Division of Costs for Approved Installations

Cost sharing will be governed by the following rules at normal intersections with four approaches and on a pro-rata basis at other intersections.

1.1 At the junction of two arterials the Department will pay all costs.

1.2 At the junction of an arterial and a municipal road the sharing will be 50% by the Department of Highways and 50% by the municipality.

1.3 At the junction of a secondary highway and municipal road 25% of costs will be paid by the Department.

1.4 At the junction of an arterial and secondary, 75% will be paid by Department and 25% by municipality.

6.08. Cont'd

2. Street Lights

2.1 The Department will participate in installation costs at intersections with costs shared as outlined above providing the Department's warrants for the installation are filled and the design and type of light source are approved by the Department.

2.2 The Department will participate in power and maintenance costs of either new or existing lighting at intersections with costs shared as outlined above providing the Department's warrants for the installation are filled and the design and type of light source are approved by the Department.

2.3 A municipality shall be fully responsible for existing and new street lighting between intersections. An exception is the lighting installed by the Department at full cost to the Department to illuminate traffic islands and channelization extending beyond an intersection. In this area, the costs of power and maintenance of the lighting but not installation costs shall be shared by the Department and municipality on the same basis as the adjoining intersection lighting. On highways where no private access is allowed, the Department will pay the full cost of installation, power, and maintenance of lighting not at an intersection.

2.4 On roads designed to freeway standards, the Department will bear the full cost of installation, operation and maintenance of lighting that the Department feels is necessary.

2.5 On new highways (where the new provincial road intersects a busy municipal road) the Department will bear the full cost of installation at intersections. However, operation and maintenance costs must be shared by the municipality.

6.08. Cont'd

3. Traffic Signals (Stop and Go, or Flashing Beacon Type)

3.1 Where new traffic signals are to be installed or existing traffic signals reconstructed, at existing intersections, if the Department agrees that such an installation or reconstruction is necessary, the costs of installation, operation and maintenance will be shared with the municipality as described previously under Division of Costs.

3.2 Responsibility for maintenance and operation of all existing traffic signals at intersections will remain unchanged.

3.3 On new highways (where the new provincial highway intersects a busy municipal road) the Department will bear the full cost of installation if signal warrants are filled. However, operation and maintenance costs must be shared with the municipality, as described previously under Division of Costs.

4. Application for Cost Sharing

4.1 Application for cost sharing on either existing or planned installations should be directed to the District Official of the Department of Highways.

4.2 A written agreement will be drawn up embodying details in connection with each installation. This agreement should be approved and signed by the Department and the municipality before work on the installation commences.

4.3 Where the installation is to be designed and installed by the municipality, the municipality should supply details of the installation and a preliminary plan at the time when application for cost sharing is made.

5. Fire Signals

5.1 Fire signals are the responsibility of the municipality or fire district concerned and may be erected on arterial highways only under permit from the Senior Traffic Engineer, All costs are the responsibility of the municipality or fire district.

6.08 . Cont'd

5.2 Payment for fire pre-emption on traffic signals is the responsibility of the municipality or fire district concerned but installation may be included in the signal installation contract.

5.3 Cost of installation necessitated by construction of a new highway is the responsibility of the Department but maintenance will be to the account of the municipality or fire district.

6. General

If a municipality has any questions or problems concerning lighting or signal installations these should be referred to the local Department of Highways District Engineer or District Superintendent.

CHAPTER 7

CONTROLLED ACCESS HIGHWAYS

7.01 OBJECTIVE

The objective of the Controlled Access strategy is to preserve a reasonable level of service to long trip vehicles on the trunk and major highway and street system and to enhance safety.

7.02 POLICY

The strategy of Controlled Access is to develop a balanced hierarchy of road facilities in all areas, discourage sprawl urban development in rural areas and limit points of access to trunk high speed highways.

The strategy is applied through complex policies in highway and street design standards, zoning controls, subdivision controls and access controls. The major elements of these policies are:-

1. Road Design
    1. Keep number of intersections and driveways to a minimum.
    2. Locate to minimize access opportunity.
    3. Provide frontage/service roads as required.
    4. Set right of way width to allow future expansion.
2. Subdivision
    1. Developer to dedicate road widening for existing trunk and major roads.
    2. Developer to dedicate right of way for horizon network of collector and local streets but not build them unless required at this time.
    3. Developer to build all collector and local streets necessary to access lots and pave them where intended use is residential, industrial or commercial. Developer to improve existing public roads of lower standard both in the subdivision and leading to it.
    4. Where proposed services (water, sewer) are tied to allowable parcel size require the services to be installed before plan approval.
    5. Where zoning bylaws exist honour the minimum parcel sizes. Where no zoning bylaws exist follow the Provincial Regulations except where a Regional Plan (i.e. Lower Mainland) regulates.
    6. Along Controlled Access Highways get dedication of frontage widening or of service roads to provide alternate access to all parcels: ensure continuity of this frontage/service system.

7. For access to body of water, require dedication regardless of topography. Require construction where public need is projected and grades do not exceed 25%. Allow grouping of up to 3 accesses fairly freely to achieve wider accesses at less frequent spacing.

8. Refuse residential, commercial and industrial subdivisions in areas subject to flooding. Refer floodproofing proposals to Deputy Minister of Environment . Recommend agricultural subdivisions to Environment for approval subject to restrictive covenants. Refuse all non-agricultural subdivisions in areas subject to landslip, rockfall, snow slide, etc. because of public safety.

9. When regional districts enact new bylaws encourage them to consent to completion of subdivisions of proposals recently given preliminary layout approval. However, if regional district does not consent, then refuse approval to such subdivisions.

10. Allow access by water subdivisions only in rare cases in remote areas and in small numbers of lots in order to reduce demands for overland connections at Provincial cost.

11. Freely seek the advice of experts in other agencies: Health, Wildlife, Municipal Affairs, Environmental Engineering, Water Resources, regional district, etc.

12. Refuse subdivision in Agricultural Land Reserves except as provided in Land Commission Regulations.

13. Refuse subdivision approval where conditions are such (unsafe sewage disposal etc.) that other Ministries or Agencies would subsequently be obliged to refuse permission to develop: thus avoiding the anomalous situation where one arm of Government creates difficulties for another arm by part-approving a proposal.

3. Land Use

1. Encourage municipalities and regional districts to maintain concentration and density within the limits of urban areas to reduce linear and low density sprawl. Allow small rural commercial developments at existing selected developed nodes. Require urban uses such as shopping centres, residential developments to be in urban areas. Refuse approval to zoning bylaws not in conformity with this.

2. Apply subdivision, zoning, and access approvals to refuse developments with inadequate off street parking and/or poor internal layout so that the highway or major street function is not impaired by private (especially commercial) activity.

7.02.3

3. Where zoning does not exist, apply subdivision and access approvals to prevent inimical land uses as if zoning did exist.

4. On new major routes select areas of highway commercial development and recommend their retention by the Crown.

4. Access

1. Allow no direct access on limited access facilities.

2. Allow direct access to conventional controlled access facilities for compatible land uses where the land use is not excessively inimical to the controlled access strategy.

3. Allow sufficient access points for projected volumes within the constraint of maintaining level of service for through traffic as long as possible.

4. Refuse access where minimum safety conditions of sight distance etc. are not met.

5. Allow access for specific land uses of specific size and scope only, so that redevelopment or expansion requires new application and new review.

6. Where channelization or nearby street upgrading is required to accommodate development, require the Developer to pay the cost.

5. Road Closures

1. Allow closures where roads are not required for the existing or projected network, and where utilities are absent or protected by easements.

2. Require non-company applicants to use Plans Cancellation Act where possible.

3. Require companies to compensate the Crown for area of land gained in road closure.

4. Allow no loss of waterfront but allow closure of roads to water where equivalent waterfront is to be dedicated in exchange in an acceptable location.

* 6. Setbacks

1. Where sight distance is not impaired allow setback less than the 4.5 meters where topography is difficult.

2. Allow setback less than 4.5 meters freely from the cross street for narrow corner lots.

* Amendment

* 7.03 APPLICATIONS AND PROCESS

Driveway application is made by applicant on form H20A. Report is made by District Highways Manager on form H34 and forwarded to Region. Region reviews, discusses with Executive where applicable, issues permit or refuses and advises District Highways Manager with copy to Headquarters. District Highways Manager advises applicant.

Zoning or land use contract application is made by letter by municipality or regional district to District Highways Manager who reports on form H250 or 250A to Region. Region reviews, discusses with Executive where necessary, approves or disapproves and returns material to District Highways Manager (with c.c. to Headquarters) who returns material to applicant.

Subdivision is submitted to District Highways Manager by applicant (in unorganized territory) or municipality (in organized territory) See Chapter 5 for process.

7.04 EVALUATION OF DEVELOPMENTS

1. In this section these words have the following meanings:

"design hour" is the time of day and week on which reasonably maximum volumes are produced by the land use considered. It is not the highest volume in the year but rather generally represents something of the order of the 30th highest hour i.e. the volume which is exceeded by 29 hours. If design hour coincides with peak hours on street system (0700-0900, 1600-1800) it is called peak hour.

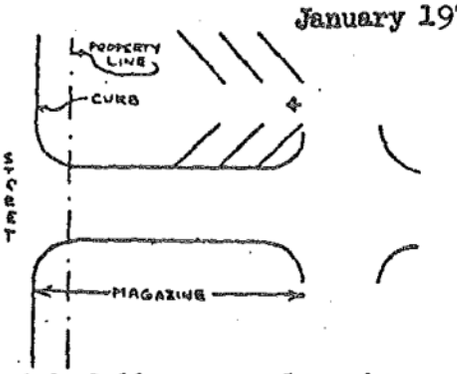
"gross leasable area" (GLA) is the total floor area designed for tenant occupancy and exclusive use, including basements, mezzanines and upper floors, if any, expressed in square metres measured from the centerline of the joint partitions and from the outside face of outside walls. It does not include malls, public washrooms, heating plant, etc.

"highway" includes street.

"junior department store" is a generally lower priced store with generally less than the full range of goods: includes Zellers, K-Mart, Kresge, Stedmans, Woolworth, Woolco and Metropolitan - see major department store.

* Amendment

"magazine" is the carrying of a driveway some distance into the property without connection or parking on it so that vehicles can store without interference from cross traffic or from marginal friction.



"major department store" is one with full range of goods: includes Woodwards, Eatons, Bay and Sears - see junior department store.

"peak hour" means street peak at 0700-0900 and/or 1600-1800 weekdays - while maximum is generally 1600-1800 the 0700-0900 should also be considered because of directional characteristics.

"street" includes highway.

"trip" is a journey from an origin to a destination. For example, a housewife leaving home and proceeding to an arena to drop off a child, then to a supermarket to shop, then to an office to pick up husband, then to home has undertaken 4 trips: home-arena, arena-supermarket, supermarket-office, office-home. The home has generated one trip: home-arena, and has attracted one trip: office-home. The home has produced two trips: home-arena and office-home.

"variance" is a measure of the dispersion of values around an average. High variance mea great dispersion and low variance means small dispersion. - see 7.04 .2

"v.p.h." means vehicles per hour. It is a rate and it must be remembered that X v.p.h. does not mean X vehicles arriving over an hour. V.p.h. for conventional facilities is generally the rate for the peak 15 minutes i.e. if Y vehicles arrive in the 15 minutes then v.p.h. is 4Y. For freeways and interchanges the 5 minute rate is generally used.

2. It is most important not to misinterpret any of the figures given in this section. Most of the figures are based on a reasonable number of observations but in the nature of the phenomena being observed there is room for great variation. For example, consider these two sequences of numbers:

   (a) 8, 9, 10, 11, 12

   (b) 6, 8, 10, 12, 14

7.04.2 - Cont'd.

Both have the same average value of 10 but the second sequence has a much greater dispersion and greater variance than the first. The statement that the average is 10 says nothing about the range of values. If some regulation required that a development supply 10 of whatever feature this is there would be a greater undersupply in (b) than (a). In practice in most traffic characteristics there is quite high variance. The actual true figure for a specific development depends on many factors, some of which are not easily measured. In particular, in dealing with commercial developments the traffic activity is very strongly related to the characteristics of the development's market. In most cases the market is too difficult and expensive to estimate and the estimate arrived at often in any case not particularly accurate. In dealing with the estimating of traffic volumes, therefore, the average figure is used but the likely range of true value must still be kept in mind. For example, the estimate of a left turning volume may be 150 v.p.h. The most probable true value may lie in the range between 100 and 220 v.p.h. To design and build a left turn storage lane to exactly fit the 150 v.p.h. condition may invite problems since if the true value does turn out to be 220 v.p.h. the storage may be inadequate and the channelization curbing may have to be ripped up and extended at a certain cost in both dollars and public opinion. It is better strategy to put in painted left turn storage, observe actual experience for a while, and install raised channelization later. However, in the case of parking supply use of the average figure would mean that 50% of developments would be undersupplied with consequent congestion of vehicles seeking a vacant stall and also pressure to allow on street parking. In this case, what is known as the 85 percentile value is used. This is higher than the average and is the value which includes 85 percent of the observations. In this case some 15% of developments are undersupplied to the design hour level. This is considered a reasonable level of congestion to tolerate. It is not
* desired that there be enough stalls supplied so that there is never any congestion. It would probably be more realistic in terms of the public interest to use something around an 85 percentile for volumes instead of the average. However, at this time the average is used.

* Amendment

3. The purpose of evaluating developments is to ensure that by their existence, nature, layout or design they do not contribute to undue traffic congestion thus jeopardizing the design integrity of the highway and street system and reducing level of service to traffic. The process of evaluation is basically one of estimating projected traffic volumes and relating them to the characteristics and features of the street system to assess impact and also that of reviewing layout to see its characteristics do not promote congestion. The various features such as intersections, turn slots, signals, left turn storage, access points, magazine storage, etc. are analysed and appraised using Traffic Engineering methods.

Since it is the nature of the development itself which affects traffic conditions it is proper to take a holoistic approach to the problem regardless of what specific procedure or application initiates it. It is obviously pointless to consider, for example, a subdivision for a drive-in motion picture theater as a subdivision only and approve it as a subdivision if the driveways are not acceptable and a permit will be refused. Whatever procedure initiates, whether subdivision, rezoning, setback application, driveway permit application or even if it is just an announcement in a newspaper, applicant should be requested to provide information so that the whole development can be evaluated and the consequent decisions on subdivision, zoning, setback, driveway etc. made in that light.

The chief consideration is traffic and the fundamental policy is that highways and major streets are for moving traffic and it is, therefore, desired that developments be as self sufficient as possible so that there is adequate off street parking and that internal layout and siting is so designed that it does not contribute to congestion on the street from waiting vehicles blocking lanes, etc. An unsatisfactory internal roadway system can cause congestion which can reflect back to the street. Inadequate dimensions of parking stalls and aisles can cause delays in parking and unparking so that aisles are blocked and arriving vehicles congest: this again can reflect back to the street. Inadequate number of parking stalls can cause demand for on street parking. This is difficult to police and so offers marginal friction to through traffic lanes with consequent lower level of service. In the longer run also it creates an attitude of vested interest in the property owners, particularly where land use is commercial, who oppose street widening for additional through capacity or who demand (and often get) public investment in parking facilities

to replace stalls lost by street widening. In addition, inadequate number of off street stalls causes arriving vehicles to cruise aisles searching vacant stalls or to illegally park along main internal circulatory roads again causing congestion which can reflect back to the street. Inadequate street features, of course, also cause congestion in the street. There are 5 main aspects to be considered in reviewing a proposal:

A. Siting of the development in relation to the street system and the adequacy of that system to carry the extra traffic generated by the development.
B. Location and adequacy of driveways.
C. Satisfactory internal roadway layout including magazine roads inside access points.
D. Adequate off street parking including satisfactory stall and aisle dimensions.
E. Whether the development generates high or low volumes and whether these volumes peak with the same characteristics as volumes on the surrounding street system.

Poor satisfaction of even only one of these aspects may contribute to congestion.

The full process is quite complex and time consuming. To evaluate a regional shopping center, for example, may take 4 or 5 full man days of Engineer and Technician time. However, most developments offered are, in fact, quite small and simple and the process is considerably simplified by this.

Generally speaking, most of the developments presented do not need major street frontage for traffic reasons. Many developments on major streets would actually have better traffic conditions if located on cross streets but many developers and merchants (especially retail merchants) insist on major street frontage because of "exposure" and "competitive advantage". Some of these benefits are, in fact, largely illusory as the location of retail stores in malls (hidden from the street) attests. Nevertheless, the pressure to be on a major street is very real. Some types of development such as gas stations, drive-in cafes, etc. do benefit in real terms from frontage on major streets and some major developments which are high traffic producers should be located on or close to major streets so that the high volumes can be accommodated. Indeed a large traffic intense development should be located near the intersection of two major streets so that it can draw traffic from four directions and thus, by dispersing, lessen impact on any one street. However, in urban and suburban areas zoning and

the difficulties of private land assembly restrict the developer's choice of property and siting as a result is often not of the best.

It is necessary to develop some sort of information on which to base analysis and the developer may be requested to provide information (depending on the size, etc. of the development) ranging from a simple traffic site plan (see 7.04.7) to a full scale study by a Traffic Engineer which may include:

a) an estimate of traffic demand into the development based on economic forecasting by the developer's market studies or in relation to generally known parameters such as floor area.
b) an estimate of directions of traffic flow.
c) details of existing traffic on surrounding street system.
d) study of access location to give easy access in and out of the development with satisfactory operation for street traffic.
e) study of parking layouts to determine the layout that best combines stalls required with ease of parking and circulation.
f) study of special problems such as commercial vehicle access, loading and unloading, etc.

Generally the professional large development developers will do this without urging since it is in their own interest to do so to maximize the return on their investment. However, it is surprising how many developers are willing to risk large investments on the basis of minimal information and in these cases it is necessary to work up the information ourselves as best we can.

In large developments driveway locations are frequently governed by the need to get adequate storage lengths for left turn lanes, auxiliary right turn lanes, etc. without operational conflict with intersections, other developments etc. It is necessary to project street traffic demands for future intersection channelization and to undertake coarse possible future layouts in order to acquire horizon RW requirements at the time of development and to ensure future compatibility of driveways, etc. as well as present compatibility. This does not commit the Ministry to any future layout but rather insures flexibility in the future to accommodate to one of several options of horizon layout. It is done also bearing in mind the lack of quantitative accuracy in the evaluation procedure. In small developments these features are often not so critical but it may still be necessary to avoid conflict with intersection channelization, etc.

A satisfactory internal road layout is a most important feature and in some cases may be the most important feature. Freedom of circulation in the internal road system will allow vehicles to seek vacant stalls or proceed to exits without undue delay thus reducing the possibility of congestion. Two way 2 lane roadways should be a minimum of
* 7.5 m wide, preferably 8.5 m wide, and with a maximum of about 9 m to discourage illegal parking. One way one lane roadways should be about 5 m. This will generally provide sufficient width for a vehicle to squeeze past a disabled vehicle yet not be attractive to illegal parking. Some form of magazine at the access points is often necessary so that arriving vehicles may store off the street for short periods while instantaneous congestion is clearing. Arrivals may be assumed to be in the Poisson distribution. This is not particularly accurate over about 50 v.p.h. but appears good enough (and simple to calculate) under the circumstances.
* The storage length may be calculated (at 7.5 m per vehicle) as the number of vehicles arriving in 15 seconds using probability .01 for conventional facilities and .001 for developments near freeway interchanges. Conditions at the downstream end of the magazine should be evaluated. If there are a lot of left turns, for example, the magazine length may need increasing.

The parking standards (see 7.04.8) do not require enough parking to provide for the absolute annual maximum demand. The standards are roughly comparable to the highway designer's concept of 30th highest hour. Provision at this level is usually still economic to the developer. Additional supply over this will likely not be economic (it means in effect some stalls used less than 30 hours a year) to the developer and, therefore, not likely in the public interest since he will pass the cost on to the consumer in increased prices and since (in theory anyway) the 30th highest hour concept means we are willing to tolerate congestion on the street for 29 hours a year ourselves. An important feature also is the width and angle of the stalls and also width of the aisles. If the module (i.e. 2 rows of stalls and 1 aisle) is inadequate then single maneuver parking and unparking will be difficult and hence parking and unparking will be more time consuming and consequently contribute to congestion by blocking aisles, etc. The dimensions given in 7.04.9 are the recommended normal minimum. Slight reductions in module width (up to about 5%) may be acceptable under special conditions but not where snow is a problem. Stall width for high turnover parking (retail, shopping centers,
* etc.) should be minimum 2.75 m with absolute minimum 2.6 m.

* Amendment

Stall width for longer term parking can be 2.6 m with
* absolute minimum (employee lots?) at 2.5 m. Stall length is standard 5.6 m and striping is recommended to be 5.0 m to encourage vehicles to go right in to the stall. Wheel stops are desirable to encourage orderly parking without obstruction into aisles and reduce wrong ways in one way aisles but they are not insisted on in snow areas as they can make plowing and snow removal most difficult. The most space efficient layout is one using 90 degree back-in stalls. This requires the most driver skill and is, therefore, recommended only for all day male driver employee parking or for attendant parking in structures. (Hasten to add that female drivers have less parking skill not because they are innately inferior but because they drive fewer miles). The stall requiring the least skill is the 45 degree drive-in stall and this is common in many lots. It is best employed with the one way aisle. Many lots are now developing with 90 degree drive-in with two way aisles and this is quite satisfactory and acceptable. Stalls must also be attractive. Stalls further than 200
* m from a shopping center building or 300 m from an office or plant should be carefully reviewed as drivers will tend to prefer to cruise closer-in aisles rather than park and walk the extra distance. The result of unattractive stalls is, therefore, a lower effective parking ratio with consequent increase in level of congestion.

The figures given in 7.04.8 for the various types of business do need some interpretation and discretion at times. For example a furniture store has a large display area compared with number of customers and employees and the retail store figure can be reduced accordingly if the tenant is known to be a furniture store. Some other types of development are not really critical. For example, a zoo generally occupies a large area and its parking layout can be designed so that if parking supply becomes inadequate the parking area can be easily expanded. Figures may also be reduced when the development is in or next to the central business district of a city or when a city bus transit terminal is to be developed as an integral part of the proposal. However, on the other hand developers will often argue that figures should be reduced because adjacent land use parking characteristics are out of phase with each other. This is very seldom true. For example a church may wish to locate next to a small shopping center and may argue that since the center is closed on Sunday minimum or even zero parking for the church is indicated. At first sight this appears reasonable. However, it ignores the fact that shopping centers

* Amendment

have high demands in evening opening times and churches also have non-worship functions on weekday evenings when the center is open. It also ignores the trend towards increased evening opening of shopping centers and retail stores which is likely to lead in time to Sunday opening of shopping centers (already a feature in parts of the U.S.).

For parking supply the most critical developments include shopping centers, industrial plants, highway commercial, etc. and these require close attention. By and large there has been good acceptance of our figures although they are often substantially higher than municipal bylaws. Our figures relate better to actual traffic activity and most professional developers recognize the need for adequate parking for auto oriented business. While our figures correlate better with specific traffic activity based on specific land use most bylaws are in contrast written in a general manner based on generic classifications such as commercial, industrial, etc. As a result, most bylaws are based on average needs which is an inadequate approach with factors of such high variance as most of these land use/traffic functional relationships are. Further, most bylaws are based on variables that are easy to measure and to police such as floor area, and these do not always correlate well. For example, a warehouse for building materials will have a much larger floor area per employee and customer than a warehouse for electronic parts. A bylaw requiring stalls per floor area may well oversupply the one and undersupply the other. Municipal bylaws also tend to be outdated. Most are drafted by taking material from other bylaws rather than making any use of current observations. As a result many of the figures used in fact date from the 1930's and 1940's before auto usage was as widespread as now.

Trip production can only be reasonably well correlated with a few types of developments such as shopping centers, airports, industrial plants, etc. and even in these the variations are high. Nevertheless, in order to evaluate a proposal qualitatively it is often necessary to make a stab at estimating quantitative trip production and having drawn qualitative conclusions, very quickly forget the figures. One key to interpreting trip production also is to keep in mind the intensity of production as well as its absolute
* value. For example, a plant with say 300 m frontage on a street and with 1000 trips per day may actually have less impact than a drive-in cafe with 30 m frontage and 500 trips per day although the absolute volume of trips is greater. Again the impact will be related to the peaking characteristics - a development whose design hour is off peak from the street peak can be more compatible than one whose design hour coincides with street peak.

4. There is no substitute for observation of a similar existing development under similar traffic conditions. No figures can supplant this experience. However, it is frequently not possible to find anything sufficiently similar and estimates must then be made in the light of general experience and trends. Following, therefore, is a brief superficial discussion of some characteristics and trends in the more common types of development, to assist in evaluation.

Boat launching ramps

Parking demand varies greatly with several unquantifiable factors such as proximity to large city, fishing quality of body of water, size of body of water, and weather, etc. and no figure is available for a norm.

Capacity of a single lane ramp is about 15 launchings or recoveries per hour. Launching and recovery times vary greatly with size of boat and skill of driver. Times as low as 1 minute and as high as 20 minutes have been recorded. Average is generally around 4 minutes. Parking stalls should
* be 11 m long to allow one auto plus one trailer. Where more than 50 stalls are provided 20% may be 5.6 m long to allow for car tops only.

Volumes produced by boat launching ramps are not predictable. Layouts should have some magazine approach storage upstream of the ramp to accommodate arrivals.

Ramps are often associated with marinas, (see Marinas).

Maximum usage of ramps is generally on weekends.

Building materials supply

A new trend is now evident in building materials supply developments. The "supermarket" approach is now beginning to be used. It takes two forms:

(1) Vehicle is parked and shopper proceeds around the shopping area with a cart which he loads like a grocery cart and then takes through a check out counter. If his purchases are light he wheels the cart to his vehicle: if heavy, he takes the cart to a loading area and brings his car over to load.

(2) Vehicle drives through the shopping area (in the same manner as a grocery cart is pushed through the aisles of a supermarket) and shopper loads his trunk with purchases and then goes through a check out counter where his vehicle is inspected and purchases paid for.

* Amendment

7.04.4 - Cont'd. - 1

The first form is apparently the more popular. Both offer promise of high volume business and hence, high traffic generation. No figures of trip production are available. Maximum activity generally takes place on weekdays 1700-1800 (probably do-it-yourselfers going home) and Saturdays.

Campground

Campground accommodates tents, recreation vehicles and camping trailers. Trailers of any size that stay any length of time require mobile home park accommodation. In some areas the illicit use of campground as mobile home park is hard to police.

Rescinded/now Reg Dist. Bylaw

amend { Campground layout must conform to B.C. Reg. 255/67 and requires MHO approval before dealing with subdivision, zoning, access, etc.

Campground may include small convenience grocery store up * to 30 m^2 retail area but it must not be sited to be oriented to highway traffic and preferably should not be visible from highway.

Design hour is 1500-1600. Maximum 2 way volumes are of the order of 1 v.p.h. per unit.

Cafe, drive-in

Three main types are current:

A.	Car hop - general food	e.g. White Spot
B.	Car hop - fast sandwich	e.g. A and W
C.	Self serve - fast sandwich	e.g. Macdonald's

Each has differing characteristics:

A has a more adult clientele. This type is less popular than it was in past years. There tends to be more of an approach storage problem than with types B and C. Perhaps customers are more deliberate, less impulsive in motivation. Approach storage of the order of 10 autos appears generally adequate.

B has a mix of adult and juvenile clientele. This type is less popular than in past years, probably due to competition from type C. Much custom appears to be impulse and approach storage is seldom a problem.

C has a dominantly juvenile clientele. Approach storage is sometimes a problem.

* Amendment

There does not appear to be a correlation between maximum customer demand and size of building, number of ovens, etc. When lots are full, potential customers generally tend to pass up except to an extent (as noted above) in type A. Types B and C in this sense are usually self regulating. Whatever is offered is usually generally adequate parking supply. Most developments run between 50 and 150 stalls. Types A and B generally attract an entering peak v.p.h. of about 2 times # stalls. Type C can run to 4 times # stalls because of faster service with precooking. Peak time is usually 1730-1900 with lesser peaks 1200-1300 and around 2300.

Many type B and C establishments install speed bumps on their property. These should be checked at entrance points to ensure they do not slow approaching vehicles on the street.

Cafe, take-out

Three main types are current:

A. fried chicken
B. pizza
C. fish and chips

All three are frequently located in a shopping center or an existing business district. Peak time is usually 1730-1900. Volumes vary greatly depending on market, etc., but can go as high as 500 v.p.h. 2 way. Type B generally has less activity than types A and C. Waiting time is longer, however, so parking requirements are about the same.

Car wash

There are three main types current:

A. Fully automatic tunnel with internal cleaning.
B. Fully automatic tunnel - external cleaning only.
C. Hand wash - self serve.

A is labor intensive and generally exists as an independent operation. B is really A without the labor and produces a lower level of service. These are usually associated with a gas station as cross merchandizing. The wash is usually "free" with a purchase of gasoline. C is not as popular as it once was.

The number of car washes has expanded greatly in the past 15 years. In the earlier days spillbacks were a problem and large queues resulted in many operations but the increased supply of car washes has greatly improved the situation. Type A should have storage upstream of the vacuum bar equal to 25 autos in not more than 2 lines. Type B needs about 10 autos storage. Type C used to require 5 per bay but the declining popularity of this type makes it likely that 3 per bay will be adequate.

Design hour is generally 1300-1500 Saturdays with 2 way volume about 120 v.p.h.

Gas station

Three main types are current:

A. neighborhood
B. highway
C. mixed

The neighborhood station derives most custom from repeat steady customers who patronize a particular station largely because of convenience and personal relationship with the operator. The operator derives about half of his revenue from repairs, tires, batteries and accessories and half from gas sales. The highway station derives most custom by selling gasoline to passing traffic. Repairs, etc. are a minor part of the business operation. The mixed station is one with a "highway" location that does both types of business. Many gas stations in smaller towns (e.g. Golden) are of this type.

The objective of an oil company is to sell gasoline. This is not always congruent with the objectives of the neighborhood type operator who consequently often resists premium offers, cross merchandizing, etc. There is, consequently, a trend away from small lessee or owner gas stations to larger company owned gas stations with "free" car wash, grocery store attached, cafe, etc. At this time the average gas station pumps about 1 million litres of gas per year with some of the high volume stations doing as much as
* 5 million litres per year. A station doing around 1 million litres per year will have a peak hour 2 way volume of the order of 60 v.p.h. while one doing around 5 million may go as high as 250 v.p.h.

* Amendment

7.04.4 - Cont'd. - 4

Oil companies are now looking for larger sites and prefer not to get much less than 4000 square metres but do, of course, get less in some urban areas where land values are high. The trend is towards bigger and fewer gas stations. The trend for highway stations is also towards cross merchandizing by the addition of car washes, small grocery stores and cafes. The car washes are usually the automatic kind, external wash only.

For truckers and farmers the unattended "key lock" fuel pump is becoming more popular. Volumes vary widely and no figures are available. Layouts should be checked against truck turning templates.

Another recent trend is toward self serve gas stations. The attraction here appears to be the lower price of gas generally offered at those stations.

Hospitals

The correlation in hospitals is best with employment (although still quite good with # of beds) but employment is hard to measure because of part time workers (relief nurses, kitchen workers, etc.) and volunteer helpers. A public hospital of X beds will generally have a total employment of the order of 2.3X. Traffic activity is highest with acute hospitals, lower with chronic hospitals and lowest with mental hospitals and private hospitals/rest homes. Design hour at all types is generally around 1500 Saturdays when shift change coincides with visiting. Design hour 2 way volumes per bed are of the order of:

public	1.0 v.p.h.
chronic (extended care, VLA, etc.)	.5 v.p.h.
mental, private	0.15 v.p.h.

Volumes in the a.m. peak can be of the order of 80% of design hour volumes.

Hotel/motel

Hotel or motor hotel is distinguished from motel by having a cocktail lounge and/or beer parlor.

Hotel has maximum activity in peak hour. Tentative trip production for entering volume is .75 x # rooms plus .25 x # seats in bar and beer parlor plus .1 x # other seats (cafe, convention hall, etc.) in v.p.h. Exiting volume is about 90% of this.

Amendment

With motel the activity correlates more with the room aspects. Maximum activity is again generally in the evening peak hour and entering volume is of the order of .5 v.p.h. per unit and exiting about .25 v.p.h. per unit.

Industrial and service commercial

Most industrial is now of the so-called industrial park type. This is usually single storey with large areas of at grade parking and landscaping. Correlation is strong with number of employees. Peak hour volumes are of the order of .5 v.p.h. per employee for entering 0700-0900 and also for exiting 1600-1800. Parking again strongly correlates with number of employees counted as the total of 2 shifts.

Large developments such as pulp mills, mines, refineries, etc. are special cases. Generally they are high traffic generators during construction and light generators during operation with high mix of trucks.

Liquor stores

Liquor stores are most active in trip production and parking supply. They are most difficult to evaluate because there does not appear to be much relationship between the area of the building and the volume of business. The volume of business is not amenable to easy prediction. In any case it appears that the dominant feature is the characteristics of the parking layout. This is because the duration of shopping is short and consequently the time taken to park, walk to the store, walk back to the auto, and unpark is appreciable in relation to the time shopping. Thus, number of stalls required is no longer so directly a function of the activity (i.e. $ volume) in the store. Our standard parking requirement * is 1 per 12 m^2 gfa. If traffic circulation is very free and stalls are 2.7 m wide at least, parking module is not less than standard and entrance to building is some distance from the street, then requirement can be reduced up to 50%. The best strategy is to locate liquor stores in shopping centers and ensure that the store entrance is some distance from the street.

Design hour depends on store hours. Saturday 1300-1500 is generally strong but equivalent peaks occur at about 1700-1800 with stores that close at 1800 and at about 2000 with stores that close at 2300. Peaks are stronger before public holidays. 2 way design hour volumes are of the order * of 22 v.p.h. per 100 m^2 gross floor area but variance is very high.

* Amendment

Marinas

Normal design hour takes place on Saturdays and Sundays in summer. 2 way volume is of the order of .25 v.p.h. per boat stall but variance is high. Excessive peaks also take place during special events such as fish derbies. These are unpredictable.

Boat mooring area will accommodate about 40 boats per acre. **See also: Boat launching ramps.**

* Mobile home parks

Mobile home parks are urban residential developments with densities of up to 10 units per acre. **Where subdivision is indicated the proposal must be the subject of a land use contract.**

Characteristics are similar to single family residential except that proportion of children is marginally smaller.

Motor vehicle accident inspection facilities

Maximum flow through is of the order of 30 v.p.h. Daily volumes have two peaks: 0700-1000 and 1600-1900. Weekly peak is 0700-0800 Mondays. December is highest month. Design hour is 0700-0800 Mondays and design hour 2 way volume is of the order of 80 v.p.h.

Motor vehicle testing station

Maximum discharge rate is about 60 v.p.h. Most stations are open 0830 to 2030 weekdays. Heaviest days are Mondays, Tuesdays and Fridays with maximum volumes at 0830 and 1800-2000. Most designs can store about 100 equivalent autos which is generally adequate. Test stations tend to attract gas stations in their vicinity presumably to take advantage of minor adjustments required, such as headlights, etc.

Test stations can provide severe spillback problems in the first months of operation in an area, particularly when the deadline approaches. However, once this first flush is through they quickly settle down to more even traffic characteristics.

* Amendment

Offices

Office buildings may be classed into 2 types - single tenant and multi-tenant. The single tenant building of any size tends to have strong internal relationships and, hence, lower visitors than the multi-tenant. Correlation is strong with number of employees. Correlation per m^2 floor area (common in bylaws) is poor. There is great variation in floor area per employee and the variation is growing
* greater. Older buildings trend to 15 m^2 per employee but newer buildings trend to 24 m^2 per employee with some up as high as 28 m^2 A recent trend also is to so-called office parks which, analogous to industrial parks, are generally single storey buildings with at grade parking and large areas of landscaping. These developments are strongly auto oriented.

Peak hour volumes are of the order of .45 v.p.h. per employee entering 0700-0900 and .55 v.p.h. per employee exiting 1600-1800. Variance is low. On floor area basis volumes are of
* the order of 2.7 v.p.h. per 100 m^2 entering and 3.2 v.p.h. per 100 m^2 exiting. Variance is high.

Residential

Densities in dwelling units per net acre are generally of the order of:

single family dwelling on large lots	0.4 du/1000 m^2
single family dwelling on ordinary lots	1.5 du/1000 m^2
mobile home park	2.5 du/1000 m^2
* town houses, garden apartments	4.5 du/1000 m^2
low rise apartments (up to 4 storey, frame construction)	7.4 du/1000 m^2
high rise apartments (7 + stories, steel or concrete)	12.4 du/1000 m^2

Trip production per dwelling unit correlates fairly well with low variance. However, trip production per capita does not correlate as well over the full range because of different characteristics, especially persons per du, in apartments.

Peak hour volumes are of the order of:

0700-0900	outgoing	.55 v.p.h. per du
	incoming	.1 v.p.h. per du
1600-1800	outgoing	.1 v.p.h. per du
	incoming	.6 v.p.h. per du

(4) Check volumes in 2 and 3 against street features, existing and proposed, such as intersections, number of lanes, etc. Especially check critical conditions such as left turn storage lengths, weave distances, etc. This process should be done for the several conditions of:

1700-1800 weekday	-	street volume plus 65% center design hour
1900-2000 weekday	-	street volume plus 100% center design hour
1300-1500 Saturday	-	street volume plus 100% center design hour

(5) Check to see there is easy flow in the street system surrounding the center.

(6) Check to see access points are sufficient to handle the projected volumes - check widths.

(7) Check to see access points are located at proper clearances from other features - check sight distance especially in the light of proposed landscaping.

(8) Check to see there is adequate magazine storage inside access points - as a rough guide use the number of vehicles arriving in 15 seconds using Poisson distribution probability of .01 for conventional facilities and .001 for cross streets close to interchanges. However, take care to review characteristics of the intersection downstream of the magazine section and * increase magazine when indicated. Use 7.5 m per auto length of magazine. Discourage auxiliary turn lanes on the street and do not count them as storage - otherwise there may be future arguments over conversion to through lanes.

(9) Check to see there is a main internal circulatory road within the center, with no parking stalls on it and with good continuity and reasonable alignment.

(10) Check to see circulatory road is of adequate width - * not less than 7.5 m and not more than 9 m for 2 lanes (to discourage parking on it).

(11) Check aisle layout in relation to buildings - prefer aisles at right angles to buildings for better pedestrian control.

(12) Check to see loading areas are separated from customer areas.

* Amendment

(13) Check to see parcel pickup lane is provided.

(14) Check to see bus stop is provided within attractive walking distance of stores. If this is a terminal or transfer point see that bus stop is long enough to accomodate all buses without any obstruction to circulatory road.

(15) Check to see number of parking stalls fits the requirements.

(16) * Check to see stalls are attractive i.e. preferably within 200 m walking distance of stores and that pedestrian paths of travel are attractive and safe.

(17) * Check width of stalls - prefer 2.75 m and accept no less than 2.6 m.

(18) Check angle of stalls and module depth for adequacy (see 7.04(9)).

(19) * Check return radii on all corners in center and at access points. Prefer 9 m radius on main roadways and accept no less than 7.5 m. Check truck and bus paths with templates.

(20) * Check to see there is adequate parking for service trucks at loading areas - generally look for a minimum of .05 truck stalls per 100 GLA.

(21) * Check illumination in parking areas - look for an average of about 10 horizontal lux.

(22) Check wheel stops.

(23) Check surface water drainage against Ministry interests.

(24) When proposal approved require developer to underwrite cost of street and highway improvements necessary as a result of the center.

* Current trends in regional centers are towards increasing GLA and inclusion of non retail activities such as motion picture theaters and offices. The floor area of theaters should be included in the center GLA. However, offices can be considered separately and the lower figure of 1 stall per 30 or 35 m^2 GFA required. Note this is GFA, not GLA.

* Amendment

Retail stores

Retail stores vary tremendously in both trip production and parking characteristics. The most active are supermarkets and liquor stores (which see). The most inactive
* per m^2 are generally furniture and appliance stores. If type of retail is unknown (i.e. zoning is generic and intended lessees are unknown) it must be assumed to be active and parking supply provided accordingly. A group of retail stores clustered around a supermarket or department store with parking and buildings set back from the street becomes a shopping center (which see). Shopping center characteristics are more predictable than retail stores alone because they aggregate the different characteristics of the individual stores. See shopping center - below.

Stores catering dominantly to convenience goods (i.e. day to day items such as food drugs, laundry, hair care, etc.) tend to have fairly even volumes seasonally throughout the year. Stores catering dominantly to comparison (or shopping) goods such as furniture, appliances, clothing, etc. have increased business seasonally especially at Christmas. Some stores are quite extreme in these characteristics. The following list of some of the most extreme gives an order of figure for the percent of annual sales done in December:

Jewelry, watches	27%
Stationery	28%
Furs	19%
Men's wear	29%
Musical instruments	24%
Toys and Games	43%
Leather goods	21%

Care must be taken in observing such stores, off season, to project to December activities.

Shopping centers

Shopping centers are generally classified into 3 classes according to function. These classes are neighborhood, community and regional.

The neighborhood shopping center is the smallest in size but the most active per area. In size it generally ranges from about 3000 m^2 GLA up to about 7500 GLA. The
* dominant store is generally a supermarket of some 2000 - 2500 m^2 gross floor area. The mix of stores runs heavily to convenience goods such as food, drugs, personal service, etc. Design hour is generally 1300-1500 Saturday. Volumes

* Amendment

do not fluctuate greatly by season. Design hour 2 way
* volume is of the order of 28 v.p.h. per 100 GLA. Site area is generally between 15000 and 40000 m^2.

Middle in size is the community center. It generally ranges from about 5,500 GLA to 17,000 GLA. The dominant store is a junior department store of about 3,000 to
* 8,000 m^2 gross floor area. The mix of stores is still heavy in convenience goods but has an increased emphasis on comparison goods such as clothing, furniture, appliances, etc. Design hour is generally 1300 - 1500 Saturday with design hour 2 way volume of the order of 9 v.p.h. per 100 GLA. Site area is generally between 40,000 and 120,000 m^2.

Next in size is the regional center which generally ranges from about 16,000 GLA and up. The dominant store is a major department store or a junior department store exceeding 8,000 m^2 gross floor area. There is much more emphasis on comparision goods. Design hour entering is generally 1300 - 1500 Saturdays with entering volumes of the
* order of 4 v.p.h. per 100 GLA. Design hour exiting is generally 2000 - 2100 weekdays or 1700 - 1800 Saturdays with exiting volumes of the order of 4.5 v.p.h. per 100 GLA. Volumes and parking usage peak strongly in the few days before and after Christmas. Sales for the 2 weeks before Christmas generally run about 3 times average annual weekly sales. Site area is generally 120,000 m^2 and up.

Some authorities recognize a fourth class called super regional. This is a center with 3 or more major or junior
* department stores. GLA goes up to 100,000 m^2 or so. Characteristics are the same as regional centers.

The following process may be used to evaluate a proposal for a regional shopping center (see also 7.04.5).

(1) Review primary market area (generally 20 minute driving time) and assign proportions of the market to the various major streets approaching the center. (Take into account trends of residential growth.)

(2) Estimate design hour volumes, entering and exiting, on each approach.

(3) Discover existing street and intersection volumes and project to future (10 - 15 years).

* Amendment

Regional shopping centers themselves attract associated development (other commercial, multi-family, etc.) in the vicinity. A decision to allow a regional center is, therefore, a decision to allow a town center type business district of medium or high density.

Theater, Drive-in

Fire Marshal's Regulations require certain standards - see Section 8.63 in the Manual. These requirements must be adhered to strictly. The 25% capacity approach storage seems to work reasonably well although it is irrational. The peak demand for storage is a function of the attraction of the motion picture and the abilities of the ticket sellers. The attractive motion picture produces large approach volumes and the inability of the ticket sellers to sell as fast as the arrival rate produces the spillback. Good ticket sellers have been timed to be three times
* **as fast as poor ones. This range almost makes the 25% meaningless but the twenty-five percent does in fact** generally suffice. Maximum entering v.p.h. rate before the show is usually taken as 2 times the capacity of the theater. Peak exiting is generally 4 v.p.h. multiplied by # of stalls.

Tourist attractions

These run the full range of types and volumes. They include historic markers, commercial museums, Hell's Gate, old mines, phoney ghost towns, Barkerville, zoos, Butchart's Gardens, fairylands, etc. Usually they are in a rural area and usually they have ample site area so when parking becomes a problem the operator can easily provide more. On an average summer day Butcharts will attract up to the order of 2000 vehicles. There is no known relationship with any parameter useful to predict volumes. Site plans should be evaluated keeping this in mind and allowing reserve land for future additional parking, if necessary. Buildings, etc. should not be sited to surround the parking as that will make future extension difficult.

* Amendment

7.04- Cont'd.

5. Sample Evaluation Analysis
(Note: This section not metric)
Evaluation- Royal Oak Shopping Center

The purpose of this evaluation is to ensure that by its existence, nature, layout or design the proposed regional shopping center does not contribute to undue traffic congestion thus jeopardising the design integrity of our facilities and reducing level of service to traffic.

Five main aspects require consideration:

A. Siting of the development in relation to the street system and adequacy of that system to carry the additional traffic load imposed by the development

B. Location and adequacy of accesses

C. Satisfactory internal layout

D. Adequate off street parking including satisfactory stall and aisle dimensions

E. Whether the development generates high or low volumes and whether these volumes peak at the same time as surrounding street system volumes

Poor satisfaction of one or more of these aspects may contribute to congestion.

Developer has not offered any market study. It is therefore necessary to estimate origins of shoppers by inspection. There appears to be seven major approaches which shoppers can take:

1) Glanford Nb
2) Pat Bay Nb
3) Quadra Nb
4) Royal Oak Wb
5) Pay Bay Sb
6) West Saanich Sb
7) Wilkinson NB

These are shown on sheet A. These will draw from general catchment areas of population as shown roughly on sheet B. Centers of significant size are shown on sheet C. Access to these centers is good and parking excellent, including the CBD. Drawing of customers to Royal Oak from beyond these centers is therefore likely to be minimal.

In assigning proportions of shoppers originating in the different areas it is necessary to keep in mind:

a) current population
b) future population growth
c) drawing power of other centers

Areas 1 and 2 are not rapidly growing. Area 3 is growing. Areas 4, 6 and 7 are rapidly growing and area 5 is growing. Since the Broadmead center is an unknown and since the worst case would arise if it did not exist then it will be ignored here.

1971 populations of the areas are:

1 - 21,100
2 - 23,000
3 - 88,400
4 - 13,400
5 - 20,100
6 - 8,800
7 - 26,000

Taking the 1971 population as a base, increasing it by 50% for the "growing" areas and 100% for the "rapidly growing" areas and reducing the population to allow for the existence of competing centers the following assignments of market are obtained:

Area 1 - 6%
2 - 3
3 - 36
4 - 10
5 - 16
6 - 10
7 - 10

This is not a rigorous method but in the absence of a standard market study has been found to give a reasonable idea of the order of the origins.

Access to the center will be in four directions only:

West Saanich Nb
West Saanich Sb
Raymond Nb
Raymond Sb

Several of the origin areas have a choice of approach. Each will be assigned on inspection bearing in mind length of approach, circuity of approach and driver preference for right turn over left. Assignments are:

Approach of Origin	West Saan.Nb	West Saan.Sb	Raymond Nb	Raymond Sb
Glanford Nb	6	0	0	0
Pat Bay Nb	0	3	0	0
Quadra Nb	36	0	0	0
Royal Oak Wb	5	4	0	1
Pat Bay Sb	0	13	0	3
West Saanich Sb	0	8	0	2
Wilkinson Nb	0	4	12	3
	47%	32%	12%	9%

Thus it appears the West Saanich movements will be very heavy and the Raymond movements very light. In effect the development can be safely said to be based on one street: West Saanich. This is not good strategy for us or the center.

Regional centers of this size attract design hour entering volumes of the order of 3.3 vph per 1000 sq. ft. gross leasable area (GLA) and generate design hour exiting volumes of the order of 3.6 vph per 1000 GLA. GLA is 360,000. Thus assigned design hour volumes are:

	Entering	Exiting
West Saanich Nb	560	610
West Saanich Sb	390	420
Raymond Nb	140	160
Raymond Sb	110	120

It is not necessary to evaluate every movement into and out of the center. From experience the most critical can be selected to be evaluated. If these are satisfactory the proposal can be assumed compatible (from this viewpoint) and if not satisfactory the proposal can be assumed incompatible.

From the viewpoint of the Quadra interchange and West Saanich Road, it appears the critical movement will be the West Saanich Nb to Wb left turn entering the center. The other most critical movement will be the left turn exiting to go Nb on West Saanich.

Current street volumes and patterns are very difficult to assess because of construction disturbance. It appears that the 4 p.m. - 6 p.m. volume on West Saanich Road is of the order of 1000 vph with a 55/45 split Nb/Sb. The 1-3 p.m. Saturday volume on West Saanich Road appears to be of the order of 750 vph with

7.04.5 - Cont'd - 3

a 40/60 split Nb/Sb. The critical movements need to be checked against both times since the center design hours are off peak with the street peak hours. Per cent of design hour at the relevant times is:

	% Design Hour Entering	% Design Hour Exiting
4-6 p.m. weekday	65	50
7-8 p.m. weekday	90	100
1-3 Saturday	100	70

It appears most likely that the horizon development of West Saanich Road will be four moving lanes and that that will occur in the reasonable future well within the life of the shopping center. Thus movements should be checked against this condition. Because of the N-S emphasis in the area likely capacity volumes on West Saanich Road are taken at 700 vph per lane.

Three entrances are shown to West Saanich Road. Observation of other centers indicates that where three entrances are offered approximately 50% will turn left into the first, 30% into the second and 20% into the third. Thus a left turn of 50% of 560 vph or 280 vph will be used. This will require gaps in the Sb volumes. Thus vph's are:

	left turn	opposing volume
4-6 p.m. weekday	180	1150
7-8 p.m. weekday	250	700
1-3 p.m. Saturday	280	1100

The access points are shown on sheet D.

Checking these movements gainst the Ontario curves for left turn storage gives

4-6 weekday - greater than 500 ft. - requires signal
7-8 weekday - 400 feet
1-3 Saturday- greater than 500 ft. - requires signal

The 280 vph turning across 1100 is the worst case. A 2-phase signal of cycle length about 40 seconds would be required. Maximum storage for the left turn would be about 200 feet. The first entrance is 800 feet from the Quadra-Glanford intersection. Thus operation of the interchange would not likely be affected if a signal were installed. However, maximum queue for the Sb through movement is likely to be of the order of 225 ft. Distance

between the first and second access is 275 ft. Interference may therefore take place between the two accesses. If no signal were installed the Sb movement having the right of way would not interfere. However the left turn may well extend the full 800 feet to the Quadra-Glanford intersection. If the left turn were not allowed at the first access it would then transfer about 65% of 560 vph or 360 to the second access and 200 to the third access. 360 would again require a signal: cycle time would be of the order of 50 seconds. Queues would be longer and the Sb again would block the third access. If the three accesses all allowed left turns the 170 vph on the second access would require signalization as well (or the storage queue exceed 500 feet again). It thus appears that the heavy left turn requires greater clearances between access points. If this were to be achieved on this site it could be done by moving the employee parking to the Raymond side and respacing the three accesses so that the first access would be where the employee access is offered. The second access would then be some 100 feet or so south of its present position. Clearance between accesses 1 and 2 would then be about 450 feet. Interaction between accesses would be improved bu the first access would then be only 500 feet from the Quadra-Glanford intersection.

The problem of the exiting left turn to go Nb on West Saanich is more difficult to assess. The distribution between the accesses is unknown and indeed the proportion that would divert to Raymond and right turn is also quite unknown. Left turns exiting on West Saanich would have to seek gaps in three lanes. With the poor local level of gap acceptance many drivers are going to want 10 seconds and 10 seconds is going to be hard to find in three lanes at or near 700 vph. Quantitative evaluation will not be attempted. The problem is another example of the poor strategy of tieing a major shopping center to only one street.

Assigning the right turn entering volumes in the same manner as the left turn, volumes entering at each access are shown on sheet E. The highest volume is 360 on the southerly West Saanich access. This may require two lanes entering. The others at around 300 vph or less will likely be sufficient at one lane entering.

Parking and unparking and maneuvers cause temporary blocking of aisles and internal roads. Vehicles arriving during these blockages must wait. This waiting must be undertaken on the property, not on the street. Thus there is a need for magazine storage at the accesses. All seven public accesses have no magazine length because they have an intersection immediately inside the property. Generally a length of storage to accommodate the vehicles arriving in 15 seconds at 1% probability is indicated. This calculates for the entrances to be:

7.04.5 - Cont'd. - 5

Entrance Volume	Storage Length
360 vph	125 ft.
290	100
310	100
80	50
70	50
50	50

There is a continuous circulatory road system provided. However there are 4 intersections offered (marked 1 on sheet F) which are close to the buildings and will have restricted sight distance and not operate well. The circulatory roads scale at about 25 feet wide which is adequate. There is, however friction on the circulatory roads (at 2) because of parking stalls. This is not desirable as it reduces the quality of flow on the circulatory system and may produce spillbacks reflecting back to the street.

Aisles are laid out at 90 degrees to the buildings which is good. Service is not fully separated from customers which is not desirable. No parcel pick up is shown. This is often left out in the design and then one is put in by operating management at the expense of the circulatory roads. No bus zone is offered.

The architect's plan says he has 1968 stalls. The standard for a regional center is 5.5 stalls per 1000 sq. ft. GLA. This center is said to be 360,000 GLA and would require 1980 stalls. Thus his figure of 1968 is short. These offered figures are generally a little optimistic so he is probably short more than the 12 stalls indicated. Stalls are all well within 600 feet of the buildings and so are all reasonably attractive. However with the imbalance toward West Saanich Road there may be a tendency for the east lot to fill first and equilibrium distribution with the west lot not be fully established. Width of stalls is unknown. With 61 feet module it would have to have 10 feet width of stall to operate single maneuver park and unpark. Applicant is probably thinking in terms of 8' 6" or 9" 0" in which case the module should be 63 feet.

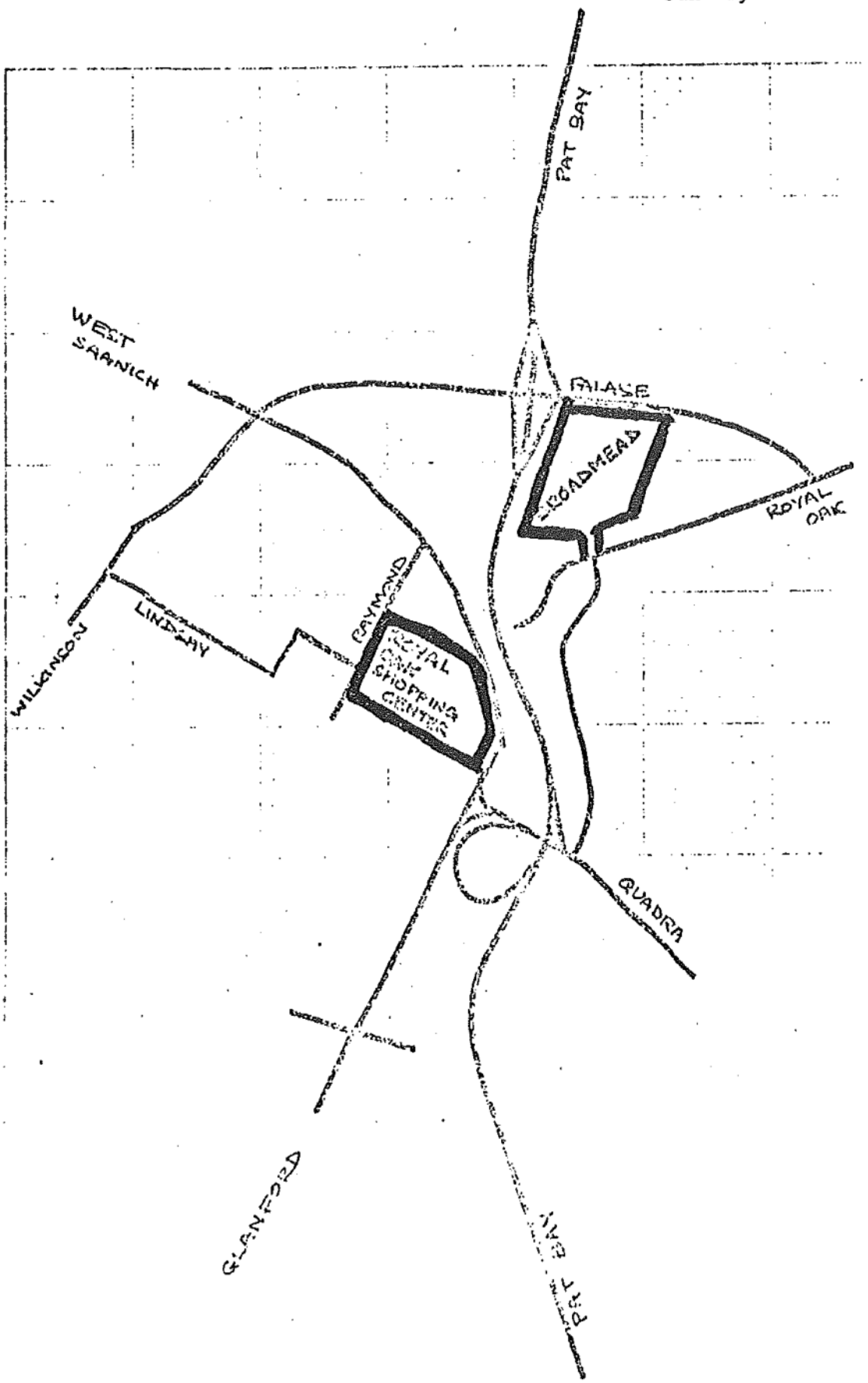
No radii are shown for the returns. If the sketching is correct most are inadequate. Radius is desirable 30 feet and minimum 25 feet. There are many inadequate returns - a few samples are marked 3.

Great caution must be exercised in the quantitative interpretation of this evaluation. The assumptions and accuracy must be borne in mind. However the quantitative statements are useful for qualitative interpretation and as a guide to engineering judgment.

It is concluded that the proposal will likely have an adverse effect on the highway and street system because of its siting and its internal layout.

7.04.5
Sheet "A"

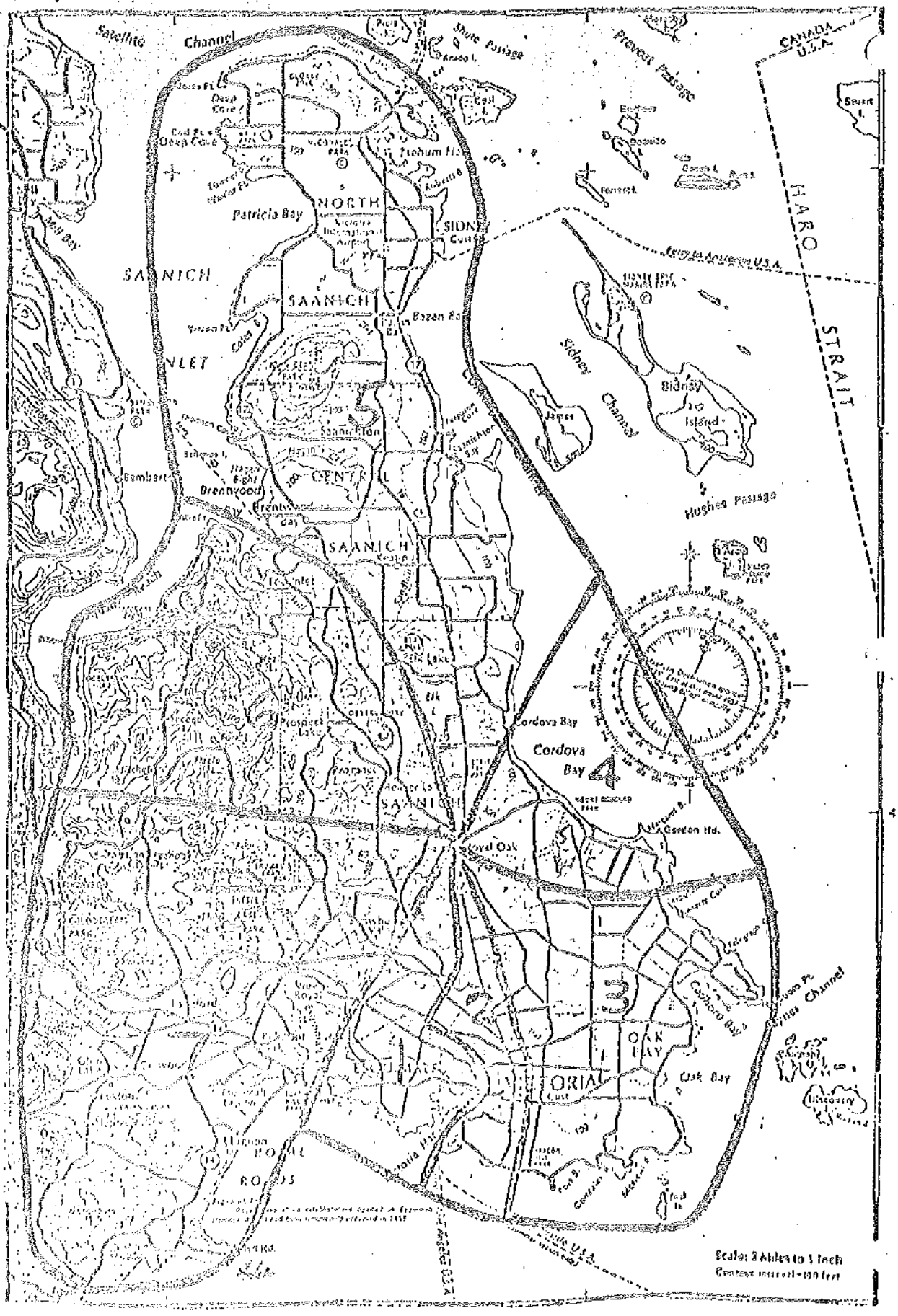
January 1977



A

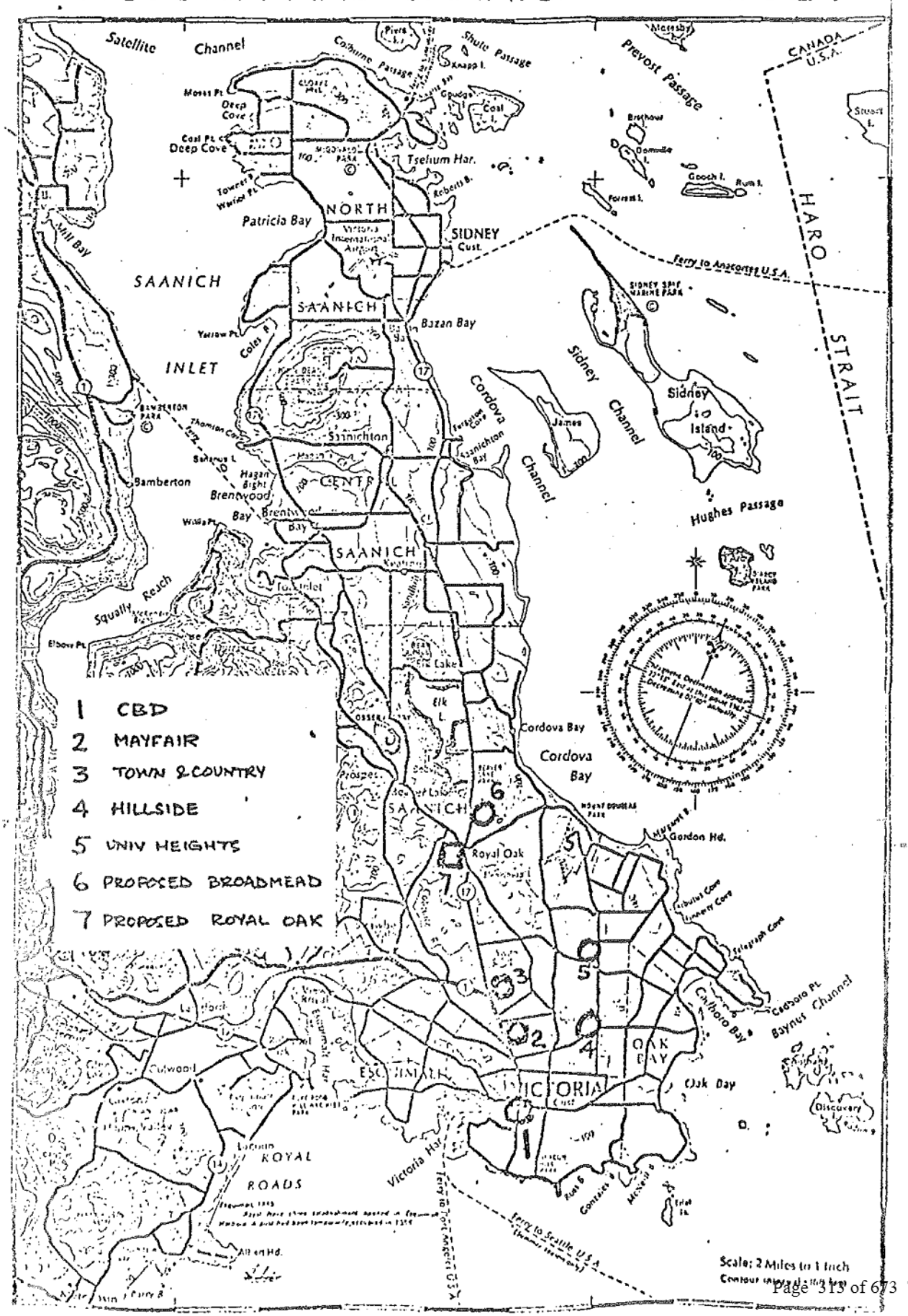
7.04.5
Sheet "p"

VICTORIA AND SAANICH PENINSULA

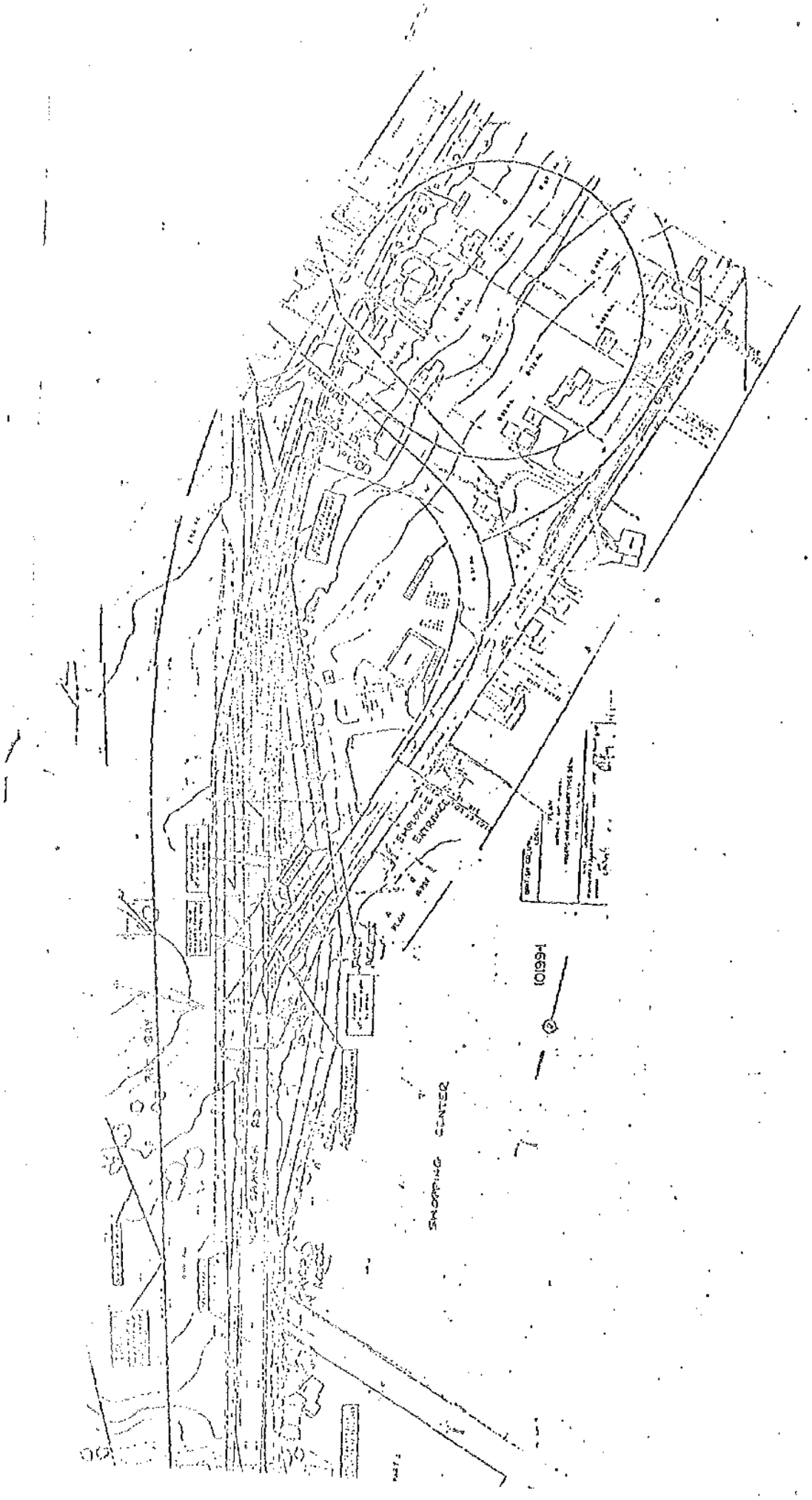


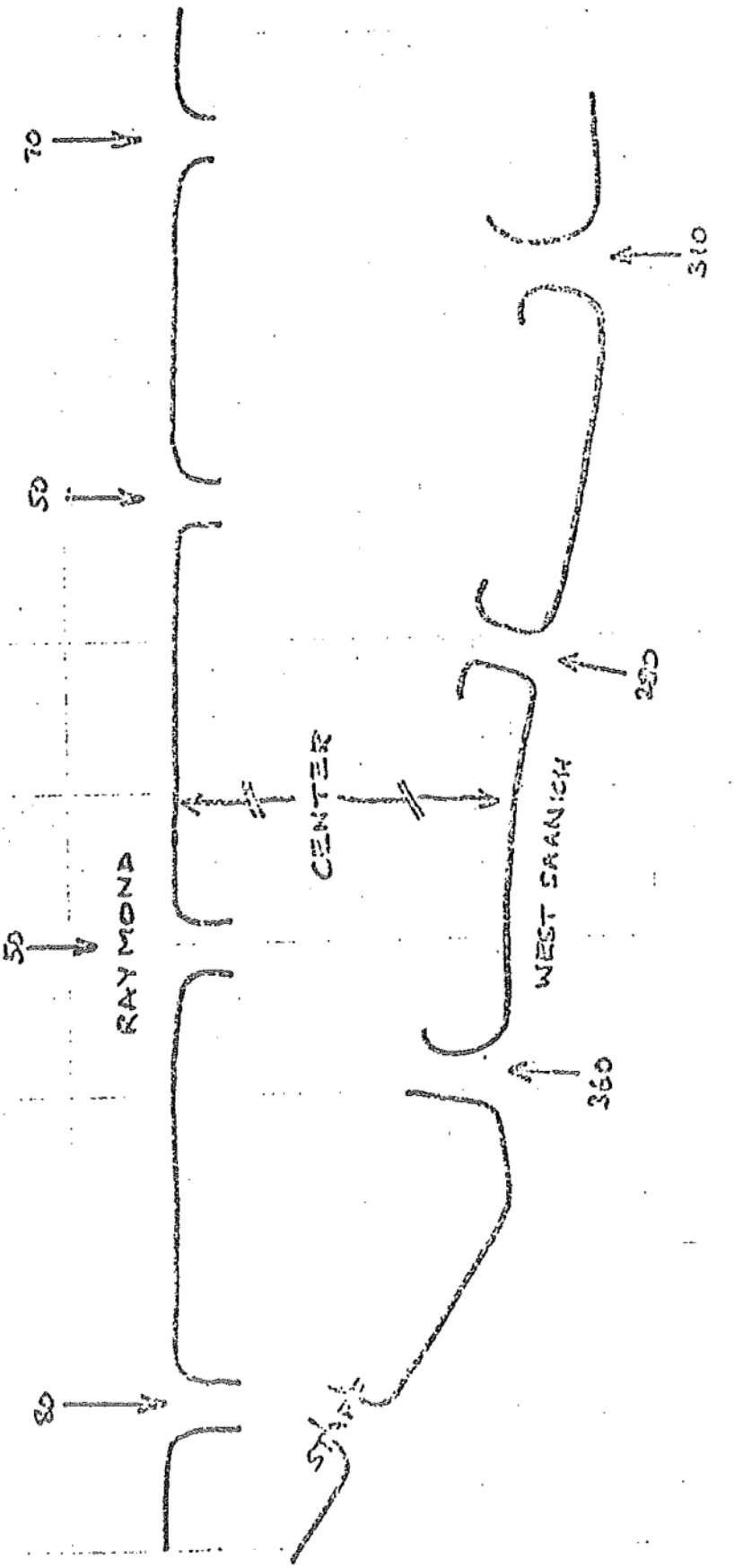
B

VICTORIA AND SAANICH PENINSULA



7.04.5
Sheet "D"
January 1977




70
50
50
80
RAYMONA
CENTER
WEST BRANCH
250
310
360
SHAFT

January 1977

7.04.5

Sheet "E"

ROYAL OAK CENTRE

SITE PLAN

7.04 - Cont'd.

6. Suggested books and papers for further reading and reference:

Traffic Engineering Handbook - Institute of Traffic Engineers

Highway Capacity Manual 1965 - HRB

Zoning, Parking and Traffic - Eno Foundation

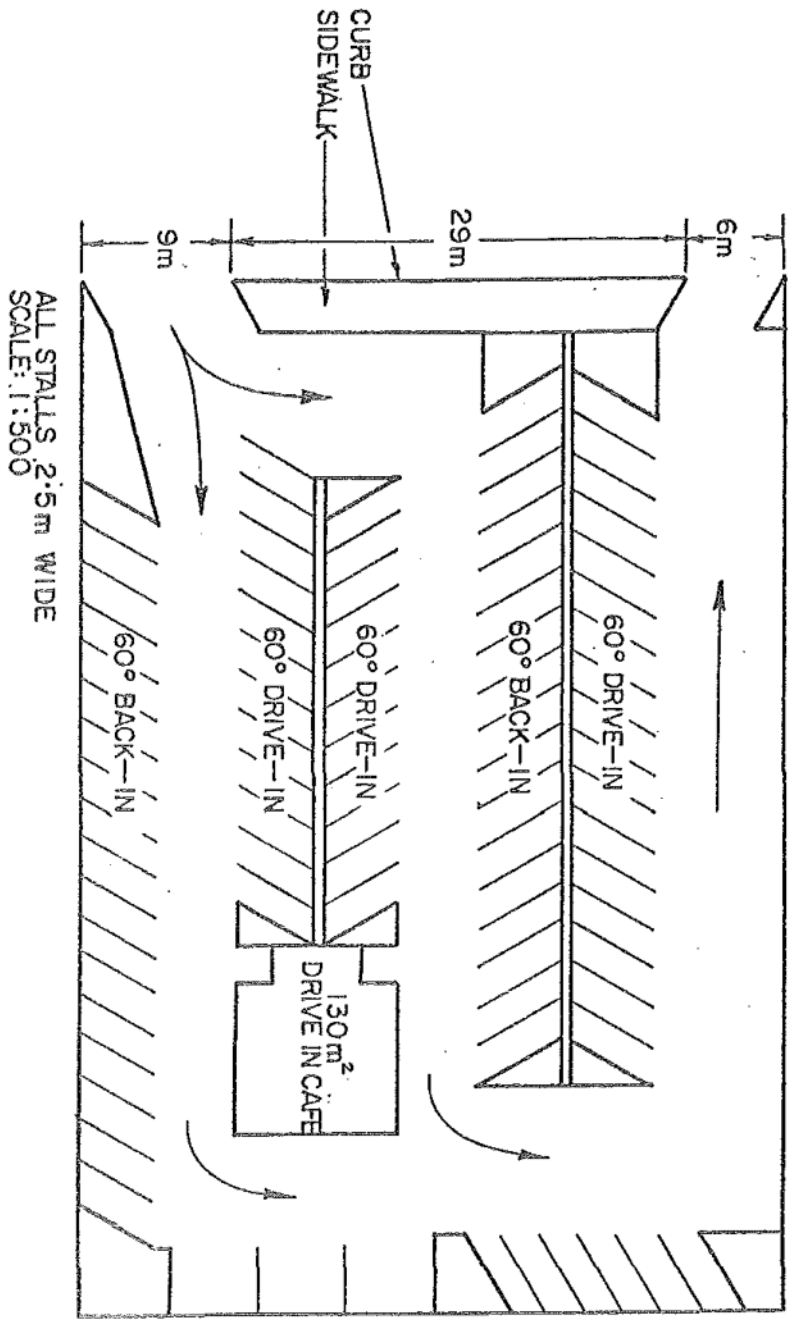
Traffic Engineering - Matson, Smith and Hurd : McGraw-Hill

Traffic Flow Theory and Control - Drew : McGraw-Hill

Traffic System Analysis for Engineers and Planners -
Wohl and Martin : McGraw-Hill

Highway Capacity Analysis Notebook - De Leuw, Cather

Guidelines for Driveway Design and Location -
Institute of Traffic Engineers



TRAFFIC SITE PLAN

What is required is a minimum quality scaleable sketch to a scale preferably not smaller than 1 : 500 showing only:

1) Property lines
2) Entrances, circulatory roads, aisles and parking stalls
3) Loading facilities (freight and customer) for shopping centers, warehouses and industrial plants
4) Buildings - showing gross floor area of each
5) Dimensions of stalls and parcels
6) Direction of traffic flow

8. Parking standards are:

Auto Sales and repair	1 per 70 metre^2 sales floor + 1 per service bay + 1 per 2 employees
Animal hospital/kennels	1 per 2 employees + 3 per veterinarian
Auction (indoor)	1 per 10 m^2 auction floor
Bank	1 per 20 m^2 gross floor area
Beach, swimming	1 per 9 m^2 developed beach above HWM
Bowling Alley	3 per alley
Boat sales & repair	1 per 2 employees + 1 per 100 m^2 display area (covered and outside)
Building materials supply	1 per 2 employees + 1 per 200 m^2 covered sales and storage
Campground/overnight trailers	1 per space plus 2
Cafe, dining room, etc.	1 per 3 seats
Cafe drive-in	Nil but requires some approach storage
Cafe takeout only	15
Church	Rural 1 per 4 seats, urban 1 per 10 seats
Clubs, lodges	1 per 4 seats
College	1 per employee + 1 per 5 students
Contractors yard	1 per 2 employees
Cultural facility (art gallery, etc.)	1 per 40 m^2 gross floor area
Funeral parlor	1 per 4 seats in chapel
Gas station	1 per 2 employees on duty + 2 per service bay
Grocery, corner	1 per 15 m^2 gross floor area of retail portion of building or 4, whichever greater
Golf course	150 stalls
Golf driving range	1 per tee plus 1 per 2 employees
Health salon	1 per 10 m^2 gross floor area
Hospital public	1 per 2 employees plus 1 per 5 beds
Hospital private	1 per 3 beds
Hotel	1 per 2 rooms + 1 per 3 seats bar, cafe, etc.
Ice Cream stand	7 per sales clerk
Laboratory	1 per 2 employees
Laundry/dry cleaning	1 per 2 employees counted as total of 2 shifts
Laundromat	1 per 3 washing machines
Motel (a) # units > # seats cafe	1.1 per unit plus 1 per 3 seats in cafe, etc.
(b) # units < # seats cafe	0.9 per unit plus 1 per 3 seats in cafe, etc.
Machinery sales	1 per 2 employees + 1 per 100 m^2 sales floor
Manufacture/industrial	1 per 2 employees counted as total of 2 shifts
Marina	1 per 2 boat spaces + 1 per 2 employees
Nurseries/greenhouses	1 per 15 m^2 gross floor area retail sales building
Offices, medical	5 stalls per doctor or dentist
Offices, single tenant	1 stall per 35 m^2 gross floor area
Offices, multi tenant	1 per 30 m^2 gross floor area

Police Office	1 per 2 employees counted as total of 2 shifts
Pool, swimming	1 per 4 m^2 pool water surface
Post Office	1 per 2 employees counted as total of 2 shifts
Prison	1 per 2 employees counted as total of 2 shifts
Public bus depot	1 per 20 m^2 waiting room + 1 per 2 employees counted as total of 2 shifts
Residential, single family & duplex	2 per dwelling unit
Residential, multi family	1.5 per dwelling unit + 1 per 100 m^2 floor area of building exceeding 60 m^2 times# of du's
Residential, winter recreational	building size 1-20 du's: 2 stalls per du plus 1 stall per 40 m^2 for the aggregate area exceeding 80 m^2 times # of du's - building size 21 + du's: 2 stalls per du plus 1 stall per 80 m^2 for the aggregate area exceeding 80 m^2 times # of du's
Recreation center	1 per 10 m^2 ice area + 1 per 4 m^2 pool surface + 1 per 4 player capacity other sports
School, elementary	1 per employee
School, secondary	1 per employee plus 1 per 10 students
Shopping Center, neighborhood	7.5 per 100 m^2 gross leasable area
Shopping Center, community	6.5 per 100 m^2 gross leasable area
* Shopping Center, regional	**5.9 stalls per 100 m^2 GLA up to 46500 m^2 GLA then for the area over 46500 m^2 at the rate of 4.3 stalls per 100 m^2.**
Store, supermarket/liquor	
other retail/personal service	0.8 per 10 m^2 gross floor area
except corner grocery	0.7 per 10 m^2 gross floor area
Ski resort	½ per person hourly capacity lift
Stadium	1 per 3 seats
Theater, not drive-in	1 per 4 seats
Theater, drive-in	1 per 2 employees
Tourist attraction	1 per 4 persons capacity
Taxi stand	1 per taxi plus 1 per office employee
Tire repair	1 per 2 employees plus 1 per bay
TV, radio studios	1 per 2 employees counted as total of 2 shifts
Vegetable/produce stand	4 per sales clerk
Warehouse	1 per 2 employees as total of 2 shifts

Note

The figures include allowance for employees, customers and visitors but do not include any allowance for other company vehicles, or for loading facilities

* **Amendment**

9. Stall and aisle dimensions: (All dimensions in metres)

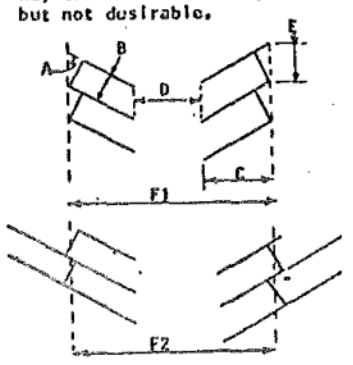
A	B	C	D	E	F1	F2
	2.5	2.50	3.7	7.0	8.70	
	2.6	2.60	3.7	7.0	8.90	
	2.7	2.70	3.7	7.0	9.10	
	2.8	2.80	3.7	7.0	9.30	
	2.9	2.90	3.7	7.0	9.50	
	3.0	3.00	3.7	7.0	9.70	
20	2.5	4.33	3.4	7.30	12.06	9.71
	2.6	4.42	3.4	7.60	12.25	9.81
	2.7	4.52	3.4	7.89	12.44	9.90
	2.8	4.61	3.4	8.18	12.62	9.99
	2.9	4.70	3.4	8.47	12.81	10.09
	3.0	4.80	3.4	8.77	13.00	10.18
30	2.5	5.06	3.4	5.00	13.53	11.36
	2.6	5.15	3.4	5.20	13.70	11.45
	2.7	5.23	3.4	5.40	13.87	11.53
	2.8	5.32	3.4	5.60	14.04	11.62
	2.9	5.41	3.4	5.80	14.22	11.71
	3.0	5.49	3.4	6.00	14.39	11.79
40	2.5	5.64	3.9	3.88	15.18	13.27
	2.6	5.71	3.7	4.04	15.13	13.14
	2.7	5.79	3.7	4.20	15.29	13.22
	2.8	5.87	3.7	4.35	15.44	13.30
	2.9	5.94	3.7	4.51	15.59	13.37
	3.0	6.02	3.7	4.66	15.75	13.45
45	2.5	5.86	4.3	3.53	16.03	14.27
	2.6	5.93	4.1	3.67	15.97	14.14
	2.7	6.01	3.9	3.81	15.92	14.01
	2.8	6.08	3.9	3.95	16.06	14.08
	2.9	6.15	3.9	4.10	16.20	14.15
	3.0	6.22	3.9	4.24	16.34	14.22

A	B	C	D	E	F1	F2
50	2.5	6.05	4.3	3.26	16.40	14.79
	2.6	6.11	3.8	3.39	16.02	14.35
	2.7	6.17	3.7	3.52	16.05	14.32
	2.8	6.24	3.7	3.65	16.18	14.30
	2.9	6.30	3.7	3.78	16.31	14.45
	3.0	6.37	3.7	3.91	16.44	14.51
60	2.5	6.27	5.8	2.88	18.34	17.09
	2.6	6.32	5.6	3.00	18.24	16.94
	2.7	6.37	5.5	3.11	18.24	16.89
	2.8	6.42	5.5	3.23	18.34	16.94
	2.9	6.47	5.5	3.34	18.44	16.99
	3.0	6.52	5.5	3.46	18.54	17.04
70	2.5	6.30	6.1	2.66	18.71	17.85
	2.6	6.33	5.9	2.76	18.57	17.68
	2.7	6.37	5.8	2.87	18.54	17.62
	2.8	6.40	5.6	2.97	18.41	17.45
	2.9	6.44	5.5	3.08	18.38	17.39
	3.0	6.47	5.5	3.19	18.45	17.42
80	2.5	6.14	7.6*	2.53	19.89	19.45
	2.6	6.16	7.3*	2.64	19.62	19.17
	2.7	6.18	7.3*	2.74	19.66	19.19
	2.8	6.19	7.3*	2.84	19.69	19.20
	2.9	6.21	7.3*	2.94	19.73	19.22
	3.0	6.23	7.3*	3.04	19.76	19.24
90	2.5	5.80	7.9*	2.50	19.50	19.50
	2.6	5.80	7.6*	2.60	19.20	19.20
	2.7	5.80	7.3*	2.70	18.90	18.90
	2.8	5.80	7.3*	2.80	18.90	18.90
	2.9	5.80	7.3*	2.90	18.90	18.90
	3.0	5.80	7.3*	3.00	18.90	18.90
90 Back in†	2.5	5.80	6.7*	2.50	18.30	
	2.6	5.80	6.4*	2.60	18.00	
	2.7	5.80	6.1*	2.70	17.70	
	2.8	5.80	6.1*	2.80	17.70	

Key

* Two-way circulation

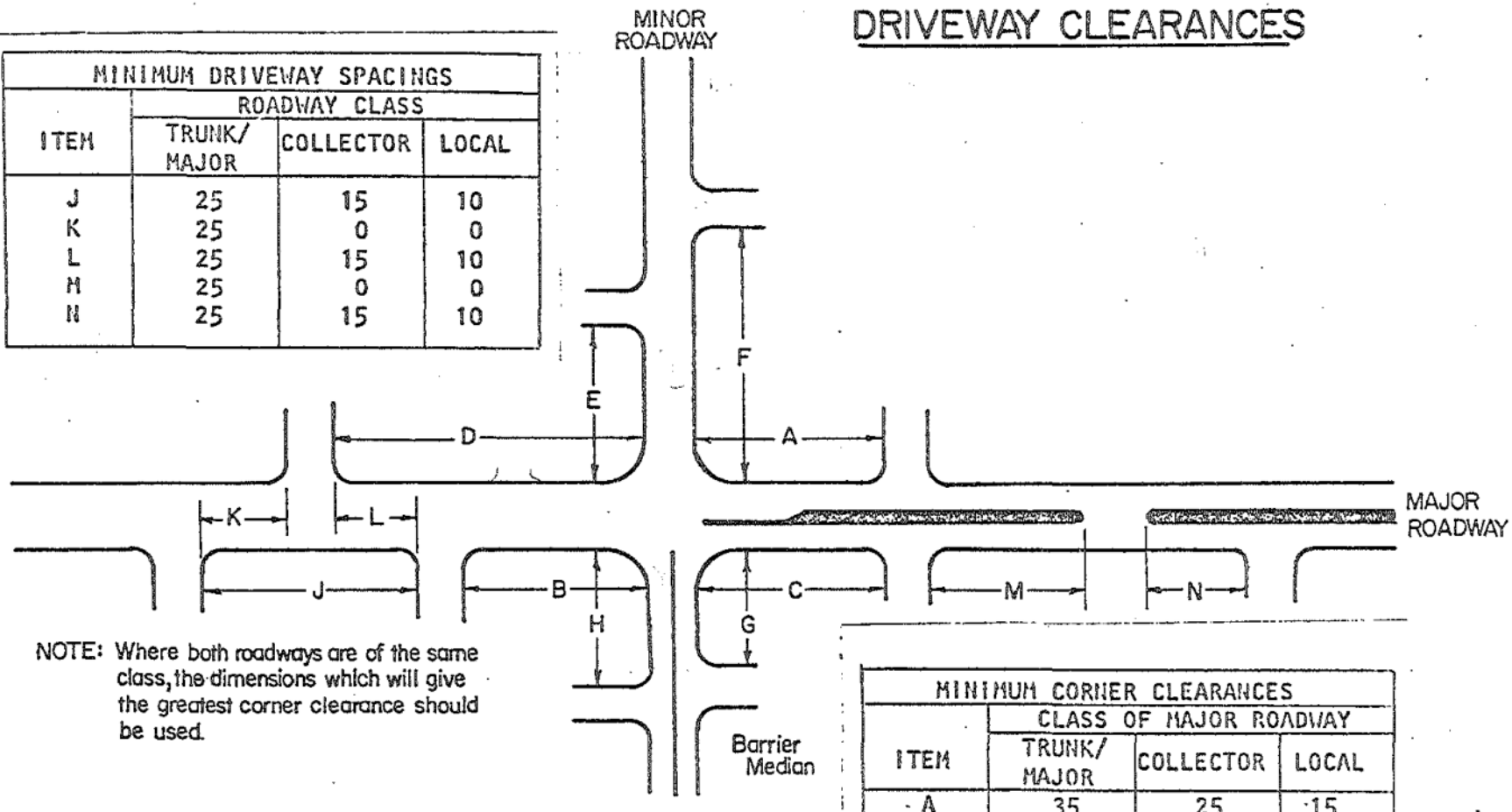
† For attendant parking only; two-way traffic in aisles possible, but not desirable.



