Volume 1

massDOT
Massachusetts Department of Transportation

Highway Division

Utility Accommodation Policy on State Highway Right of Way

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Chapter 1

1 - OVERVIEW

A. Policy

1. The accommodation of utility facilities within or upon the Massachusetts Department of Transportation (MassDOT) right of way is permitted by Massachusetts General Laws (MGL) and Code of Massachusetts Regulations. It is in the public interest for utility facilities to be accommodated within or upon the right of way of state highways, and within or upon the rights of way of local roads and streets receiving federal-aid, when use and occupancy of the right of way does not interfere with the free flow of traffic, impede pedestrian or bicycle access, or otherwise does not impair the highway or its visual quality, and does not conflict with any provision of federal, State, or local law, rule, regulation or the guidelines and procedures adopted under this *Utility Accommodation Policy*.

2. In accordance with MGL Ch. 81, Sec. 21, a highway access permit is required in order to place utilities within or upon the MassDOT right of way. Examples of utilities are above and underground electric power transmission, telephone or telegraph lines, cellular communication towers, fiber optic lines, pole lines, community antenna television lines, railways, ditches, sewers, water, heat or gas mains, gas, steam, chemical, petroleum, and other pipe lines and service connections, flumes or other structures which, under the laws of the Commonwealth of Massachusetts or ordinance by any city or town may be constructed, placed, or maintained across or along a major highway, or its right of way.

Highway access permits issued by MassDOT contain a copy of the current rules, along with the procedures that supplement these rules, general and site specific terms and conditions, and internal guidance for MassDOT employees when reviewing permit applications. The *Application for Permit to Access State Highway* and related documentation is available at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx.

B. Introduction

1. It is in the public interest for utility facilities to be accommodated on the right of way of any highway when such use and occupancy does not interfere with the flow of traffic and the safe operation of vehicles, does not otherwise impair the highway or its visual quality, does not impede pedestrian or bicycle access, and does not conflict with the provisions of federal, State or local laws or regulations.

2. MassDOT operates the State highway system to provide a safe and convenient means for the vehicular transportation of people and goods. Cooperation between MassDOT and utility owners is essential if the public is to be served in the most efficient and economical manner consistent with their respective public service needs, obligations, and interests. Although MassDOT strives to accommodate utility facilities where possible, the permitted use and occupancy of the highway right of way for non-highway purposes is subordinate to the primary interests and safety of the traveling public.

C. Purpose of Utility Accommodation Policy

1. The purpose of this *Utility Accommodation Policy* is to prescribe policies and procedures to regulate and accommodate utility facilities along, across, over, under or on the right of way of all major highways and other transportation facilities and properties owned or under the jurisdiction of MassDOT.

2. This *Policy* applies to all public and private utilities. It also applies to all existing utility facilities retained, relocated, replaced, or altered, and to new utility facilities installed on State rights of way, including those needed for highway purposes (such as for highway lighting or to serve a weigh station, rest area or recreation area).

3. This *Policy* was and continues to be developed with integrated sections. Thus, two or more sections need to be read together to understand a utility accommodation issue. Failure to read one section without reading other related sections may lead to misinterpretation of the Policy.

4. This *Policy* became effective upon approval of the Federal Highway Administration (FHWA) on **May 21, 2013.**

D. Source Documents

1. Massachusetts Statutes and Rules permit accommodation of utility facilities on Massachusetts highways. Highways include all roads established under the provisions of Article XXXIX of the Constitution of the Commonwealth of Massachusetts. This includes all highways that are constructed, improved and maintained as public highways under the jurisdiction of MassDOT.

2. The policies and procedures contained in this *Utility Accommodation Policy* were developed in accordance with the latest editions of the following:

    a. Massachusetts Statutes;

    b. Massachusetts General Laws, including c. 6C, sections 3(21), 44 and 45, and c. 81, sec. 21;

    c. Code of Massachusetts Regulations, including 720 CMR 13.03 and 13.05;

    d. United States Code, including 23 U.S.C. sec. 109(l) and sec. 123;

    e. Code of Federal Regulations, title 23, part 645, subpart B;

    f. Code of Federal Regulations, title 23, part 710, subpart D;

    g. American Association of State Highway and Transportation Officials (AASHTO) publications*, A Guide for Accommodating Utilities Within Highway Right of Way* and *A Policy on the Accommodation of Utilities Within Freeway Right of Way.*

3. In addition to the above, utility accommodation shall be in accordance with the following:

a. MassHighway *Manual on Uniform Traffic Control Devices;*

b. AASHTO publications, *Roadside Design Guide ,A Policy on Geometric Design of Highways and Streets and A Policy on Design Standards Interstate System;*

c. MassHighway *Project Development & Design Guide;*

d. MassHighway *Construction and Traffic Standards;*

e. MassHighway *Standard Specifications for Roadways and Bridges;*

f. MassDOT relocation policies and procedures. The latest versions of these policies, procedures and related forms can be found on MassDOT's web page at the following address: http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx;

g. Applicable municipal trench permits, Dig Safe requirements, and other state or local approvals.

h. Applicable provisions of Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

i. Applicable provisions of the Americans with Disabilities Act of 1990, 42 USC §§ 12131, et seq, as amended, and its implementing regulation at 28 CFR part 35, as amended.

E. Application of Policy

1. The policies and procedures contained herein apply to all public and private utilities and service connections (and private lines that are allowed to cross highways), including, but not limited to, communications, cable television, power, electricity, alternative energy, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity that is to be accommodated within the right of way of highways under the jurisdiction of the Administrator of the Massachusetts Department of Transportation - Highway Division.

2. The policies and procedures contained herein apply to underground, surface or overhead facilities, either singularly or in conjunction, including bridge attachments.

F. Scope of Policy*

1. These policies and procedures regulate the location, design, and methods for installing, adjusting, accommodating, relocating, and maintaining utility facilities on highway rights of way and within local road and street rights of way.

2. These policies and procedures are limited to sound engineering principles that preserve and protect the integrity and visual qualities of the highway and the safety of the motoring public.

3. Should new Massachusetts statutes, regulations or industry codes prescribe a higher degree of protection than is provided in these policies and procedures, the higher degree of protection shall prevail.

G. Utility Accommodation

1. MassDOT shall permit utility facilities to occupy State highway right of way so long as the following conditions are met:

    a. Such use and occupancy does not adversely affect the primary function of the highways or materially impair their safety, operation, or visual quality;

    b. Such use and occupancy does not conflict with the provisions of federal, State or local statutes, rules, or regulations or the accommodation provisions stated in this *Utility Accommodation Policy*;

    c. The occupancies do not significantly increase the difficulty or future cost of highway construction or maintenance;

    d. The roadway has not been resurfaced within five years, or the accommodation method is a non-destructive installation such as directional boring/tunneling, or the placement of overhead or pole mounted facilities.

    e. The utility owner or authorized representative can secure an Access Permit.

2. A utility owner shall abide by the current version of this Policy each time a new permit is authorized for its work. When future changes are made to this Policy, an existing utility facility is not required to meet the new version unless proposed changes to that facility require a new permit from MassDOT.

3. Nothing in this Policy shall be considered limiting to the rights of MassDOT to impose restrictions or requirements in addition to and/or deviations from those stated herein in any permit where MassDOT deems it advisable to do so. An appropriate explanation for such action should be provided to the utility owner by MassDOT.

4. The permitted facilities shall, if necessary, be altered by the utility owner to facilitate alteration, improvement, safety, or maintenance of the highways as may be ordered after permit approval. All costs of constructing, maintaining, altering, periodically inspecting, and relocating the permitted facilities shall be the obligation of the applicant. If the relocation of the utility facilities is for a MassDOT Highway initiated project, MassDOT shall reimburse the utility owner at least 50% of the costs for the relocation, in accordance with M.G.L. c. 6C, sec. 44 and MassDOT policies and procedures, and as specified in a state-executed utility agreement.

H. Exceptions to Policy

1. Exceptions to this Utility *Accommodation Policy* may be allowed if it is demonstrated that extreme hardships or unusual conditions provide justification, and where alternative measures can be prescribed to fulfill the intent of these policies and procedures. The utility owner shall submit a written Utility Accommodation Policy exception request to the MassDOT Highway Chief Engineer that documents and justifies the hardship or unusual condition.

2. Any such exception must be:

    a. Requested by an authorized person representing the utility owner;

    b. Recommended for approval by MassDOT District Highway Director (or Authorized Representative);

    c. Submitted to the FHWA for prior concurrence if the exception applies to a utility facility located on the National Highway System;

d. Approved by MassDOT - Highway Administrator.

3. All requests for exceptions shall be in the form of a complete submittal that must include an evaluation of the direct and indirect design, environmental, and economic effects that would result if an exception is made, plus any other pertinent information deemed necessary by MassDOT.

I. Enforcement of Policy

1. Policies and procedures in the *Utility Accommodation Policy* shall be enforced as provided for in existing Massachusetts statutes and Massachusetts regulations. Such enforcement might include, but is not limited, to the following:

    a. Misdemeanor citations and responsibility for restoration costs when utilities begin work without a permit;

    b. Increased bonding levels to recoup potential restoration costs;

    c. Denial of future permits until past non-compliance is resolved;

    d. Litigation;

    e. Penalties;

    f. Fines.

2. No utility owner shall rely upon any oral representations that are made by MassDOT personnel in the Permits Division or in the respective MassDOT District offices that possess delegated authority to issue said permits. All written representations made by said MassDOT personnel shall be documented and made a part of the permanent file for the project.

J. Prior Policies and Procedures

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

Chapter 2

2 - DEFINITIONS

AASHTO– American Association of State Highway and Transportation Officials.

Abandoned Facility – A facility that is no longer in service and is physically disconnected from a portion of the operating facility that is in use or still carries service.

Archaeological Resources - below-ground artifacts and features associated with significant pre- and post-contact Native American sites and other historic resources (defined below).

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

Average Daily Traffic (ADT) – The average 24-hour volume, being the total volume during a stated period divided by the number of days in that period. Unless otherwise stated, the period is one (1) year.

Backfill – Composition and shaping of soil or other suitable material to support a pipe, conduit, casing, or utility tunnel. Also, Backfill can be used to cover over an underground utility.

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

Bridge – A structure including supports erected over a depression or an obstruction such as water, highway, or railway; having a track or passageway for carrying traffic or other moving loads; and having an opening measured horizontally along the center of the roadway of twenty (20) feet or more between undercopings of abutments, between spring line of arches, or between extreme ends of openings for multiple boxes. This term also includes multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening. A length less than twenty (20) feet is considered a culvert.

Buffer Strip – That portion of the roadside, usually vegetated, between the curb or curb line and the sidewalk, or extending about four (4) feet or more from the curb where there is no sidewalk.

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

Carrier – A pipe directly enclosing a transmitted fluid (liquid, gas, or slurry). Carrier shall also include any electric or communication cable, wire, or line.

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

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

Coating – Material applied to or wrapped around a pipe.

Co-location – Locating two or more telecommunications service provider facilities or related equipment on/in the same telecommunications facility.

Co-locator – An individual, corporation, government agency, or entity such as a telecommunications service provider leasing or licensing space on a tower or support structure or within a wireline telecommunications conduit owned by tenant. The co-locator is subject to rent and other provisions set forth by the sublease agreement or the license agreement. Co-locator is synonymous with subtenant and licensee.

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

Control of Access – The condition in which the right of owners or occupants of abutting land or other persons to access, light, air, or view, in connection with a highway, is fully or partially controlled or limited by MassDOT or another public agency.

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

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

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

Drain – An appurtenance to discharge liquid contaminants from casings.

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

DUCE – District Utility/Constructability Engineer.

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

Encasement – Structural element surrounding a carrier or casing.

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

Environmentally Sensitive Area – An area that includes, but is not limited to, wetlands, flood plains, archaeological or historic sites; areas with stability or settlement problems; and areas with artesian conditions, animal or plant communities, landscapes or geologic formations with exemplary, unique, rare or threatened/endangered characteristics.

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

Fiber Optic Cable – A communications cable that contains glass fibers.

Fiber Optic Facilities or Wireline Telecommunications Facilities – Improvements, personal property, and facilities necessary to operate wireline telecommunications facilities, including, without limitation, conduit, fiber optic strands, equipment for transmitting and receiving, equipment shelters and/or cabinets, related cables and utility lines.

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

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

Freeway – An expressway with full control of access.

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

Full Control of Access – MassDOT or another public agency's authority to control access that is exercised to give preference to through traffic by providing access connections with selected public roads only by prohibiting crossings at grade or direct private driveway connections.

Gallery – An underpass for two or more pipelines.

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

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

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

Highway Access Permit – The document whereby MassDOT regulates and gives approval for the temporary use and occupancy of the highway right of way by utility facilities, private lines, and/or service connections. A highway access permit is sometimes referred to as a "Use and Occupancy Agreement".

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

Highway Structure – A general term representing structures that are part of the highway, including for example, bridges, abutments, piers, overpasses, underpasses, culverts and tunnels.

Historic Resources - buildings, structures, objects, districts or sites that possess significance in American history, architecture, engineering, or culture. Many (but not all) such resources have been listed in the National and/or State Registers of Historic Places, or included in the Massachusetts Historical Commission's "Inventory of the Historic and Archaeological Assets of the Commonwealth."

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

Interstate Highways –This includes only highways on the Interstate System as defined below.

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

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

Lease – A written document in which the rights to use and occupy the land (the Premises) are transferred by landlord to another for a specified period of time in return for a specified rent.

Limited Access Highway – Any freeway, expressway or other highway, designed for through traffic with full control of access.

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

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

Multiple State-Aid Street System – A system which includes highways constructed, improved, and maintained as public highways by municipalities.

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

Normal – Crossing at a right angle.

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

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

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

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

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

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

Premises – the defined lease area of MassDOT controlled real estate for the purpose of installing, operating and maintaining a wireline or wireless telecommunications facility or renewable energy generation/transmission facility, including utility, pedestrian and vehicular access.

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

Private lines – Privately owned facilities that convey or transmit the commodities outlined in the definition of "utility facility" below, but are devoted exclusively for private use.

Proposer – An individual or entity submitting a proposal to construct and/or operate a telecommunications facility or renewable energy generation/transmission facility on MassDOT controlled real estate. A Proposer is not synonymous with tenant.

Public Highway System –M.G.L. c. 6C, sections 1(13) and 38, and M.G.L. c. 81, sections 1 and 13, authorize the State to construct, improve, and maintain public highways and to assist political subdivisions in this work. To do so establishes the public highway system.

Renewable Energy – The generation of electrical power by means of photovoltaic solar panels, wind turbine, biomass and/or geothermal or other alternative energy technology.

Renewable Energy Facilities – The occupation of a State highway right of way by a public or private entity by means of a lease agreement, license, and/or permit for aboveground and/or underground installation, transmission and maintenance of renewable energy.

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

Rigid Pipe – A pipe designed for diametric deflection of less than one (1) percent.

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

Roadbed – Roadway (As used herein).

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

Scenic Byways – The National Scenic Byways (NSB) Program was established under the Intermodal Surface Transportation Efficiency Act of 1991. The purpose of the program is to recognize and enhance roads which have outstanding archaeological, historic, cultural, natural, recreational and scenic qualities and also support State scenic byway initiatives.

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

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

Semi-Rigid Pipe – A pipe designed to tolerate from one (1) percent to three (3) percent diametric deflection.

Slab, Floating – A slab between a utility line and a structure or pavement, but not in contact with either.

State Highway System – A system which includes highways constructed, improved, and maintained as public highways under the jurisdiction of the Administrator of the Highway Division of the Massachusetts Department of Transportation.

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

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

State – Commonwealth (State) of Massachusetts.

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

Subtenant – An individual or entity that enjoys the benefits, rights, and obligations of a sublease agreement or a license agreement. For the purposes of this *Policy*, Subtenant and licensee (an individual or entity that enjoys the benefits, privileges, and obligations of a license) are synonymous, and both Subtenant and licensee are synonymous with co-locator.

Support Structure – A freestanding structure or framework that is self-supporting, fixed to the ground, and designed to support wireless telecommunications transmissions, receiving and/or relaying antennas, and/or equipment.

Telecommunications Service Provider or **Service Provider** – An individual or entity that provides wireline or wireless telecommunications service to customers.

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

Tenant – the individual or entity occupying and using the premises.

Title VI of the Civil Rights Act of 1964 – As a recipient of federal financial assistance, MassDOT actively implements its federally assisted programs in compliance with Title VI of the Civil Rights Acts of 1964, and related nondiscrimination programs, to ensure that MassDOT, and parties that receive or benefit through federal financial assistance provided through MassDOT, do not discriminate based on race, color, national origin, age, disability or gender, in any program or activity. In the context of utility relocation, this law would apply to MassDOT departments and to utility owners or lessees in aspects of the relocation process that impact the public.

