UTILITY
ACCOMMODATION MANUAL

CONNECTICUT

DEPARTMENT OF TRANSPORTATION

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Utility Accommodation Manual

CTDOT – Utilities Section

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SECTION 1 ASSURANCE STATEMENT

The Connecticut Department of Transportation (Department) has the responsibility to maintain the right-of-way of highways under its jurisdiction as necessary to preserve the integrity, safety, and operation of the highway.

This policy is established to regulate the accommodation of utility facilities within the limits of any federal-aid highway. The manner in which utilities occupy highway right of way affect the safety, operation and aesthetics of the highway, and as such, it is necessary that the use and occupancy by utilities be authorized and regulated.

The Department, for the purpose of protecting the functional and aesthetic characteristics of any state highway, has authority to adopt regulation for the location and installation of any public service facility within, on, along, over or under the right-of-way of any state highway. This authority is pursuant to Connecticut General Statutes Sec. 13a-126a and as is required by 23 CFR 645 Subpart B.

In accordance with 23 CFR 645.215, this policy is approved by the FHWA such that proposed installations shall not require separate approval by the FHWA, except when the proposed installation is not in accordance with this policy.

Any changes, additions or deletions to this approved policy are subject to FHWA approval prior to implementation.

1.1 Application

This policy applies to all privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage and any other similar commodities, including fire and police signal systems and street lighting systems which directly or indirectly serve the public. Further, this policy shall also apply to Private Lines, hereinafter defined in Section 2 of this policy.

1.2 Scope

This policy provides for the uniform regulation governing all new facilities and any additions, alterations, adjustments, relocations or replacements of existing facilities within federal-aid highway right-of-way. They do not alter current regulations or authority for installing utilities nor for determining financial responsibility for replacing or adjusting existing utilities. In the event an existing utility requires adjustment to accommodate a Department project, the financial responsibility for this work is addressed in the Department publication entitled *Public Service Facility Policy and Procedures For Highways in Connecticut* (http://www.ct.gov/dot/lib/dot/documents/dutilities/UtilityPolicyProcedures.pdf).

This policy applies not only to state-owned highways, but also to municipally-owned highways approved as part of the federal-aid highway system. Such municipally owned highways customarily remain under the jurisdiction of the municipality.

Where public law or order, governmental or industry code prescribe a higher degree of protection than provided by this policy, then the higher degree of protection shall prevail.

This policy supplements, but does not diminish the provisions of the AASHTO *Guide for Accommodating Utilities Within Highway Right-of-Way*, the AASHTO *Policy on the Accommodation of Utilities within Freeway Right-of-Way*, and any regulation of the Connecticut Department of Public Utilities Control.

Lastly, this policy is not intended to require the adjustment of existing facilities that do not constitute a safety hazard to the traveling public or do not conflict with construction, operation or maintenance of the highway. Notwithstanding the foregoing, the duties and responsibilities set forth in Section 11.6 of this policy entitled Corrective Measures, shall apply to all facilities.

SECTION 2 DEFINITIONS

The following terms used in this policy are defined as follows:

Aesthetic Quality – those desirable characteristics in appearance of the highway and its environment, such as harmony between or blending of natural and manufactured objects in the environment, continuity of visual form without distracting interruptions, and simplicity of designs which are desirably functional shape but without clutter.

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

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

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

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

Border Area – The area between the traveled way and the right-of-way line.

Buffer Strip – That portion of the roadside between the curb or edge of pavement and the sidewalk.

Carrier – Pipe directly enclosing a transmitted fluid (liquid or gas), cable, wire or line.

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

Clear Roadside Policy – Policy employed to increase safety, improve traffic operation and enhance the appearance of highways by designing, constructing and maintaining highway roadsides as free as practical from physical obstructions above the ground such as trees, drainage structures, massive sign supports, utility poles, utility cabinets and other ground mounted obstructions.

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.

Coating – Material applied to or wrapped around a pipe.

Conduit or Duct - An enclosed tubular carrier for protecting wires or cables.

Cover – Depth to top of pipe, conduit, casing, cable or similar line or utility tunnel below the earth or roadway surface.

Cradle – Rigid structural element below and supporting a carrier or casing pipe.

Department – Connecticut Department of Transportation.

Direct Burial – Installation of a utility line or cable without conduit, duct, sleeve or any type of encasement.

Drain – Appurtenance to discharge liquid contaminants from a casing.

Encasement – Structural element surrounding a carrier or casing, typically concrete.

Encroachment – Unauthorized use of highway right-of-way or easements by such items as signs, fences, building, utilities, parking, storage, etc.

Encroachment Permit – The document issued by the Department authorizing the use and occupancy of highway right-of-way by a utility company or owner of a private line.

Exception – A written authorization provided by the Connecticut Department of Transportation to a Utility for an installation that is not in compliance with the latest revision of the Connecticut Department of Transportation, Utility Accommodation Manual.

Expressway – Divided highway for through traffic with full or partial control of access and generally with grade separations at major intersections.

Federal-Aid Highway – a highway eligible for assistance under Chapter 23 of United States Code other than a highway classified as a local road or rural minor collector.

Federal-Aid Highway Projects – those active or completed highway projects administered by the Department which involve the use of Federal-aid highway funds for the development, acquisition of right-of-way, construction or improvement of the highway or related facilities, including highway beautification projects under 23 U.S.C. 319, Landscaping and Scenic Enhancement.

Fixed Object – Any above ground rigid non-frangible base object exceeding four (4") inches in height as measured from the surface of the immediate area to the top of the object.

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

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.

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

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

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

Joint Use Agreement – an agreement between the Department and a utility which memorializes the terms and conditions associated when a utility has a compensable interest in the land it occupies and such land is to be jointly occupied and used for highway and utility purposes.

Limited Access Highway – Any freeway, expressway or other highway, designed for through traffic, where the of owners or occupants of abutting land or other persons have no rights to access, light, air, or view for any reason.

