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## I. Introduction

This Utility Accommodation Section details Minnesota Department of Transportation (MnDOT) procedures for accommodating utility facilities along, across, or on the right of way of all highways under the jurisdiction of the Minnesota Commissioner of Transportation. This manual section also includes technical components and requirements for utility owners regarding the location, design, and methods for installing, adjusting, accommodating, and maintaining utility facilities on such rights of way.

In addition to fulfilling the requirements of this Utility Accommodation Section, utility owners also must meet the requirements of the [Utility Accommodation on Highway Right of Way Policy](#). The MnDOT Utility Accommodation on Highway Right of Way Policy describes how MnDOT addresses requests by utility owners to occupy a portion of trunk highway right of way. In each case, MnDOT must evaluate the technical aspects of how accommodation of the utility facility will be accomplished, such as how and where a utility facility may be located so as not to interfere with other utility facilities or the safety of the traveling public. Simply put, utility owners must fulfill the requirements described in the Utility Accommodation on Highway Right of Way Policy and fulfill the technical requirements in this Utility Accommodation Section.

In addition to trunk highways, this Utility Accommodation Section and the Utility Accommodation on Highway Right of Way Policy apply in certain situations for projects subject to the requirements of 23 CFR § 645.209(g), such as projects within local road and street right of way where federal-aid funds are used. To satisfy the requirements of 23 CFR § 645.209(g), a local agency may exercise their authority to manage utility accommodation pursuant to Minn. Stat. § 237.163, subd. 2(b). In those situations where the local agency does not exercise its authority under the Minnesota statutes and regulations, then the local authority must follow this Utility Accommodation Section and the Utility Accommodation on Highway Right of Way Policy. Language in agreements between MnDOT and the local authority formally addresses this requirement.

Due to the nature of the subject, two or more subsections may need to be read together to fully understand a utility accommodation issue or situation. It is important to become familiar with all the content to avoid any misinterpretation.

## II. Utility Permit Application

### A. General

Minnesota statutes and rules require utility owners to obtain a permit from MnDOT to install, alter, or maintain utility facilities on trunk highway right of way. These permits incorporate the current rules under which they are issued. The utility owner or its contractor must receive an approved permit before starting work on highway right of way. The permit helps the state ensure that the utility owner will not:

1. Interfere with the safe flow of traffic
2. Impair the function or aesthetics of the highway
3. Conflict with any current or anticipated MnDOT projects
4. Conflict with any provisions of federal, state, or local laws or rules, or be inconsistent with MnDOT's Utility Accommodation on Highway Right of Way Policy or this manual section.

MnDOT documents the rules and requirements that apply to the use and occupancy of highway right of way by utility facilities or private lines in a permit. Utility owners must have an approved permit from MnDOT before starting work and follow permit regulations and requirements to occupy highway right of way. The applicant shall strictly conform to the terms of the permit and the Minnesota Rules Parts 8810.3100 through 8810.3600, together with the special provisions.

## B. Permit Types

MnDOT issues several types of permits relating to trunk highway rights of way. This manual section addresses the utility accommodation permit and the miscellaneous work permit.

1. **Application for Utility Accommodation on Trunk Highway Right of Way** (Form 2525) – MnDOT requires the Application for Utility Accommodation on Trunk Highway Right of Way for the vast majority of utility placements and relocations. Utility owners complete this form to request permission to place, construct, and reconstruct utility facilities within trunk highway right of way, whether the utility facility runs longitudinally, skewed, or perpendicular to the centerline of the highway. Drainage may be treated as a utility, requiring this form, in certain cases when a facility passes through the right of way without any outlet from or inlet to the facility within the right of way. For utility-initiated projects, utility owners submit this form to the MnDOT Utility Agreements and Permits Unit. For relocations to accommodate a highway project, utility owners submit this form to the appropriate MnDOT project manager. A valid utility accommodation permit includes the following signatures:
  - a. An authorized person representing the utility owner;
  - b. The MnDOT District Engineer (or Authorized Representative); and
  - c. The MnDOT Utilities Engineer, acting for the Commissioner of Transportation.
2. **Application for Miscellaneous Work on Trunk Highway Right of Way** (Form 1723) – The Application for Miscellaneous Work on Trunk Highway Right of Way is used for minor work, such as 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 installation of miscellaneous guy wires and anchors, to place temporary obstructions on the right of way, and to perform temporary relocations of a more minor nature to accommodate a highway construction project. In addition, MnDOT requires this form from the utility owner for service and maintenance operations within trunk highway right of way. For utility-initiated projects, utility owners submit this form to the appropriate MnDOT district permit office. For applicable adjustments to accommodate a highway project, utility owners submit this form to the appropriate MnDOT project manager.

MnDOT also issues other permits, not covered directly in this manual section, that are helpful to keep in mind. The following are among those other permits and are listed here for information only.

1. **Application for Drainage Permit (Form 30795-02)** – The Application for Drainage Permit is used for all types of drainage changes on a trunk highway; this form is to be completed when water flow on highway property is involved.
2. **Application for Access/Driveway Permit (Form 1721)** – The Application for Access/Driveway Permit is used for all requests for a driveway or other access point to a trunk highway or for a change in use of an existing access.
3. **Application for Rail Bank Access Permit (Form 1721 RB)** – Minnesota Statutes § 222.63 and Minnesota Rules parts 8830.5810 through 8830.5860 govern state rail bank property. The Application for Rail Bank Access Permit is used for all requests for access on rail bank right of way. In addition to the Rail Bank Access permit, a lease agreement and a fee will apply.

4. **Application for Utility Installation on Rail Bank (Form 1723 RB)** - Minnesota Statutes § 222.63 and Minnesota Rules parts 8830.5810 through 8830.5860 govern state rail bank property. Similar to the Application for Miscellaneous Work on Trunk Highway Right of Way, the Application for Utility Installation on Rail Bank is used for all utility installations or other objects on, along, or across rail bank right of way. In addition to the Rail Bank Utility permit, a lease agreement and a fee will apply.

**C. Application for Utility Accommodation Permit Requirements**

1. Highway number;
2. County;
3. Township, section, range;
4. City/township;
5. Is facility within tribal lands;
6. Type of facility being placed;
7. General Location;
8. Aerial construction;
  - a. Pole type
  - b. Blow out zone information
  - c. Voltage
  - d. Number and size of conductors
  - e. Height of conductor
  - f. Lighting
  - g. Type, watts, and poles;
9. Underground construction
  - a. Method of installation
  - b. Attached to bridge?
  - c. Voltage
  - d. Number and size of conductors
  - e. Depth
  - f. Conduit and casing information;
10. Tree trimming and/or clearing;
11. Start and completion dates;
12. A sketch 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 when available.

