



Mn/DOT POLICY POSITION STATEMENT

Date: July 27, 1990

Revised: November 8, 2005

Reference: Highways No. 6.4
Accommodation of
Utilities on Highway
Right of Way

Position Statement:

The accommodation of utility facilities on Minnesota Trunk Highway right of way is permitted by *Minnesota Statutes and Rules*. It is in the public interest for utility facilities to be accommodated on the right of way of Trunk Highways, including local roads and streets receiving Federal aid, when use and occupancy of the right of way does not interfere with the free safe flow of traffic, or otherwise does not impair the highway or its visual quality, and does not conflict with any provision of Federal, State, or local law, rule, regulation or the Guidelines and Procedures adopted under this policy.

Background:

This Policy Position Statement and the Guidelines and Procedures that follow were developed in accordance with: *Minnesota Statutes*, Section 161.45, 222.37, subd 2, and 216D; *Minnesota Rules*, Parts 8810.3100 through 8810.3600; *Code of Federal Regulations*, Title 23, Part 645, Subpart B; American Association of State Highway and Transportation Officials (AASHTO) publications entitled: *A Guide for Accommodating Utilities Within Highway Right of Way* and *A Policy on the Accommodation of Utilities Within Freeway Right of Way*.



Douglas H. Differt, Deputy Commissioner
and Chief Engineer

Any questions regarding this position statement should be directed to:

Utilities Engineer, Minnesota Department of Transportation, Office of Technical Support, Pre-Letting Section, Utility Agreements and Permits Unit, (651) 296-7018.

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Mn/DOT POLICY GUIDELINE

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Permits for Accommodation
of Utilities on Highway
Right of Way

Guideline:

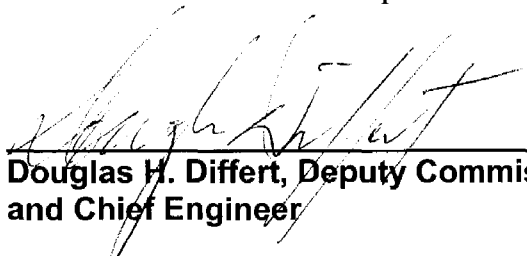
Under Minnesota law and rules it is necessary to obtain a utility permit in order to place utilities on Minnesota trunk highway right of way. Examples of utilities contemplated in Minnesota law are: electric transmission, telephone or telegraph lines, pole lines, community antenna television lines, railways, ditches, sewers, water, heat of gas mains, gas and other pipe lines, flumes, or other structures which, under the laws of Minnesota or ordinance on any city, may be constructed, placed, or maintained across or along trunk highway, or its right of way. Permits issued by the Minnesota Department of Transportation contain a copy of the current rules under which it is The Procedures that follow supplement these rules and provide internal guidance for Minnesota Department of Transportation employees when reviewing permit applications.

Position Statement Reference:

Highways No. 6.4

Background

Through the *Code of Federal Regulations* (23 CFR, Part 645.215(A)), the U.S. Department of Transportation requires each State to submit a statement to its Division Administrator on the authority of the State to regulate such use, and the policies the State employs or proposes to employ for accommodating utilities within the right of way of any highway project receiving Federal aid. Position Statement No. 6.3, the Guidelines and Procedures adopted thereunder form the basis of this submittal.



Douglas H. Differt, Deputy Commissioner
and Chief Engineer

Any questions regarding this position statement should be directed to:

Utilities Engineer, Minnesota Department of Transportation, Office of Technical Support, Pre-Letting Section, Utility Agreements and Permits Unit, (651) 296-7018.

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Date: July 27, 1990
Revised: November 8, 2005
Reference: Highways No. 6.4

**MINNESOTA DEPARTMENT OF TRANSPORTATION
PROCEDURES FOR
ACCOMMODATION OF UTILITIES ON
HIGHWAY RIGHT OF WAY**

Issued under: Mn/DOT Position Statement – Highways No. 6.4
Mn/DOT Policy Guideline – Highways No. 6.4.G-1

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I. Introduction

A. Overview of Utility Accommodation

1. It is in the public interest for utility facilities to be accommodated on the right of way of any highway when such use and occupancy does not interfere with the flow of traffic and the safe operation of vehicles, does not otherwise impair the highway or its visual quality, and does not conflict with provisions of federal, state, or local laws or regulations.
2. The Minnesota Department of Transportation (Mn/DOT) operates the state trunk highway system to provide a safe and convenient means for the vehicular transportation of people and goods. Utility owners provide other essential services to the public. Cooperation between these two entities is essential if the public is to be served in the most economical manner consistent with their respective public service needs, obligations, and interests. Although Mn/DOT strives to accommodate utility facilities whenever possible, the permitted use and occupancy of highway right of way for non-highway purposes is subordinate to the primary interests and safety of the traveling public.

B. Purpose of *Utility Accommodation Policy*

1. The purpose of this *Utility Accommodation Policy* is to prescribe policies and procedures to regulate and accommodate utility facilities along, across, or on the right of way of all trunk highways and other transportation facilities under the jurisdiction of the Minnesota Commissioner of Transportation.
2. This *Policy* applies to all public and private utilities. It also applies to all existing utility facilities retained, relocated, replaced, or altered, and to new utility facilities installed on State right of way, including those needed for highway purposes (such as for highway lighting or to serve a weigh station, rest area, or recreation area).
3. This *Policy* was and continues to be developed with integrated sections. Thus, two or more sections usually need to be read together to fully understand a utility accommodation issue. The reader is cautioned that by reading one section and not the other related sections may lead to misinterpretation of the *Policy*.
4. The Federal Highway Administration (FHWA) has approved this *Policy*.

C. Source Documents

1. Minnesota Statutes and Minnesota Rules permit the accommodation of utility facilities on the right of Minnesota trunk highways. Trunk highways include all roads established under the provisions of Article XIV, Section 2, of the Constitution of the State of Minnesota. This includes all highways that are constructed, improved, and maintained as public highways under the jurisdiction of the Commissioner of Transportation. Thus, all State maintained highways, including highways on the Interstate Highway System, are trunk highways.
2. The policies and procedures contained in this *Utility Accommodation Policy* were developed in accordance with the following:
 - a. Minnesota Statutes, sections 161.45, 161.46, 222.37, subdivision 2, and 216D.
 - b. Minnesota Rules, part 8810.3100 through 8810.3600.
 - c. Code of Federal Regulations, title 23, part 645, subpart B.
 - d. American Association of State Highway and Transportation Officials (AASHTO) publications, *A Guide for Accommodating Utilities Within Highway Right of Way* and *A Policy on the Accommodation of Utilities Within Freeway Right of Way*.
3. In addition to the above, utilities must also be accommodated in accordance with the following:
 - a. *Minnesota Manual on Uniform Traffic Control Devices*, and
 - b. AASHTO publications, *Roadside Design Guide* and *A Policy on Geometric Design of Highways and Streets*.

D. Application of Policy

1. The policies and procedures contained herein apply to all public utilities (and private lines that are only allowed to cross highways), including communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity that is to be accommodated within the right of way of highways under the jurisdiction of the Commissioner of Transportation and which by law are entitled to use public highways.
2. The policies and procedures contained herein apply to underground, surface or overhead facilities, either singularly or in combination, including bridge attachments.

E. Scope of Policy

1. These policies and procedures regulate the location, design, and methods for installing, adjusting, accommodating, and maintaining utility facilities on trunk highway rights of way and within local road and street right of way where federal-aid funds are used.
2. These policies and procedures are limited to sound engineering principles that preserve and protect the integrity and visual qualities of the highway and the safety of the motoring public.
3. Should new Minnesota Statutes, Minnesota Rules, or industry codes prescribe a higher degree of protection than is provided in these policies and procedures, the higher degree of protection shall prevail.

F. Utility Accommodation

1. Mn/DOT typically permits utility facilities to occupy State trunk highway right of way so long as the following conditions are met:
 - a. Such use and occupancy does not adversely affect the primary functions of the highways or materially impair their safety, operation, or visual quality,
 - b. There would be no conflict with the provisions of Federal, State, or local statutes, rules, or regulations or the accommodation provisions stated in this *Utility Accommodation Policy*, and
 - c. The occupancies would not significantly increase the difficulty or future cost of highway construction or maintenance.
2. A utility owner shall abide by the current version of this *Policy* each time a permit is authorized for its work. When future changes are made to this *Policy*, an existing utility facility is not required to meet the new version unless proposed changes to that facility require a new permit from Mn/DOT.
3. Nothing in *Policy* shall be considered as limiting to the rights of Mn/DOT to impose restrictions or requirements in addition to and/or deviations from those stated herein in any permit where Mn/DOT deems it advisable to do so. An appropriate explanation for such action should be provided to the utility owner.
4. The permitted facilities shall, if necessary, be altered by the utility owner to facilitate alteration, improvement safety, or maintenance of the highways as may be ordered after permit approval. All costs for constructing, maintaining, altering, and relocating the permitted facilities shall be the obligation of the applicant, unless a specific state-executed utility parcel or agreement otherwise provides

G. Exceptions to *Policy*

1. Exceptions to this *Utility Accommodation Policy* may be allowed if it is demonstrated that extreme hardships or unusual conditions provide justification and where alternative measures can be prescribed to fulfill the intent of these policies and procedures.
2. Any such exceptions must be:
 - a. Requested by an authorized person representing the utility owner;
 - b. Recommended for approval by Mn/DOT's District Engineer (or Authorized Representative);
 - c. Submitted to the FHWA for prior concurrence if the exception applies to a utility facility located on the National Highway System; and
 - d. Approved by Mn/DOT's Utilities Engineer, acting for the Commissioner of Transportation.
3. All requests for exceptions must include an evaluation of the direct and indirect design, environmental, and economic effects that would result if an exception is made, plus any other pertinent information.

H. Enforcement of *Policy*

1. Policies and procedures in the *Utility Accommodation Policy* shall be enforced as provided for in existing Minnesota Statutes and Minnesota Rules. Such enforcement might include, but is not limited, to the following:
 - a. Misdemeanor citations and responsibility for restoration costs when utilities begin work without a permit;
 - b. Increased bonding levels to recoup potential restoration costs;
 - c. Denial of future permits until past non-compliance is resolved; and
 - d. Litigation.
2. Every effort must be made by Mn/DOT to avoid the need for such enforcement. Establishing good working relationships with utility owners based upon coordination, cooperation, and communication can facilitate this effort.
3. In this regard, it needs to be made very clear that Mn/DOT districts do not have the authority to make promises to utility owners. All promises to utility owners and/or agreements between utility owners and Mn/DOT shall be handled through the Utility Agreements and Permits Unit by staff that possesses delegated authority. All such promises and/or agreements shall be documented.

I. Prior Policies and Procedures

This *Utility Accommodation Policy* supersedes and replaces all policies and procedures, or portions of pertaining to the accommodation of utilities.

II. Definitions

Abandoned Facility - An underground facility that is no longer in service and is physically disconnected from a portion of the operating facility that is in use or still carries service. An abandoned facility has been deemed abandoned by the operator. The state is the owner of any abandoned facilities.

As-Built Drawings - Depiction of the placed utility facilities within the highway right of way showing the location and elevation, and referenced to highway, stationing, and/or state grid system. Also known as record drawings, these plans depict the facility as constructed, incorporating all field changes.

Average Daily Traffic (ADT) - The average 24-hour volume, being the total volume during a stated period divided by the number of days in that period. Unless otherwise stated, the period is one year.

Backfill - Material used to replace or the act of replacing material removed during construction; also may denote material placed or the act of placing material adjacent to structures.

Bedding - Composition and shaping of soil or other suitable material to support a pipe, conduit, casing, or utility tunnel.

Boring - The operation by which large carriers or casings are jacked through oversize bores. The bores are carved progressively ahead of the leading edge of the advancing pipe as soil is mucked back through the pipe.

Bridge - A structure including supports erected over a depression or an obstruction such as water, highway, or railway; having a track or passageway for carrying traffic or other moving loads; and having an opening measured horizontally along the center of the roadway of ten feet or more between undercopings of abutments, between spring line of arches, or between extreme ends of openings for multiple boxes. This term also includes multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening.

Buffer Strip - That portion of the roadside, usually vegetated, between the curb or curb line and the sidewalk or extending about four feet or more from the curb where there is no sidewalk.

Cap - A rigid structural element surmounting a pipe, conduit, casing, or utility tunnel.

Carrier - A pipe directly enclosing a transmitted fluid (liquid, gas, or slurry). Also an electric or communication cable, wire, or line.