Tower – A freestanding structure or framework, or monopole, that is self-supporting, fixed to the ground, and designed to support wireless telecommunications transmissions, receiving and/or relaying antennas, and/or equipment.

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

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

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

Trenched – Installed in a narrow open excavation.

Unmarked Graves - Human skeletal remains without gravestones, fences or other surface indications of their presence; the discovery and treatment of these remains are subject to the procedures outlined in M.G.L. Chapter 9, Sections 26A & 27C.

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

Use and Occupancy Agreement – The document by which the transportation agency approves the use and occupancy of highway right of way by utility facilities or private lines; another term for highway access permit.

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

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

Utility Quality Level – A professional opinion regarding the quality and reliability of utility information. There are four (4) levels of utility quality information, ranging from the more precise and reliable, Level A, to the least precise and reliable, Level D. The utility quality level shall be determined in accordance with the guidelines established by the American Society of Civil Engineers in document CI/ASCE 38-02 entitled *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.*

Utility Tunnel – An underpass or subterranean tunnel for one or more utility lines.

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

Wireless Telecommunications Facilities or **Facilities** – All wireless telecommunications equipment, buildings, and support structures, including but not limited to towers with which a wireless telecommunications service carrier transmits and receives the radio-frequency waves that carry their services, microwave dishes, equipment shelters and/or cabinets, related cables and utility lines and all locations of said equipment.

Chapter 3

3 - PERMITS

A. General

1. Under Massachusetts statutes it is necessary for a utility owner to obtain a permit in order to place utility facilities on State highway right of way. Such permits are issued by the Massachusetts Department of Transportation. These permits contain general and site specific terms and conditions under which they are issued. Utility owners cannot perform without a current and valid permit issued by MassDOT. The utility owner or its contractor shall carry a copy of the approved permit at all times while working within the highway right of way.

2. The policies and procedures contained herein supplement the rules under which permits are currently issued and provide internal guidance for MassDOT employees when reviewing applications.

3. A valid permit includes the following signatures:

    a. Authorized agent/person representing the utility owner;

    b. MassDOT District Highway Director (or Authorized Representative).

4. MassDOT is not required to submit permits to FHWA for prior concurrence except when the proposed installation is not in accordance with this Policy, and then only if the utility facility is located on the National Highway System.

B. Permits and Agreements

1. Permits. MassDOT issues two (2) types of right of way permits, Vehicular and Non-Vehicular. Vehicular permits apply to processing, tracking, notifying and issuing truck permits for loads in excess of legal limits. Non-Vehicular permits are utilized for utilities and drainage and are relevant to this *Policy*. MassDOT's permit application form, *Application for Permit to Access State Highway*, is used to request permission to place, construct, reconstruct, and thereafter maintain overhead, surface and underground utility facility installations and extensions within highway rights of way, whether longitudinally, oblique, or normal (perpendicular) in relation to the centerline of the highway. It is also used for the installation of miscellaneous guy wires and anchors, to place temporary obstructions on the right of way, for temporary relocations of a more minor nature to accommodate a non-MassDOT construction project, and for other minor types of work to be done on the highway right of way.

   For a copy of the *Application for Permit to Access State Highway* and additional information regarding MassDOT's permitting requirements, see http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx.

2. License and Lease Agreements. There are three forms of agreement utilized for the accommodation of telecommunications and renewable energy facilities on State highways in accordance with Chapter 5 of this *Policy*. A Master License Agreement (MLA), and a Site License Agreement (SLA) are utilized to grant wireless telecommunications service providers the right to construct, install, operate and maintain their personal property on MassDOT-owned real estate. A Lease Agreement is utilized for the accommodation of fiber optic, some wireless, and renewable energy facility installation, operations and maintenance along State highways. See Chapter 5.H for additional information on the license and lease agreements managed through the Office of Real Estate Development (OREAD).

   An explanation of the OREAD Agreement Process is available on the MassDOT Utility web page at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/RelatedLinks.aspx.

Prior to entering a License or Lease Agreement, the Applicant shall submit a Permit request to the MassDOT District Permit Engineer. A wireless or wireline telecommunications or renewable energy permit application shall trigger the Agreement process. The District Permit Engineer and OREAD staff shall inform the Applicant of next steps to complete the Permit and any Agreements. See Chapter 5 for details on the Agreement process.

C. Application

1. A completed Application for Permit to Access State Highway shall include, without limitation, the following information and submittals in both hard copy and digital form in a format and quantity specified by the District Permit Engineer (as applicable):

    a. Highway Route Number, Mile marker, and highway station, as available;

    b. Location of the facility (including Lat Long and GPS coordinates, as available);

    c. MassDOT Project File number (if applicable);

    d. Type of construction (aerial, surface or underground);

    e. Voltage;

    f. Number and size of conductors;

    g. Conduit or pipe (type, size, and operating pressures);

    h. Casing (type and thickness);

    i. Method of installation for underground facilities;

    j. Vertical and horizontal clearances, minimum clearances required by the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12101 et seq, as amended (ADA);

    k. Tree clearances and trimming required;

    l. Sight line analysis;

    m. Turf restoration plan/topsoil salvage, seed type, fertilizer, mulch, topsoil borrow, etc.;

n. Pavement restoration and trench details;

o. Traffic management plans;

p. Site plans.

2. The applicant agrees to comply with the following environmental measures:

   a. Protection measures required for specimen trees and environmentally sensitive areas;

   b. Steps required to preserve the scenic quality of the highway;

   c. Erosion control measures, turf establishment, use and disposal of trash, treated wood, asbestos and other hazardous materials, and the legal disposal of waste material outside of the right of way;

   d. Obtain all environmental permits necessary to carry out the work.

3. The applicant also agrees to the following conditions:

   a. The applicant shall strictly conform to the terms of the permit and the Massachusetts General Laws, as set forth in Chapters 81, Section 21.

   b. The applicant shall comply with relevant regulations of all other governmental agencies required for the protection of the public, including environmental permits.

   c. The applicant shall accomplish and complete all work in a manner not detrimental to the highway while safeguarding the public.

   d. The applicant shall provide complete information for any underground facility, including its purpose.

   e. The applicant shall agree to collect and depict information about existing subsurface utility facilities prior to any excavation on highway right of way in accordance with the provisions set forth in ASCE Standard 38-02 entitled, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.*

f. The applicant shall include a photo reproducible sketch with each copy of the permit that gives the location relative to the highway center line and/or right of way line, applicable control of access lines and access points, in-place utility facilities (including highway drainage), and identifying features (including stationing on the highway) when available.

g. The applicant shall submit as-built drawings with the line and grade elevations of all utility facilities placed within the right of way, referenced to roadway alignment or the State station numbers. As-built drawings may be required as paper documents, as AutoCAD, and as pdf digital files in a format approved by MassDOT.

h. All utility companies who install, maintain and/or repair their facilities within the State layout, including municipality utilities, shall disclose current contact lists to each District Permits Engineer. This shall assist in facilitating quick and direct communication during utility repair emergencies or for normal utility planning purposes. The contacts shall be provided within the Annual Maintenance Permit Forms.

D. FHWA Review

1. When a utility owner files a notice or makes an individual application or request to MassDOT to use or occupy the right of way of a federal-aid highway, MassDOT is not required to submit the matter to FHWA for prior concurrence except as noted in D.2. immediately below. MassDOT's authority, by mutual agreement with the local Division of FHWA, is manifested in the form of an approved highway access permit, except when the proposed installation is not in accordance with this MassDOT *Utility Accommodation Policy* previously approved by the FHWA for use on federal-aid highway projects [See 23 CFR 645.215(d)].

2. Exceptions to MassDOT's *Utility Accommodation Policy* may be allowed if it is demonstrated that extreme hardships or unusual conditions provide justification and where alternative measures can be prescribed to fulfill the intent of these policies and procedures. The utility owner shall submit a written Utility Accommodation Policy exception request to the MassDOT Highway Chief Engineer that documents and justifies the hardship or unusual condition (see Chapter 1, Section H). Requests for exceptions to a utility facility located on the National Highway System require FHWA approval in addition to MassDOT approval.

E. Plan Review

1. Before issuing a permit, MassDOT must:

    a. Review the sketches, as well as pertinent information regarding the type of facility and compliance with codes, rules, and laws pertaining to the facility;

    b. Assure that utility installations crossing State lines on roadways and bridges have been coordinated with the appropriate highway permitting officials in the neighboring states.

F. Temporary Traffic Control Plan

A written temporary traffic control plan shall be designed based upon the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices,* the most current edition of the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *MassHighway Standard Details and Drawings for the Development of Traffic Management Plans,* and be approved by MassDOT's District Traffic Engineering Section.

G. Certification

Upon completion of the permitted work, the utility owner must send two (2) copies of the Certificate of Completion and as built plans to the MassDOT District Highway Director. The as built plans shall be submitted both as updated record drawings on paper and in a digital format acceptable to MassDOT. The Permit number must be referenced on submitted correspondence and as-built plans.

Chapter 4

4 - GENERAL INFORMATION

A. Private Lines

1. Private lines are privately-owned facilities that convey or transmit communications, electricity, gas, oil, or any other similar commodities outlined in the definition of utility facility, but devoted exclusively to private use.

2. Since private lines typically serve only the owner, it is generally not in the public interest for them to be located within the highway right of way. Private lines may, at MassDOT's discretion, be allowed to cross, or run longitudinally, along or within MassDOT highways.

3. Permit applications are required for private transverse or longitudinal crossings. FHWA approval is required on Federal-Aid highways, especially National Highway System facilities. All private utility installations allowed to cross or run parallel to State highway right of way shall follow the requirements of this *Policy.*

B. Public Utility Service Lines

1. Public Utility Service Lines are facilities that are either on or off State highway right of way. The sole reason for this type of service line to be on highway right of way is to facilitate interconnection between a private customer and a public utility. Because it is in the interest of both the customer and the utility owner to have these connections, service lines may be allowed to cross or run longitudinally along State highways where deemed safe and practical.

2. Utility owners shall be required to relocate or remove any service lines in State highway right of way when requested to do so.

C. Renewable Energy Facilities

1. MassDOT is committed to supporting the development of renewable energy technologies.

2. MassDOT recognizes that there are opportunities to utilize highway right of way and other MassDOT properties for installation and operation of renewable energy facilities for decentralized renewable energy production. Examples include, without limitation, solar energy projects and wind energy projects.

3. MassDOT will consider accommodation of renewable energy facilities in MassDOT right of way when such use and occupancy does not interfere with the flow of traffic, pedestrian access and the safe operation of vehicles, does not otherwise impair the highway or its visual quality, and does not conflict with the provisions of federal, State or local laws.

4. Proposals for the development of renewable energy projects on highway right of way may be pursued on an exception basis in accordance with the provisions of Chapter 1.H.

D. Manholes, Vaults, and Pits

1. Manholes, handholes, vaults, and pits must be limited to those necessary to install and service the line and must be directly in line with the utility facility and of the minimum width to accomplish their intended function and comply with any other necessary codes or requirements. They must be installed flush with the roadway or ground surface and must be of sufficient strength to withstand the superimposed loads of the roadway and traffic, including that of construction equipment.

2. Manholes, handholes, vaults, and pits shall not be placed in the pavement or paved shoulders of high-volume roadways (greater than 4,000 ADT). Exceptions may be permitted on roadways in urban areas in cases of extreme hardship.

3. Placement of new manholes/handholes under traffic lanes of low-volume roadways in urban areas requires the approval of the District Highway Director or designee. Existing manholes/handholes under traffic lanes in urban areas may remain in place. Any proposed changes to existing manhole/handhole locations shall require the same approval as new installations. MassDOT reserves the right to require future relocation of manholes/handholes as prescribed herein.

4. An application that includes vaults and manholes to be placed or constructed within the paved surface of the roadway shall include engineered drawings of the vaults and manholes. A Certificate of Compliance for the precast or cast-in-place material shall be submitted upon completion of the project.

E. Access to Utility Facilities

1. MassDOT is authorized to control all types of access to all highways and related right of way under its jurisdiction. This jurisdictional authority applies primarily to most divided highways and expressways, as well as to all Freeways. MassDOT's primary goal in controlling all types of access is to maintain the undisturbed, free flow of traffic. This goal is accomplished by giving preference to through traffic, by limiting interference from other vehicles, pedestrians, disturbances or objects that are entering, exiting, or crossing the highway.

2. There are two types of access control in Massachusetts:

    a. Full Control of Access: this type of access control gives preference to through traffic by providing access connections with selected public roads by only allowing longitudinal ingress or egress at specified, marked locations; and by prohibiting crossings at grade or direct private driveway connections. This level is typical on all freeways.

b. Partial Control of Access: This type of controlled access gives more limited preference to through traffic. Limited access connections are permitted along selected public roads as well as crossings at grade and private driveway connections. This controlled access level is typical of many undivided highways and some expressways.

3. Direct access to utility facilities may be permitted, at MassDOT's discretion, on both fully and partially controlled access highways if alternate locations and means of access are not available or are impractical, as long as such access does not adversely affect safety or traffic operations or damage any facility. The following conditions also must be met:

    a. Access for construction and/or servicing a utility facility shall be limited to frontage roads, nearby or adjacent public roads and streets, or trails along or near the highway right of way line connecting only to an intersecting road.

    b. A locked gate along the fence may be used to meet periodic service access needs. If a utility owner indicates a need to make use of gates for access to its facilities on both fully and partially controlled access highways, the following additional conditions are required.

        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. The utility owner shall provide MassDOT with keys to any locks, to be used in emergencies, etc.

        iii. Use shall not adversely affect traffic operations.

        iv. Use will not give the utility owner a claim to permanent access rights.

        v. Use shall provide MassDOT with inspection rights of that facility.

        vi. The utility owner shall provide contact information for MassDOT to arrange inspections, etc., as needed.

4. Access to utility supports, manholes, handholes or other appurtenances in medians, interchange areas, or other inaccessible portions of the right of way on both fully and partially controlled access highways may be permitted under the following conditions:

    a. Entry to the median area shall be restricted where possible to nearby grade separation structures, stream channel crossings, or other suitable locations not involving direct access from through lanes or ramps.

    b. All permits shall include a MassDOT-approved temporary traffic control plan, including adequate provisions for control of access to the utility work zone, protection of workers and the traveling public, and the provision of police details or flaggers as per MassDOT policy.

    c. Advance arrangements must be made between the utility owner and MassDOT for emergency maintenance procedures.

F. Emergency Work

1. Emergency situations may arise when immediate action to protect the safety of the general public requires utility operations within a trunk highway that are not in full compliance with the provisions of this *Policy*. Nothing herein shall be construed as requiring a utility owner to delay an emergency repair. Prior to the beginning of each calendar year; however, the utility owner must apply for and acquire from the respective District an Annual Maintenance Permit, which identifies MassDOT notification and repair requirements for emergencies. See http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx for additional information regarding MassDOT permitting requirements.

2. Emergency repairs may be performed within the right of way when physical conditions or time considerations prevent application for the usual permit. However, as soon as feasible, the utility owner shall inform the appropriate MassDOT District office of the emergency, its plans or actions for alleviating the dangerous situation, and arrangements made for the control and protection of traffic and pedestrians affected by its proposed operations.

3. A permit shall be issued for all emergency work, which will serve as a record of the work performed and identify the grantee responsible for the future maintenance of the facility repaired.

G. Discontinued Use and Abandoned Facilities

1. General. A utility facility is considered abandoned when it is no longer in service and is physically disconnected from a portion of the operating facility that is in use or still carries service. Utility owners are responsible for notifying MassDOT in the event that the owner intends to discontinue use of or abandon all or portions of its utility facilities in MassDOT ROW. Absent owner notification, if MassDOT determines a facility to be abandoned through visual inspection or other means, MassDOT shall provide written notice of said determination to the utility owner and provide the utility owner with 30 days to refute its determination.

   In the event that a utility facility is deemed to be abandoned through notification from the utility owner or MassDOT determination, MassDOT may elect to: 1) assume ownership of the facility; 2) have the facility removed at the facility owner's expense; or, 3) dispose of the abandoned facility through other reasonable means, including, for example, resale and leasing.

2. Above Ground Facilities. If a utility owner abandons use of an above ground facility, the facility shall be entirely removed from the right of way within six months after its use is discontinued, unless MassDOT grants written approval for a time extension or directs the owner to take alternate action as described above. All removal and related costs shall be the responsibility of the utility owner.