Stall length may be reduced to 4.6m for isolated stalls (caused by column placement, etc.) up to 5% of number of stalls. Such stalls must be clearly marked "small auto only" on the pavement or wall facing. In lots exceeding 100 stalls in number up to 20% of total stalls may be reduced to 4.6m provided those stalls are grouped in lots of at least 20 stalls, marked "small auto only" on the pavement or wall facing and provided the area is signed "This section small autos only" Small stalls must still remain full width.

DRIVEWAY CLEARANCES

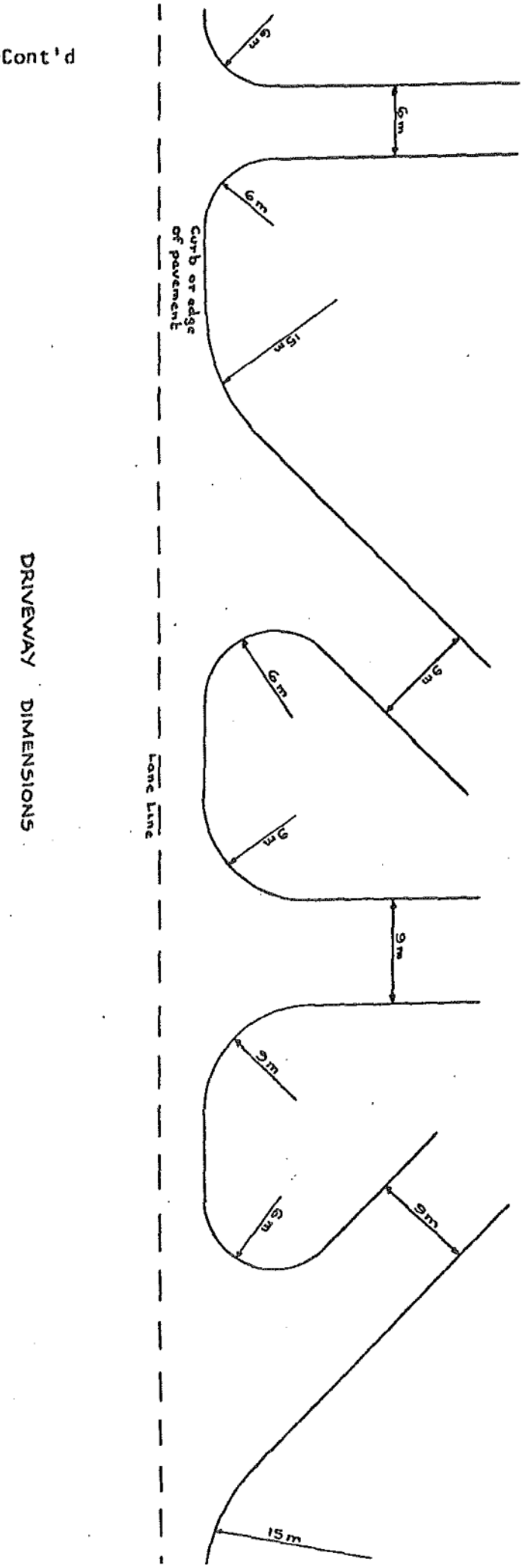
MINIMUM DRIVEWAY SPACINGS			
ITEM	ROADWAY CLASS		
	TRUNK/ MAJOR	COLLECTOR	LOCAL
J	25	15	10
K	25	0	0
L	25	15	10
M	25	0	0
N	25	15	10



NOTE: Where both roadways are of the same class, the dimensions which will give the greatest corner clearance should be used.

MINIMUM CORNER CLEARANCES			
ITEM	CLASS OF MAJOR ROADWAY		
	TRUNK/ MAJOR	COLLECTOR	LOCAL
A	35	25	15
B	25	25	15
C	35	25	15
D	35	25	15
E	70	35	15
F	70	55	15
G	15	15	15
H	70	55	15

Scale 1:500



DRIVEWAY DIMENSIONS

Sec. 17 - Hwy Act

CHAPTER 8

PERMITS FOR CONSTRUCTION OF WORKS WITHIN HIGHWAY RIGHT OF WAY AND CROWN LAND UNDER HIGHWAYS JURISDICTION

8.01 GENERAL

All must apply for and receive a permit from the Minister before constructing or maintaining a work or structure or pipe on a highway, or on land controlled by the Minister.

8.02 SIGNING

Permits must be signed and copies initialled by the designated official only. The signing authority must not be assigned.

8.03 PERMIT NUMBERS

Permits are numbered giving Regional letter, District number, number of permit and year; for example: The first Kamloops Regional Permit 1963 is K-1-63. The first Kamloops District Permit 1963 is K-16-1-63.

8.04 PERMIT HOLDERS

The permit is issued to the owner of the works, not to the agent applying.

8.05 TIME CLAUSE

Times of starting and completing construction must be reasonable and realistic.

8.06 MAIN CLAUSE OF PERMITS

The printed clauses cover most conditions and special clauses should be brief.

Identify the works and their purpose:
e.g. Two 9 m commercial entrances for gas station.
One 9 m industrial logging entrance.
7.5 KV single phase power distribution line.
2.5 cm natural gas service.

Give the legal description of the property served:
e.g. Lot 21, Plan 2691, KDYD.

Give the number and name of the road:
e.g. #6A Dennison Road

Show offsets from known boundaries, otherwise from the centre line.

8.07 SKETCHES ON PERMITS

Do not refer to attached sketches. References must be made to properly drawn numbered drawings, stapled to the permit (and becoming part of it), or exact dimensions must be written in.

8.08 TRANSFER OF OWNERSHIP

Permits are not transferred, but a new permit may be issued which is endorsed:

"This permit cancels permit # _____."

8.09 APPLICATIONS

Applications are forwarded in triplicate (on Form H.20A for Controlled Access Highways and on Form H.20 for Uncontrolled Access Highways) to the District Highways Manager. (See also Power and Telephone).

8.10 INFORMATION

In addition to the requirements on both sides of the forms, and using Form H.20B as an example, the applicant must show:

1. The official name and number of the road or the legal property description.

2. Initial and terminal points and length of structures which traverse the highway (pole lines, pipe lines, etc.)

3. The location of utility crossings referred to a convenient point (property corner, kilometrepost, etc.).

4. All other nearby utilities or works.

5. The date of an original permit if the application covers an alteration.

6. For overhead crossings, the vertical distance from the lowest portion of a wire or structure to the highway surface. The clear road width between supports, and other relevant information (width of surface, etc.).

7. For underground crossings:

   (a) The type of highway surface.
   (b) Whether the method is tunnelling or open cut. (Show dimensions of highway cut in open surfaces.).
   (c) The minimum depth below the highway surface.

8. For water pipes under pressure:

   (a) The maximum head in Kilo Pascals.
   (b) The size and type of pipe.
   (c) What the water is for.
   (d) The water licence number, if not an organized water district.

9. For non-pressure conduits (irrigation or drainage):

   (a) The size and type of pipe (give gauge, wall thickness, etc.).
   (b) The maximum flow in cubic metres/second.
   (c) The water licence number, if not an organized water district.

10. For minor undertakings:

    Details of construction. (Show length, width, timber dimensions, size of waterway, on a drawing, on the applicaton or numbered and stapled to it).

11. For major undertakings:

    Plans, profiles, etc., which fully illustrate the proposals.

12. How Crown Lands will be affected.

13. The proposed date of start and completion.

14. The length of time before removal.

8.11 SECURITY DEPOSITS

To ensure removal of temporary works, piles, etc., the applicant may be required to submit a security deposit with the application. The deposit is $50.00 minimum, or additional required to cover the cost of removal. (This includes returning the disturbed roadway to the highway standard at the time of removal).

If the applicant fails to make a satisfactory removal, the Ministry does so, returning only the residue of the security deposit, if any.

8.12 WORKS ON PROVINCIAL HIGHWAYS WITHIN MUNICIPALITIES

Applicants must state on the original application that a copy has been sent to the Municipal Clerk.

8.13 COPIES OF APPLICATION TO OTHER MINISTRIES

The Ministry will not make exceptions to Note No. 2 on the back of Form H.20.

8.14 INFORMATION TO APPLICANTS

District Highways Managers will give the name and number of the road, the type and nature of construction, and other necessary information, but will not prepare plans for applications.

8.15 ISSUE OF PERMITS

Applications involving highway structures must be referred to the Bridge Branch before a permit is issued.

1. The District Highways Manager issues the following permits directly to the applicant on:

   (a) Entrances to highways (other than Controlled Access and freeways).

(b) Pole lines on highways (other than trunk, main and scenic highways designated by the Regional Director, Highways, and freeways). (See Power and Telephone).

(c) Utilities on highways (except freeways).

2. If approval is withheld, the applicant is advised whether changes to meet requirements can be made. If the applicant appeals, the District Highways Manager forwards copies 1 and 2 of the application and his recommendations on Form H.20C to the Regional Director, Highways for a decision.

3. The District Highways Manager sends copies 1 and 2 of all other applications with recommendations, in duplicate, (H.34 Entrance to Controlled Access, H.20C Other Reports, for entrances, state "Private" or "Commercial" so the correct permit will be issued) to the Regional Approving Officer who can issue a permit, (Form H.21). Distribution:

District: Original for the applicant, plus two yellow copies.

Region: 1 yellow copy and copy of letter to District.

4. The Regional Director, Highways, if approving other applications, sends the permit to the District Highways Manager, who then issues it to the applicant. If approval is withheld, the applicant is advised whether changes to meet requirements can be made. (Form H.21).

8.16 ELECTRICAL INSTALLATIONS

Permits covering electrical installations on Crown lands are issued by the Regional Approving Officer, or at his discretion, by the District Highways Manager, after approval by the Director of Highway Planning and Traffic Engineering. The applicant should submit his application to the local District Highways Manager.

When an application is received for permission to construct an electrical installation, such as a fire signal, private lighting etc., on crown land, usually highway right-of-way, the following procedure shall be followed:

1. The applicant shall be asked to supply complete details in triplicate such as the type of installation, location, design drawings and specifications, etc. All design and installation costs will normally be borne by the applicant.

2. The District Highways Manager should arrange a site inspection to ensure that the installation is suitable, in general terms, for the proposed location.

** 3. The application should then be forwarded, together with pertinent comments, to the Region who will then forward to the Director of Highway Planning and Traffic Engineering for examination and approval of the design.

** Amendment

4. The Director of Highway Planning and Traffic Engineering will return the application to the Regional office advising whether the application is approved or whether revisions to the drawings and specifications are required. If revisions are required, the applicant should submit two revised copies of the drawings and specifications affected. Any electrical clauses which should be added to the standard permit will be specified by the Highway Planning and Traffic Engineering Branch. The issuing office may add clauses of a general nature to ensure a satisfactory installation.

5. When the applicant is approved, the Region or District will issue a permit allowing the applicant to proceed with the installation.

Note: These instructions do not apply to applications by utility companies to construct or relocate hydro or telephone lines, etc. (Refer to Sections 8.29, 8.39 - 8.43).

8.17 ENTRANCES

Number permitted - Normally, the number of entrances permitted is:

(a) Residential: One private entrance, maximum width 6 metres.

(b) Commercial or Industrial: Whatever is necessary.

(c) Farms: Enough private entrances for reasonable access, depending on the farm layout.

See Chapter 7 on Evaluation of traffic conditions and entrances on Controlled Access Highways.

8.18 SPACING OF ENTRANCES

Set entrances at least 3 metres apart.

8.19 ENTRANCE SPECIFICATIONS

The District Highways Manager specifies the size of culvert or bridge, the elevation of the ditch line, culvert elevation, etc. If public safety is involved, the bridge must be designed or checked by a Professional Engineer.

Where grades are difficult and it is necessary for part of an entrance to infringe in our right-of-way in front of an abutting property, then the applicant must have the consent in writing of the owner before the permit is issued.

8.20 HAZARD

Entrances are not permitted at points of hazard, and guardrail and/or delineators may be specified.

8.21 SUBDIVISION ROAD ENTRANCES

Intersections with new subdivision roads require no permit. The Ministry maintains the roads of the Subdivision only after it is registered.

8.22 CONSTRUCTION AND COST

Entrances to private or commercial property are constructed, under permit, at the expense of the owner, by the owner or by the Ministry. The owner maintains the entrance and culvert.

8.23 REPLACEMENT

The Ministry replaces entrances which are covered by a permit, if demolished by road construction. The Ministry is not responsible for grade changes on accesses from reconstruction of a highway, except as outlined in Section 12.13.

8.24 MUNICIPAL ROADS ENTERING CONTROLLED, ARTERIAL OR SECONDARY HIGHWAYS

(a) The Municipality requests permission from the District Highways Manager.
(b) The District Highways Manager sends the request to the Regional Director, Highways with recommendations.
(c) On Controlled Access Highways, and on other highways, the Regional Director, Highways issues a letter of approval or rejection.
(d) The letter is sent to the Municipality through the District Highways Manager.

8.25 ENTRANCE CULVERTS

Culverts under entrances must be of a permanent type (galvanized metal or concrete). Entrance must be built 15 cm lower at the ditch line than the edge of travelled way to cut off surface water.

8.26 PAVED ENTRANCES

If two paved entrances are permitted to a property, the area between must be drained with an open ditch or filled-over pipe at the owner's expense. If the ditch is culverted and filled and a pavement installed, catch basins may be required and the owner must, at his expense, place curbing or guardrail to define the entrances. The Ministry may restrict turning at these entrances and may restrict parking in the area between them.

8.27 GUARD RAIL

Any entrance to a Controlled Access Highway must be designated by a standard concrete curbing or a substantial barrier, satisfactory to the District Highways Manager. (Stone or concrete wall, round posts with wire fencing, etc.). The height of concrete or similar barriers must be less than 61 cm.

8.28 OVERHEAD CROSSINGS

**

The minimum vertical distance from the highway pavement for new overhead structures is 4.9 metres.

8.29 POLE LINE PERMITS

The District Highways Manager determines offsets or pole line locations. (For suggested offsets on local roads see Chapter 5). Other specifications are covered by the Electrical Energy Inspection Branch of Ministry of Labour.

Permits are not issued for pole lines across Crown property. Requests are forwarded to the Regional Director, Highways and the utilities company arranges for necessary survey and registration of easement at Land Titles Office.

Permits are not to be issued for pole lines on Section 4 roads.

For all trunk, main and other major higher volume highways, utility poles should be located as close to the right-of-way boundary as possible to provide a clear way of up to 9 metres for an out of control vehicle to recover control. If the intervening ground cannot be a clear way because of slope configuration or other obstruction then the pole need only be located behind this.

Particular attention should be paid to urban streets and highways notwithstanding low speed zoning, and both poles and sidewalks located so that poles can be between sidewalk and right-of-way boundary.

8.30 PIPELINES

1. MAJOR PIPELINES

Although pipelines rupture infrequently, when they do fail they usually have very serious consequences. Causes of failure are varied, including material failure, landslide, streambed scour, etc., but by far the most common cause is inadvertent excavation.

Transmission lines are usually high pressure (gas for example, can be 8 000 kPa) but distribution lines are of lower pressures. "High pressure" or "Transmission" gas pipelines are those with pressure greater than 2 500 kPa. "Low pressure" or "distribution" or "feeder" or "trunk" gas pipelines are those with pressure lower than 2 500 kPa. Transmission lines should therefore be buried and in separate rights of way that the pipeline company can fully control. Distribution lines being of lower pressure and having to access customers (by their nature) generally are placed in highway and street rights of way.

Consequently, they are much more vulnerable to inadvertent excavation and indeed rupture of gas service lines by backhoes is all too frequent.

** Amendment

Some streams are difficult to cross and in the past in a few cases the Ministry has allowed gas transmission and distribution lines on Ministry structures. It has become clear in subsequent years that this is no longer desirable:

1. pipelines are vulnerable to terrorists and vandals

2. many of Ministry bridges, while not unsafe, are in fact less secure from failure by scour, washout, etc., than had been thought

3. it has become clear from recent experience in California and Japan that many of Ministry bridges, particularly the non continous beam spans, are more vulnerable to failure from seismic forces than had been thought

4. the presence of high pressure pipes on bridges inhibits maintenance crews and their operation

5. severe structural damage to bridges, particularly through trusses, by oversize motor vehicles is increasing.

Formerly the cost of hanging pipe on bridges exceeded the cost of submarine stream crossings but in recent years the gap has narrowed largely because of fish/wildlife conditions. Allowable stream working dates may not fit a pipeline company's schedule and a request to hang on a bridge may result.

The following policy applies to pipelines carrying oil, natural gas, LP gas, aircraft fuel, sewage (force main), coal slurry, and active chemicals.

1. Transmission lines are not permitted to infringe on highway right of way. Such lines may be in separate right of way adjoining highway right of way. Care should be taken to ensure that future highway widening is not jeopardized. Gas and sewage (force main) distribution lines may be in highway right of way with suitable cover, generally at least 1 m below ditch invert.

2. Pipelines may cross highway right of way where required. Crossings should be bored, tunneled or jacked under trunk, main and major and other paved highways and open cut may be allowed freely on unpaved highways but on trunk, main and major highways it should be confined to those places where ground conditions are very difficult (note qualifier "very") and boring etc., is thus not indicated. No casings are required for any crossings: increased wall thickness or lower working stress according to CSA is required. High pressure gas and all other types except sewage (force main) should have markers, on or near the right of way boundary, to indicate location of the crossing.

3. Pipelines are in general not to be installed on bridges.

4. Ministry operators should be alerted to the presence of pipelines before commencing any excavation.

2. SEWER, WATER, IRRIGATION PIPES

Locate underground lines outside the roadway cross section, if possible.

Minimum cover on all underground lines is 75 cm below ground line or street grade, whichever is lower.

Frost is not critical for sewer or summer irrigation lines, but cover on water lines must prevent freezing in a colder than normal winter.

Not even temporary water or irrigation lines are permitted through culverts as they may obstruct flow and promote sedimentations etc.

Pipe casing and backfilling specifications are provided in Form H.21 must be added to Form H.21C.

All materials for underground pipe lines must conform to AWWA, ASTM or CSA specifications, and home-made pipes are not permitted.

Low pressure lines, such as irrigation siphons, must be of pressure pipe.

Roadway valve boxes, manholes, gratings, etc. must be flush with pavement.

All crossings of trunk, main, and major roads must be bored or tunneled except when:

(1) Unborable soil conditions exist. The applicant must either provide reliable log of soil conditions down to the depth of the crossing or on representation to the Ministry may be required to excavate test pits to this depth for visual observation. This is to be attended to before a permit is issued.

(2) Where a highway is to be reconstructed in the immediate future.

(3) The applicant provides detailed information in advance which confirms that the presence of other utilities in the roadway makes boring and jacking impractical.

(4) The cost of utility installation is excessive in comparison to open cut, in the opinion of the Ministry. The applicant must make available detailed tendered prices and must be tendered both ways at the same time.

(5) Where open cut is permitted, specifications will be provided by the Ministry.

Pumphouses may be permitted within the right-of-way, but the utility must first have exhausted all other possibilities. A pumphouse must not detract from the appearance or use of beaches, etc.

Sewer lift stations (preferably underground) may be permitted.

Underground pipe systems (except gas) not designed by a Professional Engineer must be covered by a valid certificate from the Ministry of Health or the Ministry of the Environment.

In the case of sewer systems, the Regional Office of the Waste Management Branch of the Ministry of Environment must approve all systems discharging over 22731.4 litres (5000 gallons) into the ground, or all systems with a positive discharge into water. Small and surface systems are certified by the Ministry of Health.

8.31 CONTROL OF NON-MINISTERIAL SIGNS

Section Index

1. Authority
2. Allowable Signs
3. Signs Not Allowed
4. Applications
5. Permits
6. Sign Placement
7. Sign Colour, Illumination and Reflectorization
8. Letter Sign and Message
9. Sign Size
10. Supply and Maintenance
11. Removal of Illegal Signs

1. Authority

Section 213 of the Motor Vehicle Act prohibits all signs on any Provincial Highway or within 300 metres of a highway in unorganized territory, but provides that the Minister, or others with his approval, may allow certain signs.

The policy controlling non-Ministerial signs is administered by the Director of Highway Planning and Traffic Engineering who handles and gives notice of any policy changes.

Signs on private property in organized areas (Municipalities, and Indian Reserves), and on roads other than Provincial roads and Highways, are not controlled by the Minister. Such signs are under the jurisdiction of the local governing body.

2. Allowable Signs

The various types of signs allowed are outlined in Sections 8.32 and 8.33. Section 8.32 deals with signs allowed for certain businesses and 8.33 is concerned with sign-types required for non-

business or "other" purposes. The division used to separate "business" and "non-business" signs is acknowledged to be arbitrary. No attempt has been made to define either category as several sign types could have been placed equally well in either. The division has been employed only as a means of simplifying the organization of material. Some signs in each group require that permits be issued while others are allowed without permit, provided they comply with any other specific limitations.

3. Signs Not Allowed

Non-Ministerial signs which resemble any traffic control device are not allowed. Also, non-standard regulatory or warning devices (e.g. school zone signs painted to represent the figure of a child) are not allowed on right-of-way under any circumstances. Similarly, sidewalk "A" board signs, or other business signs on portable stands, are not to be allowed.

No structures, arches, overhead banners or signs, other than those of the Ministry are to be allowed on multi-lane limited access highways.

Signs marking the boundaries of Fire, Water, Irrigation, Improvement or other similar Districts are not allowed unless the area in question is covered by a Blanket Speed Zone. In such cases, all necessary signs will be erected by the Ministry.

Signs of any type not covered in Sections 8.32 and 8.33 will generally not be permitted. However, applications for signs to cover unusual circumstances may be forwarded to the Director of Highway Planning and Traffic Engineering via the Region for consideration.

Partial restrictions concerning sign overhang, colour, illumination, size etc. are dealt with in subsections 6. to 9. below.

4. Applications

Applications for the placement of non-Ministerial signs requiring permits must be made on Form H.227 "Application for Permission to Construction Signs...". The form in triplicate should be provided by, and when completed, returned to the District Office along with three copies of a sketch showing the proposed sign location(s), and the locations and names of main and side roads. The District will then forward two copies of the application to the Region, with recomendations.

When signs are to be erected jointly by several individuals or groups, the individuals or groups must agree on one of their number making application for a permit for the joint sign. If approved the permit will be issued in the name of the one applicant.

All persons enquiring for permission to erect business signs, whether or not permits are required, should be given a copy of Form H.431 - "Business Signs Permitted Under Section 213 of the Motor Vehicle Act".

5. Permits

Most permits for non-Ministerial signs are issued through the office of the Regional Director, Highways. If an application forwarded by the District is approved, the Region will issue a permit using Form H.277A "Permission to Construction Signs...", sending a white copy to the applicant and a yellow copy to the District concerned.

Permits for the use of standard traffic signs on Provincial highways by relatively local concerns (e.g. Land Surveyors, Water District, etc.) will be issued by the Regions. Similar permits for use by utility companies or authorities and other concerns operating on a Province-wide basis will be issued by the Director of Highway Planning and Traffic Engineering with copies to the Regions.

6. Sign Placement

Whenever possible, non-Ministerial signs on right-of-way should be placed in a similar manner to Ministerial traffic signs, provided such placement does not reduce visibility of any traffic control device and further provided that a specific offset distance, mounting height, etc. has not been stipulated for any particular size or type of sign.

General specifications for the placement of signs are contained in the "Manual of Standard Traffic Signs".

Signs erected on private property should not be allowed to overhang right-of-way where curb and gutter is not in place. Where curb and gutter exists, signs supported by a business building and of a type covered in subsections 8.32.2.2 and 3., should be allowed to overhand right-of-way, without permit, provided they do not come closer than 45 cm to the curb face and 3 m of vertical clearance is provided. If illegal overhanging signs are detected, they should be allowed to remain initially, but their owners should be advised immediately, by registered letter, that the signs must be removed within six months.

7. Sign Colour, Illumination and Reflectorization

Signs allowed on highway right-of-way, or on private property in unorganized areas, are not restricted as to painted colour except that a green background may not be used.

Any colour of reflective material may be used for sign messages but backgrounds may not reflect red, yellow or green colour.

Signs on right-of-way may not be illuminated or contain neon tubing except for overhanging signs described in subsection 8.32.3.2 and 3.

8. Letter Size and Message

Signs under permit which are greater than 0.5 square metres in area must display letters a minimum of 10 centimetres in height. Examples of messages allowed for the various types of signs are given in Sections 8.32 and 8.33.

9. Sign Size

Where applicable, the maximum allowable area or dimensions of the sign face for each type of sign are specified in Sections 8.32 and 8.33. Wherever a size is specified it should be taken to include the dimensions of any border and/or frame.

10. Supply and Maintenance

Except where signs are provided in special circumstances by the Ministry all non-Ministerial signs must be supplied, erected and maintained by the appropriate organization, business operator or other permit holder.

If either the Regional Director, Highways or the District Highway Manager feel that a sign is not being properly maintained, the owner should be notified that the sign must be refurbished or removed. If the owner fails to take appropriate action, the permit (if applicable) may be cancelled and the sign removed by following procedure set out in subsection 11.

11. Removal of Illegal Signs

Except for election posters, signs on highway right-of-way without permit or other authorization shall be removed as soon as detected and carefully stored in the nearest Ministry yard. The owners should then be advised that signs are available for pick-up.

Illegal signs outside right-of-way in unorganized territory should be removed by using the following procedure:

(a) Attempt to contact the owner of the sign personally and ask him to have it removed.

(b) If the owner cannot be contacted personally, or will not agree to remove the sign, he should be advised by registered mail that the sign must be removed in three weeks.

(c) If the sign has not been removed by the date specified, contact Headquarters and obtain permission to place information with the policing authority against the owner of the sign and the property owner under Sections 213(4) and 213(5) of the Motor Vehicle Act.

The procedure to be used in removing improperly placed election posters is set down in subsection 8.33.1.7.

All non-Ministerial signs, under permit or not, must be removed or neatly covered by the owners whenever the message does not apply - whether temporarily or permanently.

8.32 CONTROL OF "BUSINESS" SIGNS

Section Index:

1. BUSINESS SIGNS ALLOWED ON RIGHT-OF-WAY

1. Tourist Accommodation Directional Signs
2. Tourist Attraction Directional Signs
3. Business Identification & Point of Sale Signs (Special Cases)
4. Refuse Disposal Directional Signs

2. BUSINESS SIGNS ALLOWED ON PRIVATE PROPERTY

1. "Business Property" Defined
2. Business Identification Signs
3. Point of Sale Signs
4. Business Directional Signs (Special Cases)
5. Tourist Accomodation Directional Signs (Special Cases)

8.32.1 BUSINESS SIGNS ALLOWED ON RIGHT-OF-WAY

1. Tourist Accomodation Directional Signs

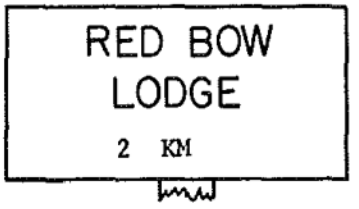
For the purposes of this policy, the term "Tourist Accomodation Establishment" means any motel, resort, hotel, trailer park or tenting ground which is registered with the Tourist Accomodation Branch of the Ministry of Tourism. Such establishments may erect certain signs under permit at approved locations on right-of-way provided all conditions stated on the permit are met.

Signs of the various approved types are illustrated below:

TYPE 3



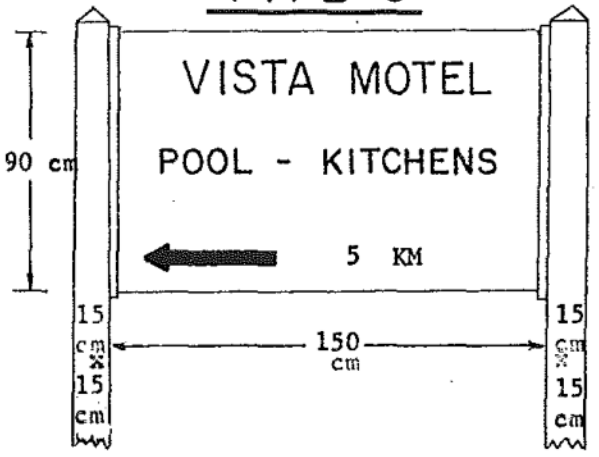
TYPE 5



TYPE 3: Maximum Size 60 cm x 45 cm centrally mounted on 10 cm x 10 cm x 2.75 m post.

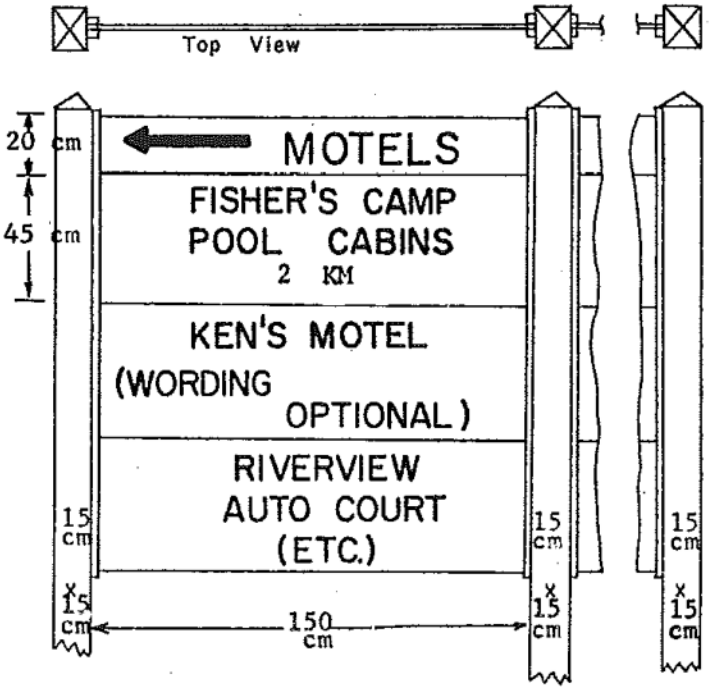
TYPE 5: Maximum size 120 cm x 60 cm centrally mounted on 15 cm x 15 cm x 3 m post or or as shown for Type 7.

TYPE 6



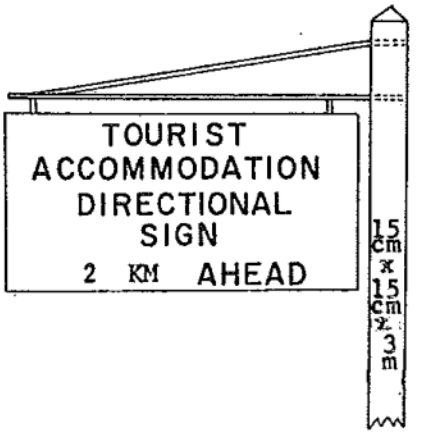
TYPE 6: For use at turnoffs leading to a single Tourist Establishment. Maximum sign size to be 150 cm x 90 cm, single or double-sided. Other types of mounting may be used for Type 6 and 6A signs provided similarly to those shown.

TYPE 6A



TYPE 6A: For use at turnoffs leading to a minimum of two and a maximum of eight establishments. For more than four establishments, add third post and additional signs. Individual sign size restricted to the boards are positioned 150 cm x 45 cm single or double-sided. Wording on the 20 cm board is restricted to a general term e.g. "AUTO COURTS", "MOTELS", "RESORTS", etc.

TYPE 7



TYPE 7: Signs should exhibit a general message similar to the one shown or "MOTEL(S) TURN LEFT 3 KM AHEAD", etc. Individual establishment names must not be used. Signs may be mounted as illustrated or as shown for Type 5. Maximum size 120 cm x 60 cm.

The types of signs illustrated may be permitted as follows:

(a) A Tourist Accomodation Establishment located adjacent to a main highway in unorganized territory may erect one Type 5 sign for each direction of travel within three km of the establishment.

(b) One Tourist Accomodation Establishment located on a side road in unorganized territory may erect the following signs:

(i) A Type 6 sign at the main highway turnoff.
(ii) A Type 7 sign for each direction of travel on the main highway and within three km of the turnoff.
(iii) A Type 5 sign for the approach direction of travel on the side road and within three km of the establishment.

(c) Where two or more Tourist Accomodation Establishments are located on a side road in unorganized territory, the operators of such establishments must agree amongst themselves to apply for a group Type 6A sign at the main highway turnoff instead of separate signs for individual establishments. Also, the group of establishments are only allowed one pair of Type 7 signs on the main highway..

An additional permit will not be required if further Tourist Accomodation Establishments wish to add boards to an existing Type 6 or 6A sign. An establishment wishing to add to an existing Type 6 sign, to form a Type 6A sign, must also provide the 20 cm top board and the new 45 cm board for the permit holder.

(d) Tourist Accomodation Establishments situated on side roads in unorganized territory may erect Type 3 signs, as necessary, at road junctions between the main road turnoff and the establishment.

(e) Tourist Accomodation Establishments situated within an organized area are not allowed to erect any signs on highway right-of-way or on private property in adjacent unorganized territory, <u>except</u> where a newly constructed main highway, other than a freeway, in unorganized territory has bypassed the organized area. In such special cases, two options are available:

(i) Establishments in the bypassed organized area can apply for a Type 6 or 6A sign at the junction of the new highway and the main side road leading to the organized area. They may also apply for Type 7 signs on the new highway, or,

(ii) with the approval of the Director of Highway Planning and Traffic Engineering, the Ministry may opt to erect signs on the new right-of-way indicating that Tourist Accomodation Establishments are located in the bypassed area. In this case, bypassed establishments must relinquish all rights to signs that would normally be permitted under (i) above.

(f) Establishments situated in unorganized territory are not permitted signs on the highway right-of-way within an organized area.

(g) Type 5 and Type 7 signs may not be erected in such a position that the highway between the signs and the Tourist Accomodation Establishment traverses an organized area.

(h) Tourist Accomodation Establishments in unorganized territory and closely grouped together on a main highway (usually within a 50 km/h zone) will not be allowed individual Type 5 signs but may be permitted group signs such as "Motels for Next Three km", or similar applicable wording as outlined in the pamphlet, "British Columbia Government Classification of Tourist Accomodation". Such signs, of the same size as Type 5, are only allowed if permits have not been issued under the following clause or Subsection 8.32.2.5.

(i) Tourist Accomodation Establishments in either organized or unorganized territory and grouped within a well-defined area, which have not been granted permits under the preceding clause or Subsection 8.32.2.5., may be issued a permit for joint Type 6A to be erected at the boundaries of the area.

(j) Where a side road in unorganized territory leads to more than eight approved Tourist Accomodation Establishments, Type 6A signs must be replaced by a generally worded Departmental sign at the turnoff. Individual establishments will be permitted Type 3 signs as necessary along the side roads between the main highway turnoff and the establishment.

(k) It will be in order for Tourist Accomodation Establishments permitted Type 6 or 6A signs to provide and operate "Vacancy" and "No Vacancy" tab signs.

(l) Any Accommodation Establishment which commences operation in an area, after that area has become part of a new or expanded municipality, will not be issued a permit for signs on Highway right-of-way.

(m) If an area containing an Accommodation Establishment is incorporated into a new or existing municipality, any signs already under permit on Highway right-of-way may remain in place, at the operator's option, for a maximum of five years from the effective date of incorporation. In such a case, the existing permit should be cancelled and replaced with a new permit indicating that the signs must be removed by the end of the period stipulated.

2. Tourist Attraction Directional Signs

There are a number of businesses developing along the highways in unorganized territory which cater mostly to tourists by displaying historical or animal collections, out of the ordinary things, or offering amusements of unusual interest. These types of businesses have been grouped under the heading of Tourist Attractions.

A Tourist Attraction Business is difficult to define but the following will serve as a guide. Examples of tourists attractions, are museums, zoos, buildings of unusual construction, and attractions devoted to forests, woods, and trees. Businesses which are not considered to be primarily tourist attractions are those which derive more than 25 percent of their income from selling goods, products, souvenirs of handicrafts, U Catch 'Em fish ponds, lapidary shops, and amusement parks.

To qualify for advance signs a Tourist Attraction Business must be located in a speed zone of 80 km/h or higher and other signs on private property associated with the business must conform with the requirements of Subsections 8.32.2. and 8.32.3.

Attraction Businesses located on a main highway should be allowed, under permit, one sign similar to Type 5 for each direction of travel and within 1 kilometre of the business.

The top line of the sign message must read "Tourist Attraction" in at least 10 cm high letters. The rest of the message may consist of either the attraction's name or a word or phrase describing the attraction, and the distance.

Advance signs are not allowed for Tourist Attraction Businesses with length highway frontage and which have signs on the business property serving as advance signs.

Attractions less than 1 kilometre apart and located on a main highway may apply to erect joint advance signs allowed one square metre for each participating attraction. Combined tourist accomodation - attraction businesses are allowed only one advance sign within three km of the business for each direction of travel.

Tourist Attraction Businesses located on a side road will be permitted to erect a pair of Type 7 signs on the main highway within 1 kilometre of the turnoff with wording similar to "Tourist Attraction - Museum - Turn Left 1 Kilometre". Such attractions may also erect a Type 6 sign at the turnoff or a Type 6A if the turnoff also serves other Tourist Attraction Businesses or Tourist Accomodation Establishments.

Any Tourist Attraction Business which commences operation in an area, after that area has become part of a new or expanded municipality, will not be issued a permit for signs on Highway right-of-way.

If an area containing a Tourist Attraction Business is incorporated into a new or existing municipality, any signs already under permit on Highway right-of-way may remain in place, at the operator's option, for a maximum of five years from the effective date of incorporation. In such a case, the existing permit should be cancelled and replaced with a new permit indicating that the signs must be removed by the end of the period stipulated.

3. Business Identification and Point of Sale Signs (Special Cases)

These two types of signs are generally allowed on business properties as detailed in Subsections 8.32..2.2. and 3. However, where the right-of-way fronting a business property is wider than the normal width along the highway, thus setting the business property an extremely large distance back from the travelled roadway and causing signs on the property to have less than usual visibility, then Business Identification and/or Point of Sale signs may be allowed on right-of-way, under permit, outside an assumed line equalling the right-of-way width normal for that highway.

This situation is frequently found where a business is located on the outside of a curve and where reconstruction has moved the travelled roadway away from the business property.

The provisions of this subsection do not apply to limited access multi-lane highways or at locations where a frontage road has been dedicated.

4. Refuse Disposal Directional Signs

Operators of refuse disposal areas located in unorganized territory will be allowed to erect signs under permit as follows:

(a) Up to 1 square m in area for signs on right-of-way and similar in style to either Type 5 or 7 signs, or,

(b) up to 2 square m in area for signs on private property.

8.32.2 BUSINESS SIGNS ALLOWED ON PRIVATE PROPERTY

1. "Business Property" defined

For the purposes of this section "business property" is taken to mean only the lot or lots (which generally have building improvements on them) necessary to satisfactorily conduct the business.

2. Business Identification Signs

Signs in this group may be erected without permit on a business property in unorganized territory to identify or advertise the business conducted thereon. e.g.:

"Brown's Restaurant and Service Station"
"James White - Licensed Electrician"
"Jones Fruit Stand"
"Fruit and Vegetable Stand - 60 m"
"Bill's Coffee Shop"
"Gomoca Gas", etc.

Any number of single or double-sided Business Identification signs are allowed provided they are painted on or otherwise supported by the business building. In addition two signs not supported by the building are allowed provided they are situated on the business property.

3. Point of Sale Signs

Single or double-sided signs of this type may be erected without permit on a business property in unorganized territory to advertise the produce, goods or services available thereon. e.g.:

"Ice Cream & Soft Drinks Ahead"
"Ideal Cigarettes for Sale Here"
"Drink Zip and Stay Fresh"
"Freshee Frozen Foods and Better"
"Shoes Repaired While You Wait"
"Apples and Peaches for Sale Ahead"
"This Property for Sale - James Realty, Kelowna" etc.

Any number of Point of Sale signs are allowed provided they are painted on or supported by the building in which the produce goods or services are available. Two additional signs not attached to the building but within 90 metres of it are allowed. Size of the independent signs is limited to 6 square metres for any one face.

The 90 metre - distance limitation does not apply to Point of Sale signs for fruit stands or for property offered for sale. Signs advertising fruit may be erected at any distance from the fruit stand, provided they are located on the business property. Similarly, signs advertising real estate may be erected anywhere on the lot, lots or acreage for sale.

4. Business Directional Signs (Special Cases)

In very special cases, permits may be issued for signs on private property in unorganized territory, other than on the business property, to direct traffic from a main highway to a business or place of public gathering. Signs may only be allowed when, in the opinion of the Regional Director, Highways, they are absolutely necessary. Such signs, not exceeding 2 square metres in area, should be erected adjacent to the main highway and in advance of the most convenient turnoff.

5. Tourist Accomodation Directional Signs (Special Cases)

Tourist Accomodation Establishments grouped within a well-defined area in unorganized territory may be issued a permit to erect a generally worded group sign on private property, provided permits have not been issued under Subsection 8.32..1.1, clause (h) or (i). Signs may be single or double-faced but any face shall not exceed 7 square metres in area and should carry a message similar to "You are Approaching Windemere Resort Area - Watch for Signs".

8.33 CONTROL OF "NON-BUSINESS SIGNS

SECTION INDEX:

1. NON - BUSINESS SIGNS ALLOWED ON RIGHT-OF WAY

1. Church Signs
2. Service Club Signs
3. Overhead Banners
4. Forest Service Signs
5. Ministry of Lands, Parks and Housing Signs
6. Ministry of Environment
7. Election Posters
8. Public Telephone Signs
9. Summer School & Camp Signs
10. Welcome to .... Signs
11. Ski Area Directional Signs
12. Weigh Scale Branch Signs
13. Signs Maintained for other Ministries.

2. NON - BUSINESS SIGNS ALLOWED ON PRIVATE PROPERTY

1. Crime Prevention Program Signs
2. Area Promotional Signs

1. NON - BUSINESS SIGNS ALLOWED ON RIGHT-OF-WAY

1. Church Signs

A church located off a main highway, in organized or unorganized territory, may be issued a permit to erect one single or double-sided sign on right-of-way at the most convenient turnoff. Such signs must not exceed 60 cm x 75 cm in size and the message must be of a directional nature only.

Churches may also, under permit, erect a group sign at each highway entrance to a community. The group signs may be similar to Type 6A or to the Service Club sign mentioned below.

2. Service Club Signs

Permits should not be issued for individual service club signs. However, a group of clubs may erect, under permit, a standard combination sign in accordance with Traffic Branch Plan No. 18-8. Such signs may be erected on right-of-way at each highway entrance to a community.

Clubs must agree amongst themselves which organization will be named in the permit. Other service clubs may add their boards to the combination sign without permit revision.

3. Overhead Banners

Fabric banners advertising a community event may be strung across a highway for a period of about one week. No permit is required for banners, but their erection should not be authorized until a written undertaking is received from the applicants to assume full responsibility for any damage claims which might arise due to the banner. No banners shall be erected within 90 cm of a major high- way structure. Banners are not permitted on highways having a median paved or otherwise.

4. Forest Service Signs

The Provincial Forest Service may erect, without permit, their "Prevent Forest Fires", "Fire Lookout", "Ranger Station", "Provincial Forest Boundary" and "Forest District Boundary" signs at suitable locations on right-of-way approved by the District Highways Manager.

5. Ministry of Lands, Parks and Housing Signs

The Parks Branch may erect natural wood signs on right-of-way, without permit, at locations approved by the District Highways Manager, to identify Provincial Park, Picnic Site and Campsite entrances. The Ministry of Transportation and Highways is responsible for the erection of advance signs as detailed in Section B5 of the "Manual of Standard Traffic Signs".

6. Ministry of Environment

The Fish and Wildlife Branch has been issued a blanket permit to legalizing use of signs reading "Vehicles Carrying Firearms, Wildlife - Stop". The signs are required by Conservation Officers operating mobile Game Check Stations.

7. Election Posters

Election posters or signs are not allowed on freeways, expressways, or any major highway structure. They will be tolerated on other highway right-of-way provided they are not attached to, obstruct vision of or simulate any traffic control device. Posters will not be allowed closer to the travelled lanes than other signs or in any position causing a traffic hazard by diverting driver attention at the wrong moment.

Signs or posters contravening the above are to be taken down and an immediate report made to the Regional Director, Highways, giving location of the offending sign(s), and name of the political party or independent candidate involved. The District Official must then personally contact the appropriate campaign manager by phone to advise why the sign was removed and seek co-operation in proper placement.

The next working day after an election, contact should be made with the campaign managers to request them to take down the posters. Failing co-operation, our own crews are to do the work. No bills are to be sent out for the cost.

8. Public Telephone Signs

Permits may be issued for "Public Telephone ..... Kilometre" symbol signs only where the pay station is located where a motorist would not normally expect to find one. (e.g. where the speed limit is 60 km/h or more). Signs should not be permitted in cities and towns, or villages and communities where the speed limit is less than 60 km/h. Changing density of population, and resulting lowering of speed limits, will necessitate cancellations of permits from time to time.

9. Summer School and Camp Signs

Summer schools offering short-term courses and summer camps operated by churches, youth groups, scouts, guides or similar organizations may erect temporary signs for the duration of the school or camp.

Permits may be issued in the same manner as for Tourist Accomodation Establishments located in unorganized areas except that all signs should be restricted to the Type 3 size.

10. "Welcome to ..... " Signs

Signs of this type should be allowed under permit on right-of-way, if possible, at municipal boundaries or at the edges of well established communities within district municipalities.

Depending on the offset distance, the following limits in sign size will apply:

(a) A maximum of 3 sq. metres if the sign is located at least 6 m from the edge of the nearest through traffic lane. This is the most common size and position.

(b) A maximum area of 14 sq. metres if the sign is located at least 15 m from the edge of the nearest through traffic lane but not between the highway and a frontage road.

(c) A maximum area of 24 sq. metres if the sign is located at least 38 m from the edge of the nearest through traffic lane.

11. Ski Area Directional Signs

The Ministry of Transportation and Highways will generally erect directional signs for those areas recognized by the Ministry of Tourism. Depending upon the size of the development, standard G-1 or G-2 signs will be used with messages similar to "Big White Ski Area" with appropriate arrow.

However, if the ski area route leaves the main highway within an urban area, such that post-mounted directional signs are not feasible, operators of the ski area must agree to pay the additional costs of davit-mounting (i.e. cost of davit, concrete pedestal and installation) before the Ministry will provide a 180 cm x 90 cm or 120 G-5 type sign.

Where ski areas are also used extensively for summer recreation, it may be necessary to replace the "Ski Area" message with "Recreational Area".

12. Weigh Scale Branch Signs

The Ministry will supply, erect and maintain, free of charge, any standard traffic signs associated with weigh scales. The Ministry will also erect and maintain special signs such as "Commercial Vehicles Report to Scale", "Stop Before Driving Onto Scale", "Truck Control" (sign only), etc. which have been supplied by the Weigh Scale Branch.

13. Signs Maintained for other Ministries

On a limited basis, with the approval of the Director of Highway Planning and Traffic Engineering, the Ministry will erect and maintain certain signs on right-of-way for the few Ministries which are not equipped to handle their own signs.

(a) Ministry of Agriculture and Food - We will supply, erect and maintain special signs dealing with the movement of livestock and signs marking the boundaries of quarantine or disease-free areas. Headquarters Accounts will debit Agriculture only for the cost of the signs.

(b) Ministry of Lands, Parks and Housing

Provincial Parks - We will supply, erect and maintain directional signs on highway right-of-way for Provincial Parks. We will also supply Provincial Park Directional Signs, as necessary, for erection and maintenance by others on roads not under the Ministry's jurisdiction. The costs of manufacturing all signs, regardless of eventual placement, will be debited to the Highways Districts in which the parks are located. The Districts will add on predetermined costs of installing signs on highway rights-of-way and journal voucher the Parks Branch.

Once installed, Districts will add Provincial Park Directional Signs under Ministry juridiction to their sign inventories so that maintenance funds can be provided in subsequent fiscal years. Headquarters will recover maintenance costs from Parks by issuing a single journal voucher annually.

It is general policy that signs will be erected to direct traffic to a park only from the closest provincial numbered route. Where part of the route to a park from a provincial highway follows municipal streets, it will be necessary to involve municipal officials in selection of the most appropriate route.

There will generally be two signs erected for each highway approach to a park entrance, or turn off to a more remote park; one at 2 km and one at 400 m in advance.

2. NON-BUSINESS SIGNS ALLOWED ON PRIVATE PROPERTY

1. Crime Prevention Program Signs

Refer to Section 9.08 Working Relationship - R.C.M.P. and Ministry.

2. Area Promotional Signs

Signs of this type may be allowed under permit, generally on private property, to promote the facilities, attractions and points of interest available in a particular geographical area. These signs can be generally worded, extolling the attractions of a community or recreational area, or they may be a map type sign indicating the names and positions of

visitor-oriented businesses or generally worded signs with attached individual smaller signs for each visitor-orientated business.

Such signs are intended for areas which may be missed by tourists because the areas are on side roads, deadened roads, or due to the nature of the organized area, business centres are widely dispersed. For other than these areas, type 5 signs under permit should generally be considered adequate. An area promotional sign will be permitted at the last main junction where a visitor must decide whether to leave his original route or at the boundary of the organized area.

The following requirements must be met for a permit to be granted:

(a) Only one group representing the majority of the tourist oriented businesses of an organized area can apply to erect an area promotional sign. A community group applying for a sign must represent the whole of an area and it must be a joint co-operative effort. In unorganized areas, the Ministry will acknowledge an application from one group that represents the majority of the visitor oriented businesses within a local area.

(b) If a pullout is required so that visitors may stop and read the details on the sign, for those signs which cannot be read while driving at normal speed, the Ministry will construct and maintain the pullout, if traffic conditions, topography, right-of-way, ease of construction and other conditions permit construction at reasonable cost.

(c) Where an area or community has less than 24 visitor oriented businesses, the area promotional sign may show the locations of each business. Where an area or community has more than 24 such businesses, the area promotional sign must be of a generally worded nature. Where a community is sufficiently large, location of a visitor information centre at each entrance should be encouraged, rather than promotional signs. Area promotional signs will not be permitted to cover areas already covered by existing visitor information centres.

(d) The group being granted a permit for an area promotional sign will be responsible for providing the complete sign face and for maintaining and replacing the sign face as necesary if damaged or deteriorated. They must maintain the sign face at all times, in good condition. The Ministry will erect and maintain the sign posts, and framework necessary to support the sign face provided the sign is of a conventional design and that the posts are not an integral part of the display.

(e) Where the sign is to be placed entirely within the right-of-way, the sign must not exceed 14 square metres and must be located at an offset of not less than 8 metres from the edge of the nearest travelled lane. As a general rule, the larger the sign, the greater the offset. Where the sign is to be erected on the highway right-of-way within municipalities or Regional Districts, then it must have the consent of the municipality or Regional Districts.

(f) Where the sign is to be erected off of right-of-way within an organized area, the sign must comply with the bylaws of the area.

(g) Where signs are erected clear of the highway right-of-way then the group applying for the sign must provide any easement or necessary property.

(h) Where the sign is to be erected off the right-of-way in unorganized areas, the size depends on the following:

1. If the area is under the control of a Regional district that have bylaws concerning the erection of signs, the Regional District's approval must be obtained.

2. In unorganized areas where there are no Regional District bylaws concerning the erection of signs, the applicant may erect up to a 23 square metre sign.

(i) In all cases, all necessary pemits, easements and consents must be obtained prior to commencement of construction of pullouts or erection of signs.

(j) Signs promoting organized areas through which a highway passes must be located at or as close to the boundary as practical. Signs must not overlap other communities or areas.

(k) Area promotional signs are generally not considered appropriate on limited access highways. In situations where the signs are requested for location on limited access highways or where the signs are to be erected at a location remote from the area being promoted, the application should be referred to the Director of Maintenance Services.

8.34 SIGNS FOR TOURIST SERVICES ON ARTERIAL HIGHWAYS

1. General

This policy covers provision of signs by the Ministry on freeways/expressways and on certain other arterial highways, for eligible service businesses providing gas, meals, accommodation, or sani-station (recreational vehicle sewage dump) facilities.

2. Eligibility

To be eligible for Ministry signs, service businesses must meet the minimum standards set down for the type of service offered and must be located at or less than the maximum allowable road distance between the service business and the nearest Provincial highway turnoff. Also, if the "service route" is not self-evident and all or part of it follows municipal streets, then the business operator must arrange erection (by the municipality or by himself with municipal approval) of any necessary confirmatory signs used on Ministry roads and must be erected prior to the placement of any Ministry signs.

3. Minimum Standards

Following are minimum standards which must be met by service businesses before the Ministry will consider signing.

1. Gasoline

A service station must be open to provide gasoline, oil, radiator water, drinking water, and rest rooms for at least 15 hours every day that signs are in place.

2. Meals

A restaurant must possess all valid licenses and certificates required by municipal, regional or Provincial health authorities and must be open to serve breakfast, lunch and dinner every day that signs are in place.

3. Accommodation

An establishment must be approved by and registered with the Provincial Tourism Authority. They must be open for business every day that signs are in place. For signing purposes, accommodation businesses are classed if four sub-types:

1. Hotels/Motels
2. Campground (Tents only)
3. Campground (Rec. Vehicles only)
4. Campground (Tents and Rec. Vehicles)

4. Sani-Station

The operator of a sani-station must hold a valid inspection certificate issued by the appropriate municipal, regional or Provincial health authority. The facility must be available for general public use, whether or not a user wishes to avail himself of any other service offered by the operator, every day that signs are in place. The charging of a nominal dumping fee has no bearing on sign eligibility.

4. Distance Limitations

The following table shows the maximum distance various types of service businesses may be located away from three road categories and still be eligible for signs. Distances are by road between a service business and the closest intersection of interchange on a designated highway:

ROAD CATEGORY	SERVICE TYPE ACCOMMODATION	MEALS AND/OR GAS	SANI-STATION
Freeway and Expressway	All types Max. 7 km away	Max. 3 km away	Max. 7 km away
Rural Arterial	Campground Max. 7 km away-other types max. 3 km away.	Max. 1 km away	Max. 7 km away
Suburban Arterial	Campground Max. 7 km away-other types max. 500 m away	Max. 500 m away	Max. 7 km away
Urban Arterial	Campground Max. 1 km away	N/A	Max. 1 km away

8.35 OVERSIZE AND OVERWEIGHT VEHICLES

Commercial Transport Division - Motor Vehicle Branch

Permits to operate oversize and overweight vehicles are issued by the Standards and Compliance Branch. The Branch issues permits on specific routes up to limits determined in conjunction with the Regional Director, Highways. Specific approvals are obtained for greater loadings or unspecified routes.

Sec. 5 Highway (Industrial) Act

8.36 MOBILE VENDING VANS

No permit is granted for mobile vans to sell produce or confectionery on a highway right-of-way. Such vending is prohibited by the Motor Vehicle Act.

8.37 BUS SHELTERS

Following is Ministry policy on construction, maintenance and advertising on Bus Shelters.

1. Shelters to be allowed on Highway rights-of-way in urban areas where a bus stop is permitted and if there is sufficient room for the shelter on the right-of-way.

2. Foundation area for the shelter to be built by Ministry at full cost to bus company.

3. Shelter including concrete base is to be erected by bus company or their agent under permit from the District Highways Manager at full cost to the bus company. During construction the bus company or agent shall be responsible for traffic control and hazard marking of the construction area as specified in the permit. In addition, the bus company is responsible for removal and restoring the roadside area to the satisfaction of the Ministry in cases where the shelter is no longer required.

4. Minimum size of passenger refuge area shall be regulated in accordance with standard far side bus stop design. Shelter to be set back 1.5 m from face of curb or 3.0 m from edge of travelled lane on roadways with an open shoulder design.

5. Shelters of a modular system of fabrication will only be permitted. The shelter size is restricted to 1.2 m x 2.4 m x 2.4 m or 1.2 m x 3.6 m x 2.4 m as required by passenger volume. Reasonable uniformity in type of shelter shall also be maintained throughout all significant sections of roadway equipped with bus shelters.

6. Shelters are to be located parallel to the roadway and bolted to a concrete base.

7. Shelters shall have a sloped roof and floor drains to satisfy drainage requirements.

8. Shelters shall provide good visibility to approaching buses (i.e. three to four sided glass shelter) that are strong, aesthetically pleasing, resistant to vandalism and afford a minimum amount of maintenance.

9. Exterior lighting will only be provided where the bus company or their agent (i.e. Improvement Districts, Water Districts, Regional Districts, etc.), are available for billing at 100% their cost including power and maintenance. Lighting designs are to be submitted to the Traffic Engineering Branch for approval.

10. The bus company or their agent is 100% responsible for the cost of maintenance including the preparation of maintenance agreements for all bus shelters and affected Highway right-of-way to the satisfaction of the Ministry of Transportation and Highways. In addition, accessories that may be deemed necessary such as trash containers, newspaper boxes and pay telephones shall be accommodated in the maintenance agreements.

11. Advertising to be allowed on bus shelters but of a type that is not distracting to passing drivers. Advertising on shelters is to be located on far side or downstream of approaching traffic and maximum size of ad restricted to 1.2 m x 2.4 m. In addition, a 1.2 m x 0.6 m ad located on the back wall within the shelter will be permitted. Urban Transit Authority advertising standard shall be followed. No reflectorized or internally illuminated signs will be allowed except in built-up urban areas where the Highway is illuminated and the speed limit does not exceed 50 km/h.

12. Uncovered benches will be permitted at bus stops provided they are of a size that can be covered by a standard modular shelter and are bolted to a concrete base. Benches must be installed parallel to the center line of the roadway.

8.38 INSTALLATIONS MADE BY CONSTRUCTION
**

On completion, the Construction Project Supervisor prepares an application for signature by the person concerned. The permit is then issued by the District Highways Manager in the normal way. Thereafter, the permit holder will be responsible for any maintenance not due to faulty design or construction (cattle passes, flumes, etc.).

8.39 PERMITS DEPENDENT UPON APPROVAL FROM OTHER AGENCIES

Cattle Guards - The District Highways Manager consults local livestock associations before issuing cattle guard permits, as they affect the control of stock on Crown range and stock movement over public roads.

Power and Telephone - The permit form used for all companies is H.21A.

8.40 PERMIT CONDITIONS
**

Clearances shall be in accordance with Revised CSA Standard, Overhead Systems and Underground Systems, forming part of Canadian Electrical Code, Part III with the exception that the minimum clearance regardless of voltage will be 4.9 metres. The applicable paragraph and table are as follows:

4.3 VERTICAL DESIGN CLEARANCES AND SEPARATIONS

4.3.1 VERTICAL DESIGN CLEARANCE OF WIRES AND CONDUCTORS ABOVE GROUND OR RAILS

4.3.1.1 BASIC CLEARANCES - The minimum vertical clearances of wires and conductors above ground or rails shall be as specified in Tables 2 and 3 and apply under the following conditions:

** Amendment

(a) The wires or conductors are at their maximum sag condition. (Since the initial or final unloaded sag of the wire is less than the maximum sag, clearances under unloaded conditions shall be appropriately greater than the minimum specified in this Code in order to ensure compliance with these requirements):

(b) In provinces and territories where the vehicle or load height for roads and highways is normally limited to 4.1 metres.

8.41 RELOCATION OF UTILITIES ON HIGHWAY RIGHTS-OF-WAY

1. General

Normally, the cost of relocating utilities is borne entirely by the utility owner. However, in some cases, because of highway widening and improvement, the Ministry pays some compensation when initiating the request for relocation. (See 8.42 for compensation policy).

Ministry officials should foresee where a highway widening or improvement is likely to occur at an early date and a problem could arise because of a utility installation on the right-of-way. Every effort should be made to require the owner to install the utility at the extremity of the right-of-way or at such location or at such grade that a costly relocation is avoided.

When District Officials receive an application for the installation of a utility on our right-of-way and in their judgment because of its proposed location, it could be affected at an early date by a highway improvement requiring a costly relocation, they should refer the application, via Region, to the Senior Approving Officer for review by the Highway Board before issuing a permit.

Only applications covering utility installations which are likely to be affected by a highway widening or improvement within a ten year period should be referred for review.

2. Pole Relocations - B.C. Hydro

Communications between Ministry and local Hydro officials must be maintained at a high level. Also, the following must be carried out to ensure continuing communication:

1. Designers are to contact the Hydro Regional Engineer at an appropriate stage early in the design process to discuss the impact and consequences of the design on Hydro's pole lines, to arrive at a mutual solution of least public cost consistent with safety and other social factors, and to explore construction scheduling.

2. The Executive Director of Engineering is to provide Hydro with a list of active major projects, on a confidential basis, so that Hydro can be aware of likely major work in the succeeding seasons.

3. District Highway Managers are to alert local Hydro officials, on a confidential basis, of likely local day labor and improvement work in succeeding seasons.

4. As much advance notice as possible is to be given to Hydro of actual moves.

8.42 COMPENSATION FOR POLE LINE MOVES

The Ministry has agreed with B.C. Telephone and B.C. Hydro to contribute on a flat rate basis to the cost of pole line moves on highway right of way where:

1. The move is made at the request of the Ministry.

2. The move is made on the schedule requested by the Ministry.

The Ministry contribution regardless of line details is:

Power: $400 per pole

Telephone: $400 per pole plus $350 per 100 sheath metres

100 sheath metres is an enclosed telephone cable 100 metres long regardless of the number of pairs in the cable. Where there is more than one cable, they will be paid for separately. Where telephone circuits are open wire, any number of open wires is considered the equivalent of one cable.

When requesting pole line moves, allow as much time as is reasonably possible. The utility companies will do their best to meet the Ministry schedule but they do have problems with availability of materials and crews on short notice. In no case should the Ministry request a move in less than 90 days (or whatever minimum the permit says) - it is preferable to allow at least 6 months.

This policy shall apply to all power and telephone utilities throughout the province.

8.43 UTILITIES ERECTED DURING CONSTRUCTION

Permit applications during construction must be referred to the Regional Manager, Construction for his comments.

HIGH PRESSURE PIPELINE PERMITS

8.44 COMPANIES REGULATED BY THE BRITISH COLUMBIA PIPELINE ACT
**

1. A pipeline to be installed on or across a public road right-of-way.

1. The pipeline company makes written application (Form H20A or H20) to the appropriate Regional Director, Highways for the crossing with the plans, profiles and any other information that the Regional Director, Highways may require.

** Amendment

2. If in order, the Regional Director, Highways grants approval in principle by letter to the company stating that he is prepared to issue a permit for the crossing when notified of favourable intent by the Chief Inspecting Engineer.

3. The company makes written application (Form P.L. 101) for the pipeline in whole in accordance with the Pipeline Act and Regulations to the Chief Inspecting Engineer, Ministry of Transportation and Highways, Engineering and Inspection Branch, Suite 245, 4299 Canada Way, Burnaby, B.C. V5G 1H9.

   Upon approval, the Chief Inspecting Engineer will issue permission to the company to construct the pipeline and forward his intent to the Regional Director, Highways who will then issue a permit for the crossing.

2. A public road to be built across or along a pipeline right-of-way.

1. All Ministerial applications to the Chief Inspecting Engineer shall be submitted in triplicate to the appropriate Regional Director, Highways. The following plans must accompany the application:

1. Description - The legal description and boundaries of adjacent properties or physical feature that will provide sufficient geographic detail to locate the crossing on a map. The plan (maximum size 61 cm x 76 cm) shall contain:-

2. A Key Plan -

1. Scale of 1:12,500 or smaller.

2. Sufficient detail to clearly show the location described in paragraph 1.1.

3. Land divisions, subdivisions, roads, rivers, railroads, etc.

4. In surveyed territory, the distance from the crossing to the nearest lot or section line measured along the centerline of the pipe or the centerline of the highway.

3. A Location Plan

1. Scale of 1:1250

** Amendment

2. Showing the stationed centrelines of both the pipeline and the highway. (Tie the centreline intersection to an established point on a registered plan if applicable).

3. Show the centreline's angle of intersection.

4. The pipeline right-of-way.

5. The proposed or established highway right-of-way.

6. The specifications, working and mill test pressure of the carrier and casing pipes.

7. The maximum wheel load allowed by the relevant authority.

8. The location of any other right-of-way in the immediate area or utility pole line within the Ministry's right-of-way.

9. Any physical feature within close proximity to either right-of-way.

4. Profiles

1.1 Scale of 1:250 horizontal.

1.2 Scale of 1:125 vertical.

2. Detailed and dimensioned drawings of the longitudinal profile along the centreline of the pipeline.

3. Detailed and dimensioned drawings of the longitudinal profile along the centreline of the highway or road.

4. A cross section of the highway or road at the intersection of the crossing showing:-

1. The least distance from the top of the pipe to the highway surface (minimum 1.2 metres).

2. The least distance from the top of the pipe to the bottom of the ditch line (minimum 0.75 metres).

3. The width of the highway, travelled surface, shoulders, ditches and right-of-way.

4. The location, height, etc. of vent pipes if a casing if required.

** Amendment

NOTE: All highways and roads shall be located so as to cross a pipeline at an angle as close as practical to 90 degrees but not less than 45 degrees. Where it is impracticable to cross within the above angle limits, special approval and directions will be issued by the Chief Inspecting Engineer.

2. The Regional Director, Highways forwards the application for the road crossing in triplicate to the pipeline company for their agreement and signature.

3. The triplicate copies of the agreement, plan and profile, and letter of consent of the pipeline company are forwarded to the Chief Inspecting Engineer by the Regional Director, Highways.

4. If the crossing meets the requirements of the Pipeline Act and Regulations, one signed copy of the application will be sent to the company and one copy forwarded to the Regional Director, Highways granting permission to construct the crossing.

5. The pipeline company shall be given 48 hours written notice prior to the commencement of any construction for inspection purposes which shall be the responsibility of the Ministry.

8.45 COMPANIES REGULATED BY THE DOMINION GOVERNMENT PIPELINE ACT
**

1. A pipeline to be installed on or across a public road right-of-way

1. The pipeline company makes written application (Form H20A or H20) to the appropriate Regional Director, Highways for the crossing with plans, profiles and any other information that the Regional Director, Highways may require.

2. If in order, the Regional Director, Highways grants approval in principle by letter to the company stating that he is prepared to issue a permit for the crossing when an order has been approved by the National Energy Board.

3. The company makes formal application to the National Energy Board for a covering order. Upon receipt of the authoritative order, the pipeline company shall forward a copy of the order to the Regional Director, Highways who will then issue a permit.

4. The pipeline company shall give the Ministry 48 hours written notice prior to any construction for inspection purposes and shall be responsible for the expenses of such personnel (wages, expenses, etc.).

2. A public road to be built across or along a pipeline right-of-way.

Procedure is the same as companies regulated by the British Columbia Pipeline Act except the Regional Director, Highways

** Amendment

**

forwards copies of the pipeline company's agreement, letter of consent, etc., to the National Energy Board who will issue a Board Order to the Ministry (Refer to Section 8.44.2, 1-5).

RAILWAY CROSSINGS

8.46 GENERAL

Crossings of railways operating under Dominion Charter are covered by an order of the Canadian Transport Commission. Crossings of railways operating under the "Railway Act" of British Columbia are covered by Order-in-Council. (Refer also to Section 18.08).

8.47 APPLICATIONS FOR AUTHORITY

All applications are made from Headquarters.

8.48 PREPARATION OF PLANS

Plans are prepared by District, Region or Headquarters on tracing paper to meet General Orders which are issued from time to time, and to meet Headquarters instructions.

Specimen plans and instructions are compiled by the Canadian Transport Commission and are included in the appendices to this chapter.

When approved, the plan is signed by the Executive Director, Engineering Division and given a Headquarters number.

8.49 GRADE SEPARATIONS

The Bridge Design Engineer prepares plans of structures for overpasses or underpasses designed from surveyed site plans drawn at 1:250 and 0.5 metre contour interval. (See Chapter 10.)

8.50 DRAWINGS FOR PROPOSED GRADE CROSSINGS
**

1. Plan, profiles and typical sections shall be drawn on one standard size sheet.

2. Title must include the name of the highway, railway, railway subdivision (or branch line), and railway subdivision mileage at the centreline of the crossing.

3. Plan must show at least 400 metres of railway and 100 metres of highway each side of the proposed intersection at a scale of not less than 1:2 000.

   Information required on the plan is:

   1. The width of the railway right-of-way.

   2. The width of the road allowance or right-of-way.

** Amendment

** 3. The width of the travelled portion of the highway.

4. The width of the shoulders.

5. The angle of the crossing.

6. The locations of road signs pertaining to the crossing and automatic protection, if any, and highway crossing signs.

7. Sight lines and all obstructions to view within the distance referred to in 8.50.3.

8. Drainage utilities, and other relevant information should be shown.

9. All pole lines must be shown and identified (i.e. telegraph, telephone, hydro, etc.), and the number of wires of each indicated on the plan. Where lines cross the highway, clearance to wires must also be shown. A minimum clearance of 6 metres is required for telegraph lines.

4. The railway profile must be drawn 400 metres each side of the crossing intersection at scales of: 1:5 000 (horizontal)
1:250 (vertical)

Information required on the profile is:

1. Percent of gradients.

2. Elevation of <u>top</u> of rail.

3. Elevation of the original ground at centreline of the track.

** 5. The highway profile must be drawn 100 metres each side of the crossing intersection at scales of not less than 1:2 000 horizontal
1:200 vertical

Information required on the profile is:

1. Percent of gradients and vertical curve detail.

2. Original ground line at centreline of highway.

** 6. The typical highway cross-section should be drawn at scales of not less than: 1:200 horizontal
1:200 vertical

Information required on the cross-section is:

1. Travelled road surface or pavement.

** Amendment

2. The width and location of the travelled road surface or pavement and the width of the shoulders and their location within the limits of the road allowance or right-of-way.

8.51 REQUIREMENTS FOR GRADE CROSSINGS

Normally the highway approach grade should not exceed 5% and a level section on each side of the crossing should be provided. A minimum of 7.5 metres is usually acceptable on minor roads, although a greater distance is desirable for main roads and where economically feasible.

8.52 ADDITIONAL INFORMATION REQUIRED

1. Is the crossing new or a reconstruction of an existing public or private crossing?

2. Is the Highway senior or junior to the railway?

3. Give the age of public crossing. (Crossings with more than 3 years public status may be eligible for assistance from the grade crossing fund if under the Canadian Transport Commission.)

4. Give the volume of highway traffic and maximum permitted speeds of same, other crossings nearby, reasons why sight distance are adequate, other parties involved, such as municipalities, and other pertinent data.

5. Reference should be made to the Board of Transport Commissioners for Canada General Order Nos. E-4 and E-5 for full detail.

6. Please refer to the following appropriate appendix for data required covering site plans at railway grade crossings.

    1. Sample Drawings for Grade Crossings:

        Appendix "A" - Construction

        Appendix "B" - Reconstruction (Railway Crossing Fund Involvement)

        Appendix "C" - Diversion Road Construction

        Appendix "D" - Pedestrian Walkway Crossing.

    2. See Chapter 10 for Grade Separation Sample Drawings.

8.53 SIGHT OBSTRUCTIONS

The Railway Act (Federal) empowers the Canadian Transport Commission to clear or disallow any obstruction on the railway or highway rights-of-way or on adjacent public or private lands, providing there is adequate compensation.

8.54 FEDERAL COST SHARING

Funds are provided by the Government of Canada to aid in the construction work for the protection, safety and convenience of the public in respect of crossings. Funds may be available for level crossings which can be eliminated or at least 90% of the traffic removed by constructing grade separations or road diversions, for improvement of existing grade separations and the installation of automatic protection.

Special grants may also be available for new grade separations on new routes, even if an existing level crossing is not eliminated.

Applications for grants are made by Headquarters, but the request should be submitted to the C.T.C. Liaison Engineer, Bridge Engineering Branch well before any work is started. If work is started before the application is approved, it will seriously jeopardize or eliminate the chances of a grant.

Only those public crossings which have been in existence for at least 3 years are eligible for assistance from the fund.

8.55 PREPARATION OF CLAIMS (ACCOUNTS) FROM THE GRADE CROSSING FUND

General Order No. 845 and amending Order No. 868 presently cover the preparation of accounts by the Road Authority, and subsequent orders may be issued from time to time by the Canadian Transport Commission. When the work has been completed, a statement should be sent to the Director of Financial Services who will submit the claim to the Canadian Transport Commission.

8.56 CROSSING TO NEW SUBDIVISIONS

Orders or Certificates are required for public road crossings before a subdivision plan may be registered. Applications are submitted by the Ministry to the proper authority in the usual manner after the subdivider prepares the plan, at his own expense, to the Ministry standard, and undertakes to pay for the installation of the crossing by agreement with the District office. The Ministry undertakes maintenance of crossings in registered subdivisions and, in the application to the Canadian Transport Commission or the Ministry Manager of Rail Policy, assumes responsibility for both construction and maintenance.

8.57 AUTOMATIC PROTECTION AT GRADE CROSSINGS

Requests for automatic protection should be made to the C. T. C. Liaison Engineer who will make the application to the Canadian Transport Commission. The railway companies design the protection, prepare the estimates and send out the accounts for payment.

The Director of Highway Planning and Traffic Engineering has funds for the Ministry's share of installation of signals. The Ministry's share of maintenance and operation of signals is paid by the Director of Financial Services.

8.58 MAINTENANCE OF GRADE CROSSINGS

When a grader passes over a level railway crossing, the graderman is to stop his machine and go back to the crossing to make sure that no dirt or stones have been deposited in the flange-way between the rails and the planking.

It is obvious that any such deposit may cause derailment of trains and, possibly, a serious accident.

8.59 GRADE SEPARATION PROJECTS

These are handled by the Director of Bridge Engineering on lines similar to those outlined above.

Before applying to the Canadian Transport Commission, general approval is sought before preparing detailed plans of any overhead structure or subway. The preliminary plan should contain all necessary information and sufficient data must be obtained for a reasonable estimate of the total cost.

8.60 INDUSTRIAL RAILWAY SPUR HIGHWAY CROSSINGS

If a railway spur is owned by an industry, a crossing of the rail line by a highway, or vice versa, is authorised by permit issued by the industry or by the Ministry to the other, although the arrangements may be started through the Canadian Transport Commission or the Ministry Manager of Rail Policy.

8.61 PRIVATE CROSSINGS

1. For Railways under the jurisdiction of the Canadian Transport Commission (Federal).

   Private crossings are obtained by a property owner applying to a railway. The Canadian Transport Commission does not enter into the arrangements directly, but sometimes makes suggestions. The railway generally carries out the installation and maintenance work, and bills the private owner for the full cost.

   The Ministry of Transportation and Highways, a municipality, or other Government Ministry may make recommendations on private crossings.

   Private crossings are covered by the Railway Act.

2. For Railways under the jurisdiction of the Ministry Manager, Rail Policy, Transportation Policy Analysis Branch.

For Railways under the jurisdiction of the Ministry Manager, Rail Policy, obtain approval, in addition to an agreement with the railway concerned. The owner pays all cost of construction and maintenance.

8.62 LOGGING AND INDUSTRIAL CROSSINGS
**

1. The company shall submit plans, profiles and other specifications that may be required to the appropriate District Highways Office.

2. The District Highways Manager reviews and forwards his comments and application to the appropriate Regional Director, Highways.

3. The Regional Director, Highways prepares and signs the necessary certificate for the company. The file is retained at the office of the Regional Director, Highways.

4. No permit shall be issued for a period longer than five years.

8.63 DRIVE-IN THEATRES

1. The Fire Commissioner approves plans for Drive-in Theatres only after they have been signed by the Regional Director, Highways or Approving Officer.

   Pertinent Fire Commissioner's Regulations are as follows:

   Section 30

   (1) In all drive-in theatres, the plans must show all highways and roads adjacent to the proposed drive-in theatre and the location and size of the off-highway parking area.

   (2) The screen tower, in all drive-in theatres, shall be so placed that as far as possible no projection on the screen shall be visible from any highway. The entrance to the drive-in theatre proper shall not lead directly off any main highway. The distance of the tower, fence, or other construction, shall be at least 92 metres from the boundary of any main highway, unless special permission is obtained from the Ministry or Municipal Engineer, as the case may be, to reduce that distance.

   (3) Sufficient off-highway parking area shall be provided outside the limits of any highway right-of-way for patrons in vehicles waiting to enter the drive-in theatre so that the adjacent highways may be kept clear. Such area shall provide at least 25% of the total vehicle capacity of the drive-in theatre. The Ministry or Municipal Engineer may, however, require the off-highway parking area to provide up to 50% of the vehicle capacity of the drive-in theatre.

** Amendment

(4) Exits from drive-in theatres shall be provided on the basis of 4 metres of exit space for each 100 vehicles with a minimum width of driveway of 7.6 m. The main entrance shall not be less than 15 m in width. Main driveways shall not be less than 7.3 m in width. All exits shall be indicated by illuminated red signs. The letters of such signs shall not be less than 60 cm in height and the principal strokes of such letters shall not be less than 8 cm in width. Drive-in theatres shall be sufficiently illuminated while open to the public to ensure safe entrance and exit passage. All ramps shall be sloped in such a manner as to permit the vehicle to proceed over such ramp to an exit.

5. No person shall construct or alter a screen tower unless the plans and specifications for the construction or alteration are:

(1) approved by a professional engineer registered under the Engineering Profession Act; and

(2) submitted in duplicate to, and approved by the Fire Commissioner.

2. The Fire Commissioner Act requires that the entrance must not be taken from a main road. It specifies that a 15 metre entrance must be provided, but the Fire Commissioner has confirmed that this width is required at the ticket plaza so two cars may enter abreast. The entrance at the highway itself is limited to a 9 metre width.

3. If the Fire Commissioner's requirement for an exit exceeds 9 metres (i.e., 4 metres for every 100 cars), two exits should be required, well separated. Traffic from exits close together interferes and the discharge is not greater than from a single opening.

4. Ministry of Transportation and Highways permits are required for entrances and exits.

5. In unorganized territory the applicant submits 5 prints of his proposed plan to the District Highways Manager, who forwards 4 prints to the Regional Director, Highways together with a report commenting on the satisfaction of the Fire Commissioner Regulations and all other pertinent points. The Regional Director, Highways (who may delegate to another memeber of his staff) reviews and, if agreeable, signs on the prints:

"Approved as to distance of structures from the main road, as to location of the screen tower, as to vehicle storage provided, as to ingress and egress.

Signature
Title "

6. The Regional Director, Highways forwards one approved print to the Fire Marshal together with a copy of driveway permits to the following address:

   Fire Commissioner
   2780 East Broadway,
   Vancouver, B.C. V5M 1Y8

   The Regional Director, Highways also forwards two copies of the approved print to the District Highways Manager who sends one print to the applicant together with any driveway permits.

7. In municipal territory the Minister has no jurisdiction except the normal controlled access or ordinary driveway function.

8.64 TIMBER REMOVAL

Cutting timber on highway right-of-way or on Crown Land under Control of the Minister

Timber on established Highways is the property of the Ministry. However, if the timber is not required for Highway purposes, the Ministry noramlly requests the involvement of the Ministry of Forests to dispose of the timber to ensure utilization where possible. The following procedures apply to the disposal of timber:

1. If lead time is available the Regional Director, Highways will advise the Regional Forests Manager of the Ministry's intention to dispose of timber on Highway right-of-way, supplying pertinent plans and details. The Regional Forests Manager will then arrange for cutting permits or timber sale licences as necessary.

2. If Ministry crews or contractors employed by the Ministry have felled merchantable timber, the Regional Forests Manager should be contacted to arrange for disposal through advertised sale.

3. Where the Ministry has called a contract for right-of-way clearing, the contract will specify the requirements for provision of licences and permits and the procedures for sale of timber. The Contractor may remove the timber subject to obtaining a cutting licence from the District Forests Manager. Alternately, the contractor may fall and deck timber for subsequent disposal by the Ministry of Forests.

8.65 CUTTING OR LIFTING TREES

The application is made in triplicate on form H.20 to the district Highways Manager with a $500.00 certified bond cheque payable to the Minister of Finance. (The application must show clearly the name and number of the road and the exact location of the work.)

The District Highways Manager sends copies 1 and 2 of the application, with the cheque and his recommendation (on Form H.20C), to the Regional Highway Engineer. The Regional Director, Highways may issue a permit (Form H.21) endorsed with the applicable following conditions:

1. The Ministry of Transportation and Highways assumes no responsibility for determining the right-of-way boundaries.

2. The Permit holder assumes all responsibility for trespass or damage to private property.

3. The Permit holder must:

    1. Cut Christmas trees at ground level.

    2. Backfill holes after removing seedlings.

    3. Remove all debris from the right-of-way.

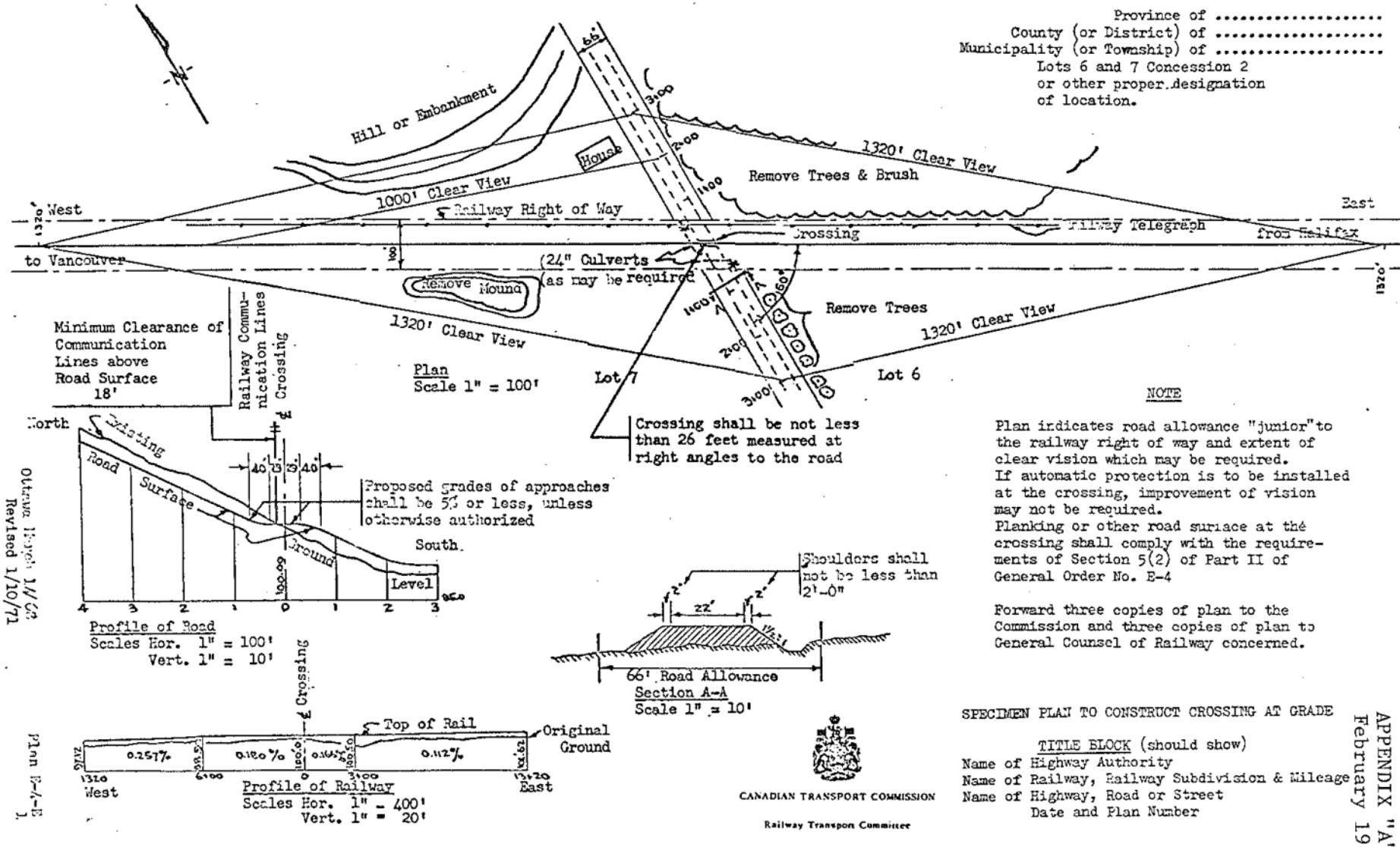
    4. Contract the B.C. Ministry of Forests to arrange for payment of royalties for Christmas trees.

    5. Park equipment more than 1.2 metres from the edge of pavement, or clear of the travelled portion of gravelled roads.

4. The District Highways Manager will stop the work if conditions '2' and '3' are not adhered to.

5. The $500.00 bond is returned if and when all conditions are satisfied.

6. Permission to cut individual trees may be given in writing by the District Highways Manager where, in his opinion, no inconvenience will be caused.



NOTE

Plan indicates road allowance "junior" to the railway right of way and extent of clear vision which may be required.
If automatic protection is to be installed at the crossing, improvement of vision may not be required.
Planking or other road surface at the crossing shall comply with the requirements of Section 5(2) of Part II of General Order No. E-4

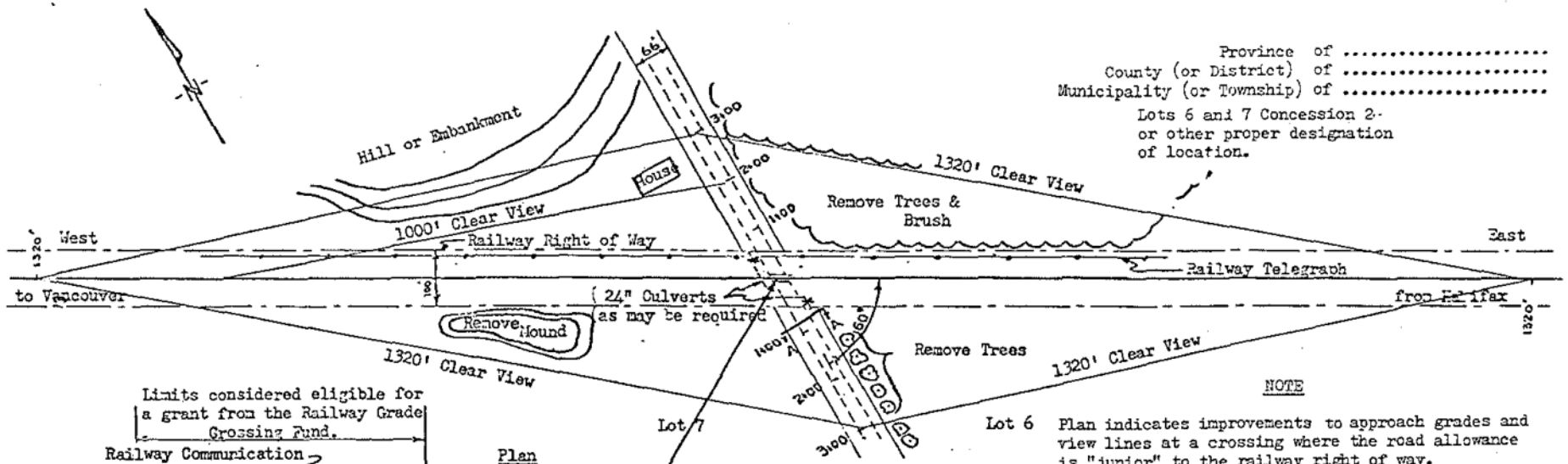
Forward three copies of plan to the Commission and three copies of plan to General Counsel of Railway concerned.

SPECIMEN PLAN TO CONSTRUCT CROSSING AT GRADE

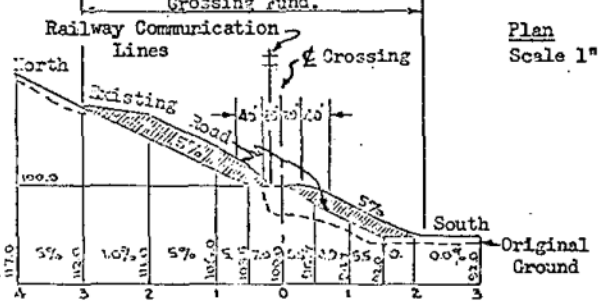
TITLE BLOCK (should show)
Name of Highway Authority
Name of Railway, Railway Subdivision & Mileage
Name of Highway, Road or Street
Date and Plan Number

Ottawa Form 1/1/68
Revised 1/10/71

Plan E-4-E 1.



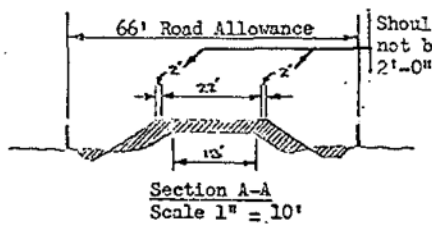
Limits considered eligible for a grant from the Railway Grade Crossing Fund.



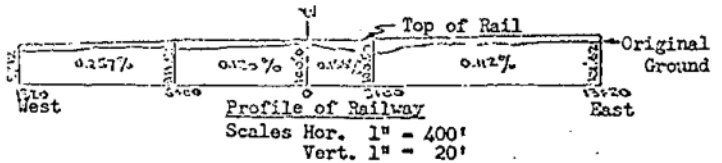
Profile of Road
Scales Hor. 1" = 100'
Vert. 1" = 10'

Plan
Scale 1" = 100'

Crossing shall be not less than 26 feet measured at right angles to the road



Section A-A
Scale 1" = 10'



Profile of Railway
Scales Hor. 1" = 400'
Vert. 1" = 20'

NOTE

Plan indicates improvements to approach grades and view lines at a crossing where the road allowance is "junior" to the railway right of way.
If automatic protection is to be installed at the crossing improvement of vision may not be required.
Planking or other road surface at the crossing shall comply with the requirements of Section 5(2) of Part II of General Order No. E-4

Minimum Clearance of Communication Lines above Road Surface 18'

Forward three copies of plan and estimate to the Commission and three copies of plan and estimate to General Counsel of Railway concerned.

