
UTILITY POLICY MANUAL

Province of British Columbia
Ministry of Transportation and Highways
Highway Planning Branch

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The Utility Policy Manual has been prepared for the benefit and guidance of Ministry staff for the management and administration of public and private utility operations on highway right-of- way.

UTILITY POLICY MANUAL

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HEADQUARTERS

MINISTRY OF TRANSPORTATION AND HIGHWAYS

4W-940 BLANSHARD STREET

VICTORIA BC V8W 3E6

REGISTER OF AMENDMENTS

Manual:

UTILITY POLICY MANUAL

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INTRODUCTION

The Ministry of Transportation and Highways is responsible for building, maintaining and operating the Province's highway system and ensuring that it operates safely and efficiently and for the benefit of the general public. The use of highway right-of-way for utility installations is a privilege which is extended to utility owners in the public interest. This reflects the Ministry's view that there is a substantial benefit to the general public from permitting utilities to occupy highway right-of-way where adequate controls are in place and it is practical to fit utilities into the right-of-way. The purpose of this manual is to set out the policies, standards and procedures which the Ministry has put in place to manage right-of-way use by utility companies.

The Ministry's policy does not distinguish between types of utilities or the ownership of those utilities. Except where safety is concerned, the same policy, standards and procedures apply to all utilities whether they are owned by a public utility company, local government, or private individuals. The following definition of "utility" generally applies throughout the manual.

"A privately, publicly, or cooperatively owned line, facility or system for transmitting or distributing:

- electricity;
- communications;
- gas, oil and petroleum products;
- water; and,
- sewage

or other similar commodity which serves the public directly or indirectly.

These include underground, surface and overhead facilities as well as facilities which use common poles, ducts or conduits on a shared basis".

Except where it is otherwise stated, policies, standards and procedures contained in this document apply only to new utility installations, modifications or replacements of existing facilities.

The Ministry will be issuing amendments to the manual to registered holders of the manual as the need arises. Comments or questions related to utility policy, standards or procedures should be addressed to:

Your local District Highways office; or,
The Ministry's Utility Coordinator,
Professional Services Division,
Victoria, B.C.

See Appendix I for a Ministry of Transportation and Highways Key Contact List.

- 2.1 General Policy for Accommodating Utilities
- 2.2 Authority Over Utility Installations
- 2.3 Utility Policy by Class of Highway
- 2.4 Coordination Between Utilities
- 2.5 Approvals by Other Agencies

Policy

1. **Highway Right-of-Way and the Public Interest.** The Ministry of Transportation and Highways permits utility owners to install equipment and facilities in highway right-of-way where it is practical and safe to do so, recognizing that the use of highway right-of-way provides a substantial benefit to the utilities themselves and to the general public.
2. **Traffic Safety and Highway Development are First Priorities.** The Ministry's primary responsibility is to *ensure that public safety is not compromised* by activities or installations within the highway right-of-way. In addition, decisions related to utilities must ensure that:
 - Existing highway facilities are not damaged or put at risk;
 - Other non-highway facilities are protected; and,
 - Future highway development is not unduly restricted by utilities.
3. **Conformance with Policy and Standards.** Utilities are permitted to use highway right-of-way only where they comply with policy and standards which are established by the Ministry.
4. **Utilities Use Highway Right-of-Way at Their Own Risk.** Although the Ministry and its staff make every reasonable effort to ensure that highway work on highway right-of-way does not damage utilities, the Ministry does not accept responsibility for loss or damage to utility facilities in the highway right-of-way or for any third party liability related to those facilities.

Background to Policy

See Section 2.2 for information on the Ministry's authority to limit and manage the use of highway right-of-way for non-highway activity.

The policy and standards which the Ministry follows in managing the use of highway right-of-way is detailed in other sections of the Manual.

Policy

- 1. Ministry Approval Required:** Utilities may not be installed in highway right-of-way without prior approval from the Minister of Transportation and Highways.
- 2. Removal:** The Minister may order the removal or alteration of utility installations, if necessary, for the protection of the highway or highway users.
- 3. Removal by the Ministry:** If the utility owner does not respond to an order to remove or alter a utility installation, the Minister may carry out that work and recover costs from the utility.
- 4. Delegation of Minister's Authority:** The Minister's power to control utility installations on highway right-of-way is delegated to District Highways Managers and their designates.

"structure" in right-of-way without first obtaining a permit.

Section 12(1) of the *Highway Act* gives the Minister the authority to have a utility installation repaired, altered, or removed, if *necessary or advisable for the protection of the highway or the safety of persons using the highway.*

Several pieces of federal and provincial legislation confer certain rights and responsibilities on utility companies to occupy highway right-of-way. These include: the *Pipeline Act*, the *Hydro and Power Authority Act*, the *National Energy Board Act*, and the *Telecommunications Act*.

Provincial and federal laws have different effects.

Provincial: Where utilities are covered by provincial law, the right to occupy highway right-of-way applies only where the Minister of Transportation and Highways has no objection. This is the case for BC Hydro and all pipelines that are regulated by the province.

Federal: For utilities that fall under federal law, the federal government may intervene and affect decisions made by the Ministry; however, this

Background to Policy

Sections 17(j) and (l) of the *Highway Act* makes it an offence to excavate in highway right-of-way or place a

Subject: 2.2 Authority Over Utility Installations

power is exercised only where a utility company's operations are affected in a "material" way. Utilities covered by federal law include BC

TEL as well as all other telecommunication, cable television, and inter-provincial and trans-border pipeline companies.

Delegation of Minister's Authority: The Minister's power to control utility installations is delegated through the issuance of a "Permit to Construct Works on Highway Right-of-Way". Authority to issue permits is currently delegated to Provincial Approving Officers and District

Highways Managers and their designated staff as follows:

- Permits to: (1) dig up part of a highway or excavate under a highway; and (2) permits to place a structure under a highway (Sections 17(j) and (l) of the *Highway Act*). (Order-in-Council 47/82 and Delegation of Authority Letter, May 24, 1994 delegating Section 17 (i), (j), (k) and (l) to Highway District staff); and,
- Permits to dig up the travelled surface or excavate under an arterial highway (Section 35(1) of the *Highway Act*). (Order-in-Council 2434/81).

Jurisdiction Over Utilities

- **Pipelines**

The province regulates all "intra-provincial" pipelines -- pipelines which move commodities between points in British Columbia. The Engineering and Inspection Branch in the Ministry of Municipal Affairs, Recreation and Housing sets and enforces standards for pipelines which operate at pressures greater than 700 kPa while the Gas Safety Branch in the same Ministry regulates gas pipelines operating below 700 kPa.

The federal government regulates inter-provincial and trans-border pipelines through the National Energy Board.

- **Communications**

The federal government regulates all telecommunication carriers and cable television companies through the Canadian Radio-television and Telecommunications Commission.

- **Electric Power**

BC Hydro and other suppliers of electrical energy are regulated by the province. Standards are set and enforced by the Electrical Safety Branch in the Ministry of Municipal Affairs, Recreation and Housing.

- **Exercise of Federal Power**

Federal authorities can override provincial decisions where they might have a "material" effect on utilities that fall under federal jurisdiction.

Policy

1. **Utilities are Permitted on Most Classes of Highway.** The Ministry's general policy is to permit utilities to occupy highway right-of-way where they can be accommodated without compromising safety or restricting highway development. Consequently, utilities may generally be installed along highway right-of-way regardless of the type of utility or class of highway.

Highway classifications are based on classifications contained in the Ministry of Transportation and Highways *Highway Design Manual*. See Glossary for definitions.

2. **Utilities Are Not Permitted to Use Certain Rights-of-Way.** Utilities generally are *not* permitted on highway right-of-way in the following situations:

- *No utilities along freeway and expressway rights of way except in areas adjacent to and outside frontage roads;*

- *No high pressure pipelines along any class of highway;*
- *No underground electric power cable rated at or above 60 kV (phase-to-phase) along any class of highway;*
- *No overhead electric power cable rated at or above 60 kV (phase to phase) along any class of highway;*
- *No overhead electric power cable supported by towers or multi-pole structures along any class of highway; and,*
- *No pipelines on a bridge or other structure, depending on the commodity that is being transmitted through the line, the design of the structure, and whether or not other pipelines are already in place. See Chapter 14 for exceptions.*

3. **Utilities May Not be Permitted to Use Certain Right-of-Way.** The Ministry may prohibit utilities from using right-of-way where: they cannot be accommodated without interfering with traffic safety; they cannot provide safe working conditions for the Ministry's staff, contractors, maintenance

operations; or they are located in or adjacent to sensitive or scenic areas.

4. Most Utilities Can Cross All Classes of Highway: Most utilities can cross all classes of highway; however, crossings generally are prohibited in the following cases:

- Underground electric cable installations rated at or above 138 kV (phase-to-phase) are not permitted to cross any class of highway; and,
- With the exception of high-voltage transmission lines rated at 138 kV (phase to phase) or greater, overhead telecommunication and electric power line installations generally **are not** permitted to cross freeways or expressways.

5. Exceptions: Exceptions to restrictions on right-of-way occupancy may be permitted by the District Highways Manager.

Background to Policy

Policy is set out in greater detail in other sections of the manual. See Section 2.1 for the Ministry's general policy on accommodating utilities within highway right-of-way. Also, see the following sections for details on particular types of installation:

Section 8	Pipelines;
Section 9	Water and Sewer Lines;
Section 10	Overhead Power and Communication lines; and,
Section 11	Underground Power and Communication Lines.

Policy Proposal

Where there is a strong likelihood that a section of highway will be reclassified to freeway or expressway standard within a 10-year period, there may be a need:

- For those sections to be formally designated as potential Freeway or Expressway;
- For freeway and expressway utility policy to be applied to those sections immediately;

The policy proposal is being developed by the Highway Planning Branch.

Policy

- 1. Coordination Between Utilities.**
In permitting utilities to use highway right-of-way, the Ministry does not accept responsibility for coordinating or protecting the interests of individual utilities.
-

The Ministry, however, has no direct interest in resolving technical or compatibility issues between utilities, and generally does not have the technical expertise required to resolve them. These matters are best addressed by the utilities themselves and, where applicable, by regulatory agencies which have authority.

Background to Policy

The need for coordination is accelerating as more utilities are installed in limited right-of-way and the Ministry improves the highway system to handle increasing traffic volume. Much of that coordination involves issues which affect only the utilities. These include: the use of common facilities under "joint pole" agreements or project-specific agreements (e.g. BC TEL cable installed on BC Hydro poles); and the design and installation of facilities which could damage other facilities (e.g. induced current in pipelines, caused by nearby electric power lines); and the design and installation of facilities which may be incompatible with each other (e.g. domestic water lines near sanitary sewer lines).

Procedure

Coordination of works on highway right-of-way focus on relationship between the highway operations and utility users in general. Relevant procedure is addressed in the following sections of this manual:

- Section 4.1 Coordination Meetings;
- Section 4.2 Program and Project Planning;
- Section 4.3 Dispute Resolution;
- Section 16. Utility Permit Administration; and,
- Section 17. Utility Relocation.

Policy

- 1. Utilities Are Responsible for All Approvals.** Utilities are responsible for obtaining necessary approvals from all other agencies. A permit or approval from the Ministry of Transportation and Highways does not eliminate the need to obtain approvals from regulatory agencies which have jurisdiction over the utility owner or the particular type of installation which is being proposed.
-

Background to Policy

In addition to any approvals from the Ministry of Transportation and Highways, a number of other approvals may be required for a utility installation. The onus is on the utility to obtain all necessary approvals.

The following is a partial list of regulators which have authority over health, safety and engineering aspects of utility installation. A utility owner may have to obtain approvals from one or more of these agencies.

Pipelines

For intra-provincial pipelines

The Gas Safety Branch, Ministry of Municipal Affairs, Recreation and Housing (for engineering design and installation, gas pipelines which are designed to operate below 700 kPa)

The Engineering and Inspection Branch, Ministry of Municipal Affairs, Recreation and Housing (for engineering design and installation of pipelines other than gas pipelines designed for less than 700 kPa)

For inter-provincial pipelines

The National Energy Board (for engineering design, installation, operation, licensing and rate approval on all inter-provincial pipeline systems)

Water and Sewer Lines

The Ministry of Health (to ensure domestic drinking water is not contaminated)

Subject: 2.5 Approvals by Other Agencies

Electric Power Lines

The Electrical Safety Branch, Ministry of Municipal Affairs, Recreation and Housing (engineering, installation, maintenance and operational standards)

Telecommunication Lines

The Canadian Radio-Television and Telecommunications Commission.

References

Provincial Legislation

Electrical Safety Act (and the Electrical Safety Regulation, Electrical and Communication Transmission and Distribution System Regulation, and the Television Equipment Installation on Overhead Electric Lines Regulation).

Gas Safety Act (and the Gas Safety Regulation).

Health Act (and the Sewage Disposal Regulation and Safe Drinking Water Regulation).

Pipeline Act (and the Pipeline Regulations).

Federal Legislation

National Energy Board Act (and the Onshore Pipeline Regulations, National Energy Board Pipeline Crossing Regulations, and the International Power Line Crossing Regulation).

Telecommunications Act.

- 3.1 Right-of-Way Acquisition
- 3.2 Utilities on Section 4 and 74 Roads
- 3.4 Disposal of Surplus Land
- 3.6 Utilities on Highways Through Native Lands
- 3.7 Scenic Enhancement
- 3.8 Utilities on Holding Property

Policy

1. **Right-of-Way for Utilities.** The Ministry's general policy is to acquire right-of-way as needed for highway development only, with no special or extra provisions for utilities.

2. **Acquiring Right-of-Way From Utilities.**

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- Where the Ministry's right-of-way requirement includes property which is occupied by **BC Hydro, BC TEL or West Kootenay Power** under an easement, the utility will extinguish its rights to that property at no cost to the Ministry.

- Where the Ministry is acquiring right-of-way which is owned by **BC Hydro**, the Ministry will compensate BC Hydro at 50 percent of unencumbered market value, with "market value" as defined in the *Expropriation Act*.

3. **Joint Negotiation for Right-of-Way.** Where appropriate, the Ministry works closely with utility owners to coordinate the right-of-way acquisition process.

However, it does not negotiate property purchases on behalf of utilities.

Background to Policy

Where Expanded Highway Right-of-Way Encroaches on Utility Easements. BC Hydro, BC TEL and West Kootenay Power have agreed to a process for extinguishing easement rights on property which is being acquired by the Ministry for highway purposes. That process applies to easements over both private property and Crown land.

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The following are key provisions in the agreements with BC Hydro and BC TEL.

- The Ministry will:

In the case of BC Hydro, *issue a permit to construct in favour of BC Hydro upon execution of the Reference Survey Plan by BC Hydro;*

In the case of BC TEL, or West Kootenay Power, *upon execution of the Reference Survey Plan by BC TEL, or West Kootenay Power ... issue to BC TEL, or West Kootenay*

<< Oct 95

Subject: 3.1 Right-of-Way Acquisition

Power a permit to construct its facilities either in the same location or in another mutually acceptable alternate location;

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- BC Hydro, BC TEL and West Kootenay Power will *forego compensation for the extinguishment of easement rights; and,*

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- Where facilities must be moved, BC Hydro, BC TEL and West Kootenay Power *accept the relocation costs as provided for in the protocol agreement(s) as full compensation for those easement rights and disturbance costs to poles and structures.* These compensation arrangements are set in the protocol agreements and in Sections 15.4 and 15.5 of the manual.

The agreements also set out arrangements for an exchange of plans and for cost-sharing commitments for future relocation of the facilities.

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See the BC Hydro, BC TEL and West Kootenay Power *Protocol Agreements* for full details. Copies of the agreements are included in Appendix I.

Where the Ministry is Acquiring BC Hydro Right-of-Way. The BC Hydro protocol agreement establishes that BC Hydro will receive compensation at "50 percent of unencumbered market value" for any property which is owned by BC Hydro and is required for highway right-of-way. Other conditions are the same as those outlined above for easements and compensation for relocated utilities. See the *BC Hydro Protocol Agreement* in Appendix I for details.

References

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/BC TEL.

Protocol Agreement -- Ministry of Transportation and Highways/West Kootenay Power Ltd.

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Policy Proposal

Exception to the General Policy of Not Acquiring Right-of-Way for Utilities. In certain conditions, there are clear benefits to the Ministry in acquiring extra right-of-way to accommodate utilities. One example is a situation where construction costs can be reduced by taking extra right-of-way to move a utility clear of the construction zone, rather than covering the cost of multiple moves.

In order to provide for special cases where Ministry costs are minimized by taking extra right-of-way for utilities, consideration is being given to a policy change which would allow for the purchase of extra property where it has been established on a cost/benefit basis that there is a net benefit for the Ministry.

The policy proposal is being developed by the Highway Planning Branch.

Policy

1. **Section 4 Roads and 74 Roads.**

By agreement with the Ministry of Environment, Lands and Parks, the Ministry of Transportation and Highways is responsible for managing utilities on Crown Land adjacent to public roads established under Section 4 of the *Highway Act* or Section 74 of the *Land Act*.

2. **Application of Policies and Procedures.**

Policies and procedures set out in this manual apply equally to Section 4 roads and Section 74 roads as well as other highways.

highway structure, land is either administered as Crown Land by the Ministry of Environment, Lands and Parks or is privately owned.

Road allowances through Crown land are also established under Section 74 of the *Land Act*, which permits the Surveyor General to "establish or cancel an allowance for a road or walkway on the border of or through a section, lot or block of Crown land."

Responsibility for managing utilities adjacent to Section 4 roads which pass through Crown Land or on Section 74 road allowances was passed from the Lands Branch to the Ministry of Transportation and Highways under a 1988 administrative agreement (*Utility Line Administration Within Road Allowances*, Memorandum of Agreement between the Ministry of Transportation and Highways and the Ministry of Forests and Lands.) This agreement was revised in 1994 and a copy of the current version is included in Appendix I to this manual.

Under the agreement, Section 4 roads which pass through Crown Land are defined as having:

Background to Policy

Section 4 of the *Highway Act* establishes that roads which have been improved or maintained at public expense are public highways, even where they have not been Gazetted or formally dedicated as a public highway. This section, however, gives the Ministry authority over the traveled way and highway structure only, not to a right-of-way which extends beyond the highway prism. Outside the

Subject 3.2: Utilities on Section 4 and 74 Roads

- *A minimum width of 20 metres (25 metres in the Peace River Block north of the Peace River); or,*
- *A greater width as determined by the MOTH but only so far as to accommodate cuts and fills plus three metres.*

The effect of the Agreement is to give the Ministry of Transportation and Highways the same responsibility for managing utility installations on Section 4 and Section 74 as it carries on other types of highway.

Any utility installations outside the "deemed" right-of-way as defined above, must be dealt with by Crown Lands.

The MOTH/Lands protocol agreement has no effect on tenure which was granted before the Agreement came into effect. Consequently, any rights-of-way or easements which were granted by Crown Lands remain in effect until they expire or are canceled by the utility.

See Appendix I for a copy of the Transportation and Highways/Environment, Lands and Parks protocol agreement.

Responsibility for the Agreement, (*Utility Line Administration Within Road Allowances*). For the purpose of this agreement, the Director, land and Water Programs Branch in consultation with the Surveyor General, (MELP) and Director, Properties Branch (MOTH), are responsible for the review, and if necessary,

amendments to the established road width requirements used in this agreement.

The MOTH Utility Coordinator is responsible for the interpretation and support of this agreement.

The Following MOTH General Circular is canceled:

G Circular 18/77 "Establishing Road Rights-of-Way To Facilitate Power Line Installation along Section 6 Pubic Roads" (canceled: December 31, 1994).

References

Highway Act, Section 4.

Land Act, Section 74.

Utility Line Administration Within Road Allowances, Memorandum of Agreement between the Ministry of Transportation and Highways and the Ministry of Environment, Lands and Parks, 1994.

Policy

1. **The Ministry Makes No Guarantee It Can Accommodate Utilities When It Disposes of Surplus Land.** Permits issued by the Ministry give utility owners permission to use highway right-of-way or structures only as long as that land or public work is under the jurisdiction of the Ministry of Transportation and Highways. The Ministry's procedures are designed to ensure that utilities are not displaced when there is a disposal of land which has been declared surplus. However, the Ministry can provide no guarantee that utilities will be accommodated when there is a disposal of land which has been declared surplus.
 2. **BC Hydro and BC TEL Must be Accommodated Before Land is Declared Surplus.** No highway right-of-way which is occupied by BC Hydro or BC TEL facilities will be declared surplus until the utility has made arrangements with prospective owners to establish an easement or otherwise acquire an interest in the property.
 3. **Sale to a Private Party or a Municipality.**
 - **Disposal by the Ministry.** Where the Ministry is disposing of land to owners of adjacent property, it generally will not conclude the sale until the owner of any utility facility located on that land has had an opportunity to negotiate an easement or otherwise acquire an interest in the property with the prospective owner.
 - **Disposal to Crown Lands.** Where MOTM is transferring land to the Ministry of Environment, Lands and Parks for disposal or for retention as Crown land, it will advise that Ministry of any utility facilities which are known to occupy that land.
-

Background to Policy

Limited Right to Use Highway Right-of-Way. Utility permits issued by the Ministry do not give utilities any right, title or interest in land that they occupy, and make no commitment to accommodate the utility if the use or title of the land is changed. While the Ministry makes a "best

Subject 3.4: Disposal of Surplus Land

effort" to ensure that utilities are not displaced when land is disposed of, it cannot accept responsibility for oversights or for situations where a utility is unwilling to accept reasonable conditions proposed by a prospective buyer.

BC Hydro and BC TEL Facilities on Surplus Land. Under its protocol agreements with BC Hydro and BC TEL, the Ministry has agreed that it *will not declare land surplus until* (the utility) *has made arrangements with the prospective purchaser to acquire an interest in those lands.*

Procedure

Land made surplus through a road closure.

Land which is no longer required by the Ministry as a result of a road closure is disposed of by Property Services at the Regional level through the following process:

- District staff complete a status report including notations on utility interests (Form H.222);
- Where there are utility installations on the land in question, the district gives the utility an opportunity to make arrangements with prospective owners;
- A recommendation to dispose of the land is usually not forwarded to Regional Property Services until the utility has reached agreement with the prospective owners; and,
- Regional Property Services advises the Ministry of Environment, Lands and Parks to initiate the disposal of the land if the utility indicates that it has no interest in the land.

Surplus Land

Properties Branch in Victoria is responsible for the disposal of any land which is not required for highway purposes (for example, where a block of land is acquired for highway right-of-way, with part to be severed for highway use and the remainder to be disposed of as surplus land). The following process is followed in disposing of that land:

- The property is referred to the Regional Property Services office for site inspection and a recommendation on disposal, using Form H.357, *Permission to Sell, Lease or Transfer Land and/or Buildings* is used for this purpose;
- Owners of adjacent property are given the first opportunity to purchase the land;
- Utilities are given an opportunity to negotiate with prospective owners to establish an easement;
- In the case of BC Hydro and BC TEL, no action is taken until the

Subject 3.4: Disposal of Surplus Land

utility has reached agreement with the purchaser;

- The Regional Properties Services office advises the Ministry of Environment, Lands and Parks to initiate disposal of the land; and,
 - If a utility line is located on the parcel of land and no purchaser is identified, the Ministry of Environment, Lands and Parks are advised and generally establish an easement in favour of the utility before the property is sold or otherwise disposed of.
-

References

Form H.222, *Closing Road Allowance by Gazette Notice*.

Form H.357, *Permission to Sell, Lease or Transfer Land and/or Buildings*.

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/BC Tel.

Policy

1. **Utilities on Highway Right-of-Way Through Native Lands.** Permits for utility installations on highway right-of-way which runs through Reserve Land must be approved by the District Highways Manager.

- Authority to use gravel, timber and other materials from the land as required for construction or maintenance of "roads, ferries, bridges or other public works" in exchange for reasonable compensation.

Background to Policy

The Province retained certain rights when it transferred the control and administration of Reserve Lands to the federal government under a 1938 Order in Council (known as "1036"). Those rights included:

- Authority for the province to "resume" or take control of up to one twentieth of the land as considered necessary for "...making roads, canals, bridges, towing paths, or other works of public utility or convenience...";
- The right to carry water over or through the land for mining or agricultural purposes in exchange for reasonable compensation; and,

Under 1036, the Province retained the right to "all traveled streets, roads, trails, and other highways" that existed at the time the Order in Council was passed.

"Resumptions" of Reserve lands represent only a fraction of the total of about 600 agreements negotiated between the Province and individual bands to use Reserve Land.

Early agreements specified that land would be used for road purposes, although the Order in Council used broader language. Beginning in the 1970's, language used in agreements includes "works of public utility or convenience." Since the earlier agreements made specific reference to a road, Native Bands are now taking exception with the Ministry's practice of permitting utility companies to install their facilities on these lands.

Subject 3.6 Utilities on Highways Through Native Lands

Regional Property Services staff are directly involved in negotiations with individual Band Councils where resolution of old or existing problems may be required in order to initiate proposed road improvements on Reserve Lands. The Ministry's Aboriginal Relations Branch is addressing policy issues related to Reserve Lands and advising Property Services staff and others in the Ministry on aboriginal issues.

Procedure

Permits to install utilities on right-of-way which runs through Reserve Lands must be signed by the District Highways Manager. Where issues require discussion, inquiries should be directed to the Regional Manager, Property Services or Director, Aboriginal Relations Branch.

References

Ministry of Transportation and Highways Act, Section 13.