3. Underground Facilities. If a utility owner discontinues use of an underground facility but desires to leave it in place on the right of way, written approval to do so shall be obtained from MassDOT and a record shall be kept in the utility owner's permanent files in order that such facility may be accurately located in the field. MassDOT may at its discretion, at any time within two years following the discontinued use, require abandoned and out-of-service pipes and appurtenant facilities (e.g. manholes, pull boxes) to be purged, cleaned, inspected and filled in or removed, or be turned over to MassDOT for use of the facility. All necessary removal and related costs for filling or removal shall be the responsibility of the utility owner. All costs associated with any such abandoned facilities shall be ineligible for Federal-aid participation.

4. Bridge Attachments. If a utility owner discontinues use of a facility on a highway bridge but desires to leave it in place on the bridge, written approval to do so shall be obtained from MassDOT. Any abandoned or out-of-service facilities that are removed from a bridge must be accomplished utilizing removal procedures approved by the MassDOT Bridge Division. All required removal and related costs shall be the responsibility of the utility owner for two years following abandonment by the utility owner. All costs associated with any such abandoned facilities shall be ineligible for Federal-aid participation.

Chapter 5

5 – TELECOMMUNICATION AND RENEWABLE ENERGY

A. Introduction

1. MassDOT, through its Office of Real Estate and Asset Development (OREAD), provides development opportunities for infrastructure deployment of wireless and wireline telecommunications facilities and renewable energy generation/transmission facilities on properties and rights-of-way (collectively, "Real Property") that are under the ownership, care, custody and/or control of MassDOT. This *Utility Accommodation Policy* will guide telecommunications and renewable energy service providers with the framework necessary for processing each stage of development from initial request for accommodation to final deployment of the facility. A summary of the Agreement Process can be found on the MassDOT Utility web page: http://www.massdot.state.ma.us/highway/Departments/UtilitySection/RelatedLinks.aspx.

2. The primary objectives of OREAD are to:

    a. Provide a source of alternative revenue from assets owned or under the control of MassDOT to the Commonwealth of Massachusetts.

b. Enhance public safety for travelers utilizing the highway systems.

c. Stimulate economic growth by expanding the total area of available real assets for development opportunities.

d. Stimulate economic growth by expanding broadband access to the citizens of the Commonwealth.

e. Improve communications capabilities for MassDOT.

3. MassDOT's OREAD shall be the primary contact for all proposed renewable energy and wireline/wireless telecommunications services projects. OREAD shall review proposed projects' viability, negotiate agreement terms, accept and/or reject proposals and manage MassDOT's interests in all telecommunications and renewable energy facilities on behalf of MassDOT. Further, executed agreements of proposed and existing telecommunications or renewable energy facilities shall be managed by OREAD on behalf of MassDOT, including but not limited to adherence to agreement terms and conditions, financial accounting of revenues and in-kind contributions and other issues relating to highway access, safety and security. OREAD shall coordinate with the affected District and FHWA as appropriate to ensure that required access permits have been properly executed and are on file in the respective District.

B. Applicability

This chapter is applicable to (1) all projects involving the accommodation of wireless telecommunications facilities on MassDOT Real Property, (2) all projects involving wireline telecommunications facilities installed longitudinally along MassDOT State highways, and (3) all projects involving renewable energy facilities installed on MassDOT Real Property or along MassDOT State highways.

C. Safety Criteria and Design Standards

1. Wireline and wireless telecommunications and renewable energy facilities shall be deployed and maintained so as not to impede the safety and security of MassDOT transportation infrastructure. The telecommunications or renewable energy facility shall not interfere with the existing use of the real property of which they are a part or preclude any future use of the real property as determined by MassDOT. Nor shall any telecommunications or renewable energy facility in any way hinder, obstruct or interfere with the radio or electronic equipment or signals of MassDOT.

   The most stringent of the following criteria shall apply to all proposed installations:

   a. This *Utility Accommodation Policy* or superseding edition.

   b. AASHTO *Roadside Design Guide,* 2011 or superseding edition.

   c. MassHighway *Project Development and Design Guide*, 2006 or latest edition.

2. Telecommunications facilities are included in the airspace leasing provisions of 23 CFR, part 710, Subpart D. While these are the parameters, the District Offices will determine District access requirements for construction and maintenance vehicles.

3. Bridge installations, directly over travel lanes, are generally undesirable for telecommunications facilities. However, due to the nature of this technology there are instances where this type of installation may be the only feasible option. These sites will be reviewed on a case by case basis. The maintenance and installation hours will be set by the District Office. This will avert potential interference with traffic during peak periods.

4. Telecommunications or renewable energy facilities shall not obstruct required motorist sight distances.

5. Utility service and vehicular access will be carefully designed and controlled, on a case-by-case basis, based on the site location. Site access management for each individual site plan will be reviewed and approved by the District Highway Director or his/her designee. See Chapter 5.E.3 for additional information on access requirements.

6. All telecommunications and renewable energy facilities shall be designed to be as unobtrusive as possible.

7. All telecommunications and renewable energy facilities must be designed and built of durable material for a long service life with minimal routine service and maintenance. All structure designs and equipment must be planned as to minimize hazards and interference with highway traffic when additional overhead and underground lines or energy generation or transmission infrastructure are installed at a future date. Installation of new hardware requires strict adherence to the temporary traffic control plans and the allowable lane closures schedule as approved in the individual site plans.

8. Telecommunications and renewable energy service providers shall be solely responsible for obtaining all required permits and approvals before commencing any construction, installation, reconstruction, maintenance, repair, operation or removal work at a renewable energy or telecommunications facility and for making all necessary submissions to appropriate environmental regulatory agencies. Telecommunications plans shall be submitted to the MassDOT ITS Section at the time of permit application to coordinate the proposed scope with any current and future MassDOT ITS deployments.

9. All operations of telecommunications and renewable energy facilities located thereon shall comply at all times with all applicable federal, State and local laws, rules, regulations, ordinances, statutes and decisions.

10. Whenever the provisions of this *Utility Accommodation Policy* may conflict with the provisions of the most current AASHTO *Guide for Accommodating Utilities within Highway (Freeway) Right of Way,* federal or State laws or regulations, the Federal Communication Commission (FCC), the Federal Aviation Administration (FAA), the wireline telecommunications industry's own guidelines, standards, or codes, the higher degree of protection for the Highway and/or public, as determined by MassDOT's Chief Engineer, shall prevail. Notification of all sites subject to the requirements of Title 23 USC and 23 CFR, will be provided to the FHWA.

D. Project Development Process

1. Prior to entering a License or Lease Agreement, the Applicant shall submit a Permit request to the MassDOT District Permit Engineer. A check mark on the permit application indicating a wireless or wireline telecommunications or renewable energy project shall trigger the Agreement process. The District Permit Engineer and OREAD staff shall inform the Applicant of next steps to complete the Permit and any Agreements. The Agreement process is outlined below.

2. Requests for information regarding proposed or existing wireless and/or wireline telecommunications or renewable energy facilities shall be directed to MassDOT's OREAD contact:

   Mass DOT, Office of Real Estate and Asset Development
   Project Manager
   Massachusetts Transportation Building
   10 Park Plaza, Room 4470
   Boston, Massachusetts 02116

3. Proposals for new facilities or fiber optic strands or access to empty fiber optic conduit, or co-location on existing towers, or new renewable energy generation or transmission projects, shall include the following exhibits (as applicable):

   a. A plan of the property of which the premises is a part.

   b. A preliminary design of the proposed wireless, wireline, or renewable energy facility.

   c. The proposed vehicle access route to the facility.

   d. The proposed access route for the electric and communications conduit to service the facility.

   e. A preliminary design for accommodating co-location of sub-tenants.

   f. A structural analysis of the tower.

   g. Filing of documentation showing tower climber certification prior to providing tower access for the installation of wireless equipment.

h. Proof of insurance coverage prior to installation of the fiber optics or renewable infrastructure.

i. Reserved space on the telecommunications tower, or empty conduit, for MassDOT use, as stipulated by MassDOT.

j. Reserved renewable energy generated power, for MassDOT use, as stipulated by MassDOT.

4. Letter of Intent from proposer to lease the premises and proposed offer of rent.

5. Internal MassDOT canvas to determine if the site is suitable for the proposed project (ITS section review, at a minimum, for telecommunications projects).

6. Notification of acceptance of the telecommunications or renewable energy project to the proposer.

7. Executed MassDOT-sponsored license or lease agreement and pertinent supporting documents.

8. Submission of 75 percent construction plans to MassDOT for review.

9. Local zoning approval, building permit, response to comments on 75 percent construction plans, and 100 percent plans to be submitted to MassDOT for review and final acceptance.

E. Guidelines for Accommodation of Wireline Telecommunications & Renewable Energy Facilities on Freeways

Wireline telecommunication facilities shall be installed longitudinally within the freeway areas according to the criteria described below. Where indicated, the criteria below also apply to renewable energy facilities.

1. Installation Timing:

    a. To minimize interference with the safe use, operation and maintenance of the freeway, and as reasonably necessary to manage the right of way, MassDOT may limit the timing of access so that, to the extent possible, there is no more than one telecommunications or renewable energy facility installation project underway at any given time on any particular segment of freeway.

    b. Once a particular right of way segment is accessed, there will generally be no further facility installation for a period of two years from the conclusion of the previous installation.

    c. MassDOT policy restricts highway surface openings and prohibits work for a period of at least five (5) years after a new pavement surface is placed, except in cases of extreme emergencies. If approved by the District Highway Director, the restriction may be waived, but the pavement restoration shall include full width pavement placement to MassDOT standards at the expense of the installer.

    d. MassDOT policy restricts highway surface openings and prohibits work from November 15 to April 1 (winter conditions).

2. Location and Alignment Requirements:

    a. Telecommunication and renewable energy facilities shall be located as close to the right of way line as practical to avoid or minimize the need for adjustment for future highway improvements, to avoid interference with highway maintenance and operations, and to permit access to the utility lines or renewable energy infrastructure for their maintenance with minimum interference to highway traffic.

    b. The minimum depth of cover for wireline telecommunications facilities installed along controlled access rights-of-way shall be three (3) feet in soil and two (2) feet in rock.

c. Below ground telecommunication facilities may be installed within the clear zone on an exception basis. All approved clear zone installations must be accomplished in accordance with the requirements of Chapter 5.F.6 below.

d. All elements of above ground telecommunication and renewable energy facilities approved by MassDOT shall be installed between the edge of the right of way and the outer edge of the clear zone and shielded with appropriate roadside safety hardware as necessary.

e. In all cases, consideration must be given to measures necessary to preserve and protect the safety, operation, integrity and visual quality of the highway, and its maintenance efficiency. Prior to approving any project, the telecommunications or renewable energy service provider shall demonstrate that the Real property or right of way is suitable to accommodate any proposed facilities without adverse effect on the highway's design, construction, future expansion, or safety characteristics.

f. All longitudinal telecommunication and renewable energy accommodations, as may be warranted herein, shall only be in accordance with an approved Lease Agreement between MassDOT and the telecommunication or renewable energy service provider.

g. Where longitudinal telecommunication facility installations must traverse interchange areas, they shall be located and treated in the same manner as a utility crossing of the right of way. Such utility crossings shall be designed in accordance with:

    i. Relevant provisions of this *Policy*, and

    ii. The MassHighway *Project Development and Design Guide*, 2006 or latest edition.

h. All longitudinal telecommunication facility installations shall be marked with approved underground telecommunication marker tapes. Marker tapes shall be installed at a depth of twenty-four (24) inches along the full length of the installation. For installations in rock, marker tape shall be installed at a depth of twelve (12) inches.

i. The telecommunications and renewable energy service provider shall comply with all federal, State and local laws, rules, regulations and ordinances wherever applicable and at the service provider's cost. The telecommunications or renewable energy service provider shall secure all necessary approvals, permits and licenses from governmental agencies as may be required to complete the project.

3. Access Requirements

a. Access to telecommunication or renewable energy facilities within MassDOT's right of way, where required for construction and/or servicing, will be from State or local highways crossing MassDOT's right of way, from adjacent frontage roads, or from adjacent property and in accordance with an approved telecommunication or renewable energy agreement as issued by MassDOT or local governing body.

b. Direct access to a telecommunication or renewable energy facility from the controlled access right of way is generally prohibited. However, in extenuating circumstances, requests may be made to access telecommunications or renewable energy facilities from a controlled access right of way. These requests will be evaluated on a case-by-case basis.

c. A locked gate along the freeway fence may be utilized to meet periodic service access needs subject to the provisions of Chapter 7.E of this *Policy*.

d. In the event that access from State highways crossing MassDOT's controlled access right of way or from adjacent service roads is not feasible for support of construction and/or servicing – as may be the case in interchange areas, service plazas and maintenance areas – the preferred vehicle access can be obtained from the right side of the ramps. In extreme cases, access may be permitted from the main lanes of the highway with prior approval of MassDOT.

e. Advance arrangements will be made between the telecommunications or renewable energy service provider and MassDOT District Maintenance Section for emergency maintenance procedures.

f. Access for construction and/or servicing of telecommunications or renewable energy facilities placed within MassDOT's freeway areas will be granted on a controlled and restrictive basis according to this *Policy* and the agreement between MassDOT and the service provider, so as to maintain the safety, aesthetics, and functionality of the controlled access right of way. Access to the facility shall be arranged through the appropriate MassDOT District Maintenance Section in accordance with the permit requirements.

4. Support Facilities

a. All above ground telecommunications or renewable energy facilities shall be located outside of the clear zone and as close to the outer edge of the right of way as possible. The telecommunication service provider may demonstrate, to the approval of MassDOT that placement underground is not technically feasible or there are no other feasible alternate locations. In exceptional situations when it is essential to locate such an above ground facility within the clear zone, appropriate countermeasures to reduce hazards shall be used. Countermeasures may include, but are not limited to, placing the facility at a location which protects or minimizes the exposure to out-of-control vehicles, using breakaway features, using impact attenuation devices, using delineation, or shielding. All above ground installations in the clear zone and proposed countermeasures are subject to the approval of MassDOT.

b. No above ground telecommunication facility will be allowed within the median. Below ground renewable energy or telecommunications facilities will only be allowed in the median on an exception basis if a service provider can demonstrate to MassDOT, in its sole and absolute discretion, that other options are technically infeasible or cost-prohibitive.

c. Utility, renewable energy, and/or telecommunications service connections to or from adjacent properties shall not be permitted from longitudinal telecommunication or renewable energy installations located within the clear zone unless approved by MassDOT.

d. Any utility service connection necessary to operate a telecommunication or renewable energy facility within the freeway right of way shall be placed underground in ducts or conduits running from crossroads or frontage roads adjacent to the required point of access or from easements obtained by the supplying distribution utility. Longitudinal installations of utility service connections in controlled access areas are prohibited.

e. Initial installation shall include all appurtenances necessary or incidental to the operation of the telecommunications facility, and shall include jacking boxes or other duct/conduit access points at appropriate spacing to permit the pulling of additional cables into the duct system without further excavation.

5. Attachment to Existing Structures

a. For cases where a separate telecommunications structure is impractical, attachment to the existing highway structure may be permitted only with the review and written approval of MassDOT. The telecommunication service provider shall provide all required documentation, design drawings and load rating calculations to demonstrate that the integrity of the highway structure is maintained and that there are no adverse impacts to the structure in terms of maintenance, structural life, carrying capacity, aesthetics and safety.

b. Installation of telecommunication and renewable energy facilities on highway structures within the controlled access areas shall comply with the requirements specified in Chapter 10 of this *Policy*.

6. Installation of Telecommunications and Renewable Energy Facilities Within the Clear Zone

   a. It is preferable that all telecommunications and renewable energy installations be accommodated outside of the clear zone. Underground facilities may, however, be accommodated within the clear zone under restricted conditions and at the discretion of MassDOT.

   b. In order to minimize interference with the safe use, operations and maintenance of a controlled access area – and as reasonably necessary to manage the right of way – MassDOT may restrict underground telecommunications facility installations to one time, as per the Telecommunications Act of 1996, in those areas of the right of way where construction would occur within the clear zone.

   c. MassDOT may also require the installation of excess capacity and the announcement of co-build opportunities during clear zone installations in an effort to accommodate multiple telecommunications service providers during the same installation process. No further installation will be allowed on that segment of right of way unless and until all existing cable and conduit capacity has been exhausted.