CANADIAN TRANSPORT COMMISSION

Railway Transport Committee

SPECIMEN PLAN TO RECONSTRUCT CROSSING AT GRADE

TITLE BLOCK (should show)

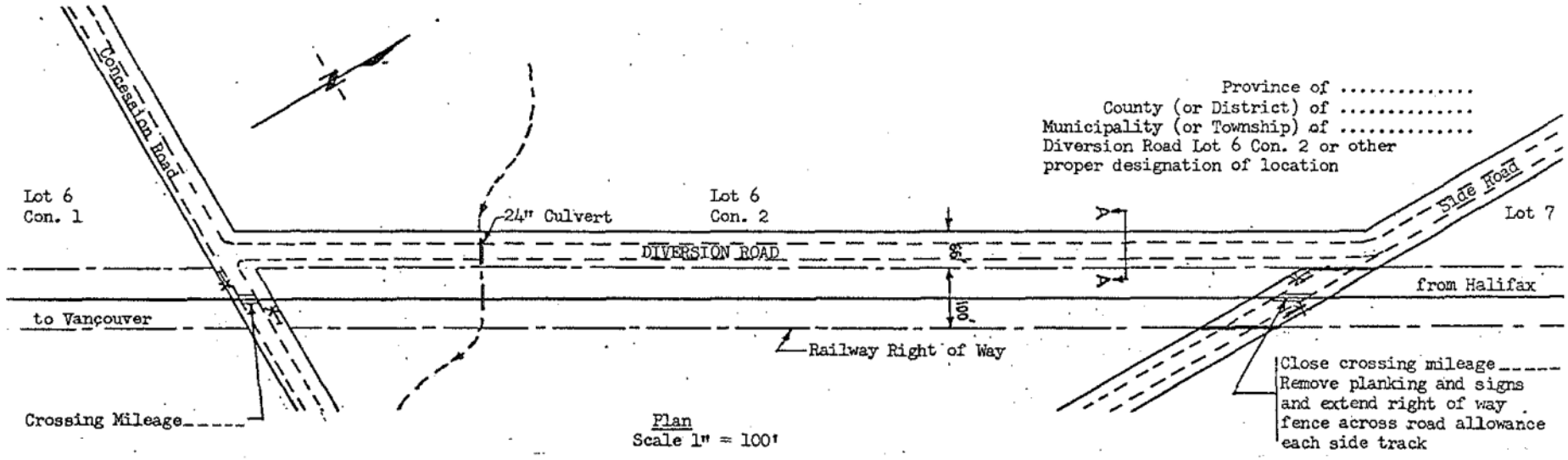
Name of Road Authority
Name of Railway, Railway Subdivision & Mileage
Name of Highway, Road or Street
Date and Plan Number

Revised 1/10/71
Ottawa March 14/63

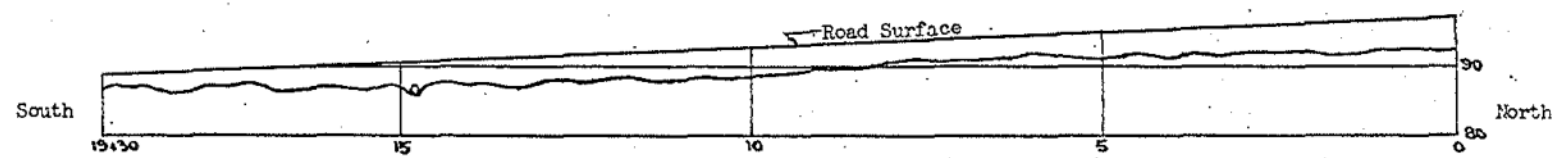
Plan E-4-1E

2

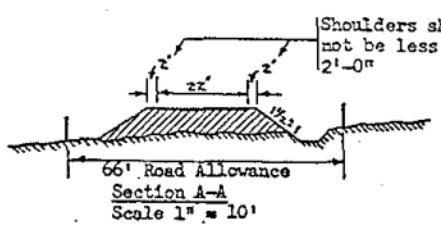
Chapter 8
APPENDIX "B"
February 1984



Plan
Scale 1" = 100'



Profile of Diversion Road
Scales Hor. 1" = 100'
Vert. 1" = 10'



Section A-A
Scale 1" = 10'

CANADIAN TRANSPORT COMMISSION

Railway Transport Committee

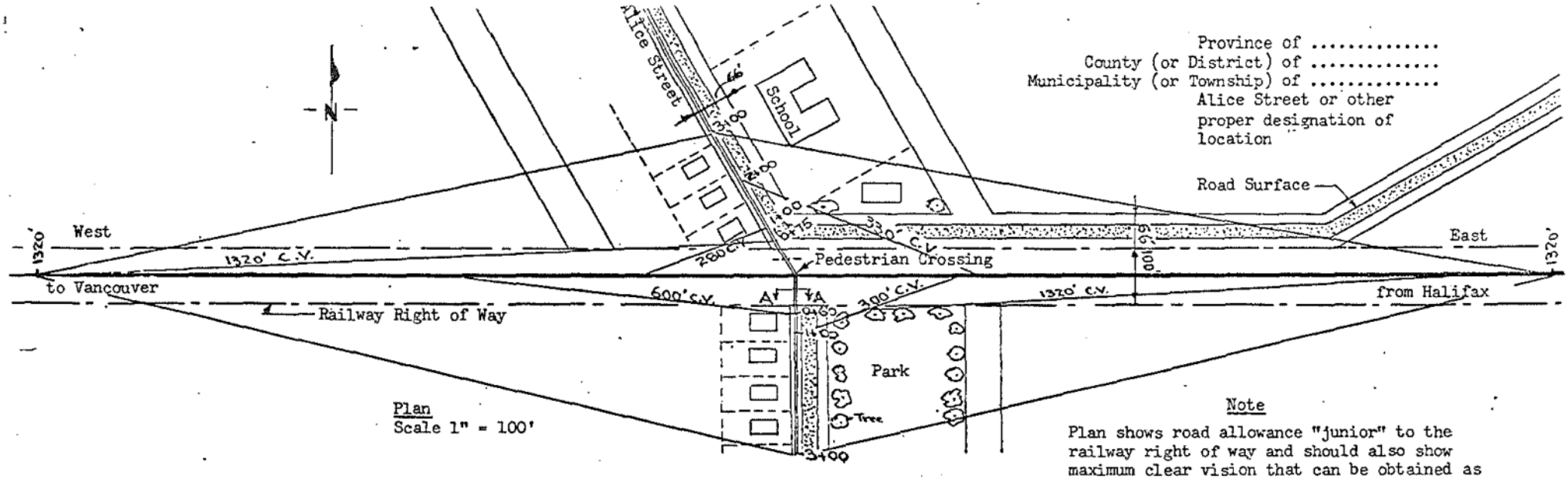
SPECIMEN PLAN TO CONSTRUCT A DIVERSION ROAD

TITLE BLOCK (should show)

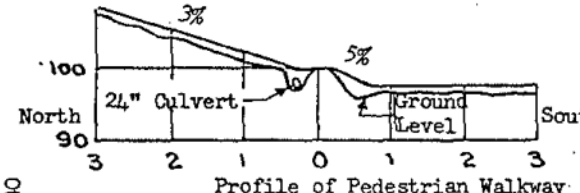
Name of Highway Authority
Name of Railway, Railway Subdivision &
Mileage of crossing to be closed
Name of Highway, Road or Street to be diverted.
Date and Plan Number

Ottawa Dec 1/70 Plan DR-E 2C

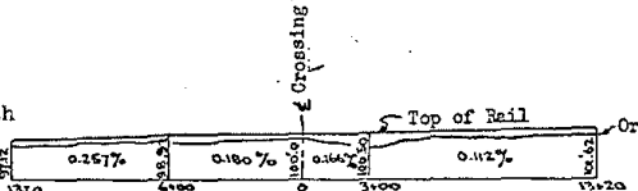
Chapter 8
APPENDIX "C"
February 1984



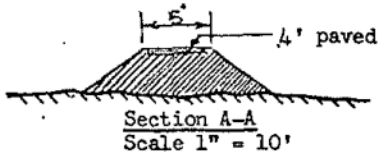
Plan
Scale 1" = 100'



Profile of Pedestrian Walkway
Scales Hor. 1" = 100'
Vert. 1" = 10'



Profile of Railway
Scales Hor. 1" = 400'
Vart. 1" = 20'



Section A-A
Scale 1" = 10'

Note

Plan shows road allowance "junior" to the railway right of way and should also show maximum clear vision that can be obtained as well as any brush and trees etc. that will be removed to improve vision at crossing. Walkway should be narrow to prevent use by automobiles. Posts and fencing can be used to prevent such use and where used, shown on the plan. If stairways or bridges are used on approaches to a crossing, plan should show details. Forward three copies of plan to the Commission and to the General Counsel of Railway concerned.

SPECIMEN PLAN TO CONSTRUCT PEDESTRIAN WALKWAY AT GRADE

TITLE BLOCK (should show)

Name of Highway Authority
Name of Railway, Railway Subdivision & Mileage
Name of Road or Street
Date and Plan Number

CANADIAN TRANSPORT COMMISSION
Railway Transport Committee

Ottawa Dec. 9/70 Plan PC-E-20

Chapter 8
APPENDIX "D"
February 1984

CHAPTER 9

REGULATIONS OF TRAFFIC

9.01 GENERAL

In British Columbia, highway traffic is regulated under three separate Acts, the "Highway Act", the "Motor Vehicle Act" and the "Commercial Transport Act". All officials should familiarize themselves with the pertinent sections of these Acts.

9.02 "HIGHWAY ACT" (Administered by the Minister of Transportation & Highways) **

Deals With:

Part 1 Establishment and Control of Highways
Part 2 Protection of Highways
Part 3 Classification and Improvement of Highways
Part 4 Protection of Bridges
Part 5 Trans-Canada Highways
Part 6 Controlled Access Highways

Salient sections requiring most frequent clarification are:

Highway Act, Section 4: This section states that where public funds are expended on a travelled road, it is a public road. The most contentious point generally is the width of right-of-way of such a road. On all such roads constructed prior to July 7, 1911, the width of right-of-way is 20.12 m (British Columbia Gazette, Page 10910, August 3, 1911). For subsequent roads the extent of the width is the area maintained and includes surface, side slopes, backslopes, ditches; but not any area on which clearing and grubbing only has been done beyond the slopes. (Attorney General's letter of November 13, 1964, file H164-1).

Highway Act, Section 19: This section empowers peace officers of the R.C.M.P. and Ministry of Transportation & Highways officials to have vehicles towed away that are so parked that they are interfering with the flow of traffic or maintenance equipment, and also provides for the cost to be borne by the vehicle owner. This section is used less than Section 189 of the Motor Vehicle Act, which empowers police only in a similar fashion. As a policy, the Ministry prefers to use the Motor Vehicle Act section, but where police are not available the Highway Act section should be used.

Highway Act, Section 26: This section empowers the Minister (who specifically delegates this power by letter) to regulate loads on highways and close highways where necessary. In practice, this section is used for imposing spring restrictions.

Highway Act - Regulations: Pursuant to Section 42 (1) - Division 4.01 requires a 4.5 m setback building line from highway property line in unorganized territory. Pursuant to Section 49 - This regulation lists traffic and cargo regulations for specific structures such as Nelson Bridge, Okanagan Lake Bridge, Agassiz-Rosedale Bridge, Pattullo Bridge, First Narrows Bridge, Second Narrows Bridge, Oak Street Bridge, Knight Street Bridge, Port Mann Bridge and George Massey Tunnel.

** Amendment

9.03 ** EXERCISE OF POWERS OF THE MINISTER OF TRANSPORTATION AND HIGHWAYS FOR PURPOSES OF SECTION 26 OF THE "HIGHWAY ACT"

Only those officials who have the written authority of the Minister of Transportation and Highways to exercise the Minister's powers, pursuant to the statute, can sign their names to regulations, notices or advertisements.

Officials who do not have this authority on file may make application for same for consideration of the Minister.

The powers granted by the Minister are to be exercised in a judicious and impartial manner.

Unless specific authority is given to the contrary, field officials of the Ministry will not enter into any agreements under Section 26 (4). All applications for such agreements are to be forwarded to the Deputy Minister.

The Deputy Minister is to be advised about all restrictions, regulations or prohibitions put into force under Section 26.

9.04 ** EXTRAORDINARY TRAFFIC (Section 26 of the "Highway Act")

By authority of the Minister of Transportation and Highways under Section 26 of the "Highway Act", District Officials are empowered to regulate, limit or prohibit the use of roads temporarily in cases where, owing to weather or other conditions, the ordinary use of the road would result in its damage or destruction.

They are also empowered to close roads to any or all traffic for construction, for the protection of persons using the highway, or to enable traffic to be handled safely and expeditiously.

9.05 ** ROAD CLOSURES

The Minister or the Deputy Minister must authorize any closures of numbered highways in the Province, for any purpose, where the period is to be longer than 30 minutes. Information must be routed through the Regional Highway Engineer or Headquarters Branch Head who will inform the Assistant Deputy Minister or Deputy Minister as quickly as possible.

The only exception will be closures due to natural hazards, i.e. - avalanche, flooding, slides, etc., which may necessitate a closure on very short notice. It is realized that to avoid endangering the motorist and Ministry personnel, closures of this type may have to be implemented whenever necessary without the prior authorization from Headquarters. Notification of such closures should be relayed to Victoria as soon as possible for the information of the Minister, the Ministry's Executive, the Senior Information Officer and other officials concerned.

Following are responsibilities for emergency road closures.

** Amendment

1. Final decision to close a highway due to unsafe conditions is the responsibility of the Ministry with the Regional Highway Engineer to make the decision or as he may have delegated to the District Highways Manager. The advice of the R.C.M.P. is to be considered if available.

2. R.C.M.P. should be notified immediately that a decision has been taken to close a highway. If the R.C.M.P. has requested a closure, but the decision is not to close the highway, the R.C.M.P. should be so informed.

3. Upon advice of a highway closure, the R.C.M.P. has the responsibility to provide assistance in establishing and enforcement of barricades. Once the closure has been established and there are no enforcement problems, the Ministry is to operate the barricades and provide traffic control.

4. If convoys are to be used to move traffic safely, Highways is responsible for providing convoy control vehicles and to organize convoys.

5. Undue hardship on the population should be avoided and light vehicles should usually be permitted to carry necessities and mails.

9.06 RECOMMENDATIONS AS TO LOAD AND SPEED RESTRICTIONS

The extent of restrictions must be left to the District Official's judgment, having regard to the circumstances. However, before any orders are made, proposals are to be discussed with the Regional Maintenance Operations Manager so there can be proper co-ordination between Districts, etc. Region will set up a Benkelman Beam programme and the results of these tests are used as a guide to assist local judgement in the imposition and relaxation of restrictions. Region will indicate certain limits for imposition of restrictions, but in the absence of a specific indication the general policy is 70% for paved roads and 50% for gravelled roads.

Weather conditions, nature of road bed and surface, and special circumstances must all be considered. Highways represent a very large public investment in order to provide convenient, economic, safe and fast movement of goods and people. Highways serve the public. Restrictions imposed must serve the public too, in the form of protecting the large public investment in highways and yet providing all possible essential services, and imposing as few as possible restrictions on movement of people and goods. Restrictions should be uniform throughout the Province and they should be imposed in a uniform manner. Therefore, procedure and regulations must follow as closely as possible those listed on the following examples. Particular attention is drawn to the necessity of properly signed regulations.

When imposing restrictions where sections of a highway only are involved, local names must be supported with route numbers or road names.

For example, instead of "#1A Whitehouse Junction to Fry's Corner", the notice should read "#1A Whitehouse Junction (#99A King George Highway) to Fry's Corner (#15 Pacific).

** (a) Advance Notices

In all cases an attempt should be made to give at least a week, and possibly two to four weeks, notice about new regulations, restrictions or closures. Example of advance notice follows:

Province of British Columbia
Ministry of Transportation and Highways

ADVANCE PUBLIC NOTICE

LOAD RESTRICTIONS

Pursuant to Section 26 of the "Highway Act", notice is hereby given that load restrictions may be placed, on short notice in the near future, on all highways in the following Highway Districts: Fort St. John, Dawson Creek, Quesnel, Prince George, Burns Lake, Smithers, Terrace and Prince Rupert. Restrictions will be imposed in each District individually, as conditions warrant, normally the most westerly and southerly areas to be restricted first.

The restrictions will limit vehicles to 70% or 50% of legal axle weights, as allowed under the regulations pursuant to the Commercial Transport Act.

All term overload permits are invalid for the duration of the restrictions.

The public, and trucking and transportation companies, should govern themselves accordingly.

Your co-operation in adhering to the above regulations will be appreciated.

Regional Highway Engineer

for: Minister of Transportation
And Highways

Date: .....

At: .....

** Amendment

** (b) Load Restriction Notices

The following are examples of Load Restriction Notices:

Example 1

Province of British Columbia
Ministry of Transportation and Highways

PUBLIC NOTICE

LOAD RESTRICTIONS

Effective 12:01 A.M. February 16, 1981, and until further notice, all Provincial roads in Cranbrook Highway District are limited to legal highway loading set by the "Regulations Pursuant to the Commercial Transport Act", or to further restrictions as they may be applied to each road.

All term overload permits are invalid for the duration of this restriction. Violators of the regulations and restrictions will be prosecuted.

Appropriate percentages of the tolerance provided in Subsection 7.06(2) of the Regulations pursuant to the Commercial Transport Act are applicable.

District Highways Manager

for: Minister of Transportation
And Highways

Date .....

At .....

** Amendment

** EXAMPLE 2

Province of British Columbia
Ministry of Transportation and Highways

PUBLIC NOTICE

LOAD RESTRICTIONS

Pursuant to Section 26 of the Highway Act and the Commercial Transport Act, the following load restrictions are hereby imposed on all Provincial highways and roads within the Salmon Arm Highway District effective 12:01 AM Tuesday, March 17, 1981, until further notice.

No person shall operate any vehicle over any Provincial highway, road or arterial highway having a weight in excess of 50% to legal axle weights;

EXCEPT on Route #1 Trans-Canada Highway from Monte Creek to Sicamous, #97B Salmom Arm-Vernon Highway from Larch Hill to the south District boundary, and #97 Kamloops-Vernon Highway from the junction with Trans-Canada Highway at Monte Creek to O'Keefe, on which the allowable weight shall be 70% of legal axle weights.

All term overload permits are invalid for the duration of the restrictions.

Violators of the regulations and restrictions will be prosecuted.

Appropriate percentages of the tolerance provided in Subsection 7.06(2) of the Regulations pursuant to the Commercial Transport Act are applicable.

District Highways Manager

for: Minister of Transportation
And Highways

Date.....

At .....

** Amendment

** (c) Notices Removing Load Restrictions

Load restrictions may be reduced or removed from any section of a highway, or a highway, or from all roads, depending on road conditions. Restrictions may be re-imposed if conditions warrant.

Two examples of notices removing load restrictions follow:

EXAMPLE 1

Province of British Columbia
Ministry of Transportation and Highways

PUBLIC NOTICE

LOAD RESTRICTIONS

Load restrictions on all roads within the Fort. St. John Highway District, imposed pursuant to Section 26 of the "Highway Act", are hereby rescinded effective 12:01 A.M. April 21st, 1981.

District Highways Manager

for: Minister of Transportation
And Highways

Date .....

At .....

** Amendment

** EXAMPLE 2

Province of British Columbia
Ministry of Transportation and Highways

PUBLIC NOTICE

REMOVAL OF LOAD RESTRICTIONS

Effective 12:01 A.M. Saturday, March 7, 1981, restrictions imposed pursuant to Section 26 of the "Highway Act" are rescinded until further notice.

All roads in the Penticton Highway District will be limited to legal highway loading set by the "Regulations Pursuant to the Commercial Transport Act", or to further restrictions as they may be applied to each road.

All term overload permits are invalid for the duration of this restriction.

Violators of the regulations or restrictions will be prosecuted. Appropriate percentages of the tolerance provided in Subsection 7.06(2) of the Regulations pursuant to the Commercial Transport Act are applicable.

District Highways Manager

for: Minister of Transportation
And Highways

Date.....

At.....

** Amendment

** (d) Notices to Close Highways

The public must be advised in advance about highway closures for purposes of repairs and maintenance, except in cases of emergency when advance notices are not possible.

Wording of an advance notice may be as follows:

Province of British Columbia
Ministry of Transportation and Highways

PUBLIC NOTICE

HIGHWAY CLOSURE

Pursuant to Section 26 of the "Highway Act", public notice is hereby given that the Trans-Canada Highway (commonly known as Upper Levels Highway) in the Municipality of West Vancouver, will be closed to through traffic at 11th Street, form 8:00 A.M. Monday, November 16, 1981, until further notice. The closure is expected to be in effect for approximately one week.

Trucks between Taylor Way and Horseshoe Bay will be detoured via Marine Drive. Cars will be detoured via Mathers Avenue and 15th Street.

District Highways Manager

for: Minister of Transportation
And Highways

Date.....

At.....

** Amendment

** Copies of all notices must be sent to the following:

1. Chief Records Clerk
   Ministry of Transportation and Highways
   940 Blanshard Street
   Victoria, B.C. V8W 3E6

2. Regional Highway Engineer
   - Burnaby
   - Kamloops
   - Nelson
   - Prince George
   - Terrace
   - Nanaimo

3. Information Officer, Transportation
   Ministry of Transportation and Highways
   2631 Douglas Street
   Victoria, B.C. V8T 4X7

4. Weigh Scale Branch
   Ministry of Transportation and Highways
   12336 King George Highway
   Surrey, B.C. V3V 3K1

5. Weigh Scale Branch
   Ministry of Transportation and Highways
   - Weigh Scale local address.

6. B.C. Motor Transport Association
   4090 Graveley Street,
   Burnaby, B.C. V5C 3T6

7. R.C.M.P. (Local Address)

8. Copy to Districts adjacent to one issuing notice.

(e) Advertising

In order that Public Notice reach the largest number of people, ensure that Public Notices are carried on all public media, i.e. radio, television, and in local and regional press. The number of times the message is repeated on each media is left to the judgement of the local official. Suggested minimum is as follows:

Radio:	6 flashes - in two days at News time.
Television	2 flashes - in two days at News time.
Press:	1 notice.

(f) Permits

1. General
   A major cause of bad public relations in spring restrictions is Ministry vehicles hauling while truckers are banned. If it is necessary for the Ministry to haul heavy loads in restrictions, the particular roads involved should not be restricted.

** Amendment

If there is good reason for a private trucker having to haul through restrictions he may be given a permit by letter and the wording should include full reference to the permitted route, times, licence number of vehicle, and the phrase "subject to the requirements of the Ministry of Transportation and Highways" so that permittees do not have an excuse to avoid the standard oversize permit, etc.

On gravel roads, such permits may specify hauling on frost at night, but on paved roads they should specify "noon to 6 P.M." as then the pavement is warmer and tolerates deflections better. There should be no permit when an alternate route or carrier is available or when there is no urgency.

** Routes involving more than one Region must be referred to the Director of Maintenance Services.

** 2. Exceptions to Seasonal Weight Restrictions

Once a District Highways Manager has imposed weight restrictions he should not undertake to make exceptions. Any requests for exceptions are to be referred to the Regional Supervisor, Weigh Scale Branch, who is responsible for evaluating the claimed emergency and issuing a permit.

The Weigh Scale Branch will not issue any exception permits without agreement of the District Highways Manager and will include any conditions which the District Highways Manager may require such as hours of travel.

Regions should undertake a monitoring program to review the uniformity of approach to exception permits throughout their region.

(g) Signing

Signs, listing restrictions imposed, must be posted at all entrances into restricted areas at the time restrictions go into force. On main highways, erect supplementary signs within a short distance of the start of the restricted areas.

Signs used must be standard Ministry of Transportation and Highways signs as shown in the latest Ministry "Manual of Standard Traffic Signs".

9.07 MOTOR VEHICLE ACT AND REGULATIONS

** 1. Motor Vehicle Act

Deals with:

Interpretations of phrases and words (Section 1).

Part 1 - Licences, Permits, Certificates, and Traffic Regulation of Motor Traffic.

Part 2 - Safety Responsibility.

Part 3 - Traffic Regulation.

Interpretation of phrases and words pertaining to Part 3 (Section 115).

"To whom does this part apply" (Sec. 116).
Exemptions of emergency vehicles (Sec. 118).
Police Traffic direction (Sec. 119).
The powers of the Council of a Municipality (Sec. 120).
Traffic tickets (Sec. 121).
Traffic control Devices and Signals (Sec. 130 to 142).
Movement of vehicles when work in progress (Sec. 143 to 148).
Driving without due care and attention (Sec. 149 and 150).
Speed restrictions (Sec. 151 to 153).
Driving on right side of roadway - Overtaking and Passing (Sec. 154 to 166).
Turning, starting and signals (Sec. 167 to 174).
Right-of-way (Sec. 175 to 179).
Pedestrians' rights and duties (Sec. 180 to 184).
Bicycles (Sec. 185).
Special Stops (Sec. 186 and 187).
Parking and leaving vehicles (Sec. 188 to 192).
Miscellaneous rules (Sec. 193 to 206).
Vehicles transporting explosives (Sec. 208).
Warning Devices - disabled vehicles (Sec. 209).
Safety equipment - powers of Minister of Transportation and Highways to regulate by public notice or placing of signs (Sec. 210).
Power of Lieutenant Governor in Council, on recommendation from the Minister of Transportation and Highways, to make regulations (Sec. 211).
Evidence of weight of vehicle or load (Sec. 212).
Erections, removal and maintenance of signs along the highways (Sec. 213).

2. Regulations Pursuant to the Motor Vehicle Act

These regulations mostly administered by the Police and the Ministry of Transportation and Highways, deal with lamps, brakes, school buses, licences, etc., including weight, length, width, loads, and highway schedules regarding length, width and load restrictions.

Section 19.07 prohibits certain classes of vehicles, pedestrians, etc., from the freeway system and permits are (very sparingly) issued by the Regional Highway Engineer.

9.08 WORKING RELATIONSHIP - R.C.M.P. AND MINISTRY **

1. General

The following policy has been established to ensure that good communications exist between the Ministry and the R.C.M.P. and that misunderstanding of responsibilities does not occur. The Ministry and the R.C.M.P. are anxious that there be good cooperation between the staffs of both agencies.

The District Highways Manager should be in close liaison with the R.C.M.P. detachment in his District, maintain current lists of personnel and positions and keep the Road Foremen informed of the proper procedure.

2. Local Contact

1. For matters relating to day to day operational needs the local R.C.M.P. detachment is to be requested to contact the Road Foreman (e.g., removal of rock slides, etc.).

2. For long-term operational, regulatory, or safety matters the R.C.M.P. are to be requested to deal with the District Highways Manager (e.g. suggestions for improved alignment, improved signing, etc.).

3. Highways Responsibility for Response

When a Road Foreman receives a request from the R.C.M.P. under 2.1 above, the Road Foreman is to deal with the matter as follows:

1. If the item is within his authority to act and he concurs with the need, the Road Foreman shall arrange the work with a priority as he sees fit and advise the District Highways Manager of the request, action planned and priority assigned.

2. If the Road Foreman does not concur with the request or feels action is beyond his authority, he shall refer the matter to the District Highways Manager and advise the R.C.M.P.

4. Traffic Control Point Duty

Where failure of traffic signals or other emergencies requires the assistance of the R.C.M.P. for point duty it is the responsibility of the R.C.M.P. to provide this assistance. Requests for this assistance should be monitored by the District Highways Manager to ensure that R.C.M.P. are not called unnecessarily. If Highways' request for assistance is met with response that no R.C.M.P. staff is available, the Highways official should ask to be referred to the R.C.M.P. shift supervisor. Where situations recur that the R.C.M.P. cannot respond due to manpower, the District Highways Manager should contact the Detachment Commander.

** Amendment

** 5. Signing for Crime Prevention Programs

1. General

The Royal Canadian Mounted Police is responsible for control of signing for approved crime prevention programs. Examples of crime prevention programs include Block Parents, Carnage Committees, Community Policing, Drinking Driving Counter-attack, Neighbourhood Watch, Range Patrol and Resource Patrol.

All applications for crime prevention signing should be referred to Inspector R.W. Rivers, Officer in Charge, "E" Division Traffic in Vancouver, or to the Royal Canadian Mounted Police Detachment with jurisdiction over traffic in the area of application.

Existing crime prevention signs in areas under the Ministry's jurisdiction will eventually have to be covered by police authority permits. Any signs which do not meet the policy requirements will have to be removed or relocated by the owners. To attain these ends, each Highways District will have to inventory both legal (under permit or with other permission) and illegal (erected without permission) crime prevention signs for the information of the Royal Canadian Mounted Police Detachments. The inventories, detailing quantities, types and locations, should not include crime prevention signs displayed in areas outside the Ministry's control.

2. Policy

1. Scope

Pursuant to Section 213(1)(a) and 213(5) of the Motor Vehicle Act, this policy applies to all arterial Highway rights-of-way (organized areas), to all Highway rights-of-way in unorganized areas and to private property in unorganized areas within 300.0 m of Highway right-of-way. The policy does not apply to private property within organized areas or to municipal street rights-of-way.

2. Definitions For the purpose of this policy:-

1. Citizen Group means a group of people who assist the Police Authority in organizing and carrying out a program.

2. Police Authority means the Officer i/c Traffic, "E" Division Headquarters, Royal Canadian Mounted Police or his/her delegates.

3. Program means a crime prevention program which is sanctioned by the Community Policing Division, Police Services Branch, Ministry of Attorney General.

** Amendment

4. Sign means a sign, displaying a crime prevention message, erected with the prior approval of the Police Authority at the boundary of an area covered by one or more programs.

3. Signs Within Municipalities

Signs will not be allowed on arterial Highway rights-of-way. Permission to erect signs on municipal street rights-of-way and/or on private property within a municipality must be obtained from municipal authorities.

4. Signs in Unorganized Areas

1. On Private Property By virtue of a blanket permit issued on behalf of the Minister of Transportation and Highways, the Police Authority and/or a citizen group may erect signs on private property; assuming the owner/occupier of the property has granted permission.

2. On Highway Right-of-Way In very unusual circumstances, a Regional Director, Highways, at the request of the Police Authority, may amend the permit issued under Subsection 1. above to allow for the placement of a sign on a non-arterial Highway right-of-way at a specific location and in a specified manner. Such an amendment shall not be granted for the placement of a sign on a freeway or expressway right-of-way.

5. Application for Signs

To ensure conformance with this policy, all applications for signs should originate with or be referred to the Police Authority.

6. Sign Specifications

1. Size The face area of any sign shall not exceed 2.97 m^2 (32 square feet). Where two or more programs are being carried on in the same area, joint signs not exceeding 2.97 m^2 shall be used.

2. Colour and Reflectivity Sign messages may be in any colour; painted or reflectorized. Sign backgrounds may not be painted or reflectorized green or reflectorized red or yellow.

3. Message Clarity and Design Messages may be symbolized or worded or both. Preferably, messages should be brief and clear enough for motorists to understand them when passing signs at the posted speed. Lettering shall generally be a minimum of 10.0 cm in height. Signs bearing complex messages,

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which cannot be simplified, shall only be erected where motorists can stop off the travelled roadway to read them. Signs must have a professionally made appearance and must be maintained in good condition.

7. Provisions and Installation of Signs

All signs shall be provided, installed and maintained by the Police Authority/and or a citizen's group.

8. Identification of Signs

Individual signs shall be identified by a unique serial number or number/letter combinations placed on the bottom right hand corner of sign faces. Characters shall be a minimum of 2.0 cm in height.

9.09 STANDARD TRAFFIC SIGNS

Signs are usually divided into these main groups:

1. Regulatory signs.
2. Warning signs.
3. Guide signs.

Their function is to regulate, warn, guide, direct, inform and protect.

Their aim is safe, efficient, convenient and fast transportation.

They are used on construction projects, during maintenance, to mark hazards, curves, and generally along highways wherever they are needed.

To be effective, signs must be:

1. Standard signs, properly designed.
2. Correct signs, located in the right places.
3. Well maintained. Old and damaged signs to be promptly replaced; dirty signs to be cleaned. Usually a sign, to be fully effective, should be cleaned at least once a year.

Barricades, flashing lights, and even flagmen, are an integral part of the "signs" used to regulate, warn, guide, direct, inform and protect.

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9.10 RESPONSIBLITY

The Ministry of Transportation and Highways is responsible for control, erection and maintenance of traffic signs on highways in unorganized territory, and on arterial highways within municipal boundaries.

Only standard traffic signs, or approved special-purpose signs are to be erected. Standard signs and the most commonly used special signs are listed in the latest "Manual of Standard Traffic Signs".

9.11 SUPPLY OF SIGNS

Sign Order Form H.309 must be used by Districts for ordering all traffic signs. Orders for various types of signs should be forwarded as shown below.

Orders for all signs listed in the Sign Manual, other than Directional and Distance signs (G-1, -2, -3, -3A, -4, -5, -6 -9), should be sent directly to the Ministry of Transportation and Highways Sign Shop, 2920 Jacklin Road, Victoria, B.C.

Orders for special (non-standard) signs not listed in the Sign Manual are to be forwarded to the Director of Traffic Engineering for approval.

All Directional and Distance sign orders are to be sent to the Regional Operations Maintenance Manager for checking before being forwarded to the Sign Shop. Re-orders for established signs must show the assigned Record Sheet Number, give a reason for replacement, and indicate whether a hardboard sign face or complete replacement sign is required.

Orders for new or revised Directional and Distance signs must be accompanied by completed H.172A or H.172B Sign Record Sheets giving full location details and the (revised) message required.

For further details on sign ordering, refer to the "Manual of Standard Traffic Signs".

9.12 POSTS AND MOUNTING OF SIGNS

As a rule wooden posts, preferably cedar, with 10cm x 10cm or 15cm x 15cm cross sections, shall be used to mount signs. Posts should be painted white up to the bottom edge of the sign. The backs of the signs and the portion of the post behind the sign shall be green. Metal posts can be used in special circumstances. The top of a post should not be allowed to show above the top of any sign.

Refer to the "Manual of Standard Traffic Signs" for further details on mounting and erection.

9.13 TRAFFIC SIGNALS (AND FLASHING BEACONS)

Responsibility for maintenance and operation of all existing traffic signals at intersections is set down in the written agreement made with the Municipality, where signals are located in a Municipality.

On new highways, where the new highway intersects a busy Municipal road, the Ministry will bear the full cost of installation. However, operation and maintenance costs will be shared with the Municipality.

The Ministry's share of installation costs for signals on arterials is a charge to the Signs and Signals vote. The Ministry's share of the power costs is paid by Headquarters. Maintenance costs for work done by the municipalities are also paid by Headquarters. Maintenance costs for work done by the Ministry are a charge to the District or Region vote. Invoices to municipalities for shared cost work done by the Ministry are issued by Headquarters from data supplied by the Districts.

Where the Ministry is not prepared to participate in the cost of installing a signal, the Ministry may issue a permit for the Municipality to install, operate, and maintain a signal at its own cost. Signal head arrangements are required to be standard and the Ministry reserves the right to regulate timing and hours of operation as it sees fit. Permits for signal installation are issued by the Director of Traffic Engineering.

At signals where the Ministry is responsible for maintenance, and Ministry electricians are not available to carry out the work, the District Official must engage a local electrician to maintain the electrical part of the installation.

Bulb replacement is carried out on a schedule in accordance with the rated life of the 100 Watt traffic signal lamps used and experience regarding occurrence of burnouts. Lenses and reflectors are carefully cleaned as necessary. Periodic painting of cabinets, signal heads, poles, etc., will also be required. Care should be taken to see that signal heads remain properly aimed for maximum visibility, and that 5 metres of vertical clearance is maintained under overlane heads.

The approval of the Director of Traffic Engineering must be obtained before any alterations are made in the timing of traffic signals except in emergency situations.

Modifications to existing signal installations must not be made without prior approval from the Director of Traffic Engineering. Repeated damage and/or failure of electrical systems should be brought to the attention of the Traffic Engineering Branch. It is often possible to correct problem situations by means of design modifications which may incorporate new techniques or utilize more up-to-date materials and equipment.

9.14 INSTALLATION COSTS

Requests for traffic signals must be forwarded to the Director of Traffic Engineering. If the Ministry agrees that installation of a new signal, or reconstruction of an existing signal, is necessary, then the municipality involved will be asked to agree, in writing, (except in (a) below) to share the costs of installation, operation and maintenance as follows:

(a) At the junction of two arterials, the Ministry pays all costs.

(b) At the junction of an arterial and a Municipal road, 50% shall be paid by the Ministry and 50% by the Municipality.

(c) At the junction of an arterial and a secondary highway, 75% shall be paid by the Ministry and 25% by the Municipality.

(d) At the junction of a secondary highway and a Municipal road, 25% shall be paid by the Ministry and 75% by the Municipality.

(e) At a "T" junction, where two legs are arterial and one municipal, 66-2/3% shall be paid by the Ministry and 33-1/3% by the Municipality.

(f) At complex intersections, the cost is pro-rated according to relative responsibility on the legs of the intersection.

9.15 ROADWAY ILLUMINATION - SHARING WITH MUNICIPALITIES

Applications for lighting installations are forwarded to the Director of Traffic Engineering through the Regional Highway Engineer. If the request originated outside the Ministry, the District Official's comments on the necessity for the requested illumination are forwarded with the application. If the Ministry is agreeable to the installation of new lighting or reconstruction of existing lighting, and funds are available, the Ministry will require the written agreement of the Municipality to participate in the cost. Costs are borne as follows:

(a) At the junction of two arterials, the Ministry pays all costs.

(b) At the junction of an arterial and a Municipal road, 50% shall be paid by the Ministry and 50% by the Municipality.

(c) At the junction of an arterial and a secondary highway, 75% shall be paid by the Ministry and 25% by the Municipality.

(d) At the junction of a secondary highway and a Municipal road, 25% shall be paid by the Ministry and 75% by the Municipality.

(e) At a "T" junction, where two legs are arterial and one municipal, 66-2/3% shall be paid by the Ministry and 33-1/3% by the Municipality.

(f) At complex intersections, the cost is pro-rated according to relative responsibilty on the legs of the intersection.

A Municipality shall be fully responsible for existing and new lighting between intersections. An example is the lighting by the Ministry to illuminate traffic islands and channelizations. Where this lighting extends beyond the intersection, the same cost responsibility shall apply as applies to the lighting at the intersection.

Responsibility for maintenance and operation of all existing lighting at intersections will remain unchanged.

On new highways where the new road intersects a busy Municipal road, the Ministry will bear the full cost of installation at the intersection. However, operation and maintenance costs must be shared by the Municipality.

On roads designed to freeway standards, the Ministry will bear the full cost of installation, operation and maintenance of lighting that the Ministry feels is necessary.

Applications for lighting aid by municipalities should, if possible, be made before September 30th of any year so that any necessary funds are included in annual estimates for the next fiscal year.

When an application is received from a Municipality for lighting aid, it should include:

(1) Description of location

(2) Number and type of luminaires to be installed.

(3) Detailed estimate of the total cost of installation.

(4) Estimate of the total cost of operation and maintenance.

(5) Statement as to whether is is completely new lighting, or whether it replaces or augments existing lighting.

In unorganized areas the Ministry may enter into cost-sharing arrangements with Improvement, Fire Protection, or Regional Districts on the same basis as Municipalities for lighting at intersections on main highways.

9.16 LIGHTING INSTALLATION

The Ministry usually installs lighting by contract at channelized intersections and at arterial intersections isolated from other street lighting.

At intersections in built-up areas, it is customary for the municipality to be responsible for the installation and maintenance of lighting. This lighting may be an ornamental standard or may be erected on utility poles by the power utility. The latter arrangement can be paid for as an initial cost plus an annual (or monthly) charge, or with no initial cost and a somewhat higher annual (or monthly) charge. The Ministry may also make arrangements of this kind with utility companies for installations of a luminaire or two at locations in unorganized territory.

Where the Ministry is responsible for maintenance of a lighting installation, and Ministry electricians are not available to carry out the work, the District Official must engage a local electrician to maintain the electrical functions of the installation.

Lamp replacement is done on a schedule in accordance with the rated life of the lamps used and figure of 4,000 hours of operation per year, or they may be replaced as burnouts occur, depending on which scheme is more economical.

Refractors and reflectors are carefully cleaned as required to maintain good light output. Periodic painting of poles and cabinets, etc., will also be required. Note should be taken to ensure that the photoelectric cell is turning the lights on and off at a suitable point between daylight and darkness.

Lamps and most luminaire replacement parts are available through the Director of Traffic Engineering.

Modifications to existing lighting installations must not be made without prior approval from the Director of Traffic Engineering. Repeated damage and/or failure of electrical systems should be brought to the attention of the Traffic Engineering Branch. It is often possible to correct problem situations by means of design modifications which may incorporate new techniques or utilize more up-to-date materials and equipment.

9.17 FIRE SIGNALS
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See Sections 6.03.14 and 8.17.

9.18 RAILWAY CROSSING SIGNALS

Requests for signals at railway crossings should be forwarded to the Director of Traffic Engineering through the Regional Highway Engineer. The Canadian Transport Commission in Ottawa authorizes signals for crossings on railways under Federal jurisdiction, such as the Canadian National, Canadian Pacific and Burlington Northern Railways. The Ministry of Energy, Transport and Communications authorizes signals for crossings on railways under Provincial jurisdiction, such as the B.C. Railway and the B.C. Hydro Railway.

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Applications should include the mileage, subdivision and name of the railway, the name of the road or highway involved and reasons why signals are considered necessary. Road traffic volumes should be at least 200 vehicles per day unless there are other problems such as sight distance, grades, angle of intersection, accident record, etc., which could modify this requirement. The Director of Traffic Engineering will arrange for applications to be submitted to the appropriate authority for consideration.

The Ministry's share of the cost of installation of signals is paid from the Signs and Signals Vote at Headquarters. The cost of power and operation is paid from a Headquarters maintenance vote.

9.19 SPEED LIMITS

Speed limits can be divided into three types:

1. Permanent speed limits.
2. Temporary speed limits.
3. School and Playground speed zones.

9.20 PERMANENT SPEED LIMITS

Permanent speed limits are established under Section 151 of the Motor Vehicle Act.

There are two types of permanent speed limits in British Columbia:

(a) B.C. Statutory speed limits - Statutory speed limits are covered by Section 151 of the Motor Vehicle Act. Sub-section (1) limits the speed of travel within municipal boundaries to 50 km/h and in unorganized areas to 80 km/h.

(b) Speed Limits established by Form H.223 - These speed limits are established under Section 151(2) of the Motor Vehicle Act and are covered by Form H.233 issued by the Director of Traffic Engineering.

9.21 PROCEDURE IN ESTABLISHING PERMANENT SPEED LIMITS

The Motor Vehicle Act establishes statutory speed limits in British Columibia and no additional coverage of statutory speed limits is required except signing as and where necessary.

Under Section 151(2), "The Minister of Transportation and Highways may, by causing a sign to be erected or placed on any portion of a highway limiting the rate of speed of motor vehicles .....". Under this sub-section a person authorized by the Minister may, by erecting a speed limit sign, increase or decrease the statutory limit.

However, in this way speed limits would be imposed locally according to judgement of an individual, resulting in lack of uniformity and lack of records, and local pressure groups could influence speed limits.

In order to establish and maintain uniformity throughout the Province, to reduce or eliminate local pressure group influences and to maintain speed limit records centrally, the speed limits are controlled by the Director of Traffic Engineering, with changes and additions subject to the approval of the Minister.

All applications for amendments to existing speed limits, or establishment of new speed limits, must be directed to the Director of Traffic Engineering through the Regional Highway Engineer. If he agrees with the proposal, he issues amendments or establishes new speed limits on Form H.223.

Two copies of the speed limit are sent to the Regional Highway Engineer who notes them and, if he has no objection to the changes, he forwards them to the District Official. The District Official on receipt of Form H.223, arranges for signs to be erected, notes the date on which the speed limit went into effect, signs Form H.223, places one copy of the form on his files, and forwards the other copy to the Director of Traffic Engineering for Headquarters files. Districts must maintain a special speed limit file for ready reference. The forms may, from time to time, be used in Courts or for reference purposes by the public and by District, Regional and Headquarters personnel.

When applying for amendments or establishment of new speed limits, obtain and forward the following information to the Director of Traffic Engineering, through the Regional Highway Engineer, whenever it is applicable:

1. Speed zone number - if existing speed zone is to be amended or cancelled. If a new zone is requested, mark "NEW". State the speed limit.

2. Location of speed zone, e.g. Winfield - Route #97.

3. Description of proposed terminal points. When describing terminal points, the following points should be remembered.

   (a) A well-described point should be easily located in the field. For this reason, legal descriptions, using lot and section number, are not desirable. Describe terminal points in general terms, referenced to well-known, fairly permanent landmarks.

   (b) State if it is an east, west, north or south terminal point. Use general direction of highway for the purpose, rather than local bearings, e.g. Trans-Canada Highway is an east-west highway, Route #97 is a north-south highway.

4. Give the length of the proposed zone to the nearest 0.1 km if the zone is 16 km or less in length. The following is a properly described speed limit:

WINFIELD - ROUTE #97

Speed zone #238.
Speed limit: 60 km/h

South terminal point: 90 m south of Beaver Lake Road.
North terminal point: 0.5 km north of Berry Road #13.
Length: 1.5 km.

5. Attach copies of any pertinent correspondence.

6. Discuss changes with the officer in charge of the local police detachment and obtain his opinion or recommendation, possibly in writing.

7. Attach your recommendations.

8. Forward to the Regional Highway Engineer, who in turn adds his comments or recommendations and forwards the information to the Director of Traffic Engineering.

9.22 TEMPORARY SPEED ZONES

The District Official can impose temporary speed limits without reference to the Director of Traffic Engineering, in emergency or during maintenance work. Speed limits on construction must be approved by the ~~Regional Highway Engineer.~~ DHM

Temporary speed zones should be in effect for as short a time as possible and should be in effect only when they are needed. On construction projects they may be imposed for longer periods whenever safety dictates that a lower limit is required.

Project Supervisors are not to impose speed limits without first obtaining authority to do so from the Regional Highway Engineer within whose jurisdiction the project is located.

Temporary speed limits imposed must be reasonable. It is of little use to impose a 30 km/h speed limit where 90% of traffic will travel at 60 km/h. Temporary 50 km/h or lower speed limits should be imposed only on very short sections where they are essential from a safety and construction point of view.

Avoid long low-speed zones whenever possible. Maintain a low temporary speed limit in effect only as long as it necessary. For example, on construction, due to movement of heavy equipment, it may be necessary to impose a 30 km/h speed limit from a safety point of view. The work on the project continues daily from 8 A.M. to 6 P.M., no work is done on Sunday, and when work is stopped the highway becomes basically the same as the remainder of the highway. Therefore, maintain the 30 km/h speed limit in effect only between 8 A.M. and 6 P.M. on weekdays. During the remainder of the time normal highway speed prevails and 30 km/h signs are removed. Failure to do so breeds disrespect of construction signs on the part of the public and disobedience of speed limits.

The above also applies to survey crews and small maintenance crews who impose 30/50 km/h speed limits with signs: "CREW WORKING - MAXIMUM (SPEED) 30/50 km/h". Allow these signs to remain on the road only as long as men are actually working on the road. As soon as they leave the road, or are not in any immediate danger from traffic, these signs must be removed.

9.23 SCHOOL AND PLAYGROUND SPEED ZONES

School or playground 30 km/h speed zones shall be installed only in very special cases, e.g. poor visibility, a narrow road, or a large number of children along the road adjacent to the school, combined with some additional hazard.

Never install School or Playground crosswalk signs within a section of highway which has a 30 km/h School or Playground speed zone.

Generally the Director of Traffic Engineering is to be consulted before 30 km/h school or playground speed zones are established.

Where a school is located adjacent to a highway with a speed limit of 60 km/h or higher, and a school speed zone less restrictive than 30 km/h is required, regulatory tabs reading "50 km/h When Children on Highway" may be erected below "School Warning" signs. Such assemblies may be used either in advance of a school crosswalk or to enclose a hazardous section of highway along which school children must walk.

9.24 CROSSWALKS

There are two types of crosswalks:

1. Crosswalk by definition: "the portion of a highway at an intersection that is included within the connection of the lateral lines of the sidewalks on the opposite sides of the highway, or within the extension of the lateral lines of the sidewalk on one side of the highway measured from the curbs or, in the absence of curbs, from the edges of the roadway". (See Section 121, "Crosswalk" means, (b)).

2. Crosswalks marked by signs and pavement markings, which can be subdivided into:

   (a) Pedestrian Crosswalks

   Pedestrian crosswalks are for general use by pedestrians. Their use is restricted to the following special cases:

   (1) Crosswalks for the blind, to be located near Institutes for the Blind.

   (2) At "T" type intersections in urban areas where the intersection is not too noticeable to motorists on the arterial highways, and traffic volume is at least 400 vehicles per hour, and at least 30 persons cross during that hour.

(3) Across a four-lane, heavily travelled highway where crosswalks are necessary to create artificial gaps in traffic to allow for safe crossing.

(b) School and Playground Crosswalks

School and Playground crosswalks shall be installed only where the following "School Crosswalk Warrants" are met:

Warrant Vehicles Per Hour	No. of Children Crossing Per Hour	School Cross-Walk	Warning Signs	Remarks
300 or less	100 or less	No	Yes, if more than 25 children cross	Special study recommended if more than 100 children cross.
301 to 400	50 or less	No	Yes, if more than 10 children cross.	Crosswalk should be considered if over 50 children cross.
401 to 500	25 or less	Yes	Yes	If poor visibility, crosswalk may be allowed even if less than 25 children cross.
501 or more	5 or more	Yes	Yes	As traffic volumes increase above 501 vehicles per hour, and as they become progressively higher, additional protection is necessary, such as police officer on duty, signals, overpasses and underpasses

NOTE:
1. These warrants apply to any legal speed limit.
2. When a school crosswalk is installed, insist on a school patrol.
3. Always study the routing of children along the safest routes. Proper routing may eliminate the need for a crosswalk and improve safety.
4. At all times give special treatment to special conditions, e.g. in case of poor visibility, warning signs and possibly a crosswalk may be necessary, despite the fact that warrants are not met.

5. Warrants for high school students must be increased by 100 vehicles per hour. Due to abuse of crosswalk privileges by high school students, school crosswalks should be installed only if a school patrol is guaranteed to operate at the crosswalk; otherwise crosswalks will not be put in for high schools.

If warrants are not met at existing crosswalks marked by signs, make an effort to remove the crosswalk signs during the summer holidays and do not replace them in September. However, leave advance warning signs in place if more than six children cross.

When investigating school crosswalk requests, proceed as follows:

(1) Inspect the site at the time children are crossing the highway in order to become familiar with actual conditions and problems, and to form opinions.

(2) Find out which population areas the school serves and the routes children take when going to and from schools. See if safety cannot be improved and the need for a crosswalk eliminated by re-routing children along safer roads, perhaps utilizing existing crossing points.

(3) Obtain traffic counts of vehicles and children crossing, at the time children go to and from school. Half-hour vehicle and children counts are, in most cases, adequate. Multiply by two, half-hour counts of vehicles before checking with warrants. If warrants indicate rejection of request, and it is in general agreement with your opinion, then the request should be rejected. In case of conflict between opinion and warrants, additional inspection of the site and study of the problem may be advisable.

(4) School crosswalk warrants should be used as a deciding factor when installing crosswalks, except in special cases where studies and solutions are necessary.

(5) Whenever in doubt, refer the problem to the Director of Traffic Engineering for study and decision.

9.25 DESIGN OF INTERSECTIONS AT GRADE

An at-grade intersection in which traffic is directed into definite paths by islands is termed a channelized intersection. Channelization is required at grade intersections having large paved areas, such as those with large corner radii and those at oblique angle crossings. Vehicle and pedestrian conflicts may be reduced in extent and intensity by layout design to include islands.

9.26 ISLANDS

The three main types of islands are:

(1) Directional islands to control and direct traffic movements, usually turning movements.

(2) Divisional islands to divide opposing or same direction traffic streams.

(3) Refuge islands to provide a protected space for pedestrians.

Islands are:

(a) Generally raised and outlined by curbs. (See Drawing #19-1A Misc. and Section 228 and 317 in General Specifications for Highway Construction).

(b) Formed by pavement markings. (See Drawing #349 Misc. in General Specifications for Highway Construction).

9.27 CHANNELIZATION DESIGN NOTES

(a) Do not channelize areas too small to permit use of adequate size channelizing islands. Recommended minimum size of islands: Length 3 m and Width 1.25 m, with 1.85 m preferred for width.

(b) Design approach end of islands to give desired natural vehicle path such that island does not create an obstruction in roadway. Use markings and signs to delineate all leading curbed noses.

(c) Do not let areas of unused pavement be too large.

(d) Use adequate illumination and reflectorized signs and hazard markers on channelization.

(e) Do not use narrow entrances between islands. Use wide entrances and provide a funnelling effect.

(f) Make design adequate to accommodate any large size trucks and buses using the intersection. Provide adequate lane width to take care of off-tracking and overhang on sharp turns.

(g) Make provision for adequate storage, tapers and speed change areas at the intersection.

(h) Make provision for future traffic signal installation by providing for stage construction to permit proper functioning of a traffic signal when it has to be installed.

(i) Do not use right turn radii between 11 m and 23 m, as 'Stop' signs cannot be located in a suitable location. For radii under 11 m the 'Stop' sign can be suitably located on the shoulder. For radii over 23 m the 'Stop' sign is located on an island.

9.28 ASSISTANCE FROM HEADQUARTERS

Proper design of an intersection requires experience and a considerable amount of information. Any completed design done in a District office should be forwarded to the Director of Traffic Engineering, through the Regional Highway Engineer, for his approval.

Complete design information cannot be listed in this manual, therefore it is recommended that a plan of an intersection requiring design be forwarded to the Director of Traffic Engineering for design purposes.

Requests for design of intersections forwarded to the Director of Traffic Engineering should include photos of the intersection taken from each approach and a site plan (preferably original tracing which will be returned or a good quality sepia) showing:

(a) Overhead utilities with vertical clearance over roadway (Identity utilities i.e. hydro, telephone, etc.)
(b) Culverts and underground utilitites with depth of cover (Identity utilities i.e. sewer, water, gas, etc.)
(c) Pavement edges of curbs.
(d) Buildings.
(e) Sidewalks.
(f) Property lines.
(g) Entrances.
(h) Pavement markings.
(i) Signs.
(j) Road names.
(k) Directions to nearest city and north point.
(l) Scale 1:200 or 1:500
(m) Any other features that might influence design.

Also, make comments as outlined in the sample Traffic Survey sheet (available from the Director of Traffic Engineering) for Vehicle Turning Movements for hours 7:30 to 9 A.M., 11 A.M. to 1 P.M., and 3 P.M. to 5:30 P.M. on a normal weekday.

9.29 PAVEMENT MARKINGS

No unauthorized markings are to be permitted on roadways. Pavement markings can be divided into the following:

Directional dividing lines and lane lines

Pavement edge lines

Islands

Crosswalks

Parking and no-parking lines and other restrictions.

Standards for pavement markings are set by the Director of Traffic Engineering. All requests and enquiries regarding standards, design or layout should be forwarded to the Director of Traffic Engineering.

Painting of directional dividing lines, painted channelization, and edge lines is done by centreline crews operating under the Centreline Marking Supervisor. Requests for the painting of such lines should be forwarded to the Centreline Marking Supervisor, Ministry of Highways and Public Works, 17395 - 56th Avenue, Surrey, B.C.

9.30 COLOR AND DIMENSIONS OF LINES

Color of Lines

Basically yellow lines will separate traffic flows in opposite directions; white lines will separate traffic flows in the same direction. Following are the pertinent points:

- On two-lane highways the directional dividing line, including solid no-passing lines, will be yellow and lane edge lines will be white.
- On multi-lane undivided highways the directional dividing line will be yellow and lane lines and lane edge lines will be white.
- On freeways and other multi-lane highways divided by a non-traversible median, lane lines and right side edge lines will be white and left side lane edge lines will be yellow.
- Markings on either side of a two-way left turn lane will be yellow, as will all cross-hatch markings on non-traversible areas if traffic is going in opposite directions on either side of the cross-hatch marking.
- Lane edge lines on the left side of one-way ramps will be yellow.
- All gore markings, both outlining the gore and cross-hatch markings within the gore, will remain white. A gore is the wedge-shaped paved area between a through lane and a one-way off or on ramp or connection.
- The single solid line between a left turn lane and its adjacent through lane will remain white but the outline of the left turn channelizing island and any cross-hatching will be yellow.
- The curbs of raised islands will be either white or the natural color of concrete.
- Pavement arrows, crosswalks, stop lines and word messages will remain white.

Width of lines

(a) Directional dividing lines, lane lines, and edge lines shall be 10 cm to 15 cm wide.

(b) Stop lines shall be 30 cm to 60 cm wide.

(c) Crosswalk lines shall be 10 cm to 20 cm wide.

(d) Cross-hatching lines shall be 100 cm wide.

Dimensions of Lines

(a) Directional dividing line (or lane line) spacing for dashed lines shall be 5 m dash and 8 m gap on rural roads.

(b) Directional dividing line (or lane line) spacing for dashed lines shall be 3 m dash and 6 m gap on urban streets.

(c) Urban streets are defined as those with unrestricted access, with a speed limit of 60 km/h or lower.

9.31 DIRECTIONAL DIVIDING LINES

Directional dividing lines normally consist of a dashed line alone, a dashed line and a barrier line, side by side, or two barrier lines side by side, with the type used being determined by the available sight distance. The latter two types of markings can be termed the "Regulatory Design" of directional dividing lines. Standard and basic lane width is 3.5 m.

On some highways with 6 m or less of pavement width, poor alignment and little or no shoulder, the standard marking is costly, takes up too much pavement width and restricts passing unduly. In such cases a single solid line can be used in place of the double lines described above. This can be termed a "Warning Design" as it does not prohibit passing in either direction of travel. This type of directional dividing line is used very sparingly, and usually requires the erection of "Winding Highway - Use Caution When Passing" signs. Road should not be initially painted in this fashion unless the Director of Traffic Engineering has so approved.

9.32 BARRIER LINES

All no-passing or barrier lines shall be spotted prior to painting on all roads, using the two vehicle and dragging-rope system or radio communication system between two vehicles, whichever is available. Using two light delivery trucks, a marking shall be placed 0.6 m above the roadway on the rear of the front vehicle, and be sighted on, from a point on the rear vehicle located 1.4 m above the roadway, i.e. eye level of a sighter on rear vehicle shall be about 1.4 m above the road surface.

** A no-passing zone where sight distance is restricted shall be one in which the sight distance ahead is less than:

150 m for 50 km/h
245 m for 60 km/h to 80 km/h
305 m for 90 km/h

In no case shall a barrier line in one direction be less than 120 m in length. If the actual no-passing distance is less than 120 m length, the additional length of barrier line shall be added at the beginning of the zone. If the distance between successive no-passing zones is less than 120 m then the barrier line in one direction or in both directions, as the case may be, must connect the successive no-passing zones. If this results in three-quarters or more of a 3 to 5 km section of road having no passing opportunities, then a 90 m distance shall be used.

** Amendment

Barrier lines shall be marked, unless otherwise instructed by the Director of Traffic Engineering, at all points as follows:

1. Where sight distance is restricted because of either vertical or horizontal curvature, or both.

2. On each approach to a signalized intersection, or intersections of numbered highways or on the approach to painted or curbed median islands, or on the approach to the beginning of a three lane section of a highway with a barrier line length of 150 metres.

** 3. In the single lane direction on all three lane sections.

Existing barrier lines on horizontal curves must be checked for accuracy every three or four years because of changes in sight distance caused by growth or removal of trees and brush, construction or destruction of buildings, etc. If speed limits are changed, then all barrier lines must be re-measured.

9.33 LANE EDGE LINES

Lane edge lines shall consist of single solid white lines marking the right edge of a lane and normally separating the lane from a paved shoulder. Generally, lane edge lines shall be put down only where there is a paved shoulder more than 0.3 m wide.

On main highways the lane edge may be marked if the resulting lane is no less than 3.45 m in width, c to c markings, and where sufficient pavement is available lane width must be 3.5 m. On secondary and minor roads the corresponding dimensions are 3.25 m and 3.35 m. Generally a lane edge line shall be put down only where the resulting paved shoulder, measured from the centre of the marking, is more than 45 cm wide.

Edge lines at intersections shall be ended at an appropriate distance from the intersection, such that a decelerating or accelerating vehicle, when using the pavement outside the normal travelled lane, will not have to cross a white line.

9.34 INTERSECTIONS

At urban intersections with standard stop line and crosswalk markings, lane lines and directional dividing lines shall end at the stop line on the approach side of the intersection.

Directional dividing markings and lane lines shall not be continued through a signalized intersection or any main side road or across street intersections in municipalitites, but may be continued through intersections with minor roads. A minor road would be defined approximately as one which has a summer traffic volume under 200 vehicles a day.

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A directional dividing marking may be a single solid line, a dashed line alone, a dashed and a solid line, or two solid lines. In no case shall a marking consisting of two solid lines (a double line) be carried across a public road intersection. An adequate turning gap must be left where lines are omitted at intersections.

9.35 LEFT TURN CHANNELIZATION

Ministry of Transportation and Highways Drawing #349 Misc. in General Specifications for Highway Construction indicates the method of marking left turn channelization. This shall serve mainly as a guide, and generally detailed instructions are given on each new channelization marking.

9.36 MARKING OF THREE-LANE (TWO-WAY) ROADWAYS

Standard plans of the markings on three-lane roadways are available from the Director of Traffic Engineering. These should be studied carefully. It is most important that the continuation of the centreline be kept as straight as possible throughout the entire length of the three-lane section of highway. In case of doubt, or special cases, contact the Director of Traffic Engineering.

9.37 ISLANDS

Islands are painted in order to channelize vehicle movements.

Painting and repainting of traffic islands is generally done by centre-line crews. District crews can repaint hatch marks if necessary, and island outlines if they have suitable equipment.

Standards for painting islands and approaches to islands are contained in the "Manual on Uniform Traffic Control Devices for Canada".

Proper layout and design of islands is important. It is recommended that the Director of Traffic Engineering, through the Regional Highway Engineer be asked for island layouts.

9.38 CROSSWALKS

Paint crosswalks only where crosswalk warrants are met.

District crews paint crosswalks. In some cases, on arterial highways, District Officials give permission to municipalities to paint cross-walks, but location and standards of crosswalks remain the responsiblility of the District Official.

Standards for painting crosswalks are contained in the "Manual on Uniform Traffic Control Devices for Canada".

9.39 STOP LINES

Stop lines shall be as per the Canadian Standard, which requires a minimum 30 cm, maximum 60 cm wide line. There should be 1 m of unpainted surface between the stop line and the nearest crosswalk line, should there be a crosswalk. Where there is no marked crosswalk, the lines should be at the desired stopping point, but never less than 1.2 m from the edge of the intersecting roadway.

On urban streets where speeds are not high, a width of 30 cm is sufficient. Where speed limits are 60 km/h or more, the maximum width of 60 cm should be used.

9.40 MISCELLANEOUS

(a) Single solid directional dividing lines, rather than dashed directional dividing lines, shall be painted on two-lane highways in communities where more than 50% of the lots fronting on the highway are developed commercially. Minimum length of single solid line shall be 120 m.

(b) Freeway exit ramps - Where the main highway curves at the ramp (particulary to the left) a white dashed line shall be painted across the exit in line with the right-hand through lane edge. This line shall consist of about 0.6 m long dashes and 1.2 to 1.5 m long gaps between dashes.

(c) Freeway one-way ramps - With paved shoulders shall be painted to a 4.9 m width between lines.

(d) Painted pavement markings - The following painted work message shall not be repainted, and shall be replaced with the appropriate arrows as shown in the the "Manual on Uniform Traffic Control Devices for Canada":

'Left of Thru'
'Left Turn Only'
'This Lane Turn Left'
'Right Turn Lane'

(e) Parking and no-parking lines - These are usually required on arterial highways in built-up areas close to or in business sections of a municipality. As a rule, parking spaces and restrictions within municipalities are painted and maintained by the municipality, but with knowledge and approval of District Official. Parking spaces and areas are to be marked using white paint. Parking prohibtions are to be marked along curbs using yellow paint

(f) Recommended traffic paint - The Ministry conducts extensive tests of pavement marking paints, and on the basis of these tests purchases large quantities of paints. Since the paint purchases should be the most economic paint for pavement markings, it is recommended that Districts use only these paints for pavement marking.

Paint specifications and sources of supply can be obtained from the Director of Traffic Engineering, Centreline crew stocks maintained in District shops should not be used by District crews.

FREEWAY OPERATIONS

9.41 GENERAL

Freeways are different from conventional roads. Accident records are substantially lower and traffic volume handled substantially higher than for conventional highways and streets. The chief differences are the elimination of stops and cross traffic conflict by grade separations and interchanges with acceleration and deceleration lanes, and the reduction of side friction by elimination of direct entrances, parking, etc.

Stops at stop signs, signals, etc., contribute to rear end accidents and cause delays in driving. Cross traffic conflict contributes to intersection accidents and causes delays because of interruption to through traffic. Direct entrances contribute substantially to left turn, head on and rear end accidents from vehicles making turning movements into and out of entrances. Elimination of these features results in safer, smoother and faster traffic flow.

This smooth, fast traffic flow has several important properties which must be taken into account in freeway operations. In heavy traffic streams, drivers judge positions and guide themselves by other vehicles rather than by the road. Because of lack of distinguishing roadside development such as power poles entrances, dwellings, etc., this general property is accentuated on freeways. Drivers are then referencing themselves primarily with other moving vehicles and their appreciation of the travelling speeds is frequently inaccurate.

After driving some distance on a freeway, drivers' reactions are slowed. The monotony of driving apparently lulls drivers into slower thinking and reacting. An especial feature is the sameness of the close roadside development.

Many drivers drive too close to the car ahead. Headways (the length between the front bumpers of two successive cars, usually measured in terms of time) in a close stream of vehicles generally average around 2 seconds, but a significant proportion of drivers have lower headways, some as low as 1 second. The Motor Vehicle Branch suggested car length following rule of one car length per 20 km/h of speed approximates a headway of 1 1/2 seconds. Thus is can be seen that many drivers are following too close.

The result of these properties is that anything unexpected to the driver can contribute to severe accidents. The most frequent driver reaction to something unexpected is to brake. The braking driver, in slowing, will cause following drivers to brake and slow, and a shock wave can proceed along the stream of vehicles until it reaches a driver of insufficient headway (sometimes up to 3 km from the cause). The result can be a rear end accident, frequently multiple.

Other drivers may swerve on meeting the unexpected and move into an adjoining lane, causing a possible sideswipe accident. Some drivers may gawk and slow or swerve, causing similar potential accidents. The unexpected may take many forms - an animal crossing the roadway, a preceding vehicle slowing because of a blowout, a vehicle stopped on the shoulder, an illegal sign, a hitchhiker, a police car parked, an accident, debris on the roadway, a slow vehicle ahead, and many others.

The chief principle, therefore, in freeway operations, is to reduce the unexpected to a minimum. The many rules of good freeway operations follow from this principle.

9.42 LEGAL PROHIBITIONS

In addition to the usual provisions of the Motor Vehicle Act, and other laws relating to drivers, Section 19.07 of the Regulations Pursuant to the Motor Vehicle Act prohibits the following from the freeway system:

(a) Vehicles drawn by animals.

(b) Domestic animals, with the meaning of the Animals Act, either at large, or led, ridden, or driven on the hoof.

(c) Farm implements and farm machinery, whether self-propelled or towed.

(d) Pedestrians, unless attending a disabled vehicle.

(e) Vehicles incapable of maintaining a minimum speed of 60 km/h on level road, except construction or maintenance equipment owned or hired by the Ministry of Transportation and Highways while working on or travelling to or from a work-site located on a highway.

and defines the highway system as:

Route 99 Vancouver-Blaine Highway - from the Canada-United States Border to Oak Street Bridge.

Route 1 Trans-Canada Highway - from its junction with Cassiar Street in Vancouver to its junction with Route 9, except that part of Route 1 where it crosses the Veddar Canal, and lying between the junction of No. 1 Road west of the canal and the junction of Yale Road West east of the canal.

9.43 SLOW VEHICLES

Some Provinces and States impose minimum speed limits on freeways but it is not intended, at this time, to do so in British Columbia. Police may use Section 150 of the Motor Vehicle or Sections 2.01 to 2.03 of the Highway Act Regulations to remove slow vehicles from the freeway generally or from specific major freeway structures.

Maintenance men observing very slow vehicles on the freeway, particularly when volumes are medium or heavy, should radio a description to Deas Tower so that the appropriate highway patrol can be notified.

Slow moving maintenance equipment such as graders, mowers, etc., should proceed to and from freeway work areas on side roads as far as possible. While travelling slowly on a through lane or ramp, such vehicles should display an amber rotating flasher.

Officials asked by the Commercial Transport Division for clearance to move oversize, overweight and other slow vehicles on the freeway should refer all such requests to the Regional Technician. He may designate an alternative route or, if available, may specify less vulnerable hours for travel.

9.44 MOTORIST SERVICES

Drivers of disabled vehicles (out of gas, flats, mechanical troubles, etc.) are isolated from help on a freeway. It is dangerous for them to try to walk for help. Some will flag a passing vehicle (again very hazardous) and some will sensibly stay with the vehicle and raise the hood or display a white cloth on the left side (which is the United States Interstate standard help signal).

Highway patrol and maintenance vehicles should stop in a safe manner and ascertain the problem. If the driver and passengers do not appear suspicious, they should be asked if they need help. Many will be A.A.A. members and ask for an A.A.A. service vehicle. Others will specify a certain garage, or say they have certain credit cards. Maintenance men should radio the information to Deas Radio Tower, together with licence number, make, estimated year of manufacture and color of vehicle, together with location. Persons not specifying an agency or garage should be asked if they wish to specify, otherwise Tower will select the nearest available. The vehicle should remain with the disabled vehicle until Tower confirms that the service trip is arranged. Persons may also ask for personal messages to be transmitted, especially if they are key industrial plant personnel who will be late for shift, and such messages may be passed to Tower.

If the driver or passengers of the disabled vehicle appear suspicious or drunk, the maintenance men should radio Twoer who will advise the appropriate highway patrol.

Persons with flat tires are expected to change them themselves, although there is not objection to Ministry personnel exercising discretion and assisting ladies or the elderly.

9.45 BRIDGE SERVICES

A more acute problem with disabled vehicles takes place on the major structures. First and Second Narrrows (Burrard Inlet) Bridges, George Massey (Fraser River) Tunnel, Oak Street (Fraser River) Bridge, and Port Mann (Fraser River) Bridge do not have shoulders or emergency bays and disabled vehicles block the main lanes which is very dangerous indeed.

The Ministry maintains wreckers at these facilities, and one of the major duties of the operators is to get stalled vehicles off the bridge as soon as possible. Maintenance vehicles seeing stalled vehicles should radio Tower, reporting location, type of vehicle, lane and direction of travel. If the maintenance vehicle is equipped with amber rotating flasher and is in the same lane and direction as the stalled vehicle, the operator should stop about 15 m behind and display his flasher and await the wrecker.

9.46 UTILITIES

The presence of utilities, especially pole lines, along a freeway right-of-way causes side friction by the installations themselves, and by the parking of utility maintenance vehicles and equipment along the shoulder. Consequently, the Ministry has adopted the policy of arranging, wherever possible, that no utilities will use freeway right-of-way for infringements. Unfortunately, some sections involve prior existing pole lines, such as Route 1 Trans Canada Highway westbound lanes between Vedder River and C Street (Route 11). In addition, there are crossings of pole lines, sewers, etc., across the freeway. Some maintenance foremen, seeing utility equipment parked on the freeways and not being previously advised by their District Office that they will be there, must report them to the District Official.

9.47 VEHICLES PARKING - FLASHERS

Private vehicles are not permitted to park under Section 19.07 of the Regulations Pursuant to the Motor Vehicle Act. Ministry of Transportation and Highways vehicles, police vehicles, and service vehicles attending disabled vehicles, should park on the shoulder as far to the right as possible. They should not display flashers at any time unless marking a hazard in the main lanes or ramps. Flashers contribute to gawking and the unexpected and are a hazard. Police vehicles are major offenders in this respect. Flashers should only be displayed:

(i) when a vehicle has to stop in a main lane or ramp;
(ii) when a vehicle stops on the shoulder but is marking a hazard in the main lane or ramp;
(iii) when a vehicle is travelling slowly or escorting a slow vehicle.

Vehicles parked on the shoulder at night should display the right turn signal so that following vehicles do not mistake the shoulder for a main lane and cause an accident.

9.48 ACCIDENTS

Vehicles involved in accidents may themselves contribute to other accidents. Vehicles involved in minor accidents may therefore be moved out of the main lanes to prevent further accidents. Disabled and abandoned vehicles may also be so moved. However, in an accident involving death or injury, the vehicles and persons should not be moved until police attend.

Maintenance vehicles should give protection by parking a vehicle displaying rotating flasher approximately 150 m ahead of the scene, and assisting in warning by flagging. Men should not stay in the vehicle as they are occasionally struck by other vehicles in spite of the flashers, etc.

All accidents should be immediately reported to Deas Radio Tower, with location and number of injured requiring ambulance.

9.49 HARD HATS

Maintenance men should wear hats at all times. Supervisory and engineering personnel on inspection, survey, etc., should also wear hard hats out of vehicles. The wearing of hard hats tends to make drivers accept the presence of the men as part of the scenery and thus reduces the unexpected.

9.50 NAMING INTERCHANGES, RAMPS AND LANES

It is important, when reporting, to properly name locations. Many methods of description are in use. Points between interchanges should be described by direction of travel and mile marker, or by approximate distance from a prominent feature, such as a bridge or underpass, etc.

Interchanges are name by the name of number of the cross street and this name or number should always be used, although the public (and many police) have their own names for interchanges.

Ramps should be described whether off or on, and where one cross street has more than one on or off ramp in one direction, cardinal directions should be given. For example, at Lynn Valley Interchange, which has only the one off ramp in each direction, it is enough to say "Lynn Valley westbound off ramp". At Brunette Street Interchange there is more than one ramp and a cardinal is necessary, as for example, "Brunette westbound to south off ramp", indicating the ramp that takes traffic New Westminster. Likewise, "Second Narrows north approach, northbound to west off ramp".

Lanes are numbered from left to right. The left lane is "Lane 1 (north, east, south, west) bound". The right lane of 4-lane is Lane 2. The center lane of 6-lane is Lane 2. The right lane of 6-lane is Lane 3, and so on.

9.51 MAINTENANCE PROCEDURES

Great care must be taken to maintain safety at all times for public and maintenance crews. Work should be scheduled for hours of lighter volumes and not attempted in suburban areas in peak hours. Times of poor visibility, such as night or fog, should be avoided whenever possible. Debris, etc., likely to contribute to an accident, should be removed, however, as soon as possible. Dead animals should be removed from the main lanes, and, if domesticated, the owner contacted to remove the corpse as soon as convenient, bearing in mind traffic volumes.

Crews must pay special attention to driving habits and techniques. Pulling into main lanes, or off on to shoulders, should be done at speed, so that accelerating and decelerating is accomplished on the shoulder. No wrong way driving may be undertaken except by striping and marking crews and, under some special circumstances, snowplowing crews. Road foremen are to ensure that hired equipment operators are properly briefed. Emergency crossovers are only to be used with great caution.

Close attention must be paid to winter maintenance. Interchange clearing must keep pace with main lanes work so that drivers can enter and leave the freeway at speed. Many interchange loops have greater than normal super-elevation so close attention should be paid to surface friction qualities. Abandoned vehicles in the way of operations may be hauled away under Section 189 of the Motor Vehicle Act. Maintenance crews should advise Deas Radio Tower, who will arrange with the appropriate Highway Patrol.

Knocked down signs, delineators, bullnose flashers, etc., should be replaced as soon as possible with temporary repairs where necessary.

Very close attention is to be paid to work signing. Work is to be scheduled, as far as possible, for daylight hours only (paying attention) to peak morning and afternoon hours). Any lane closure, infringement or detour that has to be in effect over night must have the prior approval and design of the Regional Traffic Superintendent so that proper flashing barricades, etc., can be arranged.

It is important to give proper advance warning of work, especially with lane closures, and the correct and full signing must be undertaken. Signing should be set out starting with the advance warning, and taken down in the reverse order.

Attention must be paid to see that cones are properly set; a common failure is to set out too short a taper.

The correct oversize signs are only to be used on the high speed multilane system. Special problems are to be referred to the Regional Traffic Superintendent for design.

Standard lane closures, shoulder work, and progressive shoulder work, are to be signed as in the "Manual of Construction and Maintenance Signs".

9.52 SUMMARY OF TRAFFIC VOLUMES

Traffic count data is not to be revealed to the public. Requests are to be referred to Region for transmittal to the Director of Traffic Engineering. If authority is given to release data, the letter will be written directly to the applicant by the Director of Traffic Engineering.

9.53 VERTICAL CLEARANCES

The Provincial highway system for which this Ministry is responsible is an excellent facility but like most everything else, does have its limitations and "restrictions". Vertical clearances, horizontal clearances and load capacities are but three such "restrictions".

The Commercial Transport Division in policing the usage of the highway system by commercial vehicles through the weigh scale operations must therefore have all "restriction" information readily available if they are to perform an efficient function.

The Ministry of Transportation and Highways is thus committed to providing the required information which is at present contained in a listing of all vertical clearances by Route number and by District for local roads. This listing should also include all horizontal restrictions that are less than 4.26 metres in overall width (the width of the largest house trailer) to complete the information listing.

Production of the listing and all revisions thereto is the responsibility of the Contract Documents Officer who in turn is kept informed of all such additions, deletions and revisions by the District Highways Managers through the Regional Highway Engineers as and when they occur.

Headquarters Branches who install or revise any structure having a vertical clearance, or a horizontal clearance of less than 4.26 metres, shall advise the District Highways Manager of the location and clearance measurements of such structures.

9.54 ABANDONED VEHICLES ON HIGHWAY RIGHT-OF-WAY
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Section 7 of the Highway Scenic Improvement Act provides for the removal and disposal of abandoned vehicles on public right-of-way. Action is initiated by the R.C.M.P. in consultation with the District Highways Manager.

1. R.C.M.P. Responsibilities

   a) To establish that a vehicle has been abandoned.

   b) To arrange for removal and towing of an abandoned vehicle to storage.

   c) To trace the last registered owner and attempt to make contact as stipulated in the Act.

   d) To proceed with prosecution or assessment of costs to the owner of any abandoned vehicle incurred through towing and storage.

   e) To arrange final disposition of the abandoned vehicle.

2. District Highways Manager Responsibilities

   a) To immediately advise the R.C.M.P. of abandoned vehicles that may be causing a hazard due to obstruction, sight distance, etc.

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b) To receive certified accounts from the R.C.M.P. in connection with towing, storage or disposal of unclaimed abandoned vehicles and, if in order, to pass on to the Director of Maintenance Services for processing.

3. Remote Locations

In remote areas of the Province, the Ministry may assist by towing and storing an abandoned vehicle due to the high cost of employing private wreckers.

4. Final Disposal of Abandoned Vehicles Values at Less than $300

The R.C.M.P. will arrange to dispose of the vehicle at a wrecker or dump site within two weeks of contacting the owner, or four weeks after sending a registered letter without response, to thereby limit storage charges.

5. Abandoned Vehicles Valued in Excess of $300

Most abandoned vehicles are values at less than $300. If the R.C.M.P. and Ministry officials value a vehicle at over $300, appropriate steps must then be taken to auction the vehicle. The procedure should be co-ordinated through the Purchasing Commission to tender the sale after registration is first transferred to the Ministry on behalf of the Crown by the signing of a statutory declaration. Again, steps should be taken to expedite the process to minimize storage charges.

6. Seriously Damaged Abandoned Vehicles

Abandoned wrecks with no value should be disposed of directly without incurring storage charges.

7. Vehicles Abandoned on Non-Ministry Roads

Responsibility to remove and dispose of abandoned vehicles rests with the R.C.M.P. in conjunction with the agency responsible for the road or right-of-way.

CHAPTER 10

FIELD SURVEYS AND PLANS

10.01 HIGHWAY FUNCTIONAL STUDIES

1. Functional studies are carried out to determine the feasibility and/or approximate costs of alternates in order that survey and design time and costs can be kept to a minimum.

   These investigations are carried out with the aid of aerial photography and aerial mapping of varying scales and accuracy.

2. Photography

   Aerial photo coverage over our Province is very extensive and all areas of interest can usually be viewed with either 20 or 40 chain photography (Metric equivalent is 1:15 000 to 1:20 000 and 1:25 000 to 1:45 000, respectively). The 20 chain photography is normally taken with a 12 inch (metric equivalent is 3095 mm) focal length camera. Air photos are no longer available for loan. A quick print photo "Iteck" is available for viewing from the air photo library but they will only supply a maximum of 10 prints at one time. They are available from Air Photo Sales, Mapping Section, Surveys and Mapping Branch, Ministry of Environment, Parliament Buildings, Victoria. Another source worthy of consideration is the office of the District Forester, who has photo coverage of his district; these photos cannot be removed from his office but could be viewed to confirm photo orders to ensure proper coverage.

   Indexes of coverage are available and are ordered by the standard geographic grid reference, e.g. 92 m (E) or (W) for 20 chain and 92 m for 40 chain.

   Many areas of the Province are covered by Special Projects which are usually covered with low level photography. Specific enquiry regarding coverage should be made directly to the Air Photo Sales Office.

   For certain Functional Studies new photography is obtained from either the Ministry of the Environment, or Aerial Mapping Consultants who have aircraft equipped to obtain the desired photos. Scale of the photography is set depending on its required usage.

   Generally, 1:5 000 photo scale will be used to produce 1:500 mapping and 2 metre contours; 1:10 000 will produce 1:1 000 mapping and 2 metre contours; photo scales greater than this are usually used to produce recce type uncontrolled mapping, at a scale of 1:50 000 with 5 metre contours.

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3. Mapping

** Mapping at various scales can be obtained photogrammetrically. Particular care should be taken to select a scale which is suitable for the required use as costs vary terrifically for the different types, ranging from $2.00/ha to as much as $90.

Caution should also be exercised in expecting accuracy under dense tree cover. The machine operator drawing the contours cannot plot what he cannot see. In such cases, average tree heights are deducted from the instrument readings and the results are at most approximations. Areas of greatest concern are those of undulating terrain and varying soil types. In the first instance drainage in the depressions causes greater growth than the drier areas on the heights of land; and in the second, growth could be more vigorous in soil than on adjacent rock out-croppings.

Mapping is available in manuscript or fairdrawn format. Manuscript mapping is prepared at the machine, usually on mylar with a minimal amount of drafting. Fairdrawn mapping is traced by draftsmen from the manuscript sheets and presented in a finished form. Fairdrawing doubles production time and cost.

4. Mapping Usage

Large areas of terrain can be mapped cheaply at 1:5 000 scale with 5 m contours and this base serves as an ideal aid for route comparisons and analysis. No prior survey is required to establish control. Generally, it is best to investigate alternates on stereo pairs of photos indicating all possible alternates; then eliminate the obvious, and outline a mapping area which covers the remainder, for closer study.

Mapping of 1:2 000 to 1:500 is known as "high order" mapping and must be controlled mathematically to ensure accuracy. This requires the establishment of a survey control line and fixing predetermined controls prior to commencement of the mapping.

The 1:1 000 scale would serve as plan base in rural undeveloped areas, the 1:500 being selected for areas of greater planimetric detail. The same applies for urban or semi-urban areas. If the amount of detail to be added to the sheets is excessive, a larger scale map is required to provide space for the detail, e.g. an urban street with gas, power, telephone, water, storm and sanitary utilities plotted would show very cluttered on a 1:1 000 plan but not so cluttered on a 1:500 plan. There must be room to show new design detail.

5. Economic Evaluation

In order to determine the preferred route considerable work is involved. Sometimes the obvious route can be selected by simply comparing projected alignments and plotted profiles. Other times sophisticated cost comparisons are required - extracting necessary

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** projects the L line can be run as soon as P line data is plotted; on more complex ones, a great deal of office analysis must be carried out using the P line topography to estimate preliminary quantities on several trial centre lines. Computer programs are available for this purpose.

4. Miscellaneous Surveys

Elements of the location survey are applied to minor projects involving bridge or culvert replacements, intersection improvements, passing lanes, railway and pipeline crossings, grade separations, retaining wall installations, property acquisition, gazette requirements, and preventative maintenance operations of various kinds.

5. Field Books

The use of proper form and order in entering survey information in the field books is important because the information is used by the field draftsmen preparing the topographic detail plan, by the highway designer preparing contract drawings and estimates, and by the construction supervisor directing the work of the contractor.

The notes must be neat and legible and in a form clearly understood by all concerned. Examples of standard field notes are contained in the Design and Surveys Manual.

10.03 HIGHWAY DESIGN

1. Earthwork Program

After the L line is run in the field, the second group of programs is used. This group, the Earthwork System, is based on cross sections taken on the ground, as previously described. These sections are punched on cards, checked for error, and then stored on magnetic tape, from which they can be recalled in whole or in part for processing. Roadway widths, slopes and ditches, superelevation, berms, stripping, shrinkage and swell factors and vertical geometry can all be varied as the designer wishes, but once the initial earthwork run has been processed, it is usually the vertical geometry which is modified to obtain satisfactory balances and haul distances.

The printed output includes excavation and fill volumes, a volume overhaul diagram, toe-to-toe roadway templates, plus various options - gravel and stripping quantities, plan and profile plots, and cross sections and template plots - any or all of which may be asked for. Where necessary, rock and Type "C" stratum sections may be added to the ground cross sections; line shifts are also allowed for.

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2. Standards

The main reference for design is the Manual of Geometric Design Standards for Canadian Roads and Streets distributed by the Roads and Transportation Association of Canada. Additional good references are the two publications by the American Association of State Highway Officials, "A Policy on Geometric Design of Rural Highways", and "A Policy on Arterial Highways in Urban Areas."

The Branch has a Design and Surveys Manual which includes a number of detail drawings and charts to assist in design. This Manual also contains a number of Design Instructions to familiarize the Designer with the policy and procedures in preparing a project.

3. Drawings

A. Preliminary Plan

Whenever aerial mapping is not available or is difficult to obtain, the results of field surveys are drawn on vellum paper. If possible, the grid should be in accordance with bearings derived from Legal Survey plans.

A preliminary traverse (P-line) of the approximate proposed highway route is plotted, and existing roads, fences, railways, water courses, location of existing culverts, manholes, telephone and hydro poles, houses, structures, underground services, etc., are shown. Recommended symbols to be used are shown on three sheets under Appendix "A".

Contours are drawn at 1 or 2 m intervals.

All cadastral information (Township, Section or District Lot Lines, Subdivision plans, Rights-of-way, etc.) is shown from the field tie information.

The preliminary plan is then used to project the Location Line.

B. Location Plan

After the final location has been selected and all plotting checked, the information from the preliminary plan (excluding the P line) is traced onto vellum sheets. The sheet size is standardized at 594 x 841 mm. The most common scales are 1:500 and 1:1 000. For urban street designs a scale of 1:250 should be used.

All information concerning the horizontal alignment is shown, i.e. P. I.'s, stationing, curve data, spiral data and bearings. Also shown are proposed right-of-way boundaries, clearing and grubbing lines and areas in hectares.

Other design information, such as laning, proposed culverts, minor structures and creek diversions should be shown.

C. Key Plan

This plan shows the relationship of the Project to the nearest town, and should also show the major Land Subdivisions.

If available, the Inventory Mileage with Segment should be given.

D. Profiles

These drawings show centreline ground line, design grades with vertical curves, bench marks, culvert elevations and structures.

A typical section drawing must accompany the profile showing lanes and shoulder widths, crossfall, curbing and sidewalk (where applicable). Also shown are the various depths of gravel and pavement, side slopes, and ditch slopes.

Preferred scales are Horizontal 1:2 000 and Vertical 1:200.

E. Volume Overhaul Diagram

This drawing is a plot from the mass ordinate sheets.

This diagram shows freehaul limits, overhaul and balance points.

Preferred scales are Horizontal 1:5 000 and Vertical 1 cm = 5,000 or 10,000 m^3.

F. Gravel Haul Chart

This chart shows the amount and haul distance for the various types of gravel on a Project.

G. Cross Sections

These drawings show the required cut and fill. The cross sections with roadway template can be plotted manually or by computer.

Preferred scales are Horizontal: 1:100 and Vertical: 1:100.

H. Detail Drawings

Additional drawings are required when there is not room to show details on the Location Plan, e.g., intersection layout, laning, underground drainage, large culvert site plan, curbing, guard rail, etc.

A number of special drawings are required for interchanges and these show geometric layout, landscaping, curbing, drainage, spot elevations and profiles.

I. Draughting Guide Lines

Since most drawings are reduced to half size and microfilming is used more extensively, it is preferable to use India Ink to ensure sufficient clarity. Also the use of lettering templates provides uniformity in lettering style. The minimum letter height should be 1.8 mm (18 metric template with 0.18 mm pen), or 2.5 mm (25 template with 0.25 mm pen) if half sizing is proposed. "Rub On" symbols on tape may be obtained for greater efficiency.

4. Quantity Schedule and Estimate

The following Appendix B, lists the basic items required for a highway project. Depending on the type of project, there are many other items such as Manholes, Catch Basins, Curbing, Guard Rail, etc., which may be added.

If the work is to be by Contract, Special Provisions must be written for any of the Items where the work or method of payment deviates from that described in the General Specifications.

To complete an estimate it is necessary to prepare an additional sheet listing all materials to be purchased by the Ministry. This sheet should also include any work item not included in the Schedule and to be done by Others.

10.04 SURVEYS AND PLANS FOR BRIDGE SITES

The survey of a bridge site, being one of the fundamental operations in bridge construction, should be given close attention and consideration. Complete and accurate field data should be obtained so that a complete and accurate site plan may be prepared.

Site plans should be drawn on standard size tracing sheets to a natural scale of 1:100 for structures of length less than 30 m, and 1:250 for structures of length more than 30 m. Each plan should have a title at the lower right hand corner together with a date, name of surveyor and name of draftsman. Datum used should be noted and location and elevation of nearest construction bench mark given.

1. General Requirements for Site Plans

(a) 0.5 m contours of site extending at least 35 m either side of the centreline and 35 m along the highway centreline beyond the probable limits of the structure.

(b) Profile at centreline showing ground line and proposed grade line and stating finished grade (i.e. bridge deck grade).

(c) Nature of terrain, i.e. swamp, solid rock, other material, boulders, etc., and locale of each.

(d) Description of vegetation.

(e) Locations of power, telephone, and telegraph poles, the number of wires on each line, and names of owners.

(f) Location and general description of existing structure including all available foundation data.

(g) Width of finished roadway, number and width of lanes.

(h) Vertical and horizontal clearances required.

(i) Number and location of sidewalks required.

(j) Alignment showing bearing, curve and spiral data with rate of superelevation.

(k) Property lines, buildings, municipal or village sidewalks, etc.

(l) Highway right-of-way.

(m) Location of probable detour, if required.

(n) Location and depth of underground services and names of owners.

2. Rivers and Streams Requirements

The following additional data should be shown in connection with site plans for river or stream crossings:

(a) Profile of stream bed for 60 m upstream and downstream of highway centreline.

(b) Key map of 1:1 000 showing stream alignment 150 m upstream and downstream of highway centreline.

(c) Velocity of stream, metres per second.

(d) Elevation of extreme high water, date.

(e) Elevation of normal high water.

(f) Elevation of water at date of survey.

(g) Elevation of low water.

(h) Description of drift, logs, debris or log jams.

(i) Description of scouring and silting.

(j) Description of shift in channel.

(k) Description of ice flow.

(l) Description of river bed, i.e. silt, sand, boulders, etc.

(m) Location of flood plains.

(n) Effect of tides.

(o) Location and general description of any bridge owned by others within 150 m upstream or downstream of highway centreline; plus minimum vertical clearance at extreme high water with elevation on structure of point of minimum clearance, evidence of scour, drift or ice.