Casing - A larger pipe, conduit, or duct enclosing a carrier.

Clear Zone - The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes, speeds, and roadside geometry.

Coating - Material applied to or wrapped around a pipe.

Conduit - An enclosed tubular casing, singular or multiple, for the protection of wires, cables, or lines, usually jacketed and often extended from manhole to manhole.

Control of Access - The condition where the right of owners or occupants of abutting land or other persons to access, light, air, or view in connection with a highway is fully or partially controlled by public authority.

Full Control of Access - The authority to control access is exercised to give preference to through traffic by providing access connections with selected public roads only by prohibiting crossings at grade or direct private driveway connections.

Partial Control of Access - The authority to control access is exercised to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private driveway connections.

Coring - The operation by which a small casing is drilled into firm soil. As the pipe advances, the core material is removed by sluicing during or after the drilling.

Cover - The depth to top of pipe, conduit, casing, cable, or similar line or utility tunnel below the earth or roadway surface. It is normally referenced from the bottom of the highway ditch.

Cradle - A rigid structural element below and supporting a carrier or casing.

Direct Burial - Installing a utility underground with or without encasement by plowing or trenching.

Drain - An appurtenance to discharge liquid contaminants from casings.

Driving - The operation by which a small pipe is driven through compressible soils by a steady thrust, hammering, or vibrating. A casing or corrosion-resistant covering is required to be used.

Duct - An enclosed tubular casing for protecting wires, lines, or cables, often flexible or semi-rigid.

Encasement - Structural element surrounding a carrier or casing.

Encroachment - The unauthorized use of highway right of way or easements by such items as signs, fences, buildings, utilities, parking, storage, etc.

Environmentally Sensitive Areas - Areas that include, but are not limited to, wet lands, flood plains, archaeological or historic sites; areas with stability or settlement problems; and areas with artesian conditions, animal or plant communities, landscapes or geologic formations with exemplary, unique, rare or threatened/endangered characteristics.

Expressway - A divided arterial highway for through traffic with partial control of access and generally with grade separations at major intersections.

Fiber Optic Cable - A communication cable that contains glass fibers.

Force Main - Construction that forces flow in a certain direction.

Freeway - An expressway with full control of access.

Frontage Road - A local street or road auxiliary to and located on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

Gallery - An underpass for two or more pipelines.

Gravity Systems - Elevation with a certain profile that only requires gravity for flow.

Grounded - Electrically connected to earth or to some extended conducting body that serves instead of the earth, whether the connection is intentional or accidental.

Grout - A cement mortar or slurry of fine sand or clay.

Highway, Street or Road - A general term denoting a public way for the transportation of people, materials, goods, and services but primarily for vehicular travel, including the entire area within the right of way.

Horizontal Directional Drilling (HDD) - Also known as directional boring and directional drilling. A method of installing underground pipes and conduits from the surface along a prescribed bore path. The process is used for installing telecommunications and power cable conduits, water lines, sewer lines, gas lines, oil lines, product pipelines, and casings used for environmental remediation. It is used for crossing waterways, roadways, congested areas, environmentally sensitive areas, and any area where other methods are more expensive and not feasible.

Interstate Highways - Freeways (as used herein). This includes, but is not limited to, highways on the Interstate System as defined below.

Interstate System - The Dwight D. Eisenhower National System of Interstate and Defense Highways. Highways on this system that are in Minnesota are included in the Minnesota Trunk Highway System.

Jacket - A concrete encasement placed around a carrier or casing.

Manhole/Utility Access Hole - An opening in an underground system that workers or others may enter for the purpose of making installations, removals, inspections, repairs, connections, and tests.

Median - The portion of a divided highway separating the traveled ways for traffic in opposite directions.

National Highway System(NHS) - An interconnected system of principal arterial routes serving major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and major travel destinations. The NHS includes all highways on the Interstate System, a large percentage of urban and rural principal arterials, the defense strategic highway network, and major strategic highway connectors.

Normal - Crossing at a right angle.

Out-of-Service Facility - An underground facility that is no longer maintained and is not intended for future use, but has not been deemed abandoned. An out-of-service facility may still be connected to a portion of the operating facility that is in use or still carries service. The utility owner retains ownership of such a facility.

Pavement Structure - The combination of subbase, base course, and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.

Permit - The document by which the Minnesota Department of Transportation regulates and gives approval for the use and occupancy of highway right of way by utility facilities or private lines. A permit is sometimes referred to as a “use and occupancy agreement”.

Pipe - A tubular product made as a production item for sale as such. Cylinders formed from plate material in the course of the fabrication of auxiliary equipment are not pipe as defined here.

Flexible Pipe - A plastic, fiberglass, or metallic pipe having large ratio of diameter to wall thickness, which can be deformed without undue stress.

Rigid Pipe - A pipe designed for diametric deflection of less than one percent.

Semi-Rigid Pipe – A pipe designed to tolerate from one percent to three percent diametric deflection

Pipeline - A continuous carrier used primarily for the transportation of liquids, gases, and/or solids from one point to another using either gravity or pressure flow.

Plowing - Direct burial of utility lines by means of a "plow" type mechanism that breaks the ground, places the utility line, and closes the break in the ground in a single operation.

Pressure - The relative internal pressure in a pipe (measured in pounds per square inch gauge, psig).

Prairie Passage Route - A continuous transportation route that starts in Minnesota and continues through Oklahoma, Kansas, Missouri, Iowa, and Tennessee. The partnership promotes awareness of natural and cultural resources and encourages the protection and planting of native wildflowers and grasses along roadsides.

Private Lines - Privately owned facilities that convey or transmit the commodities outlined in the definition of “utility facility” below, but are devoted exclusively for private use.

Public Highway System - Article XIV of the Minnesota Constitution authorizes the State to construct, improve, and maintain public highways and to assist political subdivisions in this work. To do so it establishes the following public highway systems:

Trunk Highway System - This system includes highways that are constructed, improved, and maintained as public highways under the jurisdiction of the Commissioner of Transportation. (Article XIV, Section 2, of the Minnesota Constitution). Also see definitions for “Interstate System” and “Trunk Highways”.

County State-Aid Highway System - This system includes highways that are constructed, improved, and maintained by the counties as public highways, including streets in municipalities of less than 5,000 population where necessary to provide an integrated and coordinated highway system and some similar streets in larger municipalities. (Article XIV, Section 3, of the Minnesota Constitution).

Municipal State-Aid Street System - This system includes highways that are constructed, improved, and maintained as public highways by municipalities having a population of 5,000 or more. (Article XIV, Section 4, of the Minnesota Constitution).

Right of Way - A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to transportation purposes.

Roadside - A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

Roadway - The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

Roadbed - Roadway (As used herein).

Safety Rest Area - A roadside area with parking facilities separated from the roadway provided for motorists to stop and rest for short periods of time. It may include drinking water, toilets, tables and benches, telephones, information, and other facilities for travelers.

Scenic Overlook - A roadside area provided for motorists to stop their vehicles beyond the shoulder, and primarily used for viewing the scenery in safety.

Scenic Quality - Environmental factors that influence the aesthetic and physical characteristics of the surrounding area.

Slab, Floating - A slab between a utility line and a structure or pavement, but not contacting either.

Sleeve - A short casing through a pier or abutment of a highway structure for passing conduit or pipe.

Specimen Trees - A notable and valued tree in consideration of species, size, condition, age, longevity, durability, crown development, function, visual quality, and public or private prominence or benefit as indicated in the contract documents or as determined by the Engineer.

State - State of Minnesota.

Subsurface Engineering (SUE) - The management of certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation, communication of utility data, utility relocation cost estimates, implementation of utility accommodation policies, and utility design. SUE tools include traditional records, site surveys, and new technologies, such as surface geophysical methods and non-destructive vacuum excavation, to provide quality levels of information.

Temporary Barrier - A barrier used to prevent vehicular access into construction or maintenance work zones and to redirect an impacting vehicle so as to minimize damage to the vehicle and injury to the occupants, while providing worker protection.

Traffic Barrier - A device used to prevent a vehicle from striking a more severe obstacle or feature located on the roadside or in the median, or to prevent crossover median accidents.

Transportation Agency - The department, agency, commission, board or official of any State or political subdivision thereof charged by its law with the responsibility for highway administration.

Traveled Way - The portion of the roadway for the movement of through traffic.

Trenched - Installed in a narrow open excavation.

Trunk Highways - All roads established or to be established under the provisions of Article XIV, Section 2, of the Minnesota Constitution. This includes all highways that are constructed, improved, and maintained as public highways under the jurisdiction of the Commissioner of Transportation, including highways on the Interstate System.

Untrenched (Trenchless) - Installed without breaking the ground or pavement surface for such operations as jacking, tunneling, or boring.

Utility Accommodation Policy - A statement of the policies and procedures used by a transportation agency to regulate and accommodate utilities on the highway right of way.

Utility Facility (Utility) - A privately, publicly or cooperatively owned line, facility or system for producing, transmitting, or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity, including any fire or police signal system or street lighting system, which directly or indirectly serves the public. The term utility also means the utility company inclusive of any substantially owned or controlled subsidiary. For the purposes of this part, the term includes those utility-type facilities that are owned or leased by a government agency for its own use, or otherwise dedicated solely to governmental use. The term utility includes those facilities used solely by the utility that are a part of its operating plant. (See Minn. Stat., Sec. 161.45 and 23 CFR 645.207, M.).

Utility Quality Level - A professional opinion about the quality and reliability of utility information. There are four levels of utility quality information, ranging from the more precise and reliable, Level A, to the least precise and reliable, Level D. The utility quality level must be determined in accordance with guidelines established by the American Society of Civil Engineers in document CI/ASCE 38-02 entitled *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*.

Utility Tunnel - An underpass for one or more utility lines.

Use and Occupancy Agreement - The document by which the transportation agency approves the use and occupancy of highway right of way by utility facilities or private lines.

Vent - An appurtenance to discharge gaseous contaminants from a casing.

Wildflower Routes, Designated - State highway routes designated as wildflower routes in consideration of quality prairie stands.

III. Permits

A. General

1. Under Minnesota Statutes and Minnesota Rules it is necessary for utility owners to obtain a permit in order to place utility facilities on trunk highway right of way. Such permits are issued by the Minnesota Department of Transportation (Mn/DOT). These permits contain a copy of the current rules under which they are issued. Before they can begin work, utility owners shall receive an approved permit from Mn/DOT. The utility owner or its contractor shall carry a copy of the approved permit at all times while working on the highway right of way.
2. The policies and procedures contained herein supplement the rules under which permits are issued and provide internal guidance for Mn/DOT employees when reviewing applications.
3. A valid permit includes the following signatures:
 - a. An authorized person representing the utility owner;
 - b. Mn/DOT's District Engineer (or Authorized Representative); and
 - c. Mn/DOT's Utilities Engineer, acting for the Commissioner of Transportation.
4. Mn/DOT is not required to submit permits to the FHWA for prior concurrence except when the proposed installation is not in accordance with Mn/DOT's approved *Utility Accommodation Policy*, and then only if the utility facility is located on the National Highway System.

B. Types of Permits

1. Mn/DOT issues three types of permits:

- a. Short Form No. 1723, Application for Installation of Utilities or Miscellaneous Work on Trunk Highway Right of Way. This form is used for minor work, such as the installation of utility service connections that do not cross or parallel the roadway within the trunk highway right of way. It is also used for the installation of miscellaneous guy wires and anchors, to place temporary obstructions on the right of way, for temporary relocations of a more minor nature to accommodate a construction project, and for other minor types of work to be done on highway right of way.
 - b. Drainage Form 30795-03, Application for Drainage Permit. This form must comply with the most current version of Mn/DOT Technical Memorandum No. 97-16-ENV005, Wetlands.
Utility owners submit the Short Form and Drainage Form to the district for approval. The Assistant District Engineer, Maintenance, issues these permits.
 - c. Long Form No. 2525, Application for Utility Permit on Trunk Highway Right of Way. This form is used to request permission to place, construct, reconstruct, and thereafter maintain overhead and underground utility facility installations and extensions within trunk highway rights of way, whether longitudinally, oblique, or normal (perpendicular) in relation to the centerline of the highway. The Long Form is issued from the Mn/DOT Engineering Services Division, Preletting Services Section, with the approval of the District Engineer (or authorized Representative).
2. See <http://www.dot.state.mn.us/utility/index.html> for copies of these permits.