Manhole – An opening in an underground system which workmen may enter for the purpose of making installations, removals, inspections, repairs, connections, and tests.

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

Out-of-Service Facility (Deactivated) – Any facility which is disconnected or deactivated from the system and is not intended to be reconnected and reactivated in the future by the owner.

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

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

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

Pressure – Relative internal pressure.

Private Lines – privately owned facilities which convey or transmit commodities outlined in the definition of *utility facility* of this section, but devoted exclusively to private use.

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

Rigid Pipe – Pipe designed for diametric deflection of less than 1%.

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

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

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

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

Semi-Rigid Pipe – Pipe designed to tolerate from 1% to 3% diametric deflection.

Shoulder – The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles for emergency use and for lateral support of base and surface courses.

Sleeve – Short casing through pier or abutment or other highway structure.

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.

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

Trenchless Installation - Installed without breaking ground or pavement surface such as horizontal directional drilling (HDD) or jack and bore.

Use and Occupancy agreement (permits) – see definition of *Encroachment Permit* in this section.

Utility Company - Any person or private or public entity owning or operating a utility facility, including any wholly owned or controlled subsidiary. The term "Utility Company" shall also mean "Public Service Company" or "Municipality".

Utility Facility– All privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage and any other similar commodities, including fire and police signal systems and street lighting systems which directly or indirectly serve the public. The term "Utility Facility" shall also mean "utility" or "facility".

Vent – Appurtenance to discharge gaseous contaminants from a casing.

SECTION 3 GENERAL REQUIREMENTS

The following general requirements are for the location and design of all utility installations within the highway right-of-way other than limited access highways. The requirements pertaining to utilities within a limited access highway right-of-way is found in Section 4 of this policy.

3.1 Accessibility for Disabled Individuals

The Americans with Disabilities Act of 1990 (ADA) established minimum criteria to allow unobstructed access or passage by a disabled person using a wheelchair or other personal transportation device.

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

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

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

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

3.2 Location and Alignment

1. Above ground utility installations, where permitted, shall be located as far from the traveled way as possible, preferably along the right-of-way line. Above ground utility installations should not be installed within the clear zone of the highway unless a determination has been made that placement beyond the clear zone or installation underground is not technically feasible or is unreasonably costly and there are no feasible alternate locations. See Chapter 13 of the *Connecticut Highway Design Manual* (http://www.conndot.ct.gov/publications/hdm/Chapter%2013.pdf) for determining clear zone. When it is necessary to locate such above ground utility facilities within the established clear zone of the highway, appropriate countermeasures to reduce hazards may be used. Countermeasures are to be coordinated with the Department and include placing utility facilities at locations which minimize exposure to run-off-the road vehicles, use of breakaway type design, delineation or guide rail.

2. Utility lines shall be located to minimize need for later adjustment to accommodate future highway improvements and to permit servicing such lines with minimum interference to highway traffic.

3. Longitudinal installation shall be located on uniform alignment as near as practicable to the right-of-way line so as to provide a safe environment for traffic operations and preserve space for future highway improvements or other utility installations. Where irregular shaped portions of the right-of-way extend beyond the normal right-of-way limits, variances in the location from the right-of-way line will be allowed as necessary to maintain a reasonably uniform alignment for longitudinal installations.

4. On longitudinal installations, underground utility locations parallel to the pavement or adjacent to the right-of-way line are preferable so as to minimize interference with existing or future highway drainage, the structural integrity of the traveled way, shoulders, and embankment, and the safe operations of the highway. Whenever possible, such installations shall be located as far off the paved roadway or curb line as practicable.

5. When ground-mounted utility facilities are installed in back of existing guide railing, they shall be placed a minimum of one (1) foot beyond the design deflection of the guide rail system. For information on guide rail deflection, refer to the Highway Design Manual. If in restricted conditions the deflection offset cannot be met, the guide railing should be stiffened considering the available deflection distance.

6. In the case of utility poles in areas with restricted right-of-way, the utility shall consider utilizing alternate pole-top construction to provide adequate horizontal clearance from the travel way. The pole-top configuration including spacer cable construction and armless construction shall be considered.

7. Where sidewalks are required, or space provided for same, utility facilities should be located to the backside of the sidewalk, however if adequate right-of-way is not available or clearance to an existing building makes this impractical, then the facility may be installed within the curb and grass strip if available.

8. To the extent feasible and practicable, utility facilities shall cross the highway on a line generally perpendicular to the highway alignment.

9. The utility, in the design and installation of a facility, shall be cognizant of the needs of other existing or proposed utilities in the vicinity of the installation and take appropriate measures in the planning and installation of a facility. These appropriate measures shall include maintaining sufficient offsets to other facilities and assuring that all other utilities have reasonable access to their own facility.

10. In all cases, full consideration shall be given to the measures reflecting sound engineering principles and economic factors necessary to preserve and protect the safety and operations of highway traffic, its maintenance efficiency, and the integrity and visual quality of the highway.

11. Any exceptions to this policy will only be granted under unusual conditions, which shall be substantiated and found justified in accordance with the Exceptions section of this policy.

3.3 Design

1. The utility is fully responsible to ensure that their facility is properly designed, installed, operated and maintained including depth, clearances, and separation between lines and that the work is in accordance with Department's Utility Accommodation Manual as well as all other applicable laws, regulations and industry standards.

2. The Department is responsible for review and approval of the utility's proposal with respect to this Department's Utility Accommodation Manual. This includes required measures to be taken to preserve the safe and free flow of traffic, structural integrity of the roadway or highway structure, ease of highway maintenance, appearance of the highway, and the integrity of the utility facility. The encroachment permit issued by the Bureau of Highway Operations will constitute the Departments final approval for a utility installation. The Department's approval in no way derogates the utilities full responsibility for their installations.