Policy

1. **Scenic Values.** Protection of scenic values along highway corridors is an important consideration in approving utility installations on highway right-of-way.
 2. **Design for Appearance.** The location and design of utility installations must take account of views and the surrounding landscape. The Ministry may impose aesthetic design guidelines as a condition of right-of-way occupancy.
 3. **Underground Installation.** Utilities may be required to install facilities underground as a condition of using highway right-of-way.
 4. **Parkway Reserves.** The Ministry generally does not permit above-ground utility installations in areas which have been designated as Parkway Reserves under the *Land Act*.
-

Background to Policy

Design Practice

The Ministry's *Manual of Aesthetic Design Practice* sets out principles and practices to be followed in approving a utility permit application or designing utility installations. These include:

- Designing pole lines to have the lowest possible visual impact:
 - Through joint pole use;
 - By providing the greatest possible setback from the roadway;
 - By accounting for views in deciding which side of the highway is to be used for a pole line;
 - By spacing poles as far apart as practical;
 - By integrating structures with surrounding landscape and vegetation (e.g. by choice of colour); and,
- Requiring underground installation in scenic and sensitive areas.

The *Manual of Aesthetic Design Practice* should be consulted for additional information.

Subject: 3.7 Scenic Enhancement

Parkway Reserves

The Ministry of Environment, Lands and Parks has established five parkway reserves for "... the use, recreation and enjoyment of the public, and in order to preserve aesthetic values." Those reserves extend along the following sections of highway:

- The Blueberry-Paulson section of Highway 3;
- Nancy Greene Junction to Rossland (Rossland - Sheep Lake Reserve);
- The Salmo-Creston section of Highway 3;
- Highway 31A between Kaslo and New Denver; and,
- The Trans Canada Highway between Glacier National Park and Golden.

As a participant in the parkway reserve system, the Ministry of Transportation and Highways generally does not permit above-ground utility installations in the above noted parkway reserve areas. Exceptions are limited to installations which are ancillary to an underground installation (such as vents for pipeline casings).

Procedure

Proposed utility installations will be assessed in terms of their appearance, their compatibility with adjacent landscape and development, and their effect on views and sensitive areas. Where the impact of the proposed facility is considered to be unacceptable, Ministry staff will work with utility representatives to develop a solution which brings the facility within an acceptable level of impact.

Where district staff conclude that a proposed installation has too great an impact, and there is no opportunity to reduce the impact to an acceptable level, they may:

- Require that the facility be installed underground as a condition of right-of-way occupancy; or,
- Reject the application.

No above-ground installations will be approved on sections of highway right-of-way in areas which have been designated as Parkway Reserves. Low-impact works which are ancillary to an underground installation may be approved as exceptions.

References

Land Act.

Manual of Aesthetic Design Practice, Ministry of Transportation and Highways, 1991 (Section J - Above Ground Utilities)

Proposed Scenic Highway Program

The Highway Environment Branch has initiated the development of a scenic highways program for British Columbia. Work which is underway will result in criteria for rating the scenic value of highway segments and establish a systematic basis for the designation of significant scenic highways, byways and corridors for scenic enhancement and tourism promotion. Results of that work could include more specific guidelines and criteria for utility installations than are now contained in the Manual of Aesthetic Design Practice. The project is scheduled for completion by the end of 1994. Highway Environment Branch is responsible for developing the proposed policy.

Policy

1. **Protection for Future Use.** Where the Ministry of Transportation and Highways administers Crown land for future use, it will ensure that any development which is permitted on that land is consistent with intended future use.
2. **Licence of Occupation Required.** Because holding property is not held as highway right-of-way, a "Licence of Occupation" is issued by the Ministry of Transportation and Highways. The Ministry's Utility Permit is not issued for proposed utility installations on holding property administered by the Ministry.

recreational corridors. These corridors may be occupied by utilities provided that the utility does not restrict the Province's use of the land. In one case, for example, a pipeline was permitted in a corridor on condition that its design include protection against possible damage from induced electrical current caused by a proposed electric-powered Light Rail Transit installation.

Steps which might be taken to protect holding property for future use include: restrictions on the location of utility installations; special design measures to ensure compatibility; and granting occupancy for a limited period of time.

Holding Property Tenure

In most cases, the future use of "holding property" is uncertain. A particular corridor might be held for a number of transportation, recreational or other potential uses. At the same time, the timing of future development is undefined. Consequently, "holding property" is administered as Crown land reserved for public use rather than as highway right-of-way.

Background to Policy

Protection for Future Use

The Ministry of Transportation and Highways manages corridors which have been acquired for possible future use. For example, the Ministry is responsible for a number of abandoned railway rights-of-way which could be developed as road, transit or bicycle routes or as

Procedure

Requests for tenure across holding property are referred to the Regional Property Services Branch.

In responding to a request for a tenure, Regional Property Services will assess the proposed installation in terms of its compatibility with possible public use of the land. Where appropriate, a Ministry "Licence of Occupation", prepared by regional property offices, and is issued for proposed utility installations located on holding property.

The following conditions apply:

- No tenure will be issued for a period exceeding ten years. Tenures are subject to cancellation upon notice by the Ministry;
- Where a long term "recreation" lease or other use has been granted for a public use on Holding Property, the lease shall specify that utility access to the holding property will be a condition of the lease;
- Where appropriate, the lessee will be consulted prior to issuing a Licence of Occupation to the utility applicant; and,
- The conditions of BC Hydro protocol agreement and the BC TEL protocol agreements apply in the event that the Ministry declares any holding property surplus with the intent of disposing of these lands.

No Statutory Right of Way tenures are to be issued to utilities for access through, on, or across holding property.

A Ministry of Transportation and Highways "Licence of Occupation" document is issued by Regional Property Services. The Ministry's Utility Permit is **not** issued by Highway Districts on lands declared Holding Property. See Appendix I for a copy of the Licence of Occupation form.

- 4.1 Communications -- District Maintenance and Operations
- 4.2 Communications -- Construction Program and Projects
- 4.3 Dispute Resolution

Policy

1. **Information Exchange on Program Plans.** Where the Ministry's highway improvement program is expected to have an effect on utilities, District Highways Managers and staff will meet with utility owners on a regular basis to exchange information on plans, programs and schedules.
 2. **Utility Protocol Agreements.** The Ministry recognizes the importance of good communication with utility owners at the management and executive levels, and has established protocol agreements with major utilities as one way to promote and maintain an effective working relationship.
-

meetings and frequent exchange of information foster good communication and ensure that issues are addressed and resolved before they escalate. The protocol agreements which have been put in place with BC Hydro, BC TEL and West Kootenay Power provide a model which applies equally well to other utilities.

Procedure

District Highways Managers should make every effort to hold meetings with utility owners (including municipalities) on a regular basis throughout the year. As a minimum, those meetings should cover the following topics:

- New programs or projects to be carried out by the Ministry within the District, or which will have an impact on the District and by each of the utilities that operate in the district (e.g. pole replacement programs and other infrastructure improvements);

Background to Policy

Oct 95>> **Information Exchange.** Good communication between the Ministry and utility companies is an important part of managing highway right-of-way. Experience has shown that regular

**Subject: 4.1 Communications – District
Maintenance and Operations**

- On-going coordination of maintenance and rehabilitation programs (e.g. ditch maintenance and vegetation management);
 - New policies or standards that are being developed by the Ministry or by the utilities; and,
 - Any procedural changes which might affect the use of highway right-of-way.
-

References

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/BC TEL.

Protocol Agreement -- Ministry of Transportation and Highways/West Kootenay Power.

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Policy

- 1. Information Exchange on Construction Programs.** Where a Utility will be affected by the Ministry's overall construction program, the Ministry will ensure that information and plans are exchanged on a timely basis.
 - 2. Information Exchange on Construction Projects.** Where a highway improvement project includes utility relocation or might otherwise have an impact on utilities, the Ministry's Project Manager will ensure that information and plans are exchanged on a timely basis.
-

Procedure

Regular Exchange of Program Plans

For those Utilities which are affected by highway improvement projects every year, the Ministry arranges a regular exchange of information on forthcoming projects. In the case of BC Hydro, BC TEL and West Kootenay Power the information exchange process operates on the following timetable as set out in protocol agreements:

- By October 1 of each year:** West Kootenay Power/MoTH key contacts will meet for a confidential review of anticipated projects to be included in the (program for the) next fiscal year;
- By November 1:** The BC Hydro/MoTH Key Contacts and BC TEL/MoTH Key contacts will meet respectively for a confidential review of anticipated projects to be included in the (programs for the) next fiscal year;
- Between October and March of each year:** Significant changes to project lists will be exchanged between West Kootenay Power and MoTH Key Contacts;
- Between November and March:** Significant changes to project lists will be exchanged between the BC Hydro and MoTH Key Contacts, and BC TEL and MoTH Key Contacts respectively;

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Subject: 4.2: Communications – Construction Program and Projects

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- **In February:** The Ministry will provide a list of "early tender" projects to BC Hydro, BC TEL and/or West Kootenay Power and identify the Project Managers; and,
- **In April:** Key contacts from BC Hydro, BC TEL and/or West Kootenay Power and MoTH will meet respectively to firm up approved construction projects, schedules, and identify the MoTH Project Manager.

"Key contacts" are identified by the Ministry and the three utilities through a bi-annual exchange of lists. In most cases, the Ministry's key contacts are District Highways Managers.

Project Coordination

Planning for individual projects is generally carried out on a project-by-project basis as outlined in Section 17 of this manual.

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Background to Procedure

The need for information exchange varies. BC Hydro, for example, is affected by the Ministry's program each and every year. On the other hand, a local utility such as an Irrigation District, may be affected only once every 10 years.

Budget cycles also vary, and often do not conform with the Ministry's planning and budget cycle. This is illustrated by key budget planning dates used by BC Hydro and BC TEL, with BC Hydro's schedule paralleling the Ministry's while BC TEL's runs about three months ahead.

BC Hydro

- Fiscal year extends from April 1st to March 31st;
- By mid-October -- all field managers must complete budget submissions for the following fiscal year;
- By early December -- final adjustments to the proposed budget must be complete; and,
- Early in January -- business plans are presented for approval.

BC TEL

- Fiscal year extends from January 1st to December 31st; and,
- By June 30th -- all budget submissions must be completed for the forthcoming fiscal year.

**Subject: 4.2: Communications – Construction
Program and Projects**

Wherever possible, Ministry efforts to keep utilities aware of Ministry plans should account for the planning, scheduling and decision-making process in each utility.

References

*Protocol Agreement -- Ministry of
Transportation and Highways/BC Hydro.*

*Protocol Agreement -- Ministry of
Transportation and Highways/BC TEL.*

*Protocol Agreement -- Ministry of
Transportation and Highways/West
Kootenay Power.*

Oct 95>>

Policy

- 1. Equitable and Timely Resolution of Disputes.** The Ministry is committed to settling disputes at the lowest possible management level and on an equitable and timely basis.

Step 2 *If a resolution is not derived in Step 1, then either party may refer it to the key contact in its organization. This level will be the MOTH District Highways Manager/Project Manager and:*

Background to Policy

Oct 95>> Protocol agreements with BC Hydro, BC TEL and West Kootenay Power include a dispute-resolution process and a commitment to resolve disputes at the lowest possible level in each agency's management structure. This policy extends that principle to all dealings between the Ministry and utilities.

In the case of BC Hydro; *The District Manager, Customer Service, and; The Design Manager or Production Area Manager for Transmission Lines.*

In the case of BC TEL; *The District Manager, Access Operations.*

In the case of West Kootenay Power; *The Regional Manager or his delegate (area supervisors).*

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Procedure

Oct 95>> The BC Hydro, BC TEL and West Kootenay Power protocol agreements set out the following process for dispute resolution:

Step 1 *The first line managers from each organization will give their best effort to resolve all conflicts and issues as they arise on any project.*

Within thirty (30) days of referral, a decision is to be given.

Step 3 *If a satisfactory resolution is not derived in Step 2, then the issue is to be referred to the MOTH Regional Director and:*

Subject: 4.3 Dispute Resolution

In the case of BC Hydro; *The Area Manager, Customer Service and Production Manager, Transmission Lines.*

In the case of BC TEL; *Regional Manager, Access Operations*

Oct 95>>

In the case of West Kootenay Power; *the Manager of Transmission and Distribution.*

References

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/BC TEL.

Protocol Agreement -- Ministry of Transportation and Highways/West Kootenay Power.

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A decision is to be given within sixty (60)days of referral in Step 2.

Step 4 *If the Step 3 individuals cannot reach an agreement, then they must agree on, by the sixtieth day in Step 3, a process for resolution which may require referral to the respective executives, a mutual single third party arbitrator, or some other means appropriate under the circumstances. A final resolution within six months of first notice is expected.*

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Where appropriate, a similar process should be followed in resolving disputes with parties other than BC Hydro and BC TEL and West Kootenay Power.

- 5.1 General Design Standards
- 5.2 Location Within the Right-of-Way
- 5.3 Clear Zone

Policy

1. **Standards Set by the Ministry.** The Ministry maintains a set of standards for utility installations in highway right-of-way with a particular focus on public safety, protection of Ministry staff and contractors, and protection of highway facilities. The Ministry's standards are not intended to replace standards set by regulators or accepted as good engineering practice.
 - Consistency with Ministry policy;
 - Location within the right-of-way; and,
 - The method of installation or attachment.
 2. **Highest Standards Apply.** Where the Ministry and a regulator both set a standard or requirement in a particular area, the highest or most stringent of the two will apply to any installation on highway right-of-way.
 3. **Design Responsibility.** The utility is responsible for the design of any utility facility which it proposes to install in highway right-of-way and for the installation and maintenance of any facility once it has been installed. The Ministry's responsibility is limited to review and approval related to:
 4. **Durability.** All utility installations must be designed for long service life expectancy and must be relatively free from routine servicing and maintenance.
 5. **Design for Expansion.** All new utility installations (or adjustments to existing lines) must make provision for known or planned expansion of those facilities, particularly where the facilities are attached to structures or are buried in the right-of-way.
-

Background to Policy

The general design requirements are based on a number of factors:

- The Ministry's interest in utilities is centred on public safety and preservation of highway facilities;
 - The requirements which are set out in this manual are intended to
-

Subject 5.1: General Design Standards

address these safety/highway preservation issues, and do *not* replace any standards which are set by regulators which have authority over the utility in question;

- The Ministry's interest does not alter the fact that the utility is responsible for safety and for conformance with applicable regulations; and,
 - Requirements for durable design/materials and allowance for future expansion requirements are intended to minimize disruption caused by installation and repair of utility facilities.
-

Standards

For detailed requirements see the following sections of this manual:

Section:

- 8 Pipelines;
- 9 Water and Sewer Lines;
- 10 Overhead Power and Communication Lines;
- 11 Underground Power and Communication Lines; and,
- 13 Trenching, Boring and Jacking.

Policy

1. **Minimum Need for Future Relocation.** Utilities must be located so as to minimize the need for later adjustment to accommodate future highway improvements and to permit servicing those facilities with minimum interference with highway traffic.
 2. **Conformance with Locational Standards.** Utility installations must conform with location-related standards which are set out in this manual.
-

Background to Policy

Locational standards are set out in the following sections of the manual:

Section:

- 8 Pipelines;
- 9 Water and Sewer Lines;
- 10 Overhead Power and Communication Lines; and,
- 11 Underground Power and Communication Lines.

Policy

1. **Conformance with Clear Zone Standards.** Above-ground installations must conform with the Clear Zone standards when:
 - New above-ground utilities are being installed;
 - An existing utility line is being rebuilt or replaced; and,
 - Utilities are being relocated as part of new highway construction or major upgrading of an existing highway.
 2. **Other Remedies.** Other design measures may be acceptable in situations where Clear Zone standards cannot be achieved.
 3. **The Clear Zone Does Not Override Other Standards.** The Clear Zone standard is one of several standards related to the location of utilities within the highway right-of-way. Conformance with Clear Zone requirements does not eliminate the need to conform with other standards.
-

Background to Policy

Clear Zone standards are set out in Section B.1.1 of the Ministry's *Highway Design Manual*. Under that standard, a defined area beyond the pavement edge must be kept clear of all above-ground obstacles including poles, guy lines, and other above ground facilities.

Utilities may be permitted to install facilities within the Clear Zone if they are adequately protected by barriers or other measures. The following design options might be considered (the list is presented in descending order of preference and effectiveness):

1. *Remove the obstacle or redesign it so it can be safely traversed;*
2. *Relocate the obstacle to a point where it is less likely to be struck;*
3. *Reduce accident severity with an appropriate breakaway device; and,*
4. *Redirect the vehicle by shielding the obstacle with a traffic barrier and/or crash cushion.*

Source: *Highway Design Manual* Ministry of Transportation and Highways

Subject: 5.3 Clear Zone

On the recommendation of the Director, Highway Safety Branch, the District Highway Manager will make a determination of the appropriate design option based on local conditions including the accident history of the location of the proposed utility installation.

Clear Zone is one of several standards which affect the location of utilities within highway right-of-way. Each of those standards has a different purpose and effect. Consequently, they must all be accounted for as decisions are made. For example, compliance with Clear Zone standard does not eliminate the need to locate utilities within 2 metres of the edge of right-of-way wherever possible. Other locational standards appear in the following sections of this manual.

Section:

- 3.7 Scenic Enhancement
- 5.2 Location Within the Right-of-Way
- 8.2 Pipeline Location -- General
- 8.3 Pipeline Location -- Lines Along Right-of-Way
- 9.2 Water and Sewer Line Location -- General
- 9.3 Water and Sewer Line Location -- Lines Along Highway Right-of-Way
- 10.2 Pole Lines and Overhead Cable Location -- General
- 10.4 Pole Lines and Overhead Cable Location -- Lines Along Highway Right-of-way

- 11.2 Underground Power and Communication Line Location -- General
 - 11.3 Underground Power and Communication Line Location -- Lines Along Highway Right-of-Way.
-

Procedure

Where utilities are being relocated as part of a new highway construction project or a major upgrading project, the Ministry's Project Designer or Project Manager is responsible for the application of Clear Zone standards.

The District Highways Manager is responsible for the application of Clear Zone standards in cases where: an existing utility installation is being rebuilt or replaced or a new utility facility is being installed on an existing highway. In the case of a pole line which is being rebuilt or replaced, the standards apply only where more than three adjacent poles are affected (i.e. more than three poles in a row).

Standards

New Installations on Open-Shoulder Highway

Clear Zone standards are set out in the Ministry's *Highway Design Manual*. Clear Zone setback requirements depend on a

Subject: 5.3 Clear Zone

number of factors including: class of highway; design speed; whether the facility is being installed on a cut or fill section; and the steepness and height of the cut or fill slope. The following table provides an indication of the set-backs required to conform with clear zone standards for fill sections on rural highways. It is important

to recognize that *Clear Zone requirements for a particular case depends on highway design details.*

All pole lines, guy wires and other structures must be located outside the clear zone width which is set out in this chapter.

Clear Zone Set-back Requirements on Fill Sections

Design Speed (km/h)	MINIMUM CLEAR ZONE WIDTH (m)						
	Design Classification						
km/h	RLU	RCU	RCD	RAU	RAD	RED	RFD
50	3.5	4.0	-	-	-	-	-
60	3.5	4.0	4.5	-	-	-	-
70	4.5	5.5	6.0	6.0	6.5	-	-
80	4.5	6.0	6.5	6.5	7.0	7.0	-
90	-	7.0	7.5	7.5	8.0	8.0	8.0
100	-	8.0	8.5	8.5	9.0	9.0	10.0
110	-	-	-	-	-	9.0	10.0

Source: Table B.1.1a, *Highway Engineering Design Manual*, Ministry of Transportation and Highways.

Road Class

RLU Rural Local Undivided
 RCU Rural Collector Undivided
 RCD Rural Collector Divided
 RAU Rural Arterial Undivided

RAD Rural Arterial Divided
 RED Rural Expressway Divided
 RFD Rural Freeway Divided

NOTE: The Clear Zone width does not apply to Subdivision Roads or Low Volume Roads. However, an obstacle free area, or utility setback adjacent to Subdivision Roads and Low Volume Roads which is 2 metres from the toe of the slope is required.

New Installations on Curb and Gutter Sections

Where the posted speed on curb and gutter sections is 60 km/h or less, poles, guy wires, and other structures must be located at least 0.5 m behind the sidewalk (if there is one) or a minimum of 2.0 m from the outside face of the curb, whichever is greater.

Where the posted speed exceeds 60 km/h, pole lines, guy wires and other structures must be located outside the clear zone distance which is set out in this Section, or be protected by an approved guardrail.

Exceptions to Offset Requirements for New Installations

An exception to new-installation offset requirements can be made in the following circumstances:

- Where poles or other facilities are being replaced as part of a routine maintenance program for a facility which is covered by a valid permit, the offset

requirement for existing facilities can be used. In the case of a pole line, no more than three poles in row are being replaced. *Multiple permits cannot be used to avoid relocation where more than three poles are being replaced;*

- Offset requirements do not apply when above-ground facilities can be placed behind existing guardrails, retaining walls, and other similar protected area; and,
- Offset requirements do not apply when an approved guardrail or other suitable and approved protection is installed by the applicant.

References

Highway Engineering Design Manual,
Ministry of Transportation and Highways.

**New Standards
Clear Zones for Highway Rehabilitation Projects**

Clear Zone standards for highway rehabilitation projects are being developed at the present time. Proposed standards will be circulated in September 1994 as a Discussion Paper. Highway Engineering Branch is responsible for developing this policy in conjunction with the Highway Safety Branch.

- 6.1 Installation and Maintenance
- 6.2 Risk Management
- 6.3 Traffic Control
- 6.4 Vegetation Management

Policy

- 1. Safety of Maintenance Crews is of Prime Importance.** Utilities are permitted on highway right-of-way only where they do not create safety risks for Ministry staff or contractors.
 - 2. The Location and Design of Utility Installations May be Controlled by Highway Maintenance Requirements.** Utilities must be designed and located so that they do not unduly interfere with maintenance operations.
 - 3. Special Precautions may be Required in Order to Protect Maintenance Crews.** Although safety is a prime consideration when utility installations are designed, there will be situations where special precautions are required in order to eliminate or minimize the risk of an accident.
-

Procedure

Electric Power Lines at the Base of Rock Slopes.

In keeping with the importance that is attached to highway safety, electric power lines may not be permitted at the base of rock slopes which require rock scaling on a routine or regular basis. (See Section 10 Overhead Power and Communications Lines for details.)

Maintenance Operations in the Vicinity of Electric Power Lines.

Maintenance operations must conform with requirements of *Industrial Health and Safety Regulations* established under the *Workers Compensation Act*. Those requirements are particularly relevant to: rock scaling operations; installation and repair of luminaries; overhead signing and traffic signals; and, tree trimming operations. A copy of Section 24 of the Regulations is included in Appendix I for reference.

Where minimum clearance requirements from high voltage lines cannot be maintained "because of the circumstances of the work or inadvertent movement of persons or equipment" the Ministry or the contractor carrying out the work must obtain written assurance from the utility that the conductors will be:

- *de-energized;*

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- *effectively guarded against contact; or,*
- *displaced or re-routed from the work area.*

Whenever the second of these options is used, a *qualified safety-watcher shall be posted to control the approach of equipment and loads and to stop immediately the movement when contact with guarding appears possible.*

Responsibility for the Cost of Special Precautions

In certain limited situations, the Ministry provides compensation for staff time and expenses incurred by electric power companies in order to protect highway maintenance or construction crews. That policy is outlined below.

- There is no charge for the initial visit by the utility's staff to assess the risk associated with the proposed work;
- Where it is necessary to re-route or relocate the pole line in order to carry out the work, BC Hydro and West Kootenay Power are compensated in accordance with the respective protocol agreements (see Section 15.4 of this manual);
- Where it is necessary to de-energize or guard a line, the Ministry provides no compensation; and,

- Where there is a need for the utility to provide a safety-watcher, the Ministry provides no compensation.
-

References

Southern Interior Safety Instructions, BC Hydro, 1992.

Industrial Health and Safety Regulations, Workers Compensation Act.

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/West Kootenay Power.

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THIS SECTION SHOULD BE READ IN CONJUNCTION WITH THE MINISTRY'S INSURANCE AND BONDS POLICY AND PROCEDURES MANUAL.

Policy

1. **Risk Management.** District offices must take a risk management approach to managing utilities on highway right-of-way. With that approach, the permit processing and site inspection effort reflects:
 - The risk which is inherent in each installation;
 - Risks involved in installing and maintaining the facility;
 - Potential effects on the highway system; and,
 - Past performance of the utility and its contractors.
 2. **Appropriate Precautions.** District Highways Managers and their delegates are expected to put adequate controls in place to ensure that utilities are installed in accordance with the applicable standards and the general public is not endangered by utility installations or operations. *See Section 16 for information on the review and approvals process and the following sections for standards and requirements:*
 - *Section 8 - Pipelines;*
 - *Section 9 - Water and Sewer Lines;*
 - *Section 10 - Overhead Power and Communication Lines;*
 - *Section 11 - Underground Power and Communication Lines;*
 - *Section 13 - Trenching, Boring and Jacking; and,*
 - *Section 14 - Installations On or Near Structures.*
 3. **Referrals.** When proposed installations do not comply with Ministry policies or standards and where there are technical questions which are outside the District's expertise, District officials are expected to refer applications to specialists within the Ministry.
-

Background to Policy

Risk Management.

Risk management is the process of:

- Identifying the risks associated with an initiative or action;
- Assessing the liability associated with that risk as well as the likelihood of a failure or accident and the nature and extent of the damages that might result; and,
- Finding the most efficient and economical way bringing those risks within acceptable limits.

In short, risk management involves systematic, effective methods to protect the general public and the Ministry's interests.

The Primary Responsibility for Risk Management Related to Utilities Rests with District Offices and the Utilities Themselves.

The principal responsibility for implementing Ministry risk management policy and procedures rests with District offices. In the case of utilities, this requires careful consideration of the nature of each installation, any risk that it entails, the past performance of the utility, and the reliability of its crews and contractors. To a large extent, the Ministry's approach to risk management is to hold utilities fully responsible for their own facilities and

actions, and to use a range of risk control methods to ensure that they comply with Ministry requirements.

Utilities on highway right-of-way present risks in a number of areas. These include:

- Traffic safety (e.g. equipment operating in the right-of-way, obstructions in the right-of-way, the risk of fire or explosion, etc.);
- Employee safety (e.g. when a line is struck by ditching, sign or rock scaling crews);
- Damage to highway structures (e.g. by erosion caused by a pipeline failure); and,
- Restrictions on future highway development.