C. Application

1. A completed “Application for Utility Permit on Trunk Highway Right of Way” includes the following information:
 - a. Highway number;
 - b. Location of the facility (including coordinates, if possible);
 - c. Type of construction (aerial or underground);
 - d. Voltage;
 - e. Number and size of conductors;
 - f. Conduit (type and size);
 - g. Casing (type and thickness);
 - h. Method of installation for underground facilities;
 - i. Vertical and horizontal clearances;
 - j. Tree clearances and trimming required;
 - k. Contemplated starting and completion dates;
 - l. Turf restoration plan/topsoil salvage, seed type, fertilizer, mulch, topsoil borrow, etc.

2. The applicant agrees to comply with the following environmental measures:
 - a. Protection measures required for specimen trees and environmentally sensitive areas;
 - a. Steps required to preserve the scenic quality of the highway; and
 - b. Erosion control measures, turf establishment, NPDES, use and disposal of treated wood/trash/waste and asbestos, and the disposal of waste material outside of the right of way.

3. The applicant also agrees to the following conditions:
 - a. The applicant shall strictly conform to the terms of the permit and the Rules of the State of Minnesota as set forth in Minnesota Rules Parts 8810.3100 through 8810.3600, adopted as of July 31, 1983, together with the Special Provisions.
 - b. The applicant shall comply with relevant regulations of all other governmental agencies required for the protection of the public.
 - c. The applicant shall accomplish all work in a manner that will not be detrimental to the highway and that will safeguard the public.
 - d. The applicant shall provide complete information for any underground facility, including its purpose.
 - e. The applicant shall agree to collect and depict information about existing subsurface utility facilities prior to any excavation on highway right of way in accordance with procedures set forth in ASCE Standard 38-02 entitled, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*, and in *Minnesota Statutes*, Section 216D.
 - f. The applicant shall include a photo reproducible sketch with each copy of the permit that gives the location relative to the highway center line and/or right of way line, applicable control of access lines and access points, in-place utility facilities (including highway drainage), and identifying features (including stationing on the highway) when available.
 - g. The applicant shall submit as-built drawings with line and grade elevations of all utility facilities placed within the right of way, referenced to roadway alignment or the State grid coordinates.

D. FHWA Review

1. When a utility owner files a notice or makes an individual application or request to Mn/DOT to use or occupy the right of way of a Federal-aid highway, Mn/DOT is not required to submit the matter to the FHWA for prior concurrence. Mn/DOT's authority, by mutual agreement with the local Division Office of the FHWA, is manifested in the form of an approved Utility Permit, except when the proposed installation is not in accordance with Mn/DOT's *Utility Accommodation Policy* approved by the FHWA for use on Federal-aid highway projects [See 23 CFR 645.215(d)].

2. Exceptions to Mn/DOT's *Utility Accommodation Policy* may be allowed if it is demonstrated that extreme hardships or unusual conditions provide justification and where alternative measures can be prescribed to fulfill the intent of these policies and procedures. As set forth in the exception's procedure in Section I.G., requests for exceptions must be submitted to the FHWA for prior concurrence if the exception applies to a utility facility located on the National Highway System.

E. Plan Review

Before issuing a permit, Mn/DOT must:

1. Review the sketches, as well as pertinent information regarding the type of facility and compliance with codes, rules, and laws pertaining to the facility and
2. Assure that utility installations crossing state lines on roadways and bridges have been coordinated with appropriate highway permitting officials in the neighboring states.

F. Traffic Control Plan

A written traffic control plan shall be designed based upon the *Minnesota Manual on Uniform Traffic Control Devices* and approved by Mn/DOT's Traffic Office.

G. Certification

Upon completion of the permitted work, the utility owner must send two copies of the Certificate of Completion and "as built" plans to the Mn/DOT Assistant District Engineer, Maintenance.

IV. General Information

A. Private Lines

1. Private lines are privately owned facilities that convey or transmit communications, electricity, gas, oil, water, or any other similar commodities outlined in the definition of utility facility, but devoted exclusively to private use.
2. Since private lines serve only the owner, it is generally not in the public interest for them to be located within highway right of way. Even so, private lines may be allowed to cross State trunk highways, but longitudinal installations are not allowed. Reasons for needing to cross the highway right of way might vary. There might be a need by a private entity to expand its operations to the other side of a highway, or there might be a need to restore existing private facilities that would be severed by construction of a highway project.

3. Permit applications are required for private crossings. FHWA approval is not required. All private utility installations allowed to cross State highway right of way shall follow the requirements of this *Policy*.

B. Service Lines

1. Service lines are a special class of private lines. Whether the public utility facility is on or off highway right of way, the sole reason for a service line to be on highway right of way is to facilitate its connection with a public utility. Because it is in the interest of both the customer and the utility owner to have these connections, service lines may be allowed to cross State trunk highways wherever practical, but longitudinal installations are not allowed.
2. There is a wide variation among utility owners on the division of ownership, costs, and responsibility between the utility owner and the customer for the portion of the service line on highway right of way. Mn/DOT neither seeks nor desires to regulate this relationship, however, because the utility owner clearly benefits from these service lines and, as a practical consequence of effectively regulating utility occupancy of highway right of way, the utility shall locate any service lines when requested to do so.

C. Manholes, Vaults, and Pits

1. Manholes, vaults, and pits must be limited to those necessary to install and service the line and must be directly in line with the utility facility and of the minimum width to accomplish their intended function and comply with any other necessary codes or requirements. They must be installed flush with the roadway or ground surface and must be of sufficient strength to withstand the superimposed loads of the roadway and traffic, including that of construction equipment.
2. Manholes, vaults, or pits shall not be placed or permitted to remain in the pavement or shoulders of high-volume roadways. Exceptions may be permitted on roadways in urban areas in cases of extreme hardship.
3. Manholes may be placed or permitted to remain in place under traffic lanes of low-volume roadways in urban areas provided measures are taken to minimize these installations and to avoid their locations at intersections as practical.

D. Access to Utility Facilities

1. Mn/DOT has the authority to control access to all highways under its jurisdiction. This authority is not exercised on most highways. It is most applicable to some divided highways and expressways and to all freeways. Its purpose is to maintain the undisturbed, free flow of traffic. This objective is accomplished by giving preference to through traffic by limiting interference with vehicles, pedestrians, and other disturbances or objects that are entering, exiting, or crossing the highway.
2. There are two types of access control in Minnesota:
 - a. Full Control of Access – The authority to control access is exercised to give preference to through traffic by providing access connections with selected public roads only by prohibiting crossings at grade or direct private driveway connections. This level is typical on all freeways.
 - b. Partial Control of Access – The authority to control access is exercised to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private driveway connections. This level is typical of many divided highways and some expressways that have some intersections and driveways.
3. Direct access to utility facilities may be permitted on both fully and partially controlled access highways where alternate locations and means of access are not available or are impractical, as long as such access does not adversely affect safety or traffic operations or damage any facility. The following conditions also must be met:
 - a. Access for construction and/or servicing a utility facility shall be limited to frontage roads, nearby or adjacent public roads and streets, or trails along or near the highway right of way line, connecting only to an intersecting road.
 - b. A locked gate along the fence may be used to meet periodic service access needs. If a utility owner wants to make use of gates for access to its facilities on both fully and partially controlled access highways, the following conditions are required:
 - 1) Access to and from the highway will be on the basis of a revocable permit.
 - 2) The gates shall be locked when not in use and can only be used by authorized utility personnel.
 - 3) Use shall not adversely affect traffic operations.
 - 4) Use will not give the utility owner a claim to permanent access rights.

4. Access to utility supports, manholes, or other appurtenances in medians, interchange areas, or other inaccessible portions of the right of way on both fully and partially controlled access highways may be permitted under the following conditions:
 - a. Entry to the median area shall be restricted where possible to nearby grade separation structures, stream channel crossings, or other suitable locations not involving direct access from through lanes or ramps.
 - b. All permits shall include a traffic control plan and adequate provisions for control of access to the utility work zone and protection of workers and the traveling public.
 - c. Advance arrangements must be made between the utility owner and Mn/DOT for emergency maintenance procedures.

E. Emergency Work

1. Emergency situations may arise when immediate action to protect the safety of the general public requires utility operations within a trunk highway that are not in full compliance with the provisions of this *Policy*. Nothing herein shall be construed as requiring a utility owner to delay an emergency repair.
2. Emergency repairs may be performed within the right of way when physical conditions or time considerations prevent application for the usual permit. However, as soon as feasible, the utility owner shall advise the appropriate Mn/DOT District office of the emergency, its plans or actions for alleviating the dangerous situation, and arrangements made for the control and protection of traffic and pedestrians affected by its proposed operations. When the *Policy* requires a permit for such work, a permit shall be obtained as soon as possible and any alterations deemed necessary through the permit approval process shall be made.

F. Discontinued Use of Facilities

1. Above Ground Facilities. If a utility owner discontinues use of an above ground facility, the facility shall be entirely removed from the right of way within one year after its use is discontinued, unless Mn/DOT grants written approval for a time extension. All removal costs shall be the responsibility of the utility owner.
2. Underground Facilities. If a utility owner discontinues use of an underground facility but desires to leave it in place on the right of way, written approval to do so shall be obtained from Mn/DOT and a record shall be kept in the utility owner's permanent files in order that such facility may be accurately located in the field. Mn/DOT may at its discretion require abandoned and out-of-service pipes and appurtenant facilities (e.g., manholes, pull boxes, etc.) to be filled in or removed. All necessary removal and related costs shall be the responsibility of the utility owner.

3. Bridge Attachments. If a utility owner discontinues use of a facility on a highway bridge but desires to leave it in place on the bridge, written approval to do so shall be obtained from Mn/DOT. Any abandoned or out-of-service facilities that are removed from a bridge must be done so utilizing removal procedures approved by the Mn/DOT Bridge Office. All required removal costs shall be the responsibility of the utility owner.

V. Location Requirements

A. General

1. The location of utilities on highway right of way is governed by the provisions of the most recent versions of the following AASHTO publications:
 - a. *Roadside Design Guide*;
 - b. *A Policy on Geometric Design of Highways and Streets*;
 - c. *A Policy on the Accommodation of Utilities Within Freeway Right of Way*;
and
 - d. *A Guide for Accommodating Utilities Within Highway Right of Way*.
2. Utility facilities shall be located to minimize the need for later adjustments to accommodate future highway improvements, reduce risks to trunk highway and environmentally sensitive areas, and permit access for servicing such lines with a minimum of interference to highway traffic.
3. The location of utility installations along urban streets with closely abutting improvements usually requires special considerations. Such considerations must be resolved in a manner consistent with the prevailing limitations and conditions.
4. The location of utility facilities and appurtenances shall be in accordance with the Americans with Disabilities Act.
5. The horizontal and vertical location of utility facilities within the highway right of way must, to the extent practicable, conform with the clear zone policy applicable to the type of highway and specific conditions of highway section involved. Clear zone policies are employed by Mn/DOT to increase safety, improve traffic operations, and enhance the appearance of highways by designing, constructing, and maintaining highway roadsides as wide, flat, rounded, and as free as practical from physical obstructions above ground; such as from trees, drainage structures, massive sign supports, utility poles, and other ground-mounted obstructions. Mn/DOT's policy is based on criteria contained in the most recent version of the *AASHTO Roadside Design Guide*.

B. Crossings

1. Utility crossings of highways shall be normal to the highway alignment, where practicable.
2. Non-Controlled Access Highways. For utility crossings on highways where access is not controlled, all supporting structures and above ground appurtenances shall be located outside the clear zone.
3. Controlled Access Highways. For utility crossings on highways with partial and full control of access, all supporting structures and above ground appurtenances shall be located outside the access control line, and preferably outside the right of way line. Installation and maintenance shall be from frontage roads, crossroads, or streets, whenever practicable, or otherwise from outside the access control line and preferably outside the right of way line. Occasional exceptions may be allowed for an unusually wide right of way or median. Utilities permitted to cross freeways should preferably be located under the freeway. More information about freeway crossings may be found in Section VI.B., Crossings.
4. Utility crossings shall be avoided in deep cuts, near footings of bridges, retaining walls, noise walls, and at highway cross drains where flow of water, drift, or streambed load may be obstructed; in wet or rocky terrain where it is difficult to attain minimum cover; and through paved or unpaved slopes under structures.