(p) Centreline profile to be carried across river bottom, where possible.

(q) Location of spawning grounds, whether fish-producing river or stream.

(r) A ground survey tie between the proposed bridge centreline at one high water line and an established point on a registered land subdivision.

(s) The Land Registry Office Property description of the parcel of land used for the reference point in (r) above.

(t) Any evidence of occupancy of water lots or brooming ground leases within 35 m of either side of the centreline.

3. Railway Crossings

The following additional data should be shown in connection with site plans for railway crossings:

(a) Complete alignment of all railroad tracks showing degree of curvature, location of points on spirals and circular curves, distance centre to centre of tracks and superelevation of tracks.

(b) Angle between centreline of highway and centreline of each track; if railway on curve angles should be measured between highway centreline and 30 m chords to centreline of each track on both sides of highway centreline.

(c) Elevations of base of rails on highway centreline.

(d) Chainages of rails on highway centreline.

(e) Profile base of rail along railway for 60 m either side of highway centreline.

(f) Location of railroad right-of-way.

(g) Location of railroad culverts, ditches, etc.

(h) Location of sidings.

(i) Location of switches or railway installations.

(j) Distance along track to nearest mile or km post.

10.05 LAYOUT PLANS FOR RAILWAY CROSSINGS

Please refer to the following appropriate Appendix for data required covering site plans at railway crossings:

Construction of Overpass	- Appendix "C"
Reconstruction of Overpass	- Appendix "D"
Construction of Subway	- Appendix "E"
Reconstruction of Subway	- Appendix "F"
Construction of At Grade Crossing	- Appendix "G"
Environmental Agencies	- Appendix "H"

10.06 SOIL SURVEYS

1. General (See also related sections 12.16, 12.17, 13.45 to 13.53 and 14.37 to 14.43)

Adequate soils and rock information is a prerequisite for the accurate and safe design of new highways and their attendance structures. Ideally, a soil survey will identify the type and condition of all materials along the proposed route; establish to location, quality and quantity of borrow and gravel materials; and give design information affecting the estimating, construction and future performance of the proposed highway and structures.

Because of the variable conditions usually prevailing in British Columbia, complete soil and rock information can rarely be obtained without excessive costs. Soil survey practice therefore concentrates on the recognition and investigation of specific elements, such as large cuts, poor foundation areas, existing or potential slide areas, gravel and borrow pit prospecting and pavement design conditions.

The recognition of areas to be investigated not only requires knowledge of the proposed design and a general familiarity with the soil types and their relevant behaviour characteristics, but also an appreciation of the consequences of errors or omissions in the investigation. For example, bridge foundation areas are always checked intensively because of the large cost and hazard of failure; wrong assumptions for large rocks or soil cuts can drastically change the design; marginal fill foundations, though frequently used in undeveloped areas, must be thoroughly investigated if there are houses located in the possible slide path.

The Geotechnical and Materials Branch use different methods to carry out soil surveys. The methods vary greatly in cost, effectiveness, and in the kind of information they yield.

2. Soil Survey Methods and Characteristics

Name	Kind of Information	Relative Cost & Effectiveness
Visual Field Identification	Preliminary recognition of surface soil types and condition. In bedrock areas this may take the form of rock mapping for cut slope design.	Very cheap, fairly effective only in open terrain.
Airphoto Interpretation	Broad identification of soil types and conditions through recognition of landforms.	Large area coverage at low cost; used to identify major problem areas and as a preliminary to gravel prospecting.
Seismic Refraction Survey	Gives approximate solid rock profiles under overburden and may identify other strata.	Moderate cost for large possible coverage. Accuracy of information variable, correlation drilling required.
**Electro-magnetic Conductivity Survey	Identifies electro-magnetic conductivity without direct ground contact; used to delineate soil deposits.	Very fast and cheap. Results used to optimize drilling program.
Electrical Resistivity Survey	Identifies anomalies in electri-resistivity. Mostly used for prospecting and the delineation of large gravel deposits.	Moderate cost for broad possible coverage. Aids in setting up of test pitting and drilling program.
Sounding with Rods	Determination of depth to firm material.	Very cheap and rapid. No identification of soil types but very effective in conjunction with HPA or other drilling.
Swedish Vane Shear Field Testing	Measurements of the in situ undrained shear strength of soft soils.	Moderate cost, rapid production, semiportable into poorly accessible areas. No identification of soil types. Very effective with HPA or other drilling.

Name	Kind of Information	Relative Cost & Effectiveness
**Static Cone and Pressure Meter testing	Measurement of in-situ density, strength and pressure; mostly in sandy soils.	Moderate to fairly high cost because of specialized testing. Mostly for problem areas and detailed foundation testing.
Hand Power Auger (H.P.A.) Drilling	Identification of type and moisture condition of soft and loose soils.	Moderate cost, rapid production, limited to soft or loose soil. Mostly disturbed samples only.
Truck-mounted Machine Auger (A.R.) Drilling	Identification of type and condition of all but dense and bouldery soils.	Fairly expensive but rapid Mostly disturbed but can be fitted for undisturbed sampling. Effective for general soil survey and most gravel pit investigations but requires good access
Rotary (Diamond) Drilling (D.D.)	Identification of type and condition of all soils and rock.	Relatively expensive. Most versatile for disturbed and undisturbed sampling and field tests. Requires good access for a large truck.

In addition, backhoes are frequently used for test pitting, especially in gravel prospecting work. It may be noted that the listing above is ranked from methods that are relatively inexpensive, giving broad general coverage to those that are expensive but producing specific and detailed information for a small area.

3. Reporting

Soil survey reports are usually requested by and submitted to the Survey and Design Branch. A preliminary visual field soil identification along the proposed route is done by the Design and Surveys Branch on Form H.740. Subsequent reporting by the Geotechnical and Materials Branch is by letter reports if the investigations are few and far between; when a more thorough soil survey is done, a soils profile is prepared on standard sized sheets showing all drill logs, test results, probes, etc., as well as typed notes on material suitability, slope design, gravel pits, pavement structure design, etc. Such soil profiles are for use only within the Ministry; another copy without the typed notes is made part of the contract documents for information to the Contractors.

10.07 LEGAL SURVEYS
**

Legal Survey plans are required to define lands acquired for the following:

(a) Statutory Right-of-Way for Highways
(b) Statutory Right-of-Way for Easements
(c) Yard Sites
(d) Gravel and Borrow Pits
(e) Foreshore Lots

These surveys must be carried out by a commissioned British Columbia Land Surveyor.

Legal Surveys are administered from Headquarters by the Lands Survey Officer and paid under the Legal Survey and Construction Project Votes. The Construction Project Vote covers the cost of defining the right-of-way and other works within the limits of the construction project, and the Legal Survey Vote covers the cost of undertaking all surveys of other highways and any legal survey requirements of the Ministry.

District offices may submit request for surveys to the Lands Survey Officer, providing the area to be surveyed has been acquired by the Property Services Branch or is established under the Highways Act.

The surveys will be undertaken providing sufficient funds are available. Requests should be accompanied by two paper prints of the plan showing the area to be surveyed in a red outline.

Upon completion of the survey, plans are forwarded to the Property Services Branch for deposit. The District Official is advised by means of a form letter that the plan has been prepared for deposit in the Land Registry Office.

10.08 PRESERVATION OF MONUMENTS

Monuments refer to highway right-of-way, pipe posts, concrete monuments, rock posts, iron pins, monuments for triangulation stations, control surveys, district lot section corners, geodetic bench marks, tidal surveys, etc.

Prior referencing should be carried out in order to avoid future unnecessary work and expense to the Ministry. When it is apparent that a monument is to be disturbed, arrangements can be made to have it referenced by providing the Lands Survey Officer at Headquarters with a complete detailed description.

Proper care must be taken during road construction to prevent the loss or removal of valuable survey evidence. The destruction or unauthorized removal of monuments is an offence and bears a penalty.

** Amendment

	METRIC PEN SIZES
International Boundary	1.00
Section Lines & District Lot Bdy.	1.00
Quarter Section Line	0.70
Subdivision Boundary	0.35
Old Road R/W (surveyed)	0.35
Proposed Highway R/W	1.00
Easement (state type)	0.35
Control Lines	0.25 P-Line 23 0.50 L-Line 78
℄ Plan & Grade Line	1.00
Clearing & Grubbing	0.50

	PEN SIZE	EXISTING	PEN SIZE	PROPOSED
Road (paved)	0.35	GRAVEL SHOULDER / PAVEMENT EDGE	0.5	
Road (gravel)	0.35	GRAVEL EDGE	0.5	
Guard Rail	0.35	Timber Steel	0.5	Timber Steel
No Post Guard Rail	0.35	Conc. Asphalt	0.5	Conc.
Drainage Ditches	0.35	EL 24.1 23.8 23.5	0.5	7.35 7.25
Storm Drains & Sewers	0.35	S S S	0.5	S S S
Sanitary Sewer	0.35	SAN SAN	0.5	SAN SAN
Retaining Wall	0.35	Timber Metal Bin Conc.	1.00	Metal Bin Conc.

Approved by Director of D a S.

Date 77-08-19
Revised

B.C. MINISTRY OF TRANSPORTATION, COMMUNICATIONS AND HIGHWAYS
DESIGN AND SURVEYS BRANCH

PLAN AND SURVEY SYMBOLS

DESIGN MANUAL No. H.1-1

Water Main — W — 200 mm A.C. — W — 100 mm Plastic — W

pen 0.25

Gas Main — G — 150 mm L.P., I.P., H.P. — G — G

Oil Line — OIL — 600 mm T. M. P. L. — OIL — OIL

Underground Electric Cable — U.E. — U.E. — U.E.

Underground Telephone Cable — U.T. — U.T. — U.T.

PROPOSED RELOCATIONS TO BE NOTED AS SUCH

Fence with Gate — show type e.g.: 4 St. B. W. — C. L.

Fence along Lot lines — Type

Railway — C. P. R. — C. N. R. — 20 mm — 20 mm

Telephone Poles — show Nº of wires on Plans

Power Poles — Hydro

Power Pole with Transformer

Power Pole & Tel. Pole combined

High Tension Power Poles

High Tension Power Tower — HT

Telephone Booth — T

Telephone Guy Poles

Dead man

Power Guy Pole

Lamp Standard — LS

Road Sign

Fire Hydrant — F.H.

Gas Valve — G.V.

Water Valve — W.V.

Water Meter — W.M.

Catch Basin existing — C.B.

" " proposed — C.B.

Manhole existing — M.H.

" " proposed — M.H.

Combined Catch Basin and Manhole — C.B.-M.H.

Traffic Signal

Traffic Signal Control Box

Appoved by Director of D. & S.
T. T. Readshaw

Date 77-08-19
Revised 83-07

B.C. MINISTRY OF TRANSPORTATION AND HIGHWAYS
DESIGN AND SURVEYS BRANCH

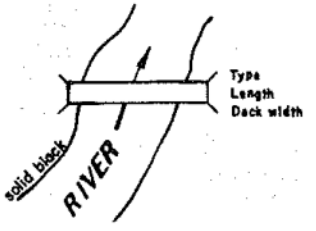
PLAN AND SURVEY SYMBOLS

DESIGN MANUAL No.
H.I-2

Culverts existing — 12m – 300 ø C.S.P.

Culverts proposed — 37m – 900 ø C.S.P.

Bridge



Curb — Conc. / Asphalt

Island Curbing

Sidewalk — Wood / Asphalt

Sidewalk — Concrete

Rock wall

Hedge

Wooded area

Trees

Buildings — H

ABBREVIATIONS

House	H.
Shed	SH.
Garage	G.
Chicken H.	Ch.H.
Barn	B.

Show Business Names on Commercial Bldgs.

Swamp

SURVEY SYMBOLS

Witness Post — o Wt.P.

Hub — Δ

Wooden Post — o W.P.

Iron Post — ● I.P.

Monument — ◉ Mon. Conc.

Sketch showing Land description i.e. Tps., D.L., Secs.



Land ties — Δ - - - - - 34°06' / 120.344 - - - - ● I.P.
Shown on Hardshell only

Approved by Director of D. & S.	B.C. MINISTRY OF TRANSPORTATION, COMMUNICATIONS AND HIGHWAYS DESIGN AND SURVEYS BRANCH
Date 77-08-19 Revised 82-11-01	PLAN AND SURVEY SYMBOLS
	DESIGN MANUAL No. H.1-3

ELECTORAL DISTRICT METRIC

PROJECT NO.

HIGHWAY NO.

(RE)CONSTRUCTION: TO

STATION TO STATION BK. =

STATION AH. TO STATION

km

LANDMARK INVENTORY - SEGMENT

km TO km DATE:

SCHEDULE OF APPROXIMATE QUANTITIES AND UNIT PRICES

ITEM NO.	DESCRIPTION OF WORK	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT ¢
1.	Mobilization (See Special Provisions, Clause ___) Move In and Move Out	L.S.				
	PART I - GRADING					
2.	Clearing and Grubbing (See Special Provisions, Clause ___)					
	(a) Clearing	ha				
	(b) Grubbing	ha				
3.	Roadway & Drainage Excavation 300 m Freehaul (See Special Provisions, Clause ___)					
	(a) Type "A"	m^3				
	(b) Type "B"	m^3				
	(c) Type "C"	m^3				
	(d) Type "D"	m^3				
	(e) Type "D", Borrow	m^3				
	(f) Organic Stripping (and Waste Material)	m^3				
	(g) Topsoil	m^3				
4.	Overhaul on Excavation (See Special Provisions, Clause ___)	1000 Sta. m				
5.	Pavement Ripping (See Special Provisions, Clause ___)	m^3				

H.88 (Rev. 84/06)

ITEM No.	DESCRIPTION OF WORK Project No. Page 2	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT c.
6.	Increasing Compaction and Watering (See Special Provisions, Clause ___)					
	(a) Increasing Compaction of Top 0.3 m of Subgrade, Section 201.22	m^2				
	(b) Watering in Accordance With Section 201.23	kL				
7.	Granular Base (See Special Provisions, Clause ___)					
	(a) Select Granular Sub-Base, Section 202 100% to Pass 75 mm Square Mesh Screen	t				
	(b) Crushed Granular Base, Section 202, 100% to Pass 75 mm Square Mesh Screen	t				
	(c) Crushed Granular Surfacing, Section 202, 100% to Pass 19 mm Square Mesh Screen	t				
	(d) Crushed Granular Surfacing, In Stockpile, Section 202, 100% to Pass 19 mm Square Mesh Screen	t				
8.	Gravel Blacket (See Special Provisions, Clause ___)	t				
9.	Rock Blanket (See Special Provisions, Clause	m^3				
10.	Gravel Facing (See Special Provisions, Clause ___)	t				
11.	Bridge End Fill (See Special Provisions, Clause ___)	t				
12.	Haul on Granular Base, Gravel Blankets, Facing and Bridge End Fill (See Special Provisions, Clause ___)					
	(a) First Kilometre	t				
	(b) Second Kilometre	t				
	(c) Third Kilometre	t				
	(d) Fourth Kilometre	t				
	(e) Fifth Kilometre	t				

FORM H.69 0

ITEM NO.	DESCRIPTION OF WORK Project No. Page 3	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $
12.	Haul on Granular Base, Gravel Blankets, Facing and Bridge End Fill (continued)				
	(f) Sixth Kilometre	t			
	(g) Seventh Kilometre	t			
	(h) Eighth Kilometre	t			
	(i) Ninth Kilometre	t			
	(j) Tenth Kilometre	t			
	(k) Eleventh Kilometre	t			
	(l) Twelfth Kilometre	t			
13.	Fencing and Farm Gates (See Special Provisions, Clause ___)				
	(a) Fencing, Type "__", (Dwg. No. __-SP203 M)	m			
	(b) Gates, 5 m Opening (Dwg. No. 3-SP203 M)	Each			
14.	Foundation Excavation				
	(a) Type "A"	m^3			
	(b) Type "B"	m^3			
	(c) Type "C"	m^3			
	(d) Type "D"	m^3			
15.	Culverts (See Special Provisions, Clause ___)				
	(a)	m			
	(b)	m			
	(c)	m			
*Each is used for Elbows etc.	(d)	m			
	(e)	m			
	(f)	m			
	(g)	m			

FORM H.66 o

ITEM NO.	DESCRIPTION OF WORK Project No. Page 4	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT c.
15.	Culverts (continued)					
	*(h)	Each				
	*(i)	Each				
	(Delivery to site and installation in accordance with Section 210. Foundation Excavation to be paid for under Item ___. All pipe to be supplied to Contractor, f.o.b. _____, B.C.					
16.	Structural Steel Plate Pipe (See Special Provisions, Cluase ___)					
	(a)	m				
	(b)	m				
	(c)	m				
	(d)	m				
	(Delivery to site and installation in accordance with Section 210. Foundation Excavation to be paid for under Item ___. All pipe to be supplied to Contractor, f.o.b. _____, B.C.					
17.	Precast Concrete Catch Basins, Manholes and Catch Basin Manholes (See Special Provisions, Clause ___)					
	(a) Catch Basins (Dwg. No. __-SP219 M)	Each				
	(b) ___ Manholes (Dwg. No. __-SP219 M)	Each				
	(i) 0 - 2 m	Each				
	(ii) 2 - 3 m	Each				
	(iii) 3 - 4 m	Each				
	(c) ___ Catch Basin Manholes (Dwg. No. __-SP219 M)	Each				
18.	Storm Drains					
	(a)	m				
	(b)	m				

FORM H.89 0

ITEM NO.	DESCRIPTION OF WORK Project No. Page 5	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT ¢
18.	Storm Drains (continued)					
	(c)	m				
*Each is used for Tees, Wyes, etc.	(d)	m				
	(e)	m				
	(f)	m				
	*(g)	Each				
	*(h)	Each				
	(i) Bedding and Backfill (Delivery to site and installation in accordance with Section 210. Foundation Excavation to be paid for under Item ___. All pipe to be supplied to Contractor, f.o.b. _____, B.C.	m^3				
19.	Metal Bin Wall (See Special Provisions, Clause ___)					
	(a) Delivery to Site and Erection. All Materials to be Supplied to the Contractor, f.o.b., _____, B.C.	m^2				
	(b) Structure Backfill	t				
20.	Concrete Crib Retaining Wall (See Special Provisions, Clause ___)					
	(a) Delivery to Site and Erection. All Materials to be Supplied to the Contractor, f.o.b., _____, B.C.	m^2				
	(b) Structure Backfill	t				
*21.	Concrete Retaining Wall (See Special Provisions, Clause ___)					
	(a) Class "_" Concrete, Supplied In Place	m^3				
	(b) Supply and Place Reinforcing Steel	kg				
22.	Riprap (See Special Provisions, Clause ___)					
	(a) Hand Laid	m^3				

*When a "CONCRETE CONSTRUCTION" section is included in the Schedule include this item in that section.

FORM H.89 0

ITEM NO.	DESCRIPTION OF WORK Project No. Page 6	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT c.
22.	Riprap (continued)					
	(b) Loose	m^3				
23.	Sandbags, Supplied In Place (See Special Provisions, Clause ___)	Each				
24.	Chain Link Mesh, Supply and Install (See Special Provisions, Clause ___)	m^2				
25.	Shotcreting, Supplied In Place (See Special Provisions, Clause ___)	m^3				
26.	Rock Bolts, Supply and Install (See Special Provisions, Clause ___)	m				
27.	Accommodation of Government Employees (See Special Provisions, Clause ___)	Month				
28.	Plant Mixed Portland Cement Treated Base Course (See Special Provisions, Clause ___)					
	(a) Cement Treated Base Course, Supplied In Place	t				
	(b) Spray Bituminous Seal	L				
	(c) Sand Cover	t				
29.	Asphaltic Plant Mixed Stabilized Base (See Special Provisions, Clause ___)					
	(a) Class "__", Medium Mix, Supplied in Place	t				
	(b) Integral Curb (Dwg. No. 5-SP223 M)	m				
30.	Spray Primer (See Special Provisions, Clause ___)	L				
31.	Asphalt Levelling Course					
	Class "__", Medium Mix, Supplied in Place	t				

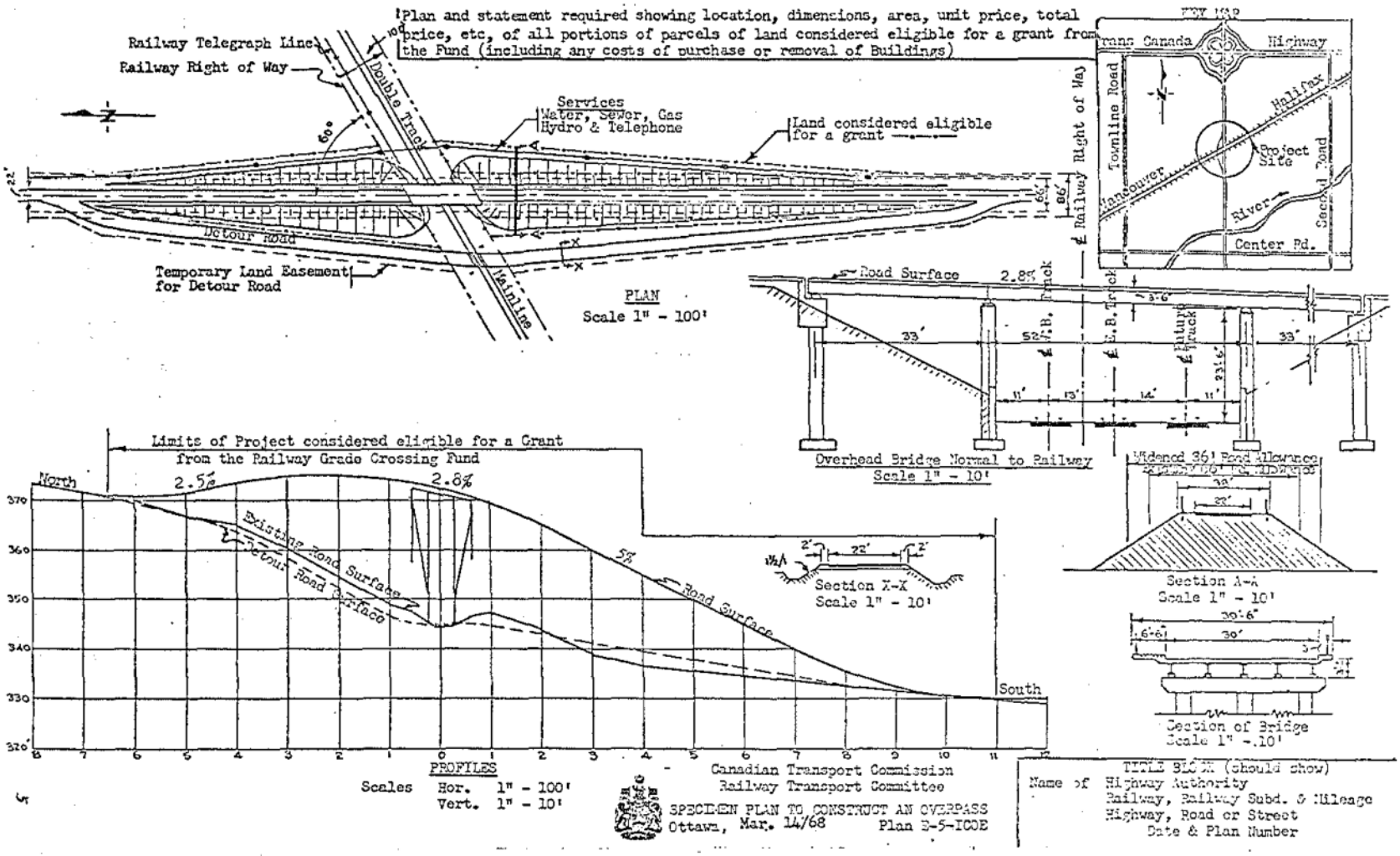
FORM H.89 0

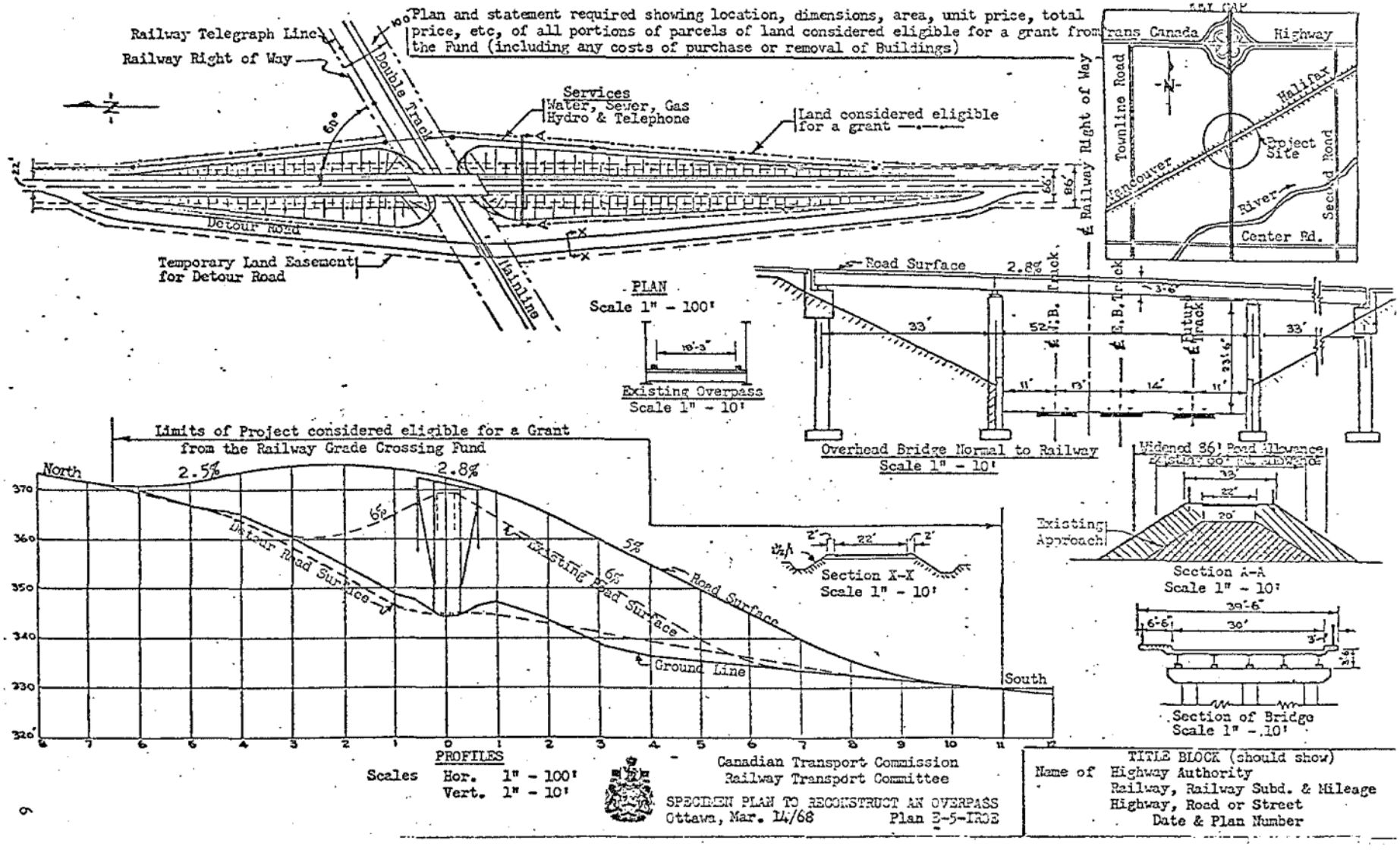
ITEM No.	DESCRIPTION OF WORK Project No. Page 7	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	¢
32.	Asphalt Concrete Pavement (See Special Provisions, Clause ___)					
	(a) Class "__", Medium Mix, Supplied in Place	t				
	(b) Class "__", Medium Mix, f.o.b. Plant	t				
33.	Extruded Asphalt Curb (See Special Provisions, Clause ___)					
	Type "__" (Dwg. No. 6-SP223 M)	m				
34.	Extruded Concrete Curb (See Special Provisions, Clause ___)					
	(a) Drawing No. 17-SP219	m				
	(b) Type "__" (Dwg. No. 6-SP223 M)	m				
35.	Drainage Outlets (In Accordance With Section 226)					
	(a) 200 mm Diameter Corrugated Metal Pipe	m				
	(b) Cast Iron Catch Basin (Dwg. No. 1-SP226 M)	Each				
36.	Shouldering Aggregate, Supplied In Place	t				
37.	Shouldering Work	km				
38.	Precast Reinforced Concrete No Post Barrier					
	(a) 457 mm Type "B" (Dwg. No. 1-SP323 M)	m				
	(b) 686 mm Type "A" (Dwg. No. 5-SP323 M)	m				
	Taking delivery, hauling to the site and installation. All guard rail to be supplied to Contractor, f.o.b. _____, B.C.					
39.	Allowance for Adjustment of Haul (See Special Provisions, Clause ___)	Prov.Sum				
40.	Allowance for Payments Under Specifications Section 223.43 (See Special Provisions, Clause ___)	Prov.Sum				
41.	Allowance for Handwork (See Special Provisions, Clause ___)	Prov.Sum				

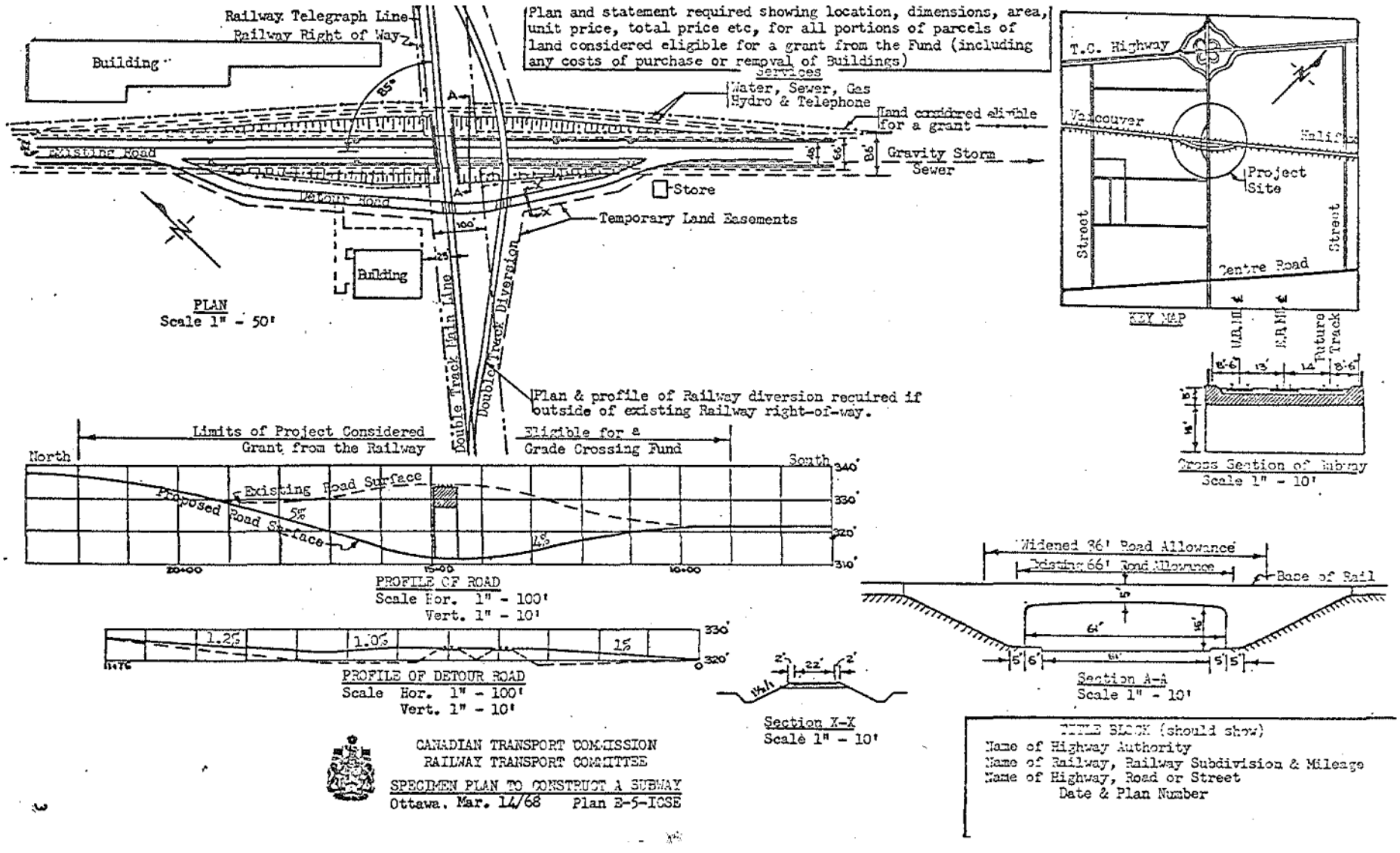
FORM H.69 0

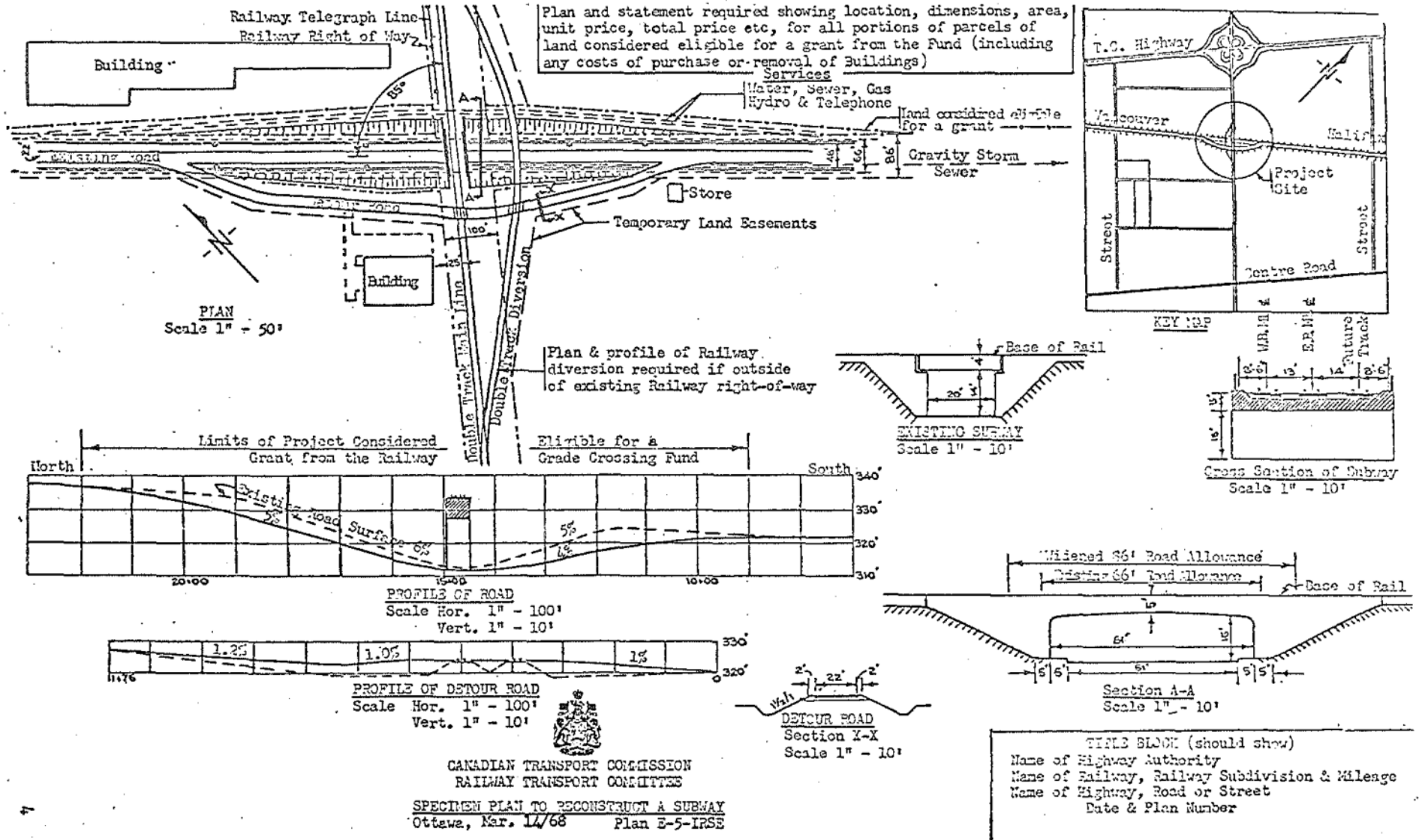
ITEM NO.	DESCRIPTION OF WORK Project No. Page 8	UNIT	QUANTITY	RATE IN DOLLARS	AMOUNT $	AMOUNT C.
42.	Preparatory Work at Railway (and Bridge) Crossing (See Special Provisions, Clause ___)	Prov.Sum				

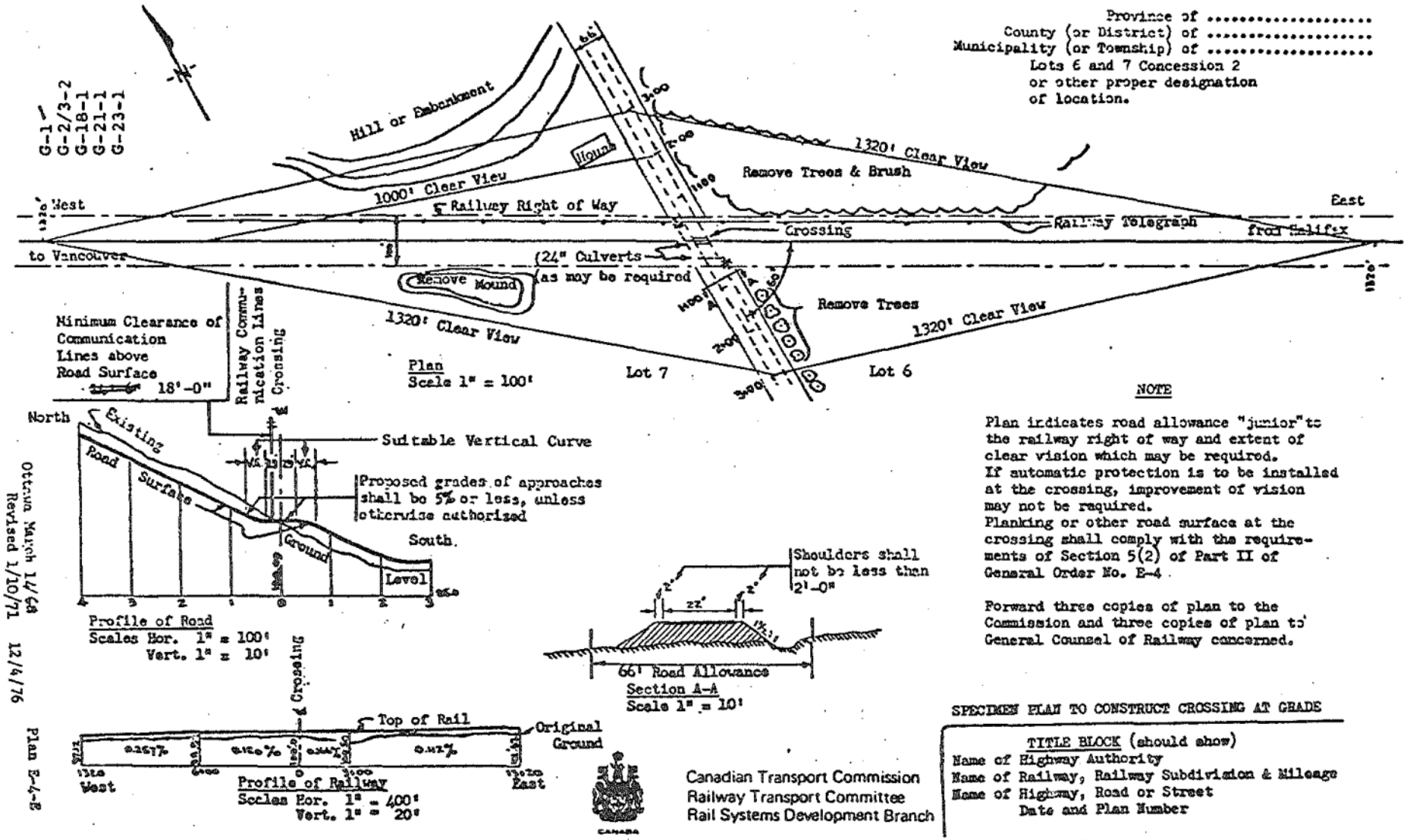
FORM H.88 0


Plan and statement required showing location, dimensions, area, unit price, total price, etc, of all portions of parcels of land considered eligible for a grant from the Fund (including any costs of purchase or removal of Buildings)
Railway Telegraph Line
Railway Right of Way
Double Track
Services
Water, Sewer, Gas
Hydro & Telephone
Land considered eligible for a grant
Detour Road
Temporary Land Easement for Detour Road
Mainline
Railway Right of Way
PLAN
Scale 1" - 100'
KEY MAP
Trans Canada
Highway
Townline Road
Halifax
Project Site
Vancouver
River
Second Pond
Center Pd.
Road Surface
2.8%
Truck
S.B. Track
Future Track
33'
52'-0"
23'-6"
11'
13'
14'
Overhead Bridge Normal to Railway
Scale 1" - 10'
Limits of Project considered eligible for a Grant from the Railway Grade Crossing Fund
North
South
2.5%
2.8%
5%
Existing Road Surface
Detour Road Surface
Road Surface
370
360
350
340
330
320
Section X-X
Scale 1" - 10'
Widened 36' Road Allowance
Section A-A
Scale 1" - 10'
30'-6"
6'-6"
30'
Section of Bridge
Scale 1" - 10'
PROFILES
Scales Hor. 1" - 100'
Vert. 1" - 10'
Canadian Transport Commission
Railway Transport Committee
SPECIMEN PLAN TO CONSTRUCT AN OVERPASS
Ottawa, Mar. 14/68
Plan E-5-ICOE
TITLE BLOCK (should show)
Name of Highway Authority
Railway, Railway Subd. & Mileage
Highway, Road or Street
Date & Plan Number


Plan and statement required showing location, dimensions, area, unit price, total price, etc, of all portions of parcels of land considered eligible for a grant from the Fund (including any costs of purchase or removal of Buildings)
Railway Telegraph Line
Railway Right of Way
Double Track
Services
Water, Sewer, Gas
Hydro & Telephone
Land considered eligible for a grant
Detour Road
Temporary Land Easement for Detour Road
Mainline
PLAN
Scale 1" - 100'
Existing Overpass
Scale 1" - 10'
Trans Canada Highway
Townline Road
Halifax
Project Site
Vancouver
River
Center Rd.
Road Surface
2.8%
Railway Right of Way
Future track
Overhead Bridge Normal to Railway
Scale 1" - 10'
Limits of Project considered eligible for a Grant from the Railway Grade Crossing Fund
North
South
2.5%
2.8%
Detour Road Surface
Existing Road Surface
Road Surface
Ground Line
PROFILES
Scales Hor. 1" - 100'
Vert. 1" - 10'
Section X-X
Scale 1" - 10'
Widened 86' Road Allowance
Existing Approach
Section A-A
Scale 1" - 10'
Section of Bridge
Scale 1" - 10'
Canadian Transport Commission
Railway Transport Committee
SPECIMEN PLAN TO RECONSTRUCT AN OVERPASS
Ottawa, Mar. 14/68
Plan E-5-1703
TITLE BLOCK (should show)
Name of Highway Authority
Railway, Railway Subd. & Mileage
Highway, Road or Street
Date & Plan Number


Railway Telegraph Line
Railway Right of Way
Building
Existing Road
Detour Road
Building
Double Track Main Line
Double Track Diversion
Plan and statement required showing location, dimensions, area, unit price, total price etc, for all portions of parcels of land considered eligible for a grant from the Fund (including any costs of purchase or removal of Buildings)
Services
Water, Sewer, Gas
Hydro & Telephone
Land considered eligible for a grant
Gravity Storm Sewer
Store
Temporary Land Easements
Plan & profile of Railway diversion required if outside of existing Railway right-of-way.
PLAN
Scale 1" - 50'
T.C. Highway
Vancouver
Halifax
Project Site
Street
Street
Centre Road
KEY MAP
U.H.M.
E.B.M.
Future Track
Cross Section of Subway
Scale 1" - 10'
Limits of Project Considered for Grant from the Railway
Eligible for a Grade Crossing Fund
North
South
Existing Road Surface
Proposed Road Surface
5%
4%
340'
330'
320'
310'
20+00
15+00
10+00
PROFILE OF ROAD
Scale Hor. 1" - 100'
Vert. 1" - 10'
1.2%
1.0%
1%
330'
320'
PROFILE OF DETOUR ROAD
Scale Hor. 1" - 100'
Vert. 1" - 10'
Section X-X
Scale 1" - 10'
Widened 36' Road Allowance
Existing 66' Road Allowance
Base of Rail
Section A-A
Scale 1" - 10'
CANADIAN TRANSPORT COMMISSION
RAILWAY TRANSPORT COMMITTEE
SPECIMEN PLAN TO CONSTRUCT A SUBWAY
Ottawa. Mar. 14/68 Plan E-5-ICSE
TITLE BLOCK (should show)
Name of Highway Authority
Name of Railway, Railway Subdivision & Mileage
Name of Highway, Road or Street
Date & Plan Number


Railway Telegraph Line
Railway Right of Way
Building
Plan and statement required showing location, dimensions, area, unit price, total price etc, for all portions of parcels of land considered eligible for a grant from the Fund (including any costs of purchase or removal of Buildings)
Services
Water, Sewer, Gas Hydro & Telephone
Land considered eligible for a grant
Gravity Storm Sewer
Existing Road
Store
Temporary Land Easements
Building
Double Track Main Line
Double Track Diversion
PLAN
Scale 1" = 50'
Plan & profile of Railway diversion required if outside of existing Railway right-of-way
T.C. Highway
Vancouver
Project Site
Centre Road
Street
KEY MAP
Base of Rail
EXISTING SUBWAY
Scale 1" = 10'
Future Track
Cross Section of Subway
Scale 1" = 10'
Limits of Project Considered
Grant from the Railway
Eligible for a
Grade Crossing Fund
North
South
Existing Road Surface
PROFILE OF ROAD
Scale Hor. 1" = 100'
Vert. 1" = 10'
PROFILE OF DETOUR ROAD
Scale Hor. 1" = 100'
Vert. 1" = 10'
Widened 66' Road Allowance
Existing 66' Road Allowance
Base of Rail
Section A-A
Scale 1" = 10'
DETOUR ROAD
Section X-X
Scale 1" = 10'
CANADIAN TRANSPORT COMMISSION
RAILWAY TRANSPORT COMMITTEE
SPECIMEN PLAN TO RECONSTRUCT A SUBWAY
Ottawa, Mar. 11/68 Plan E-5-IRSE
TITLE BLOCK (should show)
Name of Highway Authority
Name of Railway, Railway Subdivision & Mileage
Name of Highway, Road or Street
Date & Plan Number



NOTE

Plan indicates road allowance "junior" to the railway right of way and extent of clear vision which may be required.
If automatic protection is to be installed at the crossing, improvement of vision may not be required.
Planking or other road surface at the crossing shall comply with the requirements of Section 5(2) of Part II of General Order No. E-4.

Forward three copies of plan to the Commission and three copies of plan to General Counsel of Railway concerned.

SPECIMEN PLAN TO CONSTRUCT CROSSING AT GRADE

TITLE BLOCK (should show)
Name of Highway Authority
Name of Railway, Railway Subdivision & Mileage
Name of Highway, Road or Street
Date and Plan Number

Canadian Transport Commission
Railway Transport Committee
Rail Systems Development Branch

Ottawa March 14/68
Revised 1/10/71 12/4/76
Plan E-4-2

Chapter 10
Appendix "G"
June 1981.

REGION 1

PROVINCIAL AGENCIES

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
MINISTRY OF ENVIRONMENT				
10334 - 152A Street Surrey, B.C., V3R 7P8	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish & Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.
Marine Resources Branch 780 Blanshard Street Victoria, B.C., V8W 2H1	Director	Protection of Marine Resources (Oysters, Clams, etc.)	Effect on oyster beds, etc.	Letter with Plans
MINISTRY OF LANDS, PARKS AND HOUSING				
Parks & Outdoor Rec. Div. 1610 Indian River Drive North Vancouver, B.C., V7G 1L3	Master Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Reserves Unit 1019 Wharf Street Victoria, B.C., V8W 2Y9	Director	Jurisdiction on Ecological Reserves		Letter with Plans
Lands & Housing Regional Operations Division 4240 Manor Street Burnaby, B.C., V5G 1B2	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
MINISTRY OF PROVINCIAL SECRETARY AND GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1V8	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments on Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES				
525 Superior Street Victoria, B.C. V8W 1H8	Chief Inspector of Mines	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check on ALR to be alienated. If none, do not submit plans. Compliance with the Act	Letter with Plans

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
		FEDERAL AGENCIES		
Fisheries & Oceans, Land Use Div, Habitat Protection Fraser River, Northern BC Yukon Division 549 Columbia Street New Westminster, B.C., V3L 1B3	Senior Habitat Mgmt. Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Fisheries & Oceans South Coast Division Habitat Protection 60 Front Street Nanaimo, B.C., V9R 5H7	Senior Habitat Mgmt. Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans
Canadian Coast Guard Transport Canada P. O. Box 10060 700 West Georgia Street Vancouver, B.C., V7Y 1E1	Senior Officer	Navigable Waters Protection Act	Compliance with Act	Letter with Plans
		REGION 2		
		PROVINCIAL AGENCIES		
MINISTRY OF ENVIRONMENT				
1259 Dalhousie Kamloops, B.C., V2C 4A2	Regional Director-Thompson-Nicola			
Water Management Branch	Regional Manager-Thompson-Nicola	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager-Thompson-Nicola	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager-Thompson-Nicola	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.
3547 Skaha Lake Road Penticton, B.C. V2A 1K2	Regional Director-Okanagan			
Water Management Branch	Regional Manager-Okanagan	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager-Okanagan	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager-Okanagan	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976. Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
540 Borland Street Williams Lake, B.C., V2G 1Z6	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976. Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act
MINISTRY OF LANDS, PARKS AND HOUSING				
Parks & Outdoor Rec. Div. 101 - 1050 W. Columbia St. Kamloops, B.C., V2C 1L4	Systems Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Reserves Unit 1019 Wharf Street Victoria, B.C., V8W 2Y9	Director	Jurisdiction on Ecological Reserves		Letter with Plans
Lands & Housing Regional Operations Division 348 Tranquille Road Kamloops, B.C., V2B 3G6	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
Lands & Housing Regional Operations Division 172 North 2nd Avenue Williams Lake, B.C., V2G 1Z6	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
MINISTRY OF PROVINCIAL SECRETARY AND GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1V8	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments on Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES				
525 Superior Street Victoria, B.C., V8W 1H8	Chief Inspector of Mines	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check on ALR to be alienated. If none, do not submit plans. Compliance with the Act	Letter with Plans
FEDERAL AGENCIES				
Fisheries & Oceans, Land Use Division, Habitat Protection Fraser River, Northern B.C. Yukon Division 202 - 317 Seymour Street Kamloops, B.C., V2C 3E9	Regional Habitat Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans

REGION 3

PROVINCIAL AGENCIES

MINISTRY OF ENVIRONMENT

310 Ward Street Nelson, B.C.	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish & Wildlife Branch	Acting Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.
3547 Skaha Lake Road Penticton, B.C. V2A 1K2	Regional Director-Okanagan			
Water Management Branch	Regional Manager-Okanagan	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager-Okanagan	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager-Okanagan	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976. Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act

MINISTRY OF LANDS, PARKS AND HOUSING

Parks & Outdoor Rec. Div. 612 Front Street Nelson, B.C., V1L 4B7	Systems Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Resources Unit 1019 Wharf Street Victoria, B.C., V8W 2Y9	Director	Jurisdiction on Ecological Reserves		Letter with Plans
Lands & Housing Regional Operations Division 828 A Baker Street Cranbrook, B.C., V1C 1A2	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
Parks & Outdoor Rec. Div. 101-1050 W. Columbia St. Kamloops, B.C. V2C 1L4	System Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
Lands & Housing Regional Operations Division 348 Tranquille Road Kamloops, B.C., V2B 3G6	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
MINISTRY OF PROVINCIAL SECRETARY AND GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1V8	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments on Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES				
525 Superior Street Victoria, B.C., V8W 1H8	Chief Inspector of Mines	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check on ALR to be alienated. If none, do not submit plans. Compliance with the Act	Letter with Plans
		FEDERAL AGENCIES		
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans
Fisheries & Oceans, Land Use Division, Habitat Protection Fraser River, Northern B.C. Yukon Division 202 - 317 Seymour Street Kamloops, B.C., V2C 3E9	Regional Habitat Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
		REGION 4		
		PROVINCIAL AGENCIES		
MINISTRY OF ENVIRONMENT				
1011 Fourth Avenue Prince George, B.C. V2L 3H9	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
540 Borland Street Williams Lake, B.C., V2G 1Z6	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish and Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976. Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act
Marine Resources 780 Blanshard Street Victoria, B.C., V8W 2H1	Director	Protection of Marine Resources (Oysters, Clams, etc.)	Effect on oyster beds, etc.	Letter with Plans
MINISTRY OF LANDS, PARKS AND HOUSING				
Parks & Outdoor Rec. Div. 1011 - 4th Avenue Prince George, B.C., V2L 3H9	Senior Regional Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Reserves Unit 1019 Wharf Street Victoria, B.C., V8W 1X4	Director	Jurisdiction on Ecological Reserves		Letter with Plans
Lands & Housing Regional Operations Division Omineca Region #308 - 1011 - 4th Avenue Prince George, B.C., V2L 3H9	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
Lands & Housing Regional Operations Division Peace Region #220 - 9900 - 100th Avenue Fort St. John, B.C., V1J 1Y3	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
Lands & Housing Regional Operations Division 172 North 2nd Avenue Williams Lake, B.C., V2G 1Z6	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
Parks & Outdoor Rec. Div. 101-1050 W. Columbia St. Kamloops, B.C. V2C 1L4	System Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
MINISTRY OF PROVINCIAL SECRETARY AND GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1V8	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments on Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES				
525 Superior Street Victoria, B.C., V8W 1H8	Chief Inspector of Mines	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check on ALR to be alienated. If none, do not submit plans. Compliance with the Act	Letter with Plans

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
		FEDERAL AGENCIES		
Fisheries & Oceans, Land Use Division, Habitat Protection Fraser River, Northern B.C. Yukon Division 202 - 317 Seymour Street Kamloops, B.C., V2C 3E9	Regional Habitat Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Fisheries & Oceans North Coast Division Habitat Protection Room 109, 417-2nd Ave., West Prince Rupert, B.C., V9R 5H7	Senior Habitat Management Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans
Canadian Coast Guard Transport Canada P. O. Box 10060 700 West Georgia Street Vancouver, B.C., V7Y 1E1	Senior Officer	Navigable Waters Protection Act	Compliance with Act	Letter with Plans
Dept. of Public Works Canada 1110 West Georgia Street Vancouver, B.C., V6E 3W5	Environ-mental Coord. Engineer	Environmental Impact	Relaying of Information for the Northern Package Jobs.	Northern Package Jobs Only. Letter with Plans
		REGION 5		
		PROVINCIAL AGENCIES		
MINISTRY OF ENVIRONMENT				
Box 3250, Courthouse 3793 Alfred Street Smithers, B. C., V0J 2N0	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)
Fish & Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.
Marine Resources 780 Blanshard Street Victoria, B.C., V8W 2H1	Director	Protection of Marine Resources (Oysters, Clams, etc.)	Effect on oyster beds, etc.	Letter with Plans
MINISTRY OF LANDS, PARKS AND HOUSING				
Parks & Outdoor Rec. Div. 3793 Alfred Avenue, 2nd Floor Smithers, B. C., V0J 2N0	Systems Planner	Jurisdiction Over Provincial Parks, Camp-grounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Reserves Unit 1019 Wharf Street Victoria, B.C., V8W 1X4	Director	Jurisdiction on Ecological Reserves		Letter with Plans

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
Lands & Housing Regional Operations Division Bag 5000 3793 Alfred Avenue, 2nd Floor Smithers, B.C., V0J 2N0	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
MINISTRY OF PROVINCIAL SECRETARY AND GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1X4	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments on Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES				
525 Superior Street Victoria, B.C., V8W 1H8	Chief Inspector of Mines	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check on ALR to be alienated. If none, do not submit plans. Compliance with the Act	Letter with Plans
FEDERAL AGENCIES				
Fisheries & Oceans North Coast Division Habitat Protection Room 109, 417-2nd Ave., West Prince Rupert, B.C., V9R 5H7	Senior Habitat Mgmt. Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Fisheries & Oceans, Land Use Division, Habitat Protection Fraser River, Northern B.C. Yukon Division 549 Columbia Street New Westminster, B.C., V3L 1B3	Senior Habitat Mgmt. Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans
Canadian Coast Guard Transport Canada P. O. Box 10060 700 West Georgia Street Vancouver, B.C., V7Y 1E1	Senior Officer	Navigable Waters Protection Act	Compliance with Act	Letter with Plans
Dept. of Public Works Canada 1110 West Georgia Street Vancouver, B.C., V6E 3W5	Environmental Coord. Engineer	Environmental Impact	Relaying of Information for the Northern Package Jobs.	Northern Package Jobs Only. Letter with Plans

REGION 6

PROVINCIAL AGENCIES

MINISTRY OF ENVIRONMENT				
2569 Kenworth Road Nanaimo, B.C., V9T 4P7	Regional Director			
Water Management Branch	Regional Manager	Hydraulic Studies Control and Licencing of all Flowing Water	Major effect on rivers or streams. Disruption of private works. Hwys through irrigation and Fire Protection Dists., minor stream diversion and bank protection	Letter, Application Form for Permit Plan (in triplicate)

	POSITION	FUNCTION OF AGENCY	REASON FOR CONTACT	METHOD OF CONTACT
Fish & Wildlife Branch	Regional Manager	Wildlife Protection (fencing) and Fish Protection (Fresh Water)	Construction of bridges, installation of culverts, diversion of all spawning streams, riprap bank protection	Letter with Plan
Waste Management Branch	Regional Manager	Control of all Waste Discharge to Land, Air and Water	Compliance with Pollution Control Act, 1976, Requires that all waste discharges to environment must be covered by Permit or Approval from Director	Letter outlining proposal with emphasis on environmental impact and subsequent application for permit or approval if it is determined that such is required by the Act.
Marine Resources Branch 780 Blanshard Street Victoria, B.C., V8W 2H1	Director	Protection of Marine Resources (Oysters, Clams, etc.)	Effect on oyster beds, etc.	Letter with Plans
MINISTRY OF LANDS, PARKS & HOUSING				
Parks & Outdoor Rec. Div. 203 - 190 Wallace Street Nanaimo, B. C., V9R 5B1	Senior Regional Planner	Jurisdiction Over Provincial Parks, Campgrounds, etc.	Highways through and servicing parks, camp sites, etc. Lookout sites	Letter with Plans
Lands Program Branch Ecological Reserves Unit 1019 Wharf Street Victoria, B.C., V8W 2Y9	Director	Jurisdiction on Ecological Reserves		Letter with Plans
Lands & Housing Regional Operations Division 851 Yates Street Victoria, B.C., V8V 1M1	Regional Director	General Environmental Coordination (Prov. Gov't.)	Information for Provincial Government Coordination purposes	Letter with Plans. List of Agencies contacted
MINISTRY OF PROVINCIAL SECRETARY & GOVERNMENT SERVICES				
Impact Assessment Section Heritage Conservation Branch 1016 Langley Street Victoria, B.C., V8W 1V8	Head	Preservation and Excavation of Archaeology and Heritage Sites	Conflicts of Highway Alignments and Archaeological and Historic Sites	Letter and Key Maps
MINISTRY OF ENERGY, MINES & PETROLEUM RESOURCES				
Inspection & Engineering Div. 525 Superior Street Victoria, B. C.	Chief	Engineering & Inspection	Location of Mine Shafts	Letter and Mosaic
B. C. AGRICULTURAL LAND COMMISSION				
4940 Canada Way Burnaby, B.C., V5G 4K6	Chairman	Enforcement of the Land Commission Act (Agricultural Land)	Check ALR's for project. If none, do not submit plans. Compliance with the Act	Letter with Plans
		FEDERAL AGENCIES		
Fisheries and Oceans South Coast Division Habitat Protection 60 Front Street Nanaimo, B.C., V9R 5H7	Senior Habitat Mgmt. Biologist	Salmon Protection and any Marine Life For coastal areas and river systems	Construction of bridges, installation of culverts and diversion of salmon spawning streams and riprap bank protection	Letter with Plans
Canadian Wildlife Service Habitat & Ecological Assess. 5421 Robertson Road Delta, B.C., V4K 3N2	Head	Canadian Wildlife Protection in Northern Regions and Migratory Bird Sanctuaries	Affect on Wildlife	Letter with Plans
Canadian Coast Guard Transport Canada P. O. Box 10060 700 West Georgia Street Vancouver, B.C., V7Y 1E1	Senior Officer	Navigable Waters Protection Act	Compliance with Act	Letter with Plans

CHAPTER 11

EXPLOSIVES

11.01 USE

**

The Ministry uses explosives for:

(1) Breaking drilled rock in highway cuts or quarries.
(2) Breaking oversize boulders.
(3) Ditching saturated ground.
(4) Displacing muskeg under embankments.
(5) Dislodging stumps from the ground.
(6) Loosening hard pan or gravel for easier excavation.
(7) Breaking log jams threatening bridges.
(8) Cutting off old piles under water.
(9) Cutting off danger trees.
(10) Breaking log or ice jams.
(11) Seismic detonations.
(12) Breaking boulders in drill holes.
(13) Avalanche Control.

11.02 STORAGE

1. GENERAL

Storage of explosives is regulated by the Federal "Explosives Act and Regulations".

All explosives used by the Ministry must be stored in a magazine licensed under the Explosives Act. (For exceptions see "Storing Small Quantities of Explosives", Section 11.02.4 of this Chapter).

2. LICENSES

1. Existing Magazines

The Chief Inspector of Explosives usually notifies the Ministry of the pending expiry of licenses, sending forms for application if the license is to be renewed. Expiry date is twelve months after issue for a temporary license, or December 31st of each year for permanent magazines. (Permanent magazines refers to vendors' magazines as opposed to users' magazines). Notify the Regional Highway Engineer if a new license is not received.

2. New Magazines

Applied for through the Regional Highway Engineer on forms available from him.

3. Temporary Magazines

Applications for temporary magazine licenses (user's license) should be submitted to: Explosives Division, Department of Energy, Mines and Resources, 580 Booth Street, Ottawa, Ontario, K1A 0E4.

** Amendment

3. MAGAZINES

1. General

A magazine must be a fire and burglar resistant building used for storing explosives specified on the license, only. It must be located a safe distance from habitation and roads, and must be posted with necessary signs in a manner required by the Explosives Act.

2. Construction and Location

Construction standards for magazines, with permissible location and other information, are specified in Department of Energy, Mines and Resources booklets, "Standards for Blasting - Explosives Magazines" and "Storage, Transportation, Destruction and sale of Blasting-Explosives and Detonators".

** 3. Rules for Magazines

1. The operation and maintenance of any magazine must be in accordance with "Part VIII Magazines For Explosives". (See appendix "C").

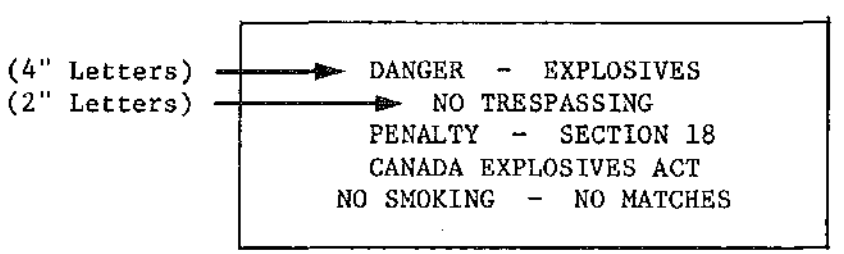
2. The following must be posted in any magazine:

    1. Part VIII Magazines For Explosives which is supplied with the license.

    2. Forms J, K and L of the license. (They may also be kept on file in the Maintenance Yard Office as an alternative).

    3. A "Special Instructions" card supplied with the license on which an Inspector of Explosives will indicate maximum limits.

3. A sign, shown below, may be displayed near the magazine. The sign should not be attached to the magazine but rather located along the normal approaches and out of the "line-of-fire" of the magazine. The signs should be posted in a manner that does not attract undue attention.



24" x 18"
RED ON WHITE
NOT REFLECTORIZED

** Amendment

4. Record of Receipts and Issues - A strict account must be kept of all explosives received by a magazine, and care taken that the maximum stock is within the limit allowed by the license. When withdrawals are made for use by shot firers, the number and kind of cases or sticks, and th number of detonators given out and returned must be checked against the amount used so all explosives are accounted for. All shortages must be reported immediately to the nearest R.C.M.P. Detachment.

4. Storing Small Quantities of Explosives

While existing regulations permit unlicensed storage of up to 75 kg of blasting-explosives and/or 100 detonators in separate "detached stores" or "suitable receptacles" as defined in Part XIII regulations, it is recommended that such storage take place only in facilities constructed in accordance with "Standards for Blasting-Explosives Magazines" and located in accordance with the table of safety distances. Plans for "Type 6" receptacles suitable for such storage are available from the explosives division, Department of Energy, Mines and Resources.

Such unlicensed facilities shall be suitably marked with "EXPLOSIVES" signs of appropriate size displayed in a manner that does not attract undue attention. Reference Appendix D

A detached store means:

(1) A building well and substantially constructed of brick, stone, concrete, or other fire resistant substance, such as wood covered or treated with fire resistant material. Reference Appendix C

(2) A bin, substantially and well constructed of 2" planking and covered or treated with fire resistant material.

5. Storing Safety Fuse

Safety fuse or safety fuse assemblies must not be kept with detonators, but may be stored in the dynamite magazine or in an unlicensed building with a low fire risk.

11.03 CONVEYANCE OF EXPLOSIVES

1. GENERAL

The movement of explosives is governed by:

1. Rail - Board of Transport Commissioners for Canada, Regulations under the Railway Act. (See Appendix A.)

2. Vessel - Canada Steamship Act. Shipping Regulations P.C. 1954 - 1811. (Contact Steamship Inspection Service, 700 West Georgia Street, Vancouver.)

3. Aircraft - The Aeronautics Act (Canada P.C. 1960 - 1772). (No passenger except the representative of the owner of the explosive is to be carried.)

Regulations on shipment must be carried out to the last detail.

In particular, dangerous articles must be properly declared and labelled before presentation for shipment by Public carrier.

Introducing undeclared dangerous goods to a train, vessel (including ferries), or aircraft, is a serious criminal offence.

Note that "Explosives" under the Aeronautics Act, covers materials other than dynamite (Oxygen tanks, etc.) and the regulations on labelling and preparation of bills must be meticulously investigated and observed in cooperation with the carrier's agent.

4. Other means - Trucks, small boats, etc. (See Appendix C).

2. TRANSPORTATION BY ROAD

Transportation must be in accordance with federal regulations (See Appendix B).

REMINDERS

Quantities of explosives moved by road must be securely stowed to eliminate movement by jolting. The body must have a tight wooden floor with sides and ends, and the explosive must be covered with a fire resistant tarpaulin. Smaller quantities may be carried in a timber box secured within the truck body.

Detonators must not be carried in the same vehicle as dynamite or stumping powder without a partition of wood, 15 cm thick, separating the detonators from the other explosive. Even so, the total number of detonators and electric blasting caps must not exceed 5,000 No. 6 or their equivalent.

No other goods of a dangerous or easily combustible nature, such as matches, oils, gasoline, etc., may be conveyed in a vehicle carrying explosives.

Smoking on, in, or while attending a vehicle transporting explosives is not permitted.

Passengers, other than those essential to the loading and unloading of explosives, must not be carried.

Halts near occupied buildings are prohibited and the driver, or the person responsible for the load, must attend the vehicle at all times.

The vehicle must be mechanically sound.

A vehicle transporting explosives shall be operated at a speed that conforms to all local traffic laws, ordinances and bylaws and that is consistent with road and weather conditions. In no case shall such a vehicle be operated at a speed in excess of 90 km miles per hour.

If over 25 kg of explosives is being transported, the vehicle must bear "EXPLOSIVES" signs, front, rear, and on both sides in letters at least 15 cm high of red luminous paint on a contrasting background.

The transportation of explosives through the George Massey Tunnel is prohibited, except blasting caps or igniters; not more than 100 caps.

Reference
Appendix B

11.04 BLASTING

1. GENERAL

Blasting may be carried out with safety fuse, electricity, and by detonating fuse. Safety fuse conveys flame at a uniform rate to a detonator cap. Electrical blasting fires a charge by a current through leads to an electric blasting cap. Detonating fuse (primacord) is initiated by detonators or electric blasting caps and conveys the detonation to the explosive charges.

2. POWDERMEN - BLASTERS

Under no circumstances shall any employee be given responsible charge of handling explosives or blasting unless he is, in the opinion of the District Official, fully competent to do so.

Ref. 1
Sec. 46.02

No person shall conduct, or be allowed to conduct a blasting operation, including the preparing, fixing and firing of charges, and the handling of misfires, unless he is the holder of a valid blaster's certificate issued by the Workers' Compensation Board. A blaster's certificate should be in his possession at all times. Details of Certificates of Highway Blasters must be recorded at the District Office.

Ref. 1
Sec. 46.04

3. HELPERS

A blaster may be assisted by reliabe persons not holding licenses but the blaster shall have full authority over them and shall exercise continuous visual supervision over them and be responsible for their work.

4. WARNING BEFORE BLASTING

Before blasting, every blaster shall ensure that sufficient warning is given in every direction and shall ensure that all persons have reached a place of safety. Suitable cover shall be provided for protection and workmen shall use it.

The blaster shall ensure that a signalling device, of a type distinct from other signalling devices in the area, is provided and is used to give warning, in accordance with the following procedure:

1. Preceding the blast, twelve short whistle signals shall be sent at one second intervals.

2. Two minutes shall elapse after the last warning signal before the explosive is detonated.

3. Following the blast and after the area has been found safe, one continuous whistle signal of fifteen seconds duration shall be sounded, to signify that permission is granted to return to the blasting area.

Ref. 1
Sec. 46.112

In addition, men with red flags must be stationed at a safe distance on all roads, trails or other access to the site of the blast. They must stop all persons approaching the danger zone until the "All Clear" signal is given.

** 5. SIGNS ERECTED WHEN BLASTING NEAR ROADWAYS IN PUBLIC USE

C-10 BLASTING ZONE, SHUT OFF YOUR RADIO TRANSMITTER (400 m in advance)

C-12 END OF BLASTING ZONE (300 m past)

C-28 FLAGPERSON SILHOUETTE

6. MISFIRES

No one shall be allowed to approach a misfire for at least thirty minutes when using a safety fuse or for at least ten minutes when blasting electrically.

Ref. 1
Sec. 46.124
46.126
46.128

Missed shots must be detonated with new explosives and detonators. They must not be dug out.

7. AMMONIUM NITRATE PRILL, etc.

Mixing of Ammonmium Nitrate with fuel oil or other material to form an explosive must take place only under the authority of written permission granted by the Chief Inspector of Explosives.

Because of high voltages created by air flow, holes which are filled by air must not be primed with electric caps.

** Amendment

APPENDIX "A"

Extracts from
BOARD OF TRANSPORT COMMISSIONERS FOR CANADA REGULATIONS
for the
Transportation of Explosives and Other Dangerous Articles by Freight, and Specifications for shipping containers Tariff C.T.C. NO. 2, R.A.C. No. 2.

RAILWAY ACT

Section B (1)

The Railway Act of 1919 requires the shippers of explosives and other dangerous articles to describe, pack and mark his packages properly, and to inform the agent of the carrier of the true character of their contents. Heavy penalties are provided for the shipper who knowingly solicits the transportation of any explosives or other dangerous article without complying with these requirements, as well as for the carrier that knowingly accepts and transports them.

Section B (2)

No person may, under any circumstances, offer any shipment of explosives for transportation on any passenger car, in violation of the Railway Act of 1919. No person or carrier may accept for shipment by rail, or so transport any explosives or other dangerous articles as defined herein pursuant to the Act, on any railroad car before written notice of the true character of the article is given the carrier, without being subject to the penalties of the act.

CHANGES IN THE REGULATIONS
Shippers by Carriers by Rail

Section C (1)

Changes in and additions to the regulations usually result from new information or altered conditions, and proposals will be considered by the Board upon its own motion or upon application made by any interested party. The services of the bureau for the safe transportation of explosives, and other dangerous articles, hereinafter called Bureau of Explosives, may be utilized by the Board in the Execution of its provisions. This Bureau will make inspections and conduct investigations and will confer with manufacturers and shippers with a view to determining what regulations will with reasonable limits afford the highest degree of safety in preparing and packing explosives and other dangerous articles for transportation by carriers by rail. The Board will give due weight to the expert opinions thus obtained. Reports of these investigations will be made to the Board with recommendations.

Section C (2)

Specifications for shipping containers, methods of packing for shipment, and other regulations, will be considered and prescribed from time to time by orders effective as conditions may appear to warrant.

REGULATIONS APPLYING TO SHIPPERS

Purpose of the Regulations

Section 10 (a)

To promote the uniform enforcement of law and to minimize the dangers to life and property incident to the transportation of explosives and other dangerous articles by carriers engaged in commerce by rail, these regulations are prescribed to define these articles for transportation purposes and to state the precautions that must be observed by the shipper in preparing them for shipment by rail freight. It is the duty of each such shipper to make the prescribed regulations effective and to thoroughly instruct employees in relation thereto.

Section 10 (b)

Explosives and other dangerous articles may be offered to carriers for transportation provided the articles are in proper condition for transportation, are as defined, and are packed, marked, labeled, described, certified, and otherwise as provided for herein for acceptable articles for transportation by rail freight. Articles must be loaded and stayed according to regulations herein applying to carriers by rail. Methods of manufacture, packing and storage, in so far as they affect safety in transportaton, must be open to inspection by a duly authorized representative of the initial carrier or of the Bureau of Explosives. Shipments that do not comply with these regulations must not be offered for transportation.

Section 402 (n)

EMPTY LABEL as described in Sec. 404 (r) must be applied to containers which have been emptied and on which the old label has not been removed, obliterated or destroyed. It must be so placed on the container as to completely cover the old label.

Section 402 (p)

Labels and marking name of contents are not required on carload quantities of dangerous articles by rail freight, when such shipments are unloaded by the consignee or his duly authorized agent from the car in which originally loaded.

Section 402 (q)

When it is known that subsequent shipments of these packages may be made by consignees in less than carload or in carload quantities to a point where they may be handled by other than the original consignee, the original shipper should attach labels to the packages as would be required for less-than-carload shipment.

Section 417 SHIPPING ORDER AND BILL OF LOADING DESCRIPTION

The shipper when offering for transportation by carriers by rail freight any Class A, Class B or Class C explosive, inflammable liquid, inflammable solid, oxidizing material, corrosive liquid, compressed gas, or poison, as defined by these regulations, must describe such article in the shipping order, bill of lading or other shipping paper by the shipping name used herein (see commodity list) and may add a further description not inconsistent therewith. Abbreviations must not be used. For shipments of blasting caps the shipper must, in addition, show the number of caps in the shipment.

(NOTE: In commodity list shipping names are shown in roman, not italics).

LABEL OR PLACARD NOTATION

Section 418

The Shipping order, bill of lading or other shipping paper must also show thereon in conection with the entry of the article as prescribed in Section 417, the color kind of label applied, and for cars containing such articles loaded by the shipper, requiring placards the kind of placard applied to the car.

Section 421 CERTIFICATE

The shipper offering for transportation by carriers by rail freight any Class A or Class B explosive and blasting caps or electric blasting caps in any quantity, and any inflammable liquid, inflammable solid, oxidizing materials, corrosive liquid, compressed gas, or poison, requiring labels, or carloads requiring placards, as prescribed by these regulations, must show on the shipping order, bill of lading, or other shipping paper, in the lower left-hand corner, the following certificate over the written or stamped fascimile signature of the shipper or his duly authorized agent:

(This is to certify that the above articles are properly described by name, and are packed and marked and are in proper condition for transportation according to the regulations prescribed by the Board of Transport Commissioners of Canada).

APPENDIX "B"

Extracts from
EXPLOSIVE ACT AND REGULATIONS

PART VI - TRANSPORTATION BY ROAD AND PRIVATE RAILWAY

48. In this Part,

"carrying capacity", in respect of a vehicle, means the gross vehicle weight rating (manufacturer's rating) of the vehicle less the aggregate of the weight of the unloaded vehicle and the weight of all necessary equipment, fuel and tires;

"Explosives Transportation Permit" means a permit issued by the Minister pursuant to section 52;

"net explosives quantity" means the total net weight of explosive and pyrotechnic substances contained within a package of explosives excluding the weight of any case, contrivance, box, wrapper, packaging or package;

"semitrailer" means a vehicle towed by a truck tractor and so constructed that some part of its weight rests upon the truck tractor;

"truck tractor" means a vehicle designed and used for towing other vehicles and not so constructed as to carry a load other than a part of the weight of the vehicle and load so towed. SOR/80-488, s.1.

49. Subject to subsections 51(2) and (3), no operator of a vehicle shall at any time transport or permit the transportation of explosives by means of the vehicle with a load that weighs in excess of 80 per cent of the carrying capacity of the vehicle. SOR/80-488, s.2.

50. No person shall transport explosives by any railway to which the Railway Act does not apply except in accordance with the Regulations for the Transportation of Dangerous Commodities by Rail.

51. (1) Subject to subsection (2), the maximum net explosives quantity of explosives that may be transported by means of any vehicle without an Explosives Transportation Permit is 2000 kilograms.

(2) A vehicle may be used without an Explosives Transportation Permit to transport any quantity of explosives where the load the vehicle is carrying does not exceed its carrying capacity and the explosives so transported are exclusively any of the following explosives;

(a) nitrocellulose of Division 2, Class 3, when wetted with water or alcohol in the proportions of not less than 1 kilogram of water or alcohol to 4 kilograms of dry nitrocellulose;

(b) ammunition of Division 1, Class 6;

(c) manufactured fireworks of Division 2, Class 7; or

(d) solid propellants that, in the opinion of the Minister, constitute a mass fire risk but only a moderate explosion risk. SOR/80-488, s.3.

52. (1) The Minister may issue an Explosives Transportation Permit in respect of a vehicle to the operator of the vehicle applying therefor for the transportation by that vehicle of explosives of a net explosives quantity in excess of 2 000 kilograms but not in excess of 5 000 kilograms.

(2) Notwithstanding the limitation set out in subsection (1), the Minister may issue an Explosives Transportation Permit in respect of a vehicle to the operator of the vehicle applying therefor for the transportation by means of that vehicle, at different times, of

(a) Explosives of Class 1 or 3 or any combinations of Class 1, 2 and 3 of a net explosives quantity in excess of 5 000 kilograms but not in excess of 20 000 kilograms, but each Explosives Transportation Permit issued under this paragraph shall restrict the transportation of such quantities of explosives to isolated highways designated in the Explosives Transportation Permit; or

(b) explosives of Class 2 and detonating cord of Division 2 of Class 3 of core weight not exceeding 13 grams per metre, of an aggregate net explosives quantity in excess of 5 000 kilograms but not in excess of 20 000 kilograms.

(3) The Minister may, in respect of a vehicle that complies with the standards set out in Schedule III, issue an Explosives Transportation Permit that authorizes the transportation of any quantity of explosives, subject to the limitations set out in subsections (1) and (2), by means of the vehicle while the vehicle is carrying a load not exceeding its carrying capacity. SOR/80-488, s.3.

53. Every application for an Explosives Transportation Permit in respect of a vehicle shall be made by the operator of the vehicle on Form 18 set out in Schedule II and shall set out the information required by that Form and, in the case of an application for an Explosives Transportation Permit referred to in subsection 52(3), shall be accompanied by a statement of a mechanic qualified in the province in which the vehicle is licensed to the effect that the vehicle complies with the standards set out in Schedule III. SOR/80-488, s.3.

54. Notwithstanding anything in these Regulations, no person shall transport nitroglycerine or ethylene glycol dinitrate in any vehicle in any quantity, except within a licensed factory, without having first obtained written authority from the Chief Inspector for such transport.

55. Notwithstanding anything in these Regulations, no person shall transport any explosive that is not an authorized explosive or any explosive that is damaged or deteriorated without the consent of an inspector.

56. No person shall transport explosives in any towed vehicle or tow any vehicle transporting explosives without the written authority of the Chief Inspector, except that explosives may be transported in a semi-trailer when attached to a truck tractor subject to all other conditions, limitations and restrictions in this Part.

57. (1) Subject to subsection (2), no person shall transport any explosives in a vehicle carrying public passengers.

(2) A quantity not exceeding 3 kilograms of explosives included in Division 1 of Class 6 (safety cartridges) or Division 2 of Class 7 (fireworks) may be carried in a vehicle carrying public passengers.

58. No person shall forward a consignment of explosives to a warehouseman or carrier unless

(a) he gives notice to each warehouseman and carrier who will receive or carry the explosives prior to their delivery to the consignee of the name and quantity of the explosives proposed to be forwarded and the name and address of the proposed consignee; and

(b) he has received notice from the warehouseman or carrier to whom he proposes to deliver the explosives of the time at which the warehouseman or carrier is prepared to receive the consignment.

59. A warehouseman or carrier shall not state that he is prepared to receive a consignment of explosives nor shall he receive such consignment, unless he is prepared forthwith to despatch the consignment or to deposit the explosive in a magazine or store duly licensed or authorized for the keeping of such explosives.

60. The owner or operator of a vehicle shall not receive a consignment of explosives unless he has before receiving the consignment
(a) given notice to the owner of a magazine of the time at which he is prepared to deliver the consignment to the magazine; and
(b) received from such owner or operator of the magazine confirmation that he is prepared to receive such consignment at or about the time specified in the notice.

61. The driver of a vehicle shall, while explosives are being transported thereon, have in his possession
(a) one of the following documents:
(i) a manifest, memorandum receipt, bill of lading, shipping order or other document marked with the words "EXPLOSIVES - EXPLOSIFS" and indicating the names and addresses of the vendor and purchaser, the consignor and consignee and the name and quantity of the explosives being transported,
(ii) a Purchase and Possession Permit, or
(iii) where the explosives are being transported from a temporary magazine operated by the driver or his employer to a blasting site, a statement of the quantity, brand name, strength and cartridge size of each explosive and the purpose for which the explosives are being transported.

(b) a valid registration certificate for the vehicle, issued by an authorized provincial or territorial agency, and

(c) where the vehicle is not being driven by the owner, a document signed by the owner naming the persons authorized to drive and accompany the vehicle,

and shall, when requested, produce the documents referred to in paragraphs (a) to (c) for inspection by an inspector or by a peace officer as defined in section 2 of the Criminal Code.

62. Transportation of explosives in any vehicle is subject to the following conditions:

(a) no explosive of Class 5 (fulminate), of Division 3 of Class 6 (ammunition) or of Class 7 (firework) shall be transported in the same vehicle with any explosive not of the class or division to which it belongs, unles it is sufficiently separated therefrom to prevent any fire or explosion that may take place in one such explosive from being communicated to another; detonators and electric detonators of Division 3 of Class 6 (ammunition) shall be deemed, for the purpose of this paragraph, to be sufficiently separated from an explosive of another class or division if
(i) the detonators and electric detonators are packed in accordance with Part V,
(ii) the total number of detonators and electric detonators does not exceed 5000 No. 6 detonators or their equivalent, and
(iii) the detonators and electric detonators are separated from other explosives by a solid partition of wood 15 centimetres thick and extending at least 15 centimetres above the highest level to which explosives are packed in the vehicle;

(b) the portion of the vehicle in which explosives are transported shall be a fully enclosed, locked, fire resistant van, tank, fixed container or compartment;

(c) no iron or steel shall be in the interior of the portion of the vehicle where te explosive is deposited, unless the iron or steel is covered either permanently or temporarily with leather, wood, tarpaulin or other suitable material;

(d) no heater or light shall be in the interior of the portion of the vehicle where the explosive is deposited without the written authorization of an inspector, but where the explosive is deposited in the portion of the vehicle occupied by the operator thereof, no such written authority is required for a heater and lights fitted for the comfort and convenience of the operator;

(e) no matches other than safety matches shall be carried in any vehicle containing an explosive, and such safety matches shall be kept in a safe place apart from the explosive; and

(f) due precautions shall be taken by means of a partition or otherwise and by careful stowing, to secure the explosive from being endangered by any other article or substance transported in the vehicle.

63. The following conditions shall be observed in the loading, unloading, maintenance and operation of vehicles used in the transportation of explosives:

(a) All persons engaged in the loading or unloading of explosives in or from a vehicle, or in the operation of a vehicle carrying explosives, shall observe all due precautions to prevent accidents resulting in fire or explosion and to prevent unauthorized persons from gaining access to the explosives, and all such persons shall abstain from any act that tends to cause fire or explosion and that is not reasonably necessary for the loading, unloading or operation of the vehicle and shall take all reasonable steps to prevent others from committing any such act in the vicinity of the vehicle or the explosives;

(b) After the operation of loading or unloading of explosives in or from any vehicle is commenced, the operation shall not be stopped until completed and it shall be completed as expeditiously as possible;

(c) No bale hooks or other metal tools shall be used for the loading, unloading or other handling of packages containing explosives nor shall any package or container of explosives be thrown or dropped during loading or unloading;

(d) The engine of a gasoline or oil-driven vehicle shall not be run during the loading or unloading of explosives;

(e) The ignition of a gasoline or oil-driven vehicle shall be turned off and the brakes set when a vehicle carrying or containing explosives is parked;

(f) Gasoline or oil-driven vehicles used for the transportation of explosives shall be inspected daily to ascertain that:

(i) the fire extinguishers are filled and in working order,
(ii) the electric wiring is completely insulated and firmly secured,
(iii) the fuel tank and feed lines have no leaks,
(iv) the chassis, engine, pan and bottom of the body are clean and free from surplus oil and grease,
(v) the brakes and steering apparatus are in good condition, and
(vi) the spare tire and wheel are in a fixed position.

(g) Vehicles used for the transportation of explosives shall be in sound mechanical condition in all respects and suitable for and capable of safely transporting explosives;

(h) Explosives shall not be loaded on or in a motor vehicle unless the vehicle has been fully serviced;

(i) The fuel tank of a vehicle carrying or containing an explosive shall not be filled except in case of necessity, in which case the engine shall be stopped, the ignition shut off and the tank filled only at a place where filling is not a danger to the public safety;

(j) Smoking on, in, or while attending any vehicle carrying or containing an explosive is prohibited;

(k) The driver or operator of any vehicle carrying or containing an explosive shall not drive or conduct the same in a dangerous or reckless manner, and a person who is impaired shall not have charge of any such vehicle and shall not be permitted to be in, on or attend the vehicle;

(l) The driver or operator of a vehicle carrying or containing an explosive shall not stop unnecessarily or for a longer period than is reasonably required; stops at places where the public safety would be endangered shall be avoided;

(m) Routes passing through centres of habitation shall, as far as possible, be avoided;

(n) Due provision shall be made to prevent the introduction into a vehicle of fire, matches or any substance or article likely to cause explosion or fire, or any iron, steel or grit that may come into contact with an explosive; this paragraph does not prevent the introduction of an artificial light of a construction or character, or of safety matches of a character that will not cause any danger of fire or explosion;

(o) Subject to paragraph (p), on any vehicle carrying or containing explosives weighing in excess of 25 kilograms the word "EXPLOSIVES" or, in the case of manufactured fireworks only of Division 2, Class 7, the word "FIREWORKS" shall be displayed painted in luminous paint in letters not less than 15 centimetres in height on a contrasting background so that the word "EXPLOSIVES" or the word "FIREWORKS", as the case may be, is plainly visible from the front and rear and from both sides of the vehicle, but such markins shall not be displayed when no explosives are carried or contained in the vehicle;

(p) Paragraph (o) does not apply when the explosives carried are exclusively safety cartridges or safety fuses included in Division 1 of Class 6;

(q) Every vehicle transporting more than 25 kilograms of explosives shall be equipped with a fire extinguisher in working order, is located in the vehicle in such manner as to be readily available for use at all times and has a rating, as determined in accordance with National Standard System CAN 4-S508-76 of at least 5-B.C.;

(r) Each vehicle transporting explosives shall be in the exclusive charge of a licensed driver, 18 years of age or over, who shall not leave the vehicle unattended;

(s) Where a vehicle transporting or containing explosives is parked over night,

(i) the premises in which the vehicle is parked

(A) shall not be used for any other purpose that might give rise to the presence therein of an open flame, matches or any substance or article likely to cause explosion or fire; and

(B) shall be reasonable distance from any habitation or storehouse containing articles of an inflammable nature, and

(C) the vehicle shall, at all times, be attended by a person who is 18 years of age or over and capable of looking after the vehicle;

(t) When there is a convoy of two or more vehicles transporting explosives, where practicable, a space of at least 300 metres shall be maintained between each such vehicle;

(u) Vehicles transporting explosives shall not be driven past fires of any kind burning on or near the highway or other thoroughfare unless it has been ascertained that such passing can be made with safety;

(v) Where it is necessary to keep a motor vehicle transporting explosives moving on the road for a period in excess of ten hours, two licenced drivers, 18 years of age or over, shall accompany the vehicle;

(w) A vehicle transporting explosives shall be operated at a speed that conforms to all local traffic laws, ordinances and bylaws and that is consistent with road and weather conditions but in no case shall such a vehicle be operated at a speed in excess of 90 kilometres per hour;

(x) Subject to subsection 57(2), no passengers other than persons assigned to assist in handling explosives shall be permitted on a vehicle transporting explosives;

(y) The driver or operator of a vehicle transporting explosives shall:

(i) before crossing any railroad track protected by an automatic signal device, reduce the speed of the vehicle and establish that the crossing can be made in safety, and

(ii) before crossing any railroad track that is not protected by an automatic signal device, or before crossing any main highway, bring the vehicle to a full stop and proceed only when the way is safely clear; and

(z) No more than 75 kilograms of explosives shall be carried in a vehicle primarily designed for the carriage of passengers and their baggage.

64. (1) Where a vehicle transporting explosives is involved in an accident, fire or any other occurrence that causes a significant delay in delivery of the explosives or damage to the vehicle or explosives, the driver or operator of the vehicle shall

(a) comply with all requirements of provincial or municipal laws relating to highway accidents;

(b) immediately notify the nearest Royal Canadian Mounted Police detachment or nearest provincial or municipal police officer;

(c) notify the owner of the vehicle who shall, if the explosives have not been damaged, arrange for their immediate transportation to the destination to which they were being transported or to a suitable place for storage until they can be transported to that destination or, if they have been damaged, arrange for their immediate transportation to a place designated by an inspector,; and

(d) notify the Chief Inspector of the circumstances attending the accident.