The applicant agrees to comply with measures to protect the environment, including:

1. Required protection measures for specimen trees and environmentally sensitive areas;
2. Required steps required to preserve the scenic quality of the highway; and
3. 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.

For further information see the [Environmental Requirements Document](#). The applicant is responsible for obtaining any other permit needed from other agencies in addition to MnDOT.

The applicant also agrees to the following conditions:

1. The applicant shall strictly conform to the terms of the permit and the Minnesota Rules Parts 8810.3100 through 8810.3600, together with the Special Provisions.
2. The applicant shall comply with relevant regulations of all other governmental agencies.
3. The applicant, or the applicant's contractor performing the work, shall carry a copy of the approved permit at all times while working on the highway right of way.
4. The applicant shall accomplish all work in a manner that will not be detrimental to the highway and that will safeguard the public. The utility owner will develop a written traffic control plan based upon the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) and the Temporary Traffic Control Zone Layout Field Manual (Part 6K of the MN MUTCD). The MnDOT Traffic Office must approve the plan.
5. The applicant shall provide complete information about any underground facility, including its purpose.
6. The applicant shall agree to collect and depict information about existing subsurface utility facilities before any excavation on highway right of way in accordance with [Minnesota Statutes Chapter 216D](#).
7. After completing the permitted work, the applicant must send one copy of the Certificate of Completion and "as built" drawings with line and grade elevations of all utility facilities placed within the right of way, referenced to roadway alignment to the MnDOT Assistant District Engineer, Maintenance.

#### D. Permit Rules

Parts 8810.3100 through 8810.3600 of the [Minnesota Administrative Rules Chapter 8810](#) detail the specific requirements that govern utility accommodation and use. Every Application for Utility Accommodation on Trunk Highway Right of Way contains a copy of these rules.

1. Rule Highlights

Each utility owner is responsible for understanding and following all rules and requirements of the permit. Several requirements from Minnesota rules that govern permits are highlighted below:

  - a. The rules require that utility construction and relocation not begin until MnDOT receives a permit application and grants a permit. The permit application includes a sketch that shows the proposed utility location. MnDOT may remove any installation that occurs without a permit and charge the utility owner removal costs.
  - b. For work being performed to accommodate a MnDOT project, the rules give utility owners within 15 days after written notice to begin requested work and require that utility owners complete the work within the specified date in the Notice and Order, which shall be reasonable under the circumstances.
  - c. Utility facilities along interstate highways shall be located outside the control-of-access lines except as outlined in the rules.
  - d. MnDOT may require the utility owner or its contractor to provide a deposit to protect the state in the event of damage to the trunk highway right of way or other costs arising from the permit.
  - e. "Except for the negligent acts of the state, its agents, and employees, the utility shall assume all liability for, and save the state, its agents and employees, harmless from, any and all claims for damages, actions, or causes of action arising out of the work to be done herein and the continuing uses by the utility, including but not limited to the placing, constructing,

reconstructing, maintaining, and using of said utility under this application and permit for construction.”

- f. The work permit or permit for construction does not in any way imply an easement on private property or state property.
- g. The rules also include standards that cover trees, brush, and vegetation removal; operation of drainage ways; topsoil and sod replacement; protection of existing utility facilities; warning devices; restoration of right of way to original condition; conformity to laws and rules; and requirements and specifications for aerial lines and underground lines.

## 2. Nonconformance

If the application for permit does not conform to accepted standards, requirements, and practices, MnDOT will refuse the permit application. MnDOT may suggest modifications, and the utility owner can then resubmit the application with a revised plan.

## E. Permit Preparation

The following submittals apply to applications for permit for utility-initiated projects on trunk highway right of way. See this manual's Utility Coordination Section for information about permit application submittals for relocation work to accommodate MnDOT projects. The utility owner submits the following to the Utility Agreements and Permits Unit:

1. One permit application form completed in its entirety
2. Two sets of sketches
3. A separate application for each trunk highway
4. A separate application for each MnDOT maintenance area involved

The utility owner must provide a sketch that shows, in detail, the proposed location of any new and/or altered facilities. The sketches must be on state right of way maps that are available at: [http://dotapp7.dot.state.mn.us/cyberdocs\\_guest/](http://dotapp7.dot.state.mn.us/cyberdocs_guest/) or <http://www.dot.state.mn.us/maps/gisweb/row/>

The sketch must contain references from the trunk highway centerline or the right of way line and display starting and ending points. If there is no right of way map available, a detailed drawing must be submitted with distances given from pertinent features such as centerline, right of way lines, curb and gutter, distances from the nearest county roads and highway mile markers, etc.

An authorized representative of the utility owner must sign, date, and submit the original permit.

## F. Permit Review

The following information applies to applications for permit for utility-initiated projects on trunk highway right of way.

Before issuing a permit MnDOT must:

1. Review the sketches and any pertinent information regarding the type of facility for compliance with this manual's section, the Utility Accommodation on Highway Right of Way Policy, and rules and laws that relate to transportation and the accommodation of utilities.



2. Verify that utility installations crossing state lines on roadways and bridges have been coordinated with appropriate highway permitting officials in the neighboring states.

When the Utility Agreements and Permits Unit receives a permit application, Permit Staff logs the application into the database and assigns a permit number to it. Then a Permit Writer begins the review of the application.

1. Permit Writer  
If a utility owner submits incomplete or inadequate information, the Permit Writer may request that the utility owner provide additional information or improved sketches. The Permit Writer revises the application and adds the new plan and/or sketches upon receiving them.
2. [Permit Special Provisions](#)  
After reviewing and/or revising the application, the Permit Writer writes the permit, which includes specific utility placement location with reference to highway stationing, centerline and right of way. The Permit Writer includes any necessary or appropriate special provisions.  
The number and type of special provisions in the permit will vary from project to project. Special provisions list requirements for different circumstances, such as pipeline installation, open trenching, or restoration.
3. Permit Supervisor Review and Permit Assembly  
The Permit Writer submits the written permit to the Permit Supervisor, who reviews, makes any corrections or changes, and then approves the permit.  
The Permit Writer reviews, assembles, and sends the application to the district permit office.
4. District Review and Approval  
The district reviews the application, makes note of any changes or special provisions that it wants to include in the permit, and sends it back to the Permit Supervisor in the Utility Agreements and Permits Unit. The Permit Supervisor reviews the district comments and discusses any issues that need to be resolved with the District Permit Staff.
5. Final Preparation  
The Permit Supervisor makes any final corrections and prepares an [approval-of-permit letter](#) and a [utility permit certificate of completion form](#). The Utilities Engineer must approve and sign all Utility Accommodation on Trunk Highway Right of Way permits.