3. Utility installations on, over, or under the right-of-way of State highways and utility attachments to highway structures shall adhere to Department requirements, regulations of the DPUC and the following industry requirements:

a. Electric power and communication facilities shall conform to the current applicable National Electrical Safety Code and to the current Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines, issued by the National Bureau of Standards, U.S. Department of Commerce.

b. Water lines shall conform to the current American Water Works Association Standards and Specifications.

c. Pressure pipelines shall conform with the currently applicable sections of the Standard Code for Pressure Piping of the American National Standards Institute; Title 49 CFR, Parts 192, 193, and 195; and applicable industry codes.

d. Liquid petroleum pipelines shall conform with the currently applicable recommended practice of the American Petroleum Institute for pipelines crossing under railroads and highways.

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.

4. Ground-mounted utility facilities shall be of a design compatible with the scenic quality of the specific highway section being traversed.

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

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

7. Any necessary permits and environmental controls required for accommodating utilities within the highway right-of-way shall be obtained by the utility.

3.5 Out-of-Service (Deactivated)

All facilities taken out of services and located either above ground or attached to a highway structure shall be removed within three (3) months of its last use. Underground facilities that are placed out of service may remain in their existing location provided the owner retains ownership, liability and maintains record of the facility. Should any out of service facility within the highway right-of-way interfere with the safety or operation of the highway, hinder construction or maintenance operations or effect the structure integrity of the highway, the owner of the facility shall correct such deficiency in a manner prescribed by the Department which may include removal of the facility.

3.6 Department Gain

The Department of Transportation shall have the right to occupy and use, without payment therefor, one gain upon each public utility pole or in each underground communications duct system installed by a public service company. When designing and constructing a pole line or duct system, the utility shall make appropriate provision for this gain. The gain shall be reserved for use by the Department pursuit to CGS 16-233.

SECTION 4 LIMITED ACCESS HIGHWAYS

Due to increased land costs and scarcity of suitable routes, the desire to use the right-of-way of limited access highways for longitudinal utility installations has increased tremendously.

However, it has long been determined that the preservation of the integrity of the control of access feature is of prime importance in maintaining the efficiency and safety of highways. With this mission in mind, the Department has set forth the following standards, criteria and procedures for the purpose of evaluating individual applications that propose to install a utility within a limited access highway.

Any installations that are ultimately approved under this section shall conform to the AASHTO *Policy on the Accommodation of Utilities Within Freeway Right-of-Way* and the Title 23 Part 645 Subpart B of the Code of Federal Regulations. Further, any installation shall conform with applicable requirements found in each of the sections of this document.

4.1 Longitudinal Installations

In general, new utility installations shall not be permitted longitudinally within the right-of-way of a limited access highway except that in special cases, the State may allow such occupancy under strictly controlled conditions. Where longitudinal installations are requested, the utility shall in each case show to the Department's satisfaction that all of the following conditions are met:

1. The facility is in-fact a utility facility and not a private line. Private lines are not permitted to be installed longitudinally within the right-of-way of any limited access highways.

2. The utility presence within the non-access right-of-way will not adversely affect the safety, design, construction, operation, maintenance, stability, or efficient use of the highway.

3. Alternate locations are not available or cannot be implemented at reasonable cost, from the standpoint of providing efficient utility service that is safe, reliable and economical over the long term.

4. The utility installation will not adversely affect the present use of the highway nor will it impair the future expansion of the highway.

5. The only viable alternate routes outside the highway right-of-way would result in the loss of productive agricultural land, or the loss of productivity of agricultural land. In this case, the utility shall provide compelling evidence on the direct and indirect environmental and economic effects of such loss for consideration by the Department pursuant to 23 USC Section 109(1)(1).

   When the documentation submitted by the utility has been reviewed and the Department has determined that the utility has met the above criteria, permission to occupy the right-of-way may be granted by the Chief Engineer on an individual basis. This permission by the Chief Engineer will be in writing and granted only under the following conditions:

   a. The area to be occupied by the utility is not required for future expansion of the highway.

   b. The median area of the highway will not be occupied in any way by the installation.

   c. A utility strip will be established along the outer edge of the right-of-way by locating a utility access control line between the proposed utility installation and the highway. In no instance will the utility strip be located within the clear zone of the highway.

   d. Ownership of the utility strip shall remain with the Department.

   e. The utility and any associated appurtenances shall be located outside the clear zone of the existing highway.

   f. Service connections will not be permitted from within the utility strip.

   g. The utility shall agree to enter into an Encroachment Agreement with the Department, the terms and conditions of which are acceptable to the Department, for such occupancy of the highway right-of-way. No construction activities may proceed until such agreement is fully executed.

   h. The utility is to be located and designed in such a manner that they can be constructed and serviced without direct access from the limited access highway or connecting ramps. Such direct access shall not be permitted except for special cases where alternate locations and/or means of access are unavailable or impractical due to terrain or environmental constraints, and such use will not adversely affect safety or damage the State's facility. Where direct access is permitted by the Department, an encroachment permit must first be obtained for the installation and any subsequent maintenance.

i. The facility shall be designed and constructed with added capacity, at no cost to the Department, to provide one (1) gain for use, without payment therefor, by the Department. The gain shall be reserved for use by the Department pursuit to CGS 16-233.

4.2 Approvals for Longitudinal Occupancy

If the Department determines the utility has fully complied with the above conditions, only then will the proposal be forwarded to the Chief Engineer for approval. If the Chief Engineer determines that the proposed installation will not impair or interfere with the free and safe flow of traffic of the highway and that such occupancy is in the public's best interest, he will forward such proposal to the FHWA Division Administrator for approval. Final approval for the proposed occupancy is contingent upon approval by the FHWA Division Administrator pursuit to 23 CFR 1.23(c).