These risks are addressed in several ways:

- By having effective procedures and standards in place;
- By maintaining a permit system which puts the onus and liability on utility owners where appropriate;
- By requiring certain documentation (e.g. drawings) and commitments from utility companies;
- By completing a thorough review of applications before a permit is issued;

- By regulating the location of utility installations within the right-of-way;
- By carrying out site inspections on a systematic basis, consistent with the nature of each installation and the past performance of the utility owner or their contractor;
- By limiting work on the right-of-way to conditions and hours which are consistent with traffic flow and traffic safety considerations; and,
- By ensuring that utility installations are kept in an adequate state of repair.

Responsibility for implementing most of these risk management initiatives rests with District Highways Managers and their staff. Procedures, engineering standards and standard forms have been developed in order to assist District offices with that work. These procedures, standards and forms are an important component of the Ministry's risk management program.

Procedure

Risk Management Initiatives by District Offices.

The principal means by which districts manage the risk associated with utilities on right-of-way include:

- Holding regular planning meetings with utility representatives. These meetings help to ensure that utilities have a full understanding of Ministry requirements and concerns see Section 4 on Communications;
- Expecting utilities to submit complete applications for permits, together with drawings and other information as needed to ensure that the proposed installation conforms with policies and standards;
- Completing a site inspection before issuing a permit in any case where an installation could have a negative effect on highway safety, highway operations, highway access, or future highway development;
- Adhering to standard permit language, particularly where liability and the utility's obligations are involved;
- Consulting with specialists in areas such as bridge engineering, geotechnical engineering, engineering standards, highway planning, and insurance and bonds where special conditions are apparent see Section 16 on the permit approval process;
- Requiring advance notice and pre-approval of utility company work schedules;
- Ensuring that no work begins without a completed permit;

- Inspecting the site during construction, if warranted by: the nature of the work; past experience with the utility company and its contractors; site conditions; and traffic conditions;
- Inspecting the site on completion, particularly for site restoration; and,
- Requiring "as-built" drawings and/or certification that work was installed in accordance with Ministry standards and the drawings/information submitted with the permit application.

Assessing Performance

Districts are encouraged to conduct a periodic performance assessment for utilities which are most active in their area. The *Utility Performance Evaluation* Form (Exhibit 6.2 - 1) should be used for this review. As indicated, the following factors should be accounted for:

- Completeness and accuracy of applications and drawings;
- Compliance with policy and standards;
- Job site performance, including traffic control;
- Quality of restoration and clean-up work;
- Communication with Ministry staff (advance notification of work, etc.); and,
- Provision of "as-built" drawings.

The District's assessment of performance should be discussed with utility representatives in annual or bi-annual planning/review meetings. The response to every request for a utility permit should take

account of the applicant's past performance.

Where Past Performance is Satisfactory

Where performance has been satisfactory, the standard permit approval process would be followed as outlined in Section 16. Certain steps in that process are an essential part of risk management:

- Ensuring that the application is complete and is supported with drawings and other information, all in good form;
- Ensuring that location within the right-of-way, proposed depth of bury, etc. are consistent with Ministry requirements;
- Completing a site inspection before preparing or issuing a permit; and,
- Consulting with specialists when an application raises questions which are outside the area in which district staff normally have expertise.

Where Special Conditions Apply or Past Performance Is Unsatisfactory

Districts are expected to take extra precautions where conditions warrant and

where past performance of the utility or its contractors has been inconsistent or unsatisfactory. Depending on circumstances, these precautions might include:

- Requiring the utility to have a qualified inspector on site throughout the project or at certain critical stages of the project;
- Requiring the utility to cover the cost of an inspector who is retained by the Ministry;
- Requiring the utility to post some form of financial security;
- Requiring certification of as-built drawings by a Professional Engineer; and,
- Requiring accurate "as-built" drawings showing ground line elevation and the actual elevation of underground utilities -- based on a "benchmark" or "datum" survey.

Incident Reporting

The standards and procedures which are set out in this manual are kept under continual review to ensure that they are meeting Ministry needs -- particularly at the District level. As one means of ensuring that standards and procedures are having the desired effect, the Ministry's Utility Coordinator will coordinate District feedback on any failures or accidents involving utilities.

Information gathered through the reporting system is forwarded to others who are affected or should be looking at the need for change (e.g. Standards Engineer for a failure or incident which is related to standards).

The information is also used to compile a province-wide activity report which is distributed to District offices which reports incidents and the Ministry's response to these incidents.

To ensure that the Ministry has a reliable measure of the frequency and seriousness of any incidents involving utilities, the Utility Coordinator will carry out a periodic review of incident reports with district officials.

Departures from Standard Procedures

The incident reporting system will also be used to collect information on conditions where the Districts find it advisable or necessary to depart from standards, normal procedures, or standard language in Ministry forms. Once again, the Utility Coordinator will monitor these reports, provide Districts with feedback on developments in this area, and carry out periodic reviews with District staff. The Incident Reporting System will form the basis of updating the *Utility Policy Manual*.

References

Satege: 6.2 Risk Management

Insurance and Bonds Policy and Procedures Manual, Ministry of Transportation and Highways.

**Exhibit 6.2 - 1
Utility Performance Evaluation**

Evaluation by: _____ Position: _____ Date: _____ Utility Name: _____ Date of Previous Assessment for this Utility: _____ Areas Rated Unsatisfactory on Previous Assessments:

Evaluation Factor	Performance		Comments
	Since Last Review		
	Satisfactory	Not Satisfactory	
Completeness and accuracy of applications.			
Completeness and accuracy of drawings.			
Conformance with standards.			
Traffic control (signing, flagging, etc.)			
Job site performance (materials storage, etc.)			
Quality of restoration and clean-up work.			
Communications with the Ministry (advance notice of start of work, etc.)			
Provision of "as-built" drawings.			
Notes and Comments:			

Follow-up: Discussed with _____ (Utility representative) on _____ (date)

Notes:

Policy

- 1. Ministry Standards Apply:** All utilities and their contractors must follow standards and procedures set out in the *Traffic Control Manual for Work on Roadways*.
- 2. Restrictions on Hours of Work:** The Ministry will limit hours of work on utility installation, maintenance and repair as required to maintain an acceptable standard of highway safety and traffic flow.
- 3. Lane Closures:** All lane closures must be approved in writing by the District Highways Manager or their designate.

All utilities are required to adhere to the Ministry's traffic control standards, whether or not the installation they are working on is covered by a permit. That is, the Ministry's traffic control standards apply to both "primary" (permitted) and "secondary" (unpermitted) installation and maintenance operations.

Procedure

Traffic Control Standards

All utility permits must include a requirement that utilities adhere to Ministry traffic control standards. (See Section 16)

Lane Closures

All lane closures must approved in writing by the District Highways Manager or their designate. A "Lane Closure Request Form" is required for the Lower Mainland office at the present time. This requirement may be expanded as traffic conditions in Districts with large urban centres or highway conditions warrant. The form must be completed and approved by the District prior to work taking place.

See Appendix I for a sample copy of the Lane Closure Request Form.

Background to Policy

The Ministry's traffic control standards are published in a Field Edition and an Office Edition to a *Traffic Control Manual for Work on Roadways*. These manuals can be purchased from Crown Publications Inc., 521 Fort Street, Victoria, B.C. V8W 1E7. Traffic control standards were initially introduced as voluntary standards, but became compulsory in January, 1994.

All lane closures for the Lower Mainland must be in accordance with the Ministry's Manual of "*Single Lane Closure Windows - Lower Mainland*" which provides guidelines for closing single lanes of directional traffic in the Greater Vancouver area. The purpose of the manual is to minimize the impact of temporary lane closures on highway users.

References

Ministry of Transportation and Highways
Single Lane Closure Windows, Lower Mainland, April, 1994.

Policy

1. **Coordination.** The Ministry will work with utility companies to coordinate vegetation management programs and to ensure that joint vegetation management activities fulfill environmental objectives, including aesthetic, as well as vegetation control.
2. **Harvesting of Timber on Highway Right-of-way.** Removal of timber from highway right-of-way by major utility companies will be in accordance with the terms and conditions outlined in the Ministry of Forests and the Ministry of Transportation and Highways Protocol Agreement (September, 1992)

management pilot project with BC Hydro, aimed at providing the basis for a vegetation management agreement between the two organizations. That agreement could then serve as a model for agreements with other utilities. Issues being addressed in the pilot project include:

- Joint contracting for vegetation management on highway right-of-way;
- Contractor evaluation;
- Selective vegetation management, including preservation of ground cover and selected species;
- Vegetation inventories, including an information base on special treatment for certain plant species;
- Responsibility for vegetation management in urban areas;
- Hazard trees -- coordination with BC Hydro's Hazard Trees and Problem Trees programs;
- Stewardship issues, including possible limited use of herbicides to encourage certain species;
- Priority-setting for vegetation management; and,
- Budgeting.

Background to Policy

The Ministry and the major utilities currently carry out vegetation management programs on highway right-of-way independently of each other. Although each agency has its own vegetation management needs, it is apparent that all parties can benefit from a coordinated effort.

The Ministry has initiated a vegetation

management guidelines for utilities are set out in the *Manual of esthetic Design Practice*.

The Ministry of Transportation and Highways has established a protocol

agreement with the Ministry of Forests to clarify responsibilities and interaction between the two ministries.

The section of the agreement with the heading "Harvesting of Crown Timber on Highways Rights of Way", outlines the process for the removal of timber from highway right-of-way by utility companies. Previous Ministry procedures specified that only MOTH could obtain a cutting permit for the removal of timber from highway right-of-way.

Procedure

Harvesting Crown Timber On Highway Right-of-Way.

A Licence to Cut timber is required to remove timber from highway right-of-way. A major utility, who has obtained a permit from the Ministry of Transportation and Highways to construct works within highway right-of-way may, obtain the required approvals directly from the District Manager, Ministry of Forests, to cut and remove timber from highway right-of-way.

Under previous arrangements, the Ministry of Forests only issued Licence to Cut timber to the occupier of the land. *The Forest Protocol Agreement Between the Ministry of Forests and MOTH* (September, 1992) now views a major utility agency as an occupier of land and as such the Licence To Cut is issued to the major utility agency

when it is working under a MOTH Utility Permit.

Once the major utility has received a Permit to Construct Works On Highway Right-of-Way from the Ministry of Transportation and Highways, the utility will make application to the Ministry of Forests for a Licence to Cut timber on Crown Land. There are three options for approval available to the Ministry of Forests for the removal of timber.

1. Free Use Permit. If the Ministry of Forests determines that the timber to be removed is not merchantable, they will issue a free use permit to the utility agency to remove the timber. No stumpage is paid by the Permittee (Utility) and the Permittee has the option of how they dispose of the timber.

2. Removal by the Utility or Contractor. The Ministry of Forests can arrange for the timber to be cruised while still standing. Two options are then available for the removal of the timber.

- The Ministry of Forests would contract a logging company, through a small business sale, to cut the timber and haul it away; or,
- The Utility is issued a Licence to Cut. A Timber Mark is issued to the Utility. The Utility has the option of how it will dispose of the timber but is responsible for the payment of a stumpage fee.

3. Removal of the Timber by the Ministry of Forests. The timber is cold decked on site and removed by the Ministry of Forests. No stumpage is paid on the timber. If this option is considered, a location is required where the merchantable timber can be stored in a safe manner and is accessible for equipment to remove from the site without damaging the highway facility.

- That all debris is to be chipped and removed from the highway right of way; and,
 - That the standard of grubbing work carried out ensures that stumps are cut off at a level that would permit grass mowing.
-

Responsibility of the Utility

It is the responsibility of the utility company or their contractor to ensure that the right-of-way has been left in a neat and orderly condition. This includes:

References

Manual of Aesthetic Design Practice,
Ministry of Transportation and Highways.

Pilot Project

The Skeena Highways District has been selected as the pilot project location, with work to be carried out on test plots during the summer of 1994. A draft vegetation management program will be completed by January 1995 for implementation in 1995/96. Responsibility for the policy initiative is shared between Highway Environment Branch and Highway Maintenance Branch.

Policy

Background to Policy

Procedure

Standards

8.1 Design

8.2 Location -- General

8.3 Location -- Lines Along Highway Right-of-Way

8.4 Crossings

8.5 Clearances

8.6 Depth of Cover

8.7 Pipelines on Bridges and Other Structures

8.8 Measures to Protect Pipelines

8.9 Appurtenances

Background to Standards

References

Application

This section deals with all pipelines other than sewer lines and domestic water lines, including pipelines which are used to transport:

- water for non-domestic use
- steam
- natural gas
- oil and petroleum products
- oxygen
- chlorine

Definitions

The following definitions apply throughout this section.

- **High Pressure Pipelines:** Pipelines intended to operate at pressures greater than 2,070 kPa (300 psi).
- **Intermediate Pressure Pipelines:** Pipelines intended to operate at pressures greater than 700 kPa (100 psi) and up to 2,070 kPa (300 psi).
- **Low Pressure Pipelines:** Pipelines intended to operate at pressures which are less than or equal to 700 kPa (100 psi), and include lateral connections from the gas distribution mains which are within and parallel to the right-of-way to the customer.

Policy

1. **Locations Where Pipelines Are Not Permitted:** Pipeline installations which run parallel to the highway centre line generally are not permitted in the following conditions:
 - **high pressure pipelines** within and parallel to any class of highway right-of-way; or
 - **intermediate pressure or low pressure pipelines** within and parallel to Freeways or Expressways.
2. **Crossings:** All classes of pipeline can be constructed across all classes of highway.
3. **Bridges and Structures:** See Section 14 for policy on utility attachments to bridges and structures.

High Pressure Pipelines:

Restrictions on high pressure pipelines are based primarily on safety considerations. Restricting the use of highway right-of-way for high pressure pipelines has little effect on pipeline location. In most cases, pipeline companies can keep construction and maintenance costs for high pressure lines to a minimum by choosing a direct, overland route.

Pipelines along Freeways and Expressways:

Restrictions on the use of freeway right-of-way for pipelines (and all other utilities) is based primarily on safety considerations and is the practice of most highway departments across North America. Drivers on freeways and expressways expect high-speed, free-flowing traffic. Any activity which disrupts traffic flow, (such as construction equipment and service vehicles accessing work sites directly from freeway lanes), may increase the risk of an accident.

Background to Policy

Restrictions on pipeline installations within and parallel to highway right-of-way are based on the following considerations:

Procedure

See procedures for issuing pipeline permits in Section 16 and for pipeline relocation projects in Section 17.

Also see Section 16 for information on:

- Drawings which are to be submitted with applications for permits; and,
- Requirements for "as-built" certification and drawings.

Conditions which are unsuitable for pipeline installations must be avoided. Examples include:

- High embankments (because of the risk of settlement);
- Locations near bridge footings, culverts and retaining walls (because of the risk of erosion and instability in the event of failure); and
- Locations where it is difficult to maintain full depth of cover.

Standards

8.1 Design

See Section 5 for general design standards which apply to all utility installations.

Where the Ministry has prescribed a more stringent requirement than other regulators, the Ministry's requirement will apply. Similarly, where a regulatory authority sets a higher standard than the Ministry's requirement, the regulator's standard will apply.

8.2 Location -- General

See Section 5 for general location and alignment requirements.

Exceptions may be made by the District Highways Manager where:

- The pipeline design is approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design and is registered in B.C. at the time a permit application is submitted to the Ministry; and;
- The District Highways Manager is satisfied that the proposed installation will not have an adverse effect on highway maintenance, safety, or operations.

8.3 Location -- Lines Along Highway Right-of-Way

Highways Manager where there is a conflict with other utilities.

8.3.1 Alignment

Where possible, pipelines are to be located parallel to the highway centreline and within 2 metres of the inside boundary of the highway right-of-way.

Where the highway right-of-way boundary is irregular, the Ministry will consider a reasonable alignment which does not affect backslopes, drainage systems, other improvements, or maintenance operations. However, every effort must be made to locate pipelines a consistent distance from the edge of highway right-of-way and the toe of the slope.

8.3.2 Minimum Distance from the Highway Structure

The distance between a pipeline and the top of a cut, the toe of a fill, or the ditch line must be sufficient to ensure that installation and maintenance of the pipeline will not damage the highway structure or interfere with highway maintenance and operations. In general, this requires a minimum offset of 2 metres from the toe of embankment fills and 2 metres beyond the top edge or daylight point of a cut slope.

In urban areas where curb and gutter are in place, the minimum offset generally is 2 metres from the outside edge of the curb. Exceptions may be approved by the District

8.3.3 Installation Under Ditches

No pipelines are permitted under ditch slopes and ditch bottoms except for crossings.

Other exceptions may be considered when all of the following conditions are met:

- The pipeline owner has clearly demonstrated to the satisfaction of the District Highways Manager that alternate locations (including locations outside the highway right-of-way) are not feasible because they involve high-risk locations, unacceptable environmental hazards, or extremely high costs;
- The pipeline design includes protective caps, increased depth of bury, or other measures which are approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design and is registered in B.C. at the time a permit application is submitted to the Ministry;
- The special design measures proposed by the pipeline owner are satisfactory to the District Highways Manager or their designate; and,

- The pipeline is not a high pressure pipeline.

8.3.4 Installation Under the Highway Structure

Low pressure and **intermediate pressure** gas pipelines may be located under traveled lanes, parking lanes, sidewalks, boulevards and shoulders if all of the following conditions are met:

- The pipeline owner demonstrated to the satisfaction of the District Highways Manager that:
 - Physical constraints (such as rock cuts or limited right-of-way width in urban areas) make it impossible or extremely expensive to conform with standard offsets defined in 8.2.1 and 8.2.2; and,
 - Installation on another alignment outside highway right-of-way would be so expensive, hazardous or environmentally damaging as to not be feasible;
- The Ministry is not planning any highway construction which would modify the location and/or profile of the roadway or sidewalk;
- Traffic interruptions during installation and subsequent pipeline maintenance will not cause unacceptable levels of

congestion, traffic delays, or hazard;

- If the standard depth of bury is not being adhered to or, in the view of the District Highways Manager, conditions warrant special care, the pipeline design is approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design, registered in B.C. at the time the permit application is submitted, and certifies that the design accounts for conditions in the proposed location, including vehicle live loads; and,
- The District Highways Manager is satisfied that the proposed installation will not have an adverse effect on highway maintenance, safety, or operations.

8.4 Crossings

8.4.1 Angle of Crossing

Pipelines must cross highway right-of-way at an angle which is as close as practicable to 90 degrees, considering the economics of practical alternatives. No crossing will be at an angle of less than 45 degrees unless installation can be proved advantageous at a lesser angle.

8.4.2 Installation of Crossings

All pipeline crossings will be bored, tunneled, jacked or directionally drilled under the highway structure using equipment and methods which will not damage the highway or affect traffic safety and operations.

Boring, tunneling and jacking must conform with standards which are set out in Section 13 of this manual.

Trenching will only be permitted in exceptional circumstances which have been approved by the District Highways Manager in accordance with Section 13 of this manual.

8.5 Clearances

8.5.1 Clearance from Structures and Culverts

Minimum clearance from bridges and other structures will be determined on a case by case basis by the Regional Bridge Engineer. Clearance distances will be set to ensure that maintenance operations are not impaired by the presence of pipelines or related facilities.

Pipelines must be offset from culverts and sign or signal structures by at least 0.5 metres.

8.5.2 Clearance from Other Utilities

Except in special circumstances and where standards are specified, the Ministry of

Transportation and Highways will not prescribe minimum clearances from other utilities. Clearances will be in accordance with the governing industry, CSA or regulator standard.

8.6 Depth of Cover

8.6.1 Depth of Bury Under the Road Surface

The top of any pipeline or casing must be at least 1.2 metres below the top of the pavement.

The District Highways Manager may make exceptions, or specify the depth of bury or additional protection which may be required in conditions where, in their opinion, special measures are warranted by local conditions and in order to protect the pipeline, the highway structure, or the public. Examples of special conditions include:

- When minimum depth of cover cannot be achieved at reasonable cost, and concrete caps or other measures that provide a standard of protection which is equivalent to the standard depth of bury and are approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design and is registered in B.C. at the time a permit application is submitted to the Ministry;

- When live loads from highway traffic or maintenance and construction equipment require protective measures in excess of the standard depth of bury; or,
- When local soil conditions require greater depth of bury in order to provide adequate protection for the proposed pipeline installation.

8.6.2 Where Minimum Depth of Bury Cannot be Achieved

The District Highways Manager may permit substandard depth of bury where necessary, provided that the pipeline is protected by concrete slabs or other measures which provide a standard of protection which is equivalent to the standard depth of bury and are approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design and registered in B.C. at the time a permit application is submitted to the Ministry.

Exceptions will be made only in special circumstances and for short distances. Examples include:

- Locations where the trench is to be cut in solid rock; and,
- Locations where the presence of other utilities make it impossible to comply with the standard.

8.6.3 Depth of Bury Under Ditches

The top of **low pressure pipelines** or their casings must be at least 0.75 metres below design ditch bottoms as indicated by the District Highways Manager or their designate.

The top of **intermediate and high pressure pipelines** or their casings must be at least 1.0 metre below design ditch bottoms as indicated by the District Highways Manager or their designate.

The District Highways Manager may require a greater depth of bury where conditions warrant, particularly where there is a possibility that ditch depth will be increased by scour, maintenance operations, or the need to increase ditch capacity.

8.6.4 Depth of Bury Elsewhere in the Right-of-Way

Outside the highway structure, the top of **low pressure pipelines** or their casings must be at least 0.6 metres below the established grade.

Outside the highway structure, the top of **intermediate pressure and high pressure pipelines** or their casings must be at least 1.0 metre below ground level.

The District Highways Manager may require a greater depth of bury or other protective measures where warranted by: soil or slope conditions; loading from

highway facilities, such as signal structures; and other special conditions.

8.7 Pipelines on Bridges and Other Structures

Standards for pipeline installations on bridges and other structures are set out in Section 13.

8.8 Measures to Protect Pipelines

Where, in the Ministry's view, a pipeline is vulnerable because of its depth, location in the roadway prism, etc., the District Highways Manager may require special protective measures which are approved and signed (or sealed) by a Professional Engineer who is experienced in pipeline design and registered in B.C. at the time a permit application is submitted to the Ministry. This additional protection may take the form of a reinforced concrete cap, a casing, increased depth of cover, or increased pipe wall thickness which is designed to withstand higher than normal loadings. (*Bagged concrete is not an acceptable means of protecting pipelines.*) The onus is on the pipeline owner to demonstrate that the design addresses Ministry concerns related to public safety, highway operations and protection of highway facilities.

Pipeline protection consisting of increased pipe wall thicknesses may be used either in addition to, or as a replacement for pipeline casings for new installations. The

continued use of pipeline casings may be required, however, where in the opinion of the District Highways Manager or their designate, local conditions such as the soil type, or the nature of the highway facility require increased protection.

Where additional pipeline protection is required, the use of increased pipe wall thickness may be permitted for all types of crossings.

8.9 Appurtenances

8.9.1 Above-ground Markers

Above-ground markers are required in urban and rural locations (generally where there is open drainage along the highway) for the following types of installation:

- Gas Pipelines: All intermediate pressure and high pressure pipelines; and,
- Other Pipelines: All pipelines which are used to transport dangerous commodities.

Markers must be placed at both ends of crossings at the right-of-way edge and at 200 metre intervals for pipeline installations located within and parallel to highway the right of way.

Signage must be consistent with CSA requirements. This includes:

- The word "warning", "caution" or "danger" clearly displayed in 25 mm high, bold lettering;
- The type of pipeline system prominently displayed, for example "High Pressure Natural Gas Pipeline" in 13 mm high bold lettering; and,
- The name of the operating company and an emergency response number, including the area code where appropriate.
- Do not interfere with right-of-way maintenance;
- Are consistent with Clear Zone standards which are set out in Section 5.3;
- Are not concealed by vegetation;

The preferred location for vent standpipes is as close as possible to the inside boundary of the highway right-of-way.

8.9.4 Drains

Drains are required for casings on pipelines that are carrying liquids, liquefied gas or gas which is heavier than air.

Drains may outfall only into facilities and locations approved by the Highway Environment Branch.

8.9.5 Valves

The location of valves within highway right-of-way is subject to approval by the Ministry.

Valves must be located below ground and clear of the highway, intersections and driveways. They must also be located in such a way that they will not interfere with highway maintenance.

Multiple valve and/or meter stations are generally not permitted within highway right-of-way. Exceptions may be permitted where:

In heavily populated urban areas, signs will not be required where the placing of signs is impractical, or where they would not serve their intended purpose. In such areas alternative identification methods, adopted by the pipeline industry and approved by the District Highways Manager or their designate, will be used.

8.9.2 Underground Markers

Non-metallic pipe must be marked by underground markers which make it possible to locate the pipe using an electronic device. Metallic tape or 12-gauge copper wire may be used for this purpose.

8.9.3 Vent Standpipes

Where cased crossings are installed, vent standpipes must be located and installed in such a way that they:

- The pipeline owner has clearly demonstrated that alternate locations are not feasible because they involve high-risk

location, unacceptable environmental hazard, or extremely high cost; and,

- The District Highways Manager is satisfied that the proposed installation will not have an adverse effect on highway maintenance, safety, or operations.

8.9.6 Manholes

Manholes which are located within the Clear Zone as defined in Section 5.3 must be at ground level or be designed in such a way that they do not create an obstacle.

In all rural areas and in urban areas with posted speeds above 60 km/h, manholes must not be located in the pavement, on shoulders, or in medians.

The District Highways Manager may make exceptions for future installations where:

- Manholes are essential;
- Manholes are not located under wheel paths; and,
- There are two or more lanes in each direction.

In urban areas with posted speeds of 60 km/h or less, manholes may be located in

the pavement provided they are not in the wheel path and there are two or more lanes in each direction.