(2) Where a vehicle transporting explosives breaks down, the driver of operator shall

(a) make or permit to be made minor repairs if the repairs can be made without hazard;

(b) where major repairs are required, prevent such repairs being made until the explosives are transferred to another vehicle or are removed from the vehicle and placed under proper security at a safe distance from the highway and at least 300 metres from any inhabited premises; and

(c) notify the Chief Inspector of the circumstances attending the breakdown.

65. In addition to all other requirements respecting transportation of explosives by road under these Regulations, the operator of a vehicle to whom an Explosives Transportation Permit has been issued shall, when transporting more than 2000 kilograms of explosives, observe the following conditions:

(a) the Explosives Transportation Permit or a photocopy thereof shall be carried at all times in the vehicle for which it is issued and shall be produced when requested by an inspector or by a peace officer as defined in section 2 of the Criminal Code;

(b) at least two persons shall accompany the vehicle, one of whom shall be a licensed driver, 21 years of age or over, and the other his helper who shall be 18 years of age or over, but a helper is not required to accompany a vehicle transporting bulk Class 2 explosives out of a factory if

(i) the vehicle is operated only within a 50 kilometres radius of the factory,
(ii) the vehicle is equipped with a two-way telephone system of sufficient range for the radius of operation of the vehicle,
(iii) the two-way radio telephone at the factory is constantly attended while the loaded vehicle is away from the factory
(iv) the serial number of the vehicle appears on the factory licence, and
(v) a licensed driver with a vehicle at his disposal is on hand at the factory to render assistance if called;

(c) where it is necessary to keep the vehicle moving on the road for a period in excess of 10 hours, two licensed drivers, 21 years of age or over, shall accompany the vehicle;

(d) the vehicle shall be equipped with two fire extinguishers that are in good working order, are located and attached to the vehicle in such manner as to be readily available for use at all times and have a rating, as determined in accordance with National Standard System CAN 4-S508-76 of at least 10B.C.;

(e) no other goods, materials, or articles shall be transported in the same vehicle with explosives without written approval of the Chief Inspector;

(f) no explosives of Division 3 of Class 6 shall be transported in the same vehicle with any explosive of another class or of another division of Class 6 except which shall be so transported subject to the following conditions:

(i) the electric detonators shall be packed in accordance with Part V,
(ii) the total number of electric detonators shall not exceed 5000, and
(iii) the packages of electric detonators shall be contained within a completely enclosed container or compartment conforming in construction and accessibility to the standards set out in Schedule IV;

(g) the tires with which the vehicle is equipped shall be of a rated capacity equal to or greater than the gross weight of the vehicle when loaded, shall be in good, serviceable condition and shall not be worn smooth, regrooved or evidently defective;

(h) no part of the fuel tank, intake pipe or discharge shall be located in, under, beside or over the cargo section of the vehicle without written approval of the Chief Inspector;

(i) all fuel tanks shall be equipped with a nonspill type air vent and shall be equipped with fusible safety vents designed to prevent a pressure rise under fire conditions;

(j) all fuel lines shall be equipped with suitable shut-off valves or automatic devices to prevent free fuel flow in the event of a broken fuel line; and

(k) no operator shall drive or allow to be driven a vehicle containing explosives unless the load of the vehicle is evenly distributed between the load-bearing axles. SOR/80-488, s.4.

66. Where the operator of a factory or magazine reasonably believes that the transportation of explosives in a vehicle would violate any provision of the Act or these Regulations or any term or condition of an Explosives Transportation Permit, he shall not delivery explosives to the driver of the vehicle.

APPENDIX "C"

extracts from
EXPLOSIVES ACT AND REGULATIONS

PART VIII - MAGAZINES FOR EXPLOSIVES

87. (1) The terms of a license for a magazine shall be strictly observed, and the keeping or any work connected with the keeping of explosives shall not be carried on except in accordance with those terms.

(2) Every magazine:
(a) shall be used only for the keeping of such explosives as may be specified in the licence and of receptacles for the tools or implements for work connected with the keeping of such explosives; and

(b) shall have a door of solid construction securely hung, which, except when it is required to be open for the receipt or issue of explosives or other necessary purpose, shall be securely locked.

88. The operator of a licensed magazine may store and have in his possession authorized explosives to which his licence applies.

89. When an explosive of Class 5 (fulminate) is kept in a magazine, no explosive of any other class shall be kept in that magazine.

90. When two or more explosives are kept in the same magazine they shall be separated from each other by an intervening partition of such substance and character as will effectually prevent explosion or fire in one communicating with the other, except that
(a) The various explosives of Classes 1, 2, 3, 4, safety fuse belonging to Division 1 of Class 6, and such of the various explosives of Division 2 of Class 6 as do not contain any exposed iron or steel may be kept with each other without any intervening partition;

(b) The various explosives of Division 1 of Class 6 may be kept with each other without any intervening partition;

(c) Such of the various explosives of Division 2 of Class 6 as contain any exposed iron or steel may be kept with each other without any intervening partition;

(d) The various explosives of Division 3 of Class 6 may be kept with each other without any intervening partition; and

(e) The various explosives of Class 7 may be kept with each other without any intervening partition.

91. A building in which explosive is kept or present shall, unless specially exempted by the licence or by an order of an inspector, be deemed to be a danger building, and the interior of every such bulding, and the benches, shelves and fittings in such building shall be so constructed or so lined or covered as to prevent the exposure of any iron or steel and the detachment of any grit, iron, steel or similar substance in such manner as to come into contact with the explosive in such bulding, and such interior, benches, shelves and fittings shall, so far as is reasonably practicable, be kept clean and free from grit; except that so much of this section as applied to the exclusion of grit, iron or steel does not apply in a building in which no explosive of Division 1 of Class 6 (ammunition) is kept.

92. Charcoal, whether ground or otherwise, oiled cotton, oiled rags or oiled waste, or any articles liable to spontaneous ignition, shall not be taken into any danger building except for the purpose of immediate supply and work or immediate use in such building, and upon the cessation of such work or use shall be forthwith removed.

93. Before repairs are done to, or in any room in or other part of, a danger building, that room or part shall, so far as is practicable, be cleaned by the removal of all explosive, and by the thorough washing of such room or part; such room or part of the building, after being so cleaned shall be deemed not to be a danger building within the meaning of the Part until explosive is again taken into it; and during the time that such room or part of the building is so deemed not to be a danger building within the meaning of this Part a person employed to make such repairs may, notwithstanding anything in this Part, have matches in his possession in such room or part of the building if the work to be done by him requires the use of matches and if he holds a permit, signed by or under the authority of the operator of the magazine, authorizing him to have matches in his possession in such room or part of the building.

94. The Minister may, in writing, impose such conditions or restrictions as he deems necessary in respect of any particular magazine under this Part and he may, subject to such conditions as he may think expedient, waive any requirement under this Part in respect to any particular magazine.

95. The operator of a magazine shall constantly keep affixed in every danger building, either outside or inside, in such a manner as to be easily read, a statement of the quantity of explosive allowed to be in the building, a copy of this Part, a copy of any portions of the Act required by the Minister to be so affixed, such part of the licence as applies to the buildings and a copy of all conditions and restrictions imposed by the Minister under this Part with reference to that building, and the operator shall also suitably place in or near the site of the magazine, notices giving warning against trespassing on the property which notices shall include the terms of Section 18 of the Act.

96. All tools and implements kept or used in a danger building shall be made only of wood, copper, brass or some soft metal or material, or shall be covered with some safe and suitable material.

97. No person shall have in his possession a match or other fire-producing device in any part of a magazine except in such part, if any, as may be allowed by the Minister under this Part.

98. Due provision shall be made, by the use of suitable working clothes without pockets and suitable shoes and by searching and otherwise, as by some

all of such means, to prevent the introduction into any danger building of fire, matches, or any substances or article likely to cause explosion or fire, and to prevent the introduction of any iron, steel, or grit into any part of a danger building where it would be likely to come into contact with explosive; and in the case of a magazine in which any explosive that is liable to be dangerously affected by water is kept, due precautions shall be taken to exclude water from such magazine; but this section does not prevent the introduction of an artificial light of such construction, position, or character that will not cause any danger of fire or explosion; and so much of this section as applies to the exclusion of iron, steel, or grit does not apply in a magazine in which no explosive other than explosive of Division 1 of Class 6 (ammunition) is kept.

99. No person shall smoke in any part of a magazine, except in such part, if any, as may be allowed by the Minister under this Part.

100. Any vehicle or receptacle in which explosive is conveyed from one building to another in a magazine, or from any building to any place outside of a magazine shall, unless specially exempted by the licence or by an order of an inspector, be constructed without any exposed iron or steel in the interior thereof, and shall convey only the explosive, and shall be closed or otherwise properly covered over; and the explosive shall be so conveyed with due diligence and with such precautions and in such manner as will sufficiently guard against any accidental ignition or explosion; except that so much of this section as applies to the exclusion of iron or steel does not apply to a vehicle or receptacle in which no explosive other than explosive of Division 1 of Class 6 (ammunition) is conveyed.

101. A person under the age of 16 years shall not be employed in or enter any danger building, except in the presence and under the supervision of some responsible person over the age of 21 years.

102. On the approach of a thunderstorm the magazine, if open, shall be closed, and every person in or about the magazine shall be withdrawn therefrom for the duration of the storm.

103. (1) The operator of a licensed magazine shall, with respect to explosives other than fireworks and safety cartridges, keep the following records:

(a) a record of the quantity of each explosive received, containing,
- (i) the brand name
- (ii) the strength,
- (iii) the cartridge size,
- (iv) the name and address of the person from whom the explosive was acquired,
- (v) the designation of the magazine where the explosive is being stored, and
- (vi) The date the explosive was received;

(b) a record of each explosive in his possession, which shall contain the information set out in subparagraphs (a)(i) to (iii) and (v);

(c) except where the magazine is a temporary magazine, a record of the quantity of each explosive issued from the magazine containing
- (i) the name and business address of each purchaser or consignee,
- (ii) any one of the following numbers:
  - (A) the federal magazine licence number,
  - (B) the provincial or territorial magazine licence or permit number, or
  - (C) the Purchase and Possession Permit number of each purchase of consignee
- (iii) the destination to which each shipment of the explosive is being sent,
- (iv) the method of transport of each shipment of the explosive, including the security seal number where applicable,
- (v) the manifest, bill of lading or shipping order number for each shipment of the explosive,
- (vi) the quantity, brand name, strength and cartridge size of the explosives in the shipment,
- (vii) the name, residential address and signature of the person taking delivery of the shipment,
- (viii) the record of documents presented as proof of identity of the person taking delivery of the shipment, and
- (ix) the date of delivery of each shipment;

(d) where the magazine is a temporary magazine, a record of the quantity of each explosive issued from the magazine, containing
- (i) the brand name,
- (ii) the strength,
- (iii) the cartridge size, and
- (iv) the use to which the explosive was put.

(2) The records described in subsection (1) shall be

(a) kept up to date;

(b) produced by the operator of the licensed magazine to an inspector, or to a peace officer as defined in section 2 of the Criminal Code whenever the inspector or peace officer so requires;

(c) kept in a form approved by the Chief Inspector; and

(d) retained for three years.

104. (1) Subject to subsection (2), the operator of a licensed magazine shall ensure that outer package containing explosives is plainly and permanently marked with the federal magazine licence number or the Purchase and Possession Permit number of the purchaser or consignee of the explosive.

(2) When the purchaser or consignee of explosives from a licensed magazine possesses a federal temporary magazine licence or a provincial or territorial magazine licence, the operator of a licensed magazine shall ensure that every outer package containing explosives is plainly and permanently marked with an identification number assigned by the operator of the licensed magazine.

105. Every person who is required by the Minister under this Part to do or abstain from doing anything, shall do or abstain from doing such thing as may be required of him.

APPENDIX "D"

Extracts from
EXPLOSIVE ACT AND REGULATIONS

PART XII - AMOUNT OF AUTHORIZED EXPLOSIVE THAT MAY BE KEPT FOR USE AND NOT FOR SALE IN PLACES OTHER THAN LICENSED FACTORIES AND LICENSED MAGAZINES AND REGISTERED PREMISES AND THE MANNER IN WHICH IT SHALL BE HANDLED AND STORED

132. This Part does not apply to premises used for the keeping of explosives of Division 1 of Class 6 (ammunition) or of Division 2 of Class 7 (fireworks).

133. Subject to this Part, explosives kept for private use, and not for sale, in any place other than licensed magazine or licensed factory shall be kept in a detached store or a suitable receptacle as defined in this Part and the quantity of explosives so kept shall not exceed the maximum quantities prescribed by this Part.

134. In this Part, "detached store" means
(a) a building well and substantially constructed of brick, stone, concrete, or other fire-resistant substance or of wood covered or treated with fire-resistant material, and

(b) a bin well and substantially constructed of wood covered or treated with fire-resistant material,

which building, or bin is

(c) detached from any dwelling house and situated at a safe distance from any highway, street, public thoroughfare, or public place;

(d) made and closed so as to prevent unauthorized persons having access thereto, and to secure it from danger from without; and

(e) exclusively used for the keeping of explosives.

135. In regard to any detached store, the following provisions shall be observed:
(a) the door of the store shall be of substantial construction and shall open outwards, and shall be kept securely closed and locked except when the store is required to be open for the receipt or issue of explosives, or for other necessary purpose;

(b) adequate provision shall be made for the ventilation of the store;

(c) the interior of the store and all fittings therein shall be so constructed, covered or lined as to prevent the exposure of any iron or steel, or of any hard or gritty surface, or the entry, detaching or accumulating of any grit, iron, steel or similar substance;

(d) the interior of the store shall be kept scrupulously clean;

(e) in the case of any explosive that is liable to be dangerously affected by water, such as those of Division 1 of Class 3, due precautions shall be taken to exclude water from the store;

(f) any article or substance of a highly flammable nature, or any article liable to cause fire or explosion shall be kept at a safe distance from the store;

(g) no fire, lights, matches, oiled waste, iron, steel, grit or any article liable to spontaneous ignition, or likely to cause explosion or fire shall be taken into, or permitted to be at any time in the store;

(h) all tools or implements kept or used in a store where explosives are present, or in opening, securing or removing packages containing explosives shall be made only of copper, bronze, brass, gun metal, wood or other safe and suitable material; and

(i) the store shall have the word "EXPLOSIVES" clearly displayed thereon in large letters on a contrasting background.

136. In this Part, "suitable receptacle" means a substantial box or substantial container,
(a) that may be placed inside a building that is not itself adapted for the keeping of explosives;

(b) the location of which is not changed from that prescribed by an inspector or under provincial or municipal law;

(c) that is kept away from goods of an inflammable nature; and

(d) that is of easy access for removal in case of fire.

137. In regard to any receptacle, the following provisions shall be observed:
(a) it shall be provided with a closely fitting lid secured by a lock, and hinges and fastenings, preferably of copper or brass, and otherwise closed and secured as to prevent unauthorized persons having access thereto, and shall be kept locked except when required to be open for receipt or removal of explosives, or other necessary purpose;

(b) it shall be exclusively used for the keeping of explosives;

(c) it shall be made of wood, copper, or other suitable material;

(d) the interior of the receptacle and all fittings therein shall be so constructed, covered or lined as to prevent the exposure of any iron or steel, or of any hard or gritty surface, or the entry, detaching, or accumulating of grit, iron, steel or similar substance;

(e) the interior of the receptacle shall be kept scrupulously clean; and

(f) the receptacle shall have the word "EXPLOSIVES" conspicuously displayed thereon on a contrasting background.

138. Explosives kept for use and not for sale shall not be kept on the same premises with any explosive that is not an authorized explosive or an explosive of Class 5 (fulminate).

139. No detonators shall be kept in a detached store or suitable receptacle in which explosives of Class 1, 2, 3, or 4 or safety fuses, fuse lighters, igniter cords or connectors are stored.

140. (1) Subject to subsection (2), the quantity of authorized explosives that may be kept in a detached store shall not exceed

(a) 75 kilograms, in the aggregate, of explosives of Classes 1, 2, 3 and 4; or

(b) 100 detonators.

(2) A quantity of explosives in excess of the quantity set out in paragraph (1)(a) or (b) may be kept in a detached store by a person who certifies that he will

(a) use the excess quantity of the explosives within 24 hours after taking delivery of them; and

(b) ensure that the explosives are properly safeguarded.

(3) The quantity of authorized explosives that may be kept in a suitable receptacle shall not exceed

(a) 10 kilograms, in the aggregate, of explosives of Classes 1, 2, 3 and 4, of which not more than 5 kilograms shall be blasting cartridges; or

(b) 100 detonators.

(4) Notwithstanding subsections (1) to (3), where a person keeps authorized explosives in a detached store and a suitable receptacle the aggregate quantity so kept by him shall not exceed the quantity set out in paragraph (1)(a) or (b).

(5) Subject to section 139, any number of safety fuses, fuse lighters, igniter cords and connectors may be kept in a detached store or a suitable receptacle.

141. When two or more explosives are kept on the same premises they shall each be kept in separate stores or receptacles, so separated from one another as to effectually prevent fire or explosion in one explosive from communicating with the other, except that

(a) the various explosives of Class 1 (gunpowder), Class 2 (nitrate mixture), Class 3 (nitro-compound), Class 4 (chlorate-mixture), safety fuse belonging to Division 1 of Class 6 (ammunition), and such of the various explosives of Division 2 of Class 6 (ammunition) as do not contain any exposed iron or steel, may be kept in the same store or receptacle with each other without any intervening partition or space;

(b) the various explosives of Division 1 of Class 6 (ammunition) may be kept in the same store or receptacle with each other without any intervening partition or space;

(c) such of the various explosives of Division 2 of Class 6 (ammunition) as contain exposed iron or steel may be kept in the same store or receptacle with each other without any intervening partition or space;

(d) the various explosives of Division 3 of Class 6 (ammunition) may be kept in the same store or receptacle with each other without any intervening partition or space; and

(e) the various explosives of Class 7 (fireworks) may be kept in the same store or receptacle with each other without any intervening partition or space.

APPENDIX "E"
GENERAL NOTES AS TO USE OF EXPLOSIVES

(Excerpted from "Handling of Explosives" published by the Department of Energy, Mines and Resources, Canada).

OPENING CASES OF EXPLOSIVES

A case should never be opened in a magazine or near other explosives. Cases of fibre construction and sealed with tape may be carefully slit with a sharp knife.

A case must be properly closed before returning it to the magazine. Under no circumstances should there be open cases or loose cartridges in a magazine. Wherever possible a cartridge must be replaced in its original case.

FRICTION, HEAT AND SHOCK

Friction

The Chief explosive ingredient of most high explosives is nitroglycerine, and the sensitiveness of this dangerous chemical is particularly high. Where there is laxity in proper supervision and magazine housekeeping, leakage of pure nitroglycerine from the cartridges may occur. If disregarded, the leaking nitroglycerine is in turn absorbed by the cases, the magazine floor and the ground underneath the magazine. If the floor has been permitted to become gritty the situation inside the magazine is now ripe for an explosion through friction, impact or a combination of both. All that is now necessary for an explosion is the slithering or scraping of a hob-nailed or caulked boot across the pregnant surface. This is not theory; it is proven fact. Thus constant vigilance, good housekeeping and impeccable magazine habits are vital.

Heat

It is commonly assumed that high explosives will burn like any ordinary combustible substance. Under most circumstances that is true, but under certain other circumstances any application of heat would be explosively disastrous. The intentional burning of explosives for any reason whatever must be left to the expert or specialist who understands the proper technique, and under no circumstances whatever must any user experiment simply for his own satisfaction, or perhaps to prove to a neighbour, that "the stuff burns". More often than not dynamite or stumping powder, if contained in an unopened case, will explode at some phase when the case is ignited. Consequently, in case of fire which may threaten a magazine the stock should be removed at once to a place of safety.

Many small operators show an utter disregard for weatherproofing and ventilating their magazines. In addition to creating unsafe conditions such a disregard can be most uneconomical. Stumping powder, for instance, becomes quite inert when in contact with water for even a relatively short period. Even the normal blasting explosives which are semi-gelatinous lose their potency in time when directly associated with water.

Thus it is obvious that for best results, and to offset the possibility of misfire later on, the magazine should be kept absolutely weatherproof. At the other extreme, weatherproofing does not mean the exclusion of adequate ventilation, because proper ventilation is just as necessary as water is harmful. Air circulation should be assured to help offset temperature extremes, particularly the higher extreme with its consequent and undesirable promotion of nitroglycerine leakage. Vents should be baffled or otherwise protected from rain. To help cope with high summer temperatures aluminum sheeting to cover magazines is coming into wide use; as a further and inexpensive aid, cases may be placed on floor slats, and kept from contact with the magazine walls.

Shock

Common sense dictates that high explosives be given the treatment which their unpredictable nature demands. Nitroglycerine is extremely sensitive to shock; therefore, the dropping of a case, or even one cartridge, must be regarded as an explosive possibility.

THAWING

Due to cold weather, winter land clearing is not usual in most Canadian provinces, but it sometimes becomes necessary to use explosives for other purposes in winter. Modern Canadian explosives will not freeze at normal cold temperatures, but in extremely low temperatures they may become hard and lose some of their strength. Under no condition should artificial softening be resorted to by an inexperienced amateur. The proper procedure is to maintain the explosives at room temperature until the desired consistency has been obtained.

Ref. 1
Sec. 46.66

Explosives which have deteriorated due to contact with water or exposure to high temperature and humidity should not be used. Such explosives are usually soft and soggy, and sometimes the ingredient salts are crystallized on the outside of the cartridge wrapper. Advice should be sought regarding immediate disposal of such explosives.

SAFETY FUSE

Safety fuse is as important as any other link in the blasting chain, and consequently must be carefully stored and handled. Burning speed is designed to be 40 seconds per 30 cm, with an allowable variation of 10 per cent either way (fast or slow). For general practical purposes, however, it is wise to assume that the burning speed is 60 cm per minute. But it should be remembered that the burning speed varies with elevation.

DETONATORS

A detonator must be a highly sensitive mechanism and until it is safely placed with the primer in the shothole, it must be treated with the utmost delicacy. So sensitive is this little innocent-looking aluminum shell, that it will explode from any of the following causes:

(a) Slight compression of the explosive end.
(b) Picking the explosive ingredient,
(c) Heat (Flame or sparks),
(d) Induced explosion through close proximity to another detonation.

BLASTING

The field of blasting is so wide and varied that only the simplest standard procedure can be mentioned here as a basic guide to the inexperienced. For safe blasting, using standard safety fuse, here are the proper steps in sequence:

1. Study the situation on hand, and be assured that it calls for blasting.

2. Don't guess the amount of the charge. Seek advice if necessary.

3. Clean the shothole thoroughly.

4. Bring the fuse roll and the charge of explosives to the site of the proposed shot, then make a separate trip for the detonator.

5. Cut off a length of fuse about 30 cm longer than the length of the hole, or 90 cm, whichever is longer. Ref. 1 Sec. 46.84

6. Cut 1 inch from either end of the fuse length, squarely and with a sharp knife.

7. Insert this end into the open end of the detonator, and gently push it home, avoiding any twisting or undue pressure.

8. With a pair of crimping pliers, gently, but firmly, crimp the detonator on the fuse about .317 cm (not more) from the open end.

9. Open a cartridge wrapping at one end and, using a pencil-shaped piece of hardwood, pointed at one end, make a hole in the cartridge about 5 cm deep.

10. Into this hole push the detonator with its attendant fuse, wrap the opened cartridge paper around the fuse at the insertion and tie snugly with string. Your primer is now prepared.

11. With a wooden rod ascertain if the shothole is free from obstruction and ready for the charge.

12. Using a flat-ended wooden tamping rod (never metal) press the first cartridge of the charge to the bottom of the shothole and follow by gently pressing the primer next. Press the balance of the charge home, one cartridge at a time, being cautious not to damage the fuse.

13. Using fine sand, clay or earth (but never rough gritty material) loosely tamp about two handfuls of stemming material against the charge. Continue tamping a little firmer until the shothole is filled to a point about 30 cm from the collar.

14. Cut about 2.54 cm from the protruding end of the fuse, split the exposed end with a sharp knife and turn back each side to expose the powder train.

The shot is now ready for firing, but before doing so the shotfirer must be assured that everyone is clear of the danger area and that every approach is guarded or otherwise satisfactorily stopped. Finally, he should sound signals for at least two minutes and then ignite the fuse. Ref. 1 Sec. 46.110

If these instructions are carried out faithfully and in sequence there is little chance that the charge will not explode. However, should it fail to explode, no one should approach the hole until a period of at least thirty minutes for safety fuse blasting or ten minutes for electrical blasting has elapsed. A close examination of the protruding fuse may be show that the "spit" did not catch. If such is the case, 2.54 cm may be cut from the fuse, the end slit and the sides turned back, and the exposed end relit. This procedure can be safely undertaken only once. Ref. 1 Sec. 46.114(2)

Should the hold prove to be a true misfire, NO ATTEMPT MUST BE MADE TO PULL OUT THE FUSE or otherwise interfere with the tamping or the charge. Normally the safest procedure in such cases is to make up a fresh primer, insert it in the 30 cm empty length of shothole and reblast, taking care the new fuse is at least 90 cm long. There is every likelihood that the second primer will explode the parent charge, but a careful search of the debris must be made for possible unexploded cartridges and particularly the original primer. Ref. 1 Sec. 46.12.

DESTRUCTION OF EXPLOSIVES

It is often necessary to destroy explosives. These explosives may be fresh material, used material or material which has deteriorated or become unfit for use through damage. Frequently, deteriorated explosives are much more hazardous than those in good condition and hence require special care in handling and disposal. Ref C.I.L. Handbook

Destroying Dynamite

Small amounts of dynamite can be destroyed by detonating them in a safe place but this is not usually practical where larger quanitites are involved. The most satisfactory method of destroying dynamite is by burning. It is recommended that not more than 45 kg be burned at one time and a new space selected for the next lot, it not being safe to re-use ground hot from the preceding burning operation. Ref. 1 Sec. 46.64

Certain grades of dynamite used is seismic prospecting are cartridged in rigid plastic shells 5.715 cm in diameter. These shells should be carefully slit open and the contents spread out on the bed of combustible material before burning.

A bed of combustible material such as straw, hay, excelsior or wood shaving, should be prepared about 5-8 cm thick and large enough so that the dynamite cartridges may be laid in one layer without overlapping. The paper lining and sawdust packing may be spread out with the explosives, but the outer packages (cases) should be burned separately. The whole bed should be drenched with kerosene or diesel oil to assist the burning.

An ignition train of combustible material should be laid leading up to the explosives so that when the train is ignited it will burn against the wind. This ignition train should be long enough to allow plenty of time to reach a place of safety before the flame reaches the explosives.

After burning, care must be taken to see that no embers remain, and that all explosives have been consumed. The clinker-like residue sometimes found is harmful to livestock and should be gathered up and buried.

Destroying Detonator Cord

The preferred method of destroying detonating cord ("Primacord", "E-Cord", "B-Line", etc.) is by burning. Though the same general procedure for burning dynamite is followed, it must not be burned on the spool but strung out on the bed in parallel lines 1.27 cm or more apart.

Destroying Detonators

The safest and surest method of destroying detonators is to tape or tie them together in compact bundles with the "business ends" together, then place them in a box and bury under 30 - 60 cm feet of earth. The assembly should be exploded with a fuse cap or electric blasting cap, or, for still greater assurance, with a primed dynamite cartridge.

Technical Assistance

If large quantities of blasting explosives must be destroyed, if experienced or competent men are not available for the work, or if there is any question about the safety of the undertaking, then the handling and destruction of the explosives should be deferred until a representative of the manufacturer of the explosive, or of the Explosives Division, has been consulted.

WARNING - Burning Explosives

In general, the preferred method of destroying blasting explosives is by burning. It must be assumed that there is always the chance of an explosion during burning: consequently a remote location must be chosen so that no damage to people or property will result.

Every precaution must be taken to make certain that only one type of explosive is destroyed at one time. Dynamite, detonating cord, cast primers, boosters, and safety fuse must be examined carefully to ensure that no detonators of any kind are among the explosives to be burned. Primed cartridges must never be burned but should be destroyed separately by exploding them at a carefully selected place.

ABANDONING EXPLOSIVES

It is a serious offense under the Explosives Act to abandon explosives. Accidents under such circumstances border on criminal negligence for which severe penalties are provided by the Criminal Code. Ref. 1 Sec. 46.68

BURYING EXPLOSIVES

Explosives must never be buried. Nitroglycerine does not deteriorate with time but maintains its explosive force. Many instances have occurred in which men have lost their lives through the explosion of nitroglycerine that had lain for more than 20 years in the ground, or even under water. Similarily, TNT does not lose its explosive force with time.

CHAPTER 12

CONSTRUCTION OF HIGHWAYS

12.01 SAFETY PRECAUTIONS FOR TRAVELLING PUBLIC

The District Official or Project Supervisor must realize the importance of handling traffic through or around the constructon with as little inconvenience and delay as possible. Adverse criticism from the general public can be kept to a minimum through conscientious attention to this matter.

On contract work, the safe and proper handling of traffic is the respon- sibility of the Contractor. On day labour work it is the obligation of the Superintendent or Foreman in charge.

12.02 CONSTRUCTION SIGNS (Refer to Manual of Construction and Maintenance Signs)

** Construction signs are furnished either by the Contractor or the Ministry in connection with construction projects, for the purpose of warning and directing traffic during the life of the contract. Signs must comply generally with the Manual of Construction and Maintenance Signs and are made available by the Ministry at a nominal cost. A Contractor obtains signs from the Regional Stockman after completing Form H-424 from the Project Supervisor. At points of extreme hazard, amber electric flashing lights or flares are recommended.

12.03 CONTRACTORS' SUPPLEMENTAL SIGNS

The General Specifications require the Contractor to furnish, erect and maintain adequate warning devices as are necessary to prevent accidents and avoid damage or injury to passing traffic. However, it is not legal for the Contractor to erect a speed limit sign, even though the Ministry may so instruct him. The law provides that the signs may be erected only by the Ministry of Transportation and Highways after due authorization has been granted by the Regional Director, Highways.

12.04 ERECTION AND MAINTENANCE

The erection of construction signs shall be the first order of work. However, the placing of signs as a token start of construction is not permitted. If, after the erection of the signs, there is no visible indication of actual construction, the signs must be masked until such activity is apparent. The removal or masking instruction also applies to any warning construction sign, when the conditions for which it has been placed or changed have passed or changed, so that it no longer applies. Keeping these signs in position after they are no longer necessary weakens their effectiveness.

Signs are to be properly maintained in the correct position and in good condition throughout the duration of the construction period. The Project Supervisor is responsible for the appearance of the signs. They shall be inspected as to position, that the message is clearly legible and that they will function satisfactorily after dark.

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Signs should be erected in a workmanlike manner and maintained in a neat condition, as carelessly erected signs and barricades, framed in scrap lumber, are a discredit to the Ministry of Transportation and Highways.

** Sign positioning is to be governed by the Manual of Construction and Maintenance Signs, March 1979 edition. Always ensure Highway Improvement Project Sign (C-35) and Road Construction Ahead (C-18) are in place.

It is the duty of the Project Supervisor to ensure that all safety measures are being applied.

12.05 CONSTRUCTION SPEED ZONES

Construction speed zones are established on roads under construction by authority of the Minister of Transportation and Highways reduced speed is necessary for the safety of the travelling public during all hours of the day or night. They are not established for conditions which exist only during working hours, as protection is provided by use of construction signs placed and used under the direction of the Project Supervisor.

It is imperative that construction speed zone signs be removed immediately following correction or change in the conditions for which they were installed. Speed limits should be realistic at all times.

TRAFFIC CONTROL

12.06 DETOUR AND TRAFFIC SIGNS

Public traffic must be cared for by suitable detours or temporary roads during the course of highway construction. This matter is the most important of the secondary duties of the Project Supervisor. Inattention or laxity on his part in this respect discredits the entire Ministry.

Signs properly placed, are of prime importance in the warning, regulation, and guidance of the public. The Project Supervisor should periodically review detours during the darkness, as well as the daylight hours, to assure himself that signs and warnings are functioning properly.

** Projects reconstructing heavily travelled routes often require many detours and traffic lane changes. A constant review of detours, lane change signing and markings, temporary guardrail requirements, and project signing is to be carried out. On projects requiring heavy use of signing, detours, lane changes, and special marking, it is strongly suggested to have Contractors submit traffic control proposals, keep a strip map of signing, and assign a crew member to traffic control review when required.

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12.07 FLAGPERSONS

Where the passage of public traffic is restricted or endangered, due to the operation of equipment on the travelled way, it may be necessary to assign flagpersons to warn and direct traffic past the operation.

Adequate warning signs should also be erected, and flagpersons should be carefully instructed in the correct methods to use in flagging so that there will be no confusion in the minds of the travelling public on the meaning of signals given.

Flagpersons employed by the Contractor should be advised on the importance of protecting persons working on the job, as well as the public, and the Project Supervisor should see that they are courteous and diligent and perform their duties as directed. The flagpersons should be outfitted with blaze orange jackets and gloves and paddles bearing the clear message "STOP" and "SLOW". The public shall be warned by means of a sign (C- 28 - Traffic Control Ahead) placed well in advance of the area.

12.08 TRAFFIC THROUGH CONSTRUCTION AREA

** Section 194 of the General Specifications and Contract Agreement outline the Contractor's responsibility respecting the passage and safety of public traffic through construction, and the Project Supervisor shall see that these provisions are followed. He shall also ensure that traffic delays are reasonable, and there is no favouritism on the part of the flagperson in holding up traffic unnecessarily to benefit the Contractor.

The Contractor shall keep the travelled way as smooth as practicable, and endeavour to complete the subgrade as soon as possible in order that some gravel surfacing may be applied. The Ministry will supply the Contractor with calcium chloride or oil to be used as a dust palliative. This will be covered by Extra Work Order.

12.09 EQUIPMENT ON THE TRAVELLED WAY

When working on the travelled way, equipment should be so placed as to present the least interference and hazard to traffic. If possible, equipment units should be kept as close together as working conditions will permit, and on the same side of the travelled way. Equipment should not be left on the travelled way overnight, but should be so located that there will be no possibility of an accident.

12.10 BARRICADES

Where roads are closed to traffic, barricades shall be erected across the entire width of road, except that special arrangements may be made for passing local traffic through. The barricades shall be constructed in accordance with the Ministry's standard plans, as shown in General Specificiations and Manual of Construction and Maintenance Signs, and lighted at night.

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12.11 DAY LABOUR CONSTRUCTION

District Officials are to be commended for their constant interest in improving trunk and main highways in their jurisdiction with local improvements such as shoulder widening, curve easing, truck lanes, etc. However, sometimes this work conflicts with planning proposals and if undertaken may be a waste of funds. Conversely, some long range proposals can be introduced gradually in this manner. Therefore no improvement work of this nature may be done without the prior approval of the Regional Director, Highways.

Changes in the day labour program as approved by the Legislature must be discussed with the Regional Director, Highways and approved before they may be undertaken. In the case of day labour on highways where a design has been provided by Design and Surveys, no changes whatever may be made to the design by the District without the approval in writing of the Regional Director, Highways after consultation with the Regional Manager, Design and Surveys. Much thought and work goes into these designs and the decisions are not to be lightly cast aside. The Regional Manager, Design and Surveys is always open to suggestion if a District Official has a proposal that is within standard and cheaper and he will always give it serious consideration. No changes of grade, shortening of vertical curves, tightening of horizontal curves, etc., may be made without the written permission of the Regional Director, Highways.

ENTRANCES - PRIVATE AND BUSINESS

12.12 NEW CONSTRUCTION OF HIGHWAYS
**

Entrances will not be constructed to vacant Crown land, nor to any unoccupied or unused private property fronting a highway.

Entrances shown on design plans should be constructed at no cost to the property owner.

Thereafter, any property owner, upon making application for an entrance will be assessed the full cost of the permitted entrance, unless other provision is stipulated by right of way agreement.

All purchasers of property subsequent to construction of the public highway will be assessed the actual cost of an approved entrance.

Any parcel of land which can be serviced adequately from a side road or street will not be permitted access from a Controlled Access Highway.

Before Property Negotiators contact property owners, entrances on the location plan should be approved by the Regional Director, Highways.

12.13 RECONSTRUCTION OF HIGHWAYS
**

Where reconstruction alters the elevation of the road or ditch to such a degree that an adequate existing entrance is affected, it is the practice of the Ministry to renew the entrance or do whatever work is necessary so that the proprietor will not be put to additional expense; a permit is to be issued through the District official and the property owner is to maintain his entrance with no further cost to the Ministry.

EARTH MATERIALS

12.14 SIGNIFICANCE OF EARTH MATERIAL CLASSIFICATION
**

Earth material classification is the grouping of soils, gravels and rock in such a a way that materials in any one group exhibit, generally, similar characteristics and behaviour.

Most Ministry of Transportation and Highways employees deal with earth materials in some way from the time the first consideration is given to a project until the finish of construction and even following that; during the maintenance period many communications of Highways personnel include descriptions of earth material types. In addition, the individual experiences of all engineers and technicians must be discussed and summarized into a body of knowledge that can be assimilated readily, so that they do not lose their value to the engineering profession.

The classification system used during the design and construction for payment purposes makes four divisions - types A, B, C, D. This classification should only be used in communications dealing with payments for quantities, since it is based on the ease or difficulty

** Amendment

with which modern construction equipment can handle the material and bears very limited relationship to its behaviour as an engineering construction material.

Many detailed classification systems are in existence based on certain gravel, sand and soil properties, such as gradation, strength, and other characteristics. No classification system is perfect under all circumstances because of the wide variety of type and condition of soil and rock. The various classification systems each have certain advantages and disadvantages for a particular purpose.

The gravel-sand-soil classification system most suited for highway purposes is the Unified Soil Classification System. Every highway engineer and technician should be able to use this system and should attempt to familiarize himself with it.

12.15 IDENTIFICATION AND CLASSIFICATION PROCEDURES **

In order to group a soil type into the Unified Soil Classification System it first has to be identified.

The Unified Soil Classification System is based on those characteristics that suggest how it will behave as a construction material. The following properties have been found most useful for identification purposes and form the basis of soil identification. These properties can be determined by simple tests and, with experience, can be estimated with some accuracy.

1. Gradation

A sieve analysis is performed to obtain percentages of gravel, sand and fines.

Cobbles are between 75 mm and 300 mm and boulders over 300 mm in size.

Gravel is sized from 75 mm to the 4.75 mm screen.

Fines (silt or clay) are finer than the .075 mm screen.

2. Grain Size Distribution

Earth material mixtures may be well graded (all sizes well represented, showing a smooth gradation curve), or poorly graded.

This distinction is usually only made in coarse grained mixtures as gravel and sand. Poorly graded mixtures are uniformly graded (few sizes present) or gap-skip or step-graded (intermediate sizes lacking). To define closely the boundary between well and poorly graded in coarse grained soils, the following coefficients are used:

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1. C_u (uniformity coefficent) = $\frac{D_{60}}{D_{10}}$

2. C_c (coefficent of curvature) = $\frac{(D_{30})^2}{D_{10} \times D_{60}}$

where the D_{10}, D_{30}, D_{60} are the grain diameters at 10, 30 and 60% passing on the grading charts.

3. Plasticity Characteristics

Where an earth material mixture contains a large proportion of fines (material passing the .075 mm screen such as silt and clay), its behaviour depends not so much on the gradation of the mixture as on the plasticity characteristics of the fine constituents.

The constants, used for the identification and classification of fine grained soils, are:

1. Liquid Limit

This is defined as the moisture content at which the soil is sufficiently fluid to close a standard size groove, made in a sample, when jarred in a specified manner. It is the moisture content at the boundary between the plastic and fluid states. Of practical significance in the field, if field moisture contents are found to be higher than the Liquid Limit, excavations by dragline operations will be necessary, as the soil will revert to a fluid when disturbed.

2. Plastic Limit

This is defined as the moisture content at which the soil begins to crumble when rolled into threads of specified size. It is the moisture content at the boundary between the plastic and semi-solid states.

3. Plasticity Index (P.I.)

This is defined as the numerical difference between the Liquid Limit and Plastic Limit. It gives the magnitude of the range of the moisture contents over which the soil is in a plastic state as defined by the tests.

NOTE: The liquid and plastic limits are both dependent on the amount as well as type of clay in a soil. The plasticity index (P.I.) is generally only dependent on the amount of clay present. The liquid limit and plasticity index are extensively used to classify fine grained soils.

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4. Liquidity Index (L.I.)

Defined as the moisture content of a soil in excess of the plastic limit, expressed as a percentage of the plasticity index. This index is used for clay and shows in what part of its plastic range a given sample lies. Thus an L.I. of 0% indicates a field moisture content at the Plastic Limit and 100% is a field moisture content at the Liquid Limit.

In addition to the above mentioned tests to identify and classify soils, the following soils properties are used when identifying fine grained soils in the field.

1. Feel

Silt and clay feel smooth and stain the fingers when rubbed between the fingers; sand feels gritty and does not stain. The "teeth test" (biting a portion of the sample between teeth) will determine accurately the presence of sand which again feels gritty, whereas silt and clay do not.

2. Dilatency (Reaction to Shaking)

After removing by hand particles larger than the 0.425 mm screen, a small lump of soil is taken and water added until the soil is soft but not sticky. Place the pat of soil in open palm of one hand and shake horizontally, striking vigorously against the other hand several times. If the surface becomes wet and the mass livery, the material is silt or sandy silt. When this pat is then squeezed between the fingers, the watery gloss disappears and the sample stiffens. The more distinct this reaction, the coarser the soil. Clay will have no, or a very slow reaction.

3. Dry Strength

After removing by hand particles larger than the 0.425 mm screen, mold a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air-drying and then test its strength by breaking and crumbling between the fingers. High dry strength is characteristic for highly plastic clays. Silts and sandy silts have only slight dry strength and crumble easily when squeezed.

4. Colour and Odour

A dark colour of a sample and rotten odour, especially when slightly heated, indicates organic material present in the sample.

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12.16 SOIL TEST SPECIFICATIONS

**

Tabulated below are the principal soil tests, used in soils identification and construction control. Tests to measure the strength and consolidation characteristics of a soil are, because of their complexity, not performed in the field.

Name	Purpose	Standard Procedure Reference
Grain-size analysis	Quantitive determination of the distribution of particle sizes from 75 mm to the colloid sizes, (using sieves and hydrometers).	ASTM D422
Liquid Limit Test	Determination of the liquid limit of the portion of the soil passing the 0.425 mm screen.	ASTM D423
Plastic Limit Test	Determination of the plastic limit of that portion of the soil passing the 0.425 mm screen.	ASTM D424
Plasticity Index	Determination of the numerical difference between liquid and plastic limits.	ASTM D424
Standard Proctor Test	Determining the moisture-density relations of soils when compacted according to the Standard Proctor procedure.	ASTM D698
Field Density Test	Determination of the soil density in place.	Nuclear Densometer method.

Engineers and technicians who perform any or all of the above tests may obtain a copy of the relevant ASTM references from the Ministry Librarian.

12.17 THE UNIFIED SOIL CLASSIFICATION SYSTEM

**

Included in this manual is Chart I showing all the symbols used in the unified soil classification system. (Reference: U.S. Army Corps of Engineers, Technical Memorandum No. 3-357). By working across the chart from left to right it is possible to name each soil type with one, or at the most two symbols. Double symbols are often used when a classification is based on field identification only.

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If complete identification tests are carried out in the laboratory, double symbols are used only to classify coarse grained soils having between 5 and 12% fines (passing the 0.075 mm screen). Where the chart refers to little or no fines, less than 5% fines are present; where it refers to an appreciable amount of fines, more than 12% fines are present.

In addition to symbols it is often found desirable to use descriptions. Proper descriptions can be given from the chart, if the symbol is known.

If descriptions are used it is also desirable to include additional information which is essential to a proper analysis of a particular problem; for example, size, shape and mineralogical composition of particles in coarse grained soils; and strength, density, moisture content and plasticity characteristics in fine grained soils.

A few examples of good descriptive classifications are:

(1) Uniform fine, clean sand with rounded grains (SP).

(2) Well-graded gravelly silty sand; angular gravel, 10 mm max. size; silty binder with low plasticity, well compacted and moist (SM).

(3) Fine sandy silt; very low plasticity; saturated and soft in the undisturbed state (ML).

(4) Dark grey, fat clay; stiff in the undisturbed state; soft and sticky when remolded (CH).

12.18 CHARACTERISTICS PERTINENT TO HIGHWAY CONSTRUCTION AND MAINTENANCE

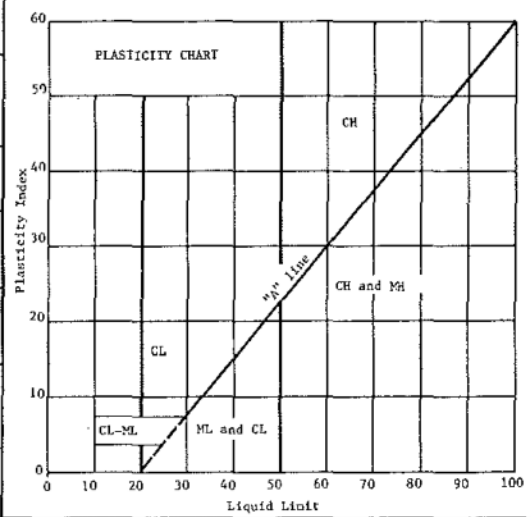
Included in this manual is Chart 2 showing characteristics pertinent to highway construction and maintenance.

Soils, as found during highway construction, are extremely variable, not only in type, but also in condition. Some variable conditions are: field moisture content, density, shape of grains, mineral composition. Consequently the chart does not provide a very accurate description but one of general application. Hence, exact interpretations should not be inferred from the classification chart. For detailed evaluations the classification test results must be included.

The field moisture content is important, as a high value may make unusable waste of otherwise good embankment material.

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UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria		
Coarse-grained soils (More than half of material is larger than 0.075 mm sieve size)	Gravels (More than half of coarse fraction is larger than 4.75 mm sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent.....GW, GP, SW, SP More than 12 percent.....GM, GC, SM, SC 5 to 12 percent.....Borderline cases requiring dual symbols**	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM* d / u	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than 4.75 mm sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. less than 7	
Fine-grained soils (More than half of material is smaller than 0.075 mm sieve size)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils, elastic silts			
			CH	Inorganic clays or high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		Pt	Peat and other highly organic soils			

* Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when LL is 28 or less and the P.I. is 6 or less; the suffix u used when LL is greater than 28.

** Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well graded gravel-sand mixture with clay binder.

CHARACTERISTICS PERTINENT TO ROADS AND AIRFIELDS

Major Divisions (1)	(2)	Letter (3)	Name (4)	Value as Foundation when not subject to Frost Action (5)	Value as Base Directly under Bituminous Pavement (6)	Potential Frost Action (7)	Compressibility and Expansion (8)	Drainage Characteristics (9)	Compaction Equipment (10)	Unit Dry Weight kg/m³ (11)	Field CBR (12)
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines	Excellent	Good	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired equipment, steel-wheeled roller	2000-2240	60-80
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines	Good to Excellent	Poor to fair	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired equipment, steel-wheeled roller	1760-2080	25-60
		GM d	Silty gravels, gravel-sand-silt mixtures	Good to Excellent	Fair to good	Slight to medium	Very slight	Fair to poor	Rubber-tired equipment, sheepsfoot roller; close control of moisture	2080-2320	40-80
		GM u		Good	Poor	Slight to medium	Slight	Poor to practically impervious	Rubber-tired equipment, sheepsfoot roller	1920-2240	20-40
		GC	Clayey gravels, gravel-sand-clay mixtures	Good	Poor	Slight to medium	Slight	Poor to practically impervious	Rubber-tired equipment, sheepsfoot roller	1920-2240	20-40
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines	Good	Poor	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired equipment	1760-2080	20-40
		SP	Poorly-graded sands or gravelly sands, little or no fines	Fair to good	Poor to not suitable	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired equipment	1600-1920	10-25
		SM d	Silty sands, sand-silt mixtures	Good	Poor	Slight to high	Very slight	Fair to poor	Rubber-tired equipment, sheepsfoot roller; close control of moisture	1920-2160	20-40
		SM u		Fair to good	Not suitable	Slight to high	Slight to medium	Poor to practically impervious	Rubber-tired equipment, sheepsfoot roller	1680-2080	10-20
		SC	Clayey sands, sand-clay mixtures	Fair to good	Not suitable	Slight to high	Slight to medium	Poor to practically impervious	Rubber-tired equipment, sheepsfoot roller	1680-2080	10-20
FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Fair to poor	Not suitable	Medium to very high	Slight to medium	Fair to poor	Rubber-tired equipment, sheepsfoot roller; close control of moisture	1600-2000	5-15
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Fair to poor	Not suitable	Medium to high	Medium	Practically impervious	Rubber-tired equipment, sheepsfoot roller	1600-2000	5-15
		OL	Organic silts and organic silt-clays of low plasticity	Poor	Not suitable	Medium to high	Medium to high	Poor	Rubber-tired equipment, sheepsfoot roller	1440-1680	4-8
	SILTS AND CLAYS LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Poor	Not suitable	Medium to very high	High	Fair to poor	Sheepsfoot roller	1280-1600	4-8
		CH	Inorganic clays of high plasticity, fat clays	Poor to very poor	Not suitable	Medium	High	Practically impervious	Sheepsfoot roller	1440-1760	3-5
		OH	Organic clays of medium to high plasticity, organic silts	Poor to very poor	Not suitable	Medium	High	Practically impervious	Sheepsfoot roller	1280-1680	3-5
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils	Not suitable	Not suitable	Slight	Very high	Fair to poor	Compaction not practical		

NOTES

** 1. Column 3, Division of GM and SM groups into subdivisions of d and u are for roads and airfields only; subdivision is on basis of Atterberg Limits; suffix d (e.g. GMd) will be used when the liquid limit is 28 or less and the plasticity index is 6 or less; the suffix u will be used when the liquid limit is greater than 28. The British Columbia Ministry of Transportation and Highways use a local variation to show the amount of fines in the G and S fractions. For example GM_1 and SM_1 have 12 to 19% silt fines while GM_2 and SM_2 have 20 to 29% clay fines. Similarly GC_1 or SC_1 have 12 to 19% clay fines. It is possible to have up to a CG_4 classification which would be 40 to 49% clay sizes and 51 to 60% gravel sizes.

2. Column 5, values are for subgrade and base courses except for base course directly under bituminous pavement.

3. In Column 6, the term "excellent" has been reserved for base materials consisting of high quality processed crushed stone.

4. In Column 7, these soils are susceptible to frost as indicated under conditions favourable to frost action described in the text.

5. In Column 10, the equipment listed will usually produce the required densities with a reasonable number of passes when moisture conditions and thickness of lift are properly controlled. In some instances, several types of equipment are listed, because variable soil characteristics within a given soil group may require different equipment. In some instances, a combination of two types may be necessary.

   1. Processed Base Materials and Other Angular Materials. Steel-wheeled rollers are recommended for hard angular materials with limited fines or screenings. Rubber-tired equipment is recommended for softer materials subject to degradation.

   2. Finishing. Rubber-tired equipment is recommended for rolling during final shaping operations for most soils and processed materials.

   3. Equipment size

      The following sizes of equipment are necessary to assure the high densities required for airfield construction:

      Crawler-type tractor - Total weight in excess of 13.6 Mg.

** Amendment

NOTES

Rubber-tired equipment- Wheel load in excess of 6.8 Mg, wheel loads as high as 18.1 Mg may be necessary to obtain the required densities for some materials (based on contact pressure of approximately 450 to 1030 kPa).

Sheepsfoot roller - Unit pressure to be in excess of 1720 kPa and unit pressures as high as 4480 kPa may be necessary to obtain the required densities for some materials. The area of the feet should be at least 5% of the total peripheral area of the drum, using the diameter measured to the faces of the feet.

6. Column 11, unit dry weights are for compacted soil at optimum moisture content for modified AASHO compactive effort.

CHAPTER 13

HIGHWAY MAINTENANCE

VEGETATION CONTROL

13.01 GENERAL

The Ministry of Transportation and Highways is responsible for the management and control of all vegetation on road rights-of-way. The vegetation must be managed in such a manner that the highway is safe for the travelling public, that is as economical as possible when all aspects of road construction and maintenance are considered and that is as aesthetically pleasing as possible.

** The present policy of the Ministry of Transportation and Highways allows the use of herbicides for shoulder sterilization and to control noxious weeds as required by the Noxious Weed Act, or other herbaceous weeds as directed by the Ministry of Agriculture and Food. The Ministry of Transportation and Highways does not allow the use of any type of chemical to control brush. Therefore, alternate means of controlling brush such as machines and hand labour must be utilized.

When vegetation is to be controlled on the road right-of-way considerable thought should be given as to what end result is desired. In many cases it may not be necessary to remove any growth, while in some cases a good quality grass turf may be the desired result.

13.02 NEED FOR BRUSH CONTROL

Some of the reasons for the need for the control of roadside vegetation are:

1. To ensure the safety of the travelling public.

    1. Sight distance must be maintained on corners.

    2. Whenever possible vegetation should be removed that allows shadows, and hence black ice to form in patches on the road.

    3. Overhanging limbs that could be at a dangerous level under a snow load should be removed.

    4. "Danger" trees should be removed.

    5. In some cases trees and brush can be left to form a natural glare screen from headlights on an adjacent or connecting road.

    6. If pedestrians can be expected on a road, the vegetation should be controlled to provide adequate walking space for them when vehicles are using the road.

    7. All road signs should be clearly visible and vegetation must be controlled to make this possible.

** Amendment

2. To allow proper maintenance of the roadbed and other Ministry facilities.

    1. All drainage facilities should be kept clear of growth that would impede flow.

    2. In many instances a well-developed grass, brush or tree root system will stabilize a slope which would otherwise erode.

    3. Materials removed by vegetation control programs, when chipped or mulched, can be stockpiled for future use in landscaping projects.

    4. A natural growth regime, established by selective cutting, will, over a period of years, be economical in that less and less new growth will appear. Also when a natural growth is maintained few if any weeds will grow.

3. To provide an aesthetically pleasing appearance and other benefits to the public.

    1. A well cared for right-of-way with some growth and open areas for scenic viewing can be much more pleasing than bare earth or large areas of weeds.

    2. Many small animals and birds live in the brush near the road. Their natural habitat is not destroyed if the brush and trees are not all cut.

    3. It is sometimes possible to provide a sound-depressing barrier between a busy highway and a residential area by leaving as much brush as possible on the right-of-way.

13.03 MANAGEMENT AND CONTROL METHODS

Each section of highway should be reviewed and a standard of vegetation control assigned to it. The Road Foreman will then know what the expected result is and he will be better able to plan his work to obtain that expectation.

In special circumstances such as viewpoints, scenic vistas, unique woodland settings, etc., the Regional Landscape Supervisor should be consulted to ensure that the best aesthetic appearance can be obtained.

Standards are now available for guidance on the control of roadside vegetation and should be used. In most cases a selection of one of the following methods will be required.

1. Selectively cut the vegetation to establish an aesthetically pleasing natural regime of tree and brush growth.

2. Mulch all growth on a revolving cycle program. This work is a clear-cut method with a machine, usually a flail or rotary mower.

3. Establish a grass turf and mow and maintain the grass.

4. Allow the natural growth to continue and only trim the trees enough to allow vehicles to use the road without undue obstruction.

The Maintenance Standard selected for each road should be in keeping with the service the road is expected to provide and the requirement for proper road maintenance.

(i.e.) A country-lane type road may only require sufficient trimming to prevent brush from scratching the vehicles and perhaps sufficient clearing to allow free drainage in the ditches. On the other hand, a wide median on a freeway may require selective cutting, some special plantings and the establishment of a grass turf.

13.04 WEED CONTROL

When chemical herbicides are involved, this maintenance activity is to be carried out only by the Regional Landscape Supervisor. This person must be contacted should a Highways District require weed eradication by chemical.

Under the "Weed Control Act 1979" the Ministry of Transportation and Highways is responsible for the control, suppression and elimination of all weeds listed in the Regulations pursuant to this Act. This Act is administered by the Ministry of Agriculture and Food but at the same time there is provision for the municipalities and Regional Districts to appoint Inspectors.

** At the present time the following list of Noxious Weeds is in the Regulations but this list will be expanded from time to time for specific areas on recommendations received from municipalities and Regional Districts. This list at present is:

**

SCHEDULE A

Noxious Weeds - Provincial

Canada Thistle (Cirsium arvense (L.) Scop.)
Dodder (Cuscuta spp.)
Knapweed spp. -
- Diffuse (Centaurea diffusa Lam.)
- Spotted (Centaurea maculosa L.)
- Russian (Centaurea repens L.)

Sow thistle, annual and perennial (Sonchus spp.)
Leafy spurge (Euphorbia spp.)
Toadflax spp. -
- Common (Linaria vulgaris Hill)
- Dalmation (Linaria dalmatica L.)

Wild oats (Avena fatua L.)

**

SCHEDULE B

Noxious Weeds - Regional District of North Okanagan

Hoary Cress (Cardaria spp.)
Morning glory (Field Bindweed (Convolvulus arvensis L.)
Sulphur cinquefoil (Potentilla recta L.)
Burdock (Arctium minus Hill)

** Amendment

** SCHEDULE C

Noxious Weeds - Regional District of Thompson-Nicola

Hoary Cress (Cardaria spp.)
Blueweed (Echium vulgare)
Houndstongue (Cynoglossum officinale)
Sulphur cinquefoil (Potentilla recta L.)
Burdock (Arctium minus Hill)

** SCHEDULE D

Noxious Weeds - Regional District of Peace River-Liard

Giant Burdock (Arctium spp.)
Water Hemlock (Cicuta maculata L.)
Scentless Mayweed (Matricaria maritima L.)
Cleavers (Galium aparine L.)
Tartary buckwheat (Fagopyrum tataricum L.O
Night flowering catchfly (Silene noctiflora)

** SCHEDULE E

Noxious Weeds - Regional District of Columbia-Shuswap

Tansy (Tanacetum vulgare L.)
Burdock (Arctium minus Hill)
Sulphur cinquefoil (Potentilla recta L.)
Houndstongue (Cynoglossum officinale)
Blueweed (Echium vulgare)

** SCHEDULE F

Noxious Weeds - Regional Districts of Central Fraser Valley, Dewdney-Alouette, Fraser-Cheam, Cowichan Valley, Nanaimo, Alberni-Clayoquot and Comox-Strathcona

Tansy ragwort (Senecio jacobaea L.)

** SCHEDULE G

Noxious Weeds - Regional District of Cariboo

Burdock (Arctium minus Hill)
Houndstongue (Cynoglossum officinale)
Nodding thistle (Carduus nutans L.)

** SCHEDULE H

Noxious Weeds - Regional District of Fraser-Fort George

Burdock (Arctium minus Hill)

Since some of these weeds cannot be controlled by mechanical or hand methods it is possible that a Weed Inspector may issue an order, under the Weed Control Act, to the Minister of Highways (as owner) to control specified weeds in a specified area. If such should happen you should immediately notify the Regional Highway Engineer.

** The best means of control is the prevention of weed distribution in the first place, especially by vehicles and equipment.

** Be sure to check all vehicles and equipment and remove attached weed vegetation, weed seeds and any soils that may be contaminated with weed seed before leaving an infested area.

** Amendment

** This will prevent equipment from moving out of an infested area and distributing weeds to weed-free or marginally weed-free zones.

GRAVEL SURFACE MAINTENANCE

13.05 GENERAL

Maintenance of most gravel surface roads requires constant and unrelenting attention, and cannot be neglected for even a short time.

13.06 MATERIAL

When repairing or resurfacing a gravel road, do not spread new material to a depth exceeding 10 cm loose, and final depth of gravel will depend on type of traffic, conditions of subsoil, and original condition of road. Do not use material larger than 3 cm.

Use gravel of proper gradation and containing sufficient free binder to ensure compaction under traffic. If the gravel contains a high percentage of silt or clay it will be subject to heaving and serious break-up in the spring.

Suitable shale will, when properly compacted, provide an excellent surfacing material, particularly on sections of road that are subject to gravel erosion through the action of weather and traffic.

Run-of-bank gravel containing large particles will not readily compact. The large stones are moved under the impact of traffic and if they do eventually become imbedded in the surface, they give a cobblestone effect that cannot be graded.

During spring break-up, use sand, not rock, in repairing frost boils, etc., loads used in repair work should be kept to a minimum weight so that further damage by hauling is not caused to the road bed.

13.07 GRADING

Before grading, ensure that the grader is in good order. It must be serviced, any loose bolts tightened and the grader blade changed if worn out.

Set the grader blade to the requirement of each particular job, and adjust its slope so that it does not cut too deeply or carry too heavy a load, or ride over the surface ineffectively.

Do not try to do any work with a grader blade which should properly be done by the scarifier tines. When using the scarifier on maintenance work, do not cut too deep and disturb the base of the road.

Light use of the scarifier before placing fresh gravel is often very effective.

When finishing off grading, do not run the grader with the blade set at right angles to the road, but have it at an angle of no less than approximately 45° in order to avoid any corrugating action on the road surface.

It is often found useful to operate the grader in the opposite direction to the line of traffic; where this is done take every precaution to see that the traffic is safeguarded.

Maintenance grading does not consist of working old loose material or fresh gravel from the sides of the road to the centre, especially where the road is at all rough or contains any oversize stone; grading done in that way will result in a line of weakness throughout the centre of the road by segregating there the larger particles of the gravel. A centre of the road surface will readily go into potholes under traffic after a rain storm if the above precaution is not carried out.

Grade the whole road surface equally; the best method is to cut across from one side to the other side and then spread back, loosing the gravel as it is worked across the road.

Maintain road crown at all times to provide drainage. A "dish" effect allows water to lie on the surface and be absorbed into the grade, causing potholing.

Operate graders in tandem whenever possible, as this does away with the narrow roadway left by the first pass, and increases the distance that can be covered in a shift.

During hot, dry weather grade the surface only sufficiently to make travelling fairly comfortable; otherwise the "fines" will be brought to the surface, only to be blown off by wind or high speed traffic, and leaving nothing but rough, loose aggregate. At the approach of winter months make every effort to keep road surface up to a high standard of smoothness, because potholes and corrugations will be impossible to repair after freeze-up. Even though the winter surface may be good due to the potholes being filled with hard snow or ice, the first thaw will aggravate these potholes, and the road surface will be extremely rough.

Turn graders around at least once every 2 km wherever possible, to shorten the length of windrow on the road at one time.

13.08 OPERATION OF GRADERS

The importance of having a good operator cannot be overemphasized. Unless he takes pride in his work and the proper servicing of his machines, good results will not be obtained. An efficient graderman has a good eye, a lot of patience and, above all, good judgment.

13.09 MAINTENANCE OF GRADE CROSSINGS

When a grader passes over a level railway crossing, the operator is to stop his machine and walk back to the crossing to make sure that no dirt or stones have been deposited in the flangeway between the rails and the planking. It is obvious that any such deposit could cause derailment of trains and possibly a serious accident.

13.10 DUSTLAYING
**

Standards are now available for guidance in the control of roadway dust problems. Where roads are dry a liquid product should be applied in the form of calcium lignosulphonate, calcium chloride, or a road oil such as Bunker C fuel oil or MC asphalt which has been further cut-back (diluted) with Kerosene. Roads that have been pre-wetted either naturally or by water truck may be treated with a flaked calcium chloride or equivalent. Application rates are described in the Maintenance Standards and vary depending on product, number of applications during the year, and whether there is retention from previous years.

Roads should be graded prior to treatment to ensure minimum loose gravel, and so that fines are well distributed in the road surface. If the gravel has a reasonable amount of binder in it a more uniform, dense, tight surface, and, consequently, a more successful treatment will be possible.

The Standards also describe those situations that should normally be given dust palliative treatment and typical length and width of application.

PAVED AND GRAVEL SURFACE TREATMENT

13.11 SEAL COATING OF MINOR ROADS

Successful treatment will depend on the application of suitable cover material neither too coarse nor too fine. It will also prolong the life of an old, dry, weathered road mix pavement by livening up the surface and sealing it against moisture. Post speed limits of 30 km/h for two days along the section of road which is being seal coated. MC2 is recommended because most districts use MC2 for road mix pavement and therefore storage is less of a problem. However, emulsions RS2K and RS2 would be more suitable bonding asphalts and would give excellent results, If the cover material is graded somewhat, then emulsion RS-K is recommended.

The seal coating of road mix pavements on minor roads with an MC2 asphalt and a cover of coarse sand 9.5 mm minus, with no fines, is recommended, particularly one year after the pavement has been laid. Experience has shown that the seal coat prolongs the life of the pavement and reduces potholing considerably. Many minor roads have been successfully treated with this type of seal coating. It is not recommended on a hot mix pavement or a pavement where traffic is heavy and fast.

The technique may be described as follows:

The surface of the pavement should be cleaned by sweeping immediately prior to treatment, and the bituminous material (MC2) is applied at a rate of 1.1 litres per square metre from a distributor truck. For small jobs the bituminous material may be applied by tar kettle from which the bitumen is pumped through hand hose and nozzle. Coarse sand 9.5 mm minus with no fines, which is not readily available in all

** Amendment

districts, is spread by tail gate sander at the rate of 7.5 kg per square metre. This application will ensure that there is sufficient sand and no fat spots or bleeding will take place at a later date. Traffic will eventually throw the excess sand to the side of the road, or brooming may be carried out if necessary.

13.12 FLUSH COATING

This type of treatment is essentially the same as seal coating except that the asphalt is applied to a gravel surface which has been tight bladed rather than to a road mix pavement.

For a successful flush coat it is essential that (a) the foundation of the road be sound; (b) the gravel surface, which can be pitrun or crushed gravel, must have a reasonable amount of binder - not less than 4% passing 75 micro metre sieve so that a dense, tight, uniform surface can be obtained. Flush coating will not be successful if there is loose gravel of too large a size on the road.

It is not advisable to flush coat roads which have a large traffic volume of where high speed traffic is common. The treatment is more successful on side roads in resort areas where traffic is not too heavy and is seasonal. Dust is usually a problem in such areas and a cheap surface which controls the dust problem will more than satisfy the residents.

The technique may be described as follows:

The surface of the road to be flush coated is tight bladed so that there is no loose gravel and a dense, tight surface is available. Asphalt is applied at a rate of 1.36 litres per square metre from a distributor truck. Coarse sand is spread by tail gate sander at the rate of 17.5 kg per square metre. This application will ensure that sufficient sand is available to cover the asphalt and no fat spots or bleeding will occur at a later date. Traffic will eventually throw the excess sand to the side of the road.

If a road is flush coated in the early part of the season, a second application at the end of the season will provide a more successful surface which should last a considerable number of years. However, a second flush coat may be applied the following year with very good results. If it is possible, it is recommended that the second flush coat be applied in the same season, but if not, then early the following year. Provided light patching is carried out when it is needed, a flush coated surface can be maintained for a great many years.

13.13 PENETRATION TYPE PAVING

A modified penetration type of paving, as has been carried out in some areas, has proven to be very successful on minor side roads carrying light to medium traffic. These roads are in residential and farming areas, and without some form of pavement they would require constant grading and some form of dust control such as calcium chloride or bunker oil. The penetration type of paving adopted provides a

relatively permanent surface, which is easily applied and maintained, and which eliminates grading and dust problems. It has the advantage over road mixing in that it is less costly, thus providing more distance with the limited funds usually available for this type of work; it does not require a large stock of crushed gravel; and it does not require extensive use of graders or specialized equipment.

A certain amount of preliminary preparation is done to the road, if necessary, to provide a crowned surface and adequate drainage. The amount of initial preparation is dependent on the area and the standard of road desired. If the road has a good gravel surface, this is graded to a smooth, tight surface; otherwise at least 5 cm of gravel preferably 19 mm crush, is applied, and is graded and rolled to a tight surface. If the roadbed has just been recently shaped up and is somewhat soft or loose, it is desirable to compact it with water and rolling. If possible, it is best to do the preliminary work sometime before paving to allow traffic to compact the road.

Materials used in paving are MC2, stove oil and cover material. The cover material can vary, but should not have a high silt or clay content and should not be clean chips. Clean coarse sand or 19 mm crush can be used, but it is preferable to use 16 mm or 9.5 mm crush or screened material.

The first application of oil consists of MC2, cut back with stove oil, in the proportion of 135 litres of stove oil to approximately 865 litres of MC2, applied at the rate of 1.8 litres/square metre. The road is then left for at least a day to allow this first application to penetrate.

It is better if the oil can be left without covering; however, it is usually necessary to apply a light cover to prevent traffic picking up the oil. Only sufficient material to prevent pickup is used, otherwise the amount of penetration will be reduced.

The second application, made a day or so later, is done with straight MC2 at the rate of 1.1 litres per square metre. This coat is immediately covered with a fairly heavy covering of material and rolled with a light roller. No special equipment is used for spreading the cover material, nor is any attempt made to establish a rate of application. The material is spread as evenly as possible with ordinary tailgate power sanders, in sufficient quantity to ensure that the oil is well covered. It is found that any excess material is usually cleared off the road by traffic. Any loose material that might remain until the following year is removed by sweeping prior to any further application of oil. After the first year the road is given an additional seal coat consisting of 1.1 litres per square metre MC2 and cover material in each of the following two years. It is very important that these additional seal coats be applied if a permanent surface is to be obtained.

It has been found that this process provides a pavement which varies in thickness from 2 - 4 cm or greater, depending on initial penetration obtained. Very little, if any, maintenance is required for at least three to five years, at which time another seal coat is generally sufficient to renew the life of the pavement for another period. Such holes as might occasionally appear are easily patched with patch material, or can be cleaned out and filled with gravel, tamped and oiled in a similar manner as the original pavement was produced. If a section becomes badly holed it is easily ripped up and relaid, following the original procedure.

This process may be carried out with other types of asphalt; however, MC2 is used since it is the type generally used for road mixing, and is most often available. The use of the same oil for both types of paving eliminates the need for purchasing or storing different types of oil.

BITUMINOUS SURFACE MAINTENANCE

13.14 PRELIMINARY AND GENERAL

Maintenance is the art of preserving the pavement surface, with the minimum of expense and the least inconvenience to traffic. It should be regarded not as a temporary expedient, but as an investment in pavement structure, and insurance against costly repair. To neglect maintenance is to invite progressive damage, with consequent expensive repairs at a later date. Good maintenance practice takes know-how, skill and organization. Shoddy maintenance is almost as bad as none at all, and as costly in the long run.

Asphalt pavement almost invariably are repaired or resurfaced with other asphaltic materials. Because of the plastic and adhesive characteristics of the asphalt mat, the original pavement actually is improved when the new material is properly placed. Eventually a complete resurfacing will be necessary when maintenance costs on a badly deteriorated pavement become greater than the cost of amortizing a new pavement.

The amount and type of pavement maintenance necessary will depend upon -

1. The amount and strength of the foundation.
2. Drainage conditions.
3. The type, thickness and age of pavement (roadmix, pulvi-mix, plant mix or flush coat).
4. The availability of suitable patching material.

A weak foundation can lead to many different types of pavement failures, such as potholing, alligator cracking, edge failures, distortion or settlement.

Poor drainage conditions which allow a saturated subgrade will also produce many of the above failures. In many cases, pavement repair will have a short life unless it is accompanied by improved drainage to the subgrade.

The type of pavement to be repaired will determine the type of patching material to be used and the quality and degree of workmanship. Hot plant mix pavement of high quality will, on a good foundation, require little maintenance, but when patching of potholes or depressions is necessary use hot plant mix material from a central plant if possible. Usually an important highway is involved and a patch of high quality is desirable. Many pavements, however, are of the road mix or pulvi-mix type and may be laid on foundations of varying strength. This type of pavement, because of the lack of uniformity and control in mixing and laying of materials, and the problem of locating suitable granular materials throughout the Province, will require a greater amount of maintenance than a plant mix type pavement. Pavements of this type are, in most cases, repaired with an MC2 Cold Patch Mix material, which may be stockpiled from a portable Ministry plant or windrow grader mix. The quality of patching will depend on the standard and general condition of the pavement. It must be appreciated that when a pavement of this type has failed badly over a considerable length, judgment should be used as to the quality and type of patching to be carried out, as scarifying and complete renewal at an early date may be necessary.

Flush coated surfaces can sometimes be maintained from year to year with timely light patching, but in many cases deterioration is so bad that scarifying is more advisable than a continuation of patching. Patching material can frequently be wasted maintaining surfaces of this type. Maintenance of a flush coated surface will not call for a high degree of workmanship or control.

One of the big problems associated with pavement maintenance is the availability of suitable patching material. Good or permanent patches will never be possible if the materials being used are of poor quality. It is most important that all districts have centrally located sources of suitable granular material so that crushed gravel of good quality will be available for patch mix. In some areas screened gravel might be the only available granular material.

Hot plant mix of good quality from a commercial central plant is considered ideal for patching of high quality machine-laid pavements. Very few areas have such a source of material available to them. Stockpiles of cold mix produced by portable Ministry plants are available to many districts and usually are of better quality than material produced by windrow mixing, which other districts prefer to use because of lower production costs.

13.15 BITUMINOUS MATERIALS

All recognized pavement patching materials contain bituminous asphalt in some form. Liquid asphalt is commercially available in three forms:

1. Penetration Asphalt

   Asphalt which is obtained as a natural derivative from the refining of petroleum. It is graded by the amount that a standard needle will penetrate its surface under standard conditions (ASTM-DS test). The higher the penetration value, the thinner the consistency of the asphalt.

2. Liquid Cut-Back Asphalts

   Penetration asphalt which has been thinned by dissolving in petroleum solvent. The type of solvent determines the curing rate by the solvent's rate of evaporation. Rapid-occuring cut-back and special prime have a very volatile solvent which evaporates quickly.

   The grade of cut-back (e.g. RC-0, RC-1, RC-2, etc.) is determined by the amount of solvent. The suffix "0" indicates the maximum solvent content and thinnest consistency.

3. Emulsified Asphalts

   Penetration asphalt which has been thinned by forming an emulsion in water. The suffix "K" on an emulsion grade (e.g. RS-K) indicates that a cationic charge has been placed on the particles in the emulsion. This charge shortens the settling time of the emulsified asphalt and aids coating of the rock particles.

Each form and grade of asphalt has an application for which it is best suited. The recommended type of asphalt for each application which may be encountered can be found on the accompanying Table I "Applications of Asphaltic Materials".

Liquid asphalts must be at the correct viscosity when applied so that they will properly penetrate or coat the aggregates. It is necessary to determine what viscosity is required at application and obtain the correct temperature from the supplier. The recommended spraying viscosities are given on the accompanying Table II "Recommended Spraying Viscosities".

APPLICATIONS OF ASPHALTIC MATERIALS

APPLICATIONS	GRADES OF MATERIALS																								
	Liquid Cut-Back Asphalts																	Emulsified Asphalts				Asphalt Cement		S.P. Asphalt
	Special Prime	Rapid Curing					Medium Curing					Slow Curing						Sap.set (RS or RS-K)		Slow Set.	Crack Filler			Husky Crack Sealer
Asphalt Grades		0	1	2	3	5	0	1	2	3	5	0	1	2	3	5		1	2	SS-1		AC4	AC6	
DUST PALLIATIVE												X												
PRIME COAT																								
Tightly bonded surface	X						X					X								X				
Loosely bonded sandy surface			X					X					X											
Loosely bonded coarse surface				X					X															
SEALCOATS & SURFACE TREATMENTS																								
Fine Cover Sand	X						X	X										X						
Coarse Cover Sand			X	X				X	X									X						
Fine Cover Aggregate				X					X									X						
Medium Cover Aggregate					X					X									X					
Coarse Cover Aggregate																			X					
Graded Gravel Aggregate Cover										X					X			X	X					
MIX IN PLACE																								
Open Graded Aggregate				X						X														
Dense Graded Aggregate (over 7% passing 75 micro metre)														X						X				
Dense Graded Aggregate (under 7% passing 75 micro metre)								X	X						X					X				
PREMIX PATCHING																								
Cold laid from stockpile									X					X	X									
Hot laid from plant											X											X	X	
PENETRATION PATCHING																								
Coarse clean Aggregate						X													X			X		
Finely graded Aggregate					X													X						
CRACK SEALING				X	X																X			X

TABLE I

TABLE II

RECOMMENDED SPRAYING VISCOSITIES

Type of Operation	Viscosity Range** (Saybolt-Furol Seconds)
Prime Coat	50 - 75
Sealcoat & Surface Treatments	50 - 75
Mix in Place	75 - 100
Penetration Patching	75 - 100
Hot Plant Mixing	75 - 200

** Refinery can be asked to supply temperature ranges which correspond to these Viscosity ranges.

13.16 AGGREGATES

The following brief description of recommending aggregates for each application is meant to serve as a guide while choosing suitable sources of aggregate for patching or preparation of patching material.

1. Granular backfill is used to replace sub-base material in a pavement excavation. It should be clean, and free from organic material and may be crushed or uncrushed, depending upon the particular case; it should be well graded, all passing 50 mm or 75 mm screen, with at least 25% passing 4.75 mm sieve and not over 8% passing 75 micro metre sieve.

2. Base gravel is used to replace base material in a pavement cut or excavation. It should be clean, sound, hard and free from organic material and have at least 40 - 50% crushed particles in the coarse fraction. The base gravel gradation should fall within the following limits (or subsequent limits as given in Section 202.3 of the General Specifications):

Screen Size	Percent Passing by Weight
19 mm	100
12.5 mm	70 - 100
4.75 mm	40 - 80
75 micro m	2 - 9

3. Shoulder gravel is used for the maintenance of gravel shoulders and may be the same as Base gravel or Paving gravel, as described in Section 223.45 of General Specifications.

4. Premix aggregate is for mixing with an asphaltic binder and must exhibit good natural stability, and high stability when incorporated in the mix for Premix levelling course or surface course. Premix patching material must be clean, sound, crushed and well graded, with maximum size 9.5 - 12.5 mm for coarse, deep patches or 9.5 mm for fine, feathered patches; it may be produced from Base gravel by screening out over-sized material, as long as satisfactory gradation similar to paving gravel is maintained. The aggregate should be chosen so that the final asphaltic mix is workable and contains sufficient air voids to accommodate the solvent which the liquid asphalt contains. The gravel must be capable of absorbing this excess liquid until the patch has thoroughly cured and the solvent has evaporated. If the gravel cannot absorb the solvent, the patch will either be too soft, and deform under traffic while curing, or the Premix material will not contain sufficient asphalt to produce the desired strength and resistance to moisture.

   Further information and advice on this matter can be obtained from the Regional Paving Engineers.

5. Cover Aggregate is used for seal coats, skin patches and successive applications in multiple surface treatment and penetration patches; it consists of clean, hard, crushed angular (except pea gravel or sand) material, free from organic or deleterious matter, and is relatively open-graded, or uniformly sized as follows:

Material	SCREEN SIZES Min. 90% Passing	Max. 10% Passing	Maximum % Passing 75 micro m
Coarse Cover Aggregate	19 mm	9.5 mm	1%
Medium Cover Aggregate	16 mm or 12.5 mm	7.9 mm or 6.3 mm	1 1/2%
Fine Cover Aggregate	9.5 mm or 7.9 mm	4.75 mm or 2.36 mm	1 1/2%
Coarse Cover Sand	4.75 mm		2%
Fine Cover Sand	2.36 mm or 1.18 mm	1.18 mm 0.60 mm	3%

Further size relationships can be obtained by reference to General Specifications, Section 224, and Drawing H.224-10 "Grading Chart for Sealcoat Cover Aggregates". If in doubt, please contact the Regional Paving Office for advice.

13.17 PAVEMENT DEFECTS AND THEIR TREATMENT

Deterioration of the pavement can occur in any or all of the elements due to:

1. Poor quality materials or construction, or faulty design in the original structure.
2. Adverse effect of moisture and/or weather.
3. Excessive traffic effects.
4. Lack of, or faulty maintenance.

A detailed outline of the different kinds of pavement distress, the probable cause, and treatment, is shown below:

TYPE OF DISTRESS	PROBABLE CAUSE	TREATMENT
Edge Failure	Insufficient thickness of mat, excessive loads, lack of shoulder support, base saturation, usually due to high shoulders trapping run-off.	Check drainage & clean ditches. Check shoulder and blade it down to surface grade and compact. Fill cracks and sealcoat outer edge.

TYPE OF DISTRESS	PROBABLE CAUSE	TREATMENT
Weathered or dry surface	Insufficient asphalt, or overheating of asphalt (if a plant mix), age of pavement or absorptive aggregates. Greater traffic density than pavement was originally designed for.	Fog seal of dilute, slow-setting asphalt emulsion (SS-1, RC-1 or special prime) approx. 0.5 litres/sq. metre there are pitted areas needing filling, use of slurry seal or conventional seal coat is recommended. Care should be taken not to apply too much asphalt as it can cause a slippery surface-which is a traffic hazard.
Pot Holes	Any of the several types of distress cited here will lead to pot-holing; also, water infiltration, unstable base, insufficient asphalt to maintain a bond, or open or segregated mix.	Square up hole, making sides almost vertical; replace lost base material if necessary. Spray cavity lightly with emulsified or cutback asphalt, fill with pre-mixed material to compacted height that will allow for additional traffic compaction; finally seal with 0.5 to 1.36 $1/m^2$ and 3.8 to 9.5 kgs cover aggregate per m^2. Penetration patch also used frequently
Alligator Cracking	Base saturation, lack of base support or insufficient thickness of mat.	Check and correct drainage faults; apply thin coat of liquid asphalt with cover of mineral aggregates at rates given above. (If necessary repeat treatment to furnish needed reinforcement.) Sometimes patching is indicated.
Bleeding and Instability	An excess of asphalt, changing its character from binder to lubricant, or presence in mat of large amount of silt or clay, with rounded gravel, lacing interlock. Often moisture accumulating beneath surface destroys the bond and traffic pushes the pavement to form waves or ridges.	Scarify, re-mix and relay, adding sand if there is an excess of asphalt. Where the cause is weak base and/or poor drainage, underlying fault must first be corrected. Sometimes shoving and pushing may be corrected by honing or blading off ridges, patching and sealcoating.

TYPE OF DISTRESS	PROBABLE CAUSE	TREATMENT
Ravelling	A lean or over-heated mix. Insufficient initial compaction. Initially paved late in season and very little traffic compaction.	Apply fog seal, regular seal with cover mineral, or slurry seal as judgment dictates.
Base Saturation	Standing water in side drains, leaking ditches or culverts, or other conditions which trap moisture beneath the surface.	Clean ditches and install new or additional drainage as indicated.
Longitudinal and Transverse Cracking	Contraction, or subgrade movement. Movement frequently caused by overloading slopes while dumping during maintenance work.	Crackfilling and sealing.
Distortion and Depression.	Inadequate compaction of sub-grade or base.	Spot levelling and skin patching.

13.18 TYPES OF PATCHING TECHNIQUES

There are usually four general types of patch work used in repair of asphalt surfaces throughout the Province.

1. Skin or Paint Patching.
2. Premix Patching.
3. Penetration type Patching.
4. Crack Sealing.

1. Skin Patching

Paint patching is a miniature surface treatment or spot sealing over a small area. This type of patch is used to seal areas that have begun to ravel or disintegrate. It is also used in the late fall and early spring in areas badly checked and cracked, with a fluid asphalt that will flow into cracks and prevent water infiltration.

The type of patch consists of painting the dry surface of the distressed area with a liquid asphalt material and then covering it with aggregate. The rate of asphalt application depends on the condition of the surface, its roughness, cracking, etc. Around 1.36 litres per square metre is a good starting point. The size of aggregate depends on the grade and amount of asphalt applied.

The following table will serve as a guide for determining suitable quantities.

Materials per Square Metre for Paint Patching

Asphalt	Aggregate 12.5 mm	Aggregate 6.3 mm	Sand
1.36 litres MC2 or 4, RC3 or 4, RS2	11.4 kg		
0.91 litres MC2 or 3, RC2 or 3, RS1		6.8 kg	
0.68 litres MC2, RC1 or 2, RS1			4.5 kg

The surface to be treated should be cleaned by sweeping, or preferable by a blast of high pressure air. When the surface is clean and dry, the bituminous material is applied in the proper amount.

The bituminous material may be applied by the hand brushing, by squeegee, or by spraying from a pressure tank. Such a tank may be an ordinary distributor, or a smaller tank (450 to 1800 litres) on a two-wheel trailer, from which the bitumen is pumped through the hand hose and nozzle. After asphalt application, the aggregate should be spread uniformly and rolled. Aggregate should be broomed, if necessary, to produce uniform distribution. It is important to use all the dry aggregate covering that will be held by the bitumen. Any appreciable surplus will be wasted. If the work is properly handled, fat spots will not develop.

Skin patching should not be attempted unless the air temperature is a minimum of 16°C and the temperature of the road is a minimum of 18°C. Temperature ranges for the liquid asphalt can be obtained by referring to the Saybolt Furol viscosities given in Table II, and obtaining the corresponding temperature ranges from the asphalt supplier.

It is strongly recommended that all road mix pavements one year old be sealed with MC2 Asphalt at 70 to 82°C and a cover of coarse sand 6.3 mm minus with no fines. Apply the asphalt with a distributor truck at the rate of 1.1 litres per square metre. Sand can be spread by tail gate sander at a rate of 7.5 kg per square metre. Excess sand can be broomed off at a later date. It is felt that this treatment seals the pavement against moisture and livens up the surface of the pavement.

2. Pre-mix Patching

Probably more patching is done with pre-mixed bituminous material than with any other material. Two general types are used: cold mix and hot mix.

There is a definite trend toward using more hot mix and less cold mix for patching. The hot mixes have several advantages. Generally the mix is better controlled than cold mixes made on the job, and as a result, more uniform. Fat patches, caused by excess bitumen, cease to be a problem. The mix sets quicker and can be smoothed out better under the roller. Traffic will disturb the

hot mix less than other types. The work can be done more quickly, with less obstruction to traffic, and less danger to the men doing the work. It can be used in cold or damp weather and still achieve good results.

Often the patching mix, either cold or hot, can be obtained from a commercial mixing plant. This plant may be at a permanent location or it may be a contractor's plant that has been moved into the area. Generally, an excellent patching mix can be obtained in this manner and the plant operator can usually produce any mix desired by the customers, although it may be necessary to take the special patching mix at times when he is not producing his regular material. Hot mix can be hauled by truck direct to the patching job and will remain workable for several hours with insulated boxes. Cold mixes can be used on the job, if necessary, or may be piled for storage and used from there.

The following is a step-by-step procedure in preparing and carrying out a good pre-mix patch:

1. Use chalk line to square off patch and define the edge of pavement.

2. A clean, dry, square-edged hole is important. Cut away the edges of the hold to sound material and cut vertically so as to provide shoulders against the movements of the patch.

3. Remove unstable base material or soil if found, as it may produce a soft spot, and replace with stable aggregate, consolidate to base of pavement.

4. When cutting pavement across road for culverts or waterlines, make cut wide enough so roller can be used for compacting the base.

5. Clean the patch hole with hand brooms. If the pavement is wet and the weather cold, use the Propane torch to accelerate drying.

6. If the hole is more than 5 cm deep, fill and compact in 5 cm layers to within 5 cm of the surface with stable aggregate that will compact.

7. When it is ready, prime the hole with a light application of suitable bonding asphalt, which may be MC2 asphalt which has been heated, or emulsified asphalt (Colas or Bitumals). MC2 asphalt is used mostly during winter months and emulsified asphalt during dry summer months. The primer should be thin enough so that it can be applied lightly. An excess of bitumen will certainly flush into the patching mixture and cause fat spots.

8. Place patching material in hole with shovels. Do not dump material from truck into hole, as this causes a compaction area and lack of uniform texture.

9. The patch is levelled and spread with rakes and lutes. Use the asphalt lute to remove all coarse rock and level patch. Too much raking causes small material to settle to the bottom, leaving coarse material on top. Heavy raking is necessary and desirable only in feather edging patches. In feather edging, coarse material is not left at the edges of the patch, but is pushed towards the centre with the back of the rake.

10. The patch should be 1 to 4 cm high before compaction, depending on the depth of the hole and type of patch mix. Getting a smooth riding surface requires care. Too many crews are "mound builders". A straight edge or string can be used as a guide in finishing the patch so that it will not be lower, and only slightly higher, than the surrounding pavement.

11. Roll the edges of patch first, as this stops any chance of material pushing up the side of the hole and causing a ridge.

12. If the pavement is thick, place the patching material in thin courses not exceeding 4 cm after compaction.

13. Compact all patches thoroughly before they are opened to traffic. If a patch is not compacted, traffic will kick out and whip off some of the patching mixture and produce a rough spot. It will be porous and eventually will wash out. Patches may be compacted with a conventional roller, portable vibrating roller, vibrating plate compactor, and only with wheels of loaded truck if nothing else is available.

14. When repairing edge failure it is important that the edge of pavement be properly defined and shoulder material replaced to provide adequate support. More than likely lack of shoulder material originally contributed to the failure.

15. When surface patches are over 15 m in length, it may be more convenient to spread the material with a grader. Avoid grader patches as much as possible because uniform texture is not possible. Feathered edges are usually irregular and the surface is generally rough. Such a patch can be much improved if edges are feathered out straight and finished by hand.

3. Penetration Type Patching

This entire operation is similar to the construction of a new bituminous penetration macadam pavement. A course of substantial thickness of mineral aggregate is spread uniformly and compacted, after which sufficient asphaltic binder is applied to the surface to penetrate the entire depth of compacted aggregate. The surface is then finished with a seal coat. This method produces a new low-cost type of patch that is used frequently because it is a quick, easy procedure that may be accomplished with a minimum of

equipment. If properly done the results can be very satisfactory - and often unsatisfactory if not properly done. The patch may vary from rich to lean, or may bleed, push or ravel.

The binder for penetration patches may be an asphalt cement of 85 to 100, or 120 to 150 penetration, an RC3, RC4 or RC5, or a quick breaking asphalt emulsion (RS1 or RS2). Cements and cutbacks must be heated for application, while the asphalt emulsion can be used cold. Some difference in aggregate gradation and application procedure is necessary when using the hot and cold application of material. Large voids in the aggregate are required for the penetration of the hot bituminous materials, while small voids are desirable for the cold emulsified material.

After the hole has been properly cleaned and shaped, the penetration aggregate is placed in it. The aggregate should be nearly a one-sized material. The dry aggregate in the hole is then thoroughly keyed by tamping or rolling. Bituminous binder is poured or is sprayed on the consolidated aggregate. The binder may be drawn from a kettle and poured from pouring pots by hand. A small bituminous distributor with a hose and nozzle is better.