## G. Permit Distribution

After approval, Permit Staff scan the final permit into the database at [http://dotapp7.dot.state.mn.us/cyberdocs\\_guest](http://dotapp7.dot.state.mn.us/cyberdocs_guest) and send the permit to the appropriate district permits office. If a deposit is required, Permit Staff send the issue letter requesting the deposit to the utility owner. The utility owner must then work with the District Permit Staff to provide the deposit.

The District Permit Staff distributes the permit. If the District Permit Staff has any questions or concerns to resolve, they will contact the utility owner before sending out the permit. The utility owner/contractor must give the district permits office 24-hour advance notice before starting work.

The utility owner or its contractor must carry a copy of the approved permit at all times while working on the trunk highway right of way.

## H. Changes

Once in the field, the utility owner may encounter a circumstance that necessitates a change from the terms of the approved permit. Before making any changes, the utility owner must receive approval from District Permit Staff.

The district may want to discuss those changes with the Permit Writer or Permit Supervisor. Once District Permit Staff approves the changes, the utility owner may make the adjustments. Any change to the permitted location must be approved by MnDOT. All changes must be documented in writing. If the changes cause a variation from the originally permitted work, the permit may be canceled and a new application may be required.

**NO DEVIATIONS FROM A PERMIT SHALL BE MADE WITHOUT PRIOR APPROVAL FROM DISTRICT PERMITS STAFF.**

## I. Completion of Work and Certification

Upon completion of the permitted work, the utility owner must send one copy of the [Permit Certificate of Completion](#) and "as built" plans to the MnDOT Assistant District Engineer, Maintenance.

## J. Maintenance

Once construction is complete, the utility owner must maintain the facilities at its own expense. The utility owner must follow the terms of the permit when it performs any maintenance work.

MnDOT must approve an Application for Miscellaneous Work on Trunk Highway Right of Way before the utility owner can perform service and maintenance within trunk highway right of way. Utility owners also must notify MnDOT when they perform service and maintenance operations that interfere with the normal flow of traffic.

If a utility owner discontinues use of an above ground facility, the facility shall be entirely removed from the right of way by the utility owner within 30 days after its use is discontinued, unless MnDOT grants written approval for a time extension. All removal costs shall be the responsibility of the utility owner.

If a utility owner discontinues use of an underground facility but desires to leave it in place on the right of way, the utility owner must receive written approval to do so from MnDOT, and a record shall be kept in the utility owner's permanent files so that the facility can be accurately located in the field. The utility owner shall locate discontinued underground facilities in the same manner as an active facility. MnDOT 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 by the utility owner at the time of removal from service or at any time thereafter. All necessary removal and related costs shall be the responsibility of the utility owner.

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

MnDOT 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 by the utility owner at the time of removal from service or at any time thereafter. In addition, the utility owner is responsible for obtaining approval needed and complying with requirements from any other agency, such as the Minnesota Pollution Control Agency, to leave in-service, abandoned or out-of-service facilities in place on the right of way. All necessary removal and related costs shall be the responsibility of the utility owner.

#### **K. Exceptions, FHWA Review and Enforcement**

The Utility Accommodation on Highway Right of Way Policy describes exceptions to accommodation requirements, situations requiring FHWA review, and enforcement of accommodation requirements

### **III. Freeways**

#### **A. General**

1. Federal regulations require that states address longitudinal utility installations within freeways. A [table](#) lists Minnesota's freeway locations. MnDOT updates this table as existing highways are designated for upgrade to full control of access freeway standards.
2. MnDOT exercises full control of access on all freeways in Minnesota. Minnesota Statute § 160.08, subd. 3, Minnesota Rule 8810.330, subpart 4, and Section IV.B of this section of the manual address considerations relating to access for utility facilities on all freeways.
3. MnDOT may apply freeway utility accommodation requirements to those highways identified as future freeways.

#### **B. Crossings**

1. New utility facility installations and relocations of existing utility facilities may be permitted to cross a freeway. Where a utility facility that is carried over or under a freeway, provisions should be made for the utility facility to cross the freeway in such a manner that it can be constructed and serviced without access from the freeway traffic lanes or ramps.
2. Manholes and other points of access to underground utility facilities 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 travelled way.
3. Multiple crossings of a freeway by the same utility facility should be limited to the extent possible, particularly within short distances.
4. Irrigation ditches and water canals should avoid freeway rights of way whenever possible. 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. Except for crossings permitted under Section III.B, installation of new utility facilities shall not be allowed within the right of way of any freeway, except in special cases under strictly controlled conditions. If an exception is granted, so that such an installation is allowed or allowed to remain, individual service connections shall not

- be permitted, the utility facility shall not be installed, maintained, operated, 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.
2. When utility owners believe special circumstances exist, they must present their case for longitudinal installations on freeways as early in the design process as possible. Where such installations are requested, the utility owner shall in each case demonstrate to MnDOT'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 the utility facility will not adversely affect safety and traffic operations or damage any highway facility.
  3. Installations that will have aerial encroachments that are temporary in nature, such as the blowout zone (conductor movement envelope) of wires being within MnDOT right of way, but do not permanently encroach on the MnDOT right of way may be allowed and require a MnDOT permit. Accommodations of temporary aerial encroachments of this type do not require an exception from the FHWA.

#### IV. Location Requirements

##### A. General

1. Utility facilities shall be located to minimize the need for later adjustments to accommodate future highway improvements, minimize risks to trunk highway and environmentally sensitive areas, and permit access for servicing such lines with a minimum of interference to highway traffic.
2. The location of utility installations along urban streets with closely abutting structures, such as buildings and signs, generally requires special considerations. Such considerations must be resolved in a manner consistent with the prevailing limitations and must be approved by MnDOT.
3. The location of utility facilities and appurtenances shall be in accordance with the Americans with Disabilities Act.
4. 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. (See 23 CFR § 645.207.) Clear zone policies 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. The MnDOT policy is based on criteria in 23 CFR § 645.207 and the most recent version of the [AASHTO Roadside Design Guide](#).