C. Longitudinal Installations

1. Uncontrolled Access. New longitudinal installations on highways with uncontrolled access shall be located on uniform alignment as near as practicable to the right of way line and outside the clear zone. Pole lines shall normally be placed in the outer five feet next to the right of way line. Underground facilities, such as power cable and telephone cable, should be placed in the outer 10 feet. Distribution gas mains should be parallel and adjacent to these facilities. Other locations may be approved where particular circumstances warrant. The joint use of pole lines is acceptable, as is common trenching or plowing of underground facilities. All installations should be so placed that all servicing may be done with a minimum disturbance to traffic.
2. Partial Control of Access. Longitudinal installations on highways with partial control of access shall generally be discouraged. When such installations are allowed, individual service connections shall not be permitted unless no other reasonable alternatives exist. Factors to be considered include distance between distribution points, terrain, cost, and prior existence.

3. Full Control of Access. Longitudinal installations on highways with full control of access shall not be permitted. Exceptions may be allowed as discussed in Section VI.C., Longitudinal Installations. When such installations are allowed, individual service connections shall not be permitted, the utility facility shall not be installed or serviced by direct access from the fully controlled access roadways or connecting ramps, and the utility facility shall not interfere or impair the safety, design, construction, operation, maintenance, stability, or future expansion of the highway.

D. Median Installations

1. Poles, guys, or other related facilities shall not be located in a highway median. This applies to both crossing installations and longitudinal installations. Exceptions may be made for crossings of wide medians with sufficient width to provide sufficient clear zone from the edges of both traveled ways. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way. When right of way lines and access control lines are not the same, such as when frontage roads are provided, supporting poles may be located in the area between them.
2. No utility work shall be performed in the median of any highway without prior Mn/DOT approval. When median work is authorized, unless otherwise stated in the utility's approved permit, the work shall conform to the following provisions:
 - a. The utility or its contractor shall notify Mn/DOT and/or local law enforcement agencies of the expected beginning and completion time of work in the median.
 - b. All equipment, operations, and spoil material shall be located within the center area of the median.
 - c. No openings, vehicles, equipment, or materials of any type shall be located within the median overnight.
 - d. All vehicles used to conduct the work operation shall be equipped with conspicuously visible roof-mounted revolving or strobe lights. These lights shall be in operation just prior to and during the work operation. Hazard warning lights on the vehicles shall also be operating.

E. Appurtenances

1. Appurtenant facilities (e.g., pedestals, manholes, vents, drains, rigid markers, meter pits, sprinkler pits, valve pits, regulator pits.) shall be located outside the clear zone and as close to the right of way line as possible. Manholes, valve pits, etc. shall be installed so that their uppermost surfaces are flush with the adjacent undisturbed surface. Those appurtenances that protrude more than 4 inches above the ground line shall not be in the clear zone. If no feasible alternative exists, appurtenances within the clear zone shall be placed

in areas that are inaccessible to vehicular traffic or shielded by existing traffic barriers.

2. Utility accesses and valve covers should not be located in the roadway of rural highways. In urban and suburban areas there may be no feasible alternative to locating utility accesses and valve covers in the roadway, in which case they should not be located in a wheel path, if possible. Coordination among utility owners is essential where utility accesses and valve covers are to occupy highway right of way.
3. Buildings shall not be located on the right of way. Exceptions may be granted in cases where the building can be located outside the clear zone on Mn/DOT owned right of way other than a State trunk highway. Examples of this include, but are not limited to, park-n-ride lots, rest areas, and remnant parcels.
4. Cabinets shall not be located on the right of way. Exceptions may be granted in cases where cabinets can be located in areas where they are not vulnerable to errant vehicles and as near to the right of way line as possible.
5. Manholes shall not be located in the pavement or shoulders of heavily traveled highways. Exceptions may be made on highways where manholes are essential parts of existing lines. New manhole installations shall be avoided at highway intersections.
6. Vents, drains, markers, utility access holes, shafts, shut-offs, cross-connect boxes, pedestals, pad-mounted devices, and similar appurtenances shall not be located where they would interfere with accessible facilities for the disabled along or across the highway.

F. Vertical Location

1. Underground
 - a. The depth of bury for underground facilities within the right of way, except gas and low voltage electric, shall be a minimum of three feet as measured from the finished ground surface to the top of the facility at the time of installation. Gas lines and low voltage electric for street lighting shall have a minimum depth of two feet.
 - b. The depth of bury for all underground facilities crossing the highway shall be a minimum of three feet under ditches and five feet under the pavement surface as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation.

- c. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.
- d. More information concerning specific utilities can be found in Section X of this *Policy*. All utilities shall obtain prior approval from Mn/DOT before burying any utility less than the minimum depth required.

2. Overhead

- a. Vertical clearances for overhead utility facilities shall comply with all applicable State and national electrical codes as set forth in Mn/DOT's document entitled, *Basic Clearances for the Installation of Electric Supply and Communications Lines*. [See Table I on Page 24.]
- b. In all cases, facilities crossing over highways shall at no time be less than 18 feet above the high point of the traveled way.

G. Scenic Considerations

- 1. Mn/DOT makes every possible effort to enhance visual qualities along trunk highways. They do this by the retention and/or planting of trees, shrubs, and other vegetation; the selection of special alignments and corridors; and the acquisition of scenic easements.
- 2. New utility installations, including those needed for highway purposes (such as for highway lighting or to serve a weigh station, rest area, or recreation area) are not permitted on trunk highway right of way or other lands acquired or improved with Federal-aid funds that are located within, or adjacent to, areas of scenic enhancement and natural beauty. Mn/DOT may permit exceptions under the following conditions:
 - a. New underground installations may be permitted only if extensive removal or alteration of trees or terrain features visible to the highway user is not required, or the aesthetic quality of lands being traversed is not impaired.
 - b. Aerial installations may be permitted only when other locations are not available, are unusually difficult or costly, or are less desirable from the standpoint of aesthetic quality or when placement underground is not technically feasible, or is unreasonably costly.
- 3. The proposed installation will be made at a location that will employ a suitable design and materials that give the greatest weight to the aesthetic qualities of the area being traversed. Suitable designs include, but are not limited to, self-supporting, armless, single-pole construction with a vertical configuration of conductors and cable.

Table I

MINNESOTA DEPARTMENT OF TRANSPORTATION

Basic Clearances for the Installation of Electric Supply and Communications Lines*

Nature of ground or rails underneath wires	Guys Messengers Communications	Open Supply Wire Lines and Service Drops Voltages are between conductors							
	Telephone Cable Telephone Wire	0 to 750 Volts	750 to 15000 Volts	15000 to 50000 Volts	69000 Volts	115000 Volts	169000 Volts	230000 Volts	345000 Volts

Where wires cross over

Track rails of railroads handling freight cars, men permitted on top	27 ft.	27 ft.	28 ft.	30 ft.					
Public streets, alleys, or roads in urban or rural districts	18 ft.	18 ft.	20 ft.	22 ft.	23 ft.	25 ft.	26 ft.	30 ft.	34 ft.
Public streets, alleys, or roads in Twin City Metro-District	22 ft.	22 ft.	22 ft.	22 ft.	23 ft.	25 ft.	26 ft.	30 ft.	34 ft.
Public streets, alleys, or roads in Twin City Metro-District being over height house-moving routes	24 ft.	24 ft.	24 ft.	24 ft.	24 ft.	25 ft.	26 ft.	30 ft.	34 ft.
Driveways to resident garages	12 ft.	12 ft.	20 ft.	22 ft.	23 ft.	25 ft.	26 ft.	30 ft.	34 ft.
Spaces or ways accessible to pedestrians only	15 ft.	15 ft.	15 ft.	17 ft.					

Where wires run along and within the limits of public highways or other public right-of-way for traffic

Streets or alleys in urban districts	18 ft.	18 ft.	20 ft.	22 ft.	23 ft.	25 ft.	26 ft.	30 ft.	34 ft.
Roads in rural districts	14 ft.	18 ft.	18 ft.	20 ft.	23 ft.	25 ft.	26 ft.	30 ft.	34 ft.

Note: Grade B Construction is required at crossings over highways.

The conductor height shall be such that the basic clearances shall be obtained with the sag determined at 120 degrees F.

In areas, which are prone to sleet condition, the sag shall be determined under "heavy" sleet loading (1/2 inch ice at 0 degrees F).

The condition providing the greater sag shall be used in determining the height of the supporting structures.

*These clearances modify those published in the National Electrical Safety Code.

4. Ground-mounted and aerial utility facilities shall be of a design compatible with the scenic quality of the specific highway being traversed and shall blend in with the ground contours and the scenery wherever possible. In areas of unusual scenic interest, (e.g. major recreational areas, historic areas, and major publicly and privately owned tourist attractions) underground utility placement shall generally be provided.
5. New utility installations on highways with special scenic designations may encounter sensitive natural or scenic areas that require special treatment. Such highway corridors may include designated wildflower routes, the National Prairie Passage Route, the Great River Road, and Scenic Byways. Similar sites may be located elsewhere on the trunk highway system near public parks and recreational lands, wildlife and waterfowl refuges, historic sites, scenic overlooks, rest areas, and landscaped areas. The Office of Environmental Services can verify impacted sites and recommend permit language, when applicable.

H. Tree Protection

1. Where underground utility facilities are to be installed near specimen trees, as identified by Mn/DOT, the tree root systems are to be protected by boring (tunneling) under the roots in the manner described below. The minimum tunnel depth within the root zone shall not be closer than 36 inches to the soil surface. Open trenching will not be permitted within the protection limits described. Boring will be required if the trench is located within the following radius:

Tree Diameter 4½ ft. Above Ground	Distance from Face of Tree Trunk
0"-2"	1'
3"-4"	2'
5"-9"	5'
10"-14"	10'
15"-19"	12'
> 19"	15'

2. In lieu of boring (tunneling), the applicant may re-route underground utility lines to avoid damage to specimen trees.

VI. Freeways

A. Locations

1. Minnesota's metro and rural area freeway locations are maintained in a table that can be accessed from <http://www.dot.state.mn.us/utility/index.html>.
2. Mn/DOT reserves the right to add locations as existing highways are changed to freeway standards and as new census data is received.

B. Crossings

1. New utility facility installations and relocations of existing utility facilities may be permitted to cross a freeway. Where a utility facility follows a crossroad that is carried over or under a freeway, provisions should be made for the utility facility to cross the freeway on the crossroad in such a manner that it can be constructed and serviced without access from the freeway traffic lanes or ramps.
2. Overhead utility lines crossing a freeway shall be adjusted so that supporting structures are located outside control of access lines. In no case shall the supporting poles be placed within the clear zone. Where required, intermediate supporting poles may be placed in medians of sufficient width to provide the clear zone from the edges of both traveled ways. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way. When right of way lines and access control lines are not the same, such as when frontage roads are provided, supporting poles may be located in the area between them.
3. At interchange areas, supports for overhead utility facility shall be permitted only when the appropriate clear zone is provided, sight distance is not impaired, and access can be safely obtained.
4. Manholes and other points of access to underground utility facility crossing a freeway may be permitted only when they are located beyond the clear zone of the freeway traffic lanes or ramps. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way.
5. Irrigation ditches and water canals should be excluded from freeways. When a crossing is absolutely necessary, it may be made by underground siphon or through culverts or bridges as appropriate to the size of canal, topographic conditions, and highway safety aspects. Locations and structures are to be designed in the same manner as facilities for natural transverse drainage. All access and egress for servicing such facilities shall be from outside the access control lines.

C. Longitudinal Installations

1. The installation of new utility facilities shall not be allowed longitudinally within the right of way of any freeway, except in special cases under strictly controlled conditions. When a utility already exists within the right of way of a proposed freeway and it can be serviced, maintained, and operated without access from the freeway traffic lanes or ramps, it may be allowed to remain as long as it does not adversely affect the safety, design, construction, operation, maintenance, or stability of the freeway. Otherwise it shall be relocated.
2. Due to State legislation and legal arrangements that impact the State's development of fiber optics, a separate policy is being developed to address the installation of fiber optics along freeway right of way. The installation of fiber optics on all other highways is subject to the provisions contained in this document.
3. When utility owners believe special circumstances exist, they must present their case for longitudinal installations on freeways as early in the pre-design process as possible. Where such installations are requested, the utility owner shall in each case demonstrate to Mn/DOT's satisfaction that:
 - a. The accommodation will not adversely affect the safety, design, construction, traffic operations, maintenance, or stability of the freeway.
 - b. Alternate locations are not available or are cost prohibitive from the standpoint of providing efficient utility services.
 - c. The accommodation will not interfere with or impair the present use or future expansion of the freeway.
 - d. The location of the utility facility outside of the right of way would result in the loss of productive agricultural land or loss of productivity of agricultural land. In this case, the utility owner must provide information on the direct and indirect environmental and economic effects for evaluation and consideration by the Commissioner of Transportation.
 - e. Access for constructing and servicing utility facility will not adversely affect safety and traffic operations or damage any highway facility.
4. In all cases of new longitudinal utility accommodations, whether for freeways or non-freeways, the utility owner shall obtain a permit and install the utility facility in accordance with the approved permit.