After the first coat of bituminous material has been applied, fill the surface voids with clean stone, slag chips, or pea gravel, and roll. Use only sufficient "chinking-in" aggregate to fill the surface voids. Move the aggregate about with brooms or a sweeper during the rolling to assist in obtaining a uniform distribution of the filler, and to assure the complete filling of the surface voids. Sweep away excess aggregate before the seal coat is applied. A seal coat of the same grade and kind of bituminous material used in the penetration course is applied. A final rolling and sweeping operation completes the job.

Care must be taken to see that the surface of the patch is at the same elevation as the surrounding pavement. A straight-edge or line should be used in obtaining this result. Do not allow traffic on patch until cured.

In this type of patching the tendency is to use too much bituminous material. The amount must be kept within the limits given in the following table if a satisfactory job is to be obtained.

Material per Square Metre for Penetration Patch

	Depth of Patch 7.5 cm	3.75 cm	2.5 cm
First Aggregate	141 kg (63 mm - 25 mm)	65 kg (37.5 mm - 19 mm)	32.5 kg (19 mm - 9.5 mm)
First Asphalt	8.2 litres	3.3 litres	1.9 litres
Second Aggregate	21.7 kg (25 mm - 4.75 mm)	13.6 kg (12.5mm - 2.36mm)	10.9 kg (9.5mm -2.36mm)
Second Asphalt	4.1 litres	3.3 litres	1.7 litres
Third Aggregate	13.6 kg (9.5mm - 2.36mm)	5.4 kg (4.75mm - 1.18mm)	5.4 kg (4.75mm -1.18mm)
Seal Asphalt	1.9 litres	1.9 litres	1.9 litres
Aggregate Cover**	6.5 kg (4.75mm - 1.18mm)	6.5 kg (4.75mm - 1.18mm)	6.5 kg (4.75mm -1.18mm)

** Since the strength of the patch depends upon the interlocking of the aggregate particles, a crushed, or at least an angular, material should be used.

4. Crack Sealing

Open cracks and joints allow water to seep through the slab to the base and subgrade, softening them and reducing their load-supporting value. Cracks also expose side surfaces which tend to oxidize and may ravel and spall.

The purpose of filling the crack is to seal its sides and bottom to prevent further percolation of moisture and air into the pavement structure. This can normally be accomplished with a relatively small amount of asphalt.

Small cracks develop from base and subgrade movement when the pavement is under load. Expansion and contraction of the pavement also contribute their share of cracks. As the pavement flexes during changes in temperature the small cracks gradually widen until they sometimes become 25 mm or more in width. Seal small cracks immediately, before water and dirt are allowed to penetrate the openings.

If a structurally sound pavement has only a few cracks, correct individually by filling with asphaltic material. The use of a seal coat to seal the cracks is not encouraged unless there is extensive cracking in the pavement.

Prompt maintenance keeps cost low and prevents progressive damage. Sealing of cracks and joints should not become a spring and fall operation but should be done as the need becomes apparent. At the approach of winter, make special efforts to get all joints and cracks properly sealed, and plan the work to allow completion in spite of delays due to seasonal rains.

Generally, the less viscous asphaltic materials are recommended for crack filling. These include cutbacks, RC3 or 4, MC3, or crack filling asphalt emulsions. If has been observed that frequently a much too heavy (high viscosity) asphalt material (like asphalt cement) has been used. This material did not get into the narrow crack, and merely gave a superficial bridging result.

A special crackfilling material is produced by an oil company, called "C-190, Crack and Joint Filler". This material is poured into the cracks at a temperature of from 190 - 204°C. It has proved to be a good sealer, and has desirable low temperature properties which help it withstand winter frost and snow removal. The material is available in approximately 45 kg fibreboard cartons.

Clean small cracks by directing a jet of compressed air into the opening and blowing the dust and fine dirt away. Or, broom the surface of each crack vigorously with a stiff bristle broom.

In wider cracks or joints it may be desirable that they be cleaned by blowing out the dirt and other objectionable matter by a specially-built joint plow or gouge tool.

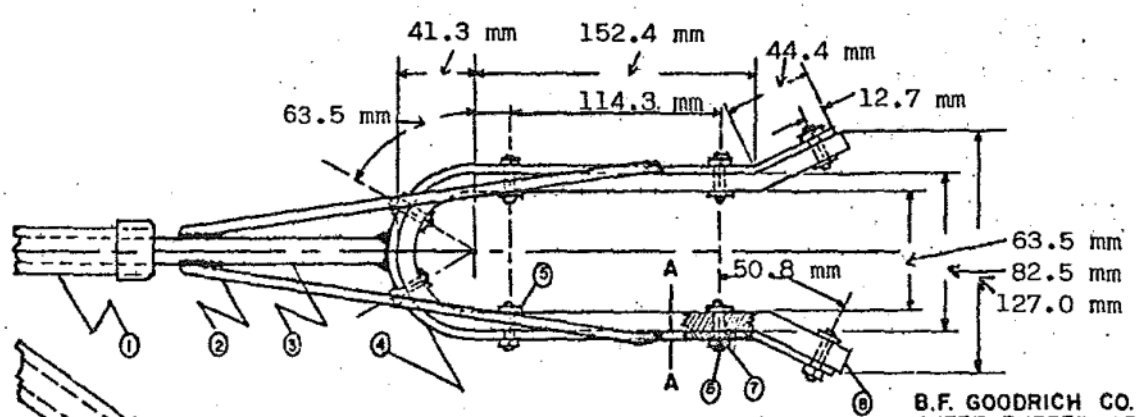
Use sealing material sparingly. Pour only enough material into the opening to fill the crevice flush with the surface of the slab. Overfilling may cause a build-up of the material. This not only produces an objectionable bump, but may track on to the pavement.

To assure even distribution of the material, it will be found that a squeegee, used as depicted in the attached figure, will serve well. It will also assist workmen in keeping the application to a minimum. The method may be described briefly as follows:

The pouring kettle is followed immediately by a rubber-edged squeegee which wipes off the surplus bituminous material and carries it forward into the unfilled opening. The material will track under traffic and must be covered immediately with very fine sand or rock dust. This not only provides a right seal but prevents possible tracking of the asphaltic material on the adjacent surfaces.

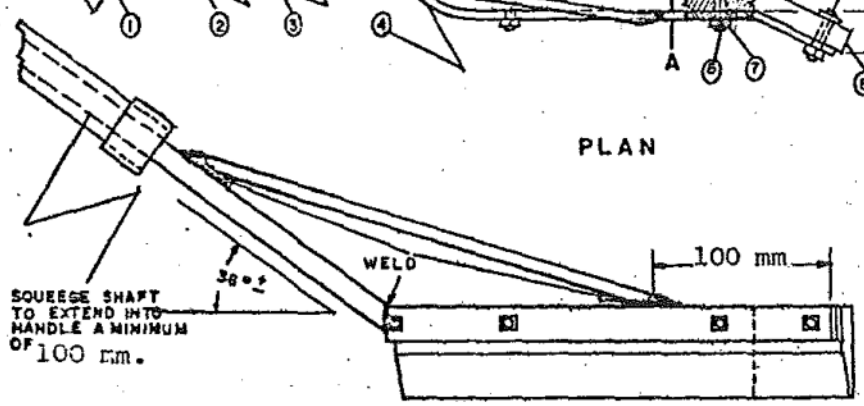
13.18.4 Cont'd.

CRACK FILLER SQUEEGEE

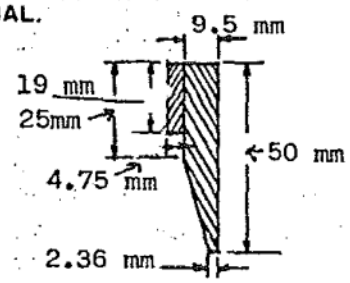


PLAN

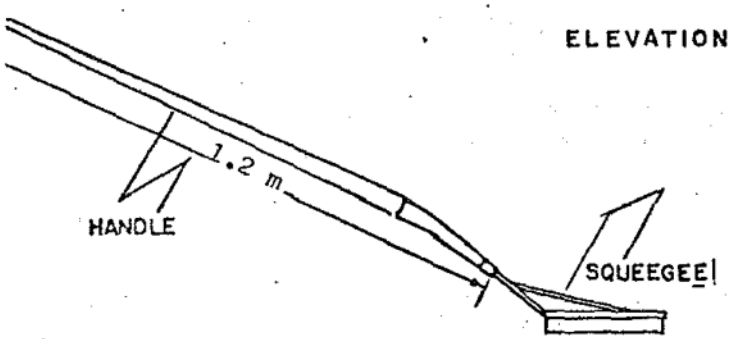
B.F. GOODRICH CO. GRADE 1170 SHEET RUBBER OR APPROVED EQUAL.



ELEVATION



SECTION A-A



ASSEMBLY

Sheets 9.5 mm x 508 mm x 915 mm will produce 18 strips of 9.5 mm x 508 mm x 50.8 mm size.

DETAIL NO.	DESCRIPTION	NO. REQ.
1	MANURE FORK HANDLE	1
2	6.3mm ø x 25.4 cm steel rod	2
3	12.5mm ø x 25.4 cm steel rod	1
4	4.75mm x 19mm x 50.8cm steel flat	1
5	NO. 10 PLAIN WASHER	8
6	NO. 10X 22.2mm Machine Screws	8
7	NO. 10 SQUARE NUT	8
8	9.5mm x 50.8mm x 508mm Sheet Rubber	1

13.19 EQUIPMENT USED IN PATCHING

The following is a list giving the various items of equipment which a well-organized patching crew should have available if it is to carry out patch repairs of high quality that will be permanent and smooth to high-speed traffic:

4 ton truck - box divided: 2.5 cubic metre rear section for patch mix and front section for tools, drums, etc.
Essick Vibrator Roller 386 kg - hangs on tailgate of truck.
Propane Torch with stove.
2 Coarse Rakes
2 Levelutes complete with teeth (fine raking)
3 Square Mouth Shovels
3 Round Shovels
1 200 litre Drum MC2
1 200 litre Drum Emulsion (Colas or Bitumals)
2 25 litre Pails (one for MC2 and one for Colas)
1 25 litre Pail for Diesel Fuel (cleaning tools)
1 25 litre Pail for Diesel Fuel (Cleaning brushes)
1 25 litre Can Gas for Jackhammer
2 Stable Brooms
2 Picks
1 Hand Tamper 15 x 15 cm base x 2 cm
1 Hand Scraper for cleaning tools
1 Fire Extinguisher
1 Tarpaulin to cover hot asphalt
1 Chalk Line and Chalk
1 Mason Line
Adequate signs in good condition to warn public
2 tar Brushes.

Small tools (axe, machete, crowbar, etc.) should also be carried; in the event that weather is unsuitable for patching, men can carry out brushing or other maintenance.

A Distributor truck would be necessary to apply asphalt for extensive seal coats. Asphalt for seal coats over a small area can be applied from a tar kettle.

13.20 PATCHING CREW

A three-man crew can adequately carry out most types of patching maintenance and on some roads, where traffic volume is low and maintenance is light, a two-man crew would be sufficient. The crew is composed of a Road Maintenance Foreman Grade 1, Power Roller Operator Grade 1, and Bituminous Rakerman. In certain circumstances, however, particularly when traffic is heavy and the patch is large, it may be necessary to have one, or maybe two, additional men on the crew to assist with flagging and unloading and spreading of the material.

It is most important that the patching crew be properly trained in good patching techniques. Only men who show an interest in this type of work should be selected, and once the crew is established, rotating the men to other jobs should be avoided. It takes skill and know-how to

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perform a good permanent patch, and this skill will be lost if the crew is not established on a permanent basis. The men must be capable of working together as a team and, as their skill in patching develops, a feeling of achievement and pride in their work will prevail.

If a well-trained patching crew is equipped with the aforementioned items of equipment, patch maintenance of high standard can be achieved with the maximum amount of mobility.

13.21 SHOULDER MAINTENANCE

A road shoulder is that part of the road on either side of the paved surface or travelled way which provides a stopping place in emergencies, a pathway for pedestrians and, primarily, lateral support for the pavement. Unless it is properly maintained its function for all purposes is impaired.

Grade shoulders in the spring and fall to restore their shape and kill vegetation. It may be necessary to grade some sections of highway more often; as much as twice a month where traffic is extremely heavy, such as on inside of curves, at intersections, or through ribbon development areas. If these sections are short they could be stabilized with calcium chloride or salt. To obtain best results ensure that gravel has 8% - 10% passing the 75 micro m sieve. Apply calcium chloride and salt at the rate of .75 kg per sq. metre, and mixed thoroughly with the top 8 cm of gravel.

In some instances where shoulder grading cannot be done on a regular basis, herbicides may be used to prevent vegetation from growing on the gravel and subsequently breaking up pavement, hindering drainage, obscuring vision and reducing stopping ability. This maintenance activity is to be carried out only by the Regional Landscape Supervisor and requests to have shoulders sterilized are to be directed to him.

** The paving of 1 m of gravel shoulder, combined with a white line, will provide greater safety to the travelling public and less erosion of the gravel at the edge of the pavement; consequently, considerably less maintenance will be necessary on the remainder of the shoulder.

Maintain shoulders at a slope of from .10 cm to .15 cm per m of width. If the slopes become greater than this, correct them by the addition of 19 mm or 31 mm crushed or screened gravel; 19 mm crushed gravel is preferable where the shoulders are used as a pathway by a large number of pedestrians.

Where trucks are using a shoulder as a climbing lane, study the feasibility of construction and paving a third lane. However, if this is too costly, a double flush coat of asphalt and rock chips may be the answer if the base has sufficient strength. Another solution is to stabilize the shoulder with calcium chloride or salt.

Properly maintained shoulders promote even distribution of surface drainage off the shoulders and down the shoulder slope, preventing erosion of the shoulders and slope. In extreme cases asphalt curbs may have to be used.

** Amendment

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** Amendment

GUARD RAIL

13.22 GENERAL

*

The types of guard rail in general use are:

Type A - 69 cm Precast Concrete No Post Barrier
Type B - 46 cm Precast Concrete No Post Barrier
Type C - 76 cm Precast Concrete No Post Barrier
Steel beam guard rail

(Refer to General Specifications, Section 204, and Standard Drawings 186-15A, 186-15A-1, 186-15A-3, 186-16F, 186-16G, 186-16H, 186-16J).

For concrete guard rail, a transition section is also available which provides a link up between the 46 cm and 69 cm types. Also, end sections (bull noses) are available for the 46 cm and 69 cm types.

Guard rail has the following primary uses:

i) To retain vehicles on the roadway and thereby prevent them from either going over a steep embankment or entering a body of water.

ii) To prevent vehicle collisions with roadside structures.

iii) To serve as a median barrier on freeways and divided highways.

iv) To serve as a protective barrier at viewpoints, parking lots, freeway entrances, etc.

For uses (i) and (ii) both the 46 cm and 69 cm guard rail types should be used. The use of the 69 cm type would be reserved for more hazardous situations since it provides a more effective (although more expensive) barrier than the 46 cm type. To determine the need for guard rail as a shoulder barrier (use (i)), a warrants index has been devised to measure the degree of hazard based on highway alignment and cross section data. The procedure for using this warrants index system is explained in Section 13.23.

The 76 cm type is used almost exclusively as a median barrier (use (ii)) although in some cases of severe hazard it may be used as a shoulder barrier. However, the use of 76 cm guard rail would not be desirable on narrow unpaved shoulders or where snow removal may be a problem.

Where guard rail is required for parking lots, viewpoints, freeway entrances, etc. (use (iv)) the 46 cm type is usually satisfactory; although in some cases the 69 cm type may be preferred.

In all cases where concrete guard rail is to be installed, it is preferable that it be placed on a paved base to control erosion due to drainage and to prevent shifting of the individual sections. In situations where guard rail is required, but the use of the concrete type is precluded due to a narrow shoulder or drainage problems, then the steel beam type should be used. However, the use of steel beam guard rail is generally being discouraged due to the high amount of maintenance that is required with this type.

* Amendment

When guard rail is used as median or shoulder barrier, it is important that runs of any one type not be less than 30 m. Short isolated sections of guard rail should be avoided because they may be difficult to see and the exposed ends could represent a hazard to someone driving close to the edge of the road.

13.23 GUARD RAIL WARRANTS INDEX

The guard rail warrants index is a measure of the degree of need for guard rail on the shoulder of a highway. The warrants index takes into account such data as road alignment, fill height, fill slope, shoulder width, traffic volume, and climatic conditions.

On the basis of this information a warrants value is determined from the Guard Warrants Nomograph. The details of how to use the warrants nomograph are explained in Appendix I.

The warrants values are typically in the range of 30 - 150. The following general guidelines should be used to install guard rail based on the warrants value:

i) If the warrants value is less than 70, then no guard rail should be required.

ii) If the warrants value is between 70 and 90, then the 46 cm type (Type B) should be installed.

If the warrants value is greater than 90, then the 69 cm type (Type A) should be installed.

It should be recognized that the above guidelines are only approximate, and that exceptions to these may be made with approval from the Highway Safety Engineer.

13.24 STEEL BEAM GUARD RAIL

Maintain guard rails true to line and grade; keep in good repair and well painted. Keep the shoulders under and around the guard rail free and clean of vegetation and debris.

Before repainting, clean guard rail and post by brushing with fibre brushes to remove dirt deposits. If flushing equipment is available, flushing equipment is available, flush the guard rail with fresh water.

Repair broken and damaged sections as quickly as convenient as they are hazardous and unsightly.

Check cable rail frequently and tighten.

Replacements and repainting, or new construction, shall conform to the requirements of the "General Specifications for Highway Construction" for the particular type of guard rail involved.

13.25 PAINTING GALVANIZED GUARD RAIL

1. Surface Preparation

    1. Weathering - Permit new galvanized guard rail to weather until it is uniformly dull in appearance. Probably six months to one year will be sufficient; do not delay beyond this period, in order that maximum life of the galvanizing may be obtained.

    2. Cleaning - Remove all road dirt, dust, grease, oil, or other contaminants. Cleaning methods will be dictated by conditions. Dry brush and rags will remove loose dust. Use water, with or without detergent, to remove adhering dirt, etc., and solvent to remove grease and oil.

2. Primer

    1. Type - Vinyl Wash Primer to C.G.S.B. Specification 1-GP-121.

    2. Mixing - The material is supplied as a two-component system to be mixed 4 parts resin to 1 part acid. The resin component is thoroughly stirred and the acid component is added slowly with stirring. Use immediately after mixing - must be discarded if not used within 8 hours of mixing.

    3. Application - Apply by brush or spray in a very thin, uniform film (8 micro metres dry).

        Add thinners supplied if necessary to obtain thin film. The acid component is not a thinner.

        Clean equipment with thinners supplied (isopropanol or denatured ethanol); do not use mineral spirits, Turpentine, etc.

    4. Recoat - The material is sufficiently dry for recoating in 60 minutes; if possible, recoat on the same day it is applied as it loses its effectiveness after short exposure to adverse weather conditions. Under ideal weather conditions (warm and dry) recoating may be delayed 24 to 48 hours, but no longer.

3. Top Coat

    1. Type - Exterior Enamel (Alkyd) White, to Ministry of Highways Specifications MOH C-4.

    2. Application - Apply by brush or spray to a uniform total film of about 25 micro metres dry. Thick films are liable to fail by loss of adhesion.

        Most satisfactory results are obtained by spray application of two thin films about 12.5 micro metres.

        The paint may be thinned as necessary to obtain a uniform thin film. Mineral spirits is a satisfactory thinner.

3. Recoat - If two coats are applied, the first may be recoated after 18 hours under good conditions; e.g. dry, with temperature 16°C - 21°C.

4. Backs of Rails

In order to prolong the life of the galvanizing, especially in severe environments (e.g. marine, coastal or industrial), also paint the backs of the rails. Since visibility is not of importance, black paint to Ministry of Highways Specifications MOH C-2 may be used. This paint is extremely durable and should require very little maintenance. The backs of the rails must be weathered, cleaned and primed as for the white paint.

5. Maintenance

1. Repainting - Keep repainting to a minimum since the build-up of thick films will encourage failure by loss of adhesion. In locations where the rail gets dirty, consider washing the rail (with brush, detergent and water) in preference to repainting to maintain general appearance.

2. Damage - Where the paint has been scraped off but the galvanizing is undamaged, or where the paint is failing by flaking, any loose paint at the edges of the damaged areas must first be removed, and the exposed galvanizing thoroughly cleaned.

If areas of exposed galvanizing are large, spot prime with Vinyl Wash Primer (as for new rails); if areas are small apply white enamel (MOH C-4) directly to galvanizing.

Where the galvanizing itself has been damaged (whether corrosion of the steel has started or not):

(a) Remove loose paint around edges of damaged area.

(b) Thoroughly clean. Remove any rust by wire brush.

(c) Spot prime with rust-inhibitive primer by brush.

Preference - Zinc Rich Paint (e.g. Galvanox, Galvacon, Galvafroid, etc.) applied quite thick (50 micro metres dry).

2nd Choice - Zinc Chromate type primer (Yellow) applied quite thin (less than 25 micro metres dry).

3rd Choice - Red Lead Type - MOH A-2 or B-1 applied as normal brush coat (25 micro metres dry).

(d) Apply thin coat(s) of white enamel (MOH C-4).

6. Acid Treatments for galvanized surfaces, e.g. acetic acid (vinegar), copper sulfate, diluted hydrochloric acid, etc., are not effective and unless used with extreme care can cause excessive damage to the zinc.

13.26 PAINTING STEEL GUARD RAIL (Non-Galvanized)

1. Surface Preparation

The importance of thorough surface preparation cannot be over stressed. While several manufacturers of propriety brand paints claim their materials will perform satisfactorily over rusty surfaces, extensive field and laboratory testing indicates that none of them give better performance than red lead in linseed oil as MOH A-1 or MOH A-2. Also it can be demonstrated that the performance of MOH A-1 or MOH A-2 is directly related to surface cleanliness. Other factors being equal, better than 10 years of life may be expected, (except in very severe environments), when the steel surface is thoroughly clean, whereas only 2 to 3 years life can be anticipated when MOH A-1 or A-2 is applied over even light rust.

Remove as much loose paint, rust, dirt, oil and grease, etc., as is economically possible. Remove dirt with detergent and water; oil and grease by solvent washing. Choice of method to remove loose paint and rust will be dictated by availability of labor and equipment. Hand cleaning (wire brush and scraper) is adequate when the amount of cleaning is small, and provided it is carried out conscientiously. The use of power tools (wire brush, grinder, etc.) will speed the job up, but care must be taken that the steel is not burnished, and if any pitting of the steel has occurred supplement the power tools by hand wire brushing. Blast cleaning is the most effective method, and is often as economical as the other methods when the amount of cleaning is large, and/or a reasonable source of clean sand is available in the vicinity.

Note: Occasionally rust will be occurring under apparently sound areas of paint; these areas will cause trouble unless paint and rust are removed.

2. Primer

1. Type - Red Lead Oil/Alkyd, Ministry of Highways Specification DOH A-2 or B-1.

2. Application - Preferably by brush. Film thickness 18 mm to 25 mm dry. Spot prime only; no advantage is gained by applying red lead over existing sound paint.

3. First top coat may be applied after 16 hours under good drying conditions.

3. Top Coats

1. Type - Exterior Enamel (Alkyd) White to Ministry of Highways Specification DOH C-4.

2. Application - By brush or spray. Film thickness 12.5 mm - 18 mm dry per coat. Do not add thinners unless absolutely necessary, and not over 10% (by volume) in any case. Mineral spirits is a satisfactory thinner.

3. Number of Coats - If entire rail is to be painted, apply one coat over spot priming, followed by one coat over entire rail.

   If touch-up is required, apply two coats over spot priming.

4. Recoat - The first coat of the enamel may be recoated after 18 hours under good drying conditions. Do not delay second coat beyond this time more than is necessary.

DELINEATORS

13.27 HAZARD MARKERS

Hazard Markers are used to mark obstructions or restrictions in width of road, including bridge abutments.

Hazard Markers are usually mounted fairly low and close to travelled section of roadway. As a consequence, they get dirty quickly, particularly in inclement weather. When dirty, they lose their effectiveness partly or completely. Since they are very important, from a safety point of view, they should be well maintained and cleaned.

There is no fixed rule as to frequency of cleaning. It depends on location, traffic, weather and time of year. In some locations, under certain weather conditions, e.g. slush, cleaning may be required once a week, while in other locations once or twice a year is sufficient. Placement and erection details may be found in the Sign Manual.

13.28 ROAD DELINEATORS

Road delineators are placed in order to delineate a roadway, particularly a curve. They are a very great aid to night driving, and to safety.

In order to be effective they must be maintained properly. Since generally they are located farther away from the travelled portion of the roadway than bridge delineators, they do not get dirty as quickly as bridge delineators. Therefore, they need to be cleaned only periodically, once or twice a year or as required. Missing reflectors, however, should be replaced immediately. Missing reflectors are noticed easily and sometimes make misleading gaps in delineation which can be mistaken for a roadway. Placement and erection details may be found in the Sign Manual.

13.29 ROAD REFLECTORS

Road reflectors used by the Ministry are sold under the trade name of "Catseyes". Since no other product has been used by the Ministry, the remarks regarding maintenance are restricted to "Catseyes" only.

Road reflectors are installed on painted white lines in order to provide for better driver orientation during inclement weather, such as fog and rain. Painted lines are poorly visible in fog or rain. The installation of road reflectors has been limited to:

(a) Freeways.

(b) Expressways.

(c) Special cases such as: Causeways, tunnels, and other cases as determined by the Director of Traffic Engineering.

13.30 ROAD REFLECTOR MAINTENANCE

There are three phases of "Catseye" maintenance:

1. Cleaning of reflectors and reflector maintenance

Generally, just driving over "Catseyes" in rain is sufficient to clean the reflectors, but at least once a year reflectors should be examined, cleaned and replaced as necessary.

Vehicles driving by "Catseyes", particularly at high speed, throw particles against reflectors, which become seared and chipped, and this reduces their light reflection. Reflectors so damaged should be replaced. Poor reflectors can be picked up by driving at night over the section, after "Catseyes" were cleaned, and noting poorly reflecting "Catseyes".

Reflectors generally last about one year to eighteen months on heavily-travelled roads and up to five years longer on lightly-travelled roads. They deteriorate more rapidly on curves, at intersections, and on dirty roads.

2. Rubber Pad Maintenance

Rubber pads last, usually, five years or longer. However, at intersections and in areas where vehicles drive over them frequently they will deteriorate more rapidly. They should be checked at the time reflectors are replaced, and discarded if in poor condition.

3. Base Maintenance

Generally, no base maintenance is necessary. However, bases may sink into pavement to the point that reflectors cannot be seen by approaching vehicles. In such cases, bases should be lifted to the proper level. In addition, when paving, sealcoating, and even patching operations are carried out, bases may have to be adjusted to give the most efficient operation.

13.31 HIGHWAY SIGNS

Signs are the furniture of a highway. Poorly maintained signs spoil the appearance of an otherwise well-maintained highway. To be respected and to be useful, signs must be correctly used and correctly placed. Good signing requires first, the choice of the right sign for a particular situation. Secondly, the sign must be correctly located, and thirdly, the sign and its post must be maintained in good condition.

Complete information on choice, position maintenance of signs is available in the Ministry's Sign Manual and in the "Manual on Uniform Traffic Control Devices for Canada". The Ministry's Manual takes precedence over the Canadian Manual in matters where they may differ.

If in doubt over any aspect of highway signing, consult the Director of Traffic Engineering.

DRAINAGE

13.32 GENERAL

Drainage is one of the most essential elements to be considered in highway maintenance.

Most problems affecting the useful life of highways and roads can be attributed to water. Uncontrolled water causes unsightly and costly damage due to erosion, robs the subgrade of strength, results in frost action and subsequent road failures, and also causes most landslides. If a stable roadway is to be maintained, drainage facilities must be provided and maintained to control and dispose of surface and subsurface water.

The subject of drainage is extensive and it is not intended to deal with the matter in other than general terms. Complete coverage of the subject, and methods of dealing with the problems, may be found in numerous reference books, or in readily available handbooks published by various companies dealing in culverts.

The design of drainage facilities, including ditches, must take into consideration the existing drainage conditions of the particular area, the importance of highway, the cost of the drainage works, and the possible damage to adjacent property. In general, the economics of each problem must be given careful consideration.

Ensure that any alteration or interference with existing drainage conditions does not cause damage to private property.

The Ministry has no responsibility or authority to undertake drainage works for the benefit of private lands. Though our work may be of incidental benefit to private property, it is limited to the necessary drainage of the highway and related public works.

Section 12 of the "Highway Act" empowers the Minister to construct necessary ditches and drainage facilities through private land, but the maintenance of such works is the responsibility of the land owner. Where such maintenance may be regarded as an undue hardship on the land owner the Minister may make other provisions.

13.33 DITCHES

Provide adequate side ditches wherever necessary to intercept and carry off water originating from the road surface, from sidehill seepage, and from runoff from areas adjacent to the roadway.

Where subsurface water is present, install subsurface drains to intercept flow before it reaches the roadway, and to lower the natural water table.

Side ditches should have ample capacity to care for all expected run-off, with additional capacity provided to care for heavy storm or flood conditions which might be expected to occur every few years or so. It is not economical, however, to provide for extreme conditions occurring only once or twice over a long period of time.

Do not construct ditches with vertical sides. Ditches may be V-shaped or trapezoidal. The V-ditch can be constructed and maintained with a grader; however, unless the sides can be made of fairly flat slope, the capacity of the ditch is limited. The trapezoidal ditch has a greater capacity and lends itself more readily to erosion control.

Ditch bottoms should be below original subgrade elevations to ensure free drainage of the base gravel. Wherever possible, construct ditches on the upper side of the road to a minimum depth of 0.6 m, and with sufficient gradient to promote runoff. In conjunction with this, excavate all soil backslopes at slopes not steeper than 1 1/2:1.

Ensure that drainage ditches in rock sections are cut into the bedrock to prevent water flowing across the rock surface into the base gravel.

Pave ditches which are constructed on steep gradients or in easily eroded soils to prevent erosion. Paving may be accomplished with metal ditch liners, asphalt, concrete or other erosion resistant material.

On fill sections where unrestricted surface runoff from the travelled surface tends to cause erosion of the road edges or embankment, direct the water by curbing to specific disposal points. The disposal point should be the lowest point on the particular section, provided it is within a reasonable distance. The point is best determined by allowing water to flow down the grade and noting the exact low point adjacent to the curb. Set catch basins at these low points as outlined in Section 226 of the "General Specifications".

Provide intercepting ditches on the top of low cut slopes which tend to erode due to seepage. On high cut slopes it may be necessary to install horizontal drains in the slope.

13.34 CULVERTS

Give careful consideration to the location of culverts to determine where they will be of most benefit in the drainage system. Normally culverts are installed at all watercourses and low points in the ground profile.

Provide culverts of sufficient capacity to carry normal flood flows without "ponding" against the road bed.

Be careful when replacing small bridges with culverts that culvert provides sufficient opening to clear possible driftwood, etc., without tending to jam. A metal or timber grill above culvert opening will prevent culvert failures by retaining drift upstream.

Install culverts from the lower or outlet end. Ensure that the culvert is bedded on firm, uniform foundation shaped to provide firm support to the lower quarter of the culvert circumference. For large culverts it may be necessary to excavate a flat foundation, providing satisfactory bedding by carefully tamping the fill under the culvert haunches.

Place backfill in layers and carefully tamp on both sides of the culvert, taking care that large rocks and stones are not allowed to rest against, or directly on, the culvert. The top of the finished backfill should be left even with the top of the pipe.

Make certain culverts are installed with the joint overlaps in the correct direction to prevent leaking at the joints.

When installing culverts in small streams, etc., alter natural stream course only if there is a definite advantage in doing so and no undesirable effects will result.

The ideal grade for a culvert is one that produces neither silting nor excessive velocities and scour, one that gives the shortest length, and one that makes replacement simple.

The capacity of a culvert with free outlet is not increased by placing on a slope steeper than "critical". A slope of 1 to 2 percent is advisable provided velocity is permissible. A minimum of 0.5 m per 100 m is recommended to avoid sedimentation.

Under high fills, install the culvert with camber to allow for greater settlement under the centre of the fill than at the edges.

Construct end walls on culverts wherever required. Information on the design of end walls may be obtained from the "General Specifications". Satisfactory end walls for use in certain cases may be constructed of sandbags filled with a dry concrete mixture. Apply water after bags are in place.

Ensure that ditches are led in to culverts properly and that water flows freely into culvert inlets. If necessary, install catch basins or sump holes at culvert inlets.

Provide heavy stone or concrete spillways at culvert outlets wherever scouring is liable to occur.

Augmented backup from full culverts flooding upstream occurs when a stream in granular soil which is wide and shallow is culverted with a round pipe. For example, assume a stream is 5 m wide and 0.3 m deep. A round pipe for 1.5 square metres waterway area would likely be a 1500 mm pipe. In full flood therefore, the entrance pool would be 1.5 m deep to pass the culvert, which means an additional depth over the natural one of 1.2 m, which may flood upstream property not flooded before.

13.35 MAINTENANCE OF CULVERTS AND DITCHES

Carry out regular and systematic inspection and maintenance of all drainage facilities. Special attention should be given to all drainage works in the fall and spring of the year, and after storms. Faulty or inadequate drainage should be corrected immediately.

Regular maintenance of shoulders and ditch slopes on paved highways should be carried out to ensure that vegetation and debris does not prevent the flow of surface water from the travelled surface.

Ensure that gravel roads retain their proper crown throughout grading operations, and that windrows of gravel or other debris are not allowed to accumulate on the road edges preventing the escape of surface water.

Vegetation or debris which impedes the flow of water in ditches should be removed. All culvert entrances should be checked for obstructions and care taken to see that the water enters the culvert freely and directly.

Material excavated when cleaning ditches should not be used for widening shoulders, since this material is generally impervious and tends to seal off and prevent free drainage of the base gravel. Except at depths below the base gravel, widening should never be carried out with other than clear granular material.

Encourage the growth of grasses on slopes which are subject to erosion.

Watch for signs of faulty drainage at all times and encourage all foremen to do likewise.

Where culverts tend to ice up and become blocked in winter, thawing by means of a steam heater will be expedited if small diameter pipes are installed through the culverts in the fall. Steam forced through the water pipe will commence thawing of the ice in the culvert throughout its length.

13.36 FROST ACTION

The freezing of water in highway subgrades causes dangerous heaving and results in cracking and premature failure of road surfaces and pavements.

Heaving results from the build-up of ice lenses in the soil mass. These lenses are formed by the freezing of capillary water in soils such as clay and silt having high capillarity. Freezing action tends to draw water from the larger capillaries and freezes it in lenticular masses of free ice or lenses. These continue to grow as more water is attracted until the supply of water is exhausted, or until the freezing rate exceeds the rate of water supply. No further action takes place until the proper relationship between the freezing rate and the rate of water supply is again established, whereupon additional ice layers are formed.

As the ground thaws in the spring, the still-frozen bottom layers prevent drainage of the thawed layers, resulting in the upper layers of soil being highly saturated and extremely unstable. Under these conditions the load-carrying capacity of the highway is considerably reduced. Under extreme conditions frost boils develop, with the resulting surface failures.

During the winter, carefully mark for future investigation all sections of highway showing signs of heaving. Quite often heaved sections return to normal in the spring and show no external signs of pavement distress, but future problems may be building up. Measurement of pavement deflections by Benkleman Beam testing can be used to establish sections suffering loss of strength, and indicate where corrective measures should be taken.

Take immediate corrective action where a major loss of strength, with resulting cracked and broken pavement, occurs. Merely treating the symptoms by adding gravel and patching the surface is of little value. Unless the cause of the trouble is located and removed, the same problem will reoccur each spring. The causes are: a source of water, and presence of frost susceptible soils.

The corrective action to be taken for any particular section may be determined by investigation, and may include all or some of the following steps:

1. Improve and deepen existing drainage ditches, or install adequate ditches if none exist.

2. Ensure that base gravel is free to drain and has not been sealed off by impervious material.

3. Fill and seal all pavement cracks to prevent water seeping into the subgrade. It is recommended that cracks be filled with sand or other filter material prior to sealing with asphalt.

4. If necessary, install subsurface drains to intercept underground seepage or to lower the ground water table.

5. Excavate the undesirable soil and backfill first with a layer of clean sand, followed by clean granular material. It may also be necessary or desirable to install perforated drain pipes.

13.37 FLOOD AND EROSION CONTROL

The Ministry is not responsible for clearing streams, or carrying out flood or erosion control on streams which do not affect public highways.

All District Officials should be conversant with the Flood Regulations under the Flood Relief Act, Order-in-Council 1619, which is included in Accounting Instruction A-72-1, and also with the River Bank Protection Act and the Erosion Act.

Municipalities are responsible for any flood control measures required for the protection of land and property within the municipal boundaries. The Ministry shall not undertake any flood control work within municipal boundaries unless requested to do so in the event of an acute emergency and as outlined under Order-in-Council 1619.

District Officials should be familiar with all potential flood areas in their district. Undertake precautionary protection work where the possibility of flooding presents a hazard to any public highway or bridge. If such work is extensive, request authority to carry it out prior to undertaking the work.

Report emergency flood conditions, including bridge washouts, slides, and road washouts involving main highways immediately. Make up detailed reports on action taken immediately following the incident.

Where the possibility of flooding exists, all equipment and materials that may be required should be checked well in advance. Check stocks of sandbags and discard those that are unserviceable.

13.38 ICE CONTROL **

Abrasive, chemicals, and mixtures of both, are used in varying degrees throughout the Province to control ice.

In coastal areas salt is used almost exclusively to remove ice and light snow from highways. Abrasives are used to a limited degree, and then only on minor roads when icing conditions are hazardous.

In the lower mainland and Vancouver Island, rates of application for salt are as follows:

50 kg per km of two-lane highway for light icing conditions.

60-85 kg per km of two-lane highway for average icing conditions.

100-150 kg per km of two-lane highway for heavy icing and snow conditions.

Usually lesser applications are necessary to control subsequent icing conditions, provided intervening heavy rains have not washed away the brine solution from the road surface.

** Amendment

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Throughout the interior of the Province, where temperatures are lower and snowfalls higher, the use of chemicals is less effective and therefore abrasives are used to a greater degree. It is usual in nearly all areas to mix Sodium Chloride with the abrasives for the following reasons:

Sodium Chloride: (a) prevents freezing of the material in the stockpile; (b) prevents freezing of the material in the truck box; (c) stays on the road better.

Abrasives are applied at a rate of anywhere between 1 tonne per km for light icing conditions to 2 tonnes per km for heavy icing and snow conditions.

In general, salt is effective for ice control down to -7°C.

Standards are available for guidance in the use of chemicals and abrasives for winter snow and ice control. Application rates and qualifying conditions for use including special situations to be aware of are included.

SNOW REMOVAL POLICY

13.39 GENERAL
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Standards are available for guidance in snow plowing operations. Snow accumulation depths prior to plowing for various road classifications are tabulated as well as maximum allowable accumulations. The latter aids in determining how many plow units may be required during storm periods. Operations shall continue throughout the storm period to ensure traffic continues to move and widening may be undertaken later if necessary.

Where a Snow Road can be maintained, plowing is done only when the depth of snow is excessive. This would be generally over 12 cm.

Exceptions are made only where traffic is light or in areas where a deep snowfall does not justify the hazard or expense in keeping the route open during the winter.

All work must be done with due regard to economy and available funds.

13.40 PRIORITIES

Roads shall be plowed and sanded in the following order of priority:

1. Certain major roads with relatively high A.D.T.
2. School bus routes and lesser roads.
3. All other maintained roads.

During icy conditions, when packed snow or a glazed condition causes loss of friction, sand or chemical shall be applied in the following priority:

** Amendment

1. Hills with troublesome grades.
2. Curves posted less than the speed limit.
3. Railroad crossings.
4. All other curves and tangents.

The above is applicable regardless of time of day and often involves reapplication during the course of a storm.

Generally, sand boxes and sand piles are placed for public use at specific locations on the more severe grades.

13.41 RAILROAD CROSSINGS

Take every precaution to ensure that ice, snow, gravel or other debris is not deposited and left to remain on railway-highway grade crossings due to the operation of highway maintenance equipment, having in mind that the taking of such precautions will reduce the accident hazard to operation of both railway and highway traffic.

Instruct all Operators to take the following precautions:

1. Where visibility of oncoming trains is obscured, snowplows should approach the crossing at the lowest possible speed consistent with safe operation.

2. Adjust all equipment so that no damage will be done to the railway crossing.

3. Be alert for trains which might be approaching the crossing, keeping in mind that the noise created by some of our heavy equipment might prevent the operator from hearing the whistle or sound of an approaching train.

4. When cleaning up accumulated snow at a crossing, where the view is obscured, care must be taken not to endanger other traffic.

5. After crossing the railway tracks, make a careful inspection of the crossing, particularly the flangeways, which should be cleared of any material left by the highway equipment in making the crossing.

6. Notify the railway authorities in the event the crossing cannot be cleared promptly, and, if necessary, action shall be taken to warn oncoming railway traffic.

13.42 CHARGES AND COSTS - General Snow Removal

Refer to Accounting Instructions A-120-2.

13.43 PRIVATE PARTIES (Minor Work)

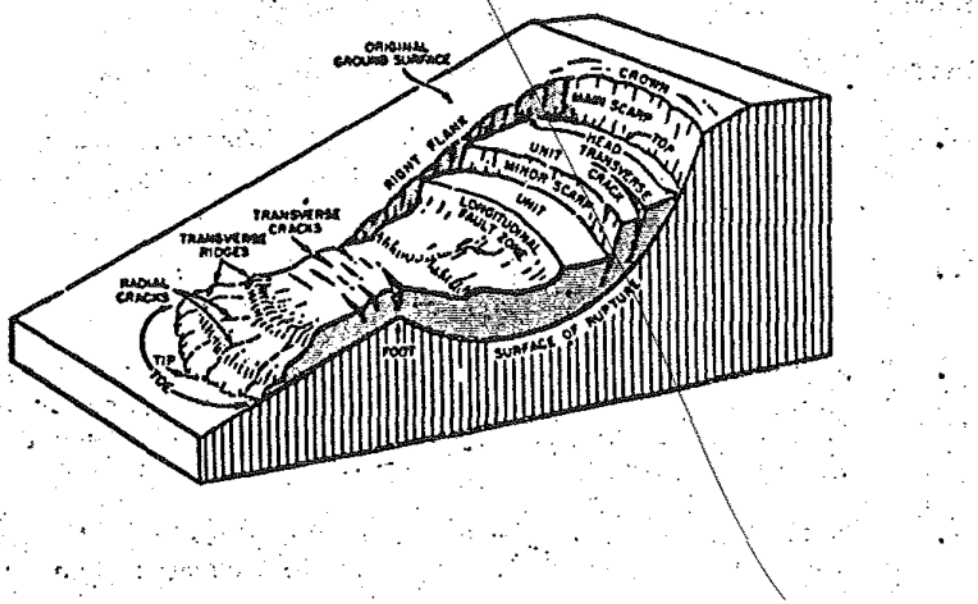
Firms or individuals wishing to have driveways plowed during the winter months are to make applications to the District Office on an 'Application for Snowplowing Private Entrance' Form H.415. this form will be made out on the distinct understanding that private entrances will be plowed after Provincial highways have been plowed and equipment and men are available, and that there is no commercial equipment in the area whose owner wishes to do the work at reasonable cost.

Conditions and charges - refer to Accounting Instruction A-120-2.

13.44 SNOW FENCES

Place snow fencing in the fall at known drift locations to intercept drifting and prevent accumulation on the highway. Locate fences properly; generally the snow will deposit behind the fence within a distance of 15 times the height of the fence. Accumulated snow behind the fence may have to be removed during the season.

LANDSLIDES



Diagrammatic Sketch of Landslide Components

13.45 GENERAL DEFINITIONS

A landslide is defined as "the downward and outward movement of slope forming materials composed of natural rock, soils, artificial fills, or combinations of these materials". There are four basic types of landslides:

FALLS: In rockfall or soilfall the moving mass travels mostly through the air and there is little interaction between individual particles. Falls are influenced by those laws which govern free-falling bodies and by mechanical and chemical weathering.

SLIDES: In true slides, the movement results from shear failures along one or more surfaces, which are either visible or may reasonably be inferred.

The moving mass, consisting of one or many units, can be categorized into five sub-classifications, depending on the degree of deformation.

1. The moving mass is not greatly deformed and there are only a limited number of units.

    1. Slump: The internal failure plane is curved so that it is concave upwards. Backward tilting of units is common.

    2. Block Glide: The internal failure plane is planar and is generally coincident with a bedding plane.

2. The moving mass is highly deformed and there are many individual units.

    1. Rockslide: The internal failure plane is planar and generally is coincident with a bedding plane. Complete disintegration is governed by bedding planes, faults and joints.

    2. Debris Slide: The internal failure plane is irregular and coincides with layers of low shear strength, or the entire mass may override solid rock.

    3. Lateral Spreading: The internal shear plane is coincident with a soft layer at depth which, in all probability, is subjected to high pore pressures. The weight of the overlying mantle extrudes the soft layer and the mantle is stretched, causing it to fall by rotation and (or) translation.

FLOWS: The movement within the displaced mass in flow slides is such that it resembles that of a viscous fluid and slip planes are not apparent. The movement generally takes place in the presence of water, but this is not a necessity. The water content may vary from wet to quite dry. The materials comprising the mass are necessarily unconsolidated at the time the mass assumes the form of a flow slide. Flow slides may be divided into three sub-classifications:

(a) Earthflow: The mass consists of non-plastic sorted sands or sensitive silts and clays. This sub-classification includes all flows in relatively fine-grained masses ranging from sand runs to mudflows.

(b) Debris Avalanche: The mass consists of a mixture of rocks and soil. This type of flow is termed "Debris Flow" if the mass contains an abundant quantity of water.

(c) Rock Fragment Flow: This type of flow originates as a rockslide or rockfall type of landslide but attains unusually high velocity. The fluidity of the mass may be attributed to the presence of entrapped compressed air.

COMPLEX: This type of landslide consists of a combination of the three major landslide divisions.

13.46 FORCES ACTING ON A LANDSLIDE

Landslides are acted upon by a number of forces. For the purpose of illustration, the disposition and origin of forces pertaining to a slump type of landslide are shown diagrammatically. Where conditions lend themselves to this approach, the mathematical analysis of landslides is one involving statics. The following forces may exist in any sloping mass of natural materials where a landslide is imminent:

W = The weight of all materials lying above the failure plane.

T = The tangential component of the weight W.

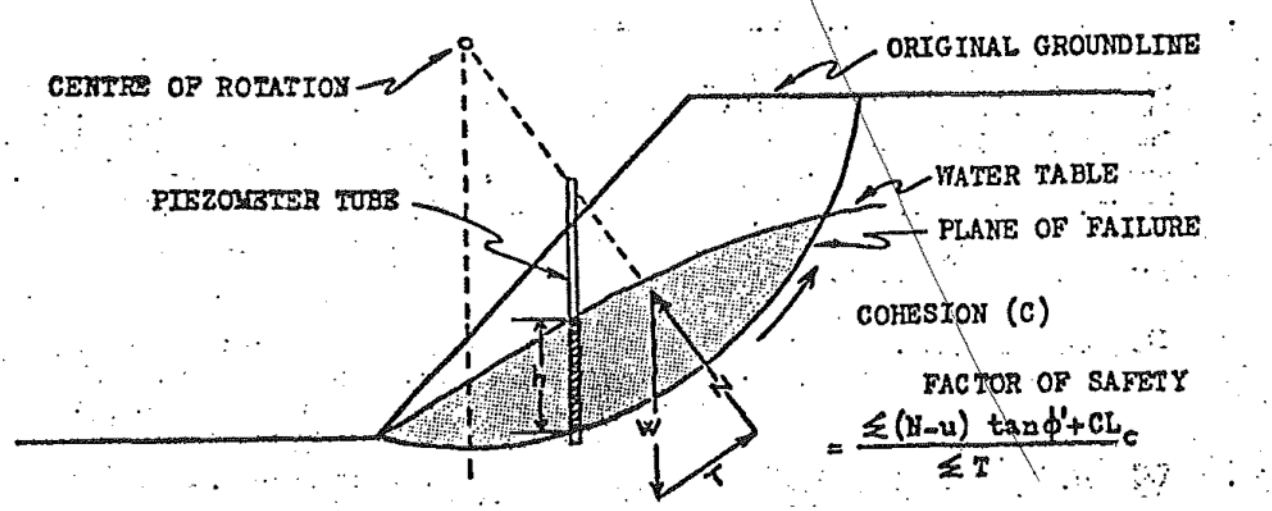
N = The normal component of the weight W.

C = Cohesion acting along the plane of failure.

L_c = Length of failure arc.

u = Neutral pressure - the porewater pressure created by a head of water (h) if the water table is situated above the failure plane.

ϕ = Angle of internal friction of soil at failure plane.



Cross Section of a Slump Type of Landslide
Illustrating the Forces which act upon it.

13.47 FACTORS CONTRIBUTING TO LANDSLIDES

The factors which cause landslides can be placed in two groups:

1. External factors which produce an increase in the shearing stresses along the potential surface of sliding, but do not alter the shearing resistance of the material.

    1. Removal of Lateral Support

        1. Erosion by streams, rivers, waves, tides, glacial ice and mechanical weathering by frost action and cycles of wetting and drying.

        2. Creation of new slopes by previous landslides, subsidence or large scale faulting.

        3. Human interference with natural conditions, including construction and factors which arise as a result of construction, i.e., cuts, quarries, pits, canals, and drainage of lakes.

    2. Surcharges

        1. Natural agencies such as precipitation, water from springs and talus overriding potential landslide material.

        2. Human agencies, including embankments, stockpiles, structures, locomotives and water transportation facilities.

    3. Transitory Earth Stresses

        1. Earthquakes.

        2. Vibrations from engines, pile driving and explosives.

    4. Removal of Underlying Support

        1. Undercutting of banks by water.

        2. Subterranean erosion caused by dissolution and piping.

        3. Mining.

    5. Lateral Pressure

        1. Formation of hydrostatic pressure resulting from water collected in cracks and caverns.

        2. Freezing of collected water in cracks and caverns.

        3. Swelling of certain soils when placed in contact with moisture.

2.

1. Inherently Weak Soils

1. Materials which respond by losing strength when placed in contact with water.

2. Soils with individual rounded grains.

3. Soils with a loose structural arrangement.

4. Materials containing discontinuities such as faults, bedding planes, foliation, cleavage, joints or brecciated zones.

2. Weathering and Physio-chemical Reactions

1. Freeze-thaw cycles.

2. Wet-dry cycles.

3. Base exchange (ionization).

4. Shrinkage followed by cracking.

5. Removal of cementing agent by dissolution.

3. Changes in Intergranular Forces due to Porewater

1. Buoyant effect.

2. Capillary tension.

3. Viscous drag.

4. Changes in Structure

1. Expansion through removal of overburden.

2. Disturbances and remoulding.

13.48 RECOGNITION AND IDENTIFICATION OF LANDSLIDES

Knowledge of the general environment of the area receiving consideration, such as climate, geology, pedology, topography, etc., is essential. Similar environments tend to give rise to similar landslides and recognition features. The best sources of information pertaining to environment are maps, aerial photographs and personal acquaintance with the area. Useful information as listed can be obtained from such studies:

1. Rock and soil types.
2. Distribution of rocks and soils.
3. Character and location of geological irregularities.
4. Drainage patterns and subsurface seepage zones.
5. Evidence of previous landslides.

Depending on the preliminary investigation, a field investigation may be instigated for detailed examination of suspicious ground in specific areas. The terrain should first be viewed from a distance in order to gain the entire perspective, then should be viewed by thoroughly walking over the area. The following landslide indicators should be looked for:

1. Hummocky ground, bulges in generally uniform slopes, terracettes.

2. Wet ground, ponded water and seepage zones.

3. Tilting or deformed trees, irregularities in communication lines or fences.

4. Cracks, scarps.

5. Modifications to existing structures made subsequent to construction which are not readily explicable.

6. Geological irregularities, i.e., faults, bedding planes, etc.

7. Spoon shaped depressions.

8. Vegetation, indicative of unstable or wet ground (alder, willow, cat tails, etc.).

The effects of proposed construction should be considered at this time since it may change natural conditions or induce stresses which may create a landslide, even in areas which currently appear to be relatively stable. This may occur not only at the site but, on occasion, in regions remote from the area of construction.

Once it has been established that a dormant, active or potential landslide exists, the next problem is to identify the type or potential type, for this will suggest what corrective or preventive measures are warranted.

13.49 PRELIMINARY INFORMATION AND DEPARTMENTAL ACTION

The following information should be obtained during a preliminary investigation of a landslide:

1. Location: Include car distance from the nearest centre of population, stationing on project and number of highway.

2. Effect on Traffic: Is traffic completely blocked or can it continue at reduced speed?

3. Potential Danger: Has the landslide stopped moving? Is there evidence of cracks behind the scarp? Estimate the velocity of initial movement.

4. Size: Estimate the length, width and depth to the plane of failure.

5. Texture: What type of material is the landslide composed of.

6. Water Conditions: Is the landslide in a fluid state and is water ponding in the landslide? Areas of seepage: broken water lines, irrigation systems, plugged ditches or culverts. Have any changes occurred to wells, streams, etc.?

7. Weather: Brief description of current weather conditions.

8. History of previous movement.

9. History of construction.

Generally the Regional Geotechnical and Materials Engineer should be notified following a major landslide. It is his responsibility to study the landslide in more detail if he considers it to be warranted. In certain situations the Director of Geotechnical and Materials Engineering should be notified directly. These situations include:

1. Loss of life.

2. Property damage where Crown liability must be assessed.

3. Major landslides which, following initial movement, are still potentially dangerous, and expensive corrective measures must be undertaken immediately.

13.50 LANDSLIDE INVESTIGATION

Following the preliminary assessment of a landslide, a thorough investigation may be considered essential. The investigation will normally be supervised, and a final report written, by an Engineer from the Geotechnical and Materials Branch. The detailed report will include the following information:

1. An evaluation of preliminary data and, where possible, conclusions which may be drawn from it.

2. A study of climatic and weather conditions preceding the landslide.

3. Photographs showing the landslide in perspective with the surrounding terrain, and also showing specific details within and immediately surrounding the zone of failure.

4. A topographic site plan showing the entire landslide and areas immediately adjacent to the landslide. At least one cross-section will be included, taken through the longitudinal axis of the landslide, including stable areas at the extremities of the cross-section.

5. Movement studies may be made by installing surface hubs or subsurface measuring devices. These points are tied with both horizontal and vertical control and are checked at regular intervals. The information is correlated with other data, i.e. fluctuations in the water table, and in doing so certain factors contributing to instability are emphasized and others eliminated.

6. A detailed hydrological survey of all water sources and ground water movement in the vicinity.

7. Subsurface investigations including vertical bore holes and piezometric installations for measuring the water table.

8. Detailed laboratory analysis giving soil classification, and in situ conditions of the soil.

9. If the landslide lends itself to a mathematical approach, an analysis will be made to determine which factors that contribute to instability can be modified most economically to increase the factor of safety against movement to an acceptable value.

10. The final report will outline definite recommended procedures pertaining to stabilization, including cost estimates and an estimated degree of success.

13.51 PREVENTION OF LANDSLIDES

Many landslides can be attributed directly to lack of precautions taken during construction. Some of the more common causes are:

1. Loading the top or cutting into the toe of an unstable area.

2. Lack of compaction in embankments.

3. Inadequate control of surface and subsurface water.

4. Excavation of backslopes on angles which exceed those at which the material can stand.

5. Failure to remove organic layers beneath embankments.

6. Inadequate keying of side hill embankments.

7. Overblasting.

8. Failure to provide culverts with protection against debris jams.

9. Construction of high embankments without detailed knowledge of subsoil.

10. Construction of deep cuts in soft silts or clays without detailed knowledge of subsoil.

The prevention of landslides is, in many respects, more difficult than correction from the standpoint of both analysis and design. The limits, type and depth of an existing active landslide can usually be determined by exploration and investigation. In contrast, the prevention of an incipient landslide requires, first, recognition of the hazard; second, anticipation of the character and magnitude of movement; and third, design of suitable treatment which will prevent land movement during and following construction.

Recognition and evaluation methods are quite similar for existing and incipient landslides. The probable failure plane and dimensions of the slide, however, must be estimated through procedures which use all available information, taking into consideration conditions which will be imposed by proposed construction. If analysis suggests that a failure is probable, measures should then be taken to remove the possibility.

Prevention of landslides may be accomplished by one or more of the following methods:

1. Reduction of the activating forces can be accomplished by two general methods: removal of material from the upper reaches of the slide which is providing the driving forces, or drainage which reduces the magnitude of the motivating forces and reduces hydrostatic pressures.

2. The forces which tend to resist slide movement can be increased by the following methods:

   (a) Subdrainage and thereby increasing the shear resistance of the soil;

   (b) Elimination of weak zones or potential surfaces of rupture by stripping or by breaking up or benching smooth sloping surfaces;

   (c) Construction of retaining structures such as piles, walls, cribs, buttresses and counter balances, and solidification of loose granular materials by chemical treatment.

3. The most obvious and sometimes the most economical method of preventing landslides is by avoidance. Methods by which this may be accomplished include relocation, complete removal, or bridging the unstable area.

Accept preventative recommendations with respect to major landslides only from experience soils engineers.

13.52 CORRECTION OF LANDSLIDES

In terms of geologic time, there can be no permanent correction of a landslide. Man can only provide a delaying action in the natural processes that tend to level the earth's surface. The relative permanence of the corrective factors are estimated in terms of "factor of safety'. The usually accepted value of the factor of safety for most earthwork is 1.5. Often a safety of less than 1.5 must be accepted, which may result in corrective measures having be taken in the future.

For a structure of great importance a factor of safety of more than 1.5 may be aimed for. The selection of an appropriate means of correction is generally reached following an economic comparison of possible alternatives. Various treatments which have yielded success in the past are listed below under the basic type of landslide where they have been utilized.

Falls

Most falls are corrected by one of, or a combination of the following methods: relocation, flattening the slopes, benching the slopes, surface drainage, rock bolting and wall insulation which protects naturally weak materials against further exposure to the elements. Potential damage can be decreased by the use of steel mesh, concrete walls, concrete guard rails and chemical applications.

Slides

1. Relocation.

2. Excavation by removal of the head, flattening of slopes, benching of slopes or complete removal.

3. Surface drainage by open ditches, regarding the surface, or sealing of surface cracks.

4. Subdrainage by horizontal drainage, drainage trenches and tunnels.

5. Rock or earth buttresses at the toe (counter balancing).

6. Cribs and retaining walls (small areas only)

7. Piling (generally not recommended as permanent).

8. Blasting (beware of sensitive soils).

9. Forcing complete failure by hydraulicing.

Flows

1. Relocation.

2. Excavation by flattening the slopes, benching the slopes, and complete removal.

3. Surface drainage by open ditches, regarding the surface and sealing surface cracks.

4. Subdrainage by horizontal drains and by trenches.

13.53 REFERENCES

For further information the reader is referred to the following literature which can be borrowed from the Geotechnical and Materials Branch, Victoria:

1. "Landslides and Engineering Practice", Highway Research Board Special Report 29.

2. Dr. K. Terzaghi - "Mechanism of Landslides", Berkey Volume, Application of Geology to Engineering Practice.

13.54 RURAL MAIL BOXES

Permits for the erection of mail boxes within the highway Right-of-Way will be issued by the District Official. Application will be made on Form H.20 and submitted in triplicate to the District Highway Official.

Mail boxes must be installed clear of the shoulder of the roadway. If necessary, the shoulder is to be widened at the expense of the applicant so that the delivery vehicle will be clear of the paved or travelled section of the highway. The mail box is to be placed on a 15 x 15 cm post painted white, 1 m above the grade line of the road.

The mail box shall be placed so that the courier will deliver mail only on the right hand side of the road while making his deliveries.

If mail boxes are damaged through ordinary maintenance work, repairs will be at the owner's expense. If mail boxes are damaged or require replacement due to reconstruction of the highway, the Ministry will bear the costs.

Group mail boxes or lockers will be covered by a permit applied for by the Post Office Department of Canada. The location will be designated by the District Official of the Ministry of Highways and Public Works after consultation with the Post Office Department. If necessary, a turn-off will be constructed and work charged to the mail box owners.

No mail boxes will be permitted on four-lane thruways or freeways.

13.55 MILK LOADING PLATFORMS

Permits for the installation of milk loading platforms within the highway right-of-way will be issued by the Regional Highway Engineer upon application on Form H.20 which will be submitted through the District Highway Official's office.

Loading platforms must be built clear of the highway shoulder, and, if necessary, the shoulder will be widened at the applicant's expense so that the vehicle loading or unloading milk will be clear of the paved or travelled section of the highway.

Maintenance of the structure will be at the expense of the applicant. If the installation has to be moved due to reconstruction of the highway, the expense will be borne by the Ministry of Highways and Public Works.

13.56 DAMAGE CLAIMS
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1. When claims for damage are received from the public, they should be acknowledged by the District Official, without admitting any liability whatever, and forwarded, together with a report of the circumstances, to the Regional Director, Highways, for, when deemed necessary, transmittal to the Insurance and Claims Officer. (For exceptions see following paragraphs.)

2. If the damage is alleged to have resulted from sanding or salting operations of the Ministry, follow procedures outlined in Accounting Instruction A-1-1, paragraph 14.

3. If the damage is alleged to have resulted from seal-coating operations of the Ministry, follow procedures outlined in Accounting Instruction A-1-1, paragraph 15.

4. If the damage has been caused by collision with a vehicle which is owned by, or leased to, the Ministry, provide the claimant with the ICBC claim number, and name of the adjuster to whom the accident was reported.

13.57 DAMAGE TO GOVERNMENT PROPERTY

Form H-36 to be completed and distributed per Accounting Instruction A-1-1, paragraph 11.

If responsible vehicle not identified, refer also to paragraph 12 of same instruction.

13.58 AIRSTRIPS

If District Officials are approached for minor assistance for local or emergency airstrips, it is in order to help without further reference to Region. Minor assistance, in this case, would be something like one day's time with a grader or equal. Requests for assistance in construction or developing such strips should always be referred to the Regional Director, Highways. District officials should acknowledge the request and then report the details, with recommendation, to the Regional Director, Highways. These will then be checked through Headquarters and the B.C. Aviation Council before decision. No work should be done on Municipal or Federal airstrips.

13.59 REFUSE DISPOSAL SITES

The Ministry does not have responsibility for operation of refuse disposal sites.

Dumping fees will be paid in cases where the Ministry is utilizing major refuse disposal sites where other customers are being charged (usually under combined Regional and Municipal jurisdiction).

Local arrangements may be made for the Ministry to assist with equipment to grade or plow accesses in lieu of dumping privileges or otherwise.

** Amendment

13.60 LANDSCAPING DESIGN, ESTABLISHMENT & MAINTENANCE **

1. General

The following is Policy Statement for landscaping of the various design classifications of highways including an outline of the division of responsibility for landscape installation; cost sharing of landscape installation and maintenance of the landscape.

A summary of landscape treatment is shown in Appendix 2 of this chapter. The definitions of highway classifications used are those in the following Roads and Transportation Association of Canada Publication, Geometric Design Standards for Canadian Roads and Streets.

CLASSIFICATION		DEFINITION
RFD	-	Rural Freeway Divided
RAD	-	Rural Arterial Divided
RAU	-	Rural Arterial Undivided
RCU	-	Rural Collector Undivided
RLU	-	Rural Local Undivided
UFD	-	Urban Freeway Divided
UAD	-	Urban Arterial Divided
UAU	-	Urban Arterial Undivided

2. Highway Outside Municipal Areas - (Rural)

1. Divided Highways (RFD & RAD): shall be hydroseeded and where median width permits, bulbs, shrubs and trees may be planted to the following guidelines:-

   Plant no trees or shrubs whose mature trunk diameter will exceed 100 mm within:-

   a. 10 m of the travelled way where the posted speed is greater than 90km/h.

   b. 7 m of the travelled way where the posted speed is between 80 and 90km/h.

   c. 5 m of the travelled way where the posted speed is less than 80 km/h.

2. Traffic islands will be paved with asphalt or, where material is available and practical, other paving may be used such as cobbles. Unusually large islands may be considered for grass or low growth planting.

3. Minimize planting that requires hand maintenance such as weeding, pruning, etc.

4. Where ever sight distance is a factor to be considered, planted ground cover should be less than 300 mm in height.

** Amendment

5. Design landscape to minimize maintenance lane closures.

6. Existing tree cover must be left intact where possible by selective cutting only of dead, dying, dangerous and/or undesirable species.

7. Slope contouring should be carried out whenever possible to obtain a natural transition between the highway and surrounding terrain and be maintainable.

   Slope contouring should be built into the highway design where practical and feasible. Where adequate terrain information is not available in the design stage, contouring should be applied in the construction stage.

8. Cut slopes shall be left in a rough condition or machine scarified to improve grass seed retention on the bank surface when hydroseeding. Scarification should be done especially when the soil is a hard or compacted material like clay and has been scraped smooth by blades.

9. Interchanges: Hydroseeding. Planting of trees, shrubs and ground covers may be considered only in special cases. Landscaping may include contouring for aesthetic and safety purposes as well as to better facilitate maintenance such as mowing operations.

10. Other Main Highways (RAU & RCU): Hydroseed only for erosion control and, where desirable for aesthetic purposes, include in the seed mix annual and perennial flower seed where seed is available.

    Items 2.6, 2.7 and 2.8 above will also apply to "Other Main Highways".

11. Minor Roads (RLU): Hydroseed - for erosion control purposes.

12. Rest Areas: These areas require a complete landscape design which may include lawn areas, trees, shrubs and ground covers; contouring, irrigation and rock paving.

13. Gravel Pits: All depleted areas of gravel pits and borrow pits shall be contoured and hydroseeded. They shall also be reforested if the pit is in view of the highway or other significant public view. Reforestation is the replanting of native tree seedlings that are usually indigenous to the locality and planted in order to obtain a natural forest appearance.

    When establishing gravel and borrow pits in locations where a natural tree cover exists, a minimum of 40 m of this tree cover between the pit and road shall be left intact to screen the pit area from the highway or other public view.

** Amendment

14. Abandoned Road Sections: Abandoned road sections where viewed by the public shall be returned to their natural state by removal and disposal of all unusable structures such as asphalt, culverts, fences and sign posts. The area shall then be recontoured, hydroseeded and, in large open areas, may also be reforested.

15. Sound Barrier: Where a highway may cause a noise problem to nearby residents and where space permits, a natural appearing berm or other sound barrier may be provided.

3. Highway in Municipal Areas: (Urban)

1. Divided Highways (UFD): Seed to grass within medians of 3 m to 10 m wide; areas less than 3 m wide will normally have median barrier with no landscaping required.

Where the above treatment is done the Ministry will pay 100% of the costs to construct; however, should a municipality require landscaping in excess of this standard, the extra cost must be borne by the municipality and be designed to the satisfaction of the Ministry. As it is undesirable to have municipal crews working on freeways, the total maintenance will be done and paid for by the Ministry.

Where the highway may cause a noise problem to nearby residential areas and where space permits, design and construct natural appearing earth berms or other suitable structures, to deflect the traffic noise.

2. Interchanges (UFD): Interchanges may include grass areas, decorative hardsurfacing, contouring and planted areas of trees, shrubs and bulbs, etc.

Cost sharing and maintenance responsibility shall be as in Item 3.1 Divided Highways (UFD) above.

3. Arterial 4 lane (UAD & UAU): Medians and boulevards are to be grassed where the median is greater than 3 m wide and where the boulevard is 1 m or wider. Shrub planting may also be included at the request of the municipality. No trees or shrubs whose mature trunk diameter will exceed 100 mm is to be planted closer than 5 m to the travelled way where the posted speed is greater than 50 km/h. When the posted speed is 50 km/h or less, trees may be planted to within 2 m of the travelled way. Where the median is less than 3 m and the boulevard is less than 1 m wide, they shall be hardsurfaced.

The Ministry will be responsible for the provision and maintenance of all asphalt, stone paving and grassed areas in medians and boulevards.

** Amendment

Where the municipality have requested landscaping beyond these standards, they shall be responsible for maintenance which would include grassed areas on right-of-way the Ministry would have originally maintained as stated in the above paragraph No. 2 of this Item No. 3.3.

4. Interchanges (UAD & UAU): Landscaping of interchanges on arterial 4 lane highways shall be the same as for Item 3.2.

5. Intersection (UAD & UAU): Landscaping, cost sharing and maintenance responsibilities shall be the same as for Item 3.3. Arterial 4 lane (UAD) as above.

   Traffic islands shall be hardsurfaced in decorative stone or asphalt. Traffic islands of 650 square metre or over may be planted with grass and/or shrubs.

6. Abandoned Road Sections: Abandoned road sections where viewed by the public shall be returned to their natural state by removal and disposal of all unusable structures such as asphalt, culverts, fences and sign posts. The area shall then be re-countoured, hydroseeded and, in large open areas, may also be reforested.

4. Community Participation Program - Arterial Highway Beautification

1. The Ministry will participate with local government agencies in a landscaping program on highway right-of-way where it is approved by the Ministry.

   The Ministry's participation will be in the form of a grant for the purchase of seed, bulbs, trees and shrubs only. The agencies involved are to be responsible for the installation of the landscape and its inherent maintenance; all at their cost.

** Amendment

Guard Rail Warrants Nomograph

The nomograph used for determining the guard rail warrants index for any particular section of highway is shown in Figure 1. To facilitate the recording and analysis of road data to determine guard rail requirements, a recording form has been developed for this purpose (see Figure 2). When this form is correctly completed, it will show the guard rail requirements (quantity and type) for the right-hand shoulder of the section of highway surveyed. To obtain the total guard rail required for a section of highway it is necessary to do a separate survey for each side of the road.

A sample of how to record the guard rail field data is shown in Figure 2 and the procedure is explained briefly below:

(i) Heading Data:

The section of highway shown in the example is for highway 3 from Elko to Fernie and the data is for the eastbound lane. Information such as district number, highway number, traffic volume, etc. is recorded in the upper section of the form as shown.

(ii) Landmark Data:

To help orient the field data, landmark information is recorded every few kilometres. For example, the odometer reading for the initial point of the survey (junction of highway 3 and 93) is recorded (0.00 km).

(iii) Road Data:

Whenever it is apparent that guard rail could be required, the road data should be recorded in the manner shown for the section between 0.72 and 0.97 km. For this section it is evident that it is on a left-hand (outside) curve of radius 220 m and on a fill 6 m high. The shoulder width for this section is 2.4 m and there is an uphill gradient of 8%. The estimated slope of the fill is 1 1/2 : 1. Also, this section has no existing guard rail.

The f-factor for the curve is obtained from the design table on the warrants nomograph and is found to be .278. (Note: In some instances it may be more convenient to use a ball bank indicator to determine the curve f-factor).

Once all the road data has been recorded for a section, the warrants index can be determined from the nomograph (Figure 1). For the example being discussed here, the warrants value is 127. This indicates that type A (69 cm) guard rail should be installed. The length required would be 250 m.

Each section of road data is recorded and and analyzed in this manner until the terminal point for the survey is reached. Once the survey has been completed, the total quantity of each type of guard rail for the highway section survey can be determined.

When new guard rail is installed on a highway, the quantity, type and date of installation should be recorded on the form.

Chapter 13

Appendix 1

Figure 1

December 1977

B.C. MINISTRY OF HIGHWAYS

GUARD RAIL PROGRAM

HIGHWAY FIELD DATA SHEET

H-676

Page 1 of

HQ Use

DATE OF SURVEY: 77 (year) 07 (month) 13 (day)

DISTRICT NO. 316

HIGHWAY NO. 13

SUBDIVISION S13915

INITIAL POINT ELKØ-JCT#913

TERMINAL POINT FERNIE-ELKRIVBRE

TRAFFIC VOLUME: (SADT) 38010

CLIMATIC CONDITION: (SIG, FOG, MOD, NFF) MØD

SECTION LENGTH (km) 33.04

DESIGN SPEED (km/h) 100

DIRECTION OF TRAVEL: (N,S,E,W) E

HQ Use	Odometer (km) Section Start	Odometer (km) Section End	Landmark Name or Notes	Alignment Radius (m)	Alignment Turn Dir.	Alignment Ball Bank	f-factor	Effect. Height of fill (m)	Shoulder Width (m)	Road Grad ±%	Fill Slope	Existing Guard Rail Length (m)	Existing Guard Rail Type	Warrants Index	Req'd Guard Rail (m)	New Guard Rail Installed (Project No. M) Length (m)	New Guard Rail Installed Type	New Guard Rail Installed Date installed year	month	day
	0.00		JCT#913 10.00KM																	
	0.972	0.997		1210	L		278	1.6	2.4	8	1:5			127	A2510					
	1.05	1.219		220	L		278	1.9	1.8	8	1:5	230	B	137	A2410					
	1.310		ELKØ ØHD 1.30KM																	
	1.461	1.717		580	R		020	1.6	1.8	-1	1:5			44	1160					
	1.913	2.215		435	L		1016	1.3	3.0	1	1:5			66	3120					
	2.165	2.390		435	R		020	3.0	1.5	0	1:5			67	2510					
	2.390	3.006			T		010	1.5	1.8	0	1:5			62	1160					
	3.212	3.416		875	R		020	3.0	1.8	0	1:5			66	2410					
	3.813		CULVERT 31.83KM																	

Key for Letters To Be Used

a) CLIMATIC CONDITION
- S I G — Significant Freezing
- F O G — Fog Prevalent
- M O D — Moderate Freezing
- N F F — No Freezing or Fog

b) GUARD RAIL TYPE
- A — 69 cm concrete NP
- B — 46 cm concrete NP
- C — 76 cm concrete NP
- D — Post & Beam Type

c) DIRECTION OF TRAVEL
- N — North
- S — South
- E — East
- W — West

d) TURN DIRECTION
- R — Right Turn
- L — Left Turn
- T — Tangent

Chapter 13
Appendix 1
Figure 2
December 1977

Outside of Residential & Commercial Municipal Areas					Within Residential & Commercial Municipal Areas			Description of Landscape Treatment
RFD	RAD	RAU	RCU	RLU	UFD	UAD	UAU 4-Lane	
X	X	X	X	X				General R/W and Slopes Hydroseed for erosion control include flower seed when available
					X			General R/W Grass, decorative surfacing, trees, shrubs and bulbs
						X	X	General R/W Grass, additional planting requested by municipality - they pay 100% of capital cost and 100% maintenance costs
					X			General R/W Sound barrier - berm planting or structure traffic barrier in medians less than 1 m wide
X	X	X	X	X				Abandoned Road Sections Where viewed by the public shall be returned to their natural state. Remove and dispose of asphalt, culverts, fences and sign posts - re-contour, hydroseed, large open areas may be reforested
X	X							Traffic Islands Will be paved with asphalt or, where material is available and practical, other paving may be used such as cobbles. Unusually large islands may be considered for grass
						X	X	Medians Less Than 1 Metre Wide Pave
						X	X	Medians Greater Than 1 Metre Wide Grass
					X	X	X	Interchanges Grass, decorative surfacing, contouring, trees, bulbs and shrubs

Outside of Residential & Commercial Municipal Areas					Within Residential & Commercial Municipal Areas			Description of Landscape Treatment
RFD	RAD	RAU	RCU	RLU	UFD	UAD	UAU 4-Lane	
						X	X	Boulevards Less Than 1 Metre Wide Pave less than 1 metre
						X	X	Boulevards Greater Than 1 Metre Wide Grass - if additional planting is requested by municipality they are responsible for all maintenance

Key to Definitions of Highway Classifications

RFD	-	Rural Freeway Divided
RAD	-	Rural Arterial Divided
RAU	-	Rural Arterial Undivided
RCU	-	Rural Collector Undivided
RLU	-	Rural Local Undivided
UFD	-	Urban Freeway Divided
UAD	-	Urban Arterial Divided
UAU	-	Urban Arterial Undivided

CHAPTER 14

HIGHWAY STRUCTURES - CONSTRUCTION

14.01 FOUNDATION EXCAVATION

Foundation excavation is the removal of superficial materials so that a structure can be founded on sound, original ground. This preparation is often abused; for instance, the use of a bulldozer under wet conditions may destroy the structure of the original ground, create unnecessary amounts of materials to be wasted, and compel backfilling with premium materials.

The need for undisturbed materials in the base of foundations cannot be overemphasized. Once clays or preconsolidated materials have been disturbed their advantageous structure has gone and cannot be regained.

Excavate a foundation to obtain a uniform bearing capacity; for example, a foundation partly on soil and partly on rock is undesirable as it leads to differential settlement.

If deep foundation excavation is required in clays, silt and water-bearing soils, shoring may be necessary to ensure the excavation backslopes do not cave. Where water is encountered in the base of the foundation in silts and granular soils, pumping directly from the excavation may cause the base of the foundation to heave or boil. If stability is the least doubtful, contact the Testing Branch for advice.

Collect water flowing up through foundations through a filter and drains and discharge clear of the work. The filter and drains usually become a part of the final structure.

A filter is a cover comprised of several layers of graded sand and gravel, ranging from fine sand next to the original ground to coarse gravel next to the drains. Alternatively a filter cloth such as Filter X or Biddim can be used to substitute for one or more sand filter layers where the last are difficult to construct properly. The object is to allow the free flow of water but to prevent the fine grains of soil in the original soil from washing out.

14.02 CULVERTS (Refer to General Specifications, Section 210)

Owing to the destructive influence of water on highway grades, do not convey water for long distances or allow it to be trapped on the upper side. Remove it frequently through culverts, which are the cheapest method of passing small water courses beneath the highway without disturbing their continuity.

14.03 CULVERT STRUCTURE

Install on sound ground and at adequate depth to prevent destruction from fill or foundation movement.

For economy, bedding and backfill are designed as part of the structure and must be properly installed to provide a balanced design.

Camber culverts under large fills to prevent sags due to foundation settlement and to provide a condition which will tighten rather than loosen joints.

Avoid placing flexible culverts in shallow fills as this becomes a flexing column beneath pavements which results in non-uniformity.

14.04 CULVERT HYDRAULICS

For hydraulic and structural efficiency the following practices should be followed when installing culverts:

(a) Design to pass a 10 year flood with the headwater level with its top at the entry.

(b) Design to pass a 100 year flood (1.8 x 10 years) without the headwater topping the road structure or causing other private or public damage.

(c) Since entrance conditions usually determine the flow, anything that can be done to streamline the entry will pay dividends.

  (1) Direct the stream to take advantage of approach velocities at any stage.

  (2) Place headwalls at right angles to the axis of the culvert.

  (3) Place wing walls at an angle of not more than 30^{o} from the axis of the stream.

(d) Make entrance floors smooth and keep them clear of debris and detritus.

(e) Consider debris when determining culvert size and include debris barriers.

14.04 - Cont'd.

(f) Leave the socket of concrete pipes open in headwalls or when projecting, as the hydraulic efficiency is increased as much as 12%.

(g) Obtain rounded entries for pipes, which will increase the hydraulic efficiency of corrugated metal and wood up to 21%, and consider this fact in dealing with previous underdesign.

(h) Since the flow conditions above a culvert may change in the near future due to logging, subdivision,or some other factor, allow for this if such development is imminent. Assess carefully the cost of allowing for nebulous future happenings against the cost of later work, before larger structures are installed.

(i) Endeavor to assess flood flows from typical watersheds during flood periods, for use in later design.

(j) As erosion at outlets is more prevalent than at inlets due to higher velocities, reduce this velocity to a level suitable for its original stream bed by riprap or other means. Velocity build-up is greatest where the stream widens after leaving the culvert because the surface drop provides additional velocity and backwash may scour the fill and culvert installation. Scour is difficult to predict and is frequently best remedied after the culvert has been in use for some time.

14.05 CULVERT BACKFILL

As the load upon a culvert is reduced if it deflects downward away from the load above, ensure that a fine granular bedding beneath a culvert is uniformly but not heavily compacted. By contrast, bedding extending beyond the diameter of the pipe should be compacted to 95% Standard proctor to provide a sound base for the columns of granular backfill alongside the pipe.

Tamp the granular backfill alongside and under the round of the pipe, compacting it to 95% of Standard proctor to provide a rigid column which will accept transfer of the load when the pipe deflects and is pressed into its bedding. Use pneumatic or vibrating tampers and have the backfill at optimum moisture to obtain adequate compaction.

14.05 Cont'd

The value of a granular backfill is proven by the fact that it is unusual to find fill failures when culverts have been backfilled with gravel. There are two reasons:

(1) It can be compacted into a column with minimum compressability.

(2) It provides a filtered drain for the base of the fill structure at a point where a failure can be most difficult to repair.

In high fills advantage can be taken of arching action to lighten the load carried by the culvert by placing the part of the fill directly above in the loosest possible condition.

14.06 THE IMPERFECT TRENCH

Because rigid concrete culverts cannot deflect away from the load by changing shape, they must have inherent strength to carry the column of earth above, plus any load transfer due to settlement in the soil columns alongside.

Fill loadings exceeding the capacity of the strongest pipe can be partially transferred to the columns alongside the pipe by the "Imperfect Trench Method" as follows:

(a) Bed the pipe in the usual manner and complete the fill to one diameter plus 1.7 m. above the pipe.

(b) Dig a trench one diameter wide and deep, directly above the pipe.

(c) Backfill the trench one-third of its depth with compressable material (straw, brush, sawdust, etc.).

(d) Overfill the remainder of the trench with 300 mm of material in loose condition.

(e) Finally, complete the embankment under the applied load.

This Imperfect Trench material deflects away, transferring stress to the columns on each side of the pipe.

Note: This method is economical only where the loading is beyond the strongest pipe available.

14.07 TRENCHES

Pipes in full or partial trenches, such as sewer installations, in sound ground are relieved of part of the load of the column of earth above them. This is due to the settlement of the back-fill which sets up soil stresses, transferring load to the original ground. While culverts are usually installed in a projecting condition, the advantages of a trench installation should be kept in mind.

14.08 REFERENCES

For most general drainage problems the Armco Drainage Handbook contains adequate information; for major problems it is recommended that the Highway Design and Surveys Engineer/Superintendent be contacted.

14.09 CULVERT TYPES AND CHARACTERISTICS

Discharge Coefficient % Theoretical flow with headwater level with top of pipe	CMP Galvanized	Asphalt Coated	Wood Stave Creosoted	Concrete Socket Closed	Socket Left Open
In Headwall	.88	.88	.88	.88	.98
Projecting from fill	.81	.81	.85	.85	.98
Rounded entry	.98	.98	.98	.98	.98
Manning's "n" (roughness coefficient)	.024	.024	.012	0.12	.012

14.09 - Cont'd

	CMP Galvanized	Asphalt Coated	Wood Stave Creosoted	Concrete
B.C. Survey of Corrosion & Erosion	Rust pitting increases in order of: a) no flow b) continuous flow c) stagnant continuous flow	Coating failures in ½ of pipes in 15 years	No decay or wear evident 22 years except where abrasion severe	No sign of wear or corrosion 22 years except where abrasion severe
	Water from organic watersheds with low PH values corrodes metal pipes and other types should be used for these conditions.			
Freight and Transport	mean		lowest	highest
Installation	Easiest to install under bad conditions.		Care required during back-filling to prevent collapse	Concrete cradle required only in extreme cases. Care required to prevent progressive failure from erosion at exit.

Bedding and backfill for which granular materials should be used are designed as part of the culvert structure.

14.10 FLOW CHARACTERISTICS

On grades greater than critical, which is the grade which gives the maximum flow, the discharge coefficient indicates the percentage of theoretical flow which will enter a culvert. These discharge coefficients show the efficiency of different types as water carriers. The coefficients also indicate the value of rounded entries for corrugated metal pipe and wood stave pipe.

14.10 - Cont'd

Flow through culverts with headwater level with top of pipe and with slope equal to, or greater than critical.

	Projecting from Fill			Rounded Entry R=.12D	
	CMP	Wood Stave	Concrete Socket Open	CMP	Concrete & Wood
Discharge Coefficient	.81	.85	.98	.98	.98
Diam. Metres	Theoretical Flow	Critical Slope	Critical Slope	Critical Slope	Critical Slope	Critical Slope
0.305	2.6	.024	.006	.007	.026	.007
0.457	7.1	.021	.005	.006	.023	.006
0.610	14.7	.019	.005	.005	.021	.005
0.762	25.6	.018	.005	.005	.019	.005
0.914	40.4	.017	.004	.005	.018	.005
1.067	58	.016	.004	.004	.017	.004
1.219	83	.015	.004	.004	.016	.004
1.372	111	.015	.004	.004	.016	.004
1.524	145	.014	.004	.004	.015	.004
1.676	184	.014	.004	.004	.015	.004
1.829	228	.014	.003	.004	.014	.004
1.981	280	.013	.003	.004	.014	.004
2.134	336	.013	.003	.003	.014	.003

To obtain flow, multiply the theoretical flow by the discharge coefficient. Critical slopes are given for these flows.

Select a pipe size to carry the 10 year or normal flood with the headwater at the top of pipe. Headwater depth for a 100 year flood will be approximately 1.8 times the diameter and should not top the fill or cause flood damage upstream.

For culverts, with tailwater or on less than critical slope, a diameter greater than that shown in the table will probably be required and must be computed.

Debris can be handled either by increasing a culvert's size, or by erection of a debris barrier; consequently the costs should be compared.

PORTLAND CEMENT CONCRETE

14.11 GENERAL

Owing to many opportunities for perfunctory workmanship, a concrete job is one project where vigilant inspection pays off. Concrete is a product where the best costs no more than the mediocre.

Concrete highway structures have to stand up to the ravages of freeze-thaw cycles, the effect of de-icing salts, and possibly attacks from sulphates and alkalis. The creation of a durable, strong product to withstand these attacks can be achieved by careful attention to:

(1) The quality of the materials - cements, aggregates, water, admixtures.

(2) Designing.

(3) Mixing.

(4) Transporting.

(5) Placing and Consolidating.

(6) Finishing.

(7) Curing.

14.12 QUALITY OF MATERIALS

It is fortuitous that cements manufactured in British Columbia are low alkali types. These are much less prone to injurious chemical reactions with certain types of aggregates than cements manufactured elsewhere.

Note: If American literature is used to proportion mixes, it should be noted that B.C. cements are packaged in 40 kg bags compared to 94 pounds in the United States.

14.13 PORTLAND CEMENT (Refer to General Specifications, Sections 211, 218, 222, 310 & 314)

In Portland cement, artificial crystalline minerals combined with water produce four major compounds. The relative proportions of these compounds control the properties of the hardened paste. In Canada there are three cements manufactured which will produce cement pastes with varying compositions, as follows:

14.13 - Cont'd.

TYPE I, or normal Portland cement, the most commonly used, is manufactured for general construction purposes. Under normal curing conditions the two brands of Type I cement produced in British Columbia (Elk and LaFarge) have initial setting times of from 3 to 4 hours, and final setting times of from 6 to 7 hours.

TYPE II Portland cement, due to a lower C_3A (Calcium tri-silicate) content is suited for areas where moderate sulfate attack is anticipated, or where a low heat of hydration is desired.

TYPE III cement is formulated to give high early strengths. Although its setting time is approximately the same as Type I, once set its strength gain is much more rapid than Type I or Type II, and normally reaches the equivalent 28-day strength of Type I in 14 days. Although the amount of heat generated during its hydration is similar to that of Type I and Type II, it is generated much quicker. Consequently, when Type III cement is used in hot weather or in massive sections, extreme care should be taken.

Although Portland cement is quite stable under normal conditions it is susceptible to changes in humidity. When storing cement on the job keep it in a weatherproof enclosure raised off the ground. Types I and II cement should, preferably, not be stored for more than six months and Type III for not more than three months. On jobs where considerable cement is stored, arrange the cement in such a way that the first shipments are used first, and so that each shipment is accessible for inspection. If cement is stored for long periods material tests may be needed, but any sacks containing lumps which cannot be broken down easily between thumb and forefinger should not be used.

14.14 AGGREGATES

The aggregates in a concrete mass are important because they provide approximately 75% of the volume and their physical characteristics govern the water-cement ratio and workability.

To be suitable they should be free of chemicals or coatings, well graded and sound. Weak friable or laminated aggregates are undesirable. Shale and cherts are to be avoided, and long slithery or flat pieces should be limited to about 15 percent.

Visual inspection will often disclose undesirable characteristics in the aggregates. Once a source has been selected, samples should be tested to verify their suitability.

14.15 ADMIXTURES

Numerous types of admixtures are available to improve workability or impart particular properties. Since some of these admixtures create undesirable effects as well, only those approved by the Department should be used.

Air entraining admixtures are used to distribute finely divided air bubbles throughout a concrete mass. Air entrained concrete is more durable than plain concrete. The greater resistance to freezing is caused by air bubbles within the concrete relieving the hydrostatic pressures set up by the inward growth of ice which would normally disrupt the concrete.

Air entraining admixtures also reduce bleeding and increase the workability of concrete because air bubbles act as a lubricant between aggregate particles and reduce the quantity of mixing water which would normally be required for a given consistency.

The most effective percentage of entrained air is between 4 and 6%. Percentages below 3% have very little effect on durability, whereas percentages above 6% cause too much reduction in strength.

A number of factors influence the entrainment of air in concrete. The majority of air is entrained in the #50 to #100 size material of the fine aggregate. If a fine aggregate is deficient in this size material less air will be entrained for a given dosage of admixtures.

Consistency and temperature affect air entrainment. For a given dosage of admixture wet mixes will have higher air content than dry mixes. Mixes of high cement content will entrain less air than mixes of low cement content. Air content varies inversely with temperature. Air content after placing and vibrating may be about 1/5 less than when first mixed. With normal mixing the maximum air entrainment usually occurs within 3 to 15 minutes. With extended mixing the air content may be somewhat higher or lower, depending upon the activity of the air entraining agent used.

In most cases the quantity of admixture recommended by the manufacturer per sack of cement is sufficient to entrain between 4% and 5% air. The dosage varies for different air entraining admixtures and is shown on the label of each container. Determine the exact percentage of air being entrained by an air meter. If the percentage of entrained air is above or below 4-5%, increase or decrease the dosage accordingly. Make adjustments to the dosage on the total dosage per cubic yard and not for each sack of cement, and in one-half ounce increments, with air tests being made after each adjustment. Once the correct dosage is determined, take hourly checks on air entrainment with air meter. It

14.15 - Cont'd - 1

must never be assumed that because the dosage of one type of air entraining admixture was required on one job to give 4-6% air that the same dosage will be suitable on another. The exact quantity is to be determined with an air meter.

Cement dispersing or water reducing admixtures are used to improve the workability of concrete at a reduced water content to facilitate placing methods or conditions or aggregate deficiencies.

Cement dispersing or water reducing admixtures are used when the concrete materials have a higher water requirement than usual, or when greater workability is required to facilitate placing methods or conditions.

When cement is mixed with water it tends to form small flocculent lumps or masses. By dispersing these cement flocs with a dispersing agent less water is required to produce a cement paste of a given volume and consistency. Such dispersion of cement is very beneficial when the surface area and void ratio of the combined aggregates is very high. This usually occurs with angular aggregates, coarsely graded fine aggregate, excessive 9.5 mm and #4 size material or gap graded aggregates. The water reduction created by cement dispersion also allows high slump concrete to be produced for pumping or placing in difficult locations without the need for large quantities of cement to reduce the water/cement ratio.