8.9.7 Cathodic Protection

Cathodic protection will be placed at locations which preclude damage to bridges, reinforced concrete structures, and other highway structures.

Background to Standards

Pipeline design standards are generally set by provincial and federal agencies: the Ministry of Municipal Affairs, Recreation and Housing in the case of pipelines which fall under provincial jurisdiction, and the National Energy Board for those which fall under federal jurisdiction. These regulators generally require compliance with standards set by the Canadian Standards Association, including the following standards or their most recent update:

CSA-Z183-M90: Oil Pipeline Systems;
and,

CSA-Z184-M92: Gas Pipeline Systems

References

Design Manual, Highway Engineering Branch, Ministry of Transportation and Highways.

Gas Pipeline Systems, Standard CSA-Z184-M92, Canadian Standards Association, 1992.

Oil Pipeline Systems, Standard CSA-Z183-M90, Canadian Standards Association, 1990.

Policy

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Standards

- 9.1 Design
- 9.2 Location -- General
- 9.3 Location -- Lines Along Highway Right-of-Way
- 9.4 Crossings
- 9.5 Clearances
- 9.6 Depth of Cover
- 9.7 Installation on Bridges and Other Structures
- 9.8 Protection of Water and Sewer Lines
- 9.9 Appurtenances

Background to Standards

Application

This section deals with sanitary sewer lines, storm drains, domestic water lines, and irrigation ditches. These types of installations are referred to as "water and sewer lines" throughout this section.

Definitions

The following definitions apply throughout this section.

- **High Pressure Water Lines:** Water lines which are designed to operate at pressures greater than 1,380 kPa (200 psi).

Policy

1. **Locations Where Water and Sewer Lines Are Not Permitted Along Highway Right-of-Way.** Water and sewer installations which run within and parallel to the highway centreline generally are not permitted in the following conditions:
 - Along freeways or expressways;
 - Along highways which are designated for upgrading to freeway or expressway standard; and,
 - **High pressure water lines** within and parallel to any class of highway right-of-way.
2. **Multiple Lines:** Collector and distribution lines are generally permitted on only one side of subdivision roads.

3. **Crossings:** As a general rule, water and sewer lines can cross all highways. However, **service connections** cannot be installed across freeway and expressway right-of-way.
 4. **Bridges and Structures:** See Section 14 for policy on utility attachments to bridges and structures.
-

Background to Policy

Locations where water and sewer lines are not permitted are as follows.

Freeways and Expressways: The restriction on water and sewer installations within and parallel to freeway and expressway right-of-way is consistent with restrictions for all types of utilities on these classes of highway. This policy is based on safety considerations and the practice of most highway departments across North America. Drivers on freeways and expressways expect free-flowing traffic. Any activity which disrupts traffic flow (such as construction equipment operating on the right-of-way or service vehicles accessing work sites directly from freeway lanes) may increase the risk of an accident.

High Pressure Lines: Failure of a high pressure water line can cause extensive damage to the highway structure and create a serious hazard for highway users. Consequently, high pressure lines are not permitted along highway right-of-way.

Multiple Lines. The "single line" policy for subdivision roads is intended to preserve limited right-of-way space and ensure that other utilities can be accommodated.

Service Lines Crossing Freeways and Expressways. The restriction on service lines crossing freeways and expressways is consistent with the role of these highways. Freeways and expressways do not provide direct access to land abutting right-of-way, and the same principle is applied to utilities.

Procedure

See procedures for issuing utility permits in Section 16 and for utility relocation projects in Section 17.

Standards

9.1 Design

See Section 5 for general design standards which apply to all utility installations.

The Ministry of Transportation and Highways may prescribe design requirements for water and sewer lines and related facilities which are to be located in highway right-of-way.

Where the Ministry has prescribed a more stringent design requirement than other regulators, the Ministry's requirement will apply. Similarly, where a regulatory authority requires a higher standard than those required to meet the Ministry's requirements, the regulator's standard will apply.

9.2 Location -- General

See Section 5 for general Location and Alignment requirements.

Conditions which are unsuitable for water or sewer installations must be avoided. Examples include:

- High embankments (because of the risk of settlement);
- Locations near bridge footings, culverts and retaining walls (because of the risk of erosion

and instability in the event of failure); and,

- Locations where it is difficult to maintain full depth of cover.

Exceptions may be permitted where:

- The design is approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines and is registered in B.C. at the time a permit application is submitted to the Ministry; and,
- The District Highways Manager is satisfied that the proposed installation will not have an adverse effect on highway safety, operations or maintenance.

9.3 Location -- Lines Along Highway Right-of-way

9.3.1 Alignment

Where possible, water and sewer lines are to be located parallel to the highway centreline and within 2 metres of the inside boundary of the highway right-of-way.

Where the highway right-of-way boundary is irregular, the Ministry will consider a reasonable alignment which does not affect backslopes, drainage systems, other improvements, or maintenance operations. However, every effort must be made to

locate water and sewer lines a consistent distance from the edge of right-of-way and/or the toe of the slope.

9.3.2 Minimum Distance from the Highway Structure

The distance between a water line or a sewer line and the top of a cut, the toe of a fill, or the ditch line must be sufficient to ensure that installation and maintenance of the line will not damage the highway structure or interfere with highway maintenance and operations.

In general, this requires a minimum offset of 2 metres from the toe of the embankment fills and 2 metres beyond the top edge, or daylight point of the cut slope.

In urban areas where curb and gutter is in place, the minimum offset generally is 2 metres from the outside edge of the curb.

Exceptions may be approved by the District Highways Manager where there is a conflict with other utilities.

9.3.3 Installation Under Ditches

No water or sewer lines are permitted under ditch slopes and ditch bottoms except for crossings.

Other exceptions may be considered when all of the following conditions are met.

- The owner of the water or sewer line has clearly demonstrated to the satisfaction of the District Highways Manager that alternate locations (including locations outside the highway right-of-way) are not feasible because they involve high-risk locations, unacceptable environmental hazards, or extremely high costs.
- The pipeline design includes protective caps, increased depth of bury, or other measures which are approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines and is registered in B.C. at the time a permit application is submitted to the Ministry; and,
- Design measures proposed by the owner of the water or sewer line are satisfactory to the District Highways Manager or their designate.

9.3.4 Installation Under the Highway Structure

Water and sewer lines can be located under traveled lanes, parking lanes, sidewalks, boulevards and shoulders if all of the following conditions are met:

- The owner of the water or sewer line has demonstrated to the satisfaction of the District Highways Manager that:
 - Physical constraints (such as rock cuts or limited right-of-way width in urban areas) make it impossible or extremely expensive to conform with standard offsets defined in 9.2.1 and 9.2.2; and
 - Use of other routes outside highway right-of-way are not feasible because potential routes involve high-risk locations, unacceptable environmental hazards, or extremely high costs.
- The Ministry is not planning any highway construction which would modify the location and/or profile of the roadway or sidewalk;
- Traffic interruptions during installation and subsequent maintenance of the water or sewer line will not cause unacceptable levels of

congestion, traffic delays, or hazard;

- If the standard depth of bury is not being adhered to or, in the view of the District Highways Manager, conditions warrant special care, the water or sewer line design is approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines, registered in B.C. at the time the permit application is submitted and certifies that the design accounts for conditions in the proposed location, including vehicle live loads; and,
- The District Highways Manager is satisfied that the proposed installation will not have an adverse effect on highway safety, operations or maintenance.

A typical application for underground utilities to be located in the roadway prism may be a urban subdivision road.

9.4 Crossings

9.4.1 Angle of Crossing

Water and sewer lines must cross highway right-of-way at an angle which is as close as practicable to 90 degrees, considering the economics of practical alternatives. No crossing will be at an angle of less than 45 degrees unless installation can be proved advantageous at a lesser angle.

9.4.2 Installation of Crossings

All water and sewer line crossings will be bored, tunneled, jacked or directionally drilled under the highway structure using equipment and methods which will not damage the highway or affect traffic safety and operations.

Boring, tunneling and jacking must conform with standards which are set out in Section 13 of this manual.

Trenching will be permitted in exceptional circumstances only when they are approved by the District Highways Manager in accordance with Section 13 of this manual.

9.5 Clearances

9.5.1 Clearance from Structures and Culverts

Minimum clearance from bridges and other structures will be determined on a case by case basis by the Regional Bridge Engineer. Clearance distances will be set to ensure

that maintenance operations are not impaired by the presence of water or sewer lines or related facilities.

Water and sewer lines must be offset from highway culverts and sign, signal and luminaire structures by at least 0.5 metres.

9.5.2 Clearance from Other Utilities

Except in special circumstances, and where standards are specified, the Ministry of Transportation and Highways will not prescribe minimum clearances from other utilities. Clearances will be in accordance with the governing industry, CSA or regulator standard.

9.6 Depth of Cover

9.6.1 Depth of Bury Under the Road Surface

The top of any water or sewer line or casing must be at least 1.2 metres below the top of pavement and have sufficient cover to avoid freezing.

The District Highways Manager may make exceptions or require greater depth of bury or additional protection in conditions where, in their opinion, special measures are warranted by local conditions and in order to protect the water or sewer line, the highway structure, or public. Examples of special conditions include:

- When minimum depth of cover cannot be achieved at reasonable

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cost and concrete caps or other measures provide a standard of protection which is equivalent to the standard depth of bury and are approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines and is registered in B.C. at the time a permit application is submitted to the Ministry;

- When live loads from highway traffic or maintenance and construction equipment require protective measures in excess of the standard depth of bury; and,
- When local soil conditions require greater depth of bury in order to provide adequate protection for the proposed water or sewer line installation.

9.6.2 Where Minimum Depth of Bury Cannot be Achieved

The District Highways Manager may permit substandard depth of bury where necessary, provided that the water or sewer line is protected by concrete slabs or other measures which provide a standard of protection which is equivalent to the standard depth of bury and are approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines and is registered in B.C. at the time a permit application is submitted to the Ministry.

Exceptions will be made only in special circumstances and for short distances. Examples include:

- Locations where the trench is to be cut in solid rock; and,
- Locations where the presence of other utilities makes it impossible to comply with the standard.

9.6.3 Depth of Bury Under Ditches

The top of water or sewer lines or their casings must be at least 1.0 metre below design ditch bottoms (as indicated by the District Highways Manager or their designate), and have sufficient cover to avoid freezing.

The District Highways Manager may require a greater depth of bury where conditions warrant, particularly where there is a possibility that ditch depth will be increased by scour, maintenance operations, or the need to increase ditch capacity.

9.6.4 Depth of Bury Elsewhere in the Right-of-Way

Outside the highway structure, high pressure water lines and/or their casings must be at least 1.0 metre below ground level. Other water and sewer lines or casings must be at least 0.75 metres below ground level. In either case, depth of cover must be sufficient to avoid freezing.

The District Highways Manager may require a greater depth of bury or other protective measures where warranted by soil or slope conditions, loading from highway facilities such as overhead sign and signal structures, and other special conditions.

9.7 Installation on Bridges and Other Structures

Standards for installations on bridges and other structures are set out in Section 14.

9.8 Protection of Water and Sewer Lines

Where, in the Ministry's view, a water or sewer line is vulnerable because of its depth, location in the roadway prism, etc., the District Highways Manager may require special protective measures which are approved and signed (or sealed) by a Professional Engineer who is experienced in the design of water and sewer lines and is registered in B.C. at the time a permit application is submitted to the Ministry. This additional protection may take the form of a reinforced concrete cap, a casing, increased depth of cover, or pipe which is designed to withstand higher-than-normal loadings. The onus is on the utility owner to demonstrate that the design addresses Ministry concerns related to public safety, highway operations and protection of highway facilities.

Where protective slabs are to be provided, they must be designed to meet specific site conditions. Bagged concrete is not acceptable as a means of protecting water and sewer lines.

9.9 Appurtenances

9.9.1 Above-ground Markers

Above-ground markers are not required for water and sewer lines.

9.9.2 Underground Markers

Non-metallic pipe used for trunk and distribution lines must be marked by underground markers which make it possible to locate the pipe using an electronic device. Metallic tape or 12-gauge copper wire may be used for this purpose.

9.9.3 Vent Standpipes

Vent standpipes must be located and installed in such a way that they:

- Do not interfere with right-of-way maintenance;
- Are consistent with Clear Zone standards which are set out in Section 5.3; and,
- Are not concealed by vegetation.

The preferred location for vent standpipes is at the edge of right-of-way.

9.9.4 Drains

Drains are required for casings on water and sewer lines.

Drains may outfall only into facilities and locations approved by the Highway Environment Branch.

9.9.5 Valves

The location of valves is subject to approval by the Ministry.

Valves must be located below ground and clear of the highway, intersections and driveways. They must also be located in such a way that they will not interfere with highway maintenance.

9.9.6 Manholes

Manholes which are located within the Clear Zone as defined in Section 5.3 must be at ground level or be designed in such a way that they do not create an obstacle.

In rural areas and in urban areas with posted speeds above 60 km/h, manholes must not be located in the pavement, on shoulders, or in medians.

Exceptions may be made for future installations where:

- Manholes are essential;
- Manholes are not located under wheel paths; and,

- There are two or more lanes in each direction.

In urban areas with posted speeds of 60 km/h or less, manholes may be located in the pavement provided they are not in the wheel path and there are two or more lanes in each direction.

9.9.7 Cathodic Protection

Cathodic protection will be placed at locations which preclude damage to bridges, reinforced concrete structures, and other highway structures.

9.9.8 Pump and Lift Stations

Pump and lift stations must be located outside of the highway right-of-way.

Background to Standards

The Ministry of Health is responsible for setting standards related to water quality, including separation of domestic water lines from sewer lines. Compliance with those standards is a responsibility of the utility owner or designer, and the Ministry of Transportation and Highways generally does not take on the responsibility for checking that designs meet Ministry of Health regulations. However, where the Ministry of Transportation and Highways has taken on the responsibility for designing a line which is to be relocated, then design responsibility would include conformance with all standards and regulations.

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10.1 Design

10.2 Location -- General

10.3 Location -- At the Base of Cut Slopes

10.4 Aesthetic Considerations

10.5 Location -- Lines Along Highway Right-of-Way

10.6 Crossings

10.7 Clearance

10.8 Cable Installations on Bridges and Other Structures

References

Application

This section deals with all pole line installations and overhead cables, including:

- electric power lines
- fibre optic cable
- other communications cable
- cable television lines

Unless otherwise indicated, **all voltages quoted in this section are phase-to-phase voltages.**

Policy

1. **Locations Where Pole Lines are Not Permitted:** The Ministry generally does not permit pole lines within highway right-of-way in the following conditions:

- Along freeways and expressways;
- Along highway right-of-way which is expected to be upgraded to freeway or expressway standard within the next 20 years;

- Where lines are supported by towers or multi-pole structures;
- Where the line is rated at or above 60 kv phase-to-phase nominal voltage;
- In medians; or,
- On highway right-of-way located below rock slopes that are identified in the Ministry's *Rock Slope Inventory* that pose a hazard to Ministry maintenance operations. (See Appendix I for locations).

2. **Crossings:** With the exception of high-voltage transmission lines

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rated at 138 kv or greater, overhead telecommunication and electric power line installations are generally not permitted to cross freeways or expressways.

3. **Bridges and Other Structures:** See Section 14 for policy on utility attachments to bridges and other structures.
4. **Single Pole Line Policy:** The use of a shared structure or a single pole by all electrical and communications utilities is encouraged and should be carried out in accordance with the Ministry's Single Pole Line Policy. See Appendix I "Technical Circular T - 12/94 Single Pole Line Policy".
5. **Minimum Vertical Ground Clearances:** Ground clearances for pole lines are measured:
 - **for crossings** - from the roadway or pavement crown directly below the crossing at mid-span under conditions of maximum sag; and,
 - **for pole lines parallel to the highway centreline** - from the surface of the ground directly below the cable or conductor at mid-span under conditions of maximum sag.

Restrictions on pole line installations along right-of-way are based on the following considerations:

Pole Lines Along Freeways and Expressways: Restrictions on the use of freeway right-of-way for pole lines (and all other utilities) is based on safety considerations and the practice of most highway departments across North America. Drivers on freeways and expressways expect high-speed, free-flowing traffic. Any activity which disrupts traffic flow (such as construction equipment and service vehicles accessing work sites directly from freeway lanes) may increase the risk of accidents.

Pole Lines Supported by Towers and Multi-pole Structures: Towers and multi-pole structures are prohibited from highway right-of-way for aesthetic and safety reasons. In any case, highway right-of-way generally is not wide enough to accommodate structures of this sort. Cost considerations usually make it more economical for lines of this sort to follow a direct, overland route rather than highway right-of-way.

Pole Lines in Medians: Medians generally are not wide enough to accommodate pole lines while conforming with Clear Zone standards. In any event, construction and maintenance vehicles entering and leaving the median from the centre lanes on a freeway would constitute an unacceptable hazard.

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Utility Pole Lines in Rock Slope Areas:

Rock slopes located in the areas identified in the Rock Slope Inventory are considered hazardous for utility pole line installation. Due to safety concerns during scaling operations, the future installation of utility pole lines in these areas is generally not permitted.

Single Pole Line Policy: The "single pole line" policy is part of the Ministry's effort to accommodate as many utilities as possible in a safe and orderly manner, within limited right-of-way.

The "single pole line" or "shared support structure" policy is intended to: support right-of-way management objectives through better joint-planning of facilities; promote highway safety; and ensure a more efficient use of limited highway right-of-way.

Procedure

See procedures for issuing utility permits in Section 16 and for utility relocation projects in Section 17.

Standards

10.1 Design

See Section 5 for general design standards which apply to all utility installations.

Design and construction standards for pole lines, overhead cable, and supporting structures must meet or exceed standards established by the Electrical Safety Branch, Ministry of Municipal Affairs, Recreation and Housing, the Workers' Compensation Board, and/or other regulatory agencies which have authority.

Where the Ministry has prescribed a more stringent standard than other regulators, the Ministry's standard will apply. Similarly, where a regulatory authority requires a higher standard than those prescribed by the Ministry, the regulator's standard will apply.

10.2 Location -- General

See Section 5 for general Location and Alignment requirements.

10.2.1 Unsuitable Pole Locations

The following conditions are unsuitable for poles and overhead cable, and must be avoided. Examples include:

- Locations near bridges and retaining walls;
- Locations where cables would obscure or interfere with overhead traffic signals and signs;
- Scenic look-out areas, scenic vistas or historical sites;
- Locations at or near the bottom of back-slopes where poles and

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overhead cable could interfere with slope maintenance and rock scaling operations (this includes the bottom, crest or face of the slope);

- Locations which will interfere with planned installation of luminaires, traffic signals or other highway facilities;
- Areas of known soil stability problems;
- Locations where pole installations would interfere with visibility sight line at intersections; and,
- Within the Clear Zone.

Where feasible, poles must not be located at the beginning of a curve in line with the tangent on the approach.

10.2.2 Single Pole Lines

The following conditions apply to location of pole lines:

- The single pole line policy will apply to all classes of highway where pole lines are permitted;
- No more than one pole line will generally be permitted on a section of highway right-of-way;
- Exceptions may be made in certain conditions. These generally include:

- where poles are required for service connections;
- where a second pole line is required to service adjacent property, and a limited number of poles is required over a short distance;
- where the Electrical Safety Act restricts the installation of utilities on a single pole;
- where the utility demonstrates that all options have been considered and it is in the public interest to construct a second pole line;
- Where a pole line already exists but is not used for electric power lines, a permit may be issued to a electric power utility to install a second pole line. All subsequent installations or replacements must make use of the electrical pole line. The Ministry will not compensate utility companies for relocations onto new pole lines;
- Pole permits may be issued by the Ministry on a limited, or on an interim basis for pole replacements that do not conform with this policy in anticipation of the utility relocating to a single pole line. Replacements will be considered on the basis of the physical condition of the plant;

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- Single pole lines must be designed and constructed in such a manner that subsequent parties will be provided equitable access to the pole line;
- Joint venture or contact agreements must not subject other parties to unfair and uncompetitive conditions, nor should pole line providers reserve space unreasonably for possible future needs. The Ministry reserves the right to invoke a dispute resolution process of its choice to settle any disagreements which may arise as a result of this policy; and,
- All pole lines located within the area of a new highway construction project will be consolidated on a single pole line as part of the highway construction project.

10.3 Location -- At the Base of Cut Slopes

Utility pole line installations are not permitted at the base of rock slopes which have been identified in the Ministry's *Rock Slope Inventory* as high maintenance rock slope areas.

Where it is necessary to relocate a pole line within the highway right-of-way to accommodate rock-scaling work, the

alternative location should be considered to be the permanent location for the utility pole line.

The District Highways Manager, in consultation with the Manager, Geotechnical Operations may make exceptions with respect to the final location of the pole line where, in his opinion, the pole line would impact scenic look-out areas, scenic vistas or historical sites if it is not located at the base of the rock slope.

Rock slope hazards occur intermittently within the areas listed in the *Rock Slope Inventory*. Therefore, all new utility pole lines that are proposed for locations contained in the inventory should be referred to Rockwork Section for an assessment of the potential rock slope hazard in order to determine whether restrictions should apply to proposed utility pole installations.

The *Rock Slope Inventory* will be replaced by the *Rockfall Hazard Rating System (RHRS)*. This system will identify the exact locations for the entire highway system where it is considered unsuitable to locate a utility pole adjacent to a high-maintenance rock slope. This system is expected to be available in 1997.

10.4 Aesthetic Considerations

The design of pole lines and related facilities must take into account the surrounding landscape, views from the highway, and characteristics of the region.

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See Section 3.7 for information on current guidelines and more detailed guidelines which are being developed.

10.5 Location -- Lines Along Highway Right-of-Way

Where possible, pole lines are to be located parallel to the highway centreline and within 2 metres of the inside boundary of the highway right-of-way.

The District Highways Manager or their designate may grant exceptions where all of the following conditions can be met:

- Pole lines can be located outside of the Clear Zone;
- The pole line will not interfere with the visibility sight line at intersections; and,
- The pole line will not interfere with future roadway work.

Where the right-of-way boundary is irregular, the Ministry will consider a reasonable alignment which does not affect backslopes, drainage systems, other improvements, or maintenance operations. However, every effort must be made to locate pole lines at a consistent distance from the edge of right-of-way and the toe of the slope.

10.6 Crossings

Pole lines and overhead cables must cross highway rights-of-way at an angle as close to 90 degrees as practicable unless conditions of installation can be proved advantageous at a lesser angle.

Diagonal crossings of intersections are not permitted.

No poles, guy lines or other facilities are permitted in medians or traffic islands except in unusual circumstances where there is no practical alternative. Where poles or related utilities are permitted in a median or traffic island, they must conform with Clear Zone standards as set out in Section 5.3 or be adequately protected for all directions of travel.

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Communications Lines**

10.7 Clearance

circumstances as defined in Section 5.3.

10.7.1 Minimum Distance from the Highway Structure

4. Existing Pole Lines

1. New Installations on Open-Shoulder Highway

New poles, ground anchors, stub poles, and related facilities on open-shoulder highways must be offset from the highway centreline by a distance which satisfies both of the following criteria:

When existing pole lines are being replaced by the utility owner, they must be relocated beyond the Clear Zone distances as defined in Section 5.3, or protected by an approved guardrail or other suitable and approved protection, in the following cases:

- At least 2 metres beyond the toe of embankment fills and 2 metres beyond the top edge or daylight point of the cut slope; and,
- Outside the Clear Zone distance as defined in Section 5.3.

- On the recommendation of the Highway Safety Branch, based on local accident history or accident prevention requirements;
- On highway reconstruction projects where the centreline is being realigned or changes are being made to the highway cross-section outside the shoulder edge (e.g. pavement widening, modifications to fill slopes and back-slopes, or increasing the ditch-line offset); and,
- Where the utility owner is replacing more than three poles in a row.

2. New Installations on Curb and Gutter Sections

New pole lines and related facilities which are installed on curb and gutter sections must conform with Clear Zone standards as defined in Section 5.3.

3. Exceptions to Offset Requirements for New Installations

An exception to new-pole offset requirements can be made in certain

The District Highways Manager may grant exceptions in the following circumstances:

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- Where poles and supports are located along tangents and inside curves where local accident data shows no evidence of off-road accidents and where the utility owner can demonstrate that the cost of pole relocation, installation of barriers, or placing cables underground is significantly greater than the potential benefits from accident reduction; or,
 - In the case of a highway relocation project, where the Highway Safety Branch has determined that pole line relocation will not result in a significant improvement to highway safety.
- electric power lines in close proximity to highway traffic signals, traffic signs and luminaires.

10.7.2 Clearance from Bridges and Other Structures

Minimum clearance from bridges and other structures will be determined on a case by case basis in consultation with the Bridge Inspection Engineer, to ensure that maintenance operations are not impaired by the presence of poles, cables or related facilities.

10.7.3 Clearance from Highway Luminaires, Signs and Traffic Signals

Minimum clearance distances shown in Table 10.7.3 - 1 must be maintained for

Table 10.7.3 - 1 Minimum Clearance from Overhead Power Lines to Traffic Signals, Traffic Signs and Luminaires.

Voltage Class (Phase to Phase)	Minimum Clearance (metres)
0 - 750	1.0
Over 750 to 75,000	3.0
Over 75,000 to 250,000	4.6
Over 250,000 to 500,000	6.1

Note: These clearances are established by *Industrial Health and Safety Regulations*, Workers' Compensation Act.

10.7.4 Vertical Clearance

The Ministry's requirements for minimum overhead vertical clearance above the ground surface or from the pavement crown are shown in Tables 10.7.4 - 1, 10.7.4 - 2, and 10.7.4 - 3. Overhead installations must conform with these requirements or with industry standards, whichever is greater.

Minimum vertical clearance for road

crossings is measured from the roadway or pavement crown directly under the crossing under conditions of maximum sag. Minimum vertical clearance for lines which parallel the highway is measured from the ground line directly below the wire under conditions of maximum sag.