D. Vehicular Tunnels

1. Utilities shall not be permitted to occupy vehicular tunnels on freeways at new locations except in extreme cases. Under no circumstances, however, shall a utility facility that transports a hazardous material be allowed to occupy a vehicular tunnel.

2. When a utility facility occupies space in an existing vehicular tunnel that is converted to a freeway, relocation of the utility facility may not be required. Utilities that have not previously occupied an existing vehicular tunnel that is incorporated into a freeway will not be permitted therein except in extreme cases.

E. Utility Access

1. Mn/DOT has the authority to control access to all highways under its jurisdiction. This authority is particularly applicable to freeways.
2. Direct access to a utility facility is generally discouraged but may be permitted when alternate locations and means of access are not available or are impractical, as long as such access does not adversely affect safety or traffic operations or damage any facility. More details about this are contained in Section IV.D. of this *Policy*.

VII. Structure Requirements

A. Utility Facilities on Highway Bridge Structures

1. Utility facility installations on highway structures are allowed by utility permit or may be provided for by agreement when installed in conjunction with highway construction. Mn/DOT's Bridge Office shall approve such installations before construction of the facility begins.
2. The utility owner is responsible for the design of its facility, subject to Mn/DOT approval. Factors influencing the design of an installation are the effects on traffic flow, structural integrity of highway structures, ease of highway and utility maintenance, and aesthetic appearance of the installation.
3. All utility facilities installed on highway structures shall be constructed of durable materials designed with a long life expectancy, and must be installed in a manner that will minimize routine servicing and maintenance over the design life of the facility.
4. Future growth of a utility should be considered. The system should be planned so as to avoid interference with highway traffic should expansion be required. It may be advantageous to install utility facilities at the time of State bridge construction to minimize the expense of a future expansion program.

5. Generally, utility facility installations on structures shall be above low superstructure and inside of the fascia elements. The strength of beams or girders cannot be reduced by drilling. Field welding on structures is not permitted. Expansion shall be provided for on all conduit and pipe runs. All supports shall be of a non-rusting material. Any abutment opening around a utility installation shall be sealed.
6. Because of concerns of potential strikes from high loads, gas and electric power installation designs shall generally be located in an interior girder bay (a minimum of two girders in from the edge of structure) and located vertically within one foot of the bottom of slab.
7. Installations of all utility facilities near bridge structures supported on spread footings shall be subject to the following restrictions:
 - a. No soils shall be disturbed below a line extending from the bottom of the footing horizontally for a distance of 3 feet from the edge of the footing and then continuing downwards and outwards on a 2:1 slope.
 - b. Any lines carrying fluids (e.g., water, sanitary sewer, storm lines,) that are within 50 feet of the edge of any spread footing shall be cased unless the elevation of the line is 15 feet or more above or 50 feet or more below the footing elevation. If it is impracticable to case storm sewer lines, they shall be placed outside the "50 foot line."
8. All visible utility facility installations shall be clearly marked at each substructure with the utility owners' name and the type of facility (e.g. gas, telephone, electric power, high voltage electric power).
9. Conduit shall be galvanized steel (may be coated) or fiberglass. A duct or conduit run shall generally terminate in the shoulder beyond the bridge approach panels.
10. Mn/DOT procedures limit parallel pipeline installations on highway structures to water, steam, sewer, cable TV, fiber optic lines, electrical power lines, and natural gas distribution pipelines. All are to be installed in accordance with the latest applicable codes.
11. Natural gas pipeline installations on highway bridge structures are subject to the following additional requirements:
 - a. Maximum operating pressure and corresponding nominal pipe diameters will be as shown below:

Operating Pressure (psi)	Maximum Diameter Pipe (inches)
0-100	6
101-175	4
176-400	3
> 400	Not Allowed

- b. Shut-off valves, automatic where practical, must be installed within 300 feet from each end of the structure, unless segments of the lines can be isolated by other devices within a reasonable distance.
 - c. Gas lines must be vented in an approved manner.
 - d. Pipelines shall be steel pipe and all joints, except expansion joints, shall be welded.
 - e. The pipeline shall be electrically insulated from the bridge structure.
 - f. The pipeline installation must be designed and installed so that the bridge structure and vehicle traffic do not create hoop stress on the pipe.
 - g. The operating pressure of the pipeline must not create hoop stress in excess of 20 percent of the specified minimum yield strength of the pipe. The specified minimum yield strength of the pipe shall be 42,000 p.s.i. (API X42).
12. High voltage electric power transmission line installations (> 35 kV) on bridge structures shall generally not be permitted except in extraordinary circumstances, and then only after a detailed analysis of all other construction methods or alternatives are determined not to be practicable. The increased cost of alternative construction methods will not be considered a reason for the installation of high voltage transmission lines on bridge structures. In addition, the utility owner shall address the following safety and operational issues to Mn/DOT's satisfaction.
- a. The proposed installation will not pose a hazard to bridge and roadway construction and maintenance personnel working on or near the installation.
 - b. The proposed installation will not pose a hazard to the motoring public.
 - c. The proposed installation will include adequate shielding protection to eliminate adverse effects of Electric Magnetic Field (EMF) on radio interference, fuel ignition potential, potential increased corrosion deterioration of reinforcing and structural steel, and long-term health effects of maintenance personnel working on the bridge for extended periods of time.
 - d. The proposed installation will be adequately designed to reduce the possibility of any shock hazards when installed on bridges that allow overtopping of flood waters or submersion of superstructure in high water.
 - e. The proposed installation would not pose environmental problems now or in the foreseeable future.

- f. The proposed installation shall be designed to allow shut down of lines. upon request of Mn/DOT, and that area to be serviced by the transmission line will have adequate and available alternate sources of power.

B. Utility Tunnels and Bridges

- 1. A utility tunnel or a bridge may be provided for a carrier or casing crossing a major highway at a strategic location. Such tunnel or bridge may serve a joint purpose as a utility and pedestrian facility and/or sign support structure. Where it can be foreseen that several utility crossings will be needed, the cost of a tunnel (either a large casing or a box culvert) or a bridge may be less than the cost of several untrenched or separate carriers or casings. Where these conditions exist, Mn/DOT should take steps as necessary to ensure that adequate coordination is performed with and among the utility owners to:
 - a. Anticipate utility needs for future crossings;
 - b. Combine facilities into a single joint use crossing;
 - c. Establish applicable permitting procedures; and
 - d. Establish applicable Mn/DOT requirements and expectations pertinent to designing, constructing, inspecting, and maintaining utility tunnels and bridges.
- 2. In a tunnel or on a bridge, provision shall be made to isolate mutually hazardous materials being carried, such as fuel and electric energy, by compartmentalizing or by auxiliary encasement of incompatible carriers.
- 3. The utility tunnel or utility bridge structure shall conform in appearance, location, cover, earthwork, and markers to Mn/DOT's standard culvert and bridge practices and shall be referenced by a bridge number obtained from the Mn/DOT Bridge Office.
- 4. Prior to installing a utility tunnel or bridge, utility owners shall agree that any maintenance, servicing, or repair of the utility lines will be their responsibility. They shall also agree that the cost of designing, constructing, and maintaining the utility tunnel or bridge is to be divided among the utility owners in an agreed upon and equitable manner. Mn/DOT will participate in these costs only to the extent that the utility owner would otherwise normally be reimbursable for such work or to the extent that the structure is used for highway purposes.

C. Lighting and Other Above-Ground Structures

- 1. Above-ground lighting facilities, lighting fixture supports, and all other above-ground structures shall be located outside the clear zone, except under the conditions listed below:

- a. Right of way width limits are less than the clear zone requirements and it is not cost effective to acquire additional right of way.
- b. Light poles conform to breakaway design features as defined in the most current edition of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals*.
- c. No ground structure or base protrudes more than four inches above the surface of the natural ground and can be maintained at that level
- d. The installation is at least ten feet from the roadway or two feet behind the face of the curb in an area where the posted speed limit is 40 miles per hour or less.
- e. The facility is shielded by an already existing guardrail or is located in an area that is inaccessible to vehicular traffic.

VIII. Design Requirements

A. General

1. Highway and utility facilities, by tradition, practice, and in some instances, laws, frequently co-exist within or along the same corridors. Therefore, it is essential that these public service facilities be compatibly designed and operated. Joint highway and utility planning and development efforts should be encouraged.
2. The potential impact on the highway and its use must be considered in the design and location of utility facilities on or along the highway. Consideration should also be given to the utility service needs of the area traversed where such service is to be provided from utility facilities on or near the highway.
3. All utility installations on, over, or under highway right of way and attachments to highway structures shall be of durable materials designed for a long service life expectancy and relatively free from routine servicing and maintenance.
4. Utility and highway facilities should be separated to avoid damage during installation and to provide for reasonable success in locating facilities with electronic devices. Separation of the facilities from highway facilities or other utilities may require the acquisition of additional property by the utility owner. Utility facilities should also be separated from one another as required by appropriate codes and ordinances.
5. On new utility facility installations or adjustments of existing ones, provisions should be made for known or planned expansion of the utility facilities, particularly those located underground or attached to bridges. They should be planned to minimize hazards and interference with highway traffic when additional facilities are installed at some future date.

B. Responsibilities

1. Mn/DOT Responsibilities. Mn/DOT is responsible for the review and approval of proposals from utility owners in accordance with the provisions in this document.
2. Utility Owner Responsibilities. Utility owners are:
 - a. Responsible for the design of the utility facility to be installed within the highway right of way or attached to a highway structure. Full consideration must be given to measures necessary to preserve and protect the maintenance, operation, safety, and aesthetic characteristics of the highway. Depth, clearances, and separation between utility facilities and the work must be in accordance with provisions in this document.
 - b. Required to collect and depict information in accordance with Minnesota Statutes, Section 216D, and in accordance with procedures set forth in ASCE Standard 38-02, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*. See Section VIII.D. below for more information.

C. Requirements

Utility installations on, over, or under highway right of way shall, as a minimum meet the following requirements:

1. Electric power and communication facilities shall conform to the currently applicable *National Electrical Safety Code*. Where the Code apparently does not apply, the minimum standards in that Code for the lowest voltage line shall apply. Utility owners or industry standards may prescribe more protection. Depending upon the installation, Mn/DOT may have more restrictive requirements (See Table I in Section V of this *Policy*).
2. Water lines shall conform to applicable standards by the American Water Works Association.
3. Pressure pipelines shall conform to currently applicable Federal, State, local, and industry codes. Federal codes are contained in 49 CFR Parts 192, 193, and 195.
4. Liquid petroleum pipelines shall conform to the currently applicable recommended practice of the American Petroleum Institute for pipeline crossings under highways.
5. Any pipeline carrying hazardous materials shall conform to the rules and regulations of the U.S. Department of Transportation governing the transportation of such materials.

D. Subsurface Utility Engineering

1. SUE is defined as a branch of engineering practice that involves managing certain risks associated with the following: utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.
2. The Subsurface Utility Engineering (SUE) process should be an integral part of the design for every new utility facility installation on highway right of way. The SUE process for collecting and depicting information about existing subsurface utility facilities is described in ASCE Standard 38-02, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*. This standard provides a system of classifying quality levels of existing underground utility data that are placed on plans. Such classifications allow the project owner, the engineer, and the contractor to develop strategies to reduce risk, or at a minimum, to allocate risk to existing underground utilities in a defined manner.
3. The SUE process basically involves systematically evaluating the need for accurate and comprehensive information. The SUE process typically and very generally works as follows:
 - a. SUE normally begins with the collection and correlation of existing utility records (Quality Level D) and surveyed visible utility facilities (Quality Level C).
 - b. It may then proceed to the application of appropriate surface geophysical methods to determine the existence and horizontal position of utility facilities within the area of proposed excavation (Quality Level B).
 - c. This information is surveyed to project control, correlated with previously obtained information, and analyzed for conflicts with the proposed installation.
 - d. It may then be determined that additional information is needed that involves physically exposing existing subsurface utility facilities (Quality Level A).
4. SUE is a step-by-step process. There are other steps in addition to those shown above, but the ones shown above establish the general framework for the process and utilize the basic technologies (surface geophysical methods for utility imaging and vacuum excavation for nondestructive excavation). Decisions are made at every step as to whether or not more information is needed.