7. Compliance with FHWA/FCC Guidance and Requirements of the Telecommunications Act of 1996

    a. MassDOT intends to accommodate telecommunications service providers on Department properties in compliance with the requirements of the *Telecommunications Act of 1996* and consistent with the *Guidance on Longitudinal Telecommunications Installations on Limited Access Highway Rights-of-Way* published by the FHWA ITS Joint Programs Office on December 20, 2000. Specifically, telecommunications service providers that wish to install telecommunications facilities within the clear zone may be required to:

        i. Announce co-build opportunity at least 90 calendar days prior to the start of construction.

        ii. Install spare fibers, conduits, and/or innerducts sufficient to accommodate reasonably anticipated future demand.

        iii. Install access points outside of the clear zone to allow access to fibers, conduits, and/or innerducts installed as excess capacity.

        iv. Establish rates, terms and conditions for fiber, conduit and/or innerduct leasing that are fair and reasonable, and applied in a neutral and non-discriminatory manner.

8. Excess Capacity Requirements

    a. Excess capacity requirements may be established for agreements that involve fiber optics installations within the clear zone or other installations where MassDOT intends to limit installation to one-time. This may include bridge crossings, tunnel installations or other unique locations where MassDOT is required to maintain a higher level of access control.

    b. Excess capacity requirements will differ for urban versus rural areas and will be determined by the telecommunications service provider in conjunction with MassDOT and OREAD.

9. Co-build Requirements

    a. Co-build requirements may be established for agreements that involve installation within the clear zone or other installations where MassDOT intends to limit installation to one-time. This may include bridge crossings, tunnel installations or other unique locations where MassDOT is required to maintain a higher level of access control.

    b. Telecommunications service providers may be required to provide other telecommunications companies with reasonable notice of a co-build opportunity associated with the anticipated or planned opening of the right of way within the clear zone or other area where installation will be limited to one-time. The notice shall be provided in accordance with MassDOT notification procedures and shall be open for a period not less than 90 calendar days.

10. Traffic Control Requirements

    a. All traffic control signs and devices, which the renewable energy and telecommunication service provider may use in the course of any installation, servicing or maintenance of a facility, shall comply with the provisions of the *Massachusetts Amendments to the Manual of Uniform Traffic Control Devices* (latest version).

    b. The telecommunication or renewable energy service provider shall provide MassDOT with a temporary traffic control plan, for review and approval by MassDOT District staff, prior to the commencement of any construction activity. The temporary traffic control plan shall specify the maintenance and protection of traffic plans for all aspects of the construction process. The temporary traffic control plan shall also specify typical maintenance and protection of traffic plans for anticipated maintenance activities, including but not limited to, restoration and repair of damaged facilities within the controlled access right of way, including repairs within the clear zone, maintenance activities associated with below and above ground facilities, and maintenance of facilities attached to highway structures.

F. Guidelines for Accommodation of Wireless Telecommunications & Renewable Energy Facilities on Freeways

1. Wireless telecommunications and renewable energy facilities shall be located outside of the clear zone as far from the roadway as possible and in locations where they are unlikely to be hit by errant vehicles. The preferred location of tower fall zones or renewable energy infrastructure such as wind turbines or solar structures is outside the State Highway Layout.

2. Wireless telecommunications facilities on MassDOT property shall be limited to monopoles and lattice towers; guyed towers shall not be allowed without the recommendation of the District Highway Director and the approval of MassDOT's Highway Administrator.

3. Siting of wireless telecommunications or renewable energy facilities shall comply with local zoning requirements; MassDOT shall not provide exemption to local zoning.

4. Wireless telecommunications and renewable energy facilities shall be installed in accordance with the scenic considerations described in Chapter 6.F. MassDOT may prohibit installations in certain instances or may require the wireless telecommunications or renewable energy facility to be camouflaged in a manner to be approved by MassDOT.

5. The safety impacts of access to construct and install the facility shall be considered in the evaluation of potential locations for wireless telecommunications or renewable energy facilities.

    a. Adequate sight distance must be provided for safe ingress to and egress from the sites.

    b. The facilities must be located outside the clear zone unless sufficient appropriate shielding already exists.

6. MassDOT may require tower sites to be developed with sufficient capacity to accommodate multiple providers, with specific excess capacity requirements to be determined by OREAD on a site-by-site basis.

7. The following describe a descending order of preference for the siting of wireless telecommunications and renewable energy facilities:

    a. Priority 1: Vehicle access to the site can be obtained from outside the through-roadway and connecting ramps (e.g., access from frontage roads or crossroads).

    b. Priority 2: Within the interchange, vehicles access can be obtained from the right hand side of the diagonal ramps.

    c. Priority 3: Within the interchange, vehicle access can be obtained from the left hand side of the diagonal ramps.

    d. Priority 4: Vehicle access from the outside shoulder (right hand side) of the mainline.

    e. Priority 5: Vehicle access from the inside shoulder (left hand side of the mainline).

    Justification must be provided for descending to any level below Priority 1. FHWA concurrence is required for any installation within a loop ramp, within any freeway weave area less than three quarters (3/4) of a mile in length, or requiring new shielding.

G. Compensation Requirements

1. In accordance with OREAD policies, and consistent with the Federal Telecommunications Act of 1996 for telecommunications projects, MassDOT will charge fair and reasonable compensation for the installation of telecommunications and renewable energy facilities on MassDOT Real Property, including freeway rights of way.

2. Compensation shall include an administrative fee for processing of telecommunications or renewable energy service provider's proposal and an annual license or lease fee. For additional information regarding compensation requirements for the accommodation of wireline, wireless or renewable energy telecommunications facilities, refer to MassDOT's utilities web page at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx and at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/RelatedLinks.aspx.

H. License and Lease Agreements

1. License Agreements for Wireless Sites. There are two forms of license agreement for the accommodation of wireless telecommunications facilities on State highways, a Master License Agreement (MLA), and a Site License Agreement (SLA). These agreements are used to grant the telecommunications service provider the right to construct, install, operate and maintain their personal property on MassDOT-owned real estate. As such, the telecommunications service provider has no real property rights and cannot encumber the property in order to obtain a loan to construct.

    a. Master License Agreement (MLA). This is the primary licensing document, with standard terms and conditions that are not site-specific (e.g., insurance, liability, hazardous materials) that apply to all telecommunications service providers prior to entering into a Site License Agreement.

    b. Site License Agreement (SLA). This agreement identifies the specific terms and conditions for the proposed facility including, for example, base license fee, specific type facility, terms and options, access, contact information, hazardous materials, description of the facility, square footage of the site, maintenance, and includes restrictions regarding the use of sites on or near MassDOT's structures (e.g. columns, signs, buildings). Attachments include the final plans, legal description and a plot plan/map showing where the facility is located on the premises. If MassDOT will jointly use the facility, the identification of MassDOT equipment must be shown on the final plans, along with an agreement on its installation. The SLA will clearly identify any controls and permits required by the District Traffic Engineer for construction or maintenance of the facility within access control.

    c. No 'Option Agreement'. There is no Option Agreement associated with the license of a site. Instead, each telecommunications service provider is entitled to a six-month "local permitting period" that grants time to obtain all necessary reviews, approvals and permits. A total of four three-month extensions (12 months) can be granted under extenuating circumstances if the telecommunications service provider has diligently pursued approval but the delay is beyond their control.

Full payment is required for all extensions, unless MassDOT did not respond to a preliminary or final proposal within the 45-day review period.

Though the telecommunications service provider is required to pay full rent beyond the six month local permitting period, extensions allow them to cancel the SLA at any time prior to the issuance of an encroachment permit without being subject to all the termination and cancellation penalties in the MLA.

d. Terms/Length of agreement: The term of the MLA is five years and will be reviewed, and revised accordingly. Recommendations to continue with the MLA will require MassDOT governance (Board of Directors) approval. The terms and conditions of each SLA executed during the first five years will remain unchanged during the life of the SLA.

2. Lease Agreement for Fiber Optics or Renewable Energy Accommodation. A highway access permit enables a renewable energy or telecommunications service provider to perform the work necessary to install facilities along MassDOT right of way. The permit does not, however, confer an ongoing right upon the service provider to occupy MassDOT property or to use or operate the telecommunications or renewable energy equipment so installed in any way. Ongoing occupancy and operations shall be subject to a Lease Agreement between MassDOT and the service provider to be negotiated prior to commencement of operation of the telecommunications or renewable energy equipment. The Lease Agreement will provide that Rent is to be paid for the occupancy of MassDOT property at rates established by OREAD; MassDOT may also receive in-kind fiber optic facilities or energy supplies or other services, subject to agreement negotiation.

3. For additional information on License and Lease Agreements and current fees for installation of telecommunications or renewable energy facilities on MassDOT property please refer to MassDOT's utility page at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/RelatedLinks.aspx.

Chapter 6

6 - LOCATION REQUIREMENTS

A. General

1. The location of utilities on highway right of way is governed by the provisions of the most recent versions of the following publications:

    a. AASHTO *Roadside Design Guide*;

    b. AASHTO *A Policy on Geometric Design of Highway and Streets*;

    c. AASHTO *A Policy on the Accommodation of Utilities Within Freeway Right of Way*;

    d. ASSHTO *A Guide for Accommodating Utilities Within Highway Right of Way*;

    e. MassHighway *Project Development & Design Guide*.

2. Utility facilities shall be located to minimize the need for later adjustments to accommodate future highway improvements, reduce risks to trunk highway and environmentally sensitive areas, and permit access for servicing such lines with a minimum of interference to highway traffic.

3. The location of utility installations along urban streets with closely abutting improvements usually requires special considerations. Such considerations must be resolved in a manner consistent with the prevailing limitations and conditions. (These resolutions will require the approval of the District Highway Director or designee.)

4. The location of utility facilities and appurtenances shall be in accordance with the Massachusetts Architectural Access Board (AAB) requirements provided in 521 CMR, the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12101 et seq, as amended (ADA), and as implemented by all applicable Code of Federal Regulations, including 28 CFR Part 35, as amended. These requirements are principally listed in Americans with Disabilities Act Accessiblity Guidelines (ADAAG) and Public Rights of Way Accessibility Guidelines (PROWAG).

    a. The ADA established minimum criteria to allow unobstructed access or passage by a disabled person using a wheelchair or other personal transportation device.

    b. For purposes of locating utility facilities, application of the accessible route criteria applies to sidewalks along public right of way. When locating a surface type utility (e.g., poles, cabinets, pole-mounted cabinets) the facility shall not encroach on the clear width of a sidewalk as defined below.

    c. Generally, the minimum clear sidewalk width is 36 inches. In the case of curbing adjacent to a sidewalk, the curb shall not be considered part of the 36 inches dimension.

    d. If the sidewalk has a width less than 60 inches, then passing spaces at least 60 inches by 60 inches are typically located at reasonable intervals not to exceed 200 feet. These passing spaces are to be kept free of obstruction.

    e. No exceptions for non-compliance with ADA/AAB criteria are given.

5. The horizontal and vertical location of utility facilities within the highway right of way must follow, to the extent deemed by MassDOT to be practicable, the clear zone policy applicable to the type of highway and specific conditions of highway section involved. Clear zone policies are employed by MassDOT to increase safety, improve traffic operations, and enhance the appearance of highway 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. MassDOT's *Policy* is based on criteria contained in the most recent version of the AASHTO *Roadside Design Guide*.

6. Any utility facility installation on a highway structure generally requires a highway access permit. If a utility facility is installed in conjunction with major highway construction, a separate written agreement between the utility and MassDOT may be required. MassDOT's Bridge Division shall approve such installations before construction of the facility begins.

7. Crossings

    a. Utility crossings of highways shall be perpendicular to the highway alignment where practicable, but not less than forty-five (45) degrees.

    b. Non-Controlled Access Highways. For utility crossings on highways where access is not controlled, all new or relocated supporting structures and above ground appurtenances shall be located outside the clear zone or as close to the right of way line as practical.

c. Controlled Access Highways. For utility crossings on highways with partial and full control of access, all supporting structures and above ground appurtenances shall be located outside the access control line, and preferably outside the right of way line. Installation and maintenance shall be from frontage roads, crossroads, or streets, whenever practicable, or otherwise from outside the access control line and preferably outside the right of way line. Exceptions may be allowed for an unusually wide right of way or median. MassDOT prefers underground, as opposed to aerial crossings, of all utilities. MassDOT further prefers use of directional boring (pipe jacking) methods. More information about freeway crossing may be found in Chapter 8.B, Crossings.

d. Utility crossings shall be avoided in deep cuts, near footings of bridges, retaining walls, noise walls, and at highway cross drains where flow of water, drift, or streambed load may be obstructed; in wet or rocky terrain where it is difficult to attain minimum cover; and through paved or unpaved slopes under structures.

e. Temporary traffic controls for utility construction shall conform to the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices,* the most current edition of the *MUTCD* and the *MassHighway Standard Details and Drawings for the Development of Traffic Management Plans*. Any utility construction operation shall be planned with full regard to safety. Any interference with roadway traffic shall be kept to an absolute minimum.

B. Longitudinal Installations

1. Uncontrolled Access. New longitudinal installations on highways with uncontrolled access shall be located on uniform alignment as near as practicable to the right of way line and outside the clear zone. The Access Permit process shall address any safety protections required for installation outside the clear zone. Pole lines shall normally be placed in the outer five (5) feet next to the right of way line. Underground facilities, such as power cable and telephone cable, should be placed in the outer ten (10) feet. Distribution gas mains should be parallel and adjacent to these facilities. Other locations may be approved where particular circumstances warrant. The joint use of pole lines is acceptable, as is common trenching or plowing of underground facilities. All installations should be so placed that all servicing may be done with a minimum disturbance to traffic.

2. Sidewalks within ROW: Utility poles shall be placed as described in the 2006 MassHighway *Project Development & Design Guide* and the latest edition of the *AASHTO Geometric Design of Highway and Streets.* In urban areas where buildings, trees or other fixed objects may be present, MassDOT shall determine the required offset for utility pole locations.

3. Partial Control of Access. Longitudinal installations on highways with partial control of access shall generally be discouraged. When such installations are allowed, individual service connections shall not be permitted unless no other reasonable alternatives exist. Factors to be considered include distance between distribution points, terrain, cost, and prior existence.

4. Full Control of Access

    a. Longitudinal installations on highways with full control of access shall not be permitted. Exceptions may be allowed as discussed in Chapter 8.C, Longitudinal Installations. When such installations are allowed, individual service connections shall not be permitted, the utility facility shall not be installed or serviced by direct access from the fully controlled access roadways or connecting ramps, and the utility shall not interfere or impair the safety, design, construction , operation, maintenance, stability or future expansion of the highway.

b. Longitudinal installations of wireline and wireless telecommunications facilities on highways with full control of access may be permitted in accordance with the provisions of Chapter 5, Telecommunications Services.

C. Median Installations

1. Poles, guy, or other related facilities shall not be located in a highway median. This applies to both crossing installations and longitudinal installations. Exceptions may be made for crossings of wide medians with sufficient width to provide clear zone from the edges of both traveled ways. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way. When right of way lines and access control lines are not the same, such as when frontage roads are provided, supporting poles may be located in the area between them provided they are outside of the clear zone as defined by AASHTO, or they are protected if placed within the clear zone.

2. No utility work shall be performed in the median of any highway without prior MassDOT approval. When median work is authorized, unless otherwise stated in the utility's approved permit, the work shall conform to the following provisions:

    a. The utility owner or its contractor shall notify MassDOT and/or local law enforcement agencies of the expected beginning and completion time of work in the median. All equipment, operations, and spoil material shall be located within the center area of the median.

    b. No openings, vehicles, equipment, or materials of any type shall be located within the median overnight.

    c. All vehicles used to conduct the work operation shall be equipped with conspicuously visible roof-mounted revolving or strobe lights. These lights shall be in operation just prior to and during the work operation. Hazard warning lights on the vehicles shall also be operating.

D. Appurtenances

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

2. Utility accesses, castings, and valve covers should not be located in the roadway of rural highways. In urban and suburban areas there may be no feasible alternative to locating utility accesses and valve covers in the roadway, in which case they should not be located in a wheel path, if possible. Coordination among utility owners is essential where utility accesses and valve covers are to occupy highway right of way.

3. Buildings shall not be located on the right of way. Exceptions may be granted in cases where the building can be located outside the clear zone on MassDOT owned right of way other than a State trunk highway. Examples of this include, but are not limited to, park and ride lots, rest areas, and remnant parcels. Nothing in this section shall preclude MassDOT from pursuing construction of buildings and other facilities over MassDOT highway right of way through air rights agreements established in accordance with 23 CFR Part 710, Subpart D.

4. Traffic cabinets shall not be located on the right of way. Exceptions may be granted in cases where cabinets can be located in areas where they are not vulnerable to errant vehicles and as near to the right of way line as possible.

5. Manholes shall not be located in the pavement or shoulders of heavily traveled highways. Exceptions may be made on highways where manholes are essential parts of existing lines. New manhole installations shall be avoided at highway intersections. Manhole or any other covers within the roadway surface on highways shall conform to the applicable MassDOT specifications.