Overhead lines must not obstruct the visibility of traffic control signals and overhead advisory signs.

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Communications Lines**

**Table 10.7.4 - 1 Minimum Vertical Clearances
Telecommunications Cable**

Location	Minimum Clearance (metres)
For crossings of freeways and expressways. (See note.)	5.5
At intersections which are signalized or are likely to be signalized within the next ten years.	5.5
Where lower clearance interferes with highway maintenance and construction equipment, as determined by the District Highways Manager.	6.1
Other locations.	5.0

Note: Permitted only in extraordinary situations. See statement of Pole Line Policy at the beginning of Section 10.

**Table 10.7.4 - 2 Minimum Vertical Clearance
Electrical Distribution Lines**

Overhead Distribution Lines Voltage class (Phase-to-Ground)	Minimum Vertical Clearance (metres)
0 - 750	6.1
over 750 to 22,000	6.7
over 22,000 to 50,000	7.6

Notes: Refer to Table 10.6.3 - 1 for clearances to luminaires, traffic signals and traffic signs. Clearances include limits of approach for highway maintenance staff.

**Subject: 10.0 Overhead Power and
Communications Lines**

**Table 10.7.4 - 3 Minimum Vertical Clearances
Electrical Transmission Lines Crossing Highways**

Overhead Transmission Lines (Phase-to-Phase) Nominal Voltage	Minimum Vertical Clearance (metres)
69,000	9.6
138,000	9.9
230,000	10.5
287,000	10.9
345,000	11.2
500,000	14.2

Notes: Refer to Table 10.6.3 - 1 for clearances from traffic signals and traffic signs.
These clearances do **not** allow for future underbuilding.

References

10.7.5 Clearance from Other Utilities

The Ministry of Transportation and Highways will generally not prescribe a minimum clearance from other utilities. Clearances will be in accordance with industry standards and requirements set by utility regulators.

10.8 Cable Installations on Bridges and Other Structures

Standards for cable installations on bridges and other structures are set out in Section 13.

Design Manual, Ministry of Transportation and Highways.

Industrial Health and Safety Regulations, Workers' Compensation Act.

Technical Circular T - 12/94 Single Pole Line Policy. Ministry of Transportation and Highways.

Rock Slope Inventory, Ministry of Transportation and Highways.

Policy

Background to Policy

Procedure

Standards

- 11.1 Design
- 11.2 Location -- General
- 11.3 Location -- Lines Along Highway Right-of-Way
- 11.4 Crossings
- 11.5 Clearances
- 11.6 Depth of Cover
- 11.7 Measures to Protect Cables
- 11.8 Appurtenances
- 11.9 Cable Installations on Bridges and Other Structures

Application

This section deals with all underground cable, including:

- electric power lines
- fibre optic cable
- other communications cable

Unless otherwise indicated, **all voltages quoted in this section are phase-to-phase voltages.**

Policy

1. **Locations Where Underground Cable Installations are Not Permitted:** The Ministry generally does not permit underground cable installations along highway right-of-way in the following conditions:
 - Along freeways and expressways;
 - Along highway right-of-way which is expected to be upgraded to freeway or expressway standard within the next 20 years;
 - Where the line is rated at or above 60 kv phase-to-phase nominal voltage; and,
 - In medians.
2. **Crossings:** Underground transmission lines rated at or above 138 kv phase-to-phase nominal voltages are **not permitted** to cross highway right-of-way.
3. **Multiple Lines:** Distribution lines are generally permitted on only one side of highways and local roads.
4. **Bridges and Structures:** See Section 14 for policy on utility attachments to bridges and other structures.

Subject: 11.0 Underground Power and Communications Lines

Background to Policy

Restrictions on underground cable installations along right-of-way are based on the following conditions:

Installations Along Freeways and Expressways: Restrictions on the use of freeway and expressway right-of-way for underground cable (and all other utilities) are based on safety considerations and the practice of most highway departments across North America. Drivers on freeways and expressways expect high-speed, free-flowing traffic. Any activity which disrupts traffic flow (such as construction equipment and service vehicles accessing work sites directly from freeway lanes) may increase the risk of an accident.

High Voltage Transmission Lines: Buried cable rated at 60 kv phase-to-phase or greater is prohibited from highway right-of-way for safety reasons and the risk of serious injury in the event that a line is severed by maintenance or construction crews.

Cable Installations in Medians: Construction and maintenance vehicles entering and leaving the median from the centre lanes on a freeway would constitute an unacceptable hazard.

Multiple Lines. The shared use of facilities is part of the Ministry's effort to accommodate as many utilities as possible in a safe and orderly manner within limited

right-of-way. Conditions for exceptions are set out in Section 11.3.4.

Procedure

See procedures for issuing utility permits in Section 16 and for utility relocation projects in Section 17.

Standards

11.1 Design

See Section 5 for general design standards which apply to all utility installations.

Design and construction standards for underground cable and related facilities must meet or exceed standards established by the Electrical Safety Branch, Ministry of Municipal Affairs, Recreation and Housing, the Workers' Compensation Board, and/or other regulatory agencies which have authority. In the absence of other applicable standards, standards recommended by the CSA will apply.

Where the Ministry has prescribed a more stringent standard than other regulators or recommended CSA standards, the Ministry's standard will apply. Similarly, where a regulatory authority requires a higher standard than those prescribed by the Ministry, the regulator's standard will apply.

**Subject: 11.0 Underground Power and
Communications Lines**

11.2 Location -- General

See Section 5 for general Location and Alignment requirements.

Conditions which are unsuitable for underground cable must be avoided. Examples include:

- Locations near bridges, culverts and retaining walls;
- Locations where it is difficult to maintain full depth of cover;
- Locations at or near the bottom of rock slopes;
- Locations which will interfere with planned installation of luminaires, traffic signals or other highway facilities; and,
- Areas of known soil stability problems.

Exceptions may be made by the District Highways Manager where approved special measures are taken to protect the installation. The District Highways Manager will specify any special investigations or design work required for consideration of an exception. This may include design reviews by a Professional Engineer. Reasons for exceptions must be documented.

**11.3 Location -- Lines Along
Highway Right-of-Way**

11.3.1 Alignment

Where possible, underground cable installations are to be located parallel to the highway centreline and within 2 metres of the inside boundary of the highway right-of-way.

Where the highway right-of-way boundary is irregular, the Ministry will consider a reasonable alignment which does not affect backslopes, drainage systems, other improvements, or maintenance operations. However, every effort must be made to locate cables a consistent distance from the edge of the highway right-of-way and the toe of slopes.

**11.3.2 Minimum Distance from the
Highway Structure**

Cable installations must be offset a sufficient distance beyond the slope or ditch line to ensure that the structural and operational integrity of the highway is not impaired. In general, this entails a minimum offset of 2 metres from the toe of embankment fills and 2 metres beyond the top edge or daylight point of the cut slope. Disturbance to the roadway embankment and back slope are not permitted.

On curb and gutter sections, the minimum permissible offset is generally 2 metres from the outside edge of the curb.

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Exceptions may be approved by the District Highways Manager where there is a conflict with other utilities.

11.3.3 Installation Under Ditches, Medians, and the Highway Structure

No buried cable which parallels the highway centreline is permitted under ditches, medians or the highway structure except where all of the following conditions have been met to the District Highways Manager's satisfaction:

- The cable owner has clearly demonstrated that alternate locations (including locations outside the right-of-way) are not feasible because they involve high-risk locations, unacceptable environmental hazards, or extremely high costs;
- Installation plans include protective caps, increased depth of bury, or other measures which are approved and signed (or sealed) by a Professional Engineer who is experienced in underground cable design and is registered in B.C. at the time the permit application is submitted to the Ministry; and,
- The special design measures proposed by the cable owner are satisfactory to the Ministry.

11.3.4 Multiple Lines

Distribution lines may be permitted on both sides of the right-of-way where soil or other conditions are such that it is not feasible to bore or push lines under the roadway for service connections and where there is ample room in the right-of-way for all other utilities.

The District Highways Manager may also permit lines on both sides of the right-of-way where, in their opinion: local conditions make it impractical to concentrate all underground cable on one side; and, an exception will not compromise highway operations, safety or maintenance.

11.4 Crossings

11.4.1 Angle of Crossing

Underground cables must cross highway rights-of-way at an angle as close to 90 degrees as practicable unless installation can be proved advantageous at a lesser angle.

Diagonal crossings of intersections are not permitted.

11.4.2 Installation of Crossings

Cable crossings must be bored, jacked or directionally drilled under the highway structure using equipment and methods

Subject: 11.0 Underground Power and Communications Lines

which will not damage the highway or affect traffic safety and operations.

Boring, tunneling and jacking must conform with standards which are set out in Section 13 of this manual.

Trenching will be permitted in exceptional circumstances only when it is approved by the District Highways Manager in accordance with Section 13 of this manual.

Cables may not be run through the Ministry's highway culverts, even on a temporary basis.

11.5 Clearances

11.5.1 Clearance from Bridges and Other Structures

Minimum clearance from bridges and other structures will be determined on a case by case basis after consultation with:

- The Bridge Inspection Engineer, to ensure that maintenance operations are not impaired by the presence of cables or related facilities; and,
- The Regional Geotechnical and Materials Engineer, to ensure

that excavations do not affect the stability of footings.

11.5.2 Clearance from Other Utilities

The Ministry of Transportation and Highways generally will not prescribe a minimum clearance from other utilities. Clearances must be in accordance with industry standards and with requirements established by regulators.

11.6 Depth of Cover

Electric power installations, telecommunications cable, ducts, conduits and casings must conform with minimum depths of bury prescribed in Table 11.6 - 1.

Greater depth of cover may be required by the Ministry where conditions warrant, particularly in the following cases:

- Where the existing ditch is substandard (i.e. the elevation of the ditch bottom is higher than the elevation of a "design ditch" which meets Ministry standards as defined by the District Highways Manager or their designate);

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Communications Lines**

**Table 11.6 - 1 Minimum Depth of Bury
for Underground Cable and Related Facilities**

Type of Utility	Under Pavement and Shoulders	Under Design Ditch Inverts	Elsewhere in the right-of-way
Electric power cable	1.2 m	1.0 m	1.0 m
Fibre optics cable	1.2 m	0.75 m	0.75 m
Other telecommunications cable	1.2 m	0.75 m	0.75 m

- Where there is potential for scour, maintenance operations, or the need to increase ditch capacity;
- Where changes to vertical alignment of the highway are planned; and,
- Where footings for sign structures or other roadway facilities on the side of the highway require greater cover.

Reduced cover may be permitted where necessary provided that the installation is protected by concrete slabs or other measures which are satisfactory to the Ministry. These exceptions will be made only in special circumstances (e.g. where the trench is cut in solid rock or where the presence of other utilities makes it impossible to meet the standard) and only for short distances.

Where protective slabs are to be provided, they will be designed to meet specific site conditions. Bagged concrete is not acceptable as a means of protecting cables which are buried at substandard depth.

11.7 Measures to Protect Cables

11.7.1 Casing Requirements

Cables must be protected with ducts, conduits or concrete slabs of a design which is acceptable to the Ministry in situations where, in the Ministry's view, the lines are vulnerable because of their location or depth of bury.

The following are examples of conditions where casings of this sort may be required:

- For crossings of freeways, expressways, and other controlled-access highways and

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in other situations where trenched construction is not permitted;

- To provide protection from external loads or shock, either during or after construction of the highway; and,
- In the vicinity of bridge footings, pole footings or pedestals, and other highway structures.

Where future highway requirements or limited right-of-way width leave limited space for utilities, the Ministry may require cable owners to install additional duct capacity to accommodate other users.

11.7.2 Length of Casings

Where ducts or conduits are used for road crossings, they must extend at least 3 metres beyond the toe of fills, the back of the ditch line, or the outside of curbs unless the utility owner demonstrates that a shorter length is consistent with site conditions.

11.8 Appurtenances

11.8.1 Above-ground Markers

Above-ground markers are required in rural locations (generally where there is open drainage along the highway) for electric power cable and fibre optic cable.

Where required, markers must be placed at both ends of crossings at the right-of-way edge and at 200-metre intervals for

installations that run parallel to the centreline of the highway.

Standard markers which have been approved by the District Highways Manager must be used. The following information must appear on the marker: warning notice; the type of installation; name of the operating company; and an emergency telephone response number.

11.8.2 Underground Markers

An underground marker must be installed with any fibre optic cable which does not include a metallic tracer line. The marker must make it possible to locate the line with a readily available electronic device. Metallic tape of 12-gauge copper wire may be used for this purpose.

Where electric power cable, fibre optic cable or a conduit is installed by ploughing or trenching, a plastic warning tape must be spread above the cable at a suitable depth below ground surface. The warning tape used by the applicant must be of a type, width, durability, and colour which is commonly used in the industry.

11.8.3 Manholes

Manholes which are located within the Clear Zone as defined in Section 5.3 must be at ground level or be designed in such a way that they do not create an obstacle.

In all rural areas and in urban areas with posted speeds above 60 km/h, manholes

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Communications Lines**

must not be located in the pavement, on shoulders, or in medians.

Exceptions may be made for future installations where:

- Manholes are essential;
- Manholes are not located under wheel paths; and,
- There are two or more lanes in each direction.

In urban areas with posted speeds of 60 km/h or less, manholes may be located in the pavement provided they are not in the wheel path and there are two or more lanes in each direction.

11.8.4 Pedestals

Pedestals or other above-ground appurtenances installed as part of buried cable facility must be located: immediately inside the right-of-way boundary; well outside highway maintenance areas; and outside of the Clear Zone as defined in Section 5.3

11.9 Cable Installations on Bridges and Other Structures

Standards for cable installations on bridges and other structures are set out in Section 14.

Definitions

Policy

Background to Policy

Procedures

- 12.1 Locations on Right-of-Way Lands
- 12.2 Locations on Ministry Structures
- 12.3 Exposure to Radiofrequency Fields
- 12.4 Master Use (Operating) Agreement Required
- 12.5 Site Permit
 - 12.5.1 Site Permits
 - 12.5.2 Site Permit Review Process
 - 12.5.3 Site Permit Application Checklist
 - 12.5.4 Site Permit Referrals
 - 12.5.5 Site Permit Numbering
 - 12.5.6 Shared Structures
- 12.6 Wireless Communications Site Fee
 - 12.6.1 Fee Criteria
 - 12.6.2 Fee Calculation
 - 12.6.3 Fee Payment
- 12.7 Exceptions to this Policy
 - 12.7.1 BCBC Agreement

Standards

- 12.8 Landscape and Aesthetic Design Requirements
- 12.9 Roadside Locations
- 12.10 Non-Highway Sites
- 12.11 Structures: Bridges and Poles (signs and lighting)
 - 12.11.1 General
 - 12.11.2 Installation on Bridge Structures
 - 12.11.3 Installation on Sign Structures
 - 12.11.4 Installation on Lighting Poles

Definitions

The following definitions apply throughout this section.

- **Equipment** means the transmission and reception antennas, apparatus, fixtures, conduits, attachments, cables, wires, shelters, cabinets, and other appurtenances and structures comprising the Wireless Communications Facility.
- **Fee** means that annual amount payable by the Company as calculated in accordance with the terms set out in the schedule of fees in the Master Use (Operating) Agreement.
- **Ministry Structure** means, but is not limited to, buildings, bridges, towers, tunnels, sign and lighting structures or video poles.
- **Right-of-Way Lands** means portions of the highways under the jurisdiction of the Ministry of Transportation and Highways excluding the travelled portions and includes Ministry structures situated thereon.
- **Sites** means the portions of the Right-of-Way Lands and the Ministry Structures that may be designated from time to time as locations for a Wireless Communications Facility and is set out on the plans appended to the Site Permits and **Site** means any one of such Sites. For the purpose of this section, a site could consist of a tower or structure used to mount antennas, with or without related equipment located at ground level adjacent to the structure. A site may also be a structure where several antennas are located in various locations on or in structure but are all connected to one central equipment cabinet or shelter. Where a Ministry structure is used as a Site, the structure will be deemed to be a separate Site for each wireless communications company regardless of the configuration of equipment.
- **Site Activities** means the activities of the Company on the Sites related to the installation, maintenance and operation of the Wireless Communications Facility, including the installation, construction, repair, replacement, relocation, maintenance, operation, dismantling and removal and restoration of the Wireless Communications Facility.
- **Site Permit** means the instrument, setting out the grant of the non exclusive licence of use and occupation of the site and incorporating the terms and conditions of the Master Use (Operating) Agreement.

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- **Wireless Communications Facility** means the configuration of Equipment installed, maintained and operated at the Site for the purpose of providing wireless communications services.

Policy

1. **Applicable to New Installations Only.** Policy, procedures and standards in this Section apply only to the installation, maintenance and operation of new Wireless Communications Facilities.
2. **Locations on Right-of-Way Lands.** Except where otherwise noted, the installation, maintenance and operation of Wireless Communications Facilities are generally permitted on all Right-of-Way Lands including all classes of highways where the use will not impact the safety of the highway user, Ministry employees or their contractors, or is an impediment to the operation and use of the highway.
3. **Sites Permitted on Highway Structures.** Except where otherwise noted, the installation, maintenance and operation of Wireless Communications Facilities are generally permitted on highway structures where the use will not impact the physical integrity or the intended use of the structure, the safety of the highway user, Ministry employees or their contractors, or is an impediment to the operation and use of the highway.
4. **Exposure to Radiofrequency Fields.** All wireless communications Sites installed, maintained and operated on Right-of-Way Lands, shall comply with the recommendations described in Health Canada Safety Code 6, Limits of Exposure to Radiofrequency Fields at Frequencies from 10kHz - 100GHz.

5. **Master Use (Operating) Agreement Required.** A signed Master Use (Operating) Agreement between the Ministry and the wireless communications company is required prior to the approval of any Site Permits for the installation, maintenance and operation of Wireless Communications Facilities on Right-of-Way Lands.

6. **Site Permit required.** A Ministry permit, H1026 “Permission to Install, Maintain and Operate Utility Works on Right-of-Way Lands” is required for the installation, maintenance and operation of the Wireless Communications Facility on Right-of-Way Lands under the jurisdiction and control of the Ministry.

7. **Wireless Communications Sites subject to a Fee.** A fee, as outlined in the Fee Schedule contained in Appendix A of the Master Use (Operating) Agreement will be paid by the Company to the Ministry for the use of Right-of-Way Lands for the installation, maintenance and operation of a Wireless Communications Facility.

Background to Policy

Communications companies utilizing wireless communications technology require site specific locations on highway right-of-way to install, maintain and operate wireless communications facilities that will provide continuous communications coverage over a defined geographic area. Locations on highway right-of-way are required because of gaps in communications coverage (bridges, tunnels, topography) while using the highway and also because of the highway's proximity to population concentrations.

Wireless communications sites consist of a single or group of small antennas mounted on a structure. Because of their compact size it may also be possible to mount antennas on Ministry structures such as buildings, bridges, tunnels, sign or lighting structures/bridges or video poles. The wireless communications structure will vary in size ranging from a utility pole to larger towers depending on the area of coverage which is planned for the site. Related equipment cabinets may be installed at or adjacent to the Site.

Two different technologies are being used for wireless communication: personal communications systems (PCS) which is a digital technology; and, the cellular or analog technology. These systems may be integrated or used as separate systems. Several types

of communications can be supplied or are proposed. The more common at this time are voice and paging systems.

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The Ministry recognizes the potential benefits for permitting these stand alone sites on Right-of-Way Lands both in terms of a direct benefit to the traveling public as well as the potential indirect benefits to the Ministry through the shared use of the wireless structures for Ministry purposes.

Procedures

12.1. Locations on Right-of-Way Lands.

Wireless communications Sites are permitted in the following locations.

- Wireless communications sites are permitted on all titled and untitled lands under the jurisdiction and control of the Ministry.
- Wireless communications sites are permitted on all classes of highways including freeways and expressways where, in the opinion of the District Highways Manager, the installation, maintenance and operation of the facility does not impact the use and operation of the highway.

The following criteria should be considered when reviewing an application for location on a highway.

- Industry applicants should be advised of the status of individual properties, including possible disposition or proposed improvements which may

impact the proposed site during the permit review and approval process.

- The Wireless Communications Facility is to be installed, maintained and operated in a manner which complies with Ministry standards and directives which have been established to protect the traveling public and highway facility.
- The Wireless Communications Facility is to be installed, maintained and operated in such a manner that if it is damaged or there is an emergency related to the wireless communications facility, any service or repair activities will not impact the operation and use of the highway facility.
- The operation of the Wireless Communications Facility will comply with the safety requirements prescribed by the Ministry.
- The Wireless Communications Facility shall be landscaped in accordance with the standards and guidelines prescribed by the Ministry.

12.2. Locations on Ministry Structures

Wireless communications facilities may be located on Ministry structures. Small low powered wireless communications equipment can be placed on or in Ministry structures to fill gaps in communications coverage if the equipment does not impact the operational life and use of the structure.

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The following criteria should be considered when reviewing an application for location on a structure.

- Small compact equipment that comprises the wireless communications facility, which are installed, maintained and operated according to Ministry directives and requirements should have minimal impact on the Ministry structure and use of the highway facility.
- The wireless communications facility shall be installed in such a manner that if it is damaged or is in need of emergency repair there will be no impact on the operation and use of the Ministry structure.

at Frequencies from 10 kHz - 300 GHz, Safety Code 6 Guidelines are adopted as Ministry standards for this purpose.

- Applications for wireless communications sites will confirm that the design of the facility complies with Health Canada guidelines.

12.3. Exposure to Radiofrequency Fields

The safety of the public and Ministry employees is critical in the location and operation of Wireless Communications Facilities. When a Wireless Communications Facility is located on Right-of-Way Lands the operation will be carried out in a manner that ensures that neither the public or Ministry employees are exposed to excessive levels of Radiofrequency energy. The following safety requirements must be followed by the applicant.

- Safety guidelines for the installation, maintenance and operation of Wireless Communications Facilities as outlined in the Health Canada publication Limits of Exposure to Radiofrequency Fields

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12.4. Master Use (Operating) Agreement Required.

The Agreement has been introduced to provide general terms and conditions for the installation, maintenance and operation on Wireless Communications Facilities on Right-of-Way Lands. The Agreement has been developed because of the complexity of issues associated with the placement and use of this type of facility in a range of possible locations. A signed Agreement confirms that the Company has agreed to terms and conditions set by the Ministry. The following administrative procedures apply.

- The installation, maintenance and operation of Wireless Communications Facilities on Right-of-Way Lands including Ministry structures will be in accordance with the terms and conditions set by the Ministry and agreed to by the wireless communications company in a Master Use (Operating) Agreement.
- A signed Master Use (Operating) Agreement between the Ministry of Transportation and Highways and the wireless communications company is required prior to approval of any Site Permits for the installation, maintenance and operation of wireless communications facilities on Right-of-Way Lands.
- The Agreement specifies that a Site Permit is required for the installation, maintenance and operation of a wireless

communications Site on Right-of-Way Lands.

- The Director of Construction and Maintenance Branch is responsible for the administration of the Master Use (Operating) Agreements. The contact position for the Agreements is the Manager, Operations Policy, Construction and Maintenance Branch.

12.5 Site Permit Required.

Each Highways District will issue a Site Permit for wireless communications sites located in their District.

- The District Highways Manager will ensure that a signed Master Use (Operating) Agreement is in place between the Ministry and Company prior to approving a Site Permit for a Wireless Communications Facility in their District.
- A Ministry Permit H1026 “Permission to Install, Maintain and Operate Utility Works on Right-of-Way Lands” is required for each wireless communications site.
- The Master Use (Operating) Agreement and Site Permit are to be used conjunctively when approving a wireless communications site.
- Ministry Site Permit H1026 is available in an electronic format only, and is located on the Ministry’s Public Drive at:

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**FS_Public_Files@SVRHQ_CONS01
@Servers\Freedom\Formsmgt\H-
Forms\H1026.DOT**

- Two copies of the H1026 form, which are dated and signed by the District Highways Manager are to be forwarded to the Company Representative for signature. One copy is to be returned to the Highways District office. The Site Permit takes effect on the date that it is signed by the Company Representative.

12.5.1 Site Permits

Site Permits will be issued or amended in the following manner.

- A Site Permit is required for each wireless communications site.
- Only one Site Permit will be issued for each wireless communication site. A Site Permit will only be issued to the wireless communications company that establishes a Site. Any subsequent wireless companies that propose to share the Site will be deemed a sublicensee to the Company that has obtained the Site Permit.
- All subsequent changes to the Site by the Company or any sublicensee to the Company will require an amendment to the Site Permit issued to the Company.
- An amended Site Permit will be required when: (1) in the opinion of the District Highways Manager alterations or modifications to the site materially

change the facility; or, (2) the number of antennas has been increased or decreased either by the Company or a sublicensee at the site.

- A Site Permit is required by the wireless communications company when the company occupies space on a non-wireless structure (a hydro transmission tower, utility pole or platform) which is located on Right-of-Way Lands regardless of whether all or a portion of the Wireless Communications Facility is located on the structure. The wireless communications company will be responsible for obtaining a Site Permit to locate on the non-wireless structure.

12.5.2 Site Permit Review Process

The following Site Permit review process should generally be used.

1. Applicant submits completed H20 "Application for Permission to Construct Works Within Highway Right-of-Way":
 - District office to carry out all preliminary permit application referrals.
2. The District office will notify the applicant within thirty (30) days of the receipt of the application:
 - as to whether the site is suitable for the intended use (grant preliminary layout approval);

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- advise the applicant at this time if the Ministry requires the site to be occupied on a shared basis.
- 3. If the proposed site is located on or in a Ministry structure or a high maintenance area where additional technical information is required:
 - refer detailed permit information to those sections of the Ministry indicated for review and approval. (see Section 12.5.4 Site Permit Referrals);
 - the Ministry may be required to supply further technical specifications and requirements to the applicant to prepare a final plan for the development of the Site.
- 4. If no further technical or operational review is required, the Ministry will issue a form H1026 "Permission to Install, Maintain and Operate Utility Works on Right-of-Way Lands" to the applicant.