5. The proper use of SUE during the development of highway projects will eliminate many of the utility problems typically encountered on highway projects, including:
 - a. Delays to projects caused by waiting for utility relocation work to be completed so highway construction can begin;
 - b. Delays to projects caused by redesign when construction cannot follow the original design due to unexpected utility conflicts;
 - c. Delays to contractors during highway construction caused by cutting, damaging, or discovering utility lines that were not known to be there;
 - d. Claims by contractors for delays resulting from unexpected encounters with utilities; and
 - e. Deaths, injuries, property damage, and releases of product into the environment caused by cutting utility lines that were not known to be there.

IX. Construction Requirements

A. General

1. Construction requirements are included as an integral part of Mn/DOT permits. These requirements will not be repeated verbatim in this *Policy*. It will be the permittee's responsibility to be aware of all the construction requirements contained in the approved permit and to comply with them.
2. A few items of particular interest that may or may not be included in the permit but should be complied with are included below:
 - a. Permit at Job Site. When Mn/DOT issues a permit to a utility owner for its proposed work, a complete copy of the approved permit shall be in the possession of the utility owner's work force, consultant, contractor, or subcontractor at all times when utility work is being performed within the highway right of way.
 - b. Use of Highway Median. Any use of a highway median is prohibited unless specifically authorized in the approved permit.
 - c. Use of Temporary Guard Pole. No guard pole (i.e., pole used to prevent aerial lines from falling onto the traveled way) shall be set within the right of way unless specifically authorized by in the approved permit.
 - d. Unexpected Field Conditions. Any modification of the terms of the approved permit to meet changed or unexpected field conditions shall require prior Mn/DOT approval before work may proceed.
 - e. Blasting. Blasting on the right of way is prohibited unless specifically authorized in the approved permit.
 - f. Survey Markers. Neither Mn/DOT survey markers (e.g., right of way marker, benchmark) nor any other survey markers (e.g., USGS, County) located on Mn/DOT right of way shall be disturbed unless prior approval

has been obtained from Mn/DOT or their owners. Mn/DOT or the utility owner, at the expense of the permittee, shall restore any survey marker that is disturbed, removed, or destroyed.

- g. Vegetation. No trees, shrubs, or other vegetation shall be sprayed, cut, trimmed, or damaged in any way to facilitate the installation of a utility facility unless specifically authorized in the approved permit.
- h. Rare or Endangered Species. Utility owners should be aware of rare or endangered plant species, or animal and insect species that feed off of native vegetation in the right of way that must be protected or avoided by law.
- i. Highway Signs. A utility owner shall not remove any highway sign unless approved to do so in its permit.

B. Traffic Control

1. Traffic controls for utility construction shall conform to the *Minnesota Manual on Uniform Traffic Control Devices*. Any utility construction operation shall be planned with full regard to safety, and interference with roadway traffic shall be kept to an absolute minimum.
2. No utility work shall begin until all appropriate traffic control devices are in place and fully functional. These traffic control devices must be maintained until all utility work is complete.
3. For those operations that entirely close or encroach upon a traffic lane, shoulder, or ramp, a proper traffic control plan shall be submitted or made reference to with a utility owner's permit application. On heavily traveled highways, utility construction operations interfering with traffic should not be allowed during periods of peak traffic flow.
4. Long-Term, Intermediate-Term, and Short-Term Work. All utility work that takes longer than 15 minutes to perform should utilize appropriate typical diagrams contained in the *Minnesota Manual on Uniform Traffic Control Devices*. If desired, a utility owner may develop its own traffic control plan contingent upon Mn/DOT approval. Mn/DOT may require a more extensive traffic control plan if:
 - a. Utility work is to be performed during nighttime hours;
 - b. Traffic control zones are to be left overnight or during other non-work times;
 - c. Utility work is to be performed in a continuously moving traffic control zone; and
 - d. Typical diagrams in the *Minnesota Manual on Uniform Traffic Control Devices* do not adequately cover utility work.

5. Most utility operations fall into the category of short-term work. The work crew is present to maintain and monitor the temporary traffic control zone. Signs are mounted on portable stands and pavement markings are generally not removed.
6. Mobile Temporary Work. Mobile operations often involve frequent short stops for utility work during daylight hours that will be completed in 15 minutes or less. As compared to stationary operations, mobile operations are activities that might involve different treatments. Basic considerations for mobile temporary work are as follows:
 - a. Maintaining safe work and road user conditions is a paramount goal in carrying out mobile operations. During mobile work, it often takes longer to set up and remove the traffic control devices than to perform the work. Workers face hazards in setting up and taking down the temporary traffic control zone. Also, since time is short, delays affecting road users are significantly increased when additional devices are installed and removed. Considering these factors, simplified control procedures may be warranted for short-duration work. A reduction in the number of signs and channelizing devices may be offset by the use of appropriately colored or marked vehicles with rotating lights or strobe lights, preferably augmented with sign or arrow panels, and possibly the use of flaggers.
 - b. Mobile work usually does not require the use of a specific traffic control plan. Even so, a utility owner is still responsible for providing traffic control adequate to protect public safety. If a mobile operation does not move every 15 minutes it should be considered a short-term operation and the appropriate short-term layout should be used. If sight distance is limited or traffic volumes are high, a short-term layout should also be considered.
 - c. Safety should not be compromised by using fewer devices simply because the operation is only for a few minutes or will frequently change its location. Portable devices should be used and flaggers may be used, but caution must be exercised so they are not exposed to unnecessary hazards. The traffic control devices should be moved periodically to keep them near the work space. If mobile operations are in effect on a high-speed travel lane of a multi-lane divided highway, a flashing arrowboard should be used.

C. Work Site Safety

1. The utility owner is responsible for securing the work site against any hazard to workers, pedestrians, bicyclists, and the motoring public at all times until all of the work is completed. Vehicles, equipment, and materials that are in active use at the work site shall be regulated by the utility owner to assure consistently safe conditions.

2. Sheeting, shoring, bulkheads, and concrete barriers may be required by Mn/DOT, as may anything else deemed necessary to comply with OSHA requirements for safeguarding work sites.
3. Utility hardware or equipment that is located at the work site but not in immediate use should be stored in a safe location off of the right of way. If this is not practical, the hardware or equipment may be stored beyond the clear zone as close to the fence or right of way line as possible.
4. Vehicles and equipment shall have their high intensity flashing lights (strobe or revolving) and hazard warning lights operating during work operations when they are within the right of way.
5. All workers (utility, Mn/DOT, contractor, etc.) who are exposed to or working adjacent to moving motor vehicle traffic or mobile earth-moving equipment shall wear high visibility apparel (vest, shirt or jacket) at all times. High visibility pants are also required at all times for flag persons and during low light and night time conditions for all others. When working in an area that does not require the use of a hard hat for head protection, a high visibility hat should be worn. High visibility apparel shall comply with requirements set forth in the *Minnesota Manual on Uniform Traffic Control Devices*.

D. Trenching and Backfill

1. Trenchless Construction

- a. Every possible effort should be made to avoid disturbing the pavement surface when installing new utility facilities, especially where underground utility lines are crossing major highways, expressways, or freeways. Trenchless construction should always be considered as a means of doing this. Trenchless methods may include driving, coring, or boring.
- b. The size of the trenchless construction operation should be restricted and the conditions specified under which the void outside the carrier or casing must be backfilled with grout. Where soils are favorable and the carrier is 4 feet or more deep, the diameter of the trenchless construction hole may be five percent larger than the diameter of the carrier. Grout backfill should be considered for carriers or casings more than 12 inches in diameter and for overbreaks, unused holes, or out-of-service carriers or casings.
- c. Portal limits (e.g., surface openings, bore pit limits) of pipeline crossings should be established beyond the clear zone of the highway so as to avoid impairing the roadway during installation of the pipeline. Where a bulkhead seals the pipeline portal, the portal should be suitably offset from the surfaced area of the highway. Where a bulkhead is not installed in the pipeline, the portal should be offset no less than the vertical difference in elevation between the surfaced area of the highway and the pipeline.

2. Trenched Construction

- a. At highway crossings, care must be taken to prevent the trench from becoming a drainage channel. On longitudinal lines, care must be taken to prevent the trench from interfering with surface or subsurface drainage.
- b. During construction, open trenches or other excavations within the clear zone shall not be permitted to remain beyond the workday unless backfilled, covered, delineated, or shielded.
- c. The following minimum specifications for trenching and backfilling shall be applied:
 - 1) When the existing highway pavement must be cut to accommodate a utility facility installation, the opening should be saw cut to a minimum depth of 1.5 inches.
 - 2) The width of pavement removal should be determined by the width of the required trench plus 12 inches minimum on each side of the trench. In the event the distance of any adjacent longitudinal or transverse joint or crack is less than 4 feet from the recommended width of cut, the pavement should be removed and replaced to that joint or crack. The additional pavement removal is intended to minimize later development of a sag in the surface of pavement over the trench.
 - 3) Trenches shall be cut to have vertical faces, where soil and depth conditions permit, with a maximum width of the outside diameter of the casing or carrier, plus 2 feet. They shall be shored where necessary. Lateral and vertical support shall be provided for all existing facilities and structures. Short tunnel sections should be used near adjacent facilities.
 - 4) Bedding should be provided to a depth of 6 inches or half the diameter of the casing or carrier, whichever is less. Bedding should consist of granular material, free of lumps, clods, stones, and frozen materials, and should be graded to a firm but yielding surface without abrupt change in bearing value. Unstable soils and rock ledges should be sub-excavated from the bedding zone and replaced by suitable material. The bottom of the trench should be prepared to provide uniform bedding throughout the length of the installation.
 - 5) Backfill under the roadway and foreslopes should be placed in two stages: first, fill to the level of the top of carrier or casing and second, fill to the former surface. Fill should consist of suitable material placed in layers of appropriate thickness to permit consolidation by compaction according to current applicable specifications. Consolidation by flooding or jetting may be permitted only in specific warranted conditions. For backfill of trenched pavement, materials and methods of compaction should be adapted to achieve prompt restoration of traffic service.

- 6) Mn/DOT may require that backfill and/or repaving be performed by its forces or under its direction at the expense of the utility owner. Where a utility owner can demonstrate that it is capable of acceptable and adequate repair, it may be authorized to perform its own restoration using specifications acceptable to Mn/DOT.

E. Encasement

1. Casings should be considered for the following conditions:
 - a. As an expediency in the insertion, removal, replacement, or maintenance of carrier pipe crossings of freeways, expressways, and other controlled access highways, and at other locations where it is necessary to avoid trenched construction;
 - b. As protection for carrier pipe from external loads or shock either during or after construction of the highway; and
 - c. As a means of conveying leaking fluids or gases away from the area directly beneath the roadway to a point of venting at or near the right of way line or to a point of drainage in the highway ditch or a natural drainage way.
2. The Commissioner of Transportation will determine the need for casing of pressurized carrier pipes and carriers of materials that are flammable, corrosive, expansive, energized, or unstable.
3. Jacked or bored installations of coated carrier pipes should be cased. Exceptions may be made where assurance can be provided against damage to the protective coating.
4. Consideration should be given to encasement or other suitable protection for any pipeline with less than minimum cover; near footings of bridges or other highway structures or across unstable or subsiding ground, or near other locations where hazardous conditions may exist.
5. Rigid encasement or suitable bridging should be used where support of pavement would be impaired by depression of flexible carrier pipe. Casings should be designed to support the load of the highway and superimposed loads thereon and, as a minimum, should equal the structural requirements for highway drainage facilities. Casings should be composed of materials of satisfactory durability under conditions to which they may be exposed.
6. Casing pipe shall be sealed at the ends with a flexible material to prevent flowing water and debris from entering the annular space between the casing and the carrier. The installations should include necessary appurtenances, such as vents and markers.