4.3 Transverse Installations

In general, new transverse utility installations and adjustment or relocation of existing utility installations, located at points removed from grade separation structures, may be permitted to cross a limited access highway right-of-way. However, all such utility crossings will be permitted only under strictly controlled conditions. Where such transverse installation is desired, the utility shall meet the following conditions in order to obtain Department approval.

a. The utility, to the extent it is feasible, shall cross the highway underground. The underground installation shall be constructed utilizing a trenchless technology. Open trench installation is not permitted.

b. Underground crossing shall provide a minimum of forty-eight (48") inches vertical clearance below any point of the pavement surface and a minimum of thirty-six (36") below the unpaved portion of the highway.

c. Casing, if provided, should extend to the non-access line of the highway, but in all cases shall extend to a point outside the clear zone of the highway.

d. Manholes and other points of access to underground facilities should be located outside the highway non-access lines, or at an absolute minimum, outside the clear zone. Manholes and other points of access shall not be located within the median.

e. The utility crossing, whether underground or aboveground, shall be as close to perpendicular to the highway alignment as is possible.

f. Aerial crossings shall provide a minimum of thirty (30) feet vertical clearance over the highway as measure from any point above the road surface. The minimum vertical clearance shall be provided at the maximum sag condition of the line.

g. Supporting structures for aerial facilities should be located outside the non-access lines of the highway. When it is not possible to install the supporting structures outside the non-access line of the highway, they shall be positioned outside the clear zone.

h. Supporting structures shall not be positioned such that the structure would obstruct line of sight.

i. Supporting structures shall not be permitted within the median.

4.4 Bridge Installations

New utility installations will not be permitted on a new or existing structure carrying a limited access highway, except for special cases as provided for in Section 4.1. Additionally, the Department will consider the below listed factors in its determination.

Where a limited access highway crosses a major valley or river on an existing structure, any utility carried longitudinally by the structure at the time the highway is improved may, if approved by the Department, continue to be carried on the structure. In making the determination, the Department will rely heavily on the following factors:

1. Does the presence of the facility pose a security risk due to the nature of the product carried. Products such as gas, petroleum products or other hazardous are all considered high risk.

2. Can the utility be serviced without significant interference to the traveling public regardless of the frequency.

3. Is the cost of relocating the facility off the structure reasonable when considering all the benefits of its absence.

Any approval for an installation on a structure will be provided in accordance with Section 4.2 and subject to any applicable requirements of Section 7.

Where utility lines follow a street that passes under a limited access highway structure, the utility lines shall not be attached to any portion of the limited access highway structure. Rather, the utility line shall be installed underground within the street right-of-way. If underground installation is determined infeasible, the Department may consider permitting alternate means.

4.5 Telecommunications Towers

Pursuant to Department Policy No. E&H.O.-53 dated August 7, 2006, the Department may permit the installation of telecommunications towers within the right of way of a limited access highway. (http://www.ct.gov/dot/lib/dot/documents/dpropman/wiretelfac.pdf). See Section 8 for further guidance.

SECTION 5 ABOVEGROUND INSTALLATIONS

5.1 General

The type of construction, vertical clearance above pavement and location of ground-mounted utility facilities along the roadside are factors of major importance to preserve a safe traffic environment, the appearance of the highways, and the efficiency and economy of highway maintenance. To preserve these, it is important to keep the clear zone as free as practical from fixed objects such as poles, cabinets and related facilities. Such facilities should be placed as far as practical from the traveled way and beyond the clear zone. The nature and extent of roadside development and the nature of the terrain being traversed are controlling factors for locating poles, guys, and related facilities close to the right-of-way lines.

5.2 Utility Poles - Horizontal Clearance

There will be many sites where it will be impractical to locate utility poles outside the clear zone. The following provides the criteria for the locating of utility poles. Exceptions for utility poles located within the clear zone are required only when it is the Department's position that the utility company is not locating its poles in accordance with these following criteria:

1. Utility poles should be positioned outside the clear zone whenever practical subject to existing right-of-way.

2. Utility poles shall be setback ten (10) feet as measured from edge of pavement or face of curb to face of pole, when feasible and sufficient right-of-way exists.

3. When it is not feasible or there is insufficient right-of-way to provide the above stated ten (10) foot offset, the pole may be positioned as close to the right-of-way line as possible. In sidewalk areas, poles shall be positioned to the back of the sidewalk. If it is not feasible to position the pole to the back of sidewalk, the Department may allow poles to be placed between the curb and sidewalk, subject to minimum horizontal clearance and ADA requirements.

4. The Department may require that utility poles be setback greater than ten (10) feet up to a maximum of thirty (30) feet if conditions warrant the additional clearance. Conditions that warrant such additional clearance include, but are not limited to, a history of utility pole related accidents.

5. In no case shall a utility pole be located less than eighteen (18) inches from the edge of pavement or face of curb to the face of pole. The horizontal clearance of eighteen (18) inch is an absolute minimum and not subject to the exception process.

6. The utility shall consider utilizing alternate pole-top construction to provide adequate horizontal clearance. The pole-top configuration to include spacer cable construction, then armless construction.

5.3 Utility Lines - Vertical Clearance

The minimum vertical clearance for distribution type utility lines crossing a non-limited access highway shall be a minimum of fifteen feet six inches (15'-6") measured from the road surface. A minimum vertical clearance of fifteen feet six inches (15'-6") shall be provided for utility lines positioned longitudinal to the highway, however this clearance can be decreased to a minimum of thirteen feet six inches (13'-6") for communication lines only wherever the line does not cross a street or driveway. The minimum vertical clearance shall be provided at maximum sag condition of the line. Where a greater clearance is required by law, regulation or authority, the greater clearance shall be adhered to.

5.4 Utility Appurtenance - Clearance

The positioning of all new or replacement above ground appurtenances should be located, where feasible, either at the highway right-of-way line or outside the clear zone. The clear zone is as defined in the Highway Design Manual for the respective highway. If it is not feasible to locate the appurtenance as aforementioned, the Department may permit the facility to
be located within the clear zone. Utility appurtenances within the clear zone shall be of a breakaway design or if not feasible, shall be shielded by a traffic barrier acceptable to the Department.

The facility, however, shall not encroach on the triangular area defined by the intersection sight distance for any street or commercial driveway. Further, the facility should not obstruct the sight line of any residential driveway.