12.5.3 Site Permit Application Checklist

The following information is required as part of a Site Permit application.

1. Administration

- Company Name, address and phone number
- Company Representative (completing the application)
- Company Representative's phone number

2. Drawing Information

- The location and area required for the Site on Right-of-Way Lands
- The specifications and layout of all the Equipment
- The power output from each antenna and the total output from the Site in units of measurement used in the Health Canada Safety Code 6, Limits of Exposure to Radiofrequency Fields at Frequencies from 10kHz-100GHz
- The location, type and height of the proposed tower or structure used
- A detailed description and location of all utility connections to the Site
- Proposed landscaping improvements

3. Location on or in a Ministry Structure

- Description of the Equipment to be located on or in a Ministry structure
- The location and method of placement or attachment of the Equipment to the Ministry structure.

4. Other

- Description of any wireless communications equipment currently at the Site or in the immediate vicinity of the Site
- Method and frequency of access to the site
- any non-proprietary information that may be requested by the District Highways Manager in connection with the installation, maintenance and operation of the

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Wireless Communications Facility as it may impact the Ministry's radio communications or electrical equipment or the operation and use of a highway facility or Ministry structure.

5. Signatures

Drawings that form part of the Site Permit Application will be signed by the following Company Representatives including: A Civil Engineer; Electrical Engineer; and, Radio Frequency Engineer who are experienced in the design of wireless communications facilities and are registered in British Columbia at the time the Site Permit Application is submitted.

12.5.4 Site Permit Referrals

1. **Radio and Electronics Section.** All Site Permit applications to install, maintain and operate a wireless communications facility will be referred to the Radio and Electronics Section, Construction and Maintenance Branch who will review the application for the following:

- if the Site interferes with the Ministry's radio communications system or any other electrical or mechanical operation associated with a Ministry facility or installation;
- if the Site is, or may be required for a Ministry radio communications facility; and,

- if the proposed Site impacts Ministry staff, agents or contractors in their role of providing maintenance or support to an adjacent Ministry facility or installation.

2. Regional Property Agent.

Wireless communications sites are permitted on all Right-of-Way Lands which are defined as all titled and untitled land under the jurisdiction and control of the Ministry of Transportation and Highways. Where confirmation of the existing and future status of Right-of-Way Lands is necessary, applications will be referred to the Regional Property Agent who will:

- will confirm status of lands where wireless Sites are proposed.

3. **Manager, Electrical Engineering.** Site Permit applications should be referred to the Manager, Electrical Engineering, South Coast Region to ensure the following requirements are addressed:

- if the wireless communications site is located on or in a Ministry structure, refer to the Manager, Electrical Engineering to ensure that works comply with Ministry electrical standards and that final drawings submitted from the applicant have been completed to Ministry electrical drawing standards; and,
- if the proposed Site is near a Ministry structure or intersection, where it may interfere with worker safety or traffic (visual impediments), refer to the

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Manager, Electrical Engineering for information purposes.

The Manager, Electrical Engineering, South Coast provides guidelines and information on a Province wide basis.

4. Electrical District Manager

- Highway District to forward Site Permit to the Electrical District Manager for information purposes. The Electrical District should also be advised of scheduled work at the wireless communications site.

5. Regional Bridge Engineer.

All Site Permit applications that are proposed for Ministry structures will be referred to the Regional Bridge Engineer who will review the application for the following:

- assess the integrity of the structure to support to wireless equipment and outline modifications such as mounting methods and materials, location etc. where a wireless site can be accommodated; and,
- where a wireless company has proposed a wireless communications site on a light structure, sign bridge etc., in any location in the province, the South Coast Regional Bridge Seismic Engineer shall be consulted on technical issues.

6. Planning and Programming. Referral for information purposes.

7. Local government.
Referral for information purposes.

12.5.5 Site Permit Numbering

The following Site Permit number system will be used for wireless communications sites.

- Add the following permit code for Wireless Communications Sites to the Development Approvals System (DAS): PER_DC
- The fee for the wireless communications site will be based on the number of antennas located at the Site by the Company. An additional fee will be added for the number of antennas located on the site by each of the sublicensees. Add a Note Field to record the number of antennas located at the Site by the Company as well as the number of antennas for each sublicensee located at the Site in Schedule “2” for Permit Form H1026.
- The Site Permit number will be used for subsequent Site Permit amendments by a chronological change to the first digit to the right of the decimal place in the permit number. For example, in Lower Mainland District the initial Site Permit number to install, maintain and operate wireless communications facility would be 0106xxxxx.0. If the company

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changes the number of antennas located at the Site an amended permit would be issued with the permit number 0106xxxxx.1. If a sublicensee locates at the Site, which adds additional antennas to the Site, the amended permit number will be 0106xxxxx.2, and so on.

12.5.6 Shared Structures

Wherever possible, wireless communications companies should be encouraged to share support structures.

Where alignments are critical, or space on Ministry structures is limited, wireless companies will be required to share wireless sites. Districts will identify these critical locations when providing preliminary layout approval for wireless sites. Where the Ministry designates a site as shared use or occupation only, the following procedure will apply.

- The District will identify locations that are to be developed on a shared basis and advise wireless companies at the time of application of the shared structure status of the proposed site.
- The first applicant for a shared site will coordinate the interests of other wireless communications companies which are in the wireless communications business at the time the application is made.
- The applicant will provide to the Ministry written confirmation from

other wireless companies of their intention to share/not share the site. If no other company expresses an interest in the site or the applicant has not received confirmation in writing from other wireless companies within 30 days from the date from the initial expression of interest to other wireless companies, the Ministry will then proceed to review the application for a Site Permit.

- The Ministry will not approve subsequent applications from other wireless communications companies to develop a facility if they have been previously contacted by the applicant to develop a facility at this location unless Site is developed on a shared structure basis.

Where a subsequent company enters into an agreement with the Company as a sublicensee to share the use of the Site, the Company which holds the Site Permit will make application to amend the existing Site Permit. No additional permits will be issued for the use of the Site. The following information will be included in Schedule "2" of the amended Permit:

- the name and address of the Sublicensee;
- a contact name, address and phone number of the sublicensee;
- changes, additions, alterations and removal of equipment at the Site;
- the number of antennas installed at the Site by the Sublicensee;

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- proposed location of utility services; and,
- any other non-proprietary information required by the District.

12.6 Wireless Communications Site Fee.

The Company will be required to pay to the Ministry a fee for each wireless communications Site located on Right-of-Way Lands.

12.6.1 Fee Criteria

The fees set for the use of the Site will be in accordance with the amounts set in Schedule A "Fees" of the Master Use (Operating) Agreement with the wireless communications company.

- The annual Fee for a Site will be prorated for the first year and be payable within fourteen days of the Site Permit being signed by the Company and issued by the Ministry.
- The Fee required for any portion of a month will be treated as a fee for one/twelfth (1/12) of the annual Fee.
- The annual Fee payable to the Ministry will be paid on the first day of April for each calendar year.
- The amount owing from each wireless company will be confirmed through an audit of Site Permits issued and will be carried out by the Director, Construction and Maintenance Branch.
- The Company's Fee shall be automatically increased if the number of antennas is increased at the Site to a higher category.
- Where the Company has sublicensed the Site, the Company will pay to the Ministry, in addition to the Company's own Site Permit fee, an amount equivalent to twenty-five (25) percent of the Site Permit fee that would have been paid by the Sublicensee for their

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own site. The additional fee to be paid by the Company for each Sublicensee is based on Site criteria specified in Section 12.6.2 and forms part of the total Site Permit fee payable by the Company.

- Where the Company elects to install, maintain and operate its facilities on a structure which belongs to a non-Wireless Communications Company, and where the non-Wireless Communications Company has a Permit to locate on and use Right-of-Way Lands, the Wireless Communications Company will pay the Ministry twenty-five (25) per cent of the annual Site Permit Fee that would be normally paid to the Ministry. The Site Permit Fee paid by the Wireless Communications Company to the Ministry is based on the site criteria specified in Section 12.6.2.

12.6.2 Fee Calculation

The Fee for a Site will be based on the following three factors: (1) geographic location, (2) the total number of antennas located at the Site; and, (3) if the Wireless Communications Facility is attached, mounted or installed on or in a Ministry Structure.

1. The Province shall be divided into the following zones for the purposes of a Fee calculation:

Zone 1 is comprised of all Right-of-Way Lands under the jurisdiction of the

Ministry within the boundaries of the Capital Regional District (CRD), Greater Vancouver Regional District (GVRD), and the Fraser Valley Regional District (FVRD).

Zone 2 is comprised of all Right-of-Way Lands under the jurisdiction of the Ministry within the boundaries of municipalities within the Province of British Columbia which have a population of 50,000 or more as identified in the 1996 Canadian Census.

Zone 3 is comprised of all Right-of-Way Lands under the jurisdiction of the Ministry which are not included in Zone 1 and 2.

2. For the purposes of a Fee calculation the annual Fee paid by the Company will be determined by the total number of antennas installed by the Company and each sublicensee at the Site.
3. For the purposes of a Fee calculation the annual Fee paid by the Company will be determined on the basis of whether or not the Company's Equipment is attached, mounted or installed in, or on a Ministry Structure.

12.6.3 Fee Payment

The following payment procedures are to used.

- The Site Permit Fee will be based on the location and equipment installed at the Site as outlined in the Ministry Site

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Permit H1026 “Permission To Install, Maintain and Operate Utility Works on Right-of-Way Lands”.

- The Fee will be calculated by the Company as per the criteria contained in Schedule “A” of the Master (Operating) Agreement and outlined in Section 12.6.2 of this section.
- The initial Site Permit Fee and the Company’s annual Fee will be paid by the dates specified in the Master (Operating) Agreement to the Director, Construction and Maintenance Branch, Ministry of Transportation and Highways, Province of British Columbia P.O. Box 9850 STN PROV GOVT, Victoria, B.C. V8W 9T5.
- The initial Site Permit Fee payment, to be made payable to the “Ministry of Finance” will include a copy of the Site Permit containing: the Site Permit Number; site location; and, number of antennas located at the Site.
- The Company will make one annual Fee payment for all of it’s established Sites located on Right-of-Way Lands. The payment will include the following information: an itemized listing of Sites containing the Site Permit Number, site locations, total number of antennas at each site and the total amount payable for each of the Company’s Sites.
- Payment of the Goods and Services Tax (GST) is required, and the GST owing will be in addition to the Site Fee. The

Province’s GST registration number is R107864738. The Site Permit Fee is not subject to Social Services Tax (PST).

- The Ministry will audit all Site Permit on an annual basis to confirm payment of fees.

12.7 Exceptions to this policy

12.7.1 BCBC Agreement

The following will apply where the British Columbia Buildings Corporation (BCBC) has an interest in buildings located on Right-of-Way Lands under the jurisdiction and control of the Ministry.

- Where a building and Right of Way Land are owned by MOTH but BCBC may or may not be providing building maintenance services and billing the Ministry as part of the Building Occupancy Charge (BOC). the Ministry will enter into an agreement directly with the wireless communications company. No referral to BCBC is required and the Ministry will retain revenue for the installation, maintenance and operation of the Wireless Communications Facility on the lands or building. Examples where this may occur include, but are not limited to Weigh Scales, Rest Areas, Toll Plazas etc.
- Where the Right-of-Way Lands are under the jurisdiction and control of the

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Ministry but the building situated on the Right-of-Way Lands is owned by BCBC but occupied by MOTH, BCBC will enter into an agreement on behalf of the Ministry with the wireless communications company to develop a Site on either the building or lands on which the building is located. BCBC will refer the application to local District Highways Manager for review and approval prior to entering into a lease with the wireless communications company. BCBC will retain revenue from the lease.

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12.8 Landscape and Aesthetic Design Requirements

The proposed Site must comply with Ministry aesthetic guidelines. Facilities may be permitted if site design can be developed or modified to reduce adverse visual effects. Facilities must also be compatible with community desires; no facilities should be located in areas which are objectionable to the local community. facilities should not create a visual element that would be an unwarranted distraction to neighbouring property owners and the traveling public. Above ground equipment shelters or huts should blend into the surrounding area as much as feasible. Antenna designs should be innovative so as not to attract special attention. The following aesthetic guidelines will apply.

- The Company is requested to make the wireless communication Site as inconspicuous as reasonably possible and to ensure a design that is visually compatible with the visual quality of the highway corridor and adjacent land uses.
- Facility locations should be selected that require minimum site disturbance.
- To the greatest extent possible, towers, poles or any other similar structure required to mount or place antennas or other similar equipment required to operate the wireless communications facility shall not be of a height, bulk or size which is in excess of Ministry or utility installations that are typically located on highway right-of-way. As a general rule, no portion of the wireless facility should exceed a maximum height of twenty (20) metres above natural ground.
- To the maximum extent possible, existing vegetation shall be preserved to provide visual screens and buffers.
- New or replacement planting, and other visual screening treatments required by the Ministry will be planted and properly maintained by the Company for a period of one year.
- Sites shall not be located, designated or proposed on highways which are deemed to have high scenic qualities.

12.9 Roadside Locations

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The following standards will apply where wireless communications Sites are installed, maintained and operated at roadside locations.

- All wireless communications sites shall be located outside of the Clear Zone as outlined in the Ministry of Transportation and Highway' Highway Engineering Design Manual Section 400.
- Where a Site is located on a freeway or expressway, the following access guidelines for the construction, maintenance and operation of a Wireless Communications Facility shall apply:
 - access to the site will be from the local road or street network or adjacent frontage roads; or obtain approval from adjacent property owners to allow access through adjacent public or private property, and where access is gained to highway right-of-way in this manner, the Company will be required to maintain a locked gate at their access point.
 - access to a site cannot be from the outside radius of a curve for an on/off ramp at an interchange;
 - all above ground obstructions including facilities and equipment at the site as well as parked service vehicles will be located outside of the sight distance line or clear zone, which ever is greater; and,

- all utility services to the wireless communications site (electrical and communications) will be installed underground from the edge of the right-of-way boundary to the wireless communications site.

- Where the Site is located on a highway which is not a freeway or expressway, approval in advance from the District Highways Manager is required to access the site to construct, maintain and operate the Wireless Communications Facility.
- Maintenance pullouts shall be located in a manner where acceleration and deceleration from the traveled way can be safely achieved.

12.10 Non-Highway Sites (yards, compounds, parking lots, buildings)

The following standards will apply where wireless communications sites are not constructed, maintained or operated at roadside locations.

- Wind and seismic loading calculations and foundation designs of new towers will be approved and signed (or sealed) by a Professional Engineer who is experienced in the design of wireless communications sites and is registered in B.C. at the time the permit application is submitted.
- Unless other site protection is required in the Health Canada Limits of Exposure to Radiofrequency Fields at

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Frequencies from 10kHz -300GHz Safety Code 6 Guidelines, standard steel post barrier protection of a wireless communications site will be required. A minimum of 4 guard posts, no less than 2.5 metres in length will be installed surrounding any new towers or poles erected at non-highway sites. Posts will be no less than 150 mm in diameter, and made of schedules 40 galvanized steel. Posts will be installed 1.2 metres below the finished grade adjacent to the tower or pole, with a 300 mm diameter concrete footing surrounding each post to a depth of no less than 75 mm below the bottom of the post. Below grade, posts will also be filled with concrete. A 25 mm circular concrete cap will be installed at the top of each post.

- Open storage of equipment and materials will not be permitted at the wireless communications Site.
- The placement of the Company's equipment, which forms a portion of the Wireless Communications Facility located on or in a Ministry compound, parking facility, park and ride facility, building or any other such facility, shall not interfere with the operation of the Ministry facility, interfere with access to any portion of the facility, nor compromise public safety if located adjacent to, or is in a Ministry facility.
- The Site shall not take up a designated parking space if located in a parking lot or park and ride facility. If an

exception is approved, the space(s) shall be those that least impact the facility.

- All designs which call for the placement of components of a Wireless Communications Facility on a Ministry building must be approved and signed (or sealed) by a Professional Engineer who is experienced in the design of Wireless Communications Facilities.

12.11 Structures: Bridges and Poles (sign and lighting)

12.11.1 General

The installation, operation, and maintenance of wireless communications equipment is permitted on Ministry structures if the wireless company demonstrates that alternative sites are not practical or possible, and that it is safe to do so.

- The Ministry's first preference will be to have wireless communications equipment on a separate Company structures whenever possible.
- Conditions at the site shall remain as safe as before the Wireless Communications Facility was installed.
- The design of the Wireless Communications Facility should not have any detrimental structural or aesthetic impact on Ministry structures.
- The ability to perform maintenance inspections, repairs or other

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maintenance operations on the Ministry structure shall not be impaired by the Wireless Communications Facility.

- The service life expectancy of the Ministry structure shall not be reduced as a result of the installation, maintenance and operation of the wireless equipment.
- Where inspections indicate increased vibration or fatigue in the Ministry structure as a result of the placement of equipment which comprise the Wireless Communications Facility, the components will be modified or removed by the Company as and when directed by the Ministry.
- When installing wireless service equipment on Ministry owned and maintained lighting or signal standards, the Company will be responsible for determining conduit and wiring requirements as per the Electrical and Traffic Engineering Manual, Guidelines for the Design of Lighting, Signals, and Sign Installations, (1994), Ministry of Transportation and Highways, Province of British Columbia, and the Canadian Electric Code, and any other design guidelines that may be used by the Ministry. The Company is also responsible for the installation and any upgrades in conduits and wiring, including removing and replacing foundations, if necessary.
- Wind and seismic loading calculations and foundation designs of new towers

will be approved and signed (or sealed) by a Professional Engineer who is experienced in the design of wireless communications sites and is registered in B.C. at the time the permit application is submitted.

- The mounting of special attachments, or new components as part of the Wireless Communications Facility to existing sign or lighting structures shall be in accordance with the standards contained in the Ontario Highway Bridge Design Code Third Edition (1991) and Standard Specifications For Structural Supports for Highway Signs, Luminaries and Traffic Signals (1994). Final approval will be subject to review and approval of the Ministry's South Coast Regional Bridge Seismic Engineer.
- All designs which call for the placement of equipment which is part of a Wireless Communications Facility on a Ministry structure must be approved and signed (or sealed) by a Professional Engineer who is experienced in the design of Wireless Communications Facilities and is registered in B.C. at the time the permit application is submitted.
- All drawings for Wireless Communications Facilities to be placed on or in Ministry structures will be completed to a standard that conforms with the Ministry's Manual of Drafting Standards. The Ministry will supply electrical drawings for structures upon request.

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- Where the Ministry elects to provide electrical power to the Site, the proposed design will require the approval of the Manager, Electrical District and Manager, Electrical Engineering.
- Any installation of a Wireless Communications Facility on a Ministry structure will comply with the standards set out in Chapter 14, of the Ministry's Utility Policy Manual, 1995.

12.11.2 Installation on Bridge Structures

When there is no reasonable alternative available, the Wireless Communications Facility may be installed on a bridge structure if the proposed facility conforms with the following provisions.

- Equipment that may distract a vehicle operator from safe use of the Ministry structure shall not be permitted. This includes facilities that may distract a driver when the equipment is being serviced or maintained.
- The aesthetic architectural and historic value of the Ministry structure must be maintained.
- The operation and maintenance of the Wireless Communications Facility must not interfere with traffic operations on or near the Ministry structure.
- The Electrical or communication lines to the Site should be installed inside the

bridge for box girder bridges or between the girders for bridges with no soffit. Conduits can be cored through abutment to the street and from there to equipment located in ground installation.

- Wireless communications antennas will be allowed on a pedestrian overpass if the placement of the antenna meets Health Canada Limits of Exposure to Radiofrequency Fields at Frequencies from 10kHz - 300ghz Safety Code 6 Guidelines and all other safety and health concerns and issues have been addressed to the satisfaction of the Ministry.
- No wireless communications antennas will be allowed on or in Ministry structures which require regular maintenance by Ministry employees in the vicinity of the wireless communications antennas. Exceptions may be reviewed on a case by case basis. Where antennas are permitted, the Company will agree, as part of the permit approval, to power down the site to a level requested by the Ministry when both scheduled and emergency activities are carried out by the employees of the Ministry, its contractors or agents.
- Wireless communications equipment shall not be placed where access and maintenance may be difficult or unsafe. Access and maintenance to an existing Ministry structure shall not be limited or prevented in any way.

- Wireless communications equipment at, on or in a Ministry structure shall not interfere with the capacity or performance of existing Ministry equipment associated with the structure.

1211.3 Installation on Sign Structures

- The installation of wireless communications equipment is not permitted on signs located in the highway median.
- Wireless antenna panel should be placed behind the existing sign structures.
- Cables or conduit should be placed inside the sign poles, If this is not possible, the proposed cable should be mounted in a manner so that the cables or conduit can not be viewed by passing traffic.
- An antenna panel can only be installed behind the sign panel. Other types may be installed on top of the right post if there is no aesthetic impact or it does not detract from the primary purpose of the sign.
- Special elements may be considered for large existing Overhead Bridge Structures. Work related to mounting attachments will avoid alterations near the structures main and connecting parts including primary members, bolts, and welds.

12.11.4 Installation on Lighting Poles

- The installation of wireless communications components will be permitted only when there are no other reasonable alternatives available to the wireless company. Savings in costs to the wireless company will not be considered as a justification for approval.
- Installation should be in proportion to the size of the pole.
- The combination of antenna size and configuration and the electric pole should be design checked for structural adequacy.
- All wireless components should consist of dim, hot dip galvanized steel material.
- Lighting structures, both breakaway and non-breakaway types, shall not be structurally modified to accept wireless communications equipment.

References:

Government of Canada, Canadian Electric Code .

Ministry of Transportation, Province of Ontario, Ontario Highway Bridge Design Code Third Edition, 1991.

Ministry of Transportation and Highways, Electrical and Traffic Engineering Manual: Guidelines for the Design of Lighting, Signals, and Sign Installations, 1994.

Ministry of Transportation and Highways, Highway Engineering Design Manual .

Ministry of Transportation and Highways, Manual of Aesthetic Design Practice, 1991.

Ministry of Transportation and Highways, Utility Policy Manual, 1995.

Ministry of Transportation and Highways, Standard Specifications For Structural Supports for Highway Signs, Luminaries and Traffic Signals, 1994.

Policy

Background to Policy

Standards

- 13.1 Trenching
- 13.2 Trench Backfill
- 13.3 Trench Resurfacing
- 13.4 Blasting
- 13.5 Trenchless Technology
- 13.6 Casings
- 13.7 Jacking and Boring Pits

References

Policy

1. **Crossings:** The use of trenchless technology (which includes boring, tunneling and jacking) under the highway structure must be carried out using equipment and methods which will not damage the highway or affect traffic safety and operations.
 - Highway sections where the road surface is in such poor condition that a permanent pavement patch will not detract from the quality of the surface;
 - In urban areas on highways without full control of access; or,
 - Where the permit holder has demonstrated that a reasonable effort has been made to bore or jack the pipe or casing and that it is impractical or impossible to install the crossing in this way.
 2. **Approval of Trenching:** Any open trenching for crossings must be approved by the District Highways Manager with a notation on the permit, including reasons for an exception being granted.
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Background to Policy

Trenching may be permitted in special conditions where, in the view of the District Highways Manager, traffic flow and traffic safety can be maintained at an acceptable standard and the highway structure can be restored to an acceptable standard. These conditions might include:

- Low volume, unpaved road
- Highway sections which are likely to be recapped or rebuilt within two years;

Standards

13.1 Trenching

13.1.1 All Trenches

Trench width within the highway prism must not be greater than necessary to permit installation of the line.

Except where trenching is well clear of the road shoulder, all excavated material must be removed from the site immediately. Exceptions may be permitted where the District Highways Manager has given approval, and the following conditions have been met:

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- The material has been barricaded in a manner that has been approved by the District Highway Manager;
- The spoil piles are outside the Clear Zone; and,
- No excavated material remains on the site overnight.

Stockpiling of native material adjacent to the trench is not permitted.

Trenches must be backfilled or adequately covered at the end of the work day, unless the District Highways Manager has given their approval to an open trench. Any open areas must be adequately fenced, lit and signed.

13.1.2 Where Trenches Cross a Highway or Enter the Highway Prism

Pavement must be cut by hand or approved mechanical means in straight lines parallel to the trench centreline.

Distance from a pavement cut to the edge of the trench must be at least 150 mm or sufficient to ensure the pavement will not be undermined by sloughing.

Trench shoring must conform to WCB standards and is to be used where soil conditions warrant. Extreme care must be taken to avoid sloughing of the trench sides to minimize damage to the subgrade beyond the limits of excavation.

Machines with steel tracks or flat steel pads are generally not permitted on any portion of the paved surface at any time. When heavy rubber-tired equipment is turning on the paved surface, care must be taken to prevent scarring.

During the removal or replacement of any existing curb, gutter or sidewalk, the edges of the work area are to be saw cut in order to provide a clean and even joint.

13.1.3 Where Trenches Cross Driveways and Entrances

Excavations across entrances, whether private or commercial, must be backfilled and thoroughly compacted by the end of the current working day. The surface must be restored, whether paved or gravel, to its original condition within 48 hours.

The use of road plates may be used only when the District Highways Manager or their designate has approved their use and only when the following conditions apply:

- Across entrances to residential and commercial properties; and,
- In urban areas where roads have a posted speed of 60 km/h or less.

Affected property owners must be notified at least 48 hours in advance before excavating a driveway. The District Highways Manager may specify that a temporary traffic plan be developed and approved by the Ministry where trenching work will significantly disrupt traffic flow

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to residential or commercial property, or the movement of emergency vehicles.

13.2 Trench Backfill

13.2.1 All Trenches

Pipe bedding must conform to industry standards.

13.2.2 Where Trenches Cross a Highway or Enter the Highway Prism

The following requirements apply to all trenches which cross a highway, as well as to all trenches which are parallel to the centreline within a highway right-of-way where any part of the trench is in the gravel shoulder or within 3.6 metres of the edge of the pavement.