6. Vents, drains, markers, utility access holes, shafts, shut-offs, cross-connect boxes, pedestals, pad-mounted devices, and similar appurtenances shall not be located where they would interfere with accessible facilities for the disabled along or across the highway.

E. Vertical Location

1. Underground

    a. The depth of bury for underground facilities within the highway right of way shall be a minimum of twenty-four (24) inches for communications and cable lines, thirty (30) inches for power lines, and thirty-six (36) inches for gas and other pipelines excepting water and sewer lines. See Table 1 below.

TABLE 1 - UTILITY DEPTHS ON MASSDOT ROW

MINIMUM CROSSING DEPTHS (cased and non-cased facilities)	*Under Ditches*	*Under Pavement*
Communication and Low Voltage Power Lines	36″	60″
Power	36″	60″
Pipelines (except Water)	36″	60″
Water Pipelines	66″	66″
Sanitary Sewer and Storm Drain Lines	66″	66″

MINIMUM LONGITUDINAL INSTALLATIONS			
(all depths are for cased & non-cased facilities)	Under Pavement	In Soil	In Rock
Communication and Low Voltage Power Lines	24″	18″	18″
Power Lines	30″	30″	30″
Pipelines (except Water)	36″	36″	24″
Water Pipelines	66″	66″	66″
Sanitary Sewer and Storm Drain Lines	66″	66″	66″

b. The depth of bury for all underground facilities, except water and sewer lines, crossing the highway shall be a minimum of three (3) feet under ditches and five (5) feet under the pavement surface as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation. Water and sewer lines shall be a minimum of sixty six (66) inches for highway crossings.

c. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.

d. More information concerning specific utilities can be found in Chapter 11 of this *Policy*. All utilities shall obtain prior approval from MassDOT before burying any utility less than the minimum depth required.

e. A listing of utilities owner contacts for each municipality can be found on the MassDOT website at http://www.mhd.state.ma.us/WebApps/utilities/select.asp?d=1. It shall be the responsibility of the utility owners to ensure that the web site listing is current and accurate.

2. Overhead

a. Vertical clearances for overhead utility facilities shall comply with all applicable State and national electrical codes as set forth in the current National Electrical Safety Code.

b. Greater clearances shall be used when required by State law, regulation, or policy as summarized in Chapter 12.

F. Scenic Considerations

1. MassDOT makes every possible effort to enhance visual qualities along State highways. They do this by the retention and/or planting of trees, shrubs, and other vegetation; the selection of special alignments and corridors; and the acquisition of scenic easements. Utilities should keep aesthetics in mind when locating or maintaining appurtenances along state highways. MassDOT may require the applicant to employ the services of a qualified arborist when tree work is anticipated in sensitive areas.

2. New utility installations, including those needed for highway purposes (such as for highway lighting or to serve a weigh station, rest area, or recreation area) are not permitted on trunk highway right of way or other land acquired or improved with federal-aid funds that are located within, or adjacent to, areas of scenic enhancement and natural beauty. MassDOT may permit exceptions under the following circumstances:

    a. New underground installations may be permitted only if extensive removal or alteration of trees or terrain features visible to the highways user is not required, or the aesthetic quality of lands being traversed is not impaired.

    b. Aerial installations may be permitted only when other locations are not available, are unusually difficult or costly, or are less desirable from the standpoint of aesthetic quality or when placement underground is not technically feasible, or is unreasonably costly.

3. The proposed installation will be made at a location that will employ a suitable design and materials that give the greatest weight to the aesthetic qualities of the area being traversed. Suitable designs include, but are not limited to, self-supporting, armless, single-pole construction with a vertical configuration of conductors and cable.

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 whenever possible. In areas of unusual scenic interest, (e.g. major recreational areas, historic areas, and major publicly and privately owned tourist attractions) underground utility placement shall generally be provided.

5. New utility installations on highways with special scenic designations, such as Scenic Byways, may require special treatment. The MassDOT Environmental Section can verify impacted sites and recommend permit language, when applicable.

G. Tree Protection

1. Where underground utility facilities are to be installed near specimen trees, as identified by MassDOT, the tree root systems are to be protected by boring (tunneling) under the roots in the manner described below. The minimum tunnel depth within the root zone shall not be closer than thirty-six (36) inches to the soil surface. Open trenching will not be permitted within the protection limits described. Boring will be required if the trench is located within the radial distances specified in Table 2 below.

TABLE 2 – TREE DIAMETER & DISTANCE

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

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

Chapter 7

7 - UTILITY COORDINATION

A. Introduction

1. Utility coordination is an important element of project coordination for construction projects along or adjacent to MassDOT right of way. To improve this coordination, MassDOT has, and will continue to introduce and enforce new Directives with the objective of identifying as much existing utility facility information as possible, determining potential conflicts, and developing construction phase solutions that may include utility relocation. MassDOT's philosophy is that in order to do this successfully, all parties must assume certain levels of accountability.

2. MassDOT has put forth several directives that provide contractors, MassDOT Resident Engineers and Project Managers, designers, and the utilities themselves, with a complete set of plans, an accurate sense of how and where the relocations shall take place, when these relocations shall occur in relation to the construction phase activities, and an accurate estimate of these relocation costs.

3. Utility coordination solutions take into consideration the cost of utility relocations, duration of utility relocations, and constructability of the project in relation to utility relocations. All of these elements are coordinated during the design phase prior to putting plans, specifications, and estimate (PS&E) packages out to contractors for bid.

4. This chapter outlines the MassDOT Engineering Directives and how they are to be implemented, and describes the process of utility coordination from the beginning stages of project design through construction. Because these Directives are subject to change, the most current versions are available on MassDOT's Utility web page at http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx.

    a. Engineering Directive E-07-002, *Proposed Utility Relocations within MassDOT Design Projects*.

    b. Engineering Directive E-11-003, *Electronic Utility Plan Submission*.

    c. Engineering Directive E-11-005, *Right of Way Policy for Utility Relocations within MassDOT Projects*.

    d. Engineering Directive E-11-006, *Proposed Utility Relocation Durations within MassDOT Construction Contracts*.

    e. Engineering Directive E-11-008, *MassDOT Utility Reimbursement Policy*.

    f. Engineering Directive E-12-003, *Environmental Permitting Policy for Utility Relocations within MassDOT Projects*.

    g. MassDOT Force Account Reimbursement Guidance.

B. General Considerations

1. The utility owner shall take into consideration all applicable laws, codes, requirements, directives, etc. when relocating a utility facility, including, for example, ADA requirements, municipal codes and policies on placement of utility facilities, and the directives listed below. Utility companies should utilize roadway flaggers in lieu of police details when the conditions of 701 CMR 7.00 are met.

2. In the event that, at the request of a utility company, a municipality is unable to produce documentation or code and/or policy requirements, and the utility has addressed all other applicable requirements, then the municipality shall not be allowed to direct the utility company on the location of the utility facility solely on an aesthetic and/or convenience basis.

C. Engineering Directive E-07-002 "Proposed Utility Relocations within MassDOT Design Projects"

1. In accordance with MassHighway's *Project Development and Design Guide*, MassDOT protocols, and accepted engineering practice, all proposed public and private utility relocations (aerial and underground) shall be noted within the design plans for all projects. The design engineer shall be responsible for ensuring that this requirement is met.

2. The proposed utility locations shall be noted within all design plan phases and shall be noted within the general construction plans and/or on the utility plans.

3. Proposed aerial utility relocations shall show the proposed utility pole and overhead wire locations. Note that MassDOT requires accessible paths of travel in accordance with the *Project Development and Design Guide*, ADA and AAB regulations, and other relevant guidance documents, laws and regulations.

D. Engineering Directive E-11-003 "Electronic Utility Plan Submission"

1. In accordance with this Directive, designers shall show the utilities in their individual designated colors as per Dig Safe code. These are:

Utility	Color
Electric	Red
Gas-Oil-Steam	Brown
Communication/CATV	Orange
Potable Water	Blue
Sewer	Green
Drainage	Traditional Grayscale

2. Proposed utility alignments shall be shown using a **heavier line weight (or thickness)** than the existing facility line weight.

3. The utility facilities shall be labeled and drawn in accordance with this Directive and other MassDOT AutoCAD drafting policies and directives.

E. Engineering Directive E-11-005 "Right of Way Policy for Utility Relocations within MassDOT Projects"

1. This policy is adopted in accordance with M.G.L. c. 6C, §§ 3(21) & 19, 23 C.F.R. § 645 *et. Seq.* (for federal-aid projects), and the American Association of State Highway and Transportation Officials ("AASHTO") Standing Committee on Highways, Strategic Plan Strategy 4-4 (dated. January 6, 2004).

2. This policy requires MassDOT to prepare and secure any necessary layout alterations and plans for accommodating, removing or relocating utilities and utility facilities authorized by law to locate within the highway ROW. Utilities and utility facilities include but are not limited to wires, pipes, poles and conduits, whether above, on, through, or below ground, which require relocation due to the proposed construction project, on a permanent or temporary basis. Sufficient property rights shall also be acquired to accommodate any ongoing maintenance obligations by the utility owner of the facility.

3. The designer and the utility owners shall determine the locations and amount of property takings and/or easements required at the 75 percent design stage. MassDOT shall establish if the ROW takings are reasonable, and whether additional work by utilities is required to reduce ROW impacts and costs.

4. If a utility owner decides to change the location of the accommodated or relocated facilities after the project is advertised, and if this change results in additional ROW requirements, the utility owner may be responsible for the associated costs incurred.

5. This policy is for MassDOT projects in which MassDOT is the responsible party for acquiring the ROW for the project. However, MassDOT recommends that all municipalities, to the extent permissible, adopt this policy for transportation improvement projects for which they are responsible for securing the necessary ROW, as it reduces costs and project impacts associated with relocated construction delays.

F. Engineering Directive E-11-006 "Proposed Utility Relocation Durations within MassDOT Construction Contracts"

1. As per current policies, prior to the project's advertising, each utility will submit to the State Utility Engineer a scope of work, an estimated budget of costs, and the estimated utility durations for the phases of work needed to be done to complete the utility relocations. The State Utility Engineer shall review the documentation and file for future force accounts to be executed soon after the project's advertising date. This information will also be forwarded to the MassDOT Project Manager, (PM) and the District Utility/Constructability Engineer (DUCE).

2. The DUCE shall compile this documentation and insert the durations, etc. into the MassDOT Project Utility Coordination Form (PUC Form). This form shall be rendered complete when all of the utility relocation scopes, budgets, and duration schedules have been entered into the form

3. The PM shall request the DUCE to forward a completed Project Utility Coordination (PUC) Form to the PM. This form shall include the durations of the utility relocations, the sequence of the utility relocations, and an estimated timeframe of when the relocations should begin and end in relation to the proposed construction contract phasing. If at the time of the PM's request for the PUC Form, a certain utility has not yet supplied the information, the DUCE may estimate the time duration. These estimated time durations shall be properly noted within the form. If/when the utility does provide the duration information, the DUCE shall resubmit the form to the PM so that the most accurate information is included within the construction contract and the estimated construction contract duration. If the utilities have not provided information prior to the project's bid opening, the estimated durations shall remain within the PUC Form.

4. Upon receipt of the PUC Form, the PM will then include this information within the construction contract duration request to the MassDOT State Construction Engineer. The MassDOT Area Construction Engineer shall use this information within the calculations when deriving the overall construction contract duration.

5. The PM shall also forward the PUC Form to the project's design consultant. The consultant shall include it in the construction contract.

6. Including this information in the construction contract documents will give proper notice to the construction contractors that are bidding on the project of what is expected in time, scope, and coordination between the contractor, MassDOT Construction, and the utilities.

G. Engineering Directive E-11-008 "MassDOT Utility Reimbursement Policy"

1. Effective for all MassDOT projects advertised after September 30, 2012, MassDOT shall reimburse utility owners for necessary relocations of their facilities within MassDOT projects if the relocations are completed to the satisfaction of MassDOT, within target dates established by MassDOT, and in accordance with design criteria set forth by MassDOT, pursuant to M.G.L. c. 6C, § 44. Private utility owners shall be reimbursed through an incentive-based policy, and municipal utility owners shall be fully reimbursed.

    a. Privately Owned Utilities

        i. MassDOT shall reimburse the owners of privately-owned utilities at least 50 percent of the actual costs incurred for necessary relocation of their facilities on an incentive/schedule basis except as noted below.

        ii. MassDOT may, on a case-by-case basis, increase the reimbursement percentage for incentive-based relocation of privately-owned utilities. In these cases, MassDOT shall provide written notification of the reimbursement percentage to the utility owner prior to execution of the Utility Relocation Force account agreement for the relevant work.

        iii. For privately-owned utilities holding ownership fee to property or occupancy easement rights, including Railroads, MassDOT shall reimburse the owners of these utilities 100 percent of the actual costs incurred for necessary relocation for their facilities.

b. Municipally Owned Utilities: MassDOT shall reimburse the owners of municipally-owned utilities 100 percent of the actual costs incurred for the necessary relocation of their facilities.

c. Relocations/Adjustments of Private Underground Utility Service Connections

   i. Typically, underground utility service connections to private customers are owned by the customers. As a result, according to the utility owners, if a customer-owned underground utility service connection needs to be relocated or adjusted, the utility owner is not responsible for this work.

   ii. MassDOT will assume all costs for relocated or adjusting private underground utility service connections that are necessitated by the Department's construction and maintenance projects. These costs may be incorporated within the Utility Force Account Agreement, construction contract items, or a combination of both, as determined by MassDOT.

d. Adjustment to Structures. Adjustments to gate boxes, manholes, and any other structures necessitated by a proposed project are not considered utility relocations and are not eligible for reimbursement under this policy. For municipally-owned utilities, this work should normally be completed by MassDOT's construction contractor using construction contract bid items. For privately-owned utilities, this work should normally be completed by the utility owner with their own work forces.

H. Engineering Directive E-12-003 "Environmental Permitting Policy for Utility Relocations within MassDOT Projects"

1. The purpose of this Engineering Directive is to reiterate that the environmental permits for all MassDOT projects shall include considerations for all utility relocation necessitated by each project.

2. In accordance to Engineering Directive E-07-002, the project construction plans shall show all proposed utility relocations necessitated by the proposed project. Therefore, all utility relocations identified during the design phase of the project, within and sometimes immediately outside the project limits, shall be considered accessory to the project, and shall therefore be covered by the project's environmental permits.

3. However, if the utility owner changes their utility relocation post-design and if the proposed work cannot be completed within the permitted area or within the conditions set in the permit(s), the utility owner shall be responsible for obtaining the necessary environmental permits associated with this work.

I. MassDOT Force Account Reimbursement Guidance

1. This guidance document shows the "evolution" of the utility force account agreement from the design stage through the Resident Engineer's and the District Construction Office's responsibility.

2. It should establish the responsibilities of entities such as the design consultant, MassDOT Project Manager, MassDOT State Utilities Engineer, District Utility/Constructability Engineer, MassDOT Construction Contractor, and MassDOT Resident Engineer, as well as the utility companies.

3. This should be used as a tool for the entities to establish what their duties are with regard to the incentive based force accounts, and dictate when and by whom their respective actions need to take place.

Chapter 8

8 - FREEWAYS

A. Locations

1. An inventory of metropolitan and rural area State highway routes in Massachusetts is maintained in a table that can be accessed from http://services.massdot.state.ma.us/maptemplate/roadinventory.

2. MassDOT reserves the right to add locations as existing highways are changed to freeway standards and as new census data is received.

B. Crossings

1. New utility facility installations and relocations of existing utility facilities may be permitted to cross a freeway. Where a utility facility follows a crossroad that is carried over or under a freeway, provisions should be made for the utility facility to cross the freeway on the crossroad in such a manner that it can be constructed and serviced without access from the freeway traffic lanes or ramps.

2. Overhead utility lines crossing a freeway shall be adjusted so that supporting structures are located outside control of access lines. In no case shall the supporting poles be placed within the clear zone. Where required, intermediate supporting poles may be placed in medians of sufficient width to provide the clear zone from the edges of both traveled ways. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way. When right of way lines and access control lines are not the same, such as when frontage roads are provided, supporting poles may be located in the area between them.

3. At interchange areas, supports for overhead facility shall be permitted only when the appropriate clear zone is provided, sight distance is not impaired, and access can be safely obtained.

4. Manholes and other points of access to underground facility crossing a freeway may be permitted only when they are located beyond the clear zone of the freeway traffic lanes or ramps. If additional lanes are planned, the clear zone shall be determined from the ultimate edges of the traveled way.