The positioning of any new or replacement above ground installation that would obstruct a portion of the line of sight of a highway or commercial driveway, by a width of more than eighteen (18) inches, shall not be permitted.

Any utility facility or related appurtenance that contains liquid petroleum gas or other volatile product should be located within two (2) feet of the highway right of way line. However, in no case shall the facility be located within the clear zone of the highway. In the instance that the clear zone limit is beyond the highway right of way line, an alternate acceptable location shall be identified.

5.5 Pole Line

When constructing or reconstructing a pole line, the facility is to be designed and constructed as a singular pole line generally parallel to the highway. The distance between utility poles should be the longest feasible span lengths consistent with geometric and line load considerations.

5.6 Preferred Pole Locations

Utility Poles are fixed-objects and as such there are preferred locations for utility poles that should minimize their likelihood of being struck. It should be noted that the only object type more frequently struck in fatal fixed-object crashes is trees*. The following guidance specifies the more hazardous locations for poles. Avoiding these locations when laying out a pole line may serve to minimize pole strikes by errant vehicles.

Avoid positioning of utility poles:

1. on the outside of a curve, especially where the curve follows a long straight section of road or where the curve is sharper than previous curves.
2. at the end of a lane drop.
3. at the end of a T-intersection
4. within traffic islands.
5. within medians

* National Cooperative Highway Research Program, Volume 8: A Guide for Reducing Collisions Involving Utility Poles. (http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_500v8.pdf)

5.7 Multiple Pole Lines

Multiple or double pole lines shall not be constructed or reconstructed within the highway right-of-way. When reconstructing a multiple pole line facility, the custodian of the poles as well as each owner of attached facility shall agree to combine their respective facility into a single pole line. The custodian shall install poles of appropriate height to accommodate the other attached facilities. The existence of stub poles or service poles shall not constitute a multiple pole line.

5.8 Service Poles

All utility poles used exclusively to provide service or illumination to private property shall be installed at or beyond the highway right-of-way line.

5.9 Pole Guys and Push Braces

Utility pole guys or push braces shall not be positioned on the travel side of the pole being supported unless protected by an existing guide rail system.

SECTION 6 UNDERGROUND INSTALLATIONS

The following requirements apply to all underground installations, however in the case of limited access highways, these requirements shall be applied in conjunction with Section 4 with the most restrictive governing.

6.1 General

1. Underground utility construction shall conform to all applicable codes, standards and specifications.

2. Cabinets, pedestals, vents and other above ground utility appurtenances installed as part of the utility facility should be located at or near the right-of-way line or outside the clear zone. Also, they shall be located so not to interfere with ADA requirements. See section 5.4 for clearance requirements.

3. Any concrete foundations or slabs required for a cabinet, pedestal or other appurtenance shall not project more that 4" above the surrounding ground surface.

4. All underground electric, communication or other cables located within the highway right-of-way shall be installed within conduits. Direct burial of cable is generally not permitted within the highway right-of-way.

5. All carrier pipes installed within a casing shall be designed as if they are not encased.

6.2 Location and Alignment

The following controls govern the location and alignment of all underground utility installations.

1. Longitudinal utility installations should be installed on a uniform alignment as near the right-of-way line as practicable.

2. Utility crossings of the highway should be as near perpendicular to the highway alignment as practical, but no less than forty-five (45) degrees.

3. Underground utility facilities shall be installed at a minimum depth of thirty-six (36) inches from top of structure to the pavement or ground surface.

4. Vertical clearance between a pipeline and a structure or other highway or utility facilities should be sufficient to permit maintenance of the pipeline and the other facilities. In all cases, a minimum vertical clearance of twelve (12) inches shall be maintained between facilities.

5. Horizontal clearance between a pipeline and a structure or other highway or utility facilities should be sufficient to permit maintenance of the pipeline and the other facilities. In all cases, a minimum horizontal clearance of eighteen (18) inches shall be maintained between facilities.

6.3 Casing

Generally, a casing should be provided when a pipeline crosses the highway right-of-way. Casing pipe is required for all pipelines carrying gas, petroleum products or other hazardous substances, and for all other pipelines which, from their nature or pressure, that upon failure of the carrier pipe, may cause damage to the highway right-of-way.

1. Casings shall be designed to support the load of the highway and superimposed loads thereon and, as a minimum, should equal the structural requirements for highway drainage facilities. Casings should be composed of materials of satisfactory durability under conditions to which they may be exposed.

2. The casing shall extend three (3) feet beyond the slope or ditch line and a minimum of fifteen (15) feet outside the edge of pavement. On limited access highways, the casing shall extend to a point outside the clear zone. When a highway is widened, the casing shall be extended if necessary, to meet this criteria.

3. Casing for non-pressure pipelines shall be blocked up at each end in such a way as to prevent the entrance of foreign material into the annular space, but to allow leakage to be detected in the event of a carrier pipe failure.

4. Casing for pressure pipelines shall be suitably sealed to the outside of the carrier pipe.

5. All sealed casings shall be vented. Vents shall be of sufficient diameter but in no case less than two (2) inches in diameter, and shall be connected near the ends of the casing. Generally, vents should be located at both ends of casing. Vent pipes should extend at least four (4) feet above the ground surface. Top of vent pipe should have a properly screened down-turned elbow. If the vent pipe is to be used as a marker, it shall conform to the applicable requirements of section 6.5.

6. Casing may be omitted when the owner and designer certify that:

    a. the highway crossed is not a limited access highway, and

b. the pipeline is designed in accordance with all applicable Pipeline Safety Regulations pursuant to 49 CFR and that the applicable regulations of the USDOT or the DPUC do not mandate the use of casing, and

c. the pipeline, if welded steel construction, is cathodically protected, and the use of a casing could cause loss of that protection system, and

d. the pipeline is coated in accordance with accepted industry standards and that the construction methods should not damage the coating, and

e. the pipeline is to be installed at such a depth that failure of the carrier pipe would not cause damage to the highway structure.

