

**SECTION 15**  
**UTILITY INSTALLATIONS**

**TABLE OF CONTENTS**

15.1 GENERAL DESIGN REQUIREMENTS ..... 15-1

15.2 UNDERGROUND FACILITIES ..... 15-1

15.3 AERIAL FACILITIES ..... 15-1

    15.3.1 Aerial Facilities Passing Over Structure (*Rev. 11/04*) ..... 15-1

    15.3.2 Aerial Facilities Passing Under Structure ..... 15-2

15.4 UTILITIES ADJACENT TO STRUCTURE ..... 15-2

15.5 EMERGENCY TEMPORARY INSTALLATIONS ..... 15-3

15.6 HIGHWAY ILLUMINATION POLES (*Rev. 11/04*) ..... 15-3

15.7 HIGH VOLTAGE TRANSMISSION FACILITIES (*Rev. 11/04*) ..... 15-4



## **SECTION 15** **UTILITY INSTALLATIONS**

### **15.1 GENERAL DESIGN REQUIREMENTS**

To ensure that the structure remains functional and aesthetically pleasing wherever possible, the following Sections will apply to the installation of utilities on structures.

### **15.2 UNDERGROUND FACILITIES**

Permanent underground installations, which are to be carried on and are parallel to the longitudinal axis of the structure, shall be placed in an out of sight location between the beams. No part of the utility or its supporting structure shall project below the bottom of the bridge superstructure.

In those instances where the proposed superstructure type is not adaptable to carrying utilities in an out-of-sight location on the underside of the structure, an early determination must be made as to whether or not utilities are to be accommodated. If the utilities must be accommodated, the selection of superstructure type must be addressed accordingly.

In those instances where an existing structure type is not adaptable to carrying utilities in an out-of-sight location on the structure, the proposed utility installation shall be the subject of an individual study as to its disposition.

Underground facilities shall not be suspended from or attached to the outside face of the superstructure, unless otherwise approved by the **CTDOT**.

Where aesthetics are a prime consideration, the utility shall be placed underground to the extent necessary to preserve the aesthetics of the structure and the surrounding area.

### **15.3 AERIAL FACILITIES**

#### **15.3.1 Aerial Facilities Passing Over Structure** *(Rev. 11/04)*

Aerial facilities (telephone, electrical, cable television, etc.) located along a highway that continues onto a structure shall be made an underground installation at the ends of the structure and carried across the structure. These facilities shall be placed in an out of sight location either between the beams or inside of a sidewalk if available. Placing utilities inside of the sidewalk shall be used only for telephone or cable TV. Electric conduits shall in no case be cast inside of a sidewalk as excessive heat buildup may be detrimental to both the utility and the structure. No part of the utility or its supporting structure shall project below the bottom of the bridge superstructure. The facility should extend a minimum distance beyond the ends of the structure required to retain the aesthetics of the structure.

Where unnecessary expense would be incurred by going underground, facilities carried on support poles may be carried aerially alongside a structure if it is practical to span the entire crossing.

The determination to carry the utilities either aerially or underground shall be studied at an early stage of the design with regard to such factors as economy, aesthetics, safety, and maintaining the characteristics of the local environment

### **15.3.2 Aerial Facilities Passing Under Structure**

Aerial facilities (telephone, electrical, cable television, etc.) located along a highway that passes under a structure shall in no instance be permitted to pass over the structure but shall be attached to the underside of it. An underground installation within the structure limits should be considered. The underground portion of the installation shall extend a distance beyond the limits of the structure(s) required to retain the aesthetics of the structure.

Solutions to special or unusual conditions shall be determined at a field review with **CTDOT** and Utility Company representatives. The field review team shall include the Design Engineer and the Utilities Engineer. In the event that a mutually agreeable solution cannot be reached, the matter shall be forwarded through channels to the Transportation Chief Engineer for a ruling.

## **15.4 UTILITIES ADJACENT TO STRUCTURE**

When underground utilities (existing or proposed) are located in the vicinity of structures, a review of the utility installation relative to the substructure design is required to determine if protection of the substructure is necessary.

The factors to be considered are the type, size, and location of the utility, the pressure in the line, the soil conditions, the material composition of the utility and the structure foundation.

The initial installation and future maintenance of the utility shall be investigated for their effects on the structure.

If it is determined that protection of the utility is necessary, the following