5. Irrigation ditches and water canals should be excluded from freeways. When a crossing is absolutely necessary, it may be made by underground siphon or through culverts or bridges as appropriate to the size of canal, topographic conditions, and highway safety aspects. Locations and structures are to be designed in the same manner as facilities for natural transverse drainage. All access and egress for servicing such facilities shall be from outside the access control lines.

C. Longitudinal Installations

1. The installation of new utility facilities shall not be allowed longitudinally within the right of way of any freeway, except in special cases under strictly controlled conditions as detailed in Chapter 5. When a utility already exists within the right of way and it can be serviced, maintained, and operated without access from the freeway traffic lanes or ramps, it may be allowed to remain as long as it does not adversely affect the safety, durability, construction, operation, maintenance, or service life of the freeway. Otherwise it shall be relocated.

2. When utility owners believe special circumstances exist, they must present their case for longitudinal installations on freeways as early in the pre-design process as possible. Where such installations are requested, the utility owner shall in each case demonstrate to MassDOT's satisfaction that:

    a. The accommodation will not adversely affect the safety, durability, construction, traffic operations, maintenance, or service life 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 outside 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 MassDOT Highway Administrator.

    e. Access for constructing and servicing utility facility will not adversely affect safety and traffic operations or damage any highway facility.

3. In all cases of new longitudinal utility accommodations, whether for freeways or non-freeways, the utility owner shall obtain a highway access permit and install the utility facility in accordance with the approved permit.

D. Vehicular Tunnels

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

2. When a utility facility occupies space in an existing vehicular tunnel that is converted to a freeway, relocation of the utility may not be required. Utilities that have not previously occupied an existing vehicular tunnel that is incorporated into a freeway will not be permitted therein except in extreme cases. Fiber optic and cellular deployments are typical and shall not be considered "extreme cases."

E. Utility Access

1. MassDOT has the authority to control access to all highways under its jurisdiction. This authority is particularly applicable to freeways.

2. Direct access to a utility facility is generally discouraged but may be permitted when alternate locations and means of access are not available or are impractical, as long as such access does not adversely affect safety or traffic operations or damage any facility. See Chapter 4.D for additional information regarding access for utilities.

Chapter 9

9 - STRUCTURE REQUIREMENTS

A. Utility Facilities on Highway Bridge Structures

1. Utility facility installations on highway structures are allowed by a highway access permit or may be provided for by agreement when installed in conjunction with highway construction. MassDOT's Bridge Division shall approve such installations before construction of the facility begins.

2. The utility owner is responsible for the design of its facility, subject to MassDOT approval. Factors influencing the design of an installation are the effects of traffic flow, structural integrity and adequacy of highway structures, load carrying capacity, ease of highway, bridge and utility maintenance, bridge inspection, and aesthetic appearance of the installation. Proposed utility support attachments shall be designed by a Massachusetts Licensed Professional Structural Engineer. Design shall be in accordance with the latest edition of the AASHTO *LRFD Bridge Design Specifications* and the MassHighway *Bridge Manual*.

3. All utility facilities installed on highway structures shall be constructed of durable and non-corrosive materials designed with a long life expectancy (minimum of 75 years), and must be installed in a manner that will minimize routine servicing and maintenance over the design life of the facility.

4. Future growth of a utility shall be considered. The system shall be planned so as to avoid interference with highway traffic in the event that expansion is required. It may be advantageous to install utility facilities at the time of MassDOT bridge construction to minimize the expense of a future expansion program.

5. Generally, utility facility installations on structures shall be located above the underside of the superstructure and inside of the fascia elements. The strength of beams or girders cannot be compromised by drilling bolt holes for utility supports. Field welding on structures is not permitted. Expansion should be provided for on all conduit and pipe runs, unless utility can demonstrate that stresses on the conduit/pipe runs do not exceed allowable stresses for the specified materials. The utility owner shall provide for expansion on all conduit and pipe runs. This requirement may be waived if the utility owner performs a stress analysis for pipelines on bridges and demonstrates that expansion accommodation is not required. All supports shall be of a non-rusting material. Any abutment opening around a utility installation shall be sealed.

6. Because of concerns of potential impacts from trucks and/or high loads on trailers, gas and electric power installations on bridges that cross other roadways shall generally be located in an interior girder bay (a minimum of two girders in from the edge of structure), with a minimum vertical clearance of six (6) inches between the bottom of slab and the nearest portion of the pipeline or pipeline fitting. Utility owners may propose alternatives where there are design alternatives to locating, for example, under the sidewalk in the first girder bay. Such proposals shall require approval of MassDOT Bridge Section. Note that gas installations shall not be collocated in the same girder bay with power and communications installations.

7. Installations of all utility facilities near bridge structures supported on spread footings shall be subject to the following restrictions:

    a. No soils shall be disturbed below a line extending from the bottom of the footing horizontally for a distance of three (3) feet from the edge of the footing and then continuing downwards and outwards on a 2:1 slope.

b. Any lines carrying fluids (e.g. water, sanitary sewer, storm drain lines) that are within fifty (50) feet of the edge of any spread footing shall be cased unless the elevation of the line is fifteen (15) feet or more above or fifty (50) feet or more below the footing elevation. If it is impracticable to case storm drain lines, they shall be placed outside the "50 foot line."

8. All visible utility facilities installed on any bridge structure shall be clearly and permanently labeled. Each utility conduit or pipe shall be labeled at each approach (and pier if multiple span) which shall include the utility owner's name, 24 hour contact information, the type of utility, (for electric - the amount of voltage; for gas - the type of gas and pressure) and all other pertinent information that may assist public safety or MassDOT personnel in identifying potential hazardous conditions. These labels shall be clearly visible to public safety and MassDOT personnel.

9. Conduit shall be galvanized steel (may be coated) or fiberglass (heavy wall, above grade). A duct or conduit shall generally terminate in the shoulder beyond the bridge approach slabs.

10. MassDOT procedures limit parallel pipeline installations on highway structures to water, steam, sewer, cable TV, fiber optic lines, electrical power lines, and natural gas distribution pipelines. All are to be installed in accordance with the latest applicable codes.

11. Natural gas pipeline installations on highway bridge structures are subject to the following additional requirements:

    a. The size of the pipeline shall be restricted by the size of the beam on the supporting structure, taking into consideration the capability of the structure to support the size and weight of proposed pipeline and sleeve.

    b. Any pipeline with an operating pressure greater than 200 psi shall require the approval of the Massachusetts Department of Public Utilities (DPU). 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 casings shall be vented in a manner acceptable to MassDOT.

d. Pipelines shall be steel pipe and all joints, except expansion joints, shall be welded. Plastic pipe installed in steel casing and in accordance with 49 CFR 192.321(h) shall also be acceptable.

e. The pipeline installation must be designed and installed so that the bridge structure and vehicular traffic do not create hoop stress on the pipe.

f. The operating pressure of the pipeline must not create hoop stress in excess of twenty (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).

g. Gas mains over MBTA, Amtrak, CSX and other railroads must also follow relevant railroad restrictions, which may require the line to be cased.

h. No permit for the installation of gas facilities on bridges will be considered unless MassDOT has received a letter from the DPU approving the design (see 220 CMR 101.06(10)(b)3.

12. High Voltage electric power transmission line installations (>35kV) on bridge structures shall generally not be permitted except in extraordinary circumstances, and then only after a detailed analysis of all other construction methods or alternatives are determined not to be practicable. The increased cost of alternative construction methods will not be considered a reason for the installation of high voltage transmission lines on bridge structures. In addition, the utility owner shall address the following safety and operational issues to MassDOT'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 injection potential, potential increased corrosion deterioration of reinforcing and structural steel, and long-term health effects of maintenance personnel working on the bridge for extended periods of time.

d. The proposed installation will be adequately designed to reduce the possibility of any shock hazards when installed on bridges that allow overtopping of flood waters or submersion of superstructure in high water.

e. The proposed installation would not pose environmental problems now or in the foreseeable future.

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

g. All electric lines shall be labeled at each approach (and pier if multiple span) which shall include the owner's name, type of gas and pressure and all other pertinent information that may assist public safety or MassDOT personnel in identifying potentially hazardous conditions.

B. Utility Tunnels and Bridges

1. A utility tunnel or bridge may be provided for a carrier or casing crossing a major highway at a strategic location. Such tunnel or bridge may serve a joint purpose as a utility and pedestrian facility and/or sign support structure. Where it can be foreseen that several utility crossings will be needed, the cost of a tunnel (either large casing or a box culvert) or a bridge may be less than the cost of several entrenched or separate carriers or casings. Where these conditions exist, MassDOT should take steps as necessary to ensure that adequate coordination is performed with and among the utility owners to:

    a. Anticipate utility needs for future crossings;

    b. Combine facilities into a single joint use crossing;

    c. Establish applicable permitting procedures;

d. Establish applicable MassDOT requirements and expectations pertinent to designing, constructing, inspecting, and maintaining utility tunnels and bridges.

2. In a tunnel or on a bridge, provisions shall be made to isolate mutually hazardous materials being carried, such as fuel and electric energy, by compartmentalizing or by auxiliary encasement of incompatible carriers. They shall also be labeled as noted in Section A.

3. The utility tunnel or utility bridge structure shall conform in appearance, location, cover, earthwork, and markers to MassDOT's standard culvert and bridge practices and shall be referenced by a bridge number obtained from the MassDOT Bridge Office.

4. Prior to installing a utility tunnel or bridge, utility owners shall agree that any maintenance, servicing, or repair of the utility lines will be their responsibility. They shall also agree that the cost of designing, constructing, and maintaining the utility tunnel or bridge is to be divided among the utility owners in an agreed upon and equitable manner. MassDOT will participate in these costs only to the extent that the utility owner would otherwise normally be reimbursable for such work or to the extent that the structure is used for highway purposes.

C. Lighting and Other Above-Ground Structures

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

   a. Right of way width limits are less than the clear zone requirements and it is not cost effective to acquire additional right of way.

   b. Light poles conform to breakaway design features as defined in the most current edition of the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals*.

   c. No ground structure or base protrudes more than four (4) inches above the surface of the natural ground and can be maintained at that level.

d. The recommended installation is at least ten (10) feet from the edge of pavement or two (2) feet behind the face of the curb in an area where the posted speed limit is forty (40) miles per hour or less.

e. The facility is shielded by an already existing guardrail or is located in an area that is inaccessible to vehicular traffic.

Chapter 10

10 - DESIGN REQUIREMENTS

A. General

1. Highway and utility facilities – by tradition, practice, and in some instances, laws – frequently co-exist within or along the same corridors. Therefore, it is essential that these public service facilities be compatibly designed and operated. Joint highway and utility planning and development efforts should be encouraged.

2. The potential impact on the highway and its use must be considered in the design and location of utility facilities on or along the highway. Consideration should also be given to the utility service needs of the area traversed where such service is to be provided from utility facilities on or near the highway.

3. All utility installations on, over, or under highway right of way and attachments to highway structures shall be of durable materials designed for a long service life expectancy and relatively free from routine servicing and maintenance.

4. Utility and highway facilities shall, to the extent possible, be separated to avoid damage during installation and to provide for reasonable success in locating facilities with electronic devices. Separation of the facilities from highway facilities or other utilities may require the acquisition of additional property by the utility owner. Utility facilities shall also be

separated from one another as required by appropriate codes and ordinances.

5. On new facility installations or adjustments of existing ones, provisions should be made for known or planned expansion of the utility facilities, particularly those located underground or attached to bridges. They should be planned to minimize hazards and interference with highway traffic when additional facilities are installed at some future date.

B. Responsibilities

1. MassDOT Responsibilities. MassDOT is responsible for the review and approval of proposals from utility owners in accordance with the provisions in this *Policy.*

2. Utility Owner Responsibilities. Utility owners are responsible for:

    a. Designing the utility facility to be installed within the highway right of way and/or attached to a highway structure. Full consideration must be given to measures necessary to preserve and protect the maintenance, operation, safety, and aesthetic characteristics of the highway and/or structure. Depth, clearances, and separation between utility facilities and the work must be in accordance with the provisions in this document and any and all applicable codes, laws mandated by federal regulations, guidelines and policies, Massachusetts General Laws, OSHA, etc.

    b. Collecting and depicting information in accordance with Massachusetts General Laws, 220 CMR - 101.00 (gas), 125.00 (electric transmission), and in accordance with procedures set forth in ASCE Standard 38-02, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data,* and/or most recent version of MassDOT policies, procedures, codes, etc. See Chapter 10.D below for more information.

C. Requirements

Utility installations on, over, or under highway right of way shall meet the following minimum requirements and any applicable industry standards:

1. Electric power and communications facilities shall conform to the currently applicable National Electrical Safety Code. For configurations and circumstances not specifically identified in the Code, the minimum standards in that Code for the lowest voltage line shall apply. Utility owners or industry standards may prescribe more protection. Depending upon the installation, MassDOT may have more restrictive requirements (See Chapter 12 of this *Policy)*.

2. Water lines shall conform to applicable standards by the American Water Works Association.

3. Pressure pipelines shall conform to currently applicable federal, State, local and industry codes. Federal codes are contained in 49 CFR Parts 192, 193 and 195.

4. Liquid petroleum pipelines shall conform to the currently applicable recommended practice of the American Petroleum Institute for pipeline crossings under highways.

5. Any pipeline carrying hazardous materials shall conform to the rules and regulations of the U.S. Department of Transportation governing the transportation of such materials.

D. Subsurface Utility Engineering (SUE)

1. Subsurface Utility Engineering (SUE) is defined as a branch of engineering practice that involves managing certain risks associated with the following: utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.

2. The SUE process should be an integral part of the design for every new utility facility installation on highway right of way. Upon MassDOT review of the proposed scope of work, MassDOT shall decide on a case-by-case basis as to whether or not an SUE shall be required. The SUE process for collecting and depicting information about existing subsurface utility facilities is described in ASCE Standard 38-02, *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*. This standard provides a system of classifying quality levels of existing underground utility data that are placed on plans. Such classifications allow the project owner, the engineer, and the contractor to develop strategies to reduce the risk, or at a minimum, to allocate risk to existing underground utilities in a defined manner.

3. The SUE process involves systematically evaluating the need for accurate and comprehensive information. The SUE process typically works as follows:

    a. SUE normally begins with the collection and correlation of existing utility records (Quality Level D) and survey of visible utility facilities (Quality Level C).

    b. It may then proceed to the application of appropriate surface geophysical methods to determine the existence and horizontal position of utility facilities within the area of the proposed excavation (Quality Level B).

    c. This information is surveyed to project control, correlated with previously obtained information, and analyzed for conflicts with the proposed installation.

    d. It may then be determined that additional information is needed that involves physically exposing existing subsurface utility facilities (Quality Level A).

4. SUE is a step-by-step process. There are other steps in addition to those shown above, but the ones shown above establish the general framework for the process and utilize the basic technologies (surface geophysical methods for utility imaging and vacuum excavation for nondestructive excavation). Decisions are made at every step as to whether or not more information is needed.

5. The proper use of SUE during the development of highway projects will eliminate many of the utility problems typically encountered on highway projects including:

    a. Delays to projects caused by waiting for utility relocation work to be completed so highway construction can begin;

    b. Delays to projects caused by redesign when construction cannot follow the original design due to unexpected utility conflicts;

    c. Delays to contractors during highway construction caused by cutting, damaging, or discovering utility lines that were not known to be there;

    d. Claims by contractors for delays resulting from unexpected encounters with utilities;

    e. Deaths, injuries, property damage, and releases of product into the environment caused by cutting utility lines that were not known to be there.

Chapter 11

11 - CONSTRUCTION REQUIREMENTS

A. General

1. Construction requirements are included as an integral part of MassDOT permits. These requirements are not repeated verbatim in this *Policy*. It will be the permittee's responsibility to be aware of all the construction requirements contained in the approved permit and to comply with them.