6.4 Appurtenances

1. Appurtenances including but not limited to manholes, hand holes or other access structures should be located in such a manner that will cause the least interference to traffic operations when considering the initial construction as well as future access needs. Theses appurtenances should be located outside paved width of the highway, when possible. However, they may be permitted within the paved portion of the highway but reasonable effort should be made to minimize installations within intersections and the travel portion of the highway, insofar as practicable.

2. All vaults, manholes, or other structures within the clear zone of the highway shall be design to carry traffic loads. All structures, at a minimum, shall be designed in accordance with Section 3.1 – Superstructure Design Loads, of the Department's latest *Bridge Design Manual.* (http://www.ct.gov/dot/lib/dot/documents/dpublications/bridge/bdm.pdf)

3. Appurtenances extending more than four (4) inches above the ground line should be located outside the clear zone and near the right-of-way line. See section 5.4 for applicable clearance requirements.

6.5 Markers and Detection Aids

All new underground facilities and replacements of existing facilities, where practicable, shall be installed with a warning tape located above the facility. The minimum separation between the facility and the warning tape shall be twelve (12) inches. The warning tape shall be durable, designed to withstand extended underground exposure and be imprinted with an appropriate warning or message. The color of the warning tape shall be in accordance with the uniform color code prescribed by Section 16-345(h) of the DPUC regulations for the color assigned to the type of facility for surface markings.

All nonmetallic underground facilities shall include a trace wire, metallic type warning tape or other method which will provide the ability to effectively locate and mark the underground facility in the future.

All underground utilities that cross the entire width of the highway right-of-way shall have a readily identifiable marker, constructed of durable weatherproof material, installed at the right-of-way limits directly over the facility. Vents, when provided and located appropriately, may be used in lieu of an independent marker. The vent or marker shall prominently identify the name of owner, contents of pipe and emergency telephone number.

6.6 Corrosion Control

Adequate corrosion protection shall be provided for all underground pipelines that transmit gas or petroleum products. All pipelines should be coated with a corrosion protective material free of flaws. Cathodic protection shall be applied to the pipeline as required by applicable codes and regulations.

SECTION 7 BRIDGE INSTALLATIONS

Attachments to bridge structures should be avoided where it is feasible and reasonable to locate lines elsewhere. Where it is not practical to traverse the bridged obstruction by other means, utility facilities may be attached to highway structures. However, the utility must consider the safety, operation, and maintenance of the bridge in the design of the attachment. The utility must make request to attach to any bridge either through the permit process or in relation to a Department project. Each request will be considered on an individual basis and permission to attach shall not be considered a precedent for subsequent requests.

7.1 General

Acceptable utility installations are those that will occupy a position beneath the structure's deck, between the outer most beams and above the lowest point of the superstructure. The utility shall provide adequate clearance to the structure such that future inspection and maintenance activities will not be hindered to the point where the work cannot be reasonably accomplished.

Unacceptable utility installations are those that could jeopardize the safety or operation of the structure, negatively impact the Department's ability to reasonably perform inspection and maintenance tasks, do not preserve the structure's vertical clearance or found not to be in the public interest.

In determining if a proposed installation is acceptable, the Department will rely on factors including but not limited to the characteristics of the product being transmitted, the type of highway carried and other viable routing.

No construction or maintenance activities are to commence until the utility is in possession of an encroachment permit duly issued by the appropriate district maintenance office.

7.2 Historic Bridges

Aesthetics are a primary factor considered when accommodating utilities on or adjacent to a historic structure. A structure is considered historic if it is listed on either the National Register of Historic Places by the National Park Service or the State Register of Historic Places by the State Historic Preservation Office. In these instances, where aesthetics is a prime consideration, overhead lines will not be permitted immediately adjacent to the structure. Rather, the lines shall be placed underground, discontinued or lastly carried on the structure in an innocuous position. The utility line shall be out of sight for a minimum distance from the structure. The goal, when considering each option, is to economically accommodate the lines in a location and to the extent minimally necessary to preserve the aesthetics of the historic structure.

7.3 Utility Lines

Longitudinal to Structure

Aerial facilities located along a highway which continues on a structure shall, where economically feasible, be installed on the structure and extend underground the distance required to clear the approach slabs, at a minimum.

If the span length is sufficiently short the line may be carried on support poles located at each end of the structure. Support poles shall not be placed on any portion of the bridge structure.

Utility cables or conductors shall be encased in conduit that terminates at an access structure at either end of the bridge. The access structure should be located beyond the approach slab of the bridge.

Metallic conduits or pipe shall be electrically insulated from the structure and grounded.

Only communication type facilities are permitted to be installed within the sidewalk on a structure.

Transverse to Structure

Utility lines located along a highway which passes under a structure shall in no instance be permitted to pass over the structure.

Rather, the utility lines should be installed underground within the highway under the structure. If the structure carries a non-limited access highway and it is determined that underground installation is not feasible, the utility may be carried aerially under the structure. Only when span length and vertical clearance require it, will the lines be permitted to be attached to the underside of the structure. In the event that aerial facilities are to be attached to the underside of the structure, they shall be installed in a manner such that they will not interfere with the routine inspection and maintenance of the structure, and by means of attachments which are acceptable to the Department.

7.4 Pipeline Attachments

All pipelines carrying gas, liquefied natural gas and hazardous liquids shall be designed to be in compliance with the minimum safety standards set forth in 49 CFR, Part 192, Part 193 or Part 195, as applicable.

All pressure lines shall have valves so that the pipe segment on the bridge can be isolated.

Where a pipeline attachment to a bridge is cased, the casing should be vented at each end to prevent possible buildup of pressure and to detect leakage of gases or fluids.

Where a casing is not provided for a pipeline attachment to a bridge, additional protective measures should be taken. Such measures should employ a higher factor of safety in the design, construction, and testing of the pipeline than would normally be required for cased construction.

All pipeline attachments should be designed to pass through the back wall of the abutment, when practical. Pipe may be routed around the abutment only when the abutment back wall design prohibits pass through.