Most cement dispersing or water reducing admixtures have the added characteristic of being retarders. The degree of retardation can be increased by increasing the dosage of admixture. Set retardation can be very beneficial during hot summer days when evaporation is high and pouring is slow. Likewise, on hot days when transit mixers have long hauls, slump loss is reduced by using retarding admixtures. Retardation also allows monolithic pouring of more than one part of a continuous structure. To determine the exact dosage of an admixture necessary to give the desired retardation, it is necessary to make trial batches both in the field and laboratory with the same materials which will be used on the job.

14.15 - Cont'd. - 2

The setting time and rate of hardening of concrete can be accelerated by the use of calcium chloride, triethanolamine and some soluble carbonates, silicates and flousilicates. The most commonly used is calcium chloride. There are a number of patented admixtures on the market sold as accelerators or hardeners which basically consist of calcium chloride.

Accelerators are sometimes used in concrete to permit early removal of forms, shortening the curing period, early use of a structure, cold weather concreting, and compensating for the retarding effects of other admixtures; the most common use being for concreting in cold weather.

Do not use calcium chloride without prior authority and, if used, it must not exceed 2% by weight of the cement. Never use it in prestressed concrete. Curing is still necessary when calcium chloride is used; however, the curing period can usually be reduced by half of that required for normal concrete.

Although calcium chloride can be beneficial in a few instances it can, if not properly controlled, greatly increase drying shrinkage, reduce the concrete resistance to sulphate attack and increase alkali aggregate expansion when high alkali cements are used with reactive aggregates. It does initially cause some superficial corrosion of the reinforcing steel but does not progress with age.

Except where time is of the utmost importance, follow normal concreting practices. By using Type III cement, cement dispersing admixtures and suitable curing methods, many of the effects obtained using calcium chloride can be achieved at a slightly longer curing period but with the assurance of high quality concrete.

14.16 MIXING WATER

Ensure that the concrete mixing water contains no substances which can have a harmful effect upon the strength and durability of the concrete. It is quite safe to assume that water which is acceptable for drinking purposes is satisfactory for mixing water.

14.17 - DESIGN

Design of a concrete mixture is an art as well as a science. Rules and equations are not available; instead experience and a knowledge of the material are essential. Large jobs require laboratory work.

Very briefly, two important steps are taken; a water-cement ratio is established to meet strength requirements, a desired slump and the maximum size of the aggregate, then a ratio is established between the fine and coarse aggregates and it is here where an art is involved.

For small jobs, where time and personnel are not available, the following table can be used to design a strong, durable mix. A provision is that the concrete is not made overly wet - as a guide, it should be wet enough to slide, but not run, off a shovel.

14.17 - Cont'd.

Concrete Mixes for Small Jobs

Maximum Size of Aggregate mm	Mix Designation	Approximate (40 kg bags) cement per cubic metre of concrete (1)	kg of aggregate per 40 kg cement		
			Sand (2) kg		Gravel or crushed stone kg
			Air Entrained Concrete (3)	Concrete without air	
12.7	A	9.8	100	105	73
	B	9.6	96	100	80
	C	9.4	96	100	87
19.0	A	9.2	96	100	96
	B	8.9	96	100	105
	C	8.8	91	96	112
25.4	A	8.9	96	100	105
	B	8.7	91	96	117
	C	8.6	87	91	122
38.1	A	8.5	96	100	124
	B	8.3	91	96	137
	C	7.9	132	91	146
50.8	A	7.9	96	100	140
	B	7.7	91	96	152
	C	7.5	87	91	162

(1) Procedure: Select the proper maximum size of aggregate. Then, using Mix B, add just enough water to produce a sufficiently workable consistency. If the concrete appears to be undersanded, use Mix A; if it appears to be oversanded, use Mix C.

(2) Weights are for dry sand. If damp sand is used, increase the weight of sand 5 kg for a 1-bag batch, and if very dry sand is used, add 10 kg for a 1-bag batch.

(3) In general, air-entrained concrete should be used in all structures that will be exposed to alternate cycles of freezing and thawing.

14.18 BATCHING EQUIPMENT

Batching of coarse and fine aggregates can be done in a number of ways. Batching by weight is the most common method and is specified by the Department because it gives greater batch uniformity.

Before commencing concrete operations check weighing devices for damaged knife edges or balance arms. Ensure that dampening devices are functioning properly and that platforms on platform scales are riding freely with no obstructions under platform. Ensure that thumb screws on riders lock riders firmly to balance arm. Level weighing devices on firm ground to prevent possible settlement during use.

Weigh cement when batched in bulk. If sacked cement is used ensure that batches are of such size that only full sacks are used.

Measure mixing water either by weight or volume (5 litres per 40kg of cement). Ensure that devices for measuring and dispensing mixing water are free of leaks and have a valve system such that no unmeasured water flows into the mixer while mixer is being charged or discharged, and that measuring devices are capable of routine measurements within an accuracy of 1 percent.

In large batching plants admixtures are usually dispersed by automatic dispensers. At job site batching plants the usual procedure is to make a container capable of holding the desired quantity of admixture. Powdered admixtures can be added either in powder form or made into a solution. Predetermine concentration for accurate dispensing when used in solution.

14.19 BATCHING

Concrete mixes are designed for use with aggregates in a saturated surface drying condition. Because aggregate stockpiled on a job nearly always contains moisture which is in excess of that which is absorbed, make allowances to the aggregate proportions for this free moisture. If the drying method is used to determine the moisture contents of aggregate, make allowance for their absorption. It can be assumed that absorption of fine aggregates is approximately 1% and coarse aggregates approximately 0.5%. Make adjustments to the aggregate proportions by increasing their weight by the percentage of free moisture they contain. As this free moisture will become part of the mixing water, reduce the quantity of mixing water by the same amount. Make adjustments for moisture in the aggregate prior to every pour, or when new supplies of aggregates are used.

14.19 - Cont'd.

Do not allow cement added to a mix to drop freely as considerable loss in cement can occur, especially on windy days. For bulk cement use a canvas boot of such length that its outlet is well within the charging hopper of the mixer. When sacked cement is emptied directly into the mixer drum, keep its mouth well in the drum. When batching with sacked cement into an open skip, place the sack on top of the aggregates with the mouth of the sack buried in the cement.

Owing to various factors affecting the water requirements of a concrete mix, such as temperature, air content, shape and uniformity of aggregates, etc., the full quantity of mixing water specified for a concrete mix may not be necessary. It is advisable, therefore, when mixing operations commence, to dispense about three-quarters of the specified water into the first one or two mixes. When this water has been uniformly distributed throughout the mix, add gauged water to give the desired slump. Set the water gauge for the total amount of water added.

On large jobs where transit mix trucks are being used the water requirements will vary from truck to truck because of the design and condition of the drums and blades in each truck. On jobs where transit trucks are used, specify much lower slumps than are required for the first run of each truck. Upon arrival of each truck at the job site add sufficient water to give the required slump. Inform the batching operator at the plant of the total mixing water required for each truck by truck number. Do not allow the quantity of mixing water added to a mix to exceed that which is specified. If workability cannot be gained with the specified quantity of mixing water then the aggregate proportions need adjusting. Regain workability by increasing the percentage of fine aggregate. In order not to oversand a mix, increase the fine aggregate in increments of 2%. When such adjustments are made assume that, for a given weight of either coarse or fine aggregates, their volumes are equal. Maintain the yield of the mix, therefore, by reducing the coarse aggregate by the same weight as the fine aggregate is increased.

14.20 - Cont'd.

To produce a uniform mass in which the cement, water and aggregates are uniformly distributed, mixers should be clean and in good condition; operated at the optimum speed as recommended by the manufacturer; fed efficiently; not overloaded; mixed for a sufficient length of time. The necessary mixing time varies with the size, type and condition of the mixer. Specifications usually require a minimum of one minute mixing time for mixers up to one cubic yard capacity, with an increase of 15 seconds mixing time for each additional one-half cubic yard. The mixing time is measured from the time when all materials are in the mixing drum.

When truck mixers are used, mix each batch of concrete for not less than 50, nor more than 100, revolutions of the drum at the rate of rotation designated by the manufacturer. Any additional mixing, due to delays in placing, is done at the agitating speed designated by the manufacturer.

Deliver the concrete and discharge from the truck mixer within 1½ hours after introduction of water to the mix. If, during this time, the concrete tends to dry out or stiffen, it may be used if, upon remixing, it becomes sufficiently plastic so that it can be completely compacted in the forms. Do not allow the adding of water to make the mix more workable as this increases the water-cement ratio, thus reducing the strength and durability of the concrete.

14.21 TRANSPORTING OR CONVEYING CONCRETE

Dependent upon the type of work and equipment available, various methods are employed to transport concrete from mixer to forms. These include the use of wheelbarrows, buggies, chutes, dump buckets, conveyor belts, pneumatic and displacement pump. The method used must be suitable for use with the consistency of concrete specified in order not to cause segregation of the constituent materials. No consideration should be given to the common belief that separation occurring in handling will be eliminated in the course of other operations. Prevent segregation rather than correct after its occurrence.

Concrete being transported in wheelbarrows or buggies will segregate when wheeled over poorly constructed or dirty staging.

Make chutes for chuting concrete of metal or metal-line to reduce friction, and large enough to prevent any overflow. Not all concretes are suitable for chuting. Some mixes are too stiff to flow. Never increase the consistency of such mixes to make them wet enough to flow along a chute. If concrete in a chute is allowed to travel too fast it will quite likely segregate. This can be overcome by either changing the direction of flow at various intervals, depending on the steepness of the chute, or by placing baffles in the chutes.

14.21 - Cont'd

Dump buckets, which are usually handled by cranes, create very little segregation.

Conveyor belts, which are usually used as intermediate conveyors between mixers and hoppers, can cause considerable segregation if used at too steep an inclination or if mixes are too wet or dry.

Concrete mixes have to be especially designed for pumping with penumatic or displacement pumps. There is very little segregation of a properly designed mix when pumped with a displacement pump. Excessive segregation can occur when pneumatically pumped if the concrete is violently shot from the open end of the pipeline. This can be reduced by either burying the discharge end in the concrete or using a suitable baffle.

14.22 PLACING AND CONSOLIDATING CONCRETE

Deposit concrete in horizontal layers as close as possible to its final resting place. Do not deposit in large quantities at any one place and allow to flow within the forms as this causes segregation, poor consolidation, and sloping work planes. Compact each layer thoroughly before the succeeding layer is placed. The depth of lift will depend upon the size of placement and the rate at which concrete is being placed. Do not allow the lifts to exceed 0.67 m in depth. In all cases, time the placing operations so that a new lift is placed while the succeeding lift is still plastic, otherwise cold joints will be formed.

Never drop concrete freely more than 1.5 m as this results in segregation and possible damage to the forms. Also, the forms and reinforcing steel above the level of the placement become coated with mortar which may dry before the concrete builds up to this level. In forms where the free drop will be more than 1.5 m use elephant trunks or ports in the sides of the forms through which the concrete can be poured with a free drop of less than 1.5 m.

Nearly all concrete is consolidated by means of mechanical vibrators. The efficiency of these vibrators depends upon their frequency, amplitude and operation. The frequency and amplitude are usually shown on the name plate; however, if the vibrator is in poor working condition its output will be much less. In using the internal type vibrator, first insert it vertically into the concrete fairly rapidly to the full depth of the lift, and withdraw slowly. There are various indications as to when sufficient vibration has been applied. One is when mortar just begins to flush to the surface adjacent to the vibrator, at the forms or at the surface of steel reinforcing. Another indication is the development of a level top surface where the coarse aggregates just appear to be floating with sufficient mortar for finishing.

14.22 Cont'd.

In many cases concrete is overvibrated due to inexperienced operators. When such is the case, segregation is created by the settlement of the coarse aggregates to the bottom of the lift and the accumulation of water and mortar on the surface. Over-vibrating also causes water and fines to accumulate at the lower surfaces of the larger aggregates or reinforcing bars, reducing the quality of the concrete in these areas.

14.23 CURING CONCRETE

The hardening process of concrete is a function of a chemical reaction between the four principal compounds in cement, which is called 'hydration'. This hydration only takes place in the presence of moisture and at favorable temperatures. Because of this, curing is carried out to retain sufficient free water in the concrete and keep it at a favorable temperature to allow hydration to proceed. As the strength gain is most rapid at early ages, the greatest benefit from curing is during this period. Under normal conditions, carry out curing for at least 7 days.

The most common method of curing used is the application of water by ponding, intermittent or continuous spraying or by covering with an absorbent material such as straw, sawdust, burlap, etc., which is kept in a damp to wet condition throughout the curing period. Leaving forms in place as long as possible helps retain this moisture.

Another method of retaining moisture in concrete is the use of curing membranes. Such membranes prevent the evaporation of mixing water, making it available for hydration. To function properly membranes must be applied directly after finishing. If, during the curing period, the membrane is damaged or punctured, reseal immediately by spraying the damaged area with more curing compound.

The most favorable temperature range for most concrete during the curing period is between 15° and 38° C. It is necessary, therefore, during periods of extreme high and low temperatures, to take necessary measures to keep the temperature of the concrete within this range.

During periodsof extreme high temperatures, the surface temperature of coarse aggregates exposed to the sun becomes very high. The temperature of these aggregates will greatly increase the initial temperature of the concrete mix. To reduce this surface temperature, shade or water down the aggregate stockpiles. Effect further reduction in the initial temperature of concrete by using iced mixing water. If this method is used, however, take extreme care to ensure that particles of ice are not mixed in with the concrete. Keep the temperature of the concrete once placed within the desired temperature range on extremely hot days by keeping it shaded from the direct sun rays.

14.23 - Cont'd.

During cold weather the pouring procedure is opposite. Increase the initial temperature of the concrete to within the desired temperature range for curing concrete and maintain this temperature for the duration of the curing period. During moderately cold weather increase the initial temperature of the concrete sufficiently by heating the mixing water. Do not heat the water, however, above 75°C as any higher may cause a flash set of the cement.

If heating of the mixing water is insufficient, heat the aggregates. This is done by steam jets, hot water pipes or fire flues buried in the stockpiles. If fire flues are used do not use the aggregates within the near vicinity of the flues as these aggregates will be extremely hot and some particles possibly cracked.

During extreme cold temperatures keep the placed concrete heated during the curing period by constructing weather-tight enclosures around or over the concrete with ample space between the concrete and enclosure to permit free circulation of air. The air within this enclosure is then heated by means of steam, which not only provides heat but also moisture for hydration. Salamanders or electric heaters can also be used; however such heating devices cause non-uniform temperatures and lower the relative humidity within the enclosure.

The quality of concrete, it being a composite material, depends upon the quality and proportions of the materials, as well as mixing, placing and curing of the produced concrete. The actual quality of the concrete is never known until after it has hardened. If its quality is poor it is very costly to replace. It is therefore very important that all concrete operations be closely controlled in order to produce a finished product of suitable and predictable quality.

To assist in concrete control there are a few field tests which can be carried out. These tests are as follows:

(a)	Amount of material finer than #200 sieve	ASTM C.117
(b)	Sieve Analysis of coarse and fine aggregates	ASTM C.136
(c)	Moisture content of coarse and fine aggregates	ASTM C.70
(d)	Slump of Portland Cement Concrete	ASTM C.143
(e)	Yield of freshly mixed concrete	ASTM C.138
(f)	Air content of freshly mixed concrete by the pressure method	ASTM C.231
(g)	Making and curing concrete compression test specimens in the field	ASTM C.31

Equipment and procedures necessary to perform the above tests can be obtained through Regional Highway Testing Laboratories.

CRIB OR BIN TYPE RETAINING WALLS

14.24 GENERAL

Timber, pre-cast concrete or steel components can be used for crib-type retaining walls. Compared with cast-in-place concrete walls they offer several advantages.

(1) Being articulated they are tolerant of settlements or frost movements.

(2) Since form work and curing time is unnecessary at the job site, they speed up the work; also, in locations where it is inconvenient or expensive to mix and pour concrete, they offer a simple alternative.

(3) In locations where there are long slopes they can be installed and backfilled in short sections without undermining large volumes of unstable material.

(4) They are inherently well draining.

14.25 USES

Crib walls are better suited to retaining granular materials than they are to clay. Because of disturbance at the toe and the difficulty in carrying the wall below the slip plane, they are unsuitable for correcting circular type landslides in silts and clays.

Crib walls, especially the smooth metal types, are unsuitable for protecting stream banks from erosion. The stream velocity will likely be increased, and as a result scour may undermine the structure or cause trouble elsewhere. Better solutions are discussed in the chapter on river bank protection.

14.26 CONSTRUCTION

The Armco Drainage Handbook contains a good write-up on cribs, with emphasis on metal types.

14.26 - Cont'd.

The design of cribs is somewhat empirical but in general they should follow the principles of cast in situ walls.

They should comply with the following:

(1) Provide a gravel pad where there is bedrock in the foundation.

(2) Batter the wall from 1:6 to 1:12.

(3) Make the base width about 45% of the height, or 55% if there is surcharge.

(4) Backfill with granular materials.

(5) Ensure that water will not pond around the base.

In the case of creosoted crib-walls, the staff of the treatment plant prefer to design and fabricate each wall individually.

(Refer to General Specifications Standard Drawings Nos. 347 and 348, Standard Metal Bin Wall and Standard Concrete Bin Wall).

The walls can be erected by hand methods, placing one piece at a time. Metal bin walls can also be erected by making up sub-assemblies that can be placed with light cranes.

14.27 EXCAVATION

Excavate the soil to the elevation of the natural ground line and into the bank a short distance beyond the rear of the proposed wall. Do the final excavation, from the ground line to the base of the columns, by hand in the form of trenches just wide enough to allow the bottom members of the wall to be placed. This reduces the volume of excavation and facilitates excavation of the area under the base plates without disturbing any more of the natural ground than necessary. Alternately excavate the base to below the level of the column base over the entire width of the wall with the base area specially prepared with gravel.

14.28 PREPARING THE FOUNDATION

Clear the foundation under the wall of all sod, debris, and unstable soil. When the wall is placed on rock or other non-yielding foundation, place a cushion of granular material under the base plates or bottom members to permit the entire wall to adjust to small differential settlements and avoid concentration of loads on any individual members of the wall.

14.28 Cont'd.

Set the elevation of the foundation low enough to prevent undercutting of the foundation if a ditch or stream carries water along the face of the wall. The depth required will vary with the velocity and direction of the currents or the amount of wave action. On soils not subject to erosion, a shallow footing depth may be used.

Accurately place the base plates or bottom members to line, grade and slope. It is usual to construct a simple template for establishing the position of the base plates or bottom members for walls placed on batter.

If the wall is placed on existing fill, set the wall base on a compacted gravel layer of 0.3 to 0.6 metres in thickness.

Subdrainage of the wall is essential to eliminate the possibility of hydrostatic pressure developing behind the wall or saturating the foundation. Place such a subdrain at the back of the wall, below the lowest member and provide a suitable outlet.

14.29 ASSEMBLY

Assembly of the wall can be handled either by building the wall piece by piece or, in the case of metal bin walls, making a sub-assembly of the transverse section members, erecting it as a unit and then placing the stringers. The latter method requires a small hoist for handling the transverse sections but will prove economical for long walls. In either case, it is important to check the columns or cribs for batter and line as they are placed and before the assembly bolts are tightened.

14.30 BACKFILL

Backfill the wall as it is erected, provided caution is used to see that the columns are held in correct position while the backfill is being placed. A stringer and spacer temporarily placed at the top of the columns will assist in holding the columns in line.

To assist in erection and to hold the cribs in position during filling, interlocking units should be used, or some other form of fixing provided, to form a connection between adjoining units.

Use a clean granular backfill material with a maximum size of 75 mm. Avoid silty or clay soils. Do not use lumps, sod, cinders or frozen material.

First fill and carefully compact the trenches around the base of the wall. Place the balance of fill material in 15 cm layers and compact each layer thoroughly to minimize settlement in the backfill but avoid over-compaction. While the backfill material should be placed to fill all members of the wall, do

14.30 Cont'd.

not compact within 300 mm of any wall component. If this is not done any settlement will cause arching and full backfill load on the wall and column components; a load for which they are not designed.

Keep the backfill between the wall and natural ground approximately level with fill inside the bins at all times. Shape the fill over the wall to avoid having surface water standing in the area. Use paved ditches to carry away surface water when a nearly level surface is required behind the wall.

When a perforated pipe underdrain is specified behind the wall, place a properly graded filter layer over the underdrain.

PAINTING

(Refer to General Specifications, Sections 216,217 and 308)

14.31 SELECTION AND USE OF PAINTS

The following table is intended as a condensed guide to the selection and use of Ministry of Highways and Public Works specification paints. Advice on the selection of paint systems for service not covered in the table may be obtained from the Director of Geotechnical and Materials Engineering.

14.31 Cont'd. - 1

Surface	Surface Preparation	Primer	Top Coats
STEEL (New) All structures except those for service underground, immersed in water, or other highly corrosive environments. In some cases only parts of structures are subject to corrosive conditions and require special treatment.	Remove Rust, Millscale, Grease, Oil, Dirt, etc. (See also Para. 14.32 Surface Preparation Methods.)	MOH A-2 Brush or Spray 35-50 micro micrometres Dry Film	Intermediate: 1st. Field Coat: B-1 Brush or Spray 35 - 50 micrometres Dry PLUS Top Coat: Bridge Top Coats MOH C-1 Forest Green MOH C-2 Mid Green MOH C-3 Silver MOH C-4 Grey MOH C-5 Turquoise MOH C-6 Mid Blue MOH C-7 Highway Orange MOH C-8 Sockeye Red MOH C-9 Yellow MOH C-10 Golden Ochre Brush or Spray 25-35 micrometres dry. Lighter colours may require 2 coats to hide 2 Top Coats give added protection
STEEL (Previously Painted) All structures except those in service underground, immersed in water, or other highly corrosive environment In some cases only parts of structures are subject to corrosive conditions and require special treatment.	Remove: Rust & Millscale from areas of corrosion; all loose paint; grease, oil, dirt, etc. from sound paint. (See also Para. 14.32 Surface Preparation Methods.)	Spot prime bare metal only. MOH A-2 by brush 35-50 micrometres Dry Film.	Bridge Top Coats MOH C-1 Forest Green MOH C-2 Mid Green MOH C-3 Silver MOH C-4 Grey MOH C-5 Turquoise MOH C-6 Mid Blue MOH C-7 Highway Orange MOH C-8 Sockeye Red MOH C-9 Yellow MOH C-10 Golden Ochre By brush to primed areas only 25-35 micrometres PLUS Bridge Top Coats as above by brush or spray to the entire structure 25-35 micrometres dry Lighter colours may require 2 coats to hide. 2 top coats give added protection.

14.31 Cont'd. - 2

Surface	Surface Preparation	Primer	Top Coats
STEEL (Galvanized) All structures in service, in environment suitable for galvanized surfaces.	Permit to weather until zinc coating appears uniformly dull. (Normally at least 6 months winter weather). Remove oil, grease, dirt, etc. (See also Para. 14.32 Surface Preparation Methods)	If allowed to weather no primer required, but use of either primer below is preferable. If weathering not practical: 1-GP-121 Vinyl Wash Primer, by brush or spray 5-10 micrometres dry film. OR 1-GP-178 Zinc Dust/ Zinc Oxide. Paint by brush or spray 25-35 micrometres dry film.	Bridge Top Coats MOH C-1 Forest Green MOH C-2 Mid Green MOH C-3 Silver MOH C-4 Grey MOH C-5 Turquoise MOH C-6 Mid Blue MOH C-7 Highway Orange MOH C-8 Sockeye Red MOH C-9 Yellow MOH C-10 Golden Ochre By brush or spray 25-35 micrometres dry film. Second Top coat only required if first top coat does not hide base or primer satsifactorily.
WOOD (New) All wood except rough lumber and all structures except those for service underground, immersed in water, or interior of buildings.	Remove dirt, dust, grease, etc. by sanding and/or solvent Wood must be at least surface dry.	MOH A-3 by brush only. Brush out well to a uniform film of minimum thickness, thin primer with solvent if hard to brush out.	Top Coat: MOH D-1 Exterior Latex White or MOH D-3 White or Sign and Sign Post Top Coats: MOH T-1 Green MOH T-2 Yellow MOH T-3 White or Bridge Top Coat Colours as listed (for incidental areas) By brush or spray (and roller for MOH D-1) 25-35 micrometres dry.

14.31 Cont'd - 3

Surface	Surface Preparation	Primer	Top Coats
WOOD (Previously Painted) All wood except rough lumber. All structures except those in service underground, under water or interior of buildings.	Remove all cracked, loose, peeling or other unsound paint. Remove grease, dust, oil, etc. from sound paint.	Spot prime bare wood only. MOH A-3 by brush only. Brush out well to a uniform film of minimum thickness.	As for WOOD(New) except 1st coat to primed areas only. 2nd coat to entire structure.
MASONRY (New) Includes: Concrete, stucco, asbestos cement, cement block, brick, etc. All structures except those for service underground or immersed in water.	Remove dirt and loose scale. Suitable detergent or steam cleaning necessary to remove tightly adhering dirt, grease, etc. (New construction must be cured a minimum of 10 days before application of paint).	Thoroughly wet surface with water. Apply MOH D-1 as soon as free water has been absorbed or evaporated, but before surface has dried out. Apply 25-35 micrometres dry film.	MOH D-1 1 or 2 coats as necessary to obtain complete hiding. By brush, spray or roller. 25-35 micrometres dry film each coat.
MASONRY (Previously painted) Includes: Concrete, stucco, asbestos cement, cement block, brick, etc. All structures except those in service underground or immersed in water.	Remove loose paint, dirt, loose scale, etc.	Spot prime areas of bare masonry with MOH D-1, as above for MASONRY (New)	MOH D-1 As above for MASONRY(NEW)

14.32 SURFACE PREPARATION METHODS

The importance of thorough surface preparation cannot be overstressed. Whilst some paint systems are more tolerant of unclean surfaces than others, the life of all paint systems will be greatly increased if the surface is clean.

The cost of surface preparation is very high, often exceeding the cost of the subsequent paint and painting. This cost is invariably justified by a reduction in frequency of re-painting, except on structures whose potential life is less than that of the paint system itself.

The most suitable cleaning method for steel structures is governed by several factors, such as: the amount of rust, millscale or unsound paint to be removed, as a percentage of the total surface; the paint system to be used; the severity of the environment; the availability of equipment, etc.

Seven basic methods are available:

Solvent Cleaning

The removal of oil and grease only by use of mineral spirits (Varsol or similar).

Detergent Cleaning

The removal of oil and grease only by use of liquid detergents generally containing phosphoric acid. More effective than solvent cleaning, especially when surface is rough.

Hand Cleaning

The removal of loose rust, loose millscale and loose paint using hand scrapers, wire brushes, chipping hammers, etc. Suitable for MOH paint systems in mild environments. For contract work use C.G.S.B. Spec. 31-GP-401.

Power Tool Cleaning

The removal of loose rust, loose millscale and loose paint using power wire brushes, power impact tools, power grinders, etc. Suitable for MOH paint systems in mild environments. For contract work use C.G.S.B. Spec. 31-GP-402.

14.32 Cont'd.

Brush Off Blast Cleaning

The removal of loose rust, loose millscale, and loose paint using sand or grit blasting. Suitable for MOH paint systems in mild environments. For contract work use C.G.S.B. Spec. 31-GP-404, Type III.

Commercial Blast Cleaning

The removal of practically all rust, millscale and paint by sand or grit blasting.

Since the method is governed by a rate of cleaning, the end result is dependent on the condition of the steel before cleaning. In most cases rhe degree of cleanliness is suitable for MOH paint systems in more severe environments. For contract work use C.G.S.B. Spec. 31-GP-404, Type II.

Blast Cleaning to White Metal

The removal of all rust,millscale, paint and foreign matter by sand or grit blasting. Only required in very severe corrosive environments when coating systems superior to MOH paints are required, e.g. - epoxy systems, zinc rich primers, etc. For contract work use C.G.S.B. Spec. 31-GP-404, Type I.

It is implied that Hand Cleaning, Power Tool Cleaning and Brush Off Blast Cleaning are equally effective. This is only true if the work is done conscientiously, with the proper tools maintained in first class condition, and with considerable supervision.

14.33 USE OF THINNERS

All MOH Specification paints are supplied at a viscosity suitable for application by brush when the paint and the surface to be painted are about 20 C. to 30 C. At lower temperatures and when application is by spray add thinness (to a maximum of 10% by volume)
to the paint if necessary to facilitate proper application. Poor application resulting in runs, sags, orange peel, excessive brush marks, etc., is more detrimental to the paint film than the slight loss of dry film thickness incurred by the addition of up to 10% thinness.

14.33 Cont'd.

All MOH specification paints may be thinned with mineral spirits (Varsol or similar) except -

MOH D-1 which is thinned with water.

MOH C-3 Silver may be thinned with mineral spirits only, but more satisfactory results are obtained if a mixture of 50% Xylol and 50% mineral spirits is used.

14.34 DRYING TIME AND RECOATING

All MOH specification paints in Paragraph 14.31 will dry sufficiently overnight to be recoated, provided drying conditions are reasonbly good, except MOH D-1 which is sufficiently dry to recoat in 2 hours.

14.35 TEMPERATURE AND HUMIDITY

Best results are obtained when the surface temperature of the structure is warm (21° C.) and relative humidity is low (less than 60%).

The surface temperature of the structure must be at least 2.7°C. above the dew point when paint is applied, and must remain so for several hours after application. When the relative humidity is 85%, the dew point is only approximately 2.7° C. below the ambient temperature. Do not apply paint when humidity exceeds 85%, or is likely to before the paint has dried.

It is unwise to paint when air or surface temperatures are less than 4° C. unless the temperature is rising. Paint should never be applied when the temperature is expected to drop below freezing before the paint has dried. Exception: MOH D-1 which should never be applied at temperatures less than 10° C. irrespective of the humidity conditions.

14.36 TIMBER CONSTRUCTION, FRAMING, DRIVING PILES, ETC.

(Refer to General Specifications, Sections 213, 214, 303, 304, 305, 306, 307).

PILES

14.37 INTRODUCTION (Refer to General Specifications, 214,304,305).

Builders have been exploiting piles for 12,000 years to support their structures when surface soils are inadequate; generally this has worked so well that many erroneously consider them to be a "cure all" for every problem. With clays especially, conventional methods of pile driving may encounter a number of pitfalls which will be dealt with later.

14.38 USE

When there is a risk of shear failures or large settlements with spread footings, or there is a danger of running water scouring out the underlying soil, piles should be considered for foundations.

14.39 TYPES

They are termed bearing piles if they act as columns to transfer a load through weak materials to bear on comparatively incompressible soil or rock, and friction piles if they act to spread a load throughout a substantial depth of the soil. See Figure 1.

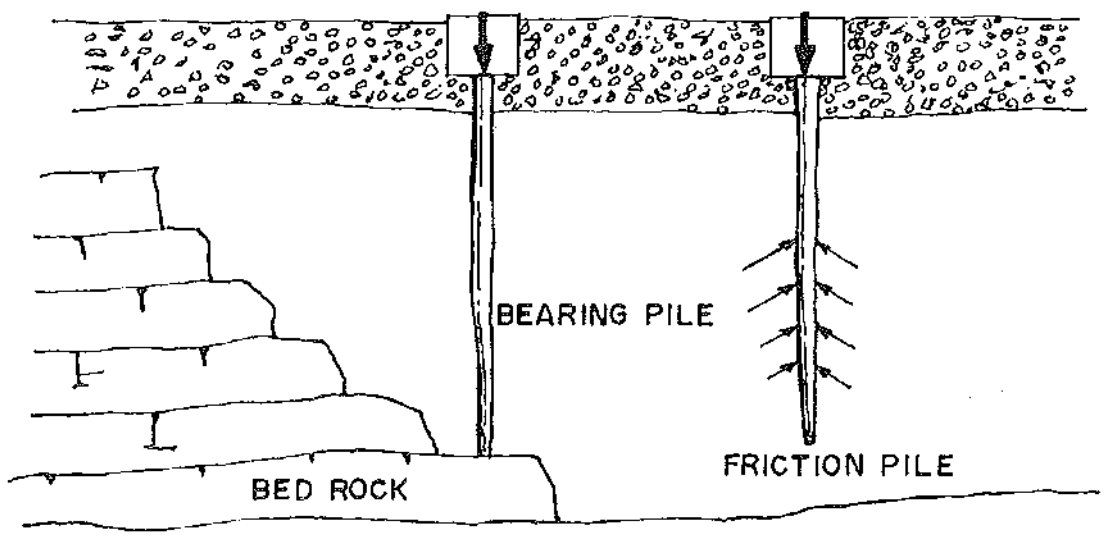


FIGURE - 1

14.40 EFFECTS OF SOIL TYPES

The engineering aspects of most soils encountered in highway work in British Columbia were acquired during episodes of the Pleistocene ice epoch; one example being the widespread, troublesome silts, which were deposited in lakes where ice temporarily dammed valleys.

A small area may acquire contrasting types, as at Cloverdale where two types had their genesis. One was loaded and consolidated by 2,286 m. of ice into a dense soil excellent for spread footings if found at the surface, and for bearing piles if found at feasible depths, as profitably used at the Patullo and Port Mann Bridge sites. The other was deposited by the Fraser River in a marine embayment, producing a weak lattice-type structure of fine-grained soil particles enclosing water-filled voids, unfit for supporting heavy structures.

Somewhat similar marine clays in the Terrace-Kitimat area furnished spectacular problems in 1962, but clays found elsewhere in B.C. usually are not as extreme; nevertheless, before driving piles be aware of their weaknesses and seek advice if there are danger signals. The adverse soil properties which may be encountered are listed in Table I.

Important structures require a subsurface drilling investigation, but occasional small jobs may not warrant the expenditure of $300 - $500 for even one drill hole if the general conditions are known. An inspection of creek channels, wells, building excavations, or cliffs in the area provides some deductions as to soil types. Accumulations of boulders in a stream bed should not be discouraging since they may be a veneer disguising other materials; in an eroding stream they may be the coarse residue of vanished strata, and in an aggrading stream, where deposits are built up when the stream systematically shifts its channel back and forth across its valley, they may have been carried down by one excessive runoff. Other strata below, reflecting fluctuations in runoff, and location, may contain materials such as peat, clay, silt, sand and gravel. For instance, a bridge site on Morissey Creek near Fernie, a formidable layer of boulders in the stream bed overlaid a deep deposit of clay which was too weak to carry conventional bridge approach-fills.

14.41 PILE DRIVING

Inasmuch as a pile suffers the roughest treatment of its life during driving, its performance depends upon getting it into place undamaged.

Ensure that the hammer's weight is equal to, or slightly exceeds, that of the pile, and its drop is about 3 metres for wood piles, 2.4m for concrete and 2m for steel. Stresses applied to the pile-top vary as the square of the velocity, which in itself varies as the square of the drop distance (friction being disregarded); therefore, if tough layers require drops of over 4.5 m. reduce this distance immediately after penetration.

Overdriving is the most prevalent bad practice in pile driving. Indications that the pile is failing are given by:

(1) Erratic rates of penetration

(2) Abrupt changes in the direction of the pile

(3) Bouncing of the hammer.

Normally in granular soils, drive a pile to a set of 10 blows per 50 mm but in cohesive soils predetermine the pile depth and adhere to it. Each time piles are driven keep a log, not only giving the details of the pile and hammer, but also the height of drop and number of blows for each foot of depth. Later, these records could be extremely useful.

14.42 CAPACITY OF PILES

Leave pile formulas and tests to soils engineers to interpret. Although many ingenious formulas have been devised, one that was developed in 1898 is still commonly used. Ironically, it is for calculating the capacity of piles in fine-grained soils where formulas would be of utmost value that they prove to be most unreliable. This is because the dynamic resistances recorded for use in the formulas are in large part due to transient pore-water pressures and bear no relation to the long-term loading resistance of the soil.

Pile tests, like other sampling procedures on non-uniform materials, rely on the number of tests to obtain a reasonable consistency; unfortunately in practice their cost, in the order of $1,000 - $2,000 each, often results in skimping.

14.42 Cont'd.

Clays and silts, owing to their wide range of characteristics, have variable pile capacities and even the authorities disagree to some extent. As a guide, the following allowable values for single wood piles with 15-18 m. embedment are quoted from Dunham's Foundations of Structures.

In compacted silt	133 kN	
In soft clay	133-178 kN	(Note: These values are on the high side).
In medium to stiff clay	178-222 kN	

In sands and gravels a wooden pile driven at least 3 metres into the ground, to a set of 10 blows/50mm, should be capable of supporting 178 kN.

For friction piles in groups a reduction is always made in the capacity of each pile. In granular soils the reduction depends upon the geometry of the group. In fine grained soils, although it amounts to reduction, the capacity of the group usually is calculated from the settlement characteristics of the large mass of soil involved, but it invariably helps if one dimension in plan can be kept small; i.e., if the pile group can be arranged in a single line it will carry much more than the same number of piles arranged in a rectangular pattern.

14.43 TYPES OF PILES

Features of commonly used piles are itemized in Table II.

14.44 GUARD RAIL

(Refer to Chapter 13, Maintenance of Highways, and
General Specifications, Section 312.
Standard Drawings 186-15A, 186-15A-1, 186-15A-2, 186-16F).

CURB AND GUTTER

(Refer to Chapter 6, Classified Highways, and
General Specifications, Sections 219 and 226.
Standard Drawings 226-1A, 226-2, 275-1A, 275-1B, 275-3, 275-4, 275-5, 289, 289-3, 289-4, 289-5, 327, 354, 354-1, 354-2,354-3, 370).

14.45 SURVEY AND PLAN REQUIREMENTS FOR URBAN STREET SURVEYS

(1) Purpose

These instructions are intended to ensure that all necessary information is obtained and recorded in a manner that will enable the design engineer to prepare an accurate design and estimate without unnecessary delay.

(2) Base Line

(a) Run the base line as near as possible to the proposed centre line; in most cases this will be close to the centre of the existing street. The base line may be run on the shoulder or sidewalk where traffic is extremely heavy. The base line should be parallel to the proposed centre line, on curves as well as tangents, although the offset may be changed where it is convenient.

(b) Run auxiliary base lines at least 60 m. down the centre line of intersecting streets and tie these into the main base line. The 60 m. is to be measured from the main base line.

(c) Tie the base lines to all legal survey pins on the right-of-way boundaries.

(d) Calculations for the base lines and ties shall be recorded on transverse sheets, Form HL 3.

(e) Carefully reference and record all P.I.'s and P.O.T.'s.

(3) Bench Marks

Select permanent bench marks every 60 m. (or as close to 60 m. as possible) and record a clearly understood description of each.

14.45 Cont'd. - 1

(4) Cross Sections

(a) Take cross sections every 7.6 m. along all base lines (including those on intersecting streets), at breaks in the ground surface and at driveways.

(b) Extreme care shall be taken to ensure all cross sections are measured at a true right angle to the base line.

(c) Measure distances to 1/10 of a metre by chain.

(d) Measure elevations to the nearest 3 mm by instrument level.

(e) Extend cross sections each side of the base line sufficiently far to include all possible cut and fill slopes which may be required by widening, realignment and grade changes, including necessary changes to driveways, frontage roads, sidewalks, etc.

(5) Buildings

(a) Tie all corners of buildings to the base line.

(b) Measure the location of all building entrances.

(c) Measure the elevation of the floors at the entrances.

(d) Include all buildings and entrances which front on the highway or on frontage roads, intersecting streets, driveways, or sidewalks which may be affected by a change in the highway.

(e) Record the type of construction of the building, and the name and type of business, or its use as residence, private garage, shed, etc.

(6) Storm and Sanitary Sewers

(a) Locate all manholes and catch basis, reference to the base line and identify them by number. Identify storm and sanitary sewers separately.

14.45 Cont'd. - 2

(b) Measure the elevation of the top rim of the manhole.

(c) Measure the invert elevation and the diameter and direction of flow of each pipe in each catch basin and manhole.

(d) Estimate the boundaries, slopes and acreages of all areas draining toward the highway, and the acreages slopes and locations of the various types of ground cover (such as bush, grass, pavements and roofs, etc.) in each area. Determine the direction of flow of surface water over these areas. Include ditches and measure the diameter of any culverts in the drainage areas. Record the general soil types in each area.

(e) Select the route of all proposed outfall pipes, traverse the route with reference to the base line and measure elevations of the ground surface every 7.6 m. Identify the water course into which the outfall will flow.

(f) Obtain plans and profiles of existing sewers from the Municipality or agency involved, and re-check any discrepancies for error.

(g) Obtain all available rainfall records of the area.

(7) Utility Poles, Lamp Standards, Signal Poles, Signs,Etc.

(a) Locate all poles, referenced to the base line.

(b) Record ownership, type of service, material, (wood, steel, concrete base, dimensions of base, etc.) and number of wires, transformers, traffic devices, etc., for each pole.

(8) Water and Gas Lines, Underground Conduits,Etc.

(a) Locate all hydrants, valves, manholes, etc., referenced to the base line.

14.45 Cont'd. - 3

(b) Measure the elevation of any pipes or conduits in manholes.

(c) Obtain plans and profiles, if available, from the owner of the utility and recheck any discrepancy on the ground.

(9) Curb Returns, Walls, Steps, Slabs, Gas Pumps, Sidewalks,Etc.

Locate and measure the elevation of any installations which are not shown completely on the cross sections.

(10) Field Notes

(a) Record all information in field books in the manner shown in the "Standard Field Notes" as these notes apply.

(b) Record information not covered by the standard notes in a neat, orderly form in field books. Make use of sketches to give a clear picture of the various pipes and direction of flows in manholes, and to indicate dimensions of any installation for which no drawings are available.

(11) Soils Information

Request the Geotechnical and Materials Engineer to supply the following information:

(a) Base Design.
(b) Proposed Source(s) of sand and gravel required.

(12) Drawings

(a) Plan

(i) Prepare plan on hardshell paper at a scale of 1:500.

(ii) Plot the base line using grid system co-ordinates.

(iii) Plot all iron pins and property lines. Identify all properties according to their legal description (lot and sub-division plan number).

14.45 Cont'd. - 4

(iv) Plot all surface and underground detail. Use blowups where necessary to clarify detail. Use the symbols and line weights of the standard legend.

(v) Show on the plan the elevations of any installations. (Sections 3,5 (c) and 9 of these instructions) that do not show completely on the cross sections.

(b) Cross Sections

(i) Plot cross sections on the special cross section sheets to a scale of 1:100.

(ii) The cross sections may be plotted in two columns on the sheets but there should be five cm of clear space between each section. Do not crowd. Cross section slope lines should not overlap.

(iii) Show the base line ground elevation at each station.

(c) Drainage Plan

(i) Draw a key plan of the entire drainage area to a suitable scale (usually 1:50,000).

(ii) Show direction of surface flow by arrows throughout the area and show location, gradient and size of culverts and ditches.

(iii) Divide the area into sections according to type of ground cover and indicate the percentage of the area of each section that is pervious, (bush, gardens, lawns, etc.) and the percentage that is impervious (roofs, pavements, etc.). Show also the general soil types in each section.

14.46 STANDARD DRAWINGS

Standard drawings are available in the Bridge Engineer's office for the following structures:

(1) Timber Bridges

(a) Trestles

For 15 ft., 17 ft. and 19 ft. sawn timber stringer spans with roadway widths from 16 ft. to 30 ft. in 2 ft. increments. Live loadings are H.15, H.20, H.20-S.16 and H25-S.20. Detail drawings of pile and framed bents are included in the set.

(b) King Trusses (for maintenance purposes only)

For 40 ft. to 70 ft. spans, with roadway widths from 14 ft. 8 ins. to 18 ft. Trusses and floor systems were designed for 10 Ton and 15 Ton trucks.

There is a standard drawing for a 60 ft. truss with a 4 ft. sidewalk, 16 ft. roadway.

(c) Glued-laminated Beams

The spans covered in this group are from 30 ft. to 90 ft. in 5 ft. increments. Roadway widths are 18 ft., 24 ft., and 28 ft., and live loadings are H.15, H.20, H.20-S.16, and H.25-S.20. There are two sets of drawings, one for spans with sidewalk(s), and one for spans without sidewalk.

Beam designs for other roadway widths are available and, should the need arise, additional designs will be added to the group.

(d) Howe Trusses (for maintenance purposes only)

Deck truss spans from 80 ft. to 180 ft., and through truss spans from 80 ft. to 225 ft. are in this set of drawings. The roadway widths are from 10 ft. 6 ins. to 18 ft. The trusses and floor systems were designed for 15 Ton and 20 Ton trucks. There are two drawings of through trusses with sidewalks.

14.46 Cont'd.

(e) Standard Log Stringer Bridges

For spans up to 48 ft., H.20-S.16 loading.

(f) Kilpatrick Series

Detail drawings of methods of strengthening and repairing timber trusses.

(2) Prestressed Concrete Bridges

Channel and box stringers for 20 ft. and 30 ft. spans. The units are 4 ft. wide and are designed for H.25-S.20 loading.

(3) Culverts

(a) Single cell reinforced concrete box culverts from 6 ft. x 4 ft. to 12 ft. x 12 ft., with or without flared ends, and for various skews.

(b) Concrete pipe culverts, 2 ft. to 5 ft. diameter, with end walls. Some double and triple barrelled types are included.

(c) Treated, laminated timber box culverts from 2 ft. x 2 ft. to 5 ft. x 5 ft. Single, double and triple barrelled types are included.

(4) Retaining Walls

(a) Reinforced concrete cantilever walls, retaining the road. For heights from 6 ft. to 32 ft.

(b) Reinforced concrete cantilever walls, toe walls retaining embankment. For heights from 6 ft. to 30 ft.

(c) Reinforced concrete counterfort walls, retaining the road. For heights from 18 ft. to 40 ft.

(d) Reinforced concrete counterfort walls, toe walls retaining embankment. For heights from 18 ft. to 40 ft.

TABLE I

BEHAVIOR OF SOILS WITH PILE DRIVING

FEATURE	EFFECT ON PILES	REMEDY
Clay		
Remoulds with drastic loss of strength on disturbance.	Pile may drive with disconcerting ease but if work is interrupted and then resumed the driving may then meet with considerable resistance.	Continue driving without interruption until pre-determined depth is reached. Depth must be based on detailed soil tests.
	With large groups the disturbance may weaken a large zone which could encroach into the soils supporting existing buildings, or could trigger earth movements where harmful gravitational forces can be abatted, as on slopes, alongside trenches or excavations. Piles on circumference of a group will drift in direction towards the remoulded area during driving. (See Figure 2)	Use small displacement piles, i.e. open-end pipe-piles, H-piles, or prebored piles. Exercise caution around buildings and arrange for drilling and laboratory analysis.
High water content is held in an almost impermeable structure of fine soil grains.	Resistance encountered during driving is due to pore water pressures at the tip and in no way resembles long term loading pressures.	Do not attempt to gauge piles' capacity by means of dynamic pile driving formulas. If necessary use load tests made 2 weeks or more following driving.
Piles driven into clays displace an equal volume of soil.	When driving groups, displaced soil may manifest itself by: buckling nearby basement walls, heaving basement floors, heaving the soil in the centre of the group, heaving previously driven piles. See Figure 3)	Use low displacement piles adjacent to existing buildings. Take pains to detect all heaved piles and re-drive them to proper depth.
Soils consolidate over a period of months if additional loads are applied.	Consolidation imparts frictional drag to the piles and this additional load causes settling and tilting. See Figure 4)	Apply loads beforehand to induce bulk of consolidation before building the pile structure. Modify the design to keep piles away from the affected zone. Use caution when storing stockpiles or locating structures alongside existing buildings. Locate new building or structure to ensure that loads will not impose harmful consolidation.
Sand		
Vibration and pressure densifies sand.	Piles may reach refusal short of design depth, especially last piles in a group.	Drive centre piles first. Use water jet for all but last few feet. On completion of group all piles should be "retapped". (Do not use jets in clay or beneath clay strata).
Sands lose one-half bearing capacity on submergence.	Danger in a built-up area, of jetting robbing existing buildings of support.	Do not jet near buildings in built-up areas.
Sands very susceptible to scour by running water.	During flood stages piles may be on verge of complete washout. Scour measurements taken after water level has dropped should be treated with suspicion.	Use ample penetration (scour has frequently reached 12 metres on the Mississippi.)
Gravel		
May be very dense, cemented or contain boulders.	Damage to piles is a hazard.	Carefully appraise. Steel tips offer some reinforcement to wooden piles. Better to use precast concrete piles; if these are not adequate try closed-end steel pipe-piles which may be inspected internally before pouring concrete, or steel H-piles. H-piles may split or bend if they encounter boulders over 200 mm ϕ without showing surface indications.
Fills		
May contain concrete blocks, automobile bodies, sawdust, large cavities, etc.	Often defy compaction, therefore piles which penetrate the fill are needed to guarantee proper support.	If necessary, use steel mandrel or section of steel H-beam to spud through formation for each pile. If steel piles are used in permanent structures ensure that fills contain no corrosive materials. Timber piles must be treated above water table. Consider the use of spread footings if fill strength is adequate.

TABLE II

TYPES OF PILES AS USED IN BRITISH COLUMBIA

ADVANTAGES	DISADVANTAGES	REMARKS
1. Timber Easy to work with. Can be rafted to simplify dock and bridge work.	Rather weak. With wooden caps capacity limited to about 20 tons. For permanent work untreated piles must be cut off below the water table. Easily damaged by overdriving. Pressure-treated types are easily damaged by careless handling.	Douglas fir, cedar, hemlock, larch, lodgepole pine are used in B.C.
2. Prestressed Concrete	They must be tailored to fit the job, involving drilling tests, perhaps load tests, beforehand. If the piles are too short and require cast-in-place extensions, the additional cost can be considerable. If hair cracks develop they may permit water to enter and corrode the steel.	
3. Steel H-Piles Strong, can be used in dense gravels, cemented gravels, boulders up to 8" ϕ. Minimum cross-section area makes them good as bearing piles where weak clays must be penetrated. Can be used to considerable depth. Very little waste. Easily obtained.	May corrode in some soils, salt water or where stray electric currents exist. An encounter with a large boulder may split them or deflect them out of line without giving any noticeable surface warning. Lower bearing capacity as friction piles than concrete or timber piles	Best suited as bearing piles.
4. Steel Pipe Piles - Filled Best for tough driving conditions since they are very strong and can be inspected internally before filling with concrete. Good as bearing pile - fair as friction piles. Very little waste. Can be driven open ended for small displacement in clay.	Costlier than steel H-piles. If driven open ended, very important that all soil be cleaned out, which is rather difficult.	
5. Expanded Base Concrete Good for high capacity and for compaction in loose sands.	Require expensive loading tests. Concrete takes time to reach ultimate strength. Pounding may injure adjacent piles. Pounding may injure other structures in built-up areas.	

CHAPTER 15

HIGHWAY STRUCTURES - MAINTENANCE

15.01 TIMBER BRIDGES

Considerable care and maintenance is required to prolong the life of the many timber bridges throughout the Province. As some of these bridges are over 40 years old, constant inspection and maintenance is necessary to keep them in a safe condition for the travelling public.

A list of some of the many and varied destructive agents that it will be necessary to combat is shown, and these are dealt with briefly and separately in the ensuing paragraphs. Inspect carefully each structure from time to time in order to determine the effects of these destructive agents, so that remedial measures may be put in hand before it is too late.

(1) Rot, decay and corrosion.
(2) Overloads.
(3) Wear and tear.
(4) Channel erosion.
(5) Washout and log jams.
(6) Frost action.
(7) Vandalism.

15.02 ROT, DECAY AND CORROSION

Probably the most destructive of the above is rot in the timbers, and this is found to be particularly prevalent in the coastal and more humid regions of the Province. Rot is best minimized in the initial design of the structure by the use of treated and select timber as much as possible in the foundations and vulnerable parts of the structure, such as piling in the piers and bents. In the case of untreated piling, rot and decay will attack first at the ground line, and then perhaps later at pile tops and brace bolt holes and truss members of the superstructure. The first thing to be done at a bridge site, therefore, is to ensure that all those conditions which encourage rot and decay of timber at vital spots are minimized as much as possible. Some of the steps to be taken in this regard area as follows:

(a) Ensure that the bridge site is kept well brushed out in order to allow a free circulation of air.

(b) Sterilize the ground at the base of the piles as much as possible by replacing adjacent bacteria-laden soil with clean sand or gravel.

(c) Ensure that all piles and stringers are of good quality and have been peeled of bark, and that chords, floor beams and caps are shielded as much as possible from the cause of rot, i.e. by metal flashing.

(d) Apply creosote oil or Cuprinol, or some suitable wood preservative, to piles and timber at the ground line and on all bearing areas. Impregnate bolt holes with wood preservative. Apply wood preservative, such as fibregum, to pile tops and where necessary or feasible; protect exposed timber such as pier nose piles, tops of truss, chord members, main braces of trusses, etc., with metal flashing, and repair same where damaged.

(e) Keep bridge decks and all flat areas, such as tops of chords, camps and sills, cleaned of all dirt and rubbish.

(f) Where piles have rotted badly at ground line, these must be cut and blocked, and rebraced, or alternatively replace with new piles or in some cases, new bents.

(g) It is as well to remember that, in general, untreated timbers, if kept permanently wet or permanently dry, should have a long life.

15.03 OVERLOADS

Study and assess design loads of bridges for practical load bearing capacities and discourage overloads by the posting of load limit signs on all sub-standard bridges. Where excessive overloads have been permitted, or are known to have used structures, inspect periodically for evidence of distress such as crushed caps or piles, cracked or broken stringers, and damaged ties and deck planking in floor system of timber bridges.

Investigate immediately any unusual variation in the level or alignment of the bridge deck and ascertain the cause thereof, so that proper arrangements for repairs can be put in hand without delay.

Inspect carefully truss-type bridges from time to time for signs of distress caused by passage of overloads; and this is evidenced by unusual deflection of either a temporary or permanent nature.

Watch for crushed or broken web members, pulled chords, crushed corbels and chord members, cracked or broken floorbeams, damaged portal bracing, torn or damaged metal flashing, cracked or broken caps and unusual settlement of piling in bents or piers.

15.04 WEAR AND TEAR

Study the cause and effects of wear and tear with a view to minimizing the cost of this maintenance item. Some of the steps to be taken in this regard are:

(a) Ensure that bridge decks are kept clean of depositions of gravel and other abrasive agents.

(b) Carry out sufficient repairs of decks to correct all worn spots, low areas, and loose planks as soon as possible, so that the deck surface is smooth-running and the effect of impact and vibration is reduced to a minimum.

(c) Repair and paint fences with a good quality white paint as soon as the wood is seasoned and dry, not only for the sake of appearance but as a preservative measure, and also to cut down potential accident hazard.

(d) Repair or replace piling, bracing and sheathing of piers and bents damaged or broken by logs, driftwood and ice, etc. Pave road approaches, where possible, for a short distance of perhaps 20 m or more, to minimize the tracking of dirt and gravel on to the structure. Check approach fills adjacent to abutments for hollows and bumps, and keep in good repair at all times to ensure smooth passage of traffic. Erect vertical clearance signs for structures having limited clearance; erect and maintain delineator signs at bridge abutments, and load limit or other warning signs where advisable.

15.05 CHANNEL EROSION

(Refer to Section 15.21)

15.06 WASHOUT AND LOG JAMS

Washout and log jams are problems in bridge maintenance that are frequently inter-related, and can be prevented in many cases by alert remedial measures before a crisis occurs at a bridge site. Some of the steps to be taken in this regard are as follows:

(a) Ensure that no threatening mass of logs and debris has accumulated and is hung up on the upstream channel of a bridge site, poised and ready to be moved downstream against piers and abutments at the first freshet.

(b) Ensure that, with any existing or proposed bridges in a district, allowance has been made for sufficient vertical and horizontal clearances in the bays and spans to ensure the safe passage of drifts and logs under all foreseeable conditions.

(c) Do not allow any accumulation of logs or drift to remain lodged against and among foundations, even under low water conditions.

(d) Erect and maintain shear booms and dolphins where necessary in the deeper channels in order to direct logs and drift through and under the main spans.

(e) Make preliminary arrangements for the emergency availability of labour and equipment at bridge sites known to be susceptible to washout by log jams under heavy runoff.

15.07 FROST ACTION

Frost action is another maintenance item which will require certain measures to be taken, and these measures will vary, depending on the locality of the bridge site.

(a) Sand slippery bridge decks when required due to frost.

(b) Unplug deck drains and fill low areas to eliminate ponding of water on asphalt or concrete bridge decks with resultant freezing in wintertime.

(c) Reduce the skin friction of piles for first few feet below ground line to control the heaving of piling in certain bents due to deep penetration in the interior and northern areas of the Province.

(d) Place steel plates over worn sections of piles where there is cutting or wearing of nose piles and piers by the action of moving sheets of ice in rivers.

15.08 VANDALISM

Vandalism, though perhaps not of prime consideration, is perhaps worth mentioning due to the presence of certain antisocial elements in the community. Carry out maintenance when required as follows:

(a) Replace signs where they have been destroyed or removed.

(b) Repaint periodically damaged and unsightly paintwork, especially on fences.

(c) Replace any missing drain grating.

(d) Remove unsightly inscriptions from concrete abutment walls and wing posts.

(e) Make periodic inspections of the whole bridge to offset the more determined acts of vandalism and sabotage involving vulnerable parts of the bridge.

15.09 STEEL AND CONCRETE BRIDGES

Maintenance in general follows a very close pattern for steel and concrete bridges to that outlined for bridges constructed of timber.

Maintenance items which are frequently overlooked, but nevertheless require attention, are as follows:

(1) Approach settlement
(2) Cleaning
(3) Painting
(4) Snow removal
(5) Prevention of scour
(6) Continuous testing for scour
(7) Expansion plates and bearings
(8) Spalling of concrete
(9) Damaged steelwork, concrete posts and fences

Any damage or deterioration noted, which may affect the strength of the structure, must be reported as soon as detected.

15.10 APPROACH SETTLEMENT

Some of the reasons which may cause settlement adjacent to the abutments are enumerated as follows:

(a) Lack of proper compaction in the placing of fill material.
(b) Choice of unsuitable fill material.
(c) Settlement of original ground under base of fill.
(d) Insufficient allowance for a proper 2:1 forward slope from the abutment.
(e) Shift forward of abutment.
(f) Improper drainage.
(g) Frost heaves.

All of which may be contributing causes to an unsatisfactory bump or hollow in the approach pavement.

The unsatisfactory grade, perhaps brought about due to an oversight in construction, is corrected by the proper placement of an asphalt patch. In some instances it may be necessary to jack the superstructure and raise the ballast wall. However, where there is excessive settlement of the abutment obtain advice from the Bridge Engineer.

15.11 CLEANING

Keep clean, as much as is practicable, steel and concrete bridges, like their counterpart in timber, including: deck, drains, bridge seats and bearings, chords, web members and panel points of truss spans, and expansion plates, curbs and gutters of all spans. In addition, pay particular attention to the surface preparation or cleaning of all steelwork as an immediate preliminary to the painting of same.

The importance of keeping bridges clean cannot be overemphasized. Dirt can harbour salt-laden moisture with an extremely corrosive effect on the surface of steel and concrete. It is mandatory that dirt which has accumulated during the winter be cleaned off as soon as possible in the spring.

15.12 PAINTING

Painting is necessary not only for the sake of appearance, but as a protection of the steel against corrosion. Before the painting is undertaken, however, it will be necessary to ensure that a proper and satisfactory program of surface preparation and cleaning of the steelwork is carried out in conjunction with the painting.

Repainting in the regions of the coast is necessary about every 5 years and in the interior about every 8 years. In any case, when the final or top coat is weathered down so as to expose the undercoat, or where there are signs of corrosion taking place, repainting is already advisable, if not overdue.

The Ministry instructions and specifications regarding surface preparations, application and quality of paint are to be closely followed. Refer to appropriate clauses in Section 216 of the General Specifications in this regard.

15.13 SNOW REMOVAL

The maintenance problem of snow removal, particularly from bridges, is important, although this work is carried out in conjunction with snow plowing of roads and highways as a whole during the winter months, and bridges are incidental obstructions to the passage of snow plows.

Before snow plowing is undertaken, however, it is necessary that the curbs at bridge abutments be clearly marked with high poles or markers, so that blades on the equipment do not damage the concrete posts, curbs and fences.

Sand spread for traction purposes is preferred to de-icing salts, as the latter will have an injurious effect on the deck concrete.

Clear drains of ice and take steps to minimize any build-up of snow, ice or water on the bridge decks.

15.14 PREVENTION OF SCOUR

Some bridge sites are more susceptible to scour than others, and an awareness of the potential danger of scour and its threat to the stability of foundations of bridges is desirable. Wherever there is a tendency for scour holes to form in the vicinity of bridge foundations, it is necessary to backfill the scour holes with suitable material and place a mattress of angular shaped riprap to cover, so that the channel is restored as much as possible to its original cross section.

15.15 CONTINUOUS TESTING FOR SCOUR

In the case of some of the larger bridges over deep and fast water, it is advisable and often necessary to arrange for periodic, and sometimes annual, soundings of the channel cross section, including extreme high-water marks, so that any unusual variations in flow or channel condition is known.

15.16 EXPANSION PLATES AND BEARINGS

The care and maintenance of expansion plates and bearings is an item that is frequently overlooked on permanent type bridges.

Repair loose and uneven expansion plates so that the deck provides a smooth-running surface with the minimum of vibration and chatter, and there is adequate allowance left for expansion or contraction. Check periodically the bearings of steel spans on the piers and abutments, whether fixed, sliding, rocker or roller, to ascertain that they are fulfilling their proper functions and have not become locked or jammed in any way. Clean, paint, oil or adjust where necessary.

Check anchor bolts so that holes are grouted, the bolts themselves have been properly set and the concrete in copings and bridge seats is in no apparent distress due to movements of foundations, or any other cause.

15.17 SPALLING OF CONCRETE

When the concrete deck has shown deterioration to a considerable degree, through spalling or scaling, a Portland cement concrete overlay should be applied.

The use of asphalt to restore the deck is no longer recommended, except that, where the spalling is particularly bad and the reinforcing steel exposed, a temporary asphalt patch may be applied until the concrete overlay is carried out.

15.18 DAMAGED STEELWORK, CONCRETE POSTS AND FENCES, DUE TO ACCIDENTS
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Those structures having a limited vertical clearance are found to be more susceptible than open structures to this type of incident.

Form H.36 will be completed whenever damage to Government property - such as guardrails, bridges, lamp standards, sign posts, etc. - is caused by the negligence of the travelling public. The form will not be used to report damage to Government motor vehicles.

The local foreman must obtain the required information to fill in the top portion of Form H.36. The form will be completed in quintuplicate, four copies of which will be forwarded to the District Office, with the fifth copy being retained in the foreman's book. The District Office will forward the original copy immediately to the Insurance and Claims Officer, and upon receipt of the costs of repair, which are to be computed manually from the Daily Activity Cards without exception (not via the Monthly Performance Report), will complete copies 2, 3 and 4 of the H.36. The second copy is then submitted to the Insurance and Claims Officer and the third copy sent to the Region for information purposes only. The fourth copy is retained in the District Office.

When the accident results in major damage to a bridge, supplementary form H.36A is to be completed and attached to the original H.36. The Director of Bridge Engineering is to be notified of the accident by the Regional Director, Highways.

Supplies of both forms may be obtained from the Headquarters Stationery Section.

15.19 CONCRETE HIGHWAY STRUCTURES

Concrete highway structures must resist two especially severe agencies that soon seek out any flaws or weaknesses; freeze-thaw cycles and anti-icing chemicals.

When water freezes within shrinkage cracks and pores, destructive forces are created. These forces can be greatly reduced by providing an air content of 5 - 6% in the form of myriad, disconnected, minute bubbles which act as a cushion.

Anti-icing chemicals cause scaling which is particularly damaging to green concrete. This damage can be reduced by the use of sealants. Anti-icing chemicals have another serious consequence; they gradually accumulate inside bridge decks, where they combine with absorbed

** Amendment

moisture to form an electrolyte. The reinforcing steel provides other components to form corrosion cells. As corrosion products accumulate at certain places on the steel rods, they build up enough pressure to spall off the overlying concrete. The resulting pot hole on the deck is then enlarged by ravelling under traffic.

Scaling also attacks fence posts, curbs and sidewalks wherever splash and spray can reach.

As an example of the destructive potential of these agencies, on one American freeway system deck replacements ran to 250 per year and 750 structures required total replacement. In Illinois, state highway authorities take such a serious view of the problem that they require an air-content test of every batch of concrete placed in critical areas.

Maintenance forces can lessen these problems in two ways. Keep the gutters and drains clear. Apply one or two applications of a boiled linseed oil - kerosene mixture to surfaces exposed to de-icing solutions or splash, but not to surfaces facing outward or to underneath portions of deck slabs.

Other available sealants are not as satisfactory. Silicones are expensive, they pose problems in applying uniformly, and their life is doubtful. Asphalts may, in some cases, aggravate the problem by entrapping salt solutions.

RIVER BANK PROTECTION

15.20 INTRODUCTION

Practically all of a river's erosion, scour and sedimentation movements are concentrated into the period of high stages each year. Since these movements are extremely sensitive to the volume of water, and also since fans and flood plains are favorite locations for developments susceptible to damage by simple flooding, the characteristics of a river's yearly runoff are of great concern. The 1894 flood on the lower Fraser River flood-plain was the greatest on record but the amount of damage apparently did not rate any tabulation. In contrast, after 50 years of development had taken place, the smaller flood of 1948 caused damages of $17,500,000.00

Generally, floods occur on small watercourses as a result of intense precipitation over a small watershed, on large rivers as a result of several days' precipitation over a large watershed, usually in spring when soil moisture is high. Thus, during a serious flood on a small creek in Oregon, the runoff reached 1,800 c.f.s. per square mile over its 20 square mile watershed; in comparison, during a major flood on the Mississippi River, the runoff amounted to only 2 c.f.s. per square mile, but over 1,2000,000 square miles of watershed.

In interior British Columbia, where floods occur as a result of a delayed melting of a large snowpack, possibly accompanied by rains, a creek with a 50 square mile watershed would have a 100-year runoff in the range of 50 c.f.s. per square mile. On the coast where floods occur as a result of intense rains, the runoff would be about 400 c.f.s. per square mile.

The size and frequency of floods in British Columbia are hard to predict because of a paucity of rainfall and stream gauging records, as well as indeterminate qualities of the watersheds. Extrapolation of short term flood graphs is dangerous, but some idea of their size can be obtained by observing details of an alluvial section, which is a record of past floods, and which will eventually be involved again. A new line of thought considers that past floods may not be an accurate measure of flood potentiality, but that, from time to time, super floods of unprecedented magnitude can occur with calamitous consequences.

15.21 BANK EROSION AND BED SCOUR LOCATIONS

Irregularities in a river's bed cause boils, eddies, rip currents, and cavitation, so that its flow is usually turbulent. In upper reaches where bedrock features are paramount, these forces have little effect on the course. On alluvial sections however, they pluck and detach particles from the banks and bed, and carry them to less turbulent areas, concomitantly, and the course becomes a succession of migrating bends.

The river's ability to transport individual sand particles, pebbles or boulders varies as the 6th or 7th power of the velocity, consequently scour and erosion will accompany any increase. Locations where an increase in velocity will occur are near the outside edge of curves, adjacent to channel restrictions, and wherever "improvements" such as cutoffs, dyking and dredging increase the hydraulic radius, increase the slope or decrease the friction of the channel. Needless to say, when the velocity is reduced again deposition will take place. Figures 1 and 2 illustrate where scour and erosion are likely to occur along a river course through a mature valley.

Bed scour is usually not much of a problem except where a bridge or structure is founded on the river bed, but bank erosion can be very vexing, mainly because of the river's tendency to increase its curvature.

Parts of a river offer different erosion problems. In a young valley the channel is usually fixed by bedrock and the river's energy is used up in turbulence, bed scour and reworking its grade. This part is susceptible to high speed flows and sudden rises in level. As such valleys often offer the only reasonable location for a highway, a deep respect should be shown in locating fills or bridge structures which may restrict the channel, but the hazards can usually be assessed and weighed against the economics of the location. If a railroad shares the valley, serious thought should be given by both parties before wasting materials in the river, or making "improvements" in the channel, as they may have dire effects on the other road-bed downstream.

Fans at the mouth of canyons offer attractive development site in arid regions but at infrequent periods cloudbursts in the hills can spew out flash floods along with mud flows and incredible channel erosion.

The most troublesome part of a river is an alluvial valley where the meanders indicate that the river is trying to establish a regime. A regime is the stage where the river's banks are made from transported bed load, and its bed load is derived in part from its banks so that the river tends to respond to every change of condition. Here, two important facts must be kept in mind; firstly, although the river's normal channel occupies only part of its flood plain, past floods created the plain and future floods will involve it again; secondly, any interference with the river will have effects elsewhere.

Irrigation engineers in the Punjab have developed modern formulas for rivers in regime. Those who are interested in this subject are referred to "Regime Behaviour of Canals and Rivers" by Professor T. Blench of the University of Alberta.

15.22 PROTECTIVE DEVICES

California has many streams notable for their remarkable range of flows; Eel River, for instance has varied from a minimum flow of 10 c.f.s. to a maximum of 900,000 c.f.s., which, incidentally, is almost double the flow of the Fraser River at Hope during its 1948 flood. A manifestation is that the state highway department has extensive experience in developing methods to cope with river problems, and since their construction methods and economics resemble ours, the following pages are based on their results.

River protection devices are expensive, not altogether predictable, and have effects both upstream and downstream. Therefore, each case should be examined and solved independently. In some cases it may be prudent to relocate rather than protect; in others, it may be more practical to use cheap, expendable devices rather than expensive, permanent ones. These devices should serve a specific purpose, viz:

(a) Resist the attack - armor.
(b) Divert the attack away from point - jetty.
(c) Reduce the force of the attack - retard.

(a) Armor of Artificial Facing

A revetment serves to protect the bank from riparian erosion. Unless for a special reason, its face should be rough to duplicate the friction of the original bank, otherwise the stream velocity will increase and scour will take place along the toe of the slope, endangering the installation and aggravating erosion downstream. As an example, a long smooth concrete wall was erected in the 1930's to protect the outside bank at a bend of the Columbia River at Trail. During a high runoff in 1961 a portion of this wall scoured out and cost nearly $300,000 to replace. It is important that the revetment's footings either be founded below the scour depth, or else sheet piles or a self-adjusting blanket used at the toe. It is also important to have proper transitions at both ends into stable banks. Various types are as follows;

(1) Rip-rap is probably the most useful type. See Figure 3. The most common mistake is to use too small rock. The size can be estimated from the velocity to be resisted. As an illustration, where a current impinges on a 1 1/2:1 slope at a bend, two-thirds of the rock should exceed 0.5 kg for a current of 1.5 m per second, 25 kg for 3 m per second and 1600 kg for 6 m per second.

A lesser mistake is to treat rip-rap as part of the fill. The fill or embankment should be slopes to 1 1/2:1 or less, a filter placed over that to retain the fines of the fill, and then the rip-rap laid over all. If hand laid, the large rocks should be placed with their longitudinal axis normal to the face of the slope, and dipping slightly backward. If machine laid, the rocks should not be dropped or pushed around unnecessarily with bulldozers. If large rock is not available, smaller rock can be used and integrated into a large mass with gunnite, in which case a filter is not necessary, but the slope should not be steeper than 1 1/2:1.

(2) Gabions have two drawbacks; the wire mesh is subject to corrosion, and they are expensive because of the hand labour required.

(3) Concrete filled sacks are expensive and too smooth.

(4) Concrete and asphaltic paving can only be laid on 1 1/2 to 1 or lesser slopes. Paving is not recommended for high speed flows, but in conjunction with retards it could be used for moderate speeds.

Failures are liable to be progressive, therefore paving should be provided with weep holes to relieve hydrostatic pressure, reinforcing steel and good foundations to provide strength, and stub walls to localize small failures.

Asphalt paving has poor resistance to plant growth and is hard to compact on a slope.

(5) Cribs provide excellent stability to a bank if proper footings are used, but metal types are not only very smooth but are also susceptible to corrosion.

(b) Diversion (See Figure 4)

Jetties are projected into the stream to control shoaling and scour by diverting the current or waves. Inasmuch as solid types create eddies which may damage the structure, or may aggravate scour and erosion damage downstream, permeable types are commonly used to allow some flow to go through. They should be heavy enough to resist pressure from drift, but if large logs are a threat their height can be cut off below flood level. Examples of impermeable types are: sheet piles, cribs, dykes.

Examples of permeable types are:

steel, wood or concrete tetrahedons

steel jacks A common source of steel is old railroad rails, hence components of jacks and tetrahedons are often a fraction of 10 m, i.e. 10 m, 6.7 m or 3.3 m in length.

single or double rows of piling with wire fencing on the river side. As the piles carry no load, low-grade timber is adequate. The outermost piles must be driven below scour level or else protected with rip-rap.

(c) Retards (See Figure 5)

Retards are placed parallel to a bank to check the riparian velocity, induce silting and accretion, and shift attacks away. They should be tied to the bank at intervals to prevent high velocity flows coming between the bank and the retard. Examples are:

steel, wood or concrete tetrahedons

timber or steel jacks

single or double rows of piles with wire fencing. For light duty a single row of fencing may be sufficient. If high speed flow is a threat, the base of the piles may require rip-rap protection against scouring; if large logs are a threat, the tops can be cut off below flood level to allow the logs to float over.

trees, in emergencies, can be cut down and tied along the bank under attack.

15.23 OTHER TYPES OF RIVER CONTROL

(1) Dykes or levees confine the river flow at flood time to a portion of the flood plain. As they increase the hydraulic radius, the peak wave is carried downstream faster and at the same time there is scour for some distance up and downstream, and flooding and sedimentation downstream. Dykes are good protection on the lower part of the river but elsewhere they should be used with caution; in any case they should be designed to fit the geometry of the flood plain and for a certain size of flood.

(2) Cut-offs improve the area alongside, though there is scour and erosion in the channel, but they menace the land above and below. Over a period of time the river will adjust to them by altering its meander system downstream. On the Mississippi River, where natural cut-offs occur frequently, they cause so much destruction that the Mississippi River Commission followed a policy for 49 years of using revetments to prevent them.

(3) Check dams, baffles and other devices can be used to dissipate the energy of small creeks through friction and hydraulic jumps. Hydraulic jumps are useful devices to dissipate energy at the foot of long, steep reaches, as at the end of steep flumes or culverts.

(4) Clearing. Log jams, fallen trees and drift may constrict the channels of smaller streams with the result that an accelerated current impinges on one bank and downstream eddies attack the other; thus at high water severe scour and erosion will take place and the creek may even create a new channel. Debris may also float down and lodge against bridge piers and culverts, intensifying scour at these installations. In many cases severe problems could be avoided simply by following an enlightened program of channel clearance during slack water.

15.24 LAKE BANK PROTECTION

The height of waves are a function of the fetch along which the wind can act, therefore in British Columbia, where lakes are not excessively large, the problem of wave erosion is not great.

The shores can be protected by rip-rap, gabions, cribs or simply by floating booms which dampen the wave pattern.

Where lake levels fluctuate over several feet, seepage conditions may produce slides, and in these cases a remedy should be based on slide analysis.

15.25 CONCLUSION

It should be appreciated that river and lake bank protection is a science, and almost always an expensive undertaking. It should also be appreciated that the transporting power of running water varies as the 6th or 7th power of the velocity, therefore a creek that appears innocent in summertime can create awesome damage at floodtime. Corrective devices may have to be substantially constructed, and if deficient may be responsible for major damage elsewhere. Often it may be logical to resist a primary objective, and assume that some minor damage which may occur will be a maintenance problem. No protective device is adaptable to all exposures, but in each case a field review by engineers is essential for the determination of a corrective layout.

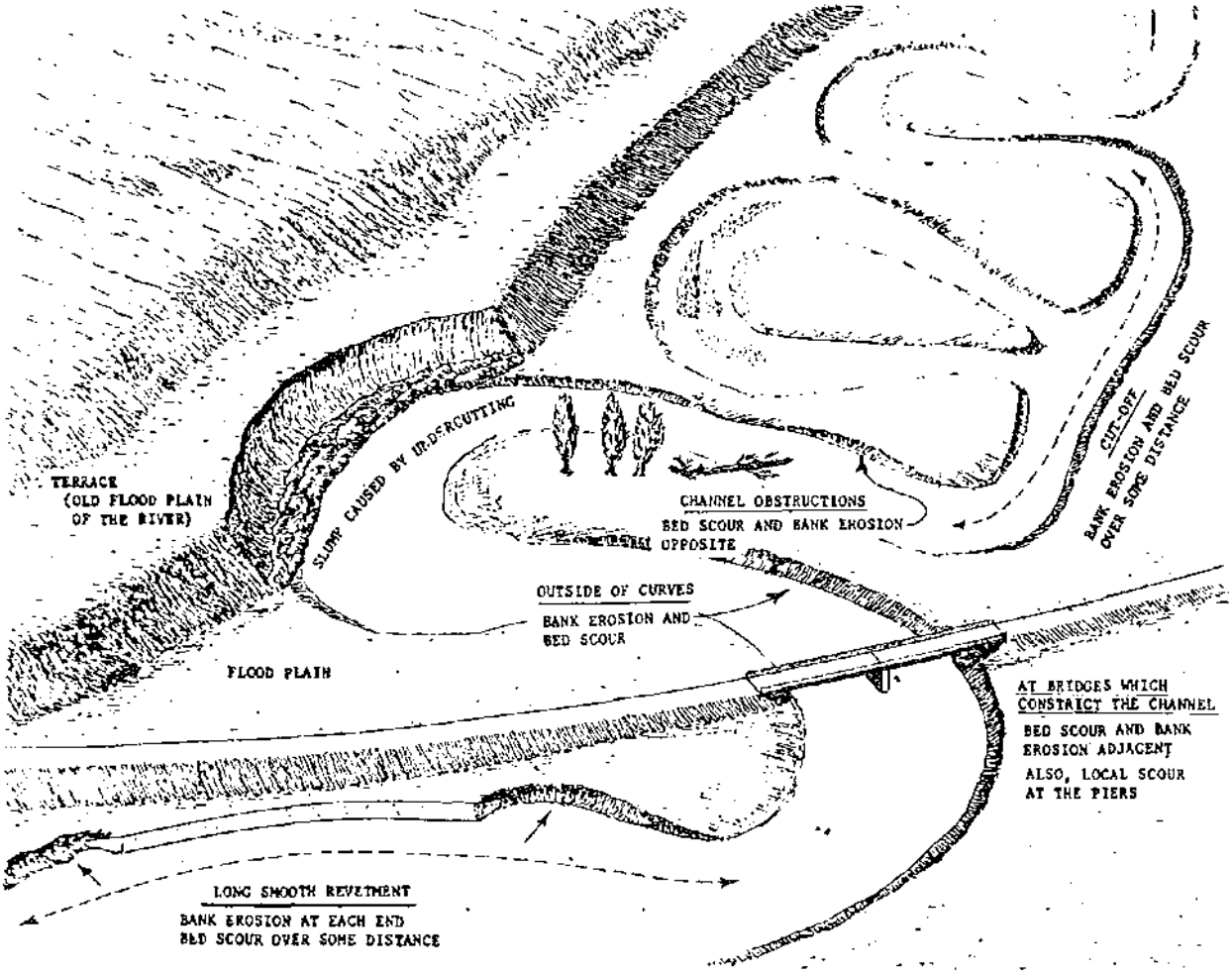


FIGURE 1. EROSION AND SCOUR LOCATIONS
IN A MATURE VALLEY

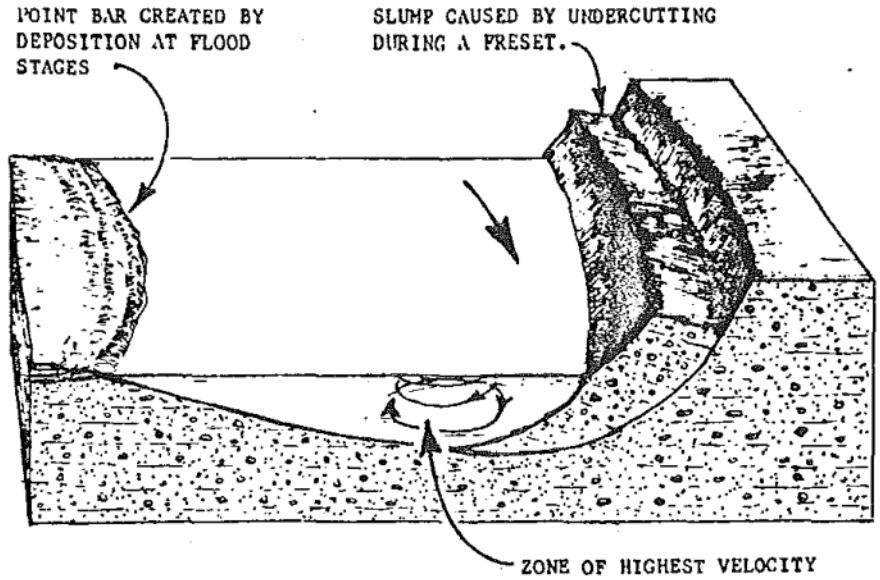


FIGURE 2. CURVILINEAR EFFECTS

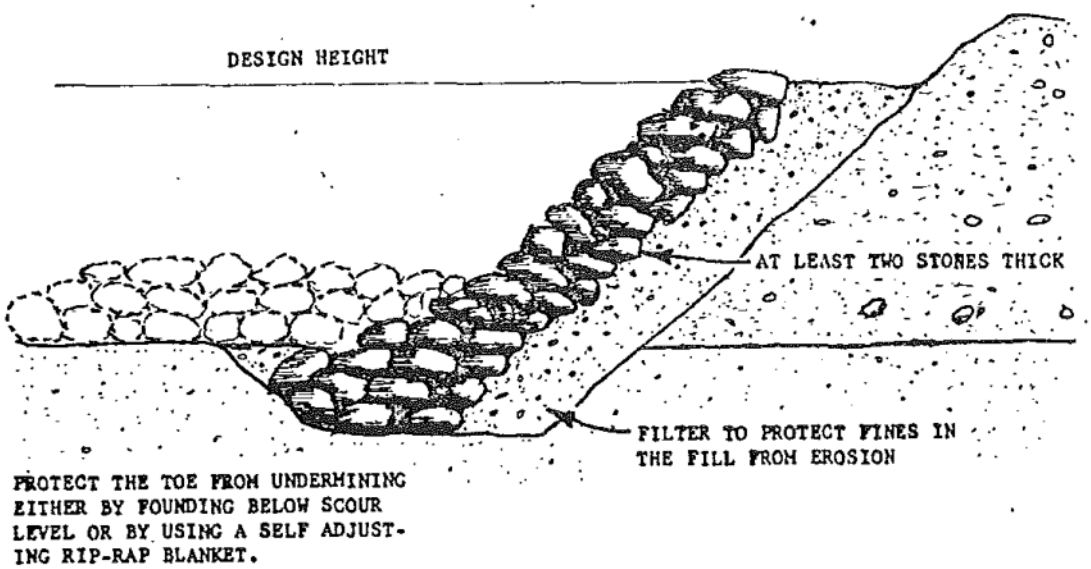
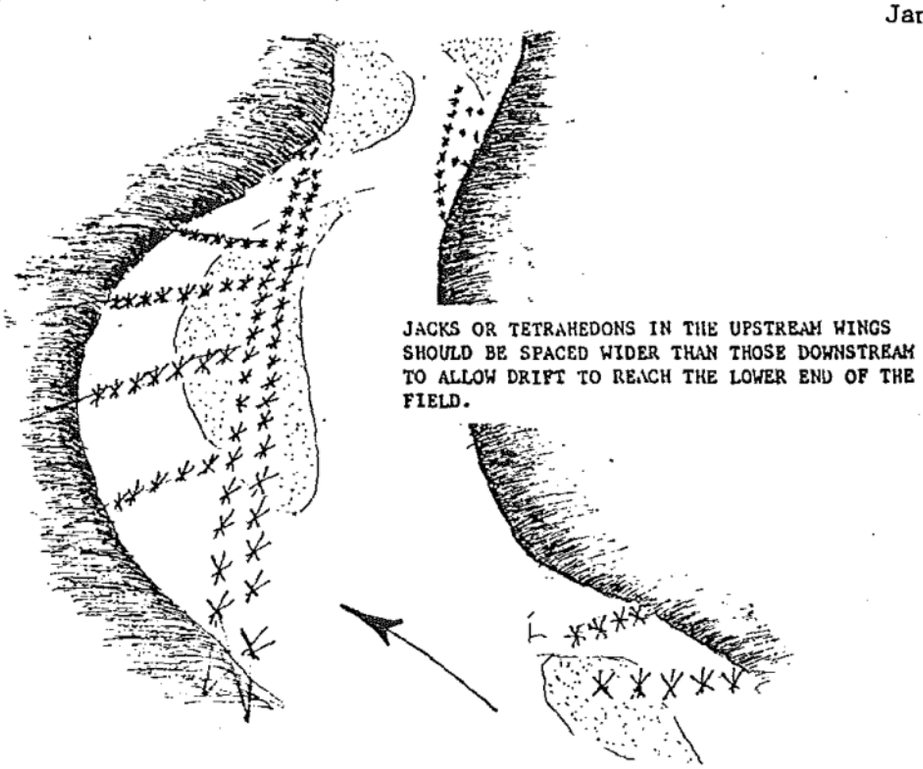
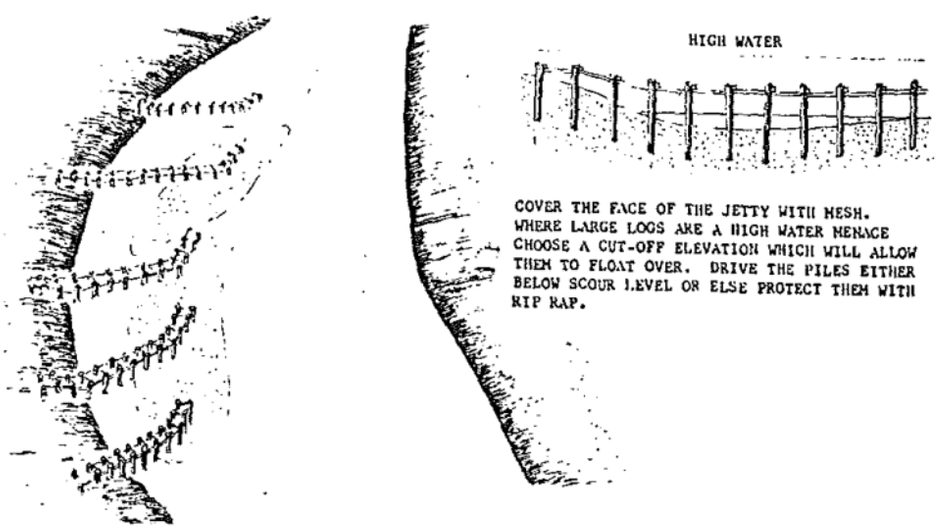


FIGURE 3. RIP RAP SECTION

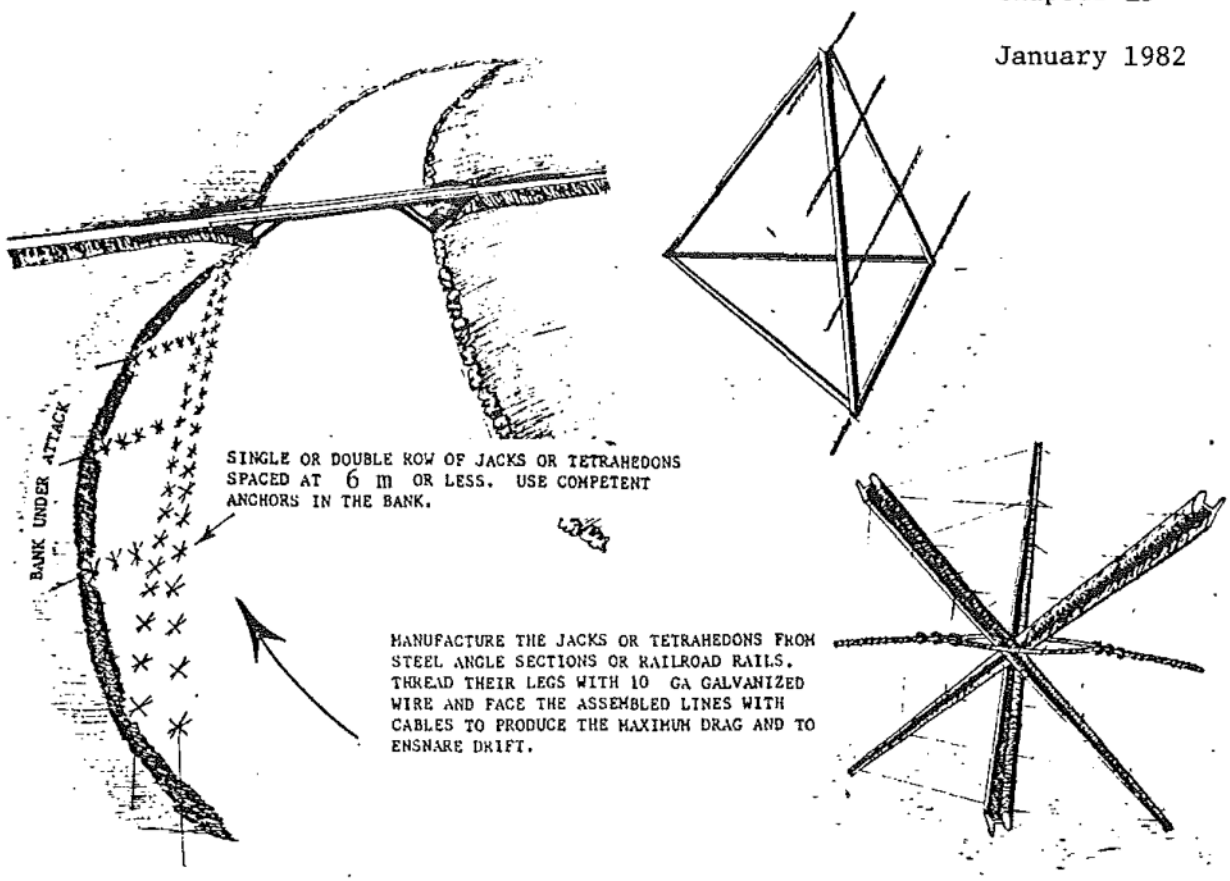


LAYOUT USING STEEL JACKS OR TETRAHEDONS

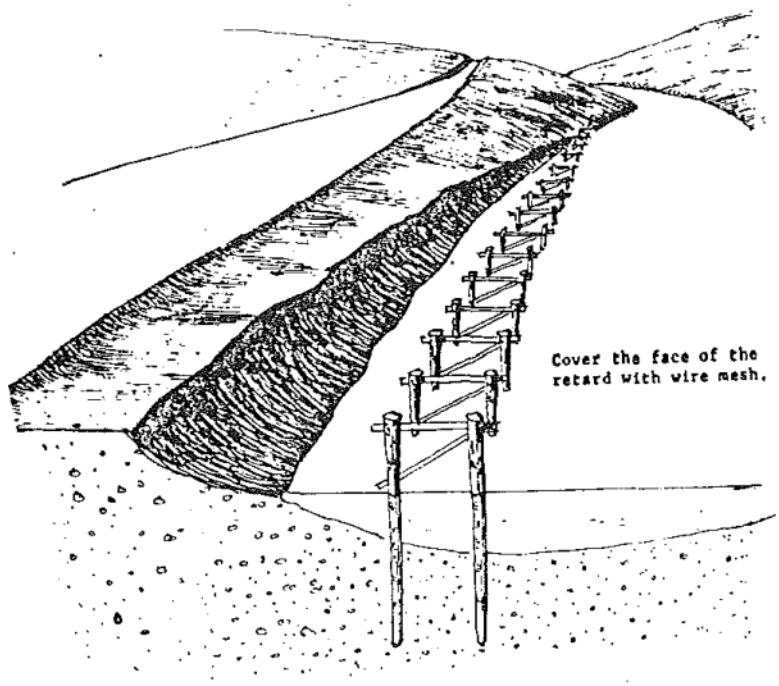


LAYOUT USING TIMBER PILE WINGS

FIGURE 4. JETTIES



TETRAHEDON AND JACK RETARDS



DOUBLE-ROW PILE RETARD

FIGURE 5. RETARDS

CHAPTER 16

FERRIES

16.01 FINANCING

The estimated annual cost of operating ferries in each district is compiled by the District Highways Manager and is submitted to Headquarters along with other district estimates. The ferry estimate is prepared on the basis of the previous year's operating costs. This is adjusted to conform with any operating changes, such as repairs, wage increases and additions recommended or approved by the Superintendent of Ferries. Do not include major repairs or replacements in the annual Ferry Vote estimate as they are usually charged to Capital Expenditure. For a new ferry service where there was no previous ferry vote, apply to the Superintendent of Ferries for an estimate of cost for the first year.