Where sloughing of trench sides has undermined the pavement, the pavement must be marked with a painted line showing the extent of the damaged area. Pavement must be removed from this area and the voids filled and compacted in accordance with backfill requirements.

Trenches must be backfilled with granular material in accordance with the following minimum requirements:

- Sub-base material must consist of granular borrow which meets Ministry standards as set out in Section 202.6, *Standard Specifications for Highway Construction*;

- Base gravel must be a minimum compacted thickness of 150 mm and consist of "50 mm minus" crushed gravel which meets Ministry standards as set out in

Section 202.04, *Standard Specifications for Highway Construction*; and,

- Surface gravel must be a minimum compacted thickness of 150 mm and consist of

"25 mm minus" crushed gravel which meets Ministry standards as set out in Section 202.04, *Standard Specifications for Highway Construction*.

Backfill must be placed in layers of approximately 250 mm thickness and compacted with approved tamping equipment to a minimum of 95 percent Proctor density to within 300 mm of the surface and 100 percent for the final 300 mm.

The District Highways Manager may require verification of backfill densities.

Shoring must be lifted as backfill is placed.

Backfill material must be free of frozen lumps.

13.2.3 Where Trenches Are Outside the Roadway Prism

Except where requested by the District Highways Manager or their designate,

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trenches outside of the roadway prism may be backfilled and compacted to native soil conditions.

Where requested, trenches outside of the roadway prism will be backfilled with native material which is compacted in 150-mm lifts to 95 percent Proctor density. Sites are to be reseeded to standards set out in Section 757, *Standard Specifications for Highway Construction* where required by the District Highways Manager.

13.2.4 Restoration of Ditches

All ditches must be restored to their previous condition or to the satisfaction of the District Highways Manager.

13.3 Trench Resurfacing

13.3.1 Temporary Patching

As soon as any portion of the highway can be re-opened to traffic, a temporary asphalt patch must be applied unless the District Highways Manager has given an exemption.

Where the District Highways Manager has agreed that a temporary asphalt patch is not required, the backfill must be brought up to grade with a final layer of "25 mm minus" crushed gravel which meets Ministry standards as set out in Section 202.4, *Standard Specifications for Highway Construction*. The surface is to be kept well-graded and compacted at all times and

a permanent patch installed as soon as possible.

13.3.2 Gravel Surfacing

Gravel and earth highway surfaces must be restored to a well-compacted, stable and free draining surface with a crown of 40 mm vertical rise for every metre of highway width.

Material must meet the following standards:

- For surfaces with no granular base course or which were not previously surfaced with granular surfacing: 75 mm select granular sub-base, (Section 202.06, *Standard Specifications for Highway Construction*.);
- For surfaces which were previously graveled and where no paving is planned: 25 mm high fines surfacing, (Section 202.05, *Standard Specifications for Highway Construction*.); and,
- For all surfaces where paving is planned: 25 mm well graded material, (Section 202.05, *Standard Specifications for Highway Construction*).

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13.3.3 Shoulders

Shoulders must be restored to a well-compacted, stable and free draining surface with a crown of 40 mm vertical rise for every metre of highway width. Shoulders must be compacted using industry standard equipment. If there is not sufficient moisture present in the material, the surface will be watered before compaction.

Material must meet the following standards:

- Base course aggregate: 25 mm well-graded material, (Section 202, *Standard Specifications for Highway Construction*);
- Surfacing: 25 mm high fines surfacing, (Section 202.05, *Standard Specifications for Highway Construction*);
- Asphalt surfacing: as specified below for Permanent Patching; and,
- All granular or other material must be removed from paved surfaces after shoulder restoration has been completed.

13.3.4 Permanent Patching

Pavement edges must be cut, made true and straight, cleaned, and primed before installing a final patch.

The District Highways Manager may specify that a concrete saw is to be used to prepare pavement edges.

Asphalt concrete or Portland cement pavement must be restored to the same thickness as the existing surface or to a minimum of 50 mm thickness, whichever is greater. Asphaltic concrete is to be a type "B" medium mix or fine mix, as specified by the District Highways Manager, and must meet Ministry standards as set out in Section 223, *Standard Specifications for Highway Construction*.

Asphalt concrete is to be laid in two or more lifts or layers. Each lift is to be thoroughly compacted before successive lifts are applied.

Where there is sufficient width and length, paving must be done by machine. The utility will ensure that the permanent pavement patch is to Ministry standards for one year from the date that the patch is installed.

13.4 Blasting

Any blasting within the right-of-way must be approved by the District Highway Manager (in the case of an existing highway) or the Project Manager (in the case of relocation for a highway construction project).

Blasting plans shall consider peak velocity and particle displacement calculated at the locations of other existing adjacent

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pipelines or other road and utility
structures.

13.5 Trenchless Technology

Trenchless technology refers to techniques for installing and repairing utilities without the use of traditional open trenching methods.

The following conditions apply to the use of trenchless techniques.

- Trenchless techniques must ensure continuous contact between the outside of the pipe and surrounding soil;
- Boring or augering equipment must be designed to encase the hole as earth is removed, with the cutting edge protruding no more than 30 mm beyond the end of the pipe or casing; and,
- Water jetting is not permitted unless the design for the crossing has been certified not to cause any settlement on the road surface. The design must be certified by a Professional Engineer who is experienced in pipeline design and is registered in B.C. at the time a permit application is submitted to the Ministry.

13.6 Casings

Casings are generally required for pipelines carrying commodities including: gases which are compressed, deeply refrigerated,

liquefied or dissolved; and, flammable and combustible liquids.

Heavy-walled pipe will be allowed for highway crossings where: soil conditions permit; depth of bury is sufficient; and, the design for the installation has been approved by a Professional Engineer who is experienced in pipeline design and is registered in B.C. at the time a permit application is submitted to the Ministry.

The Ministry may require pressure grouting to fill overbreaks and unused holes.

13.7 Jacking and Boring Pits

Jacking and boring pits must be offset from the highway structure by sufficient distance so that they do not cause instability and do not interfere with drainage facilities. Pits must be offset from the outside edge of the shoulder by a distance which is at least equivalent to the vertical distance from the pavement to the bottom of the pit.

Pits should be located and designed in such a way that ditches continue to function and do not drain or overflow into the pit.

Pits generally are not permitted in medians.

Pits must be completely fenced.

Pits which are located within the Clear Zone as defined in Section 5.3 must be shielded with a flared Concrete Roadside Barrier in accordance with the *Highway Design Manual*.

References

Highway Design Manual, Ministry of Transportation and Highways.

Standard Specifications for Highway Construction, Ministry of Transportation and Highways.

Policy

Background to Policy

Procedure

Background to Procedure

Standards

- 14.1 Location
- 14.2 Attachments
- 14.3 Abutments
- 14.4 Shut-off Valves
- 14.5 General Requirements
- 14.6 Drawings

Background to Standards

References

Definitions

The following definitions apply throughout this section.

- **High Pressure Pipelines:** Pipelines intended to operate at pressures greater than 2,070 kPa (300 psi).
- **Intermediate Pressure Pipelines:** Pipelines intended to operate at pressures greater than 700 kPa (100 psi) and up to 2,070 kPa (300 psi).
- **Low Pressure Pipelines:** Pipelines which are intended to operate at pressures which are less than or equal to 700 kPa (100 psi).
- **High Risk Seismic Zones:** National Building Code of Canada Acceleration-Related Seismic Zones 3, 4, 5 and 6. The approximate location of these zones is shown in Exhibit 14.1.
- **Seismic Design Guidelines:** ATC-6 Seismic Design Guidelines for Highway Bridges or AASHTO Standard Specifications for Seismic Design of Highway Bridges.

Policy

1. **Applicable to New Installations Only.**

Policy, procedures and standards in this Section apply to new utility installations, modifications and replacements.

2. **Bridges and Structures Can Generally be Used by Utilities.**

Except where otherwise noted in this manual, utilities are generally permitted to install cable, pipe, conduit and other

facilities on highway bridges and other structures.

3. **Restrictions on Gas Pipelines.**

Pipelines transmitting gas:

- Are only permitted on bridges which are water crossings and only then when alternatives routes or crossings are not feasible because of environmental risk or sensitivity;

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- Are *not* permitted on timber "through truss" bridges;
- Are *not* permitted in tunnels; and,
- Are *not* permitted where one or more gas pipelines have already been installed on a bridge or structure.

Pipelines transmitting gas must conform with the following restrictions on pipe diameter and design pressure:

- **Timber bridges:** only low pressure pipelines are permitted; with an outside pipe diameter no greater than 114 mm (4 inches);
- **Bridges in high-risk seismic zones that have not been designed according to seismic design guidelines:** only low pressure pipelines are permitted; with an outside pipe diameter no greater than 168 mm (6 inches).
- **On bridges other than those specified above:** only low and intermediate pressure pipelines are permitted; with an outside pipe diameter no greater than 324 mm (12 inches).

4. Restrictions on Pipelines Carrying Oil, Liquid Petroleum Products and Sewage.

Pipelines transmitting oil, liquid petroleum products and sewage:

- Are only permitted on bridges which are water crossings and only then when alternatives routes or crossings are not feasible because of environmental risk or sensitivity;
- Are *not* permitted on timber "through truss" bridges; and,
- Are *not* permitted in tunnels.

5. Restrictions on Water Lines.

Pipelines transmitting water:

- Are only permitted on bridges which are water crossings and only then when alternatives routes or crossings are not feasible because of environmental risk or sensitivity; and,
- Are *not* permitted in tunnels.

Background to Policy

Reasons for Restrictions.

General: Due to the consequences of a leak or rupture, pipelines carrying gas, oil, liquid petroleum products, water and sewage are permitted on bridges only where absolutely necessary.

On "Through Truss Bridges": The risk of collapse from errant or overheight

vehicles is high for timber "through truss" bridges and consequently gas, oil, liquid petroleum, and sewage pipelines are prohibited from this type of structure.

Pipeline Size and Diameter: The Ministry recognizes that bridges located in high-risk seismic zones that have not been designed in accordance with seismic design guidelines are much more susceptible to damage from earthquakes than other bridges. Restrictions on pipe size and operating pressure have been placed on gas pipelines as a means of reducing the consequence of pipeline rupture.

Although they were not designed to modern earthquake codes, timber bridges have proven to stand up very well to earthquakes. However, they are more susceptible to other types of damage (particularly arson) and therefore only small-diameter, low-pressure pipelines are permitted on these structures.

Procedure

General Procedure: See Section 16 for information on the approval process for installations on or near bridges and structures.

Justification for Pipelines Transporting Gas, Oil or Liquid Petroleum Products: When submitting a proposal to attach a pipeline to a Ministry bridge, the utility must provide documentation showing that alternatives are not environmentally acceptable. A cost comparison of the

alternatives, in terms of the total cost of the pipeline project, (transfer stations, supply and installation of pipes, water crossings, etc.), shall be included.

Background to Procedure

Justification for Pipeline Installations. The Ministry recognizes that the only feasible way for a pipeline to cross a river may be on a highway bridge. However, it is the utility company's responsibility to explore all of the options for a crossing and prove to the Ministry that using the highway bridge is the only feasible alternative. Utilizing the Ministry's bridge is often the least expensive alternative for a crossing, but the cost of the crossing in relation to the cost of the entire pipeline project may be small.

Standards

14.1 Location

- 14.1.1 Utilities cannot be attached above the bridge deck or to railings, rail posts or parapets.
- 14.1.2 The attachment of utilities must not reduce the vertical clearance under the bridge.
- 14.1.3 Where possible, utilities other than gas pipelines must be installed inside the fascia girder. Gas pipelines must be installed outside

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the fascia girder. Pipelines carrying fluid commodities are not permitted inside steel and concrete box girders.

- 14.1.4 Utility installations must be located so as not to interfere with bridge maintenance and inspection. Installations must be designed to accommodate vertical jacking of the bridge superstructure by up to 4 inches.
- 14.1.5 Access to service vaults behind abutments must be located outside the traveled portion of the roadway.
- 14.1.6 On structures with a low clearance to flood waters, utilities must not be installed on the outside of an upstream girder or truss.
- 14.1.7 Utilities transporting mutually hazardous commodities (such as fuels and electrical energy) must be mounted on opposite sides of a bridge.

14.2 Attachments

- 14.2.1 Holes to be made in concrete for attachments are not permitted within 150 mm of prestressing strands.
- 14.2.2 Field welding of utility attachments to existing bridge members will not be permitted.

14.2.3 Bolting of utility attachments to existing bridge members will be permitted only when it does not cause the bridge member to be overstressed. Holes to be made in existing bridge members must be drilled.

14.2.4 All steel utility conduits and mounting hardware must be hot dip galvanized or stainless steel. Pipe material used on pipelines must meet requirements of the governing CSA design specification.

14.2.5 Concrete inserts must be of the adhesive type.

14.2.6 Damage to the paint coatings of structural steel caused by a utility installation must be repaired in accordance with the Ministry's specification *Maintenance Painting of Old Steelwork*. Damage to galvanized or metallized coatings must be touched up by thoroughly cleaning the damaged area and painting with a Ministry approved organic zinc rich paint.

14.2.7 Utilities must be electrically isolated from steel bridge components.

14.3 Abutments

14.3.1 Openings created in bridge abutment walls to allow the passage of utilities must be of the minimum size necessary, but must allow for differential settlement between the abutment and the utility pipe or conduit. The opening in the abutment around the utility must be completely sealed to preclude leakage of moisture or backfill material.

14.4 Shut-off Valves

14.4.1 Shut-off valves must be installed for the following types of installation:

- All gas pipelines designed to operate at pressures exceeding 350 kPa (50 psi);
- All pipelines which are transmitting oil and liquid petroleum products; and,
- All water and sewer lines.

14.4.2 Where they are required, shut-off valves must be installed at both ends of bridges and be located between 10 and 100 metres from the back of abutments.

14.4.3 Except where they are installed on timber trestles, pipelines which are not equipped with automatic shut-off valves must be designed to accommodate movement caused by

an earthquake with a 10% probability of exceedance in a 50 year period (475 year return period).

14.4.4 Pressure-sensitive automatic shut-off valves must be used for all pipelines which:

- carry gas, oil, liquid petroleum products, water and sewerage;
- are attached to bridges which have not been designed in accordance with seismic design guidelines; and,
- are located in high-risk seismic zones.

An automatic shut-off valve must be located at the supply end of the bridge and a check valve located at the opposite end.

14.4.5 Manual valves may be used for all pipeline installations on timber trestles.

14.5 General Requirements

14.5.1 Excess vibration of the utility due to wind and traffic loads must be prevented.

14.5.2 Installations carrying transmittants subject to freezing must be insulated.

- 14.5.3 Adequate provision for expansion and contraction in pipelines and ducts must be provided.
- 14.5.4 Where appreciable loads or dynamic effects (not provided for in the original design of the bridge) are added because of a utility attachment to a bridge, the affected members of the bridge must be analyzed by a Professional Engineer. The Ministry retains the right to set the terms of reference for this analysis, but the associated fee will be paid by the utility company requesting the attachment. The engineering firm to perform the analysis must be selected from a list of firms approved by the Ministry.
- 14.5.5 Utilities and their supports must be designed to support their dead load, plus wind, thermal and earthquake forces, as well as other forces from the utility itself (e.g. surge, etc.).
- 14.5.6 All cuts, holes and damages to the surface of treated timber members caused as a result of the utility installation must be field treated to the requirements of the American Wood Preservers Association Standard M4.

14.6 Drawings

Applications for a permit to attach a utility to a bridge must include four sets of plans or drawings showing details of the proposed attachment. Information which

must appear on those drawings includes but is not limited to the following:

Drawing Title Blocks

All drawing title blocks must show the bridge name and number, the utility company's name, the name of the consultant designing the attachment if applicable, and the name and phone number of the utility's contact person.

Type of Utility

The type of utility to be carried on the structure must be indicated (i.e. fibre optic cables, natural gas, cable vision, etc.).

In the case of pipelines carrying fluids and gases, drawings must show design and maximum operating pressures and the direction of flow.

The voltage of all electric power lines must be shown (voltages shown as phase to ground).

Loading

The weight of the utility and its attachments per unit length must be indicated.

Location

Drawings must include a plan and elevation view of the bridge with the location of the utility and its attachments to the bridge. The plan view must show a north arrow, the

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direction of river flow, and the direction to the nearest community. The location and details of all service vaults and shut-off valves must be shown. The depth and location of all buried components relative to bridge substructure elements must be shown, as well as a trench detail showing backfill requirements. The location of all other utilities attached to the bridge must be shown.

Details

Details of all attachments must be shown, including the routing of the utility at the abutments.

Design Codes

Design codes used for design and construction of the utility and its attachments must be indicated.

Expansion and Contraction

The range of expansion and contraction in pipelines and ducts must be shown.

Earthquakes

Drawings must show the amount of earthquake-related movement which has been used for pipeline design.

Notes to Appear on Drawings

The following construction notes must be included on the drawings:

1. All abandoned holes in concrete must be filled with a non-shrink grout.
2. A magnetic rebar detector, such as a pachometer, must be used to ensure holes drilled in reinforced concrete do not coincide with any reinforcing steel.
3. Diamond tipped drill bits must not be used to drill holes for hanger inserts.

Background to Standards

- 14.1.1 By keeping utilities below the level of the deck, the potential for damage by vehicle accidents is greatly reduced.
- 14.1.2 Clearance must be maintained in order to ensure that utility installations are not hit by overheight vehicles and are not in violation of the Navigable Waters Protection Act. Utilities hanging below a bridge also diminish the aesthetics of the structure.
- 14.1.3 For aesthetic reasons, utilities other than gas pipelines should be mounted inside of the outer girders. This may not always be possible when attaching to an existing bridge. Gas pipelines

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- should be placed on the outside of the girders to ensure that leaking gas will not collect between girders.
- 14.2.1 Due to the consequences of damaging pre-stressing strand, it is prudent to specify this restriction which is easy to comply with.
- 14.2.2 Poor welding procedures can seriously reduce the fatigue resistance of bridge components. The Ministry does not have the resources to inspect field welding of utility attachments to bridge steel components and acceptable alternatives to field welding, such as clamps, are readily available.
- 14.2.3 Cutting holes with a torch is undesirable due to the sloppy results and the difficulty for the Ministry to ensure quality control.
- 14.2.4 Stainless steel or galvanized attachments will reduce maintenance requirements and the potential traffic closures associated with maintenance.
- 14.2.5 Adhesive anchors prevent moisture ingress and are less likely to cause spalling compared to wedge type anchors. Acceptable anchoring systems include the UCAN Poly-All Epoxy Injection Anchoring System, and Hilti C-100 epoxy system and the Hilti HVA anchor. All of these anchor systems can be installed in overhead applications.
- 14.2.7 Utilities should be electrically isolated from the bridge to prevent stray currents that may be carried by a utility from causing corrosion in steel bridge components.
- 14.4.4 Sewer lines and pipelines carrying oil and liquid petroleum products on bridges with the most vulnerability to seismic damage should be equipped with automatic shut-off valves to minimize the pollution to waterways from a pipeline rupture caused by an earthquake.
- Water lines on bridges most susceptible to earthquake damage should be equipped with automatic shut-off valves to prevent damage to the abutment and pier foundations from the scouring effects of the water in the event of a line break.
- 14.4.5 Automatic shut-off valves have not been specified for timber trestles as these are very expensive to install and maintain and therefore should not be specified indiscriminately. Automatic valves for pipelines on

timber trestles would not significantly reduce the risk of damage from a fire or rupture to the Ministry or the public

14.5.1 The Ministry has had a problem in the past with a utility installation where the anchor spacings were apparently too far apart and the pipeline vibrated in the wind.

14.5.4 The Ministry has received requests for installations that may overstress a bridge. The bridge should be rated, including the effect of the new utility, to the latest design code and live load model. The Ministry's list of approved consultants from the RISP category appropriate for the type of bridge in question should be used to select a consultant for this load rating.

14.6 **Title Blocks**
Ministry personnel reviewing utility applications often need to discuss the proposal with the utility designer. The bridge name and number should be shown on the drawing to aid in the Ministry's filing system.

Type of Utility and Transmittant

It is in the Ministry's best interest to know exactly what commodities are being carried on each of its bridges.

Loading

The weight of the utility should be indicated so that the Ministry can judge whether the utility will overload the bridge.

Design Codes

Stating relevant standards and codes on the drawings gives the Ministry some assurance that proper design, construction and maintenance procedures will be followed. Oil and gas pipelines must be designed, installed and maintained in accordance with requirements of Z662. Other utilities are governed by similar standards or codes.

Notes to Appear on Drawings

1. Using a magnetic rebar detector, such as a pachometer, prior to drilling will minimize the number of holes abandoned because of conflicts with reinforcing steel.
2. Masonry bits are usually used to drill holes for concrete anchors. Reinforcing steel is not damaged by this type of bit. Diamond drills on the other hand easily cut through reinforcing steel. Even with the use of a magnetic rebar detector, it is possible that reinforcing steel may be hit by a drill hole and, therefore, diamond bits should not be used.
3. In the case of abutment walls in which core holes must be drilled to

accept ducting, diamond tipped bits are required as they provide neat and accurate holes. While some reinforcing steel is bound to be cut in this coring operation, the holes should be located to keep this to a minimum. The cutting of some reinforcing steel is acceptable as the areas where ducts pass through the abutment walls are not subject to very heavy loading.

References

Bridge Standards and Procedures, Ministry of Transportation and Highways.

- 15.1 Compensation --General
- 15.2 Compensation --Pipelines
- 15.3 Compensation --Water and Sewer Lines
- 15.4 Compensation --Overhead Power, Communication and Cable TV Lines
- 15.5 Compensation --Underground Power and Communication Lines

Policy

1. **General Policy:** The Ministry provides varying degrees of compensation for relocation of utilities which must be moved to accommodate highway improvements.
 - Section 15.3 for water and sewer lines;
 - Section 15.4 overhead power, communication, and cable television lines; and,
 - Section 15.5 for underground cable.
2. **Where Utilities Have Prior Rights:** The Ministry will provide compensation equal to the direct cost of relocating a utility where:
 - The utility is located on land which is being acquired for highway right-of-way; and,
 - Proposed highway improvements make it necessary to relocate the utility.
3. **Relocation for Highway Improvements:** Where a utility which is on highway right-of-way must be relocated in order to accommodate highway improvements, the Ministry will provide compensation as specified in:
 - Section 15.2 for pipeline installations;
4. **Relocation of Utilities on Bridges and Other Structures:** No compensation is provided for relocation of utilities on bridges or other structures.
5. **Relocation Because of a Natural Occurrence:** Where a utility which is on highway right-of-way must be relocated because of a natural occurrence (e.g. slide or washout), the Ministry will provide no compensation.
6. **On Disposal of Surplus Land:** No compensation is provided where a utility relocates or is relocated as a result of the Ministry's disposal of surplus property. (See Section 3.4 for policy on disposal of surplus property.)

Background to Policy

The Ministry's compensation policy is based on a number of factors:

- Historic support for extension of power and telephone networks throughout the Province;
- The administrative complexity of cost-sharing arrangements which have been used in the past;
- The inability of some utilities (particularly small municipalities) to raise the capital required for relocation projects;
- The need to provide utilities with an incentive to relocate facilities to fit with Ministry construction schedules; and,
- The Ministry's inability to anticipate all highway construction projects, with the result that utility installations occasionally have to be moved shortly after they have been installed.

Policy

1. **No Compensation for Pipeline Relocation:** The Ministry provides no compensation for relocation of pipelines which are located in highway right-of-way and must be moved in order to accommodate highway improvement projects.
 2. **Exceptions:** Where an existing permit makes provision for compensation, then conditions set out in that permit will apply.
-

Background to Policy

Special compensation arrangements have been incorporated in some pipeline permits in the past. These arrangements over-ride current policy of providing no compensation for pipeline relocation.

Policy

1. **Full Compensation:** Where domestic water, sanitary sewer and irrigation lines are owned and operated by local government (a municipality, regional district or an irrigation district), the Ministry provides full compensation for the cost of relocations required to accommodate highway improvement projects.
 2. **The Utility Owner Covers the Cost of Any Upgrading:** The Ministry's compensation commitment is limited to replacement "in kind" -- a replacement with a new or relocated facility which has the same capacity and capability as the facility that is being replaced. The cost of adding capability or capacity must be covered by the utility owner (local government).
-

Background to Policy

Prior to 1990, the Ministry's policy was to pay no compensation for relocation of water, sanitary sewer or irrigation lines. As a result of a number of exceptions to this policy, cost sharing arrangements were negotiated on a project-by-project basis.

A "full-compensation" policy was initiated in 1990 with Treasury Board approval.

References

Treasury Board Request No. 8/91, "Highway Construction -- Public Utility Relocation", August 20, 1990.

UTILITY MANUAL

Subject: 15.4 Compensation – Overhead Power, Communication and Cable TV Lines

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THE BC HYDRO, BC TEL AND WEST KOOTENAY POWER PROTOCOL AGREEMENTS SHOULD BE CONSULTED FOR FULL DETAIL ON COMPENSATION.

Policy

1. No pole line compensation is provided to utilities other than BC Hydro, BC TEL and West Kootenay Power.

2. **Full Compensation for "New" Installations:** Where a pole line owned by BC Hydro, BC TEL and West Kootenay Power must be moved within two years of installation to accommodate highway improvements, the Ministry provides compensation equal to the direct cost of relocation.

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3. **Flat Rate Pole Line Compensation:** Where pole lines that are owned and operated by BC Hydro, BC TEL and West Kootenay Power must be moved, and the "full compensation" policy does not apply, the Ministry provides compensation at the rate of \$400 per pole.

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Compensation at \$400 per pole is based on the number of poles which are to be moved, rather than the number of replacement poles. Calculation of the number of existing poles includes both the energized pole and the guy anchor pole if one is present.

4. **High Voltage Towers:** Where it is necessary to move BC Hydro towers or poles on lines that are energized at a potential of 100 kV or greater, the Ministry provides compensation equivalent to full direct cost.