7.5 Temporary Installations

Temporary installations of a proven emergency nature may be placed on the sidewalk of a structure, but such an installation must be either removed or replaced by a permanent installation within a time limit agreed upon but in no case longer than one year from the date of the temporary installation. Where sidewalks are inadequate to maintain ADA requirements or are not available, fastening to the parapet may be permitted only after consideration and study by the Department.

In no case shall a utility be temporarily attached to a structure in a manner that would decrease its vertical clearance. Upon completion of the temporary installation, immediate steps shall be initiated to ensure that such temporary installation is removed or replaced by a permanent installation, as the case may be, within the time limit indicated above and in a manner acceptable to the Department.

7.6 Facility Identification

Any utility attached to a structure shall have a permanent tag affixed to each end of the facility. The tag shall identify the owner of the facility, the type of facility and a contact telephone number. All tags shall be of a material that remains legible over time when considering its exposure to the elements.

SECTION 8 TELECOMMUNICATION TOWERS

The Department may permit the installation of telecommunication towers within the state highway right-of-way provided that the wireless communication providers and wireless communications facilities providers comply with the *ConnDOT Wireless Communication Facilities Program Procedures*. (http://www.ct.gov/dot/lib/dot/documents/dpropman/wiretelfac.pdf)

A copy of the procedure may be obtained From the Department's Office of Rights-of-Way, Property Management Division. Inquires can be sent to: Property Management Division, 2800 Berlin Turnpike, P.O. Box 317546, Newington, CT 06131-7546.

SECTION 9 SCENIC AREAS

Certain areas are designated as scenic for their natural beauty. Such areas include public park and recreation lands, wildlife and waterfowl refuges, historic sites as described in 23 U.S.C. 138, scenic strips, overlooks, rest areas, the right-of-way of highway adjacent thereto, and the right-of-way of sections of highway which pass through public parks and historic sites.

In an effort to preserve the aesthetic quality of these areas, new utility installations are not permitted within highway right-of-way or other lands located within or adjacent to scenic areas unless the following conditions are met:

1. New underground installation may be permitted within such lands when they do not require extensive removal or alteration of trees or terrain features visible to the highway user or impair the aesthetic quality of the lands being traversed, or

2. New aerial installation may be permitted when there are not other locations available or those other locations are unusually difficult and unreasonably costly, or those other locations are more undesirable from the standpoint of aesthetic quality, and

   (i) the aerial installation will not require extensive removal or alteration of trees or terrain features visible to the highway user or impair the aesthetic quality of the lands being traversed, and

   (ii) placement underground is not technically feasible or is unreasonably costly, and

   (iii) the aerial installation can be made at a location, and will employ suitable designs and materials, which give the greatest weight to aesthetic qualities of the area being traversed.

Further, utility installations located within the right-of way of the Merritt Parkway shall also be in conformance with the publication entitled MERRITT PARKWAY GUIDELINES For General Maintenance and Transportation Improvements, prepared by the Merritt Parkway Working Group.

SECTION 10 AGREEMENTS

10.1 Encroachment Agreement

An encroachment agreement is required for any proposal by a utility company for the longitudinal installation of a trunkline or transmission type utility facility within a state highway. The primary purpose of the agreement is to fix the terms, conditions, rates and charges of such occupancy. The authority for such agreement is CGS 13a-126c.

10.2 Joint Use Agreement

A joint use agreement is required when a utility has a compensable interest in the land occupied by its facilities and such land is to be jointly occupied and used for highway and utility purposes.

In general, the Department does not permit joint use type arrangements for proposed utility installations. Further, whenever the Department undertakes a project to construct or reconstruct a federal-aid highway, it endeavors to extinguish any existing compensable interest that a utility may enjoy in the land constituting the highway right of way. Instead, the utility will occupy the highway right of way subject to an encroachment permit.

SECTION 11 MISCELLANEOUS

11.1 Encroachment Permit

A utility may not construct new facility nor reconstruct or adjust its existing facility within the right-of-way of a state highway without first applying for and obtaining an encroachment permit from the appropriate District Permit Section. The current publication entitled *Highway Encroachment Permit Regulations* (http://www.ct.gov/dot/cwp/view.asp?A=1394&Q=259544) issued by the Bureau of Highway Operations provides guidance on the permit process and the same shall govern all encroachment permit requests.

Exceptions to the securing an encroachment permit is that limited to emergency work or work covered by Section 16-229 of the Connecticut General Statutes. Pursuant to Section 16-229, a utility may place or replace a pole or a curb box without a permit issued by the Department.

In the event emergency work is performed, the utility must still apply for a permit in the same manner prescribed for non-emergency work.

11.2 Traffic Control Plan

Whenever a utility installation, adjustment or maintenance activity will affect the movement of traffic or traffic safety, the utility shall utilize a traffic control plan and utilize traffic control devices as necessary to ensure the safe and expeditious movement of traffic through the work zone and to enhance the safety of the workers within the work zone.

Traffic controls for utility work shall conform to the Department's current guidelines entitled *Traffic Control During Maintenance Operations*.
(http://www.ct.gov/dot/lib/dot/documents/dstc/part4.pdf)

All construction and maintenance operations shall be planned with full regard to safety and to keep traffic interference to an absolute minimum. On heavily traveled highways, construction operations interfering with traffic should not be performed during periods of peak traffic flow. Peak traffic flow periods are as determined by the Department. Any such work shall be planned so that closure of intersecting streets, road approaches, or other access points is held to a minimum.