##### B. Access to Utility Facilities

1. MnDOT has the statutory authority to control access to all highways under its jurisdiction. Most evident on divided highways, expressways and freeways, access control enhances highway safety and is commonly accomplished by giving preference to through traffic and limiting interference from other vehicles, pedestrians, and other activities, disturbances, or objects on the highway.
  - a. Full Control of Access – The authority to control access is exercised to give preference to through traffic by providing grade-separated access connections with only selected public roads and by prohibiting at-grade crossings or direct private driveway connections. Vehicles are not permitted to stop on the highway except in emergencies. All freeways employ full access control.
  - b. Partial Control of Access – The authority to control access is exercised to give preference to through traffic, typically using techniques such as separating travel lanes, adding some grade-separated access connections with selected public roads, and limiting the number of crossings at grade and private driveway connections. This level is typical of many divided highways and some expressways.
2. Subject to Section IV.D. (longitudinal installations), access to utility facilities may be permitted on both full or partial controlled access highways in limited conditions 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. In some circumstances, a locked gate along the fence may be used to meet periodic service access needs, subject to the following:
    - i. Access to and from the highway will be on the basis of a revocable permit.
    - ii. The gates shall be locked when not in use and can only be used by authorized utility personnel.
    - iii. Use shall not adversely affect traffic operations.
    - iv. Use will not give the utility owner a claim to permanent access rights

### C. Crossings

1. Utility crossings of highways shall be perpendicular to the highway alignment, where practicable.
2. For utility crossings on highways without full or partial access control, all supporting structures and above ground appurtenances shall be located outside the clear zone and as close to the right of way as practicable.
3. For utility crossings on highways with full or partial access control, 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. Where required for support, exceptions may be allowed for intermediate supporting poles to be placed in medians of sufficient width that will provide the clear zone from the edges of both travelled ways. At interchange areas, supports for overhead utility facilities shall be permitted only when they are located beyond the clear zone of the freeway traffic lanes or ramps, sight distance is not

impaired, and access can be safely obtained. More information about freeway crossings may be found in Section III.

4. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the travelled way.
5. Buried utility crossings shall be avoided in deep cuts; near footings of bridges, retaining walls, 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.

#### **D. Longitudinal Installations**

1. New longitudinal installations on highways without full or partial access control shall be located on uniform alignment as near as practicable to the right of way line and outside the clear zone. Pole and lines shall normally be placed in the outer five feet next to the right of way line. Underground facilities should be parallel and adjacent to these facilities. Other locations may be approved where particular circumstances warrant. Utilities must exercise rights available under applicable laws to make joint use of poles, and common trenching or plowing of underground facilities to minimize overcrowding of the right of way is encouraged. The placement of all installations should allow servicing and maintenance with a minimum disturbance to traffic.
2. Longitudinal installations on highways with partial control of access are 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, other prevailing site conditions and prior existence.
3. Longitudinal installations on highways with full control of access shall not be permitted. In extreme cases, exceptions may be allowed as discussed in Section III (Freeways).

#### **E. Median Installations**

Utility facilities shall not be located in a highway median except for those serving the highway. This does not prohibit crossings as allowed under Section IV. C.

#### **F. Utility Appurtenances**

1. Appurtenances protruding more than four (4) inches above the ground line shall be located outside the clear zone and as close to the edge of the right of way as practical. If no feasible alternative exists and if permitted by MnDOT, appurtenances may be allowed within the clear zone if they meet breakaway criteria or will be shielded by a traffic barrier.
2. Manholes, vaults, and pits must be limited to those necessary to install and service the line and to the extent practicable 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.
3. 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, and in that case they should not be located in a wheel path, if possible. In cases of utility accesses and valve covers occupying highway right of way, coordination among utility owners is essential.

4. Manholes, vaults or pits shall not be located in the pavement or shoulders of heavily travelled highways. Possible exceptions may be made on highways where manholes are essential parts of existing lines and where no practical alternative exists. New manhole installations shall be avoided at highway intersections, and shall be minimized and mitigated on low volume roadways.
5. Utility buildings shall not be located on the right of way. Possible exceptions may be granted in cases where the building can be located outside the clear zone of the trunk highway on MnDOT owned right of way such as a park-n-ride lot or remnant parcel.
6. Cabinets shall not be located on the right of way. Possible 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 edge of the right of way as possible.
7. 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, such as along sidewalks and at push-button accesses.

#### **G. Scenic Considerations**

1. MnDOT makes every possible effort to enhance visual qualities along trunk highways and uses techniques such as 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. As required by 23 CFR § 645.209(h), 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 or direct federal highway funds and are located within or adjacent to areas of scenic enhancement and natural beauty. Such areas include public park and recreational lands, wildlife and waterfowl refuges, historic sites as described in 23 USC § 138, scenic strips, overlooks, rest areas and landscaped areas. MnDOT may permit exceptions provided the following conditions are met:
  - a. New underground or aerial installations may be permitted only when they do not require extensive removal or alteration of trees or terrain features visible to the highway user or impair the aesthetic quality of lands being traversed.
  - b. Aerial installations may be permitted only when:
    - i. other locations are not available or are unusually difficult and costly, or are less desirable from the standpoint of aesthetic quality;
    - ii. placement underground is not technically feasible or is unreasonably costly, and;
    - iii. the proposed installation will be made at a location, and will employ suitable designs and materials, which 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.
3. For new utility installations within freeways, other provisions of Section III Freeways must also be satisfied.
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 required.
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 MnDOT Office of Environmental Stewardship can verify impacted sites and recommend permit language, when applicable.
  6. Where underground utility facilities are to be installed near specimen trees, as identified by MnDOT, the tree root systems are to be protected. Boring is required if the trench is within the diameter listed in the table below. Boring (tunneling) under the roots must be consistent with the table that follows. 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 described protection limits. Specimen trees should be avoided when installing overhead lines as well. Topping and side pruning will not be permitted.

| Tree Diameter<br>4 ½ ft. Above Ground | Distance from<br>Face of Tree Trunk |
|---------------------------------------|-------------------------------------|
| 0" – 2"                               | 1'                                  |
| 3" – 4"                               | 2'                                  |
| 5" – 9"                               | 5'                                  |
| 10" – 14"                             | 10'                                 |
| 15" – 19"                             | 12'                                 |
| >19"                                  | 15'                                 |