2. In addition to any requirements specified in the highway access permits, all permittees will be required to comply with the following:

    a. Permit at Job Site. When MassDOT issues a permit to a utility owner for its proposed work, a complete copy of the approved permit shall be in the possession of the utility owner's work force, consultant, contractor or subcontractor at all times when utility work is being performed within the highway right of way.

    b. Use of Highway Median. Any use of a highway median is prohibited unless specifically authorized in the approved permit.

c. Use of Temporary Guard Pole. No guard pole (i.e. pole used to prevent aerial lines from falling onto the traveled way) shall be set within the right of way unless specifically authorized in the approved permit.

d. Unexpected Field Conditions. Any modifications of the terms of the approved permit to meet changed or unexpected field conditions shall require prior MassDOT approval before any work may proceed. A written request must be made to amend the permit to allow such changes under the approved permit.

e. Blasting. Blasting on the right of way is prohibited unless specifically authorized in the approved permit, and in strict accordance with the terms and conditions stated therein.

f. Survey Markers. Neither MassDOT survey markers (e.g. right of way marker, benchmark) nor any other survey markers (e.g. USGS, County) located on MassDOT right of way shall be disturbed unless prior approval has been obtained from MassDOT or their owners. MassDOT or the utility owner, at the expense of the permittee, shall restore any survey marker that is disturbed, removed or destroyed.

g. Vegetation. No trees, shrubs, or other vegetation shall be sprayed, cut, trimmed, or damaged in any way to facilitate the installation of a utility facility unless specifically authorized in the approved permit, and in strict accordance with the terms and conditions stated therein.

h. Rare or Endangered Species. Utility owners should be aware of rare or endangered species, or animal and insect species that feed off of native vegetation in the right of way that must be protected or avoided by law.

i. Highway Signs. A utility owner shall not remove any highway sign unless approved to do so in its permit, and in strict accordance with the terms and conditions stated therein.

B. Temporary Traffic Control

1. Temporary traffic control for utility construction shall conform to the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices*, the most current edition of the *MUTCD* and the *MassDOT Work Zone Safety Guidelines for Massachusetts Municipalities and Contractors*. 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 temporary traffic control devices are in place and fully functional. These temporary traffic control devices must be maintained until all utility work is complete.

3. For those operations that entirely close or encroach upon a traffic lane, shoulder or ramp, a proper temporary traffic control plan shall be submitted or made reference to with a utility owner's permit application. On heavily traveled highways, utility construction operations interfering with traffic will not be allowed during periods of peak traffic flow.

4. Based on the duration of field work, all utility work that takes longer than 15 minutes to perform should utilize appropriate typical diagrams contained in the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices*, the most current edition of the *MUTCD* and the *MassDOT Work Zone Safety Guidelines for Massachusetts Municipalities and Contractors*.

5. If desired, a utility owner may develop its own temporary traffic control plan contingent upon MassDOT approval. MassDOT may require a more extensive temporary traffic control plan if:

    a. Utility work is to be performed during nighttime hours;

    b. Temporary 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 temporary traffic control zone;

    d. Typical diagrams in the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices*, the most current edition of the *MUTCD* and the *MassDOT Work Zone Safety Guidelines for Massachusetts Municipalities and Contractors* do not adequately cover utility work.

6. Most utility operations fall into the category of short-term work. The work crew is present to maintain and monitor the temporary traffic control zone. Signs are mounted on portable stands and pavement markings are not removed.

7. Mobile temporary operations often involve frequent short stops for utility work during daylight hours that will be completed in 15 minutes or less. As compared to stationary operations, mobile operations are activities that might involve different treatments. Basic considerations for mobile temporary work are as follows:

    a. Maintaining safe work and road user conditions is a paramount goal in carrying out mobile operations. During mobile work, it often takes longer to set up and remove temporary traffic control devices than to perform the work. Workers face hazards in setting up and taking down the temporary traffic control zone. Also, since time is short, delays affecting road users are significantly increased when additional devices are installed and removed. Considering these factors, simplified control procedures may be warranted for short-duration work. A reduction in the number of signs and channelizing devices may be offset by the use of some or all of the following safety devices: truck mounted attenuators, marked vehicles with rotating lights or strobe lights preferably augmented with signs or arrow boards, and flaggers/police.

    b. Most mobile work activity usually does not require the use of a specific temporary traffic control plan. Even so, a utility owner is still responsible for providing temporary traffic control adequate to protect public safety. If a mobile operation does not move every 15 minutes, a long-term operation and the appropriate long-term layout should be considered. If sight distance is limited or traffic volumes are high, a long-term operation should be considered.

c. Safety shall not be compromised by using fewer devices simply because the operation is only for a few minutes or will frequently change its location. Portable devices shall be used and flaggers/police may be used, but caution must be exercised so they are not exposed to unnecessary hazards. The temporary traffic control devices shall be moved periodically to keep them near the work space. If mobile operations are in effect on a high speed travel lane or shoulder lane of a multi-lane (high volume/high speed) highway, a truck mounted attenuator with an arrow board shall be used.

C. Work Safety

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

2. Sheeting, shoring, bulkheads, and concrete barriers may be required by MassDOT, as may anything else deemed to comply with OSHA requirements for safeguarding work sites.

3. Utility hardware or equipment that is located at the work site, but not in immediate use, shall 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 zones as close to the fence or right of way line as possible.

4. Vehicles and equipment shall have their high intensity flashing lights (strobe or revolving) and hazard warning lights operating during work operations when they are within the right of way.

5. All workers (utility, MassDOT, contractor, etc.) who are exposed to or working adjacent to moving motor vehicle traffic or mobile earth-moving equipment shall wear high visibility apparel meeting MassDOT standards (safety vest, shirt or jacket and a hardhat) at all times. High visibility pants are also required at all times for flag persons and during low light and night time conditions for all others. High visibility apparel shall comply with the requirements set forth in the *Massachusetts Amendments to the Manual on Uniform Traffic Control Devices.*

D. Trenching and Backfill

1. Trenchless Construction

    a. Every possible effort should be made to avoid disturbing the pavement surface when installing new utility facilities, especially where underground utility lines are crossing major highways, expressways, or freeways. Trenchless construction should always be considered as a means of doing this. Trenchless methods may include driving, coring, or boring.

    b. The size of the trenchless construction operation will be restricted and the conditions specified under which the void outside the carrier or casing must be backfilled with grout. Where soils are favorable and the carrier is four (4) feet or more deep, the diameter of the trenchless construction hole may be five (5) percent larger than the diameter of the carrier. Grout backfill will be considered for carriers or casings more than twelve (12) inches in diameter and for overbreaks, unused holes, or out-of-service carriers or casings.

    c. Portal limits (e.g. surface openings, bore pit limits) of pipeline crossings should be established beyond the clear zone of the highway so as to avoid impairing the roadway during installation of the pipeline. Where a bulkhead seals the pipeline portal, the portal should be suitably offset from the surfaced area of the highway. Where a bulkhead is not installed in the pipeline, the portal must be offset no less than the vertical difference in elevation between the surfaced area of the highway and the pipeline.

2. Trenched Construction

    a. At highway crossings, care must be taken to prevent the trench from becoming a drainage channel. On longitudinal lines, care must be taken to prevent the trench from interfering with surface or subsurface drainage.

    b. During construction, open trenches or other excavations within the clear zone shall not be permitted to remain beyond the workday unless backfilled, covered, delineated or shielded.

    c. The following minimum specifications for trenching and backfilling shall be applied:

i. When the existing highway pavement must be cut to accommodate a utility facility installation, the opening shall be saw cut to a minimum depth of one and one-half (1.5) inches.

ii. The width of pavement removal should be determined by the width of the required trench plus twelve (12) inches minimum on each side of the top of trench. In the event the distance of any adjacent longitudinal or transverse joint or crack is less than four (4) feet from the recommended width of cut, the pavement shall be removed and replaced to that joint or crack. The additional pavement removal is intended to minimize later development of a sag in the surface of pavement over the trench.

iii. Trenches shall be cut to have vertical faces; soil shall be shored where necessary. Lateral and vertical support shall be provided for all existing facilities and structures. Short tunnel sections shall be used near adjacent facilities.

iv. Bedding shall be provided to a depth of six (6) inches or half the diameter of the casing or carrier, whichever is less. Bedding shall consist of granular material, free of lumps, clods, stones, and frozen materials, and shall be graded to a firm but yielding surface without abrupt change in bearing value. Unstable soils and rock ledges shall be sub-excavated from the bedding zone and replaced by suitable material. The bottom of the trench shall be prepared to provide uniform bedding throughout the length of the installation.

v. Controlled Density Fill (CDF) shall be the standard backfill material for work performed under a MassDOT permit. Gas Companies may seek a waiver due to corrosion of pipe and leak detection issues. All work shall conform to MassHighway's *Standard Specifications for Highways and Bridges*, 1988, as supplemented. CDF shall meet the requirements of Section M4.08.0 (Type 1E or 2E excavatable) of the referenced document. CDF is mandatory for trench cuts within paved surfaces that are four (4) feet or less.

vi. Backfill under the roadway and foreslopes shall be placed in two (2) stages: first, fill to a level of the top carrier or casing; and second, fill to the former surface. Fill shall 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 shall be adapted to achieve prompt restoration of traffic service.

vii. MassDOT may require that backfill and/or repaving to MassDOT standards 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 MassDOT.

viii. The utility shall be responsible for repairing all settlements for a period of one year following the project completion.

ix. The option to require the utility applicant to resurface the roadway (either half or full width) shall be determined by MassDOT based on the amount of trench work.

E. Encasement

1. Casings should be considered for the following conditions:

    a. As an expediency in the insertion, removal, replacement, or maintenance of carrier pipe crossings of freeways, expressways, and other controlled access highways, and at other locations where it is necessary to avoid trenched construction;

    b. As protection for carrier pipe from external loads of shocks either during or after construction;

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;

d. For installation on highway structures.

2. The MassDOT Highway Administrator will determine the need for casings of pressurized carrier pipes and carriers of materials that are flammable, corrosive, expansive, energized, or unstable.

3. Jacked or bored installations of coated carrier pipes shall be cased. Exceptions may be made where assurance can be provided against damage to the protective coating.

4. Encasement or other suitable protection shall be provided for any pipeline with less than minimum cover, near footings of bridges or other highway structures or across unstable or subsiding ground, or near other locations where hazardous conditions may exist.

5. Rigid encasement or suitable bridging shall be used where support of pavement would be impaired by depression of flexible carrier pipe. Casings shall be designed to support the load of the highway and superimposed loads thereon and, as a minimum, shall 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 should include necessary appurtenances, such as vents and markers.

7. See Chapter 12.C.3 for additional information pertaining to encasement of pipelines.

F. Mechanical Protection

1. For some conditions, pipeline crossings of the highway may be installed without encasement. Normally, such installations should be limited to trenched construction. The following controls are suggested for providing mechanical protection to encased pipeline crossings of the highway.

a. On uncased construction the carrier shall conform to the material and design requirements of utility industry and governmental codes and standards. In addition, 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. Such installations shall employ a higher factor of safety in the design, construction, and testing than would normally be required for cased construction.

b. Suitable bridging, concrete slabs, or other appropriate measures shall be used to protect existing uncased pipelines, which by reason of shallow cover or location make them vulnerable to damage from highway construction or maintenance operations. Such existing lines may remain in place without further protection measures if they are of adequate depth and do not conflict with the highway construction or maintenance operations, provided both highway and utility officials are satisfied that the lines are, and will remain, structurally sound and operationally safe.

c. Uncased crossing of welded steel pipelines that carry flammable, corrosive, expansive, energized, or unstable materials, particularly if carried at high pressure or potential, may be permitted, provided additional protective measures are taken in lieu of encasement. Such measures would employ higher factor of safety in the design, construction, and testing of uncased carrier pipe, including such features as thicker wall pipe, radiograph testing of welds, hydrostatic testing, coating and wrapping, and cathodic protection.

G. Pavement Cuts

1. Open cutting of the pavement to install utility facilities is highly discouraged because it adversely affects the structural integrity of the roadway. If it is not possible to install a utility 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, MassDOT representatives responsible for the affected section of roadway will inspect the roadway to determine the extent of road repair that will be required to incorporate multiple patches in close proximity into one (1) large patch. Pending the extent of the project area, the MassDOT representative shall determine whether to require the applicant to resurface the roadway half or full width. All sawcut edges of pavement cuts shall be treated with a MassDOT approved hot mix asphalt joint sealer.

2. The utility owner shall be required to use patch materials at least equal in type, quality and layer thickness to the original construction, and the patch must be placed in accordance with MassDOT specifications. The limits of the pavement patch must extend at least one (1) foot outside the perimeter of the trench. The edges of the trench must be beveled at least six (6) inches. The limits of the patch must have vertical faces and must be saw cut for a clean break. The restored surface must be flush with and sloped at the same rate as the existing surface (see Utility Trench Permanent Pavement Repair Standard Drawing http://www.massdot.state.ma.us/highway/Departments/UtilitySection/FormsDocuments.aspx.

H. Markers/Facility Protection

1. A trace wire, metallic tape, or other method to effectively locate and mark the underground lines shall accompany all non-metallic underground lines. Whenever feasible, such methods shall include devices incorporated into the utility line.

2. No underground line shall be permitted within the highway right of way unless the line owner contacts the Dig Safe System (888-DIG-SAFE). MassDOT, Massachusetts Water Resources Authority (MWRA), Massachusetts Bay Transportation Authority (MBTA), the Department of Conservation and Recreation (DCR) and most municipalities are not Dig Safe members and must be contacted individually. The utility owner shall provide MassDOT with both a copy of the associated Dig Safe ticket as proof of the Dig Safe notification, and a spreadsheet notification list of contacts made to non-Dig Safe members (contact name, date, action, and related details).

3. The utility owner shall place permanent markers identifying the location of underground utility facilities, whether they are crossing the highway or installed longitudinally along the highway, where appropriate. Markers shall be installed in such a manner as to not interfere with highway safety and maintenance operations. Preferably, the markers shall be located at the right of way line if that location will provide adequate warning. The telephone number for one-call notification services to request marking the line location prior to excavation and for emergency response shall appear on the marker.

4. When it is likely that highway construction or maintenance activities could involve existing underground facilities, it is desirable to locate and identify these facilities well in advance of the commencement of the work as an aid to work crews. The location of each underground utility facility shall be identified by the utility owner with stakes, paint, or other temporary on-the-surface markings coded with an identifying color by utility type. The recommended uniform color code system is shown in Table 3.

TABLE 3- UNIFORM COLOR CODES

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

5. When it is likely that a highway construction or maintenance activity such as boring, tunneling, jacking, or other method could involve underground facilities in close proximity to a MassDOT drainage system, the applicant shall certify upon completion of the work that the utility installation has not damaged or reduced the capacity of the drainage structures or pipes. At the direction of MassDOT, a joint inspection of the facility may be required.

Chapter

12

12 - SPECIFIC REQUIREMENTS

A. Overhead Power and Communication Lines

1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to overhead power and communication lines and need to also be read in order for the reader to fully understand this topic.

2. Location

    a. In rural areas, new overhead power and communication pole lines shall be located on uniform alignment as far from the roadway as possible, preferably near the right of way line. Guy wires placed within the right of way shall be held to a minimum. They may be located as needed but in no case shall they be located within the clear zone. When practical, MassDOT prefers use of "un-guyed" utility poles.

b. In urban areas, new overhead power and communication pole lines in uncurbed sections shall be located at or as near as practical to the right of way line. Where there are curbed sections, the utility facility shall be located as far as practical behind the face of the outer curbs and, where feasible, behind the sidewalks at such locations that will not interfere with adjacent property use. MassDOT's recommendation is that there shall be at least a two (2) foot clearance behind the face of the curb. When practical, MassDOT prefers use of "un-guyed" utility poles.

c. The location of overhead utility facilities on highways with narrow right of way or on urban streets with closely abutting improvements requires special considerations. Such cases must be resolved in a manner consistent with the prevailing limitations and conditions. Before locating the utility facility at other than the right of way line, consideration should be given to designs employing self supporting, armless single-pole construction, with vertical alignment of wires or cables, or other techniques permitted by governmental or industry codes that are conducive to safe traffic environment. Exceptions to these clearances may be made where poles and guys can be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.

d. New above ground facilities shall be located outside the clear zone. If the clear zone extends to the right of way line, then no installation shall be permitted unless approved through the exception process (see Chapter 1, Section H). Where there are no feasible alternatives, new facilities that project more than four (4) inches above the ground line shall be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.

e. Longitudinal lines on highway right of way shall be limited to single pole construction. Transverse lines shall also be limited to single pole construction where practicable, but may also be approved to use the same type of supports that are used on the portion of the line immediately adjacent to the highway right of way provided all other requirements in this section are met.

f. Where irregular shaped portions of the right of way extend beyond or do not reach the normal right of way limits, variances in the location of utility facilities should be allowed to maintain a reasonably uniform alignment for longitudinal installations. Such installations will reduce the need for guys and anchors between poles and roadway.

g. Longitudinal installations of poles, guys, or other facilities shall not be located in a highway median. For crossings of a highway, poles should not be located in the highway median unless there is no feasible alternative, in which case, if located within the clear zone, they shall be shielded by existing traffic barriers or placed in areas that are inaccessible to vehicular traffic.

h. The horizontal and vertical location of overhead power and communication lines relative to a highway bridge or other structure shall provide adequate clearance for construction and maintenance activities.