In all cases the traffic control plan and the application of traffic control devices shall, at a minimum, conform to the standards set forth in the current edition of the *Manual on Uniform Traffic Control Devices (MUTCD)*.
(http://www.osha.gov/doc/highway_workzones/mutcd/index.html)

11.3 Worker Visibility

All workers within the right of way of a highway who are exposed to either traffic or to construction equipment shall wear high-visibility apparel. High-visibility safety apparel means personal protective safety clothing that is intended to provide worker conspicuity during both daytime and nighttime usage. The clothing shall meet the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled *American National Standard for High-Visibility Safety Apparel and Headwear.* (http://www.safetyequipment.org/hivisstd.htm)

11.4 Preservation and Restoration

Erosion and Sediment Control: Appropriate erosion control devices shall be in place before any other work starts. The surface area disturbed by utility installations or relocations should be kept to a minimum.

Restoration: Restoration methods and materials shall be in accordance with Department's *Standard Specifications for Roads, Bridges and Incidental Construction* (http://www.ct.gov/dot/cwp/view.asp?a=1385&Q=275956&dotPNavCtr=|41877|#41878) and the Department's *Highway Encroachment Permit Regulations*, and any special provisions included in the encroachment permit.

Drainage Facilities: Care should be taken in utility installations to avoid disturbing existing highway or private drainage facilities. If the utility or its agent disturb an existing facility in the prosecution of the work, the utility shall immediately notify the appropriate District Maintenance Office of the incident.

Trees: The utility shall be prohibited from spraying, cutting, or trimming trees unless written permission is given by the Department. In general, where permission is given, only light trimming is be permitted. However, when the removal of a tree is permitted, the stump should either be cut to the ground or be removed and the hole properly backfilled, as determined by the Department. All debris, refuse and waste shall be removed from the site. No disposal of any material is permitted within the highway right-of-way.

11.5 Records

The utility shall maintain records of all utility facilities without limitation, included those facilities which have been placed out-of-service or deactivated. The record shall be comprehensive and shall describe the facility, usage, size, configuration, material, horizontal location, vertical clearance or depth at the time of installation. Additionally, any special features such as encasement shall be noted, including information on type of material and limits of installation. Upon request, the utility shall provide the Department or its agent with as-built drawings of their facility.

Upon request, copy of record information including as-built drawings, plates and related information shall be provided by the utility to the Department or its agent and shall not be unreasonably withheld for any reason.

11.6 Corrective Measures

When the Department determines that an existing utility facility is likely to be associated with injury or accident to the highway user, the Department shall initiate or cause to be initiated in consultation with the utility, corrective measures to provide for a safer environment for the highway user. The corrective measures may include change to the utility or highway prioritized so as to achieve maximum safety benefit in the most cost effective manner. The schedule to perform the required changes shall be driven first and foremost by the degree to which the utility is a hazard with potential to cause or be associated with an accident. The timeliness of implementing corrective measures should also consider the schedule of planned utility replacement and the availability of resources. The degree to which a utility is a hazard shall be determined by the Department.

SECTION 12 EXCEPTIONS

Conditions may exist within the right-of-way that make it impractical or cost prohibitive to comply with a certain criteria contained herein. When a Utility can not comply with the Department's Utility Accommodation Manual, an Exception must be obtained before the work is permitted. All exceptions will be submitted to FHWA for review and written approval. Any work performed in non-compliance with this policy is being performed at-risk by the Utility and the Department may require its subsequent adjustment at the Utility's sole cost.

It is the responsibility of the Utility to initiate a request for an Exception when compliance with the Department's policy can not be met. It is also the responsibility of the Utility requesting the Exception to develop the supporting documentation for the request. In developing the documentation, the utility should demonstrate that the cost of complying with the Utility Accommodation Manual is greater than the overall benefit. The analysis should also address any impact to the safety or operations of the highway.

Any requests for an Exception should be transmitted to the Department's Principal Engineer – Utilities Section. The Utilities Section will process the request and provide the Utility with its disposition. Approvals will include any necessary signature of concurrence.

REFERENCES

National References

Code of Federal Regulations (CFR)

Title 23 Code of Federal Regulations Part 645 – Utilities
Electronic Code of Federal Regulations:

Title 49 Code of Federal Regulations Part 191 – Transportation of Natural and Other Gas by Pipeline
Electronic Code of Federal Regulations:

Title 49 Code of Federal Regulations Part 192 – Transportation of Natural and other Gas by Pipeline
Electronic Code of Federal Regulations:

Title 49 Code of Federal Regulations Part 193 – Liquidfied Natural Gas Facilities
Electronic Code of Federal Regulations:

Title 49 Code of Federal Regulations Part 195 – Transportation of Liquids by Pipeline
Electronic Code of Federal Regulations:

Manual on Uniform Traffic Control Devices, (available from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402)

National Electrical Safety Code, ANSI C2, current edition (Institute of Electrical and Electronics Engineers, Inc., IEEE Service Center, 445 Hoes Lane, Piscataway, New Jersey 08854)

Policy on Accommodation of Utilities Within Freeway R/W, prepared by the American Association of State Highway and Transportation Officials (AASHTO)

A Guide for Accommodating Utilities Within Highway Right-of-Way, prepared by the American Association of State Highway and Transportation Officials (AASHTO)

Roadside Design Guide, prepared by the American Association of State Highway and Transportation Officials (AASHTO)

State References

Traffic Control Signing Patterns for Maintenance, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.ct.gov/dot/lib/dot/documents/dstc/part4.pdf

Highway Encroachment Permit Regulations, (Connecticut Department of Transportation, Bureau of Highways)

Highway Design Manual, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.conndot.ct.gov/publications/hdm/cover.pdf

Bridge Design Manual, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.ct.gov/dot/lib/dot/documents/dpublications/bridge/bdm.pdf

Wireless Communications Facilities Program Procedures, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.ct.gov/dot/lib/dot/documents/dpropman/wiretelfac.pdf

Public Service Facility Policy and Procedures For Highways in Connecticut, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.ct.gov/dot/lib/dot/documents/dutilities/UtilityPolicyProcedures.pdf

Standard Specifications for Roads, Bridges and Incidental Construction, (Connecticut Department of Transportation, Bureau of Engineering and Construction)
http://www.ct.gov/dot/cwp/view.asp?a=1385&Q=275956&dotPNavCtr=|41877|#41878