**V. Structure Requirements**

**A. Utility Facilities on or Near Highway Bridge Structures**

1. MnDOT may allow parallel utility installations on highway bridge structures to water, steam, sewer, communications, electrical power lines of 35kV or less, and natural gas distribution pipelines. All are to be installed in accordance with the latest applicable codes. The MnDOT Bridge Office shall approve such installations before construction of the facility begins.
2. The utility owner is responsible for the design of its facility and MnDOT must approve the design. Factors influencing the design of an installation are the effects on the safety of the travelling public, 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 facility’s design life.
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 same time as State bridge construction to minimize the expense of a future expansion program.
5. Generally, utility facility installations on bridge structures shall be above the low superstructure elevation and inside of the fascia elements. The structural integrity of



the bridge structure must not be compromised by the installation methods for the utility facility. 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. To avoid being struck by a vehicle carrying a high load, 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. Communication and electric power line installations on highway bridge structures shall be suitably insulated, grounded, and carried in a protective conduit or duct run that shall generally terminate in the shoulder beyond the bridge approach panels.
- 8. 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:

| <i>Operating Pressure<br/>(psi)</i> | <i>Maximum Diameter Pipe<br/>(inches)</i> |
|-------------------------------------|---|
| 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).
9. Electric power line installations greater than 35 kV on highway 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 impracticable. The increased cost of alternative construction methods will not be considered a reason for the installation of high-voltage transmission lines on bridge structures. The utility owner must also address the following safety and operational issues to MnDOT'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 prevent 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 MnDOT, and to allow area that is serviced by the transmission line to have adequate and available alternate sources of power.
10. Installations of all utility facilities within 50 feet laterally, 50 feet below, and 15 feet above the base of spread footings that support bridge structures are subject to the requirements found in Section 2.4.1.6.2 Buried Utilities of the [MnDOT LRFD Bridge Design Manual](#).
  11. 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).
  12. 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.

#### **B. Utility Facilities near Wall Structures**

1. Installations of all utility facilities within 50 feet laterally, 50 feet below, and 15 feet above the base of spread footings that support wall structures are subject to the requirements in Section 2.4.1.6.2 Buried Utilities of the [MnDOT LRFD Bridge Design Manual](#). Other restrictions may apply in locations behind mechanically stabilized earth (MSE) and other similar wall support structures.
2. The horizontal and vertical location of overhead power and communication lines relative to wall structures shall provide adequate clearance for construction and maintenance activities.

#### **C. Vehicular Tunnels**

1. Utility facilities 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 be required. Utilities that have not previously occupied an existing vehicular tunnel that is incorporated into a freeway will not be permitted accommodation except in extreme cases.

#### **D. Utility Tunnels and Bridges**

1. A utility tunnel or a bridge may be allowed for a carrier or casing crossing a major highway at a strategic location. Such a tunnel or bridge may serve a joint purpose as a utility and pedestrian facility and/or sign support structure. In situations where several utility crossings may be needed, now or in the future, 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, steps should be taken 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. Comply with applicable permitting procedures; and
  - d. Comply with applicable MnDOT 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 power, by compartmentalizing or by using auxiliary encasement of incompatible carriers.
  3. The utility tunnel or utility bridge structure shall conform in appearance to MnDOT's standard culvert and bridge practices and shall be referenced by a bridge number that the MnDOT Bridge Office assigns.
  4. Before installing a utility tunnel or bridge, utility owners shall agree that any maintenance, servicing, or repair of the utility lines will be their responsibility. MnDOT will participate in these costs only to the extent that the utility owner would otherwise normally receive reimbursement for such work or to the extent that the structure is used for highway purposes.

#### **E. Lighting and Other Above-Ground Structures**

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:

1. Right of way width limits are less than the clear zone requirements and it is not cost effective to acquire additional right of way.
2. 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*. Subsequent attachment of additional utility equipment to breakaway poles will not be permitted.
3. No ground structure or base protrudes more than four (4) inches above the surface of the natural ground and can be maintained at that level.
4. The installation is at least 10 feet from the roadway or two (2) feet behind the face of the curb in an area where the posted speed limit is 40 miles per hour or less.
5. The facility is shielded by an already existing guardrail or is located in an area that is inaccessible to vehicular traffic.

### **VI. Design Requirements**

#### **A. General**

1. 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 traversed area where such service is to be provided from utility facilities on or near the highway right of way.
2. 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.
3. Utility and highway facilities should be separated to avoid damage during installation and to provide for reasonable success in locating facilities with electromagnetic utility locating devices. Separation of the facilities from highway facilities or other utility facilities 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.

4. 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.
5. Public utilities, and in particular broadband service providers, are encouraged to coordinate the placement of facilities through efforts such as joint trenching of buried facilities and advance placement of ducts available for future placement of utility lines.

## B. Responsibilities

1. MnDOT Responsibilities - MnDOT is responsible for the review and approval of proposals from utility owners in accordance with the provisions in this document and the Utility Accommodation on Highway Right of Way Policy.
2. Utility Owner Responsibilities:
  - a. Utility owners are 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 necessary measures that preserve and protect the maintenance, operation, safety, and aesthetic characteristics of the highway. Location, depth, clearances, and separation between utility facilities and the work must meet the requirements in this Utility Accommodation Section.
  - b. Utility owners are required to collect and depict information in accordance with Minnesota Statutes, Ch. 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* as described in more detail in Section VI. C. below.
  - c. When co-locating on a utility facility owned by others, the utility owner is required to obtain all necessary approvals and upon request from MnDOT, submit a written statement verifying such approval.
  - d. For wireless communication facilities, the utility owner, upon request, must supply written proof of compliance with all requirements of the local unit of government in which the facility will be installed.

## C. Collection and Depiction of Subsurface Utility Information

Applicants for MnDOT permits shall agree to collect and depict information about existing subsurface utility facilities before any excavation on highway right of way in accordance with Minnesota Statutes, Chapter 216D. Chapter 216D indicates that "the information obtained from affected (utility) operators must be submitted on the final drawing used for the bid or contract and must depict the utility quality level of that information." Utility quality levels are defined within the statute as follows:

1. **Utility quality level** - "Utility quality level" means a professional opinion about the quality and reliability of utility information. There are four levels of utility quality information, ranging from the most 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 Construction Institute of the American Society of Civil Engineers in document CI/ASCE 38-02 entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data." The following are the definitions of quality levels from CI/ASCE 38-02:
  - a. **Utility Quality Level D** – Information derived from existing records or oral recollections.

- b. **Utility Quality Level C** – Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to quality level D information.
- c. **Utility Quality Level B** – Information obtained through application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utility facilities. Quality level B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.
- d. **Utility Quality Level A** – Precise horizontal and vertical location of utility facilities obtained by the actual exposure (or verification of previously exposed and surveyed utility facilities) and subsequent measurement of subsurface utility facilities, usually at a specific point. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location, as well as other utility attributes, is shown on plan documents. Accuracy is typically set to 15-mm (0.05 feet) vertical and to applicable horizontal survey and mapping accuracy as defined or expected by the project owner.