7. See Section X.C. for additional information pertaining to encasement of pipelines.

F. Mechanical Protection

1. For some conditions, pipeline crossings of the highway may be installed without encasement. Normally, such installations should be limited to trenched construction. The following controls are suggested for providing mechanical protection to uncased pipeline crossings of the highway.
 - a. On uncased construction the carrier should conform to the material and design requirements of utility industry and governmental codes and standards. In addition, the carrier pipe should be designed to support the load of the highway plus superimposed loads thereon when the pipe is operated under all ranges of pressure from maximum internal to zero pressure. Such installations should employ a higher factor of safety in the design, construction, and testing than would normally be required for cased construction.
 - b. Suitable bridging, concrete slabs, or other appropriate measures should be used to protect existing uncased pipelines, which by reason of shallow cover or location make them vulnerable to damage from highway construction or maintenance operations. Such existing lines may remain in place without further protection measures if they are of adequate depth and do not conflict with the highway construction or maintenance operations, provided both highway and utility officials are satisfied that the lines are, and will remain, structurally sound and operationally safe.
 - c. Uncased crossing of welded steel pipelines that carry flammable, corrosive, expansive, energized, or unstable materials, particularly if carried at high pressure or potential, may be permitted, provided additional protective measures are taken in lieu of encasement. Such measures would employ higher factor of safety in the design, construction, and testing of the uncased carrier pipe, including such features as thicker wall pipe, radiograph testing of welds, hydrostatic testing, coating and wrapping, and cathodic protection.

G. Pavement Cuts

1. Open cutting of the pavement to install utility facilities is highly discouraged because it adversely affects the structural integrity of the roadway. If it is not possible to install a utility facility without disturbing the pavement, the utility owner must provide written documentation and justification for an open cut. Where a longitudinal open cut is proposed or where several cuts are proposed to cross the pavement in the same area, Mn/DOT representatives responsible for the affected section of roadway will inspect the roadway to determine the extent of road repair that will be required.

2. The utility owner will be required to use patch materials at least equal in quality and thickness of layer to the original construction and the patch must be placed in accordance with Mn/DOT specifications. The limits of the pavement patch must extend at least two feet outside the limits of the trench. The edges of the trench must be beveled at least six inches. The limits of the patch must have vertical faces and must be saw cut for a clean break. The restored surface must be flush with and sloped at the same rate as the existing surface.

H. Markers/Facility Protection

1. A trace wire, metallic tape, or other method to effectively locate and mark the underground lines shall accompany all non-metallic underground lines. Whenever feasible, such methods shall include devices incorporated into the utility line.
2. No underground line shall be permitted within the highway right of way unless the line owner subscribes to the services of Gopher State One Call and/or some other appropriate "call-before-you-dig" system serving two or more utilities in the area.
3. The utility owner shall place permanent markers identifying the location of underground utility facilities, whether they are crossing the highway or installed longitudinally along the highway, where appropriate. Markers shall be installed in such a manner as to not interfere with highway safety and maintenance operations. Preferably, the markers shall be located at the right of way line if that location will provide adequate warning. The telephone number for one-call notification services (i.e., Gopher State One Call) to request marking the line location prior to excavation and for emergency response shall appear on the marker.
4. When it is likely that highway construction or maintenance activities could involve existing underground utility facilities it is desirable to locate and identify these facilities well in advance of the commencement of the work as an aid to work crews. The location of each underground utility facility should be identified by the utility owner with stakes, paint, or other temporary on-the-surface markings coded with an identifying color by utility type. The recommended uniform color code system is shown in Table II.

Table II
Uniform Color Codes

Red	Electric power lines or conduits – distribution, transmission, and municipal electric systems.
Yellow	Gas or oil pipelines – distribution and transmission, all pipelines carrying hazardous or dangerous materials including petroleum products, steam, compressed air, or compressed gases.
Orange	Communication lines including telephone and telegraph systems, police and fire communications, and cable television.
Blue	Water systems, irrigation, reclaimed water, and slurry pipelines.
Green	Storm and sanitary sewers and drains.
Florescent Pink	Temporary survey markings.
White	Proposed excavation.

X. Specific Requirements

A. Overhead Power and Communication Lines

1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to overhead power and communication lines and need to also be read in order for the reader to fully understand this topic.
2. Location
 - a. In rural areas, new overhead power and communication pole lines shall be located on a uniform alignment as far from the roadway as possible, preferably near the right of way line. Guy wires placed within the right of way shall be held to a minimum. They may be located as needed but in no case shall they be located within the clear zone.
 - b. In urban areas, new overhead power and communication pole lines in uncurbed sections shall be located at or as near as practical to the right of way line. Where there are curbed sections, the utility facility shall be located as far as practical behind the face of outer curbs and, where feasible, behind the sidewalks at such locations that will not interfere with adjacent property use. In all cases there shall be at least a two foot clearance behind the face of the curb.

- c. The location of overhead utility facilities on highways with narrow right of way or on urban streets with closely abutting improvements requires special considerations. Such cases must be resolved in a manner consistent with the prevailing limitations and conditions. Before locating the utility facility at other than the right of way line, consideration should be given to designs employing self supporting, armless single-pole construction, with vertical alignment of wires or cables, or other techniques permitted by governmental or industry codes that are conducive to a safe traffic environment. Exceptions to these clearances may be made where poles and guys can be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.
- d. New above ground facilities shall be located outside the clear zone. If the clear zone extends to the right of way line, then no installation should be permitted unless there is no feasible alternative. Where there are no feasible alternatives, new facilities that project more than four inches above the ground line should be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.
- e. Longitudinal lines on highway right of way shall be limited to single pole construction. Transverse lines shall also be limited to single pole construction where practicable, but may also be approved to use the same type supports that are used on the portion of the line immediately adjacent to the highway right of way provided all other requirements in this section are met.
- f. Where irregular shaped portions of the right of way extend beyond or do not reach the normal right of way limits, variances in the location of utility facilities should be allowed to maintain a reasonably uniform alignment for longitudinal installations. Such installations will reduce the need for guys and anchors between poles and roadway.
- g. Longitudinal installations of poles, guys, or other facilities shall not be located in a highway median. For crossings of a highway, poles should not be located in the highway median unless there is no feasible option, in which case, if located within the clear zone, they shall be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.
- h. The horizontal and vertical location of overhead power and communication lines relative to a highway bridge or other structure shall provide adequate clearance for construction and maintenance activities.

3. Design

- a. All overhead lines regardless of voltage or metallic content shall meet the requirements of the *National Electrical Safety Code*.
- b. Designs employing self-supporting, armless, single-pole construction, with vertical alignment of wires, cables, or other techniques permitted by governmental or industry codes should be considered whenever feasible. However, they must be conducive to safe traffic operations.

- c. Joint-use single pole construction should be encouraged at locations where more than one utility or type of facility is involved.
- d. The distance between utility poles should be the longest feasible span lengths consistent with geometric and design line loading considerations.
- e. Where practical and economically feasible, existing pole lines should be replaced with buried cables when relocation is necessary within the highway right of way. Buried cable may not be practical where there will be multiple connections to overhead lines, to utility customers, or where line voltage is high.

4. Vertical Clearances

- a. The minimum vertical clearance for overhead power and communication lines above the highway and approaches to the highway shall conform to the current *National Electrical Safety Code*.
- b. Greater clearances shall be used when required by State law, regulation, or policy as summarized in Mn/DOT's document entitled, *Basic Clearances for the Installation of Electric Supply and Communications Lines*. This document may be found in Table I and at <http://www.dot.state.mn.us/utility/index.html>.
- c. Lines crossing over highways shall at no time be less than 18 feet above the high point of the traveled way.

B. Underground Power and Communication Lines

- 1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to underground power and communication lines and need to also be read in order for the reader to fully understand this topic. Due to State legislation and legal arrangements that impact the State's development of fiber optics, a separate policy is being developed to address the installation of fiber optics along freeway right of way. The installation of fiber optics on all other highways is subject to the provisions contained in this document.

2. Location

- a. Underground power and communication lines may be placed longitudinally by plowing or open trench method and must be located on uniform alignment as near as practical to the right of way line to provide a safe environment for traffic operations, preserve the integrity of the highway, and preserve space for future highway improvements or other utility facility installations. The distance from the right of way line will depend upon the terrain involved and obstructions such as trees and other existing underground or aerial utility lines. On highways with frontage roads, longitudinal installation will be located between the frontage roads and the right of way lines. Underground lines shall not be placed longitudinally beneath the median or beneath through traffic roadways

including shoulders. Underground lines placed longitudinally along a connecting roadway shall not be placed under the median or beneath through traffic roadways, including shoulders, where the roadway connects with a State highway.

- b. Underground power and communication lines to be installed across any existing roadway shall be installed by boring, tunneling, or jacking in accordance with Mn/DOT specifications. When installed by jacking or boring, encasement may be required. Bore pits should generally be located at least 30 feet from the edge of the nearest through traffic lane and at least 20 feet from the edge of pavement on ramps. On low-traffic roadways and frontage roads, bore pits should be at least 10 feet from the edge of pavement and at least five feet from the face of curb. Adequate warning devices, barricades, and protective devices must be used to prevent traffic hazards. Where circumstances necessitate the excavation of a bore pit closer to the edge of pavement than established above, concrete barrier or other approved devices must be installed for protection of traffic. Bore pits must be located and constructed to not interfere with highway structural footings. Shoring must be used if necessary.
- c. Utility crossings should be avoided in deep cuts; near footings of bridges, retaining, and noise walls; at highway cross drains where flow of water, drift, or streambed load may be obstructed; in wet or rocky terrain where it is difficult to attain minimum cover; and through paved or unpaved slopes under structures.

3. Depth of Cover

- a. The critical controls for depth of cover for underground power and communication lines are the low points in the highway cross section. Usually these are the bottoms of the longitudinal ditches. The critical controls for cover are the depths of drainage facilities, bridge structures, and likely highway maintenance operations. The depth of cover should be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.
- b. Minimum depths for longitudinal power lines are as follows:
 - 1) Lines that are not under or within five feet of the roadway shall have a minimum depth of cover of three and one-half feet and preferably four feet for both cased lines and non-cased lines. Low voltage lines for lighting shall have a minimum depth of cover of two feet for both cased and non-cased lines.
 - 2) Lines that are under the pavement surface or within five feet of the roadway shall have a minimum depth of cover of five feet for both cased lines and non-cased lines.
 - 3) All lines shall have a minimum depth of cover of three and one-half and preferably four feet under ditches.
- c. Minimum depths for longitudinal communication lines are as follows:

- 1) Lines that are not under or within five feet of the roadway shall have a minimum depth of cover of three feet for both cased lines and non-cased lines.
 - 2) Lines that are under the pavement surface or within five feet of the roadway shall have a minimum depth of cover of five feet for both cased lines and non-cased lines.
 - 3) All lines shall have a minimum depth of cover of three feet under ditches.
- d. The depth of bury for underground power and communications facilities crossing the highway shall be a minimum of (a) three and one-half feet and preferably four feet under ditches for power, (b) three feet under ditches for communications, and (c) five feet under the pavement surface for both as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation.
 - e. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.
 - f. Exceptions may be authorized for existing power and communications lines to remain in place with a reduction of six inches in the depths of cover specified. Where less than minimum cover will result, the utility line shall be provided with additional mechanical protection by the utility owner. In such instances, the designer should consider increasing wall thickness or encasing the utility facility when the depth of cover is less than desirable, taking into account the relative risk with respect to the product carried and engineering and safety factors.
 - g. Further reductions may be permitted if the line is protected by a reinforced concrete slab that meets the requirements as follows:
 - 1) Width: Three times the facility diameter but not less than four feet;
 - 2) Thickness: Minimum of six inches;
 - 3) Reinforcing: Minimum of #13 bars on 12 inch centers or equivalent; and
 - 4) Cover: Minimum of six inches between the slab and top of line.
 - h. All utility owners shall obtain prior approval from Mn/DOT before burying any utility facility less than the minimum depth required.
 - i. More information concerning specific utilities can be found in Section V.F. of this *Policy*. Minimum depths for all utility facilities are summarized in Table III at the end of this section.

4. Encasement

- a. Underground power and communication lines may be cased or non-cased provided the installation complies with the depths of cover specified herein. Encasement, where used, may be metallic or nonmetallic. Such encasement shall be designed to support the load of the highway and superimposed loads thereon, including that of construction equipment.

The strength of the encasement must equal or exceed structural requirements for drainage culverts, and it must be composed of materials of satisfactory durability under conditions to which it may be subjected.

- b. Where used, encasement must be provided under center medians, from top of backslope to top of backslope for cut sections, five feet beyond toe of slope and under fill sections, five feet beyond face of curb in urban sections and all side streets, and five feet beyond any structure where the line passes under or through. Encasement may be omitted under medians that are substantially wider than normal standards for such roadways.
 - c. See Section IX.E. for additional information pertaining to encasement.
5. Appurtenances. See Section V.E. for information pertaining to appurtenances associated with underground power and communication lines.
6. Markers/Facility Protection. See Section IX.H. for information pertaining to markers and facility protection.