All ferry estimates submitted by the District Highways Managers are checked by the Superintendent of Ferries and may be raised or lowered if necessary. Advise the Superintendent of Ferries of unforeseen circumstances, such as unusual repairs or damages to a ferry during the year, which result in expenditures which cannot be paid by the district ferry vote.

All supplies and materials required for ferries are requisitioned in the usual manner and the requisitions are checked by the Superintendent of Ferries before forwarding to the Purchasing Commission.

16.02 OPERATION

All ferries operated under the jurisdiction of the Ministry are important links in the road and highway systems and every effort must be made to maintain uninterrupted service even under the most adverse conditions. In cases where temporary closures are unavoidable, provide relief ferries or alternate routes if at all possible. In such circumstances the public must be notified by radio, by the local papers, and by posted notices. Region and Headquarters must be advised of such closures as soon as possible, with a brief account of the action being taken. Estimated extent of closure period should be included in the report. Arrangements for major repairs, overhauls and drydocking of ferries must be approved by Headquarters.

All ferry schedules are approved by Headquarters and no changes may be made without authority. This does not apply to rush periods when a ferry is unable to carry all waiting cars or pedestrians. In such cases the ferry operates a shuttle service and the regular schedule is not resumed until the traffic returns to normal. When a ferry cannot carry all waiting cars or pedestrians on the last scheduled trip it may be necessary to make an extra crossing.

16.02 - Cont'd.

When vehicles are being carried on any ferry a wooden block must be placed in front of the front wheel of the first vehicle in each lane and behind the rear wheel of the last vehicle in each lane. When only one vehicle is being carried it must be blocked front and back. This is in addition to the usual safety chains.

The efficient and economical operation of every ferry is the direct responsibility of the District Highways Manager concerned. He may contact the Superintendent of Ferries for advice or recommendations at any time, and the Superintendent of Ferries will inspect each ferry at least once a year. A copy of the Annual Report of each ferry will be forwarded to the District Highways Manager. Carry out recommended repairs as soon as possible and give prompt attention to any irregularities mentioned.

There are numerous details in connection with the administration of ferry services, but as there are several distinct types of ferries in the Province this subject cannot be dealt with generally. These details are outlined in sections dealing with each type of ferry.

16.03 REACTION FERRIES

These ferries are designed to cross rivers where the current is too fast for the operation of a conventional barge type ferry. Many of these ferries are able to operate for only a portion of the year. During the winter they must be taken out of the water before the heavy ice forms. This is usually attended to by the local Bridge Foreman.

During the winter period the ferryman is expected to carry out necessary minor repairs and painting as weather permits. He transports passengers and freight in the rowboat when conditions permit, and at some sites operates a cable car on the overhead cable. He must not advise anyone to cross on the ice or involve the Ministry any way with such crossings.

Reaction ferries have a deck area capable of carrying two automobiles or small trucks. The total weight carried should not exceed 10 tons. The wheels of all vehicles must be blocked while being transported and the safety chains must be secured and kept in good condition.

These ferries must carry the following equipment at all times:

1 rowboat with oars
2 lifebuoys with ropes
6 life jackets stored in weatherproof box
1 non-freezing type fire extinguisher
1 axe
1 pike pole
1 crow bar

16.03 - Cont'd.

Before launching reaction ferries each spring inspect the overhead cables and treat with cable dressing. At this time also check the anchor fastenings and tower saddles and adjust the cable if necessary. Overhaul the traveller and lubricate. Give particular attention to the sheave grooves. If these are not smooth and uniform they must be replaced or reconditioned. Check condition of the bridle cable, blocks and cable fastenings. Check all other components and carry out necessary repairs before launching. If necessary, paint the steel pontoons at this time. The ferryman should paint the superstructure during the summer. The local bridge foreman usually does the above mentioned annual inspection and maintenance work. Subsequent inspections and minor maintenance must be continued by the ferryman. Ferrymen must be reminded to keep the deck clean, and especially to remove any animal droppings.

The Highways District Manager should visit each ferry monthly if possible and check the general appearance and efficiency of the operation. The Superintendent of Ferries will thoroughly inspect each ferry during the year and forward a copy of his report to the Highways District Manager and the Regional Highway Engineer. Carry out recommendations included in this report as soon as possible.

A traffic record sheet (H.40) must be submitted to Headquarters each month regardless of whether the ferry is operating or not. The "Nil" reports are the only record of the length of the tie-up period. It is most important that the information contained on these sheets be accurate.

* Reaction Ferries usually operate from 7:00 A.M. to 7: P.M., with shut-down periods at noon and 5:00 P.M. for meals. After-hour trips for emergency purposes may be arranged with the ferryman.

16.04 POWER CABLE FERRIES

These ferries consist of steel barges fitted with suitable loading aprons and cable spooling machinery for propulsion. They cross lakes and slow running rivers and are guided from shore to shore by underwater cables. A power-driven spooling device located on the barge operates on another underwater cable to propel the ferry.

Due to abrasion from sand and gravel the underwater cables have a comparatively short life. For this reason, give particular care to treating the cables with underwater compound before installing. The cables are carried through the ferry on specially designed sheaves. These sheaves require constant lubrication and the grooves must be kept smooth and uniform. Ensure that each ferry has a spare set of these sheaves and a spare set of drive and guide cables.

* Amendment

16.04 - Cont'd.

Repairs and maintenance work on the machinery are usually carried out by the district mechanical forces, and the renewal of cables, etc., is attended to by the local bridge crews. Minor repairs, cleaning and painting is usually carried out by the ferry crews. On very busy ferries it is sometimes necessary to employ extra help for painting.

* Give special attention to the interior of these barges to prevent rust and corrosion.

On the larger ferries of this type the crew may consist of one ferryman and two deckhands per shift. The ferryman operates the ferry, directs the deckhands when necessary, and keeps the traffic record and log book.

The deckhands operate the aprons, handle the safety chains, direct and stow the traffic and block the wheels of the first and last vehicle in each lane.

On the smaller power cable ferries, the crew may consist of one ferryman only per shift. Where more than one shift per day is operated a Head Ferryman is required. In addition to the usual ferryman's duties, the Head Ferryman supervises all other personnel and is in charge of the complete operation. He works under the direct supervision of the District Highways Manager.

The equipment carried on this type of ferry varies with the size but generally three life jackets per vehicle are required and from two to four life buoys per ferry. One or more life boats with oars are carried, and adequate fire fighting equipment. The list of fire fighting equipment required for each ferry is prepared by the Superintendent of Ferries. As these ferries operate on an "on call" basis, no schedules are required. An accurate record of traffic carried must be forwarded to Headquarters each month on Form H.40.

16.05 CERTIFIED POWER FERRIES

Due to the size of these ferries and nature of the work carried out, they are registered vessels and are operated under the "Canada Shipping Act". A certified Captain is in charge of each shift at all times. Where the nominal horse-power exceeds 6, a certified engineer with at least a third-class certificate is required. If more than 40 persons are carried the crew must include a certified Mate. The balance of the crew consists of non-certified personnel such as oilers, pursers and deckhands. The total crew complement in each case is specified by the Steamship Inspector and is governed by the size of the vessel and the passenger capacity.

These ferries are inspected annually by the Steamship Inspection Service and the fresh water ferries must be taken out of the water every 4 years for inspection. Ferries operating in salt water

16.05 - Cont'd.

must be drydocked for inspection each year. In addition to this inspection by the Steamship Inspector these ferries are inspected annually by the Superintendent of Ferries. Copies of these inspection reports, along with recommendations and comments, are forwarded to the District Highways Managers concerned.

As these ferries operate up to 24 hours per day, several complete crews are required. A Senior Captain is placed in charge of the operation and, in addition to the duties of a shift captain, this man supervises all other captains and crew members on the ferry. He acts as a co-ordinator and is directly responsible to the District Highways Manager. A Senior Engineer is also placed in charge of all other shift engineers and engine room personnel.

As Certified Ferries are operated and maintained by competent licensed officers and inspected by the Steamship Inspector and the Superintendent of Ferries, they should not require as much of the District Highways Manager's time as some of the smaller ferries. However, there are such problems as relief ferries to maintain service during overhaul periods, investigation of complaints, requests for augmented service and the control of expenditures. Many of the problems arising from the operation of these ferries are in some way connected with the terms of the "Canada Shipping Act" and for this reason it is recommended that District Highways Managers contact the Superintendent of Ferries before making major changes to any phase of these operations.

Repairs and maintenance to these vessels are usually arranged by the District Highways Manager upon advice from the Senior Captain and the Senior Engineer. Mechanical work is usually carried out by the engine room personnel and mechanics from the District garage. Other work, painting, etc., is carried out by the crew and the local bridge crews. Where qualified ship-yards are available it is usually more expedient to have these firms dry-dock the ferries and attend to necessary repairs. In such cases all arrangements are made by the Superintendent of Ferries.

Most of these ferries charge tolls for vehicles, passengers and freight. This phase of the operation comes within the jurisdiction of the Director of Financial Services. All enquiries regarding matters in connection with tolls and fares should be directed to him. An accurate record of traffic carried must be forwarded to Headquarters each month on Form H.40.

16.06 PRIVATELY OWNED SUBSIDIZED FERRIES

These ferries should not require a great deal of the District Highways Managers' time or attention. Arrangements must be made by the District office to pay the subsidy installments as they become due, and periodical visits should be made to the ferry to see that all conditions of the tender are being met. An occasional investigation is sometimes required into complaints received or requests for schedule changes.

In most instances the ferry landings are Government property and must be maintained by the District concerned. Funds for this work, and for the subsidy payments, must be included when submitting the annual ferry estimates to Headquarters.

16.07 MISCELLANEOUS FERRIES

There are a number of unconventional ferries that cannot be classed in any particular category. These have been designed to meet unusual crossing conditions and therefore have problems which must be considered individually. When assistance is required with such problems, the Superintendent of Ferries should be consulted.

16.08 FREE TRAFFIC CLASSIFICATIONS

The following traffic classifications are to be exempt from the payment of tolls in respect of Ministry operated ferries, when being transported on scheduled trips:

(1) Police and Conservation Officers

Personnel and vehicles of the Royal Canadian Mounted Police, Municipal Police and Province of British Columbia Conservation Officers, when on duty in uniform.

(2) Ministry of Transportation and Highways

Officials and vehicles of the Provincial Ministry of Transportation and Highways, when on duty.

(3) Free Passes

All persons (such as Members of the Provincial Legislature, and sundry officials and individuals) and their cars, who are bona fide holders of current and valid passes issued by the Provincial Government.

4. Students (Comox-Powell River Service excepted)

Proceeding to and from School, Business College, or to participate in school activities, provided that the student carries a pass signed by the Principal of the School or Business College.

5. Blind Persons

Properly accredited blind people will be permitted to travel with a guide for a single adult passenger fare for guide and blind person.

Properly accredited blind people travelling alone will be permitted to travel for half a single adult passenger fare.

6. Clergy

Ministers of Religion, Missionaries, and Sisters of Charity, when bearing proper credentials or in the garb of their Order, may be sold tickets at the regular half fare. This applies to passenger fares only - not to vehicles.

It is emphasized that the foregoing instructions apply in the case of scheduled trips only; and that where the transportation calls for a special non-schedule trip, the customary special rates are to be charged, unless otherwise directed from Headquarters.

16.09 ** TRANSPORT OF HORSES ON FERRIES JULY 1982

Horses may be transported by all fresh water ferries with the following requirements:

1. Horse must be led on board by the rider/owner.

2. Horse must be held by the rider/owner at all times during transit.

3. Rider/owner will clean up any debris.

Local horse people should be made aware that in the interest of safety a clip-on type hoof covering should be worn when travelling on a steel deck ferry.

** Amendment

CHAPTER 17

EQUIPMENT

17.01 HIRED EQUIPMENT

1. GENERAL

It is recognized that the Ministry is one of the principal employers of hired equipment in the Province and as such has a responsibility to develop, assist and maintain a healthy, well-equipped construction equipment industry. In addition, the government is desirous of ensuring that local equipment owners are employed and that the available work is distributed on an equitable basis.

The Ministry realizes that no policy and procedure can cure all problems and encompass all possible situations. However, managers at all levels are expected to understand the intentions of this policy and to apply it as best as possible with common sense.

Under no circumstances is any Ministry employee to prepare hired equipment accounts or invoices on behalf of owners. Employees carrying out such service will face strict disciplinary action which may result in dismissal.

2. AUTHORITY TO HIRE EQUIPMENT

The authority to hire equipment is vested solely in the District Highways Manager and such authority will not be delegated except to the District Technician who may act in the absence of his superior.

This policy also applies to Headquarters Branches and it is the responsibility of Branch personnel to consult with the District Highways Manager who will arrange for the hire of trucks and equipment as is necessary to carry out project work in his district.

** An authority number will be issued for all hired equipment except for:

(a) Dump trucks below book rates.
(b) Lowbed or highboy hauling units within book rates.
(c) Bare rentals of less than $4.50/hour or $35.00/day provided the rental duration is less than two months, and provided rates do not exceed book rate plus 20%.

Where authority numbers are required, they will be issued by the authorizing official; i.e. District Highways Manager or Regional Maintenance Operations Manager. All hired equipment invoices and forms must quote the authority number or the fact that dump truck rentals are within the book rates.

** Amendment

3. RENTAL RATES

In all cases of equipment hire, the rates are to be negotiated using the current year "Province of British Columbia and B.C. Hydro and Power Authority Equipment Rental Rates" as an upward limit.

The District Highways Manager may offer, and accept for the Ministry, rental rates that are listed in the above-mentioned rental rate book and for a maximum rental period of two months. Rates that are negotiated higher than the book rate or rates that are negotiated for equipment units not listed in the book are to be approved prior to working the equipment. Approval is to be obtained through the Regional Maintenance Operations Manager who in turn will telex the Director of Equipment Services in Victoria for approval. Any conversion from hourly all-found rental rates to monthly or bare rates are to be approved by the Director of Equipment Services.

** On a weekly basis, each District Highways Manager is to send to the Regional Maintenance Operations Manager a composite sheet (H-627-o) showing all equipment hired, the approval number assigned, the rate of hire and the length of the hire. In turn, the Regional Maintenance Operations Manager is to send a listing to the Director of Equipment Services showing on a weekly basis all the hired equipment used in the Region.

If a District must hire equipment for longer than two calendar months, then approval is required from the Regional Maintenance Operations Manager.

4. MAINTENANCE OF BARE-RENTED EQUIPMENT

The Ministry has a responsibility to ensure that bare-rented equipment is properly maintained. Fuel, oil and air filters must be checked and replaced as required or as recommended by the manufacturer.

Failure to carry out this servicing could result in the loss of engines and abnormal wear on moving parts and the Ministry could be held liable for these repair costs if negligence of service can be proved.

5. REGISTERING OF EQUIPMENT FOR HIRE

Once a year, usually in January but no later than April, an advertisement (Appendix "A") will be placed in the local newspapers inviting equipment owners to register for Ministry work. In the urban areas of Greater Victoria and Greater Vancouver no newspaper advertisement is to be used but letters are to be sent to all previously registered equipment owners requesting them to re-register.

** Amendment

** Each District will compile, maintain and update a list for each type of equipment for each foreman area. When area foremen work from a common depot, then the lists may be combined for that depot. On approval of the Regional Maintenance Operations Manager, a local area may comprise more than one foreman area where areas are in close proximity with no clear division as to local areas.

The lists are not to be released to the public in written form but they must be available for public viewing upon request.

6. EQUIPMENT SUITABILITY

All equipment may be listed and hired (subject to other requirements in this policy) providing that it is capable and can in fact maintain productivity with the hired fleet.

All equipment hired by the Ministry must be registered with the Workers' Compensation Board and it is the owner's responsibility to ensure that his equipment and operators meet the W.C.B. requirements.

However, it is the Ministry's responsibility to ensure that the job environment is safe and meets the W.C.B. and Ministry regulations. Hence, it is the responsibility of all levels of management to ensure that hired equipment operates in a safe manner and that obviously unsafe equipment is not employed.

7. HIRED DUMP TRUCK POLICY

1. General

The intention of this policy is to allocate available government work to an optimum sized local truck fleet of established truck owners. In many areas there are too many trucks available and to try to spread the available work to all trucks would mean that none would make sufficient earnings to maintain a healthy local industry.

2. Establishment of a Dump Truck Hire List

H-25 "Dump Truck for Hire Registration Form" is to be completed in January each year. The "Dump Truck Hiring List" will consist of three groups:

Primary, Secondary and Open

Each of the Primary and Secondary groups is to be restricted in number. The size of each group is to be determined on operational requirements by the District Highways Manager and approved by the Regional Maintenance Operations Manager.

** Amendment

Only local residents may be placed in the Primary and Secondary groups. Generally only local residents are to be listed in the Open group, but if necessary transient truck owners may also be listed.

Once the size of the Primary and Secondary groups has been established, the groups are then filled on a seniority basis, i.e. - if the Primary group is to be eight in number, then the eight most senior trucks will comprise the Primary group from all those that registered for work.

Each year the truck owner's position on the list is to be reviewed, taking into account his evaluation report from the previous year. In other words, once an owner is in the Primary group it does not mean that he can "hold" that position without satisfactory performance the year before.

If an existing truck owner sells his truck, the new owner must go to the Secondary group and if that is filled, he must go to the Open group. (The truck owner is registered on the "Dump Truck Hiring List" not the truck).

** Newly listed dump trucks are to be placed on the Open list for the local area.

3. Hiring Policy (Maintenance and Day Labour Work)

As dump truck work becomes available, the work will be offered to the Primary group on a rotational basis. If more dump trucks are required than listed on the Primary List, then the work is offered on a rotational basis to the Secondary group and subsequently on a rotational basis to the Open group if even more dump trucks are required. The intention is to always offer the work first to Primary, then to Secondary and lastly to Open.

Only one unit is to be hired from any one truck owner until such time as all trucks in each group have been offered work.

** In situations where the equipment of established equipment owners in a local/foreman area with Ministry seniority are engaged, established equipment owners from adjoining areas with seniority and with equipment available are to be offered work before hiring newly listed equipment. The point of hire will be the project. When all established equipment owners are working in the District then newly listed equipment may be engaged. If a shortage still exists, then they should be hired from adjacent Districts.

Once dump trucks have been hired on any one job or project, they are to be laid off on a last on, first off basis within each group, i.e. - all the Open group are to be laid off before any Secondary group is laid off.

** Amendment

4. Hiring Policy (Prime Contractor Work)

The Ministry requires all contractors to hire local dump trucks whenever it is economically feasible. The District Highways Manager is required to give each Project Supervisor, upon request, a list of the eligible dump truck owners.

The eligibility list to be given to Project Supervisors will be the same as that used by the District; with the exception that those willing to become or if they are union members, and those who have H plates or permits, are to be indicated on the list. This information is required as the Prime Contractors may be restricted by regulations and labour agreements as to those dump truck owners they could hire.

5. Method of Payment

In order of preference, hired dump trucks should be hired on the following basis:

1. Tonne-kilometre. Rates to be calculated to enable an average truck to earn about the rental rate book hourly rate. All haul rates are to be approved by the Regional Maintenance Operations Manager.

2. Cubic metre-kilometre. Similar conditions as in #1 above.

3. Cubic metre-hour. As per that listed in the current Inter-Departmental Rental Rate Book.

No hired dump truck is to be paid, or expected to haul, more than it is legally licenced to haul. The exception is where a legally established project construction zone is in effect, which may entitle truck owners to haul overloads. Construction zones are to be established with the approval of the Regional Highways Engineer.

Example: The fact that a truck has an 11 - 12 m^3 box does not mean that it can legally haul that amount of gravel and the truck may only legally be capable of hauling 7 cubic metres in which case that is all it should be loaded and paid for.

No dump truck is to be paid an hourly rate higher than it can physically haul. Usually this is the struck capacity of the dump box.

The dump truck rate published in the Intergovernmental Hired Equipment Rate Book are calculated on 3000 pounds per cubic yard (1 780 kilograms per cubic metre). This is the only figure to be used when converting between weights and volumes for hired dump trucks.

8. HIRED EQUIPMENT POLICY (OTHER THAN DUMP TRUCKS)

1. General

The intention of this policy is to distribute the available work as equitably as possible to the locally owned construction equipment.

2. Establishment of Hired Equipment Lists

H-24 "Equipment for Hire Registration Form" is to be completed for registering equipment other than dump trucks. The list for all other types of equipment will also be of three groups:

Primary, Secondary and Open

** In most foreman areas it will be found necessary to have only Primary and Open groups. Only "local" equipment owners may be listed in the Primary and Secondary groups; all other equipment owners are to be listed in the Open group. Newly listed equipment is to be placed in the Open Group.

3. Hiring Policy

As work becomes available it is to be offered on a rotational basis to the Primary group.

Only when the Primary group is all employed or have declined work, is the work to be offered to the Open Group.

Normally, different types of equipment will be hired from different owners whenever work is available.

Equipment hired from the Open Group is to be released before equipment hired from the Primary group.

** In situations where the equipment of established equipment owners in a local/foreman area with Ministry seniority are engaged, established equipment owners from adjoining areas with seniority and with equipment available are to be offered work before hiring newly listed equipment. The point of hire will be the project.

** When all established registered equipment has been hired in a District then newly listed equipment can be hired; when this is no longer available then equipment is to be hired from adjacent Districts and then province wide.

4. Scraper Fleets

The Executive Director, Construction, is to be consulted whenever a scraper fleet is to be hired. The reason for this consultation can best be utilized to meet the Ministry's construction program.

** Amendment

** 5. Mobile Cranes

It is essential that whenever a rental mobile crane is to be placed in use, a responsible Ministry Official is to personnally inspect the "Mobile Crane Log Book" beforehand and to satisfy himself that the crane has been maintained and inspected up to date. In particular, this official should closely scrutinize the last two sections of the Mobile Crane Log Book entitled "Record of Inspections" and "Crane Accident or Mishap History".

Should this official find that the requirements of the WCB Regulations (particularly Section 56) have not been complied with, or otherwise be in doubt as to the safe operation of the crane, he must ensure that the crane is not placed in use.

Mobile cranes should whenever possible be rented all found. Bare rental should only be considered as a last resort and in such cases the Ministry operator must obtain an operating permit endorsement from the Regional Driver Trainer to ensure that he has the necessary training and experience to operate the crane in a safe manner.

9. TERMINATION OF HIRE

Managers and supervisors must be constantly aware of the productivity of all hired equipment. If the machine is not producing full productivity or if the operator is not capable of producing a good qaulity and quantity of work, then the equipment can be laid off after proper advice to the owner.

10. EVALUATION

At the end of a project or the season a form H-29 "Hired Equipment Evaluation Report" is to be completed by the Project Supervisor, Area Foreman and the District Highways Manager.

The form records availability and performance and will be used to measure the eligibility for future work with the Ministry.

11. OFFER FOR WORK

The District Highways Manager is responsible to ensure that work is offered in accordance with this policy.

A record must be kept of what work was offered and when it was offered and what the equipment owner's response was.

12. PROCEDURE

1. Advertise for equipment owners to register.

2. Have each equipment owner complete a registration form for each piece of equipment he wishes to offer for hire.

** Amendment

3. If an equipment owner accepts an offer for work a "Standard Rental Agreement" form must be completed.

4. A record is to be kept of all offers for work to each equipment owner.

5. An evaluation report must be completed at the end of a project or the season.

13. DEFINITIONS

LOCAL (AREA)	is interpreted to mean the Road Foreman area. Where two or more area foreman work from a common depot, or where the Regional Maintenance Operations Manager has consented to the combining of more than one foreman area to form a local area, then local shall mean the combined area.
URBAN AREA	means Greater Vancouver and Greater Victoria
LOCAL RESIDENT	a person who has been domiciled in the local area for one year.
SENIORITY	is interpreted to mean the length of time in years that the equipment owner has provided a substantial amount of service to the Ministry. If necessary, the amount of earnings in each year can be used to determine the seniority between truck owners.
EQUIPMENT OWNER	the registered owner on the motor vehicle registration or the holder of a lease-purchase agreement
ROTATIONAL	means that work is offered on a sequential basis within each group. A reasonable effort must be made to contact each listed truck owner as his name comes up.

17.02 RENTAL OF EMPLOYEE-OWNED EQUIPMENT

Under extenuating circumstances it may be necessary for a Ministerial official to rent equipment owned by an employee of the Ministry; however, this practice is contrary to Public Service Regulations and therefore must be rigidly controlled.

Employee-owned equipment must not be rented under any circumstances unless prior permission is obtained from the Director of Equipment Services through the Regional Maintenance Operations Manager.

In all cases rental rates are to be the same as or lower than the "book rate". Employee-owned equipment should not be hired unless there is no possibility of hiring equivalent equipment from the public.

17.03 USE OF TRANSPORTATION VEHICLES
**

1. GENERAL

Transportation vehicles are defined as all motor vehicles of 3/4 ton size and less, including automobiles and station wagons.

The following policy applies to the use of all Ministry vehicles:

1. Ministry vehicles are not to be used for personal purposes.

2. Ministry vehicles are only to be taken to the operator's home when specific approval has been granted and the residence is less than 32 kilometres from the normal assembly point.

3. All vehicles are to be parked overnight in Ministry compounds, rental parkades or building parking lots. Vehicles are not to be taken home for parking or caretaking only.

4. Ministry vehicle use at isolated and temporary field crew assembly points will be in accordance with the Component Agreements and specifically approved beforehand with the Branch or Regional Director.

5. Pool cars cannot be taken home more than 16 hours before an early departure the next day, this precludes the taking home of a vehicle on Friday night for a monday morning departure. Pool cars must be returned to the normal parking space when the operator next returns to his normal work location.

6. If the operator of an assigned vehicle that is taken home is off work longer than 3 days (excluding statutory holidays) for any reason then the vehicle must be parked in a Ministry yard or parking lot.

7. The take home permission is automatically extended to employees relieving or substituting in the positions that are approved for take home.

8. The following positions have permission to take their Ministry assigned vehicle home between shifts:

    1. Regional Director, Highways

    2. Regional Manager Maintenance Operations

    3. District Highway Managers and Technicians (one each per district)

    4. Area Road Foreman - not shift foreman

    5. Senior District Bridge Foreman

    6. Garage Foreman

** Amendment

7. Project Construction Foreman - only when the project is active and traffic control devices are in place to protect the public from project areas that are dangerous.

8. Project Supervisor - only when the project is active and the Contractor has traffic control devices on the travelled portion of the highway or detours are in use.

9. Portable Weigh Scale Inspectors

10. Regional Vehicle Mechanical Inspectors

11. Radio Technicians

12. Electrical Foremen

13. Transport Inspecting Engineers with assigned vehicles

9. Transport inspecting pool vehicles are to be assigned for take home use by the Chief Inspecting Engineer, as job requirements dictate.

10. All other Highways Operation Department Regional Managers, Engineers and Officers - assigned Ministry vehicle may be taken home in any one week when travelling away from the office for more than 50% of the working hours.

11. Regional Directors may allow Property Negotiators to take home an assigned vehicle if it is required for after hours use.

12. Regional Directors and Branch Directors may give temporary take home permission during emergencies.

13. Under normal circumstances employees must elect by March 1st each year whether or not they will use their own car on distance allowance or request to use a Ministry car for the coming fiscal year. Once the choice is made it will hold for the next 12 months. Those persons electing distance allowance will only be allowed the use of Ministry pool vehicles when it is to the Ministry's advantage or the employees' own vehicle is temporarily unserviceable.

14. Ministry assigned vehicles are not to be parked in airport and ferry parking lots for longer than two days, alternate transportation must be arranged for longer periods.

15. Applications for other exemptions to this policy must be made in writing to Mr. A.E. Rhodes, Assistant Deputy Minister - Administration, by the Director involved. Information required is the distance from the operator's home to his normal assembly point and the reason why it is necessary for the vehicle to be taken home and for what period of time the request is made.

** Amendment

** 2. RENTED VEHICLES

1. General

Ministry personnel who already have a Ministry unit assigned to them are not allowed to use rented vehicles. Rented vehicles are to be used for peak period requirements and usually for auxiliary personnel transportation. Rented transportation units are to be parked overnight at Ministry yards whenever possible.

All leased or rented vehicles are to be marked with a decal and numbers available from the District Mechanical Foreman. These decals are to be affixed as soon as possible and left in place at all times during the rental period. The decals will show the assigned "A" number on them for purposes of identification, fuel recording, maintenance management reporting and approval authorization.

Rental vehicles are to be rented whenever possible on a monthly basis with no distance restrictions (like 3000 free km then .06¢ per km) and all insurance charges are to be included in the monthly rate. The Hired Equipment Rental Rates are to be applied. These vehicles are to be of a similar type and quality as those supplied by the Ministry.

** 3. RENTAL PERIOD - 5 DAYS OR LESS

Transportation vehicles, including U-Drives, may be rented for 5 days or less, providing:

1. A government-owned vehicle is not available; ensure by checking with the Regional Manager, Equipment Services.

2. Use of the rental vehicle is advantageous to the government, is more economical than other conveyance, and official business cannot be accomplished otherwise.

3. The rental has been approved in advance by the Regional Manager, Maintenance or by the Branch Director.

** 4. RENTAL PERIOD GREATER THAN 5 DAYS

Transportation vehicles can be rented or leased for longer than 5 days but prior approval must be obtained from the Director of Equipment Services. Requests for approval must be made by either the Regional Manager, Maintenance or the Branch Director by memorandum or telex to the Director of Equipment Services.

Requests for approval are to contain:

1. Vehicle type and model.

** Amendment

**

2. Requested rental period.
3. Rental rate, including insurance charges.
4. Name of rental agency.
5. Specific work or project(s) on which it is to be used.
6. Explanation of need to rent.
7. District or Branch and operator classification.
8. Request to take home (if applicable).

** The approval reply will contain an approval number. e.g. 2H-A9123-64, which is identified as follows:

2	Region 2
H	Number assigned by Headquarters
A9123	Unique number to be used to identify the unit, to record its monthly distance and to obtain gas and oil.
6	Sixth month in the current fiscal year.
4	Fourth week in the above month.

17.04 WEEKEND TRANSPORTATION

Where crews are working at some place removed from their usual place of domicile, the use of a Ministerial vehicle for supplying transportation for employees at weekends to the employee's homes and return is prohibited except where authorized by the Supervisor who may determine such use may be more economical for the Ministry.

Conceivably, there will arise situations of an emergency nature when the use of a Ministerial vehicle may be necessary. If and when such a situation arises the District official, or possibly a member of the crew, may need to exercise discretionary power. If an accident results under such circumstances, Headquarters will decide whether the circumstances were such as to warrant the Ministry underwriting any liability arising out of such an accident.

Where camps or billeting arrangements are adequate for cleanliness and comfort, then any man wishing to return home will have to do so in his own time and by whatever conveyance he can secure, and therefore will not be protected by Workers' Compensation.

Where facilities do not exist in either fixed or mobile camps for proper drying of clothes or washing facilities, the Ministry has a responsibility to return these men to their point of assembly at least every five days, to enable them to observe reasonable hygiene and secure a change of clothing.

17.05 RENTAL/LEASE PURCHASE OF EQUIPMENT

No agreement for hire should be signed that includes a rental/lease purchase clause unless it has previously been approved by the Director of Equipment Services.

In such cases the prior approval, and usually the issuance of a purchase order, is required by the Purchasing Commission.

** Amendment

17.06 OPERATION OF GOVERNMENT OWNED (OR LEASED) MOTOR VEHICLES

1. Licenced Operators

Government-owned (or leased) motor vehicles must be operated only by authorized persons in possession of a current British Columbia driver's licence of the proper class.

An employee in charge of a government-owned (or leased) vehicle, who permits other than licenced authorized persons to operate such vehicle, will be held personally responsible for the results thereof.

2. Carrying Employees and Passengers

Passengers may not be carried in government vehicles except as provided hereunder:

1. Government employees may be carried in the performance of their duties; or such persons as are conveyed in connection with the work of the government.

2. Government employees may be carried to and from the location of their work where such transportation is a condition of employment.

3. Employees who drive government vehicles for their own transportation may be accompanied by their wife (or husband) and children when travelling on field trips outside of the normal daily area of operation. This does not apply to operating equipment such as gravel trucks, low-beds, snow plows, etc., nor to vehicles used for transportation of crews. Wives, husbands and children travelling with employees on a field trip are not permitted to drive government vehicles which must be used only for normal government business.

   Travel, accommodation and meal expenses for spouses and children cannot be borne by the government and must be assumed by the employee. In the event of an accident in a government vehicle, spouses and children will be protected by the insurance carried on all licenced government vehicles.

4. Such other persons as authorized by the Deputy Minister or Branch Head.

   UNDER NO CIRCUMSTANCES WHATSOEVER SHOULD ANY PERSON OTHER THAN THE DRIVER AND HIS HELPER BE ALLOWED TO TRAVEL IN OR ON A GOVERNMENT VEHICLE WHILE IT IS TRANSPORTING EXPLOSIVES.

3. Carrying Firearms

Carrying any type of firearm in Government vehicles, or in private vehicles used in performance of employee's duties, is prohibited, unless the firearm is required for the employee's duties and has been specifically authorized for such purpose.

** Amendment

This policy does not preclude the transportation of a legal firearm from point to point as part of an employee's personal effects, within lawful limits. However, as a rule, there should be no firearms in vehicles used for government business when the duties performed do not require their necessity.

4. Citizen Band Radios

Citizen Band radios are not to be installed in government-owned or leased vehicles.

If an exception to this policy is required, approval must be obtained from the Director of Equipment Services with application through the Regional Highway Engineer.

5. Improper Use of Vehicles

The unauthorized and/or unjustified use (i.e. after hours, holidays, Sundays, etc.) of a Government-owned, rented, or leased car or truck by any employee of the Government will render such employee personally liable for the consequence of such use. Further, he or she may be suspended or summarily dismissed from his or her position, if, in the opinion of the Ministry head, the gravity of the consequence of such use warrants suspension or dismissal.

6. Insurance

All motor vehicles licenced in the name of the Government of the Province of British Columbia, are required by law to be insured by the Insurance Corporation of British Columbia. The limits of third-part liability insurance are $500,000.00 inclusive.

17.07 VEHICLE MIRRORS
**

In order to provide vision to the rear in normal operating conditions, mirror installation will be as follows:

1. Standard Internal Mirror: As supplied by the manufacturer, the following units will be so equipped.

   a) Cars and station wagons
   b) Pick ups, vans, light trucks
   c) Graders

2. External Low-Mount Mirrors: These mirrors will be of a maximum standard dimension approximating 130 mm x 190 mm (5" x 7.5") on each side of the unit.

   a) Pick ups and vans
   b) Light trucks up to one ton
   c) Loaders (upon request)

** Amendment

**

3. External Standard Mirrors: These mirrors will be as provided by the manufacturer.

   a) Cars and station wagons

4. External West Coast Mirrors: These mirrors will be of standard dimension approximating 160 mm x 425 mm (6 3/8" x 16 3/4") and mounted on each side of the unit.

   a) One ton trucks and larger

5. Convex Mirrors: These mirrors will be of a minimum 100 mm (4") to maximum 155 mm (6") diameter and not a "stick on" type, and may be added beneath the external mirror or the bracket on each side of the unit. Supplied upon request to garage Foremen.

   a) One ton trucks and larger
   b) Graders
   c) Pick ups with canopy
   d) Vans with obstructions mounted on the exterior of the unit requiring special working views such as a ladder van
   e) All vans that are not equipped with side windows

17.08 POWER SAWS

All power saws are to be ordered on a quantity basis by the Regional Stockman (not by individual Districts or Branches). All requisitions are to be sent to the Director of Equipment Services for approval prior to sending to the Purchasing Commission; this approval ensures proper specifications are attached and that uniformity of purchase is maintained. Districts and Branches will withdraw their power saws, as required, from the Regional Stockman and accept journal vouchers for the costs, which in turn should be paid from the Districts' Tool and Small Equipment Fund.

Power saws will be charged out directly to the foreman or supervisor on the perpetual tool inventory. It is the foreman's or supervisor's responsibility to ensure that the power saws are correctly used on government work only and to ensure they are properly accounted for.

Power saw unit numbers need not be shown on Maintenance Management "DAC" cards.

Fuel and oil may be withdrawn from the Ministry fuel depots and all such withdrawals are to be shown against "X" (District or Branch Number); a project number can be shown if so desired in the signature columns of the H-141A or H-141B form.

Districts or Branches will be responsible for the cost of all repairs to power saws. The Mechanic Foreman will arrange for saw repairs if necessary. He will also decide if it is uneconomical to repair the saw. In most instances the repairs will be carried out by local power saw repair shops. However, Ministry mechanics will carry out repairs in remote areas and during emergencies.

** Amendment

All surplus power saws are to be turned into the nearest Ministry garage for disposal according to existing regulations. No unit is to be disposed of in any other manner.

All stolen or missing power saws are to be reported to the local police. No saw is to be shown on the tool inventory write-off without a valid explanation or the police report number.

Province of British Columbia

Ministry of Transportation and Highways

HIRED EQUIPMENT REGISTRATION

The Ministry of Transportation and Highways in the Kamloops Highway District is compiling its Hired Equipment List and advises all persons or companies wishing to have their rentable equipment such as trucks, backhoes, loaders, excavators, graders, rollers, scrapers, or tractors listed that they should contact the General Office at 523 Columbia Street, Kamloops, B.C. V2C 2T9.

Equipment previously listed must be re-registered during the month on January.

Full details of equipment including serial numbers are required for registration.

District Highways Manager

Kamloops Highway District

Dated at Kamloops, B.C.
this 3rd day of January, 1980.

Note: This is the suggested format and text content for the annual advertisement. Recommended printed size is two column wide by 12 cm long.

CHAPTER 18

REGULATIONS, REPORTS, ETC.

18.01 DISTRICT ROAD REGISTER

Each District maintains a Road Register (Two-post Binder X213, Detail Sheet H.59).

All roads are named and numbered, using assigned Arterial, Secondary and Truck highway numbers, or side road numbers, set by the District.

The Register has five sections:

1. Summaries
2. Road Register
3. Miscellaneous
4. Roads Closed or Abandoned
5. Areas

Sections are separated by a tabbed separator sheet.

SECTION 1 - SUMMARIES

This contains basic information for annual reports.

Part 1 - Summary of Road Functional Types

Form H.60A showing the total lengths by function is brought up-to-date each March. Show adjustments for functional class changes, new roads constructed or taken over, and roads closed or abandoned.

Part 2 - Summary of Road Surface Types

Form H.60B, showing road surface types, is brought up-to-date each March. Show adjustments for surface type changes, new roads constructed or taken over, and roads closed or abandoned.

Part 3 - Summary of Road Maintenance Types (Summer)

Form H.60C, showing road maintenance types by summer volume classification, is brought up-to-date each March. Show adjustments for classification changes, new roads constructed or taken over, and roads closed or abandoned.

Part 4 - Summary of Road Maintenance Types (Winter)

Form H.60D, showing road maintenance types by winter usage classification, is brought up-to-date each March. Show adjustments for classification changes, new roads constructed or taken over, and roads closed or abandoned.

SECTION 2 - ROAD REGISTER

This includes all public roads in the district controlled by the Ministry of Transportation and Highways.

A numerical road index precedes the detail sheets, are:

#1 Jones
#2 Cariboo Highway
#3 Gorse

Complete fully detailed sheets (H.59) for each road, placing the sheets in alphabetical order. (Index separator sheets).

(a) Complete the remarks section noting initial and terminal points by legal description, establishment data, revision and compilation dates, and other pertinent remarks.

(b) Complete the Kilometric Log, showing distances from the initial point to all road junctions, bridges, major culverts (with size and creek name). Include reference to the Highways Landmark Inventory (km.) where applicable.

(c) Complete the right-of-way section by entering current legal status of right-of-way (either Section 4, Highway Survey, or Legal Survey) and dates as well as plan reference number. Plan widths should also be noted. Gazette notice dates would apply for Highway Survey sections, and major subdivisions would be considered Legal Survey.

(d) Place additional information such as permit numbers for utilities, map reference numbers, etc., in the other Reference section.

(e) Use additional sheets if required, and use the blank back for a small plan or sketch showing the road location. A continuation of some reference data could be listed there as well.

FUNCTIONAL CLASS DEFINITIONS

"Arterial Highway"

A highway within a municipality classified as Arterial under Part 3 of the Highway Act.

For Arterial Highways, denote lengths of other functions as well:

Trunk highway connection
Main highway connection
Collector highway connection
Minor highway connection

"Secondary Highway"

A highway within a Municipality classified as Secondary under Part 3 of the Highway Act. The Ministry may contribute up to 50% of the cost of construction or reconstruction and up to 40% of the cost of maintenance if the Municipality submits an estimate by February 1st of each year and it is approved.

For Secondary Highways, denote lengths or other functions as well:

Trunk highway connection
Main highway connection
Collector highway connection
Minor highway connection.

"Trunk Highway"

A route numbered highway or a prime Provincial trunk or artery. Trunk highway designations are assigned by Headquarters and the District must adjust the register to agree with periodic lists which are issued.

"Main Highway"

A heavily travelled local highway joining centres of population. Extensions beyond a centre which act as feeders retain the higher Main Highway status. Main Highway designations are assigned by Headquarters and the District must adjust the register to agree with periodic lists which are forwarded.

If the list includes only a specified section of some highway as Main, the balance would be shown on separate detail sheet(s) as Collector of Minor.

"Collector Highway"

A local highway which serves as a traffic collector from smaller side roads, and serves to direct traffic to a population center, a Trunk Highway, or a Main Highway. These roads are used primarily for through traffic movements but also serve as access to abutting property. There is usually some continuity in the pattern of these roads, such as grid system.

"Minor Highway"

All other District side roads not included in the Trunk, Main, or Collector classifications should be classified Minor. This includes subdivision roads, frontage roads, and minor settlement roads.

The following class definitions are not listed on detail sheets (H.59) but are listed on Form H.60. They are included for reference only.

"Trails"

Ordinary trails maintained by the Ministry regularly or occasionally. Not open to vehicular traffic.

"Mining Trails"

Not normally maintained by the Ministry and not open to vehicular traffic.

"Mining Roads"

Roads open to vehicular traffic but not normally maintained by the Ministry without a Ministry of Energy, Mines and Petroleum Resources Grant.

"Forest Access"

Roads constructed and maintained by the B.C. Ministry of Forests noted for reference only.

"Private"

Roads constructed and maintained privately. These are noted for reference only if major in extent and if acting as a Traffic Generator of importance to public roads.

"Frontage Roads"

A road adjacent to a trunk or main highway servicing a built-up area or subdivision and limiting access to the major artery.

The length of these roads is recorded as part of the "Minor Highway" designation.

DEFINITIONS OF ROAD SURFACE TYPES

Type "A"

A road with a concrete surface or with 38 mm or more (compacted thickness) of hot paver-laid hot mix asphaltic concrete, prepared to precise specifications on gradation proportions and consistency of composition.

Separate totals must be shown on detail sheets for:

"A - PC" - Portland Cement Concrete Surface

"A - BPM" - Bituminous Plant Mix Surface.

Type "B"

A road with pulvi-mixed or road-mixed asphaltic base-course, bituminous penetration or soil-cement base-course. This type is frequently a base preparation for a Type "A" surface. This includes inverted prime roads built to 4 cm or more (compacted thickness) of asphaltic concrete.

Type "C"

An improved all-weather road with a surface of gravel or other fragmented material coarser than sand, with or without added sand-clay, soft shale, topsoil, light bituminous, chemical or Portland cement admixtures or light oil penetrations to lay dust or improve traffic service.

Type "D"

A pioneer road of natural earth which may or may not have been aligned, graded or drained. This includes cleared right-of-way open to traffic without other improvements.

Type "E"

A cleared right-of-way not open to traffic.

Type "F"

A legally established uncleared right-of-way not open to traffic.

SECTION 3 - MISCELLANEOUS REGISTER

Part One - Ordinary Trails

List trails maintained regularly or occasionally by the Ministry on Form H.60 as follows:

1. Name of Trail
2. Initial Point
3. Terminal Point
4. Total Length
5. This sheet is to be totalled, showing total length of trails in the district

Part Two - Mining Trails

List mining trails not normally maintained by the Ministry except by Ministry of Energy, Mines and Petroleum Resources grant on Form H.60 as in Part One. Forward a copy of this part to Senior Inspector, Ministry of Energy, Mines and Petroleum Resources, Parliament Buildings, Victoria, B.C.

Part Three - Mining Roads

Same as for Part Two, Mining Trails.

Part Four - Forest Access Roads

List forest access roads to lookouts and working circles, built and maintained by the Ministry of Forests on Form H.60. Basic information, which is obtainable from the District Forester, is shown as in Part One.

Part Five - Private Roads

List all major private roads built and maintained by private concerns or industry on Form H.60. All private logging and other roads do not require listing. List only those which act as a major traffic feeder to public roads.

SECTION 4 - ROADS CLOSED OR ABANDONED

(a) If a complete road is closed under Section 9 of the Highway Act, Road Detail Sheet H.59 will be transferred from Section 2 of the Road Register to this Section 4. Note thereon date of gazette notice and closure and reasons for closure.

(b) Where a portion of a road has been closed or abandoned, a new Road Detail Sheet H.59 will be prepared showing the portion of the road concerned and authority and reasons for closure. This sheet will be placed in Section 4. In this case, the original sheet in Section 2 will be amended by deducting the length abandoned, changing the initial or terminal point descriptions as necessary, and noting in the remarks section the portion of the road that has been closed.

(c) Under no circumstances should a road or a portion of a road be closed without noting this in Section 4 for future reference. Closure procedures are outlined in Part 1, Section 9 of the Highway Act.

SECTION 5 - AREAS

(a) Minor roads have been grouped by areas for cost accounting of maintenance expenditures.

(b) Prepare a list, using Form H.60, showing Arterial, Secondary, Trunk and Main Highways by number, name, and listing lengths of each. Following this, list each area by name and/or number.

(c) The total lengths of Arterial, Secondary, Trunk, Main and Areas should balance with the total distance of roads in the district in Section 2 of the Register.

GENERAL

(a) An extra copy of Form H.60 may be typed for general field use, if desired.

(b) Two copies of the complete register are to be prepared, one for district use and one to be forwarded to the Regional Office.

(c) Revisions to the Register, as necessary, may be made throughout the year in pencil. All revisions are to be typed and revision pages placed in the register in March of each year, with a copy to the Regional Office.

(d) Subdivision plans recommended for approval through your office and registered, will add to your road lengths. If these add to existing roads, amend the detail sheet concerned, quoting the subdivision plan registration number as authority. If subdivision roads are in a built up area, it can be indicated as a named area and lengths added to the area as additional sections are opened up.

(e) The District Technician is responsible for the preparation of this register and to see that changes are notated throughout the year.

(f) It is stressed that this register is the only official record of public roads in the Province. Completeness and accuracy are essential.

18.02 BRIDGE INSPECTION REGISTER

(a) Inspections

Bridge Inspection Register information will be prepared and maintained by each District, along with inventory data required in the Bridge Information System. Every bridge must be inspected annually and the inspector's finding's and remarks must be recorded and entered into the Bridge Information System.

(b) Reports

Bridge Inspection Register reports shall be printed such that complete sets are kept up-to-date in each District Office, Region Office, headquarters Maintenance Office, and headquarters Bridge Branch. Index listings, Inventory summaries and other standard reports will also be kept at these locations.

(c) Information

When a bridge has been replaced by culvert and fill or turned over to another agency the status of the structure must be updated in the Bridge Information System such that all information will be available in future even though no further inspections occur. This would be by special request only.

When a bridge has been repaired the repairs must be noted and the Inspection report corrected to show the current status or condition of the structure.

When a bridge has been replaced or rebuilt a complete re-inventory of the structure is required. Partial re-construction will require some amendment of inventory information from time to time.

When a bridge is being newly built or added on our road network a complete inventory of the structure is required. A number for the structure must be obtained from headquarters prior to submission of data (Bridge Branch or Maintenance Office).

Note: Bridge Inspection Register reports will show five years of inspection data only. Earlier data will be archived and available on request.

(d) Naming Convention

The following naming convention has been adopted for all highway structures on inventory with the Ministry:

Bridge (BR.) ...structure carrying highway over water and/or land except as defined below....

Overpass (O/P) ...structure carrying highway over a road.

Underpass (U/P) ...structure carrying road over a highway.

Separation (SEP) ...structure carrying highway over another highway, or carrying road over another road.

Flyover (F/O) ...structure carrying one-way traffic of a highway.

Overhead (O/H) ...structure carrying highway over railway or railway and another facility.

Railway Underpass (RAIL U/P) ...structure carrying railway or railway and another facility over highway.

Pedestrian Overpass (PED O/P) ...structure carrying pedestrians over highway.

Note: In all cases "highway" refers to any road, highway or other designation of the Provincial highway system. In the above definitions for Overpass and Underpass, "highway" is considered as senior to the other facility
** by either route designation or traffic volume, except for pedestrian structures. For Separation they are considered to have equal status (e.g. Highway #401 and Highway #9).

(e) Inspection Procedures

Inspections are to be carried out by qualified personnel. Bridge Foremen and Technicians will perform the majority of inspections, particularly on all timber or log structures or lesser permanent structures. For larger or more specialized structures (e.g. suspension spans, movable bridges, floating bridges, etc.) a Bridge Engineer should be involved in the inspection.

If in doubt on any structure refer to the Regional Bridge Engineer or the Bridge Inspection Engineer at headquarters.

Note: Bridge Inspector's Training Manuals are available from the U.S. Dept. of Transportation (Supt. of Documents, U.S. Gov't. Printing Office, Washington, D.C. 20402) via the Ministry Library. These are excellent training guides and reference manuals applicable to any organization involved in bridge engineering.

There is also a condensed discussion of bridge inspection in the Maintenance Manual available throughout the Ministry.

** Amendment

(f) Photologs

When structures are being newly constructed or re-constructed a set of photos is required for Bridge Photologs. This set should include pictures of the structure from either approach, from upstream and downstream (or equivalents), and the underside detail as well as any other detail required to adequately define the structure visually. The stream channel (or equivalents) from both directions and the roadway approaches should also be photo logged.

These photo sets are to be distributed such that each District has a set for each bridge in that District, each Region has a set for all structures in that Region, and headquarter Bridge Branch (Bridge Inspection Engineer) has a complete Provincial set. Photocopies of pictures are not acceptable.

In addition to "as-built" photographs it is necessary that unusual inspection conditions be photographed for clarification in passing information to Inspection offices at Region or headquarters. These normally would accompany written descriptions or reports as may be requested or required for serious structural defects.

(g) Inspection Rating

Each structural component is inspected and rated on a five-point condition system as follows:

1. VERY GOOD (New) ...Built within the last 12 months and no defects at all.

2. GOOD ...Structurally sound, no weathering or rot, no pitting/peeling/rusting or spalling, with immeasurable wear, and clean and free of dirt and debris.

3. FAIR ...Structurally sound but minor items in need of repair.
   e.g. Timber - minor wear and/or weathering but no rot showing.
   Concrete - minor spalling, scaling, chipping, staining and cracking.
   Steel - light rusting (pitting) on exposed surfaces but none on protected surfaces.
   All - moving parts free to move, no joints leaking.

4. POOR ...May be structurally unsound, major items in need of repair.
   e.g. Timber - loose bolts, loose or heavily worn planks, rot or vermin attack evident, cracking/sagging/crushing evident, large movement under live load, members out of line.
   Concrete - cracking, heavy spalling with reinforcing steel showing, exposed aggregate, efflorescence and heavy rust stains exuding from cracks, joints leaking, shrinkage cracks.
   Steel - loose connections, heavy rusting/paint flaking, bearings off center or seized, members bent, anchor bolts bent.

** Amendment

5. VERY POOR ... Structurally unsound requiring limiting of loads and/or immediate strengthening or replacement.
e.g. Timber - visible rot, heavy crushing, missing bolts, very heavy wear, delamination, sagging.
Steel - missing bolts/rivets, cracked welds, members buckled or badly bent, loss of cross section due to heavy rusting or deep pitting, anchor bolts broken, expansion bearings past limit of movement.
Concrete - large cracks, exposed and damaged reinforcing, pockets of loose aggregate, beams crushing mid-span or at the supports, missing pieces in load carrying areas.

Note: Non-repairable structures should be dismantled. All bridges dismantled or turned over to other agencies will be specially coded for information retrieval on request.

All "Poor" and "Very Poor" conditions must be qualified by an explanation in the commentary section of inspection data sheets. Written reports may be requested.

18.03 REGISTER OF PROPERTY, RESERVES, LEASES AND LICENCES

A register of all land, gravel pits and quarries, buildings, reserves, leases, agreements and water licences, etc., must be maintained by each District office.

This register will contain small scale plans of all land under the jurisdiction of this Ministry or reserves for the use of the Ministry as well as details of lease agreements, etc.

Sheets P.W.H. 95 and H.97 may be supplemented by a blank sheet numbered 1B, 2B, 3B, etc., for the purpose of mounting pictures.

Refer to Accounting Instructions A-95-2 and A-95-4 for preparation details and sample forms.

Indicate on left side of heading of form the use of the property, i.e. "Ministry of Transportation and Highways - Storage Yard", "Ministry of Transportation and Highways - Gravel Pit", etc.

18.04 REGISTER OF GRAVEL PITS AND QUARRIES

Shown on P.W.H.95 a sketch giving dimensions of property owned or reserves, with topographical notes.

Show on reverse side of P.W.H.95, ruled for such, suitability of gravel - (a) crushing, (b) pitrun, (c) estimated quantities.

H.187 from Geotechnical and Materials Testing Branch, may be attached.

18.05 REGISTER OF RAILWAY CROSSINGS

A register of all Railway-Highway crossings under the jurisdiction of the Ministry of Transportation and Highways is maintained at Headquarters by the Bridge Branch.

Each Region and District shall maintain a Register of its own crossings.

The Register shall consist of a computerized printout recording all desirable information pertaining to such crossings and contained in a specific loose leaf binder.

Crossings are listed by Railway, Subdivision and Mileage with the name of the location and highway, road or street name. All railway crossings, other than private crossings and those within the boundaries of the municipalities shall be included in the register. The Ministry's own private crossings shall also be listed. All other information is listed as per headings plus a remarks section which follows the layout behind and below the appropriate Board Order. Remarks should be brief and complete.

Additions and amendments are prepared at Headquarters by the Bridge Branch and copies of such additions and amendments will be distributed regularly to the Regions and Districts. Should any data by incorrect, the Bridge Branch should be advised immediately.

Detailed instructions pertaining to the establishment of crossings are contained in Chapters 5 and 10 of the Manual.

18.06 NUISANCE GROUNDS

The Ministry will maintain roads to nuisance grounds operated by organized bodies such as ratepayers' associations, Farmers' Institutes, etc., if sanctioned by the Ministry of Health and not being used for the commercial disposal of garbage.

On occasion, Ministerial equipment may be used for the preparation of pits and back-filling when required. The maintenance of the service roads to nuisance grounds, particularly in the winter time, will have a very low priority.

18.07 CAMPS

Prior to setting up a Ministerial camp, carefully consider the economic aspects, including availability of public accommodations.

Camps are considered under the following categories.

Temporary Camps

A temporary camp is a group of tents and/or trailers containing all the required services for the employees at a temporary location and on a temporary basis only.

Semi-Permanent Camps

A semi-permanent camp is a group of buildings on a permanent location to handle the needs of a crew living in a camp during extended

periods. Generally, a camp of this nature is set up where a major construction project lasts several seasons.

Permanent Camps

A permanent camp is one which is set up to operate on a permanent basis, as an integral part of the Ministry organization. These camps may be only seasonal camp, such as the camp at Allison Pass.

ACQUISITION OF LAND

Construct all camps preferably on Crown land wherever possible, and secure a reserve in favor of the Ministry of Transportation and Highways. However, where no suitable site can be secured on Crown land, then negotiate with the owner prior to setting up the camp in order to eliminate any ensuing complaints and damage claims. Carry out all conditions of the settlement as soon as possible, such as fencing, grading, timber, disposal of refuse, use of water, etc. Leave the site clean and tidy when abandoned. Lease the land for temporary camps only. Consider purchase for semi-permanent and permanent camps.

SANITARY CONTROL

Adhere to the "Regulations for the Sanitary Control of Industrial Camps", published by the Ministry of Health, British Columbia, as closely as possible in regard to securing water supply, sewage disposal, garbage disposal, and general health requirements of the camp.

FIRE CONTROL

Follow regulations pertaining to the "Fire Marshal's Act", available from the Queen's Printer, Victoria, in setting up and maintaining suitable fire protection.

In particular, provide fire extinguishers, water pails, sand pails, pumps and hoses, etc.

Lay out the camp so that the fuel storage and disposal area, shops, etc., are as far as possible from the living quarters.

Paint all shops, fuel storage areas, etc., with a fire retardant paint.

CONSTRUCTION AND MAINTENANCE

Keep the grounds of the buildings neat and tidy at all times. Prior to the setting up of the buildings, draw up a plan of the property so that the camp will develop in a neat and orderly manner.

Landscape the grounds and keep relatively free of weeds.

As all buildings require a certain amount of maintenance yearly, keep in good condition at all times. At no time allow buildings to deteriorate to the extent where they are beyond the state of normal minor maintenance.

ACCOUNTING PROCEDURE

In all cases follow closely Standing Accounting Instructions A-25-1. These instructions outline the accounting procedure and financial control in regard to setting up of, and operating, a camp.

BEHAVIOUR

All camps must be run in an orderly manner.

18.08 HIGHWAYS - FORMAL TENDERS
**

1. AUTHORITY

Sections 49 and 50 of the Ministry of Transportation and Highways Act reads as follows:

Tenders

Sec. 49. (1) The Minister shall invite tenders by public advertisement, or if that is impracticable, by public notice, for the construction and repair of all government buildings, highways and public works, except

(a) in case of pressing emergency where delay would be injurious to the public interest; or

(b) where from the nature of the work it can be more expeditiously and economically executed by the officers and employees in the Ministry.

(2) The Minister shall cause all tenders received to be opened in public, at a time and place stated in the advertisement or notice. The prices shall be made known at that time.

(3) In all cases where the Minister believes it is not expedient to let the work to the lowest bidder, he shall report to and obtain the authority of the Lieutenant Governor in Council before passing by the lowest tender, except where delay would be injurious to the public interest.

Power to contract

Sec 50. The Minister may contract with any person as may be advisable to carry out the provisions of this Part, but no deed, contract, document or writing shall be deemed to be binding on or to be the act of the Minister unless signed by him and sealed with the Ministry seal; except if it is inconvenient for the Minister to sign, the deed, contract, document or writing may be signed by a person authorized in writing by the Minister to do so.

** Amendment

The act must be strictly adhered to and, unless an "Emergency" exists, all work or services proposed to be undertaken by private individuals or firms must be publicly announced either by advertisement in the press or by public notice.

Selective invitations to bid only through letters or telephone communications to known capable firms or individuals defeat the purpose of the Act. However, there is nothing to prevent the official who posted the notice or advertisement telephoning two or more firms requesting that they submit bids.

2. MINISTRY REQUIREMENTS - FORMAL CONTRACTS

- Requires Ministry Executive and Treasury Board approval. This relates to expenditure authority and is arranged via the Director of Financial Services
- Must be advertised by Contract Documents Officer.
- Must be opened at Headquarters.
- Must be awarded by Director of Financial Services.
- Requires Bid Bond or Bid Deposit.
- Requires formal executed Contact Agreement form with c.c. to Comptroller-General (see Appendix A).
- Requires payments to be processed at Headquarters.
- Requires Statutory Affidavit prior to final payment.
- Requires W.C.B. clearance prior to final payment.
- Requires acceptance letter on final quantities before final payment.
- Usually requires a charge for set of plans and specifications.
- Usually requires Insurance coverage.
- Usually requires Performance Bond and Labour & Material Payment Bond.
- Usually requires detailed General Specifications and/or Plans.
- Usually requires Progress claims.
- Usually requires Contract Retention.

3. AUTHORITY TO ADVERTISE & ADVERTISING

All formal tenders will be advertised by the Contract Documents Officer after the necessary approvals from the Executive and Treasury Board have been obtained. Advertisements will be placed in the Journal of Commerce of any other newspaper considered desirable in certain cases.

4. ADVERTISING PAYMENTS

Accounts for Highways-Tenders advertisements for formal contracts will be processed through the Contract Documents Officer.

5. TENDER SECURITY OR DEPOSIT

All formal tenders will call for a security deposit as follows:

(a) 10% Bid Bond if tendered sum is $200,000 or more (no cheques accepted).
(b) 10% Bid Bond or 10% cash deposit if tendered sum is less than $200.000.

** Amendment

CHAPTER 19

OPERATION OF MINISTRY VEHICLES & EQUIPMENT

PREFACE

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Structure and Numbering
Purpose
Distribution
Application
Authority
Effective Date
Terms and Definitions

19.01 APPROVED USE OF MINISTRY VEHICLES & EQUIPMENT

19.02 APPROVED OPERATORS

19.03 SAFE OPERATION

19.04 VEHICLE & EQUIPMENT CONDITION

19.05 ACCIDENT ACTION AND REPORTS

19.06 RESPONSIBILITIES FOR VEHICLE & EQUIPMENT USE AND OPERATION

PREFACE

This chapter contains policies and procedures governing the use and operation of Ministry vehicles and equipment.

Scope

Specifically excluded from consideration in this chapter are related policies and procedures concerning discipline, purchasing, accounting, and mechanical maintenance. Reference should be made to the appropriate chapters of this, and other manuals for policy and procedure statements applicable to the above areas.

Detailed operating practices for specific units are presented in the EQUIPMENT OPERATOR TRAINING PROGRAM.

Structure and Numbering

This chapter contains six policy statements, numbered 19.01 to 19.06, inclusive. For ease of amendment, each policy begins on a new page. Procedures follow the appropriate policy.

Purpose

This chapter is intended for use:

(a) as an authoritative reference, to be consulted as and when necessary by persons operating Ministry vehicles & equipment, their supervisors, and their managers;

(b) as an introductory working guide, to be studied and understood by new operators; and

(c) as a reference document, to be studied in detail during the training of operators.

Distribution

Copies of this chapter are distributed to, and must be kept current by holders of all Operations Manuals and Manuals of Policy and Procedure.

It is the responsibility of the supervisor to ensure that persons working under his direction have ready access to, and fully understand the contents of this chapter.

Application

The policies and procedures contained in this chapter apply to all operators of Ministry vehicles and equipment, as defined below under the heading, "Terms and Definitions."

Authority

The policies and procedures presented in this chapter have been reviewed by the Personnel Programs Branch. They are approved by the Executive Committee.

Suggestions for change may be made by any employees, either to his supervisor or to his Regional Driver Trainer. Recommendations are to be forwarded to the Director of Personnel Programs Branch.

In the case of disagreement between this chapter and any previous directive, circular letter, memorandum, or oral instruction, the statements contained herein shall take precedence, except that no statement in this chapter shall be construed to countermand or take precedence over any order, regulation, or requirement of:

(a) the British Columbia Motor Vehicle Act and Regulations and related legislation;

(b) the Industrial Health and Safety Regulations (Workers' Compensation Board);

(c) the Master Agreement and any Component Agreement made between the Government of the Province of British Columbia and the British Columbia Government Employees' Union, or the B.C. Government Professional Employees Association.

Effective Date

The policies and procedures contained herein become effective immediately. They shall remain in effect until amended or rescinded by the Executive Committee, and until notification is received by letter over the signature of the incumbent Deputy Minister.

Terms and Definitions

1. The masculine gender, whenever used in this chapter, will also denote the feminine gender, unless stated otherwise.

2. The word, "Ministry" will refer to the Ministry of Transportation and Highways, and shall include:

   - the Administration & Services Department;
   - the Transportation Policy Department;
   - the Motor Vehicle Department;
   - the Highway Operations Department; and
   - the Motor Carrier Commission.

3. The expression, "Ministry vehicle" or "vehicle" will include any motor vehicle or unit of mobile equipment, machinery, and/or attachments that are owned, leased, or rented by the Ministry for purposes of transportation, and/or construction or maintenance of Provincial roads and highways.

4. The term, "Ministry employee", will include any person occupying a full-time, part-time, or auxiliary position staffed by the Ministry.

5. The term, "responsible official", will include Regional Branch Directors, or District Highway Managers or Managers in an equivalent position.

6. The Training Operator is a Branch or District employee delegated to train Ministry vehicle and equipment operators.

(l) Transport Inspecting Engineers with vehicles assigned for take-home use by the Chief Inspecting Engineer, as job requirements dictate;

(m) Property Negotiators, with approval from a Regional Director where an assigned vehicle is required for after-hours use.

11. Take-home permission is automatically extended to personnel relieving or substituting in the above positions.

12. An assigned vehicle may be taken home by designated Highways Operation Department Regional Managers, Engineers, and officers when travelling away from the office for more than fifty percent of the working hours during any one week.

13. During emergencies, Regional Directors and Branch Directors may give temporary take-home permission.

14. In normal circumstances, Ministry vehicles will be used whenever an employee travels by road on Ministry business. A distance allowance for personal vehicles will be permitted only when a Ministry vehicle is unavailable or when such usage is to the Ministry's advantage. Prior approval must be gained before a distance allowance will be granted for use of a private vehicle.

15. Applications for exemptions to the above procedures must be made to the Assistant Deputy Minister, Administration and Services by the Director responsible for the position in question.

19.02 POLICY REGARDING APPROVED OPERATORS

Ministry vehicles and equipment may be operated only by authorized personnel.

Application

This policy applies to all Departments, Commissions, Divisions, Branches, and Districts within the Ministry.

Procedures

1. Any person applying for employment in a position requiring the operation of a Ministry vehicle may be required to provide a current B.C. Motor Vehicle Branch transcript of his driving record or authorize Ministry access to such information before being hired.

2. Ministry vehicles will be operated only by persons possessing a valid Equipment Operating Permit (H195 or H195A) endorsed by the Regional Driver Trainer for the vehicle type. To qualify for an Equipment Operating Permit an employee must:

(a) Drivers license checks will be conducted at regular intervals to ensure compliance, in the event of non-compliance the Regional Driver Trainer will revoke the persons Equipment Operating Permit.

(b) successfully complete the prescribed Equipment Operator Training for the unit type.

3. Persons employed in a position requiring the operation of a Ministry vehicle must maintain a valid B.C. Driver's Licence. (The operator will immediately report to his supervisor any suspension of, or restriction to his Driver's Licence.)

4. The responsible official will determine the need to train an employee to operate Ministry vehicles. Regardless of the class of driver licence held by the employee, the responsible official will arrange for introductory training and evaluation with the Training Operator.

5. The Ministry has been granted the privilege of training, testing, and certifying operators according to the MVD Driver Certification Program. The Superintendent of Motor Vehicles may withdraw this privilege if, in his opinion, there is abuse of the program or failure to maintain satisfactory standards of training and assessment.

6. In accordance with the MVD Certification Program, practical road tests will be conducted as and when necessary, to maintain operator standards. In the event that performance fails to meet the required standards, the Regional Driver Trainer may revoke the operator's Equipment Operating Permit.

7. For all Ministry employees except Motor Vehicle Department Drivers Licence Examiners, authorization procedures are as follows:

(a) The responsible official will identify training needs for operations under his direction.

(b) Training will be offered to the senior employee in a related classification within the work group.

(c) The Regional Driver Trainer will coordinate the services of the closest available Training Operator.

(d) The official responsible for that Training Operator will allocate training resources and training time as operationally feasible.

(e) Training will be conducted by the delegated Training Operator, according to a planned and systematic procedure as established by the EQUIPMENT OPERATOR TRAINING PROGRAM.

Training time will be recorded on Daily Activity Cards.

(f) The Training Operator will regularly assess and discuss the trainee's progress with the trainee, and his supervisor.

(g) The Training Operator's manager and the trainee's manager will decide if training is to be discontinued as a result of unsatisfactory progress; the trainee shall be advised in writing of the reasons for discontinuance.

(h) On satisfactory completion of the training, the Training Operator will complete and forward, to the Regional Driver Trainer, the required documentation.

(i) The Regional Driver Trainer may, at his discretion, conduct any further evaluations that appear necessary.

(j) The Regional Driver Trainer will complete the operator's record, register and validate the permit, and forward the permit to the operator by the most direct route.

8. For Motor Vehicle Department Drivers Licence Examiners, the authorization procedure is as follows.

(a) The Section Head Driver Services will provide the Regional Driver Trainer with a letter advising that the Motor Vehicle Department Drivers Licence Examiner is competent to operate specified equipment. This will preclude the need for any practical exam or test.

(b) The Regional Driver Trainer and the employee's supervisor will jointly coordinate introductory training.

(c) The Regional Driver Trainer will complete the documentation and will register and issue a permit that is endorsed according to the recommendations of the Section Head Driver Services.

9. Where an employee's supervisor has reasonable cause to believe operating privileges should be suspended, he will take action as follows:

(a) The action will be as immediate as possible, by oral advice to the employee, his Manager, and the Regional Driver Trainer.

(b) The employee will be advised in writing, wherever possible within 24 hours of the action being taken.

(c) Reinstatement of an employee's privilege to operate Ministry vehicles is at the discretion of the responsible official, and may be on a trial basis. The respective Regional Driver Trainer will be informed by the responsible official, of such reinstatement.

(d) The Regional Driver Trainer is the only person authorized to revoke an Operator's Permit.

19.03 POLICY REGARDING SAFE OPERATION

Ministry vehicles shall be operated safely, and in accordance with the principles of defensive driving.

Application

This policy applies to all Departments, Commissions, Divisions, Branches, and Districts within the Ministry.

Procedures

1. Reverse movement is to be avoided whenever possible. Before backing a stopped or parked vehicle, the operator will check to the rear and both sides by walking around the vehicle. He will also sound two short horn blasts to warn nearby persons. When requested, passengers will assist the operator as lookouts and guides during reverse movement. The operator will stop the vehicle immediately if he loses sight of the guide(s). All unguided reverse movements will be at a speed not greater than 3 km per hour.

2. Parking and Vehicle Security:

   (a) Wherever possible, vehicles will be parked in such a manner that the first subsequent move does not require backing.

   (b) Runaway vehicles create a major hazard to life and property and are completely preventable.

   (c) Whenever the operator of a motor vehicle leaves the in-cab controls unattended, he must secure the vehicle against inadvertent movement by using a minimum of <u>two</u> of the following means:
   - transmissions
   - parking brakes
   - wheel chocks
   - lowering of attachments

   (d) No operator shall leave his vehicle until he has taken all necessary action to ensure that it will remain stationary. Proper blocking of the wheels is recommended.

   (e) Standard transmissions will be engaged in low if the vehicle is pointing uphill or in reverse if it is pointing downhill.

   (f) Automatic transmissions must be engaged and locked in park.

   (g) Parking brakes must be properly adjusted, applied and tested, but must not be solely relied upon.

   (h) If the vehicle is left on a grade, turn the front wheels to the curb or side of the highway and rear wheels must be chocked.

(i) Vehicles will be parked with the engine stopped, except where the engine is used to operate auxiliary attachments, in which case the wheels must be securely chocked. The lowering (grounding) of attachments, such as buckets, forks and blades, will provide additional security.

(j) Parked vehicles must be left securely locked at all times to prevent theft.

(k) If a vehicle must be stopped (to clean out a sander, adjust a snowplow, clean off lights, etc.) it will be parked in as safe a location as possible, i.e., off the traveled portion of the roadway, as far to the right of the shoulder as possible, or preferably in a recognizable parking area.

(l) Wheel chocks will be used to prevent unwanted movement of a vehicle, i.e., mobile cranes, garbage trucks, vehicles being inspected or repaired, etc.

(m) The intent of this policy is to provide primary and secondary security whether the vehicle is permanently parked, unattended during warm-up periods, or parked with motor running while external attachments are in use.

3. Seat belts must be worn by operators and passengers. No more than three persons may occupy a standard-sized truck cab equipped with a bench seat. No more than two persons may occupy compact truck cabs or trucks equipped with bucket seats. Seating capacity will be reduced by the bulk of winter clothing and the location of vehicle controls.

4. Animals will not be carried in the passenger compartment of a Ministry vehicle unless properly restrained to prevent interference with the operator of the vehicle.

5. Between October 1 and March 1, and whenever visibility is poor, Ministry vehicles will be operated with low-beam headlights on. Headlights should be turned off when a vehicle is stopped, idling, or operated at low engine speeds.

6. Transport operators must not load an inoperative (dead engine) vehicle without assistance. When a dead engine vehicle is to be loaded on transport, a second operator is to be at the controls of the inoperative vehicle to steer and to operate the brakes.

7. Vibro-packers and dyno-packers are not to be roaded.

8. Loaders, rollers, graders, tractors, and all slow-moving vehicles requiring a slow-moving vehicle warning device (as defined by the Motor Vehicle Act Regulations), will stop at uncontrolled railway crossings.

9. Amber rotary and strobe flashing lights:

Roading Only

(a) Vehicles under 2.74 metres (9 feet) in width, and not displaying a slow moving vehicle sign as per Division 7B of the Motor Vehicle Act Regulations, will not use flashing lights.

(b) Vehicles under 2.74 metres in width, and displaying a slow-moving vehicle sign as per Division 7B of the Motor Vehicle Act Regulations, will use flashing lights during hours of darkness or poor visibility.

(c) Vehicles in excess of 2.74 metres in width, including over-width projections such as the ends of plow blades, will use flashing lights during hours of darkness or poor visibility.

(d) On freeways and expressways on which Sign R-13, is posted (VEHICLES INCAPABLE OF 60 km/h, PEDESTRIANS, BICYCLES, FARM IMPLEMENTS, ANIMALS, PROHIBITED); Ministry equipment may use flashing lights while Roading when travelling at speeds less than 60 km/h anytime.

Working

(a) Flashing lights will be used by all Ministry vehicles when being operated where the public and contractors equipment, workers or other Ministry vehicles require advance warning that the unit is working and there is a hazard of contact.

Stopping or Parking

(a) The flashing light, supplemented with advance warning signs, emergency warning signs, or flares, will be used when a Ministry vehicle is required to stop or park because of an emergency, or protecting workers on that portion of the highway where there is a hazard of contact with another vehicle.

(b) When a Ministry vehicle is stopped or parked where there is no hazard of contact, the flashing light will not be used however, the vehicle four-way emergency flashers may be used as a supplement for the protection of the workers and/or vehicle.

10. Under no circumstances shall explosives be transported in a Ministry vehicle unless the operator is, in the knowledge of the responsible official, fully instructed and competent in the proper practices of handling and transporting explosives.

11. When transporting nuclear materials (i.e. nuclear densometer) they must be properly cased and the vehicle properly signed.

19.04 POLICY REGARDING VEHICLE CONDITION

Ministry vehicles shall be maintained in a safe, mechanically-sound, and presentable condition.

Application

This policy applies to all Departments, Commissions, Divisions, Branches, and Districts within the Ministry.

Procedures

1. Before operating a Ministry vehicle, the driver will carry out the operator's daily pre-trip inspection, as specified for the equipment.

2. Each shift operator will conduct an inspection of the vehicle. If repairs are necessary, or when servicing is due, he will report these requirements to his supervisor, who will make the appropriate arrangements with the Mechanic Foreman.

3. Vehicles will not be operated if judged to be unsafe by the Mechanic Foreman.

4. The operator will ensure that all repairs, fuel, lubricants, tires and accessories are obtained from Ministry garages wherever possible, and that they are properly recorded in the Vehicle Log Book.

5. The operator will keep the vehicle clean and neat.

6. No accessories may be removed from or added to Ministry vehicles without the prior approval of the Regional Manager, Equipment Services.

7. If a vehicle is to be operated in an area where a Ministry yard is not readily accessible, a credit card can be issued to the vehicle by the Regional Manager, Equipment Services. Such credit cards may be used only to purchase gasoline, oil, lubrication, and minor repairs. Purchase of parts, antifreeze, accessories or major repairs requires prior approval of the Regional Manager, Equipment Services responsible for the vehicle.

8. At the close of each month, the operator will advise his supervisor of the odometer or hourmeter reading for his vehicle.

19.05 POLICY REGARDING ACCIDENT ACTION AND REPORTS

Accidents involving Ministry vehicles will be acted upon and reported promptly and correctly to the appropriate officials and agencies.

Application

This policy applies to all Departments, Commissions, Divisions, Branches, and Districts within the Ministry.

Procedures

1. In the event of an accident directly or indirectly involving a Ministry vehicle, regardless of cost or the extent of damage, the operator will, immediately or on the first working day thereafter:

   (a) notify the nearest Mechanic Foreman;

   (b) notify his supervisor;

   (c) submit four completed copies of form H13 (Report of Motor Vehicle Incident) to the District Highways Manager responsible for the District in which the incident occurred; and

   (d) if necessary, report the incident to the police and/or ICBC.

2. Where there is death, personal injury, property damage, damage to a private vehicle, or combined damage estimated to be $400 or more, the operator of any Ministry vehicle directly or indirectly involved in an accident must:

   (a) make no statement of responsibility;

   (b) protect the scene, if necessary, by putting out emergency warning devices;

   (c) provide assistance to the injured;

   (d) request police or ambulance, as necessary;

   (e) ensure that the District Highways Manager responsible for the District in which the accident has occurred is advised;

   (f) record details on PSC 3 (Vehicle Incident Checklist);

   (g) report the incident to the police, and complete such forms as they require (Note: reports must be made within 24 hours to the Chief of Police of the city or municipality in which the accident occurs; in unorganized territory, a report must be filed within 48 hours with the nearest RCMP detachment).

3. Further to (1), in unusual circumstances, where neither the Mechanic Foreman nor any other District Official can be contacted, then:

   (a) if the vehicle is disabled, the operator will request police assistance in having it removed to a secure location; or

   (b) if the vehicle is mobile, the operator may continue his journey, paying attention to the possibility of undetected damage; and

(c) on the next working day, advise his supervisor of the incident, and present the vehicle for inspection to the nearest Mechanic Foreman.

4. Further to (2) and (3), the operator will complete the form. H13 (Vehicle Accident Report), using the information he has recorded on PSC 3. If the operator is unable to complete the H13, the District Highways Manager will designate a competent person to complete this report.

5. Where two or more Ministry vehicles or units are involved in one accident, individual reports must be completed for each vehicle or unit involved.

6. Damaged caused by a "Hit and Run" vehicle is considered as arising from a two-vehicle accident and must be reported immediately to police and nearest Mechanic Foreman. Vehicle damage by vandalism will be reported and evaluated as a vehicle accident. The last operator to use the vehicle will be responsible for completing the H-13.

7. On being notified of an incident, the Mechanic Foreman will:

(a) advise the operator whether or not to move the vehicle;

(b) if necessary, arrange for recovery of the vehicle;

(c) ensure that District Highways Manager responsible for the District in which the accident occurred is advised that there has been an accident, and of the circumstances surrounding the accident;

(d) inspect the vehicle and complete the part of Section A necessary to identify the vehicle and Section B of the H13A (Supervisor's Report - Vehicle Incident);

(e) forward the H-13A's to the delegated supervisor/investigator

(f) assist any investigator;

(g) advise ICBC, where necessary;

(h) arrange for vehicle repairs.

(i) in the case of a leased vehicle, advise the leasing firm.

8. The Supervisor/Investigator will:

(a) inspect the accident scene;

(b) interview the operator;

(c) complete Section A & C of the H-13A's;

(d) forward the completed H-13A's to the District Highways Manager.

9. The District Highways Manager will:

(a) if there has been a death or serious injury, immediately advise the Regional Director, Highways and, if applicable, the Director responsible for the employee. If the employee is a member of a union, the nearest office of that union must also be notified.

(b) designate an investigator (Supervisor, Road Foreman, or District Technician) wherever practical this should be the operators immediate Supervisor. The Regional Driver Trainer and the Regional Health and Safety Officer will be included among the investigators of a serious or fatal accident;

(c) ensure that the accident site is inspected and a suitable investigation conducted;

(d) peruse the completed H13;

(e) provide accident details to the Regional Radio Room, where a number will be assigned to the report (this number will be used as identification in all Ministry correspondence dealing with the incident);

(f) provide comments on Section D. Of H13A;

(g) forward copies of the H13 and H13A, as a set, to:

original - the Insurance and Claims Officer in Victoria

duplicate - the Regional Director (attention of the Regional Driver Trainer)

triplicate - the Regional Manager, Equipment Services responsible for the vehicle

quadruplicate - Branch/District manager responsible for the operator.

10. The Assistant Deputy Minister (Administration) must be immediately advised of death or serious injury to an employee on duty.

11. The Regional Radio Room will allocate accident report numbers to all accidents, and will maintain a record of such incidents in numerical order.

** 12. Accidents will be summarized and telexed from Region to Headquarters (attention: Employee Planning and Development) each Monday morning, in the following format:

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(a) allocated report number;

(b) District or Branch;

(c) date of the accident;

(d) operator's name;

(e) unit number;

(f) type of unit and year;

(g) brief description - including type of accident (e.g. backing up, sideswipe, head-on, etc.).

13. All vehicle accidents involving Ministry vehicles will be evaluated, in the Region of their occurrence, on the basis of defensive driving to determine the three predominant causal factors of each incident.

14. Recommendations arising from a vehicle accident will be assessed by the responsible Official(s), and all reasonable action will be taken to prevent re-occurrence.

19.06 POLICY REGARDING RESPONSIBILITIES FOR VEHICLE USE & OPERATION

Responsibilities for the proper use and operation of vehicles occur at all levels of the Ministry.

Application

This policy applies to all Departments, Commissions, Divisions, Branches, and Districts within the Ministry.

Procedures

1. The Minister:

(a) reviews and approves policy and procedure regarding the use and operation of Ministry vehicles.

2. The Deputy Minister:

(a) advises the Minister on matters pertaining to the use and operation of Ministry vehicles;

(b) reviews and recommends policies and procedures governing the use of Ministry vehicles;

(c) participates in decisions made by the Executive Committee;

(d) reviews and acts upon recommendations for dismissal involving the use of Ministry vehicles.

3. The Executive Committee:

   (a) reviews and recommends policies and procedures governing the use of Ministry vehicles;

   (b) monitors the accident evaluation program;

   (c) reviews and makes recommendations regarding vehicle accidents.

4. The Regional and Branch Directors:

   (a) develop plans, policies, and procedures for use and operation of Ministry vehicles;

   (b) interpret and implement approved plans, policies, and procedures;

   (c) maintain liaison, on matters pertaining to vehicle use, with other Ministries and industrial highway users;

   (d) submit recommendations for changes in and to vehicles;

   (e) provide overall direction to the Regional Driver Trainers in administration of the Equipment Operator Training Plan.

** 5. Employee Planning & Development:

   (a) provides technical advice and assistance to Regional and Branch Directors & their staff.

   (b) assists in forecasting training needs by compiling and analyzing statistics and other information regarding vehicle operation.

   (c) compiles total Ministry training plans and budget requests, for Treasury Board approval.

   (d) assembles, develops, provides, evaluates, and recommends changes to equipment operator training programs.

   (e) assists in establishing standards for equipment operator training.

   (f) in cooperation with the Regional Driver Trainers, prepares and administers budgets for equipment operator training.

   (g) maintains training records.

   (h) allocates funding for special projects.

   (i) in cooperation with the Regional Driver Trainers, monitors all training expenditures on operator programs.

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6. The Branch Managers and District Highway Managers:

   (a) monitor efficiency of vehicle operation.

   (b) identify manpower requirements and skill shortages.

   (c) screen and select trainees.

   (d) plan and administer training budgets and schedules.

   (e) apply consistent discipline.

   (f) monitor effectiveness of operator training.

   (g) ensure special suitability of operators assigned to ambulances and emergency vehicles.

   (h) ensure that standards of operation are monitored and maintained.

   (i) ensure that vehicles are properly selected.

7. The Regional Driver Trainer:

   (a) plans, schedules, and coordinates equipment operator training within the Region.

   (b) develops annual budget submissions for operator training.

   (c) trains training operators.

   (d) monitors effectiveness of operator training.

   (e) provides technical advice to Regional and Branch Directors, Branch and District Highway Managers, and Training Operators.

   (f) makes recommendations for policy.

   (g) recommends operating standards.

   (h) conducts specialized training.

   (i) conducts driver tests and certifies operators.

   (j) authorizes and issues Operator's Permits.

   (k) keeps operator records.

   (l) evaluates and processes vehicle accident reports.

   (l) ensures proper investigation of accidents.

   (m) compiles reports concerned with the Operator Training Plan.

** (n) submits quarterly reports to Employee Planning and Development regarding operator training.

(o) participates in identification of training needs.

(p) maintains liaison with other Ministries and agencies.

(q) may demonstrate vehicle operation.

8. The Training Operator:

(a) conducts training of operators, either individually or in groups.

(b) maintains training records.

(c) reports daily training activity.

(d) assists the Regional Driver Trainer.

(e) advises personnel concerned with the progress of the trainee.

(f) assists operators in preparation of accident reports.

(g) counsels operators.

9. The operator's supervisor:

(a) assigns vehicles, considering:

(i) selection of correct vehicle;

(ii) qualifications of operator;

(b) monitors operation and use of vehicles.

(c) controls authorized after-hours use of vehicles.

(d) assists operator to complete accident reports.

(e) investigates and reports accidents.

(f) arranges for and assists with training.

(g) assesses employee need and potential for training.

(h) processes vehicle reports

(i) maintains liaison with mechanical shop.

(j) ensures that scheduled vehicle maintenance and servicing are conducted.

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(k) counsels operators.

(l) ensures that discipline is carried out.

10. The Mechanic Foreman:

(a) provides technical training to the operator.

(b) ensures that vehicle maintenance and servicing are performed.

(c) evaluates the circumstances surrounding an accident, and advises the operator how to proceed.

(d) arranges for vehicle recovery in the event of an accident, if necessary.

(e) inspects vehicles and initiates supervisor's report in the event of an accident, operational damage, or abuse.

(f) advises the District Highways Manager of accident occurrences.

(g) advises ICBC of accident occurrence, where necessary.

(h) arranges repairs to damaged vehicles.

(i) monitors fuel consumption and repair record to identify driver training needs.

(j) provides advice on the selection and use of vehicles.

11. The operator:

(a) maintains a valid British Columbia Driver's Licence, and advises his supervisor of any suspension of or restriction to his Licence.

(b) familiarizes himself with all legislated regulations and Ministry policies applicable to the use of his vehicle.

(c) drives in accordance with defensive driving techniques and safe operating procedures.

(d) ensures that he is authorized to drive vehicles to which he is assigned.

(e) ensures the safety of passengers and/or cargo, as prescribed by specific regulations.

(f) ensures that his vehicle is in a presentable, safe, and road-worthy condition.

(g) cooperates with supervisors and mechanical shop in implementing preventive and corrective maintenance.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

CLOSING ROAD BY GAZETTE NOTICE

Date (yyyy/mm/dd) _____ (Project/Proponent) _____

Road Name & Number _____

District File: _____ Highways District _____

Location: _____

Description of road to be closed and plan attached	☐ Yes	☐ No
1. Arterial road to be closed within a municipal boundary – arterial OIC attached -	☐ Yes	☐ No
2. Road to be consolidated with applicants title	☐ Yes	☐ No
3. Status of Road:		
a) Section 42, Transportation Act	☐ Yes	☐ No
b) Established by Gazette Notice, dated (yyyy/mm/dd) _____	☐ Yes	☐ No
c) Dedicated by Plan number _____	☐ Yes	☐ No
4. Has the closure been initiated by the private sector? If yes, see attached.	☐ Yes	☐ No
5. Is there any apparent First Nations interest(s)? If yes, see attached.	☐ Yes	☐ No
6. Is there any evidence of contamination? If yes, see attached Contamination Checklist or other report	☐ Yes	☐ No
7. Are public and/or private utilities or works within the area to be closed? If yes, see attached.	☐ Yes	☐ No
8. Have regular users and adjacent property owners been informed in writing of the intent to do so?	☐ Yes	☐ No
9. Is advertising required?	☐ Yes	☐ No
If yes, has advertising been completed?	☐ Yes	☐ No
10. Are accesses maintained to all parcels affected by this closure?	☐ Yes	☐ No
11. Has local government been notified?	☐ Yes	☐ No
12. Provide reasons for closure: _____		
13. Comments or objections. If yes, see attached.	☐ Yes	☐ No
14. Has property been expropriated in the last two years?	☐ Yes	☐ No
15. Any previous applicants on file?	☐ Yes	☐ No
16. Recommended for closure?	☐ Yes	☐ No
17. Conditions of closure:		

_____

Note: ***Review attached documentation if items 5, 6, 7, 13, 14, 15 are checked "Yes"***

Review attached documentation if items 8, 9, 10 are checked "No"

Approved/Not Approved: _____

District Manager Transportation

Comments: _____

H0222 (2008/08)