## VII. Construction and Maintenance Requirements

### A. General

MnDOT permits include construction requirements and these requirements will not be repeated verbatim in this section. Utility owners who receive permits are responsible for understanding and complying with all construction requirements in the approved permit. The utility owner's on-site work force, consultant, contractor, or subcontractor must be in possession of an approved permit at all times when utility work is being performed within the highway right of way.

### B. Traffic Control

1. Traffic controls for utility construction shall conform to the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) and the Temporary Traffic Control Zone Layouts Field Manual (Part 6K of the MN MUTCD). 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. The utility owner must maintain these traffic control devices until completion of all utility work.
3. For those operations that entirely close or encroach upon a traffic lane, shoulder, or ramp, the utility owner must submit or reference a proper traffic control plan as part of its permit application. On heavily travelled highways, utility construction operations that interfere with traffic will not be allowed during periods of peak traffic flow.
4. All utility work should use the appropriate typical diagrams in the [Temporary Traffic Control Zone Layouts Field Manual](#). If desired, a utility owner may develop its own traffic control plan contingent upon MnDOT approval. MnDOT 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 Temporary Traffic Control Zone Layouts Field Manual do not adequately cover utility work.

### **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 completion of all work. The utility owner shall control all vehicles, equipment, and materials that are in active use at the work site to assure consistently safe conditions.
2. 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.
3. All vehicles used to conduct the work operation shall be equipped with conspicuously visible roof-mounted high-intensity revolving or strobe lights. Vehicles and equipment shall have their high intensity flashing lights (strobe or revolving) and hazard warning lights operating just before and during work operations when they are within the right of way.
4. All workers (utility, MnDOT, contractor, etc.) must wear high visibility apparel (vest, shirt, or jacket) at all times. Flag persons and workers must wear high-visibility pants at all times during low light or night conditions. When workers are in an area that does not require the use of a hard hat for head protection, they should wear a high-visibility for increased visibility. All high-visibility apparel shall comply with the requirements in the Minnesota Manual on Uniform Traffic Control Devices.

### **D. Trenchless and Trenched Construction**

1. Trenchless Construction and Renewal
  - a. Every possible effort should be made to avoid disturbing the pavement surface when installing new utility facilities. Trenchless methods, in accordance with MnDOT requirements, should always be considered as a means of doing so. Crossings of major highways, expressways, or freeways shall be made using trenchless methods.
  - b. The two main divisions of trenchless methods are trenchless construction and trenchless renewal. Trenchless construction methods may include, among others, directional boring, jacking, boring, pneuma gopher, augering, and microtunneling. Trenchless renewal methods may include, among others, cured-in-place pipe and sliplining.
  - c. Work shall be performed in a manner that shall minimize the movement of the ground in front of, above, and surrounding the excavation operation and that shall minimize subsidence of the surface above and in the vicinity of the excavation.
  - d. Except for directional boring, overcut, which is the annular space between the excavated hole and the outside diameter of the casing or pipe, should be limited to one inch. For directional boring, the overcut diameter shall be kept to a minimum to properly install the pipe.
  - e. All voids caused by jacking or boring (not directional boring) shall be filled by pressure grouting. MnDOT must approve the type of grout. For all pipes and casings six (6) inches in diameter and larger, a simultaneous grouting and jacking or boring procedure will be used. For directional boring, the drilling fluid in the annular space outside of the pipe shall not be removed after installation, and shall remain in place to provide support for the pipe and neighboring soil. If trenchless operations of any method must be abandoned

for any reason, such as an obstruction in the subsurface, all voids must be immediately grouted.

f. Boring Specifications

- i. Casing pipe shall 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.
- ii. 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         |
| 66"                        | 0.625         |
| 72"                        | 0.750         |

- iii. 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.

g. For directional boring:

- i. The machine must be anchored to the ground during drilling and pullback operations and have a system to detect and issue an alarm if the drill string approaches electric lines and to provide protection against electrocution.
- ii. Excess drilling fluids must be contained and disposed of in accordance with state and federal requirements with no environmental risks.

- h. Portal limits (e.g., surface openings, bore pit limits) for utility installations shall be established beyond the clear zone of the highway and 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. In certain circumstances, such as on low-traffic roadways and frontage roads, as determined by MnDOT, portal limits that are at least 10 feet from the edge of pavement and at least five feet from the face of curb may be allowed. Where circumstances necessitate the excavation of a bore pit closer to the edge of pavement or curb than established above, concrete barrier or other approved devices must be installed for protection of the workers and the traveling public. 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.
- i. Bore pits must be located and constructed to not interfere with highway structural footings. Shoring must be used if necessary.

## 2. Trenched Construction

- a. During construction, open trenches or other excavations within the clear zone shall not be permitted to remain beyond the workday and must be backfilled, covered, or shielded from vehicular and pedestrian traffic.
- b. The following minimum specifications for trenching and backfilling shall be applied:
  - i. MnDOT 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 MnDOT.
  - ii. 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 two (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.
  - iii. Bedding should be provided to a depth of six (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.
  - iv. 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 while still meeting requirements.

## E. Encasement

1. MnDOT will make the final determination of the need for casing of pressurized carrier pipes and carriers of materials that are flammable, corrosive, expansive, energized, or unstable.
2. 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.



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 crossing unstable or subsiding ground, or near other locations where hazardous conditions may exist.
5. Rigid encasement or suitable bridging should be used where the depression of flexible carrier pipe would impair pavement support. Casings shall be designed to support the load of the highway and superimposed loads thereon including that of construction equipment and, as a minimum, should equal the structural requirements for highway drainage facilities. Casings shall 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 shall include necessary appurtenances, such as vents and markers.
7. Where used, encasement must be provided under center medians, from top of backslope to top of backslope for cut sections, five (5) feet beyond toe of slope and under fill sections, five (5) feet beyond face of curb in urban sections and all side streets, and five (5) 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.
8. Where appropriate, the encasement should provide for future widening of the highway without need for any utility adjustment.
9. See Section VIII.D. Gas and Petroleum Pipelines for additional information pertaining to encasement of those facilities.

#### **F. Mechanical Protection for Uncased Crossings**

For some conditions, utility crossings of the highway may be installed without encasement. The following controls provide mechanical protection to uncased pipeline crossings of the highway.