C. Pipelines

1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to pipelines and need to also be read in order for the reader to fully understand this topic.
2. Codes
 - a. Pressure pipelines carrying gas and liquid petroleum shall conform to the currently applicable sections of Federal, State, local, and industry codes. Federal codes are contained in the Code of Federal Regulations, title 49, parts 192, 193, and 195.
 - b. High pressure gas pipelines shall conform to the currently applicable sections of the Standard Code of Pressure Piping of the American National Standards Institute and applicable industry codes.
 - c. Liquid petroleum pipelines shall conform to the currently applicable recommended practice of the American Petroleum Institute for pipeline crossings under highways.
 - d. Water lines shall conform to the currently applicable Specifications of the American Water Works Association.
 - e. Any pipeline carrying hazardous materials shall conform to the rules and regulations of the U.S. Department of Transportation governing the transportation of such materials, including Code of Federal Regulations, title 49, parts 192, 193, and 195.
 - f. Pipeline installation permits shall specify the class of materials being carried; the maximum working, test, or design pressures; and the design standards for the carrier.

- g. When it is anticipated that there will be a change in the class of materials being carried or an increase in the maximum design pressure specified in the permit, the utility owner shall give Mn/DOT advance notice and obtain approval for such changes. The notice shall specify the applicable codes to be used.

3. Encasement

- a. All high pressure pipelines less than six inches in diameter and all low pressure pipelines crossing under the roadbed of trunk highways may be cased or non-cased. However, only welded steel lines with adequate corrosion protection may be used for non-cased highway crossings.
- b. All high pressure pipelines six inches in diameter or greater carrying gases and all pipelines carrying hazardous liquids crossing under trunk highways shall be cased, unless the following conditions are met:
 - 1) Open trenching method: Pipelines placed by an open trench method must be of sufficient inherent strength to withstand the forces imposed by highway and vehicular traffic and must be coated or of a non-corrosive material that meets industry standards.
 - 2) Trenchless Technology: Pipelines placed using trenchless technologies, such as jacking, boring, or horizontal directional drilling methods, may be placed under highways without a casing pipe if they meet specified requirements. All proposed crossings using this method of installation will be reviewed and approved on a case-by-case basis considering the soil conditions, location of pipeline, pipeline size, other pipeline, pipeline size, other pertinent factors, and adherences to the following requirements:
 - a) It is a welded steel pipeline.
 - b) It is cathodically protected.
 - c) It is coated in accordance with accepted industry standards.
 - d) It complies with Federal and State requirements and meets accepted industry standards regarding wall thickness and operating stress levels.
 - e) The depth of the crossing is a minimum of three feet below the original ditch grade.
 - f) The bores are continuous from the beginning of the installation until the leading edge of the pipeline is through the entire crossing.
 - g) The completed pipeline crossings are all pressure tested.
 - h) During pipeline installation, traffic on the highway will not be restricted and all Mn/DOT regulations will be applied.
 - i) Grouting will be done along the top of the pipe to fill all voids.
 - j. Large mains that are out of service in the highway right of way will be removed or filled with approved materials.

- c. All water lines shall be cased when crossing under the roadbed of trunk highways, except service lines of two inch diameter or less. Encasement may also be omitted under entrances, depending upon the type and amount of traffic and the depth, condition, and maintenance responsibility.
- d. Where pipelines are cased, the encasement should extend a suitable distance beyond the slope or ditch lines. On curbed sections, the encasement should extend outside the outer curbs. Where appropriate, the encasement should provide for future widening of the highway without need for any utility adjustment.
- e. See Section IX.E. for additional information pertaining to encasement of pipelines.

4. Crossings

- a. Pipeline crossings should be avoided within basins of an underpass drained by a pump if the pipeline carries a liquid, liquefied gas, or other potentially hazardous materials.
- b. Installations crossing existing highways and made subsequent to highway construction may be placed by auguring from inside the pipe. Pre-auguring is not permissible. The leading edge of the auger head shall not protrude more than one inch from the end of the casing during boring operations.
- c. Carrier pipe six inches in diameter and under may be installed by pushing or jacking it under an existing roadway.

5. Depth of Cover

- a. The critical controls for depth of cover for pipelines are the low points in the highway cross section. Usually these are the bottoms of the longitudinal ditches. The critical controls for cover are the depths of drainage facilities, bridge structures, and likely highway maintenance operations. The depth of cover should be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.
- b. Minimum depths for longitudinal pipelines are as follows:
 - 1) Pipelines, except those carrying gas and liquid petroleum, which are not under or within five feet of the roadway, shall have a minimum depth of cover of three feet for both cased lines and non-cased lines. Pressure pipelines carrying gas and liquid petroleum shall have a minimum depth of two feet for both cased lines and non-cased lines.
 - 2) Pipelines that are under the pavement surface or within five feet of the roadway shall have a minimum depth of cover of five feet for both cased lines and non-cased lines.
 - 3) Pipelines shall have a minimum depth of cover of three feet under ditches.

- c. The depth of bury for all underground facilities crossing the highway shall be a minimum of three feet under ditches and five feet under the pavement surface as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation.
- d. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.
- e. Exceptions may be authorized for existing pipelines to remain in place with a reduction of six inches in the depths of cover specified. Further reductions may be permitted if the pipeline is protected by a reinforced concrete slab that meets the requirements as follows:
 - 1) Width: Three times the pipe diameter but not less than four feet;
 - 2) Thickness: Minimum of six inches;
 - 3) Reinforcing: Minimum of #13 bars on 12 inch centers or equivalent; and
 - 4) Cover: Minimum of six inches between the slab and top of pipe.
- f. All utilities shall obtain prior approval from Mn/DOT before burying any utility less than the minimum depth required.
- g. More information concerning specific utilities can be found in Section V.F. of this *Policy*.
- h. Minimum depths for all utilities are summarized in Table III at the end of this section. Boring Specifications

6. Boring Specifications

- a. Casing pipe shall be installed using equipment that encases the hole as the earth is removed. Boring without the concurrent installation of a casing pipe is not permissible. Casing pipe shall extend through the entire fill and be installed in a manner that will not disrupt traffic nor damage the roadway grade and surface. The introduction of water into an excavation is prohibited.
- b. Steel casing pipe shall be new material, with minimum yield strength of 35,000 psig (pounds per square inch gauge). All joints in steel casing pipe shall be welded. The following minimum wall thickness shall be used:

Casing Pipe Wall Thickness

Outside Diameter	Under Highway
12" to 28"	0.250
30" to 34"	0.375
36" to 60"	0.500

- c. Reinforced concrete casing pipe must be properly classed based on the depth of cover over the pipe. A minimum of 5000 psi (pounds per square inch) concrete pipe must be used when casing pipe is jacked. Bell type ends are not permitted.
- d. No boring is to be started under any portion of the roadway until an approved permit to do so has been received by the contractor.

7. Vents

- a. Vents should be located at the high end of short casings and generally at both ends of casings longer than 150 feet.
- b. Vent standpipes should be located and constructed so as not to interfere with maintenance or use of the highway. They should not be concealed by vegetation. They should preferably stand on a fence or right of way line.
- c. In urban areas, vents should be permitted only where they do not affect pedestrian traffic.

8. Drains. Drains shall be provided for casings and tunnels enclosing carriers of liquid, liquefied gas, or heavy gas. Drains should empty outside the roadside area to a natural feature, a roadway ditch, or at other locations approved by Mn/DOT. Such outfall shall not be used as a wasteway for purging the carrier unless specifically authorized.

9. Shut-off Valves. Shut-off valves, preferably automatic, shall be installed in lines at or near ends of structures.

10. Appurtenances. See Section V.E. for information pertaining to pipeline appurtenances.

11. Markers/Facility Protection. The utility owner must place readily identifiable and suitable markers immediately above any underground pipelines it places within the right of way fence line. Signs shall identify the owner/operator name, the Gopher State One Call telephone number, and the type of facility. Utility sign markers shall be placed at maximum intervals of ¼ mile and on each side of all public roads, streets, and trails the utility facility crosses. Where plastic pipe is installed without a metal casing, a metal wire must be installed concurrently or other means provided for detection purposes. See Section IX.H. for additional information about markers and facilities protection.

12. Plastic Lines. The maximum size of plastic lines must not exceed industry standards.

D. Sanitary and Storm Sewers

1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to sanitary and storm sewers and need to also be read in order for the reader to fully understand this topic.
2. Codes
 - a. Sanitary sewer shall be installed in accordance with industry standards.
 - b. Storm sewers shall be installed in accordance with Mn/DOT standards.
3. Encasement
 - a. Gravity systems shall be cased when installed by jacking and/or boring, unless the carrier pipe is of such size and material that it would normally be installed without a casing.
 - b. Force mains larger than two inches in diameter crossing the highway shall be cased under the roadbed.
 - c. Lines to be operated under pressure or which do not conform to the material, strength, or cover depths contained herein must be cased.
 - d. Encasement under entrances may be omitted, depending upon the type and amount of traffic and the depth, condition, and maintenance responsibility.
 - e. See Section IX.E. for additional encasement information.
4. Depth of Cover
 - a. The critical controls for depth of cover for sanitary and storm sewers are the low points in the highway cross section. Usually these are the bottoms of the longitudinal ditches, the depths of other drainage facilities, bridge structures, and likely highway maintenance operations.
 - b. The depth of cover should be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.
 - c. Minimum depths for longitudinal sanitary and storm sewers are as follows:
 - 1) Sanitary and storm sewers that are not under or within five feet of the roadway shall have a minimum depth of cover of three feet for both cased lines and non-cased lines.
 - 2) Sanitary and storm sewers that are under the pavement surface or within five feet of the roadway shall have a minimum depth of cover of five feet for both cased lines and non-cased lines.
 - 3) Sanitary and storm sewers shall have a minimum depth of cover of three feet under ditches.
 - d. The depth of bury for all underground facilities crossing the highway shall be a minimum of three feet under ditches and five feet under the pavement surface as measured from a straight line connecting the lowest points of

the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation.

- e. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided. Exceptions may be authorized for existing pipelines to remain in place with a reduction of six inches in the depths of cover specified above.
- f. All utility owners shall obtain prior approval from Mn/DOT before burying any utility less than the minimum depth required.
- g. More information concerning specific utilities can be found in Section V.F. of this *Policy*. Minimum depths for all utility facilities are summarized in Table III at the end of this section.

5. Materials. New and relocated sewer lines may be of any material that has been proven to be of satisfactory strength and durability in local use, provided all other requirements are met and approved by Mn/DOT.

6. Markers/Facility Protection

- a. The utility owner must place readily identifiable and suitable markers immediately above any sanitary sewer lines it places within the right of way line.
- b. Signs shall identify the owner/operator name, the Gopher State One Call telephone number, and the type of facility.
- c. Utility sign markers shall be placed at maximum intervals of ¼ mile and on each side of all public roads, streets, and trails the utility facility crosses.
- d. Where non-metallic lines are installed without a metallic casing, a durable metal wire must be installed concurrently or other means provided for detection purposes. See Section IX.H. for additional information about markers and facilities protection.

E. Irrigation and Drainage Pipes, Ditches, and Canals

- 1. Irrigation and drainage pipes installed across highway right of way should be designed and constructed in accordance with Mn/DOT standards for highway culverts and bridges.
- 2. Ditches and canals not required for highway drainage that closely parallel the highway shall generally not be constructed within the highway right of way unless approved by Mn/DOT.

Table III

UTILITIES ON MINNESOTA HIGHWAY RIGHT OF WAY

MINIMUM DEPTHS

Crossings

	Under Pavement Surface		Under Ditch
All Underground, except Power (Cased and Uncased)	5'		3'
Power (Cased and Uncased)	5'		3.5'

Longitudinal Installations

	Under Pavement Surface or Within 5' of Roadway	5' of More Away from Roadway	Under Ditch
Power Lines (Cased and Uncased)	5'	3.5'	3.5'
Low-Voltage Power Lines (Cased and Uncased)	5'	2'	3'
Communications Lines (Cased and Uncased)	5'	3'	3'
All Pipelines (Except Gas) (Cased and Uncased)	5'	3'	3'
Gas Pipelines (Cased and Uncased)	5'	2'	3'
Sanitary and Storm Sewers (Cased and Uncased)	5'	3'	3'