3. Design

a. All overhead lines regardless of voltage or metallic content shall meet the requirements of the current *National Electrical Safety Code.*

b. Designs employing self-supporting, armless, single-pole construction, with vertical alignment of wires, cables, or other techniques permitted by governmental or industry codes, should be considered whenever feasible. However, they must be conducive to safe traffic operations.

c. Joint-use single pole construction shall be encouraged at locations where more than one utility or type of facility is involved.

d. The distance between utility poles shall be the longest feasible span lengths consistent with geometric and design line loading considerations.

e. Where practical and economically feasible, existing pole lines shall be replaced with buried cables when relocation is necessary within the highway right of way. Buried cable may not be practical where there will be multiple connections to overhead lines, to utility customers, or where line voltage is high.

4. Vertical Clearances

a. The minimum vertical clearance for overhead power and communication lines above the highway and approaches to the highway shall conform to the current *National Electrical Safety Code and 220 CMR 125.*

b. Lines crossing over highways shall at no time be less than 18 feet above the high point of the traveled way. Greater clearances shall be used when required by State law, regulation, or policy.

B. Underground Power and Communication Lines

1. This *Policy* was developed with integrated sections. Thus, other sections may be applicable to underground power and communication lines and need to also be read in order for the reader to fully understand this topic. Due to State legislation and legal arrangements that impact the Commonwealth's development of fiber optics facilities, separate guidelines for these installations are presented in Chapter 5 of this *Policy*. The installation of fiber optics on all other highways is subject to the provision contained herein.

2. Location

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

b. Underground power and communication lines to be installed across any existing roadway shall be installed by boring, tunneling, or jacking in accordance with MassDOT specifications. When installed by jacking or boring, encasement may be required. Bore pits should generally be located at least thirty (30) feet from the edge of the nearest through traffic lane and at least twenty (20) feet from the edge of the pavement on ramps. On low-traffic roadways and frontage roads, bore pits should be at least ten (10) feet from the edge of pavement and at least five (5) feet from the face of the curb. Adequate warning devices, barricades, and protective devices must be used to prevent traffic hazards. Where circumstances necessitate the excavation of a bore pit closer to the edge of pavement than established above, concrete barrier or other approved devices must be installed for protection of traffic. Bore pits must be located and constructed to not interfere with highway structural footings. Shoring must be used if necessary.

c. Utility crossings should be avoided in deep cuts; near footings of bridges, retaining, and noise walls; at highway cross drains where flow of water and drift of streambed load may be obstructed; in wet or rocky terrain where it is difficult to attain minimum cover; and through paved or unpaved slopes under structures.

3. Depth of Cover

a. The critical controls for depth of cover for underground power and communication lines are the low points in the highway cross section. Usually these are the bottoms of the longitudinal ditches. The critical controls for cover are the depths of drainage facilities, bridge structures, and likely maintenance operations. The depth of cover shall be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.

b. Minimum depths for longitudinal power lines are as follows:

i. Lines that are not under the roadway shall have a minimum depth of cover of two and one-half (2.5) feet in soil and two and one-half (2.5) feet in rock for both cased lines and non-cased lines.

ii. Lines that are under the pavement surface shall have a minimum depth of cover of two and one-half (2.5) feet for both cased lines and non-cased lines.

c. Minimum depths for longitudinal communication lines and low voltage power lines are as follows:

i. Lines that are not under the roadways shall have a minimum depth of cover of one and one-half (1.5) feet in soil and one and one-half (1.5) feet in rock for both cased lines and non-cased lines.

ii. Lines that are under the pavement surface shall have a minimum depth of cover of two (2) feet for both cased lines and non-cased lines.

iii. All lines shall have a minimum depth of cover of three (3) feet under ditches.

d. The depth of bury for all underground facilities crossing the highway shall be a minimum of: three (3) feet under ditches and a minimum of five (5) feet under the pavement surface as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of the installation.

e. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.

f. Exceptions may be authorized for existing power and communication lines to remain in place with a reduction of six (6) inches in the depths of cover specified. Where less than minimum cover will result, the utility line shall be provided with additional mechanical protection by the utility owner. In such instances, the designer shall consider increasing wall thickness or encasing the utility facility when the depth of cover is less than desirable, taking into account the relative risk with respect to the product carried and engineering and safety factors.

g. Further reductions may be permitted if the line is protected by a reinforced concrete slab that meets the requirements as follows:

    i. Width: Three (3) times the facility diameter but not less than four (4) feet;

    ii. Thickness: Minimum of six (6) inches;

    iii. Reinforcing: Minimum of #4 bars on 12-inch centers or equivalent;

    iv. Cover: Minimum of six (6) inches between the slab and top of line.

h. All utility owners shall obtain prior approval from MassDOT before burying any utility facility less than the minimum depth required.

i. More information concerning specific utilities can be found in Chapter 6.E of this *Policy*. Minimum depths for all utility facilities are summarized in Table 1, Chapter 6.

4. Encasement

   a. Underground power and communication lines may be cased or non-cased provided the installation complies with the depths of cover specified herein. Encasement, where used, may be metallic or nonmetallic. Such encasement shall be designed to support the load of the highway and superimposed loads thereon, including that of construction equipment. The strength of the encasement must equal or exceed structural requirements for drainage culverts, and it must be composed of materials of satisfactory durability under conditions to which it may be subjected.

   b. Where used, encasement must be provided under center medians, from top of back slope to top of back slope for cut sections, five (5) feet beyond toes 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.

   c. See Chapter 11.E for additional information pertaining to encasement.

5. Appurtenances. See Chapter 6.D for information pertaining to appurtenances associated with underground power and communication lines.

6. Markers/Facility Protection. See Chapter 11.H for information pertaining to markers and facility protection.

C. Pipelines

1. This Policy was developed with integrated sections. Thus, other sections may be applicable to pipelines and need to also be read in order for the reader to fully understand this topic.

2. Codes

a. Pressure pipelines carrying gas and liquid petroleum shall conform to the currently applicable sections of federal, State, local and industry codes. Federal codes are contained in 49 CFR , parts 192, 193, and 195.

b. High pressure gas pipelines shall conform to the current 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 current applicable recommended practice of the American Petroleum Institute for pipeline crossing under highways.

d. Water lines shall conform to the current applicable specifications of the American Water Works Association.

e. Any pipeline carrying hazardous materials shall conform to the rules and regulations of the U.S. Department of Transportation governing the transportation of such materials, including Code of Federal Regulations, title 49, parts 192,193, and 195.

f. Pipeline installation permits shall specify the class of the materials being carried; the maximum working, test, or design pressures; and the design standards for the carrier.

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

3. Encasement

a. All high pressure pipelines less than six (6) inches in diameter and all low pressure pipelines crossing under the roadbed of trunk highways may be cased or non-cased. However, only welded steel lines with adequate corrosion protection may be used for non-cased highway crossings.

b. All high pressure pipelines six (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 be of sufficient inherent strength to withstand the forces imposed by highway and vehicular traffic and must be coated or of a non-corrosive material that meets industry standards.

ii. Trenchless Technology. Pipelines placed using trenchless technologies, such as jacking, boring, or horizontal directional drilling methods, may be placed under highways without a casing pipe if they meet specified requirements. All proposed crossings using this method of installation will be reviewed and approved on a case-by-case basis considering the soil conditions, locations of pipeline, pipeline size, other pipeline, other pertinent factors, and adherences to the following requirements:

1. It is a welded steel pipeline;

2. It is cathodically protected;

3. It is coated in accordance with accepted industry standards;

4. It complies with federal and State requirements and meets accepted industry standards regarding wall thickness and operating stress levels;

5. The depth of the crossing is a minimum of three (3) feet below the original ditch grade;

6. The bores are continuous from the beginning of the installation until the leading edge of the pipeline is through the entire crossing;

7. The completed pipeline crossings are all pressure tested;

8. During pipeline installation, traffic on the highway will not be restricted and all MassDOT regulations will be applied;

9. Grouting will be done along the top of the pipe to fill all voids;

10. Large mains that are out of service in the highway right of way will be removed or filled with approved materials.

c. All water lines shall be cased when crossing under the roadbed of trunk highways, except service lines of two inch diameter or less. Encasement may also be omitted under entrances, depending upon the type and amount of traffic and depth, condition, and maintenance responsibility.

d. Where pipelines are cased, the encasement should extend a suitable distance beyond the slope or ditch lines. On curbed sections, the encasement should extend outside the outer curbs. Where appropriate, the encasement should provide for future widening of the highway without the need for any utility adjustment.

e. See Chapter 11.E for additional information pertaining to encasement.

4. Crossings

a. Pipeline crossings shall be avoided within basins of an underpass drained by a pump if the pipeline carries a liquid, liquefied gas, or other potentially hazardous materials.

b. Installations crossing existing highways and made subsequent to highway construction may be placed by auguring from inside the pipe. Pre-auguring is not permissible. The leading edge of the auger head shall not protrude more than one inch from the end of the casing during boring operations.

c. Carrier pipe six (6) inches in diameter and under may be installed by pushing or jacking it under an existing roadway.

5. Depth of Cover

a. The critical controls for depth of cover for pipelines are the low points in the highway cross section. Usually these are bottoms of the longitudinal ditches. The critical controls for cover are the depths of drainage facilities, bridge structures, and likely highway maintenance operations. The depth of cover must be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.

b. Minimum depths for longitudinal pipelines, except water, are as follows:

i. Pipelines which are not under the roadway shall have a minimum depth of cover of three (3) feet for both cased and non-cased lines.

ii. Pipelines that are under the pavement surface shall have a minimum depth of cover of three (3) feet in soil and two (2) feet in rock for both cased and non-cased lines.

iii. Pipelines shall have a minimum depth of cover of three (3) feet under ditches.

c. Minimum depths for longitudinal water pipelines are as follows:

i. Water mains shall be laid with a minimum cover of five and one-half (5 1/2) feet or to the grade of the existing pipe unless otherwise shown on the plan or directed by the Engineer.

ii. If the minimum cover cannot be met and/or when a water pipe is to be hung within or on a bridge structure, or when placed within one foot of a drainage manhole or catch basin, proper insulating material must be installed on the water pipe as per the MassHighway *Standard Specifications for Highways and Bridges*.

d. The depth of bury for all underground facilities crossings the highway shall be a minimum of three (3) feet under ditches and five (5) feet under the pavement surface as measured from a straight line connecting the lowest points of the finished ground or pavement surface on each side of the right of way to the top of the facility at the time of installation.

e. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided.

f. Exceptions may be authorized for existing pipelines to remain in place with a reduction of six (6) inches in depths of cover specified. Further reductions may be permitted if the pipeline is protected by a reinforced concrete slab that meets the requirements as follows;

i. Width: Three times the pipe diameter but not less than four feet;

ii. Thickness: Minimum of six inches;

iii. Reinforcing: Minimum of #4 bars on 12 inch centers or equivalent;

iv. Cover: Minimum of six inches between the slab and top of pipe.

g. All utilities shall obtain prior approval from MassDOT before burying any utility less than the minimum depth required.

h. More information concerning specific utilities can be found in Chapter 6.E of this Policy.

i. Minimum depths for all utilities are summarized in Table 1 in Chapter 6.

6. Boring Specifications

   a. Casing pipe shall be installed using equipment that encases the hole as the earth is removed. Boring without the concurrent installation of a casing pipe is not permissible. Casing pipe shall extend through the entire fill and be installed in a manner that will not disrupt traffic nor damage the roadway grade and surface. The introduction of water into an excavation is prohibited.

   b. Steel casing pipe shall be new material, the minimum yield strength of 35,000 psig (pounds per square inch gauge). All joints in steel casing pipe shall be welded. The minimum wall thicknesses presented in Table 4 below shall be used.

TABLE 4- CASING PIPE WALL THICKNESS

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

   c. Reinforced concrete casing pipe must be properly classed based on the depth of cover over the pipe. A minimum of 5,000 pounds per square inch concrete pipe must be used when casing pipe is jacked. Bell type ends are not permitted.

   d. No boring is to be started under any portion of the roadway until an approved permit to do so has been received by the contractor.

7. Vents

   a. Vents shall be located at the high end of short casings and generally at both ends of casings longer than 150 feet.

   b. Vent standpipes shall be located and constructed so as not to interfere with maintenance or use of the highway. They should not be concealed by vegetation. They should preferably stand on a fence or right of way line.

c. In urban areas, vents shall be permitted only where they do not affect pedestrian traffic.

8. Drains.

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

9. Shut-off Valves

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

10. Appurtenances.

See Chapter 6.D for information pertaining to pipeline appurtenances.

11. Markers/Facility Protection

a. The utility owner must place readily identifiable and suitable markers immediately above any underground pipelines it places within the right of way fence line.

b. Signs shall identify the owner/operator name, the Dig Safe telephone number, the type of facility.

c. Utility sign markers shall be placed at a maximum interval of one-quarter (¼) mile and on each side of all public roads, streets, and trails the utility facility crosses.

d. Where plastic pipe is installed without a metal casing, a metal wire must be installed concurrently or other means provided for detection purposes. See Chapter 11.H for additional information about markers and facilities protection.

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

D. Sanitary Sewers and Storm Drains

1. This Policy was developed with integrated sections. Thus, other sections may be applicable to sanitary sewers and storm drains and need to also be read in order for the reader to fully understand this topic.

2. Codes

    a. Sanitary sewer shall be installed in accordance with industry standards.

    b. Storm drains shall be installed in accordance with MassDOT standards.

3. Encasement

    a. Gravity systems shall be cased when installed by jacking and/or boring, unless the carrier pipe is of such size and material that it would normally be installed without a casing.

    b. Force mains larger than two (2) inches in diameter crossing a highway shall be cased under the roadbed.

    c. Lines to be operated under pressure or which to do not conform to the material, strength, or cover depths contained herein must be cased.

    d. Encasement under entrances may be omitted, depending upon the type and amount of traffic and depth, condition, and maintenance responsibility.

    e. See Chapter 11.E for additional encasement information.

4. Depth of Cover

    a. The critical controls of depth of cover for sanitary sewers and storm drains are the low points in the highway cross section. Usually these are the bottoms of the longitudinal ditches, the depths of other drainage facilities, bridge structures, and likely highway maintenance operations.

    b. The depth of cover should be sufficient to withstand the greatly increased impact loads transmitted through frozen soil.

c. Minimum depths for longitudinal sanitary sewers and storm drains shall be five and one-half (5 1/2) feet, or to the grade of the existing pipe unless otherwise shown on the plan or directed by the Engineer.

d. Where minimum bury is not feasible, the facility shall be rerouted or protected with a casing, concrete slab, or other suitable measures. In solid rock, the depth of bury may be reduced if adequate protection is provided. Exceptions may be authorized for existing pipelines to remain in place with a reduction of six inches in depths of cover specified above.

e. If the minimum cover cannot be met and/or when a sewer pipe is to be hung within/on a bridge structure, proper insulating material shall be installed on the sewer pipe as per the MassHighway Standard Specifications for Highways and Bridges.

f. All utility owners shall obtain prior approval from MassDOT before burying any utility less than the minimum depth required.

g. More information concerning specific utilities can be found in Chapter 6.E of this *Policy*.

h. Minimum depths for all utility facilities are summarized in Table 1 in Chapter 6.

5. Separation Requirements.

a. Drainage Pipe Separation: Sewer pipe shall be laid at a minimum of five (5) feet horizontally and eighteen (18) inches vertically from a drainage main.

b. Water Pipe Separation:

i. Sewer pipe shall be laid a minimum of ten (10) feet horizontally from any existing or proposed water main.

ii. The elevation of the top (crown) of the sewer pipe shall be at least eighteen (18) inches below the bottom (invert) of the water main.

iii. The sewer pipe shall be laid such that the pipe joints are equidistant and located as far as possible from the water main crossing.

c. Whenever any of these minimum separation distances cannot be met, a waiver must be granted by the District Permits Engineer and/or MassDOT District Highway Director.

6. 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 MassDOT.

7. Markers/Facility Protection

a. The utility owner must place readily identifiable and suitable markers immediately above any sanitary sewer lines it places within the right of way line.

b. Signs shall identify the owner/operator name, the Dig Safe telephone number, and the type of facility.

c. Utility sign markers shall be placed at maximum intervals of one quarter (¼) mile and on each side of all public roads, streets, and trails the utility facility crosses.

d. Where non-metallic lines are installed without a metallic casing, a durable metal wire must be installed concurrently or other means provided for detection purposes.

e. See Chapter 11.H for additional information about markers and facilities protection.

E. Irrigation and Drainage Pipes, Ditches, and Canals

1. Irrigation and drainage pipes installed across highway right of way should be designed and constructed in accordance with MassDOT 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 MassDOT.