1. On uncased construction the carrier shall conform to the material and design requirements of utility industry and governmental codes and standards. The carrier pipe shall 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.
2. Suitable bridging, concrete slabs, or other appropriate measures should be used to protect existing uncased utility facilities, which by reason of shallow cover or location make them vulnerable to damage from highway construction or maintenance operations.

#### **G. Pavement Cuts**

1. Open cutting of the pavement to install utility facilities is highly discouraged because it adversely affects the roadway's structural integrity. 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, MnDOT 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 cut and patch the pavement in accordance with MnDOT specifications and special provisions. The limits of the pavement cut and

resulting patch must extend at least one (1) foot outside the limits of the trench and extend to all existing cracks or joints located five (5) feet or less from the edge of the trench. This additional pavement removal minimizes later sag development in the surface of pavement over the trench. The pavement must be cut with a saw and to such depth that will assure a clean break. The restored surface must be flush with and sloped at the same rate as the existing surface. 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.

#### **H. Markers/Facility Protection**

1. A trace wire, metallic tape, or other product provided for detection purposes shall be installed concurrently with all non-metallic underground utility 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.
3. The utility owner shall place permanent, readily identifiable, and suitable markers identifying the location of underground utility facilities, whether they are crossing the right of way or installed longitudinally along the right of way, where appropriate. Markers shall be installed immediately above installed lines in such a manner 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. Markers shall be placed at maximum intervals of  $\frac{1}{4}$  mile and on each side of all public roads, streets, and trails that the utility facility crosses. The markers shall identify the owner/operator name and the type of facility. The telephone number for Gopher State One Call to request marking the line location before excavation and for emergency response shall also appear on the marker.
4. Utility owners must comply with the uniform color code system as required by Minnesota Statute § 216D.04, subd. 3(d) and Gopher State One Call when marking the location of subsurface facilities.

### **VIII. Specific Requirements**

#### **A. Overhead Power, Communication Lines, and Overhead Wireless Facilities**

1. Location
  - a. In rural areas, new overhead facilities 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 shall not be located within the clear zone.
  - b. 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 (4) inches above the ground line should be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.
  - c. In urban areas, new overhead utility facilities 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 (2) foot clearance behind the face of the curb.

- d. 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.
- e. Longitudinal installation of overhead utility facilities on highway right of way shall be limited to single pole construction. Transverse installation of overhead utility facilities shall also be limited to single pole construction where practicable, but may also be approved to use the same type of supports that are used on the portion of the pole 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. The horizontal and vertical location of overhead power and communication utility facilities relative to a highway bridge or other structure shall provide adequate clearance for construction and maintenance activities.
- h. Locating poles in potential target locations, such as beyond lane drops, sections where the pavement narrows, and tee intersections, should be avoided.
- i. Installation of utility facilities will not be allowed:
  - i. On any MnDOT owned lighting or signal system pole or structure.
  - ii. On any break-away light pole
  - iii. In any area where the installation or operation of the facility will interfere with any existing or planned state or federal communication systems.

## 2. Design

- a. All overhead lines regardless of voltage or metallic content shall meet the requirements of the *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.
- 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 and particularly if the alternative is locating the utility facility at other than the right of way line. However, they must be conducive to safe traffic operations.
- c. Where there are existing poles for overhead utility facilities, new overhead utility facilities will be required to co-locate on those poles unless the new facilities cannot be reasonably accommodated. Written documentation of those reasons must be supplied to MnDOT upon request.
- d. The distance between utility poles should be the longest feasible span lengths consistent with geometric and design line loading considerations.

## 3. 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 or federal law, regulation, code, or policy as summarized in [Basic Clearance for the Installation of Electric Supply and Communications Lines](#). This document may be found in Table I.

- c. In all cases, facilities crossing over highways shall at no time be less than 22 feet above the high point of the travelled way.
4. Aerial Encroachments/Blowout
    - a. In addition to utility facilities that have fixed aerial encroachments within MnDOT right of way, utility facilities that will have aerial encroachments that are temporary in nature, such as the blowout zone (conductor movement envelope) of wires being within MnDOT right of way, also require a MnDOT permit.
    - b. Electric transmission facilities must be installed in locations so that induced current does not impair the safety of the traveling public or workers within MnDOT right of way or impair the public investment, short or long term, in the transportation infrastructure. In assessing these conditions, MnDOT reviews the highway facilities, including current and future roadway and right of way use, features and appurtenances, and related highway activities. The assessment includes evaluating zones where vehicles may travel and the size of necessary equipment to repair, reconstruct, or construct such facilities, at each unique segment of highway. From that zone of highway-related activities, the required clearance is added for the particular voltage of the facility to create a buffer zone. Required clearances to create the buffer zone are at a minimum taken from the Occupational Safety and Health Administration or the *National Electrical Safety Code* as applicable. Locations of poles shall be such that the blowout of wires does not infringe into the buffer zone.

## **B. Underground Utility Facilities**

1. This subsection covers information pertaining to all underground utility facilities. The subsections for each utility type offer additional information pertaining to specific types of underground utility facilities.
2. Facilities installed beneath the roadway must be of sufficient inherent strength to withstand the forces imposed by highway and vehicular traffic including that of construction equipment.
3. Minimum Depths
  - a. The depth of cover shall be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.
  - b. The depth of bury for underground facilities within the right of way and not under pavement, except power, shall be a minimum of three (3) feet as measured from the finished ground surface to the top of the facility at the time of installation. Low-voltage power for street lighting running longitudinally shall have a minimum depth of two (2) feet. All other power facilities shall have a minimum depth of bury of three-and-one-half (3 1/2) feet.
  - c. The depth of bury for all underground facilities under pavement shall be a minimum of five (5) feet under the pavement surface as measured from the top of the pavement surface to the top of the facility at the time of installation.
  - d. Minimum depths of bury are summarized in Table II at the end of this section.
  - e. Where minimum bury is not feasible, the facility shall be rerouted or protected with a concrete slab or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.
  - f. All utility facilities shall obtain prior approval from MnDOT before burying any utility facility less than the minimum depth required.

- g. Exceptions may be authorized for existing utility facilities to remain in place with a reduction of six (6) inches in the depths of cover specified. Further reductions may be permitted if the utility facility is protected by a reinforced concrete slab that meets the requirements as follows:
  - i. Width: Three times the pipe diameter but not less than four (4) feet;
  - ii. Thickness: Minimum of six (6) inches;
  - iii. Reinforcing: Minimum of #13 bars on 12 inch centers or equivalent; and
  - iv. Cover: Minimum of six inches between the slab and top of pipe.