Where it is necessary to move West Kootenay Power towers or poles on lines that are energized at a potential of 60kV (phase to phase) or greater the Ministry will provide compensation equivalent to full direct cost.

5. **Telephone Cable:** Where overhead telephone lines are owned by BC TEL and do not fall under the "full compensation" policy, the Ministry provides compensation at the rate of \$3.50 per sheath metre of cable where a splice in a cable is required. Compensation at \$3.50 per metre is determined on a "sheath metre" basis where a sheath metre is

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Subject 15.4 Compensation – Overhead Power, Communication and Cable TV Lines

defined as an enclosed cable regardless of the number of pairs in the cable. This compensation is provided only where there is a need to splice the cable.

Where there is more than one cable, they will be paid for separately. Where the telephone circuits are open wire, any number of open wires is considered the equivalent of one cable.

6. **Compensation to Permit Holders and BC TEL Only:** Compensation is paid to pole permit holders only, with the exception that BC TEL is compensated for cable relocations where a splice of the cable is required, whether the line is hung from electrical poles or BC TEL poles (where a splice is required).

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7. **Interim Moves:** Where a pole line that is owned and operated by BC Hydro, BC TEL or West Kootenay Power must be moved more than once during a highway improvement project, the Ministry pays the full cost of interim moves, together with the flat rate and sheath metre fees where applicable.

Where compensation is being provided for an "interim" move, the "full cost" of the move includes overhead expenses.

All project staging, including utility plant relocations, will be the responsibility of the MoTH project manager.

Background to Policy

The Province's policy on cost-sharing for pole line relocation projects has changed over time.

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- Prior to 1915, the Province covered the full cost of relocating power and telephone lines.
- In 1915 that policy was reversed and utilities were required to pay 100 percent of relocation costs.
- In 1939, the Province agreed to pay 50 percent of labour and trucking costs.
- In 1953, the 50-percent policy was extended to include materials.
- In 1959, new policy was introduced, with the Province paying 50 percent of labour and trucking costs for plant which was installed prior to 1959 and zero percent for post-1959 installations.
- In 1981, the current compensation policy for pole lines was introduced.

When it was first introduced, compensation at \$400 per pole and \$3.50 per sheath metre

Subject 15.4 Compensation – Overhead Power, Communication and Cable TV Lines

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was intended to be the weighted average of 50-percent compensation for pre-1959 poles and zero compensation for post-1959 poles. Compensation has remained at that level, recognizing that the weighted average has shifted as pre-1959 poles represent an ever-diminishing fraction of the poles that are being moved.

The following MOTH General Circulars are canceled:

G Circular 22/85 Pole Line Moves
(cancelled December 31, 1994).

G Circular 9/87 Pole Line Moves
(cancelled December 31, 1994).

G Circular 14/87 Pole Line Moves
(cancelled December 31, 1994).

References

*Protocol Agreement -- Ministry of
Transportation and Highways/BC Hydro.*

*Protocol Agreement -- Ministry of
Transportation and Highways/BC TEL.*

*Protocol Agreement -- Ministry of
Transportation and Highways/West
Kootenay Power.*

Procedure

See Section 17 for information on project management involving pole line relocation.

The application of compensation or cost-sharing policy to BC Hydro, BC TEL and West Kootenay Power is set out in protocol agreements with the respective utilities.

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THE BC HYDRO, BC TEL AND WEST KOOTENAY POWER PROTOCOL AGREEMENTS SHOULD BE CONSULTED FOR FULL DETAIL ON COMPENSATION.

Policy

1. **Full Compensation for Certain BC Hydro Installations:** Where underground circuits are owned and operated by BC Hydro or West Kootenay Power must be moved to accommodate highway improvements, the Ministry provides compensation equal to the direct cost of relocation in the following situations:

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- **For Distribution Circuits:** If an underground distribution circuit must be moved within 2 years of the original permit date; and,
- **For Feeder Circuits:** If an underground feeder circuit must be moved within 20 years of the original permit date.

In the case of Feeder Circuits, the full compensation policy applies from a substation to and including the first switch.

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2. **Full Compensation for Certain BC TEL Installations:** Where underground circuits are owned and operated by BC TEL and must be moved to accommodate highway

improvements, the Ministry provides compensation equal to the direct cost of relocation in the following situations:

- **For Distribution Conduit:** Where underground structures or conduits contain fewer than four ducts, and those installations must be moved within two years of the original permit date; and,
- **For Feeder Conduit:** Where underground structures or conduits contain four or more ducts and those structures must be moved within 20 years of the original permit date.

In these cases, compensation covers the cost of equipment and cables in the conduits that are owned by BC TEL as well as the conduits themselves.

**Subject: 15.5 Compensation - Underground Power
and Communication Lines**

3. **BC Hydro, BC TEL and West Kootenay Power Distribution Circuits Where Full Compensation Does Not Apply:** Where distribution circuits or conduits that are owned and operated by BC Hydro, BC TEL or West Kootenay Power must be moved and the "full compensation" policy does not apply, the Ministry provides compensation at the rate of \$25 per trench metre (regardless of the number of conductors or conduits in the trench).

Compensation at \$25 per trench metre is based on the actual length of trench as required for the highway improvement project. Trench metre costs are based on an equivalent poleline relocation cost.

4. **BC Hydro, BC TEL and West Kootenay Power Feeder Circuits Where Full Compensation Does Not Apply:** The Ministry provides no compensation for Feeder Circuits which must be relocated after the "full compensation" (20 year) period has lapsed.

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5. **BC TEL DIRECT Buried Cable:** The Ministry provides compensation to BC TEL at a rate of \$3.50 per "sheath metre" where it is necessary to relocate buried cable which is not installed in a duct.

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For underground cable, a "sheath metre" is one metre of enclosed or wrapped cable, regardless of how many wires or fibres are in the cable. Where there is more than one cable, separate compensation is provided for each cable.

6. **Interim Moves:** Where underground circuits, conduits or cables must be moved more than once during a highway improvement project, the Ministry pays the full direct cost of interim moves, together with compensation as outlined above for the final move.

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Where compensation is being provided for an "interim" move, "full cost" includes overhead expenses.

All project staging, including Utility Plant relocations, will be the responsibility of the MoTH project manager.

7. **No Compensation for Utilities Other than BC Hydro, BC TEL and West Kootenay Power:** The Ministry provides no compensation for relocation of underground power and communication lines which are owned by utilities other than BC Hydro, BC TEL and West Kootenay Power.

Background to Policy

Special compensation arrangements may have been incorporated in some permits for underground power and communication cables in the past. These arrangements over-ride current compensation policies.

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Procedure

See Section 17 for information on project management involving relocation of underground utility installations.

The application of compensation policy to BC Hydro, BC TEL and West Kootenay Power facilities is set out in protocol agreements with the respective utilities.

References

Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro.

Protocol Agreement -- Ministry of Transportation and Highways/BC TEL.

Protocol Agreement -- Ministry of Transportation and Highways/West Kootenay Power.

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Policy

Background to Policy

Procedure

Background to Procedure

References

Policy

1. **Utility Relocation and Project Management.** Utility relocation projects which are initiated by the Ministry are carried out in accordance with the Ministry's project management guidelines.
2. **District Offices and Utility Relocation Projects.** The District Highways Office is represented on all project teams and are responsible for issuing the permit for relocated utility facilities.
3. **Permits and Letters of Authority.** A Utility must hold both a Letter of Authority issued by the Project Team and Ministry permit issued by the District office before starting work on a relocation project.

Background to Policy

Utility Relocation and Project Management. Projects are defined as "...any task or group of tasks that has a defined scope, finite time frame and budget and which is intended to achieve a specified set of objectives" (*Project Management Policy and Principles Manual*, Ministry of Transportation and Highways, April 1993). Most highway improvement projects involve utility relocation work. That

relocation work is handled within the same project management structure as the overall highway construction project.

District Offices and Utility Relocation Projects. Under the Ministry's project management structure, highway construction and improvement projects are undertaken by a Project Sponsor -- usually the region. Individual projects are managed by a Project Manager who is appointed by the Project Sponsor and is responsible for the overseeing the work and managing work schedules and budgets.

Although Project Managers are responsible for construction and improvement work, the district may act as "project owner" because of their direct interest in highway operations during construction and in long-term maintenance, operation and traffic safety on the new or upgraded facility. However, in all cases, to ensure that the District's interests are accounted for in the project management process, every project management team should include a district representative. Depending on the complexity of the project, utility representatives may also be included on the team.

Permits and Letters of Authority. A Utility is issued a Letter of Authority to proceed with relocation work. This authorization document advises that a permit is required from the District office before relocation work begins. The Letter of Authority focuses on cost, timing and

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other matters related to the work itself. It does *not* deal with conditions of right-of-way occupancy or related issues such as liability. Since the permit addresses these broader considerations, it is essential that it be put in place before work begins. (Letters of Authority are addressed later in Section 17; policy and procedures related to permits are covered in Section 16.)

Procedure

Where utilities must be moved as part of a highway construction/improvement project, the project management team works with utilities from the preliminary design stage, through detailed design, to construction. Steps in the process are outlined in the following checklist. It should be noted that the following is intended as a guide rather than a rigid procedure, and details of the process depend on the nature of the project, the extent of utility relocation work, and whether the project has been initiated by the District, Region, or through headquarters as a Major Project. However, where communication and information exchange is concerned, the following checklist generally represents the minimum level of effort. Where complex relocation projects are involved, contacts between the Ministry and utilities may be more intensive than indicated here.

Preliminary Design Stage

There should be an awareness and consideration of utilities at the preliminary

design stage. Level of detail varies with the nature of the work, but drawings are usually produced at a scale of 1:5,000 for highway construction projects. In the course of the Preliminary Design work, the Designer must contact utilities to identify future development proposals.

Functional Design Stage

The Functional Design stage follows the Preliminary Design for proposed construction or improvements. Level of detail varies with the nature of the work, but drawings are usually produced at a scale of 1:500 or 1:1,000 for highway construction projects. The following utility-related steps are part of that process. A number of steps in this process apply only to municipally-owned utilities. These are highlighted with underlining>.

- During the Functional Design process, the Designer contacts the owners of all utilities which are located in the area affected by the project. The purpose of this initial contact is to make them aware of the project and to pass on information related to:
 - the nature and extent of the project;
 - expected timing for the functional and detailed stages of the design process;
 - the expected time for construction;
 - the expected impact on utilities; and,

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- the name of the Design Supervisor (who is usually a Ministry employee) who is overseeing the Functional Design process.
 - As part of the initial contact, the Designer arranges for the utility to:
 - identify a contact person for the project;
 - provide copies of "as-built" drawings for facilities that are located in the area covered by the project (if not attached to the utility permit); and,
 - in the case of a municipal water or sanitary sewer line, determine whether design work is to be carried out by

the municipality or the Ministry.
(Where work is being done by the municipality, the remainder of this procedure applies to the municipality as it does to other utilities.)
 - Where a municipal utility is being relocated, the Designer works with municipal staff to obtain agreement that the municipality is required to cover the full cost of any upgrading (any improvement to the capability or capacity) which is to be undertaken on behalf of the municipality as the facility is being relocated.
 - The Designer provides the utility company with preliminary drawings of the proposed area of construction at the earliest possible date, and asks that the utility confirm the location of facilities and advise of any errors or omissions.
 - When the right-of-way required for the project has been defined, the Designer provides the following information to the owners of any utilities which might be affected:
 - plans showing the toes of slopes, tops of cuts, and the location of utility facilities which are likely to be relocated;
 - a schedule for completing the functional and detailed design;
 - the expected call for tender date; and,
 - the utility relocation "window" -
- from the time when it is expected that right-of-way will be prepared for utility relocation work to the point where utilities must be moved in order to avoid interference with highway construction.
 - The Designer requests written confirmation from the utility on their ability to work within the relocation "window". Where the utility cannot work within that "window", the Designer obtains a written explanation.
 - Where the Ministry is handling the design work for a municipal water, irrigation or sewer line, the municipality is provided with a copy of the proposed design and is
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asked to identify any necessary changes.

- The Designer asks the utility to:
 - identify any errors or omissions in the information on existing plant which is shown on preliminary drawings; and,
 - submit a preliminary relocation plan.
- The Designer reviews the preliminary relocation plans, and discusses them with the owners.
- Where appropriate, the Designer makes changes to the design and drawings to account for information provided by utilities.

Detailed Design Phase

The Functional Design is used as the basis for Final Design, which carries the process through a further iteration -- usually with drawings prepared at a scale of 1:500 or 1:1,000. Utility locations and right-of-way boundaries are further refined as part of this process.

Detailed Design involves the following utility-related activity:

- The Designer contacts utilities at the beginning of the detailed design phase to make them aware that work is under way and to provide information on:
 - the nature and extent of the project;
- the work schedule for the detailed design process; and,
- the expected timing for construction
- The Designer identifies utility facilities which will be affected by highway development and determines which are located in the proposed highway right-of-way.
- In the case of municipal utilities, the Designer works with the municipality to confirm the extent to which the facility is to be upgraded as part of the relocation work.
- The Designer reviews all utility permits to identify special provisions including cost sharing arrangements.
- **When detailed design is 50 percent complete** and final right-of-way requirements have been defined, the Designer provides utilities with the following information:
 - plans showing utilities which are to be relocated;
 - profiles and cross-sections for proposed highway work (where relevant for utility relocation) showing the affected utility plant;
 - the expected call-for-tender date;
 - utility relocation "window"; and,

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- terms and conditions for relocation.
 - The Designer asks each utility to:
 - identify any errors or omissions which appear on the Ministry's drawings;
 - submit a relocation plan for consideration by the Ministry; and,
 - advise whether relocation work is to be carried out by the utility's own forces, by the utility's contractors, or by the Ministry's grading contractor.
 - The Designer reviews utility plans to:
 - ensure consistency with Ministry policies and standards; and,
 - identify any conflicts between utilities.
 - The Designer forwards utility relocation plans to the District office for comment. The District will respond with: approval, where appropriate; comments where changes may be required; and information on any special provisions which will apply. This work is handled through the District's representative on the project team.
 - **When design is 75 percent complete**, the Designer:
 - reviews relocation proposals with each utility;
 - ensures that any conflicts between utilities are addressed by the utility owners; and,
 - resolves technical and schedule issues with utility owners.
 - **When design is 100 percent complete** and spending authority has been confirmed in accordance with the Ministry's spending authority matrix, the Design Supervisor or Project Manager advises each utility that design is complete and asks for written confirmation that the utility accepts the engineering design, the work schedule, and compensation arrangements (if applicable).
 - Through the District representative on the project team, the Design Supervisor confirms that the design of the relocated utility is acceptable to the District.
 - In the case of a municipally-owned utility, the Designer provides the municipality with an estimate of total project cost and the portion of the cost which is being borne by the Ministry to replace the existing facility "in kind".
 - Where a utility is owned by a municipality, the Design Supervisor works with municipal staff to obtain council approval for the municipal portion of project costs, based on design quantities and estimated unit prices.
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- When a utility has accepted the terms of relocation, the Designer refers the completed relocation plans to the district office through the district's representative on the project management team for review and approval.
- Once the terms of relocation have been accepted **in writing** by the utility and the Design Supervisor has confirmed that funding has been approved, a Letter of Authority is issued advising the utility that:
 - funding is in place;
 - approval is granted for the utility to proceed with the relocation work; and,
 - a revised Ministry Utility Permit is required and will be issued by the District Highways Office. (See Section 16 for permitting procedures.)

The Letter of Authority also confirms timing of the work as well as terms and conditions of the relocation project.

- A copy of the Letter of Authority is forwarded to the District through the District's representative on the project management team.
- On receipt of a copy of the Letter of Authority, the District prepares and issues a permit for the relocated plant.

The Pre-Construction Phase:

A transition in project management begins in the pre-construction phase as responsibility shifts from Design to Construction. As part of that process, a Project Supervisor or Consultant Project Supervisor is named as the Ministry Representative for the project. Among other things, the Ministry Representative assumes responsibility for ensuring that utility relocation work is carried out in accordance with permit conditions and the Letter of Authority.

The following steps generally take place at the pre-construction stage.

Where utility relocation work is completed prior to the start of construction.

- A Ministry Representative is appointed. Responsibilities include ensuring that utility relocation work complies with permits and Letters of Authority.
- The Ministry Representative ensures that the District has issued a permit for the relocated facilities.
- The Ministry Representative works with municipal staff to obtain final council approval for the municipal portion of project costs, based on unit prices as tendered.
- Where appropriate, the Ministry Representative includes utility representatives in an "in house" pre-tender meeting. Typically, all parties involved in a project are asked to attend this meeting for a

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final review of plans and arrangements. Participants might include: the Project Manager, Designer, Design Supervisor, Manager of Construction, Ministry Representative, utilities or their consultants, and municipalities.

- Once the utility's work has been completed, the Designer obtains: "as-built" drawings showing new and abandoned plant; or written confirmation that work has been completed in accordance with the permit.
- The Designer forwards copies of "as-built" drawings to the district representative on the Project Team, to be attached to the permit in district files.
- The Designer updates project drawings to include new utility plant and highlight any abandoned plant which remains on site.

When utility relocation has not started or is incomplete when construction begins.

- The Designer provides the Ministry Representative with a copy of relevant correspondence, drawings and notes related to utilities and also advises the Ministry Representative of any incomplete relocation work or negotiations which might affect the construction program.
- When the schedule for award of contracts is firm and budget approvals are in place, the Project

Manager provides utility owners with information on the proposed work schedule.

- Where utility relocation is a major aspect of a project, the Project Representative may ask utilities to be represented at an "in house" pre-tender meeting. Typically, all parties involved in a project are asked to attend this meeting for a final review of plans and arrangements. Participants typically include: the Project Manager, Designer, Design Supervisor, Manager of Construction, Ministry Representative, utility owners or their consultants, and municipal representatives.
- Where utility relocation is a major aspect of a project, the Project Representative may ask utilities to be represented at an on-site "pre-tender" meeting to provide information to prospective bidders.

The Construction Phase

- Prior to the pre-construction meeting or within seven days of acceptance of the Tender, whichever is sooner, the highway contractor must provide the Ministry Representative with a construction schedule. (Section 1.19, Special Provisions Checklist, *Major Works Contract Agreement*). At this point, the contractor will have firmed up relocation work with utilities.

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- The Project Representative includes utility representatives in pre-construction meetings which are scheduled once construction contracts have been awarded. These meetings are designed to establish contacts and lines of communication, firm up work schedules, and ensure that all participants have the information they require.
 - The Project Representative provides the contractor with all of the Ministry's information on underground utility installations.
 - The Project Manager ensures that contractors comply with utility-related provisions of the Major Works Contract Agreement. These include the following requirements.
 - The contractor is responsible for scheduling and coordinating any utility relocation with the utility company or municipality which owns the facility (Section 18.02, *Major Works Contract Agreement*).
 - The contractor must provide the Ministry Representative and appropriate utility representatives with at least fourteen days notice prior to commencing work adjacent to any utility (Section 1.18, Special Provisions Checklist - *Major Works Contract Agreement*).
 - The contractor is responsible for preserving and protecting utility infrastructure affected by relocation for which the Ministry has compensated the utility, and will assume full responsibility for all damage caused by the contractor (Section 18.03, *Major Works Contract Agreement*).
 - The contractor is responsible for ensuring that all of its employees, subcontractors, owner/operators and any other workers on the site:
 - (a) Know where all underground utilities are located and know the importance of avoiding damage to those utilities; and,
 - (b) Observe all instructions in connection with those utilities issued by the Ministry representative on behalf of the utility company or municipality. (Section 18.04, *Major Works Contract Agreement*.)
 - The Project Manager arranges compensation for reimbursable delays during construction (i.e. any work performed by any other party including utilities which is not reasonably foreseeable by the
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contractor). (Section 36, *Major Works Contract Agreement*.)

Completion and Commissioning Phase

- Once the utility's work has been completed, the Ministry Representative obtains: "as-built" drawings showing new and abandoned plant; or written confirmation that work has been completed in accordance with the permit.
- The Ministry Representative forwards copies of "as-built" drawings to the District representative on the Project Team, to be attached to the permit in District files.

Under the Ministry's Project Management System, the a project is assigned to a Project Manager. The project is broken down into any number of identifiable component sections or parts. The Project Manger assembles a "project team", and assigns each member of the team the responsibility for completing any number of the component parts of the project.

Team members become "project managers" of their particular assignments, and using the principles of project management, ensure that those assignments are provided on schedule and within the allocated funds.

In most cases, utilities are considered in five of the seven phases: preliminary design; functional design; detailed design; construction; and completion/commissioning.

Background to Procedure

The Project Management System

Most highway improvement projects are organized in seven phases:

- A planning or conceptual phase;
- A preliminary design phase;
- A functional design phase;
- A detailed design phase;
- A property acquisition phase;
- A construction phase;
- A completion; and commissioning phase.

Project Management Teams

The following members of the project team may work with utility representatives on a highway construction project which includes utility relocation.

Project Manager. The Project Manager has overall control and responsibility for a project including responsibility for budget, scope of work and schedule. Depending on the complexity of a project, the Project Manager may deal directly with the utility or delegate responsibility to the Ministry's Design Supervisor or Ministry Representative.

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Project Designer (or Designer). Most of the Ministry's design work is now carried out by consultants who are retained by the Ministry to provide design services. The Designer is responsible for coordination with utilities throughout the design process, including agreement on: engineering design details; terms and conditions of the relocation process; and costs (where cost-sharing is involved).

Design Supervisor. The Design Supervisor is a Ministry employee who is responsible for:

- Overseeing the Designer's work;
- Negotiating formal agreements with utilities for relocation work; and,
- Ensuring that agreements and utility relocation work conform with Ministry policy and procedures.

Ministry Representative. One person is designated as the Ministry Representative for any highway construction project. The Project Supervisor or the Consultant Project Supervisor performs this role.

The Ministry Representative becomes actively involved in a project once a construction contract has been awarded. Responsibilities include coordination of highway construction and utility relocation work and resolution of any disputes that develop between contractors and utilities.

District Representative. Because of the direct interest in highway operations during construction, long term maintenance operation and safety of a proposed facility, the Highway District, where the project is to be constructed, is usually represented on Ministry project management team.

Utility Representatives. Utilities may be invited to participate in project management meetings or, where there is a major utility impact, to be a member of the team. BC Hydro and BC TEL representatives on project management teams will usually include the following:

- BC Hydro

Area service planners/service technicians (for changes in distribution facilities).

Customer service and design technicians with ongoing input from a BC Hydro Project Engineer/Coordinator (for changes in transmission facilities).

- BC TEL

Detail Design Engineer or Design Technician.

Construction Supervisor (during the construction phase).

References

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Protocol Agreement -- Ministry of Transportation and Highways/BC Hydro, 1994.

Protocol Agreement -- Ministry of Transportation and Highways/BC TEL, 1994.

Responsibility and Cost Sharing Guide, Classified Highways - Part 3, Highway Act, Circular G 23/87, Ministry of Transportation and Highways, September 1987.

Major Works Contract Agreement, Ministry of Transportation and Highways.

Project Policy and Procedures Manual, Ministry of Transportation and Highways, April 1993.

Policy Proposal

Utilities on Bridges -- Work to be Included in General Bridge Contract

Consideration is being given to a requirement that all utility work related to construction and rehabilitation of bridges and other structures will be included in the Ministry's general bridge contract, with costs to be recovered from the utility.

This approach would provide the highest possible level of coordination for work schedules and materials handling and would reduce the likelihood of delays and extra costs related to utility relocation.

This policy initiative is being developed by Bridge Branch.

Policy Proposal

Utility Relocation -- Work to be Included in T&H General Contract

Coordination of highway construction and utility relocation work could be coordinated by a general contractor who takes responsibility for both construction and relocation. BC Hydro and the Ministry have agreed to undertake a pilot project which is designed to test this approach and to develop guidelines and procedures for joint projects of this sort.

The process envisaged by BC Hydro and the Ministry would include the following steps:

- The Ministry initiates a major highway construction project.
- BC Hydro completes design work for the relocated pole line or other works.
- BC Hydro drawings and specifications are included with highway design drawings as part of the bidding package.
- Utility relocation is included as a Special Provision in the Ministry's major works contract, with the general contractor taking responsibility for utility relocation as well as highway construction.
- Sub-contractors for utility relocation work must be selected from a list which is pre-approved by BC Hydro.
- BC Hydro is compensated for relocation work in accordance with the BC Hydro/Ministry of Transportation and Highways protocol agreement.
- Relocation costs are recovered from BC Hydro. Authority to credit those funds to the project account rather than general revenue would be requested under Section 22 of the *Financial Administration Act*.

The pilot project would include development of contracting procedures, project management procedures, and methods of separating highway costs from utility costs and related overheads.

Back Slope The slope between the ditch and the natural ground at the top of a cut.

Clear Zone The roadside border area immediately adjacent to the roadway clear of fixed object hazards which may be traversed by errant vehicles. The width is dependent upon the traffic speed and volumes, and the road geometry and alignment. (*Design Manual.*)

Controlled Access Highway

Design Ditch

Designer

Holding Property

Inside Ditch Point

Expressway

Field-side Installations

Freeway

Highway As defined in the *Highway Act*, including all public streets, roads, ways, trails, lanes, bridges, trestles, ferry landings and approaches and any other public way.

Highway Prism

Limits of Approach

Low Volume Road (LVR) A road with Average Annual Daily Traffic of 200 or less, and whose service functions are oriented toward rural road systems. A Low Volume Road may be to or within an isolated community, a recreation road or a resource development road. (*Design Manual*)

Near-side Service Connection

Nominal Voltage

Open-Shoulder Highway

Phase-to-Ground Voltage

Phase-to-Phase Voltage

Posted Speed

Primary Users

Push Braces

Secondary Users

Section 4 Road

Section 74 Road

Service Connections

Sheath Metre

Stub Poles

Surplus Land

Transmission Lines

Trunk Lines

Underbuilding