#### 4. Longitudinal Installations

Underground utility facilities may be placed longitudinally by 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 on the terrain involved and obstructions such as trees and other existing underground or aerial utility lines. Underground lines shall not be placed longitudinally beneath the median, beneath through traffic roadways including shoulders, or beneath ditch bottoms.

#### 5. Crossings

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

### C. Underground Power and Communication Lines

1. Electric power and communication facilities shall conform to the currently applicable *National Electrical Safety Code*. When 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.
2. 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. See Section VII.E. for additional information pertaining to encasement.

### D. Gas and Pipelines carrying Petroleum and other Hazardous Materials

1. 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. 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.
- e. 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.
- f. 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 MnDOT advance notice and obtain approval for such changes. The notice shall specify the applicable codes to be used.

## 2. Longitudinal Installations

Only distribution lines providing natural gas service are permitted longitudinally within trunk highway right of way.

## 3. Crossings and Encasement

- 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. All pipelines generally operated at a pressure of greater than 60 psi and less than six (6) inches in diameter and all pipelines generally operated at a pressure of 60 psi or less crossing under the roadway of trunk highways may be cased or non-cased. However, only welded steel lines with adequate corrosion protection or directionally-bored high-density polyethylene (HDPE) pipe may be used for non-cased highway crossings.
- c. All pipelines generally operated at a pressure of greater than 60 psi and six (6) 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:
  - i. Open trenching method: Pipelines placed by an open trench method must adhere to the following requirements:
    - (1). It is a welded steel, cathodically protected pipeline coated in accordance with accepted industry standards.
    - (2). It complies with federal and state requirements and meets accepted industry standards regarding wall thickness and operating stress levels.
  - ii. Trenchless Construction: 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:

- (1). It is a welded steel, cathodically protected pipeline coated in accordance with accepted industry standards or a directionally-bored HDPE pipe.
- (2). It complies with federal and state requirements and meets accepted industry standards regarding wall thickness and operating stress levels.
- (3). The bores are continuous from the beginning of the installation until the leading edge of the pipeline is through the entire crossing.
- (4). The completed pipeline crossings are all pressure tested.
- (5). Mains that are abandoned or out of service in the highway right of way will be removed or with MnDOT's approval filled with approved materials.

d. See Section VII.E. for additional information about encasement of pipelines.

#### 4. 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 to not interfere with maintenance or highway use. 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.

5. 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 MnDOT. Such outfall shall not be used as a wasteway for purging the carrier unless specifically authorized.
6. Shut-off Valves - Shut-off valves, preferably automatic, shall be installed in lines at or near ends of structures.

### E. Water Mains

#### 1. Codes

- a. Water lines shall conform to the currently applicable standards and specifications of the American Water Works Association or approved standards and specifications of the local governing unit.

#### 2. Crossings and Encasement

- a. All water lines shall be cased when crossing under the roadway of trunk highways, except service lines of less than two (2) inches in diameter. Encasement may also be omitted under entrances, depending on the type and amount of traffic and the depth, condition, and maintenance responsibility.
- b. See Section VII.E. for additional encasement information.

3. Drains - Drains shall be provided for casings and tunnels enclosing water mains. Drains should empty outside the roadside area to a natural feature, a roadway ditch,

or at other locations approved by MnDOT. Such outfall shall not be used as a wasteway for purging the carrier unless specifically authorized.

4. Shut-off Valves - Shut-off valves shall be installed in lines at or near ends of structures.

#### **F. Sanitary and Storm Sewers**

1. Codes
  - a. Sanitary sewer shall be in accordance with industry standards.
  - b. Storm sewers shall be in accordance with MnDOT standards.
2. 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 two (2) inches and larger in diameter crossing the highway shall be cased under the roadway.
  - c. Lines that do not conform to the material, or strength, contained herein must be cased under the roadway.
  - d. Encasement under entrances may be omitted, depending on the type and amount of traffic and the depth, condition, and maintenance responsibility.
  - e. See Section VII.E. for additional encasement information.
3. 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 MnDOT.

#### **G. 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 MnDOT 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 MnDOT.
3. MnDOT will coordinate with watershed districts and other drainage authorities regarding construction and maintenance of drainage projects governed by the Minnesota Water Law, Minnesota Statutes Chapters 103A through 103G.



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, Communication Cables | Open Supply Wire Lines and Service Drops |                    |                      |             |              |              |              |              |
|--|--|--|--------------------|----------------------|-------------|--------------|--------------|--------------|--------------|
|  |  | Voltages are between conductors          |                    |                      |             |              |              |              |              |
|  |  | 0 to 750 Volts                           | 750 to 15000 Volts | 15000 to 50000 Volts | 69000 Volts | 115000 Volts | 169000 Volts | 230000 Volts | 345000 Volts |
| <b>Where wires cross over</b>  |  |  |                    |                      |             |              |              |              |              |
| Track rails of railroads handling freight cars, men permitted on top   | 27 ft.                                 | 27 ft.                                   | 28 ft.             | 30 ft.               |             |              |              |              |              |
| Public streets, alleys, or roads   | 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.               |             |              |              |              |              |
| <b>Where wires run along and within the limits of public highways or other public right-of-way for traffic</b> |  |  |                    |                      |             |              |              |              |              |
| 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.

Table II

**UTILITY FACILITIES ON MINNESOTA HIGHWAY RIGHT OF WAY  
MINIMUM DEPTHS**

**Crossings**

|   | <b>Under Pavement Surface</b> | <b>Under Original Ditch Grade</b> |
|---|-------------------------------|-----------------------------------|
| All Underground, except Power (Cased and Uncased) | 5'                            | 3'                                |
| Power (Cased and Uncased)                         | 5'                            | 3.5'                              |

**Longitudinal Installations**

|   | <b>Under Pavement Surface or Within 5' of Roadway</b> | <b>5' or More Away from Roadway</b> |
|---|---|-------------------------------------|
| Power Lines (Cased and Uncased)                                 | 5'  | 3.5'                                |
| Low-Voltage Power Lines for street lighting (Cased and Uncased) | 5'  | 2'                                  |
| Communications Lines (Cased and Uncased)                        | 5'  | 3'                                  |
| All Pipelines (Except Gas) (Cased and Uncased)                  | 5'  | 3'                                  |
| Gas Pipelines (Cased and Uncased)                               | 5'  | 3'                                  |
| Sanitary and Storm Sewers (Cased and Uncased)                   | 5'  | 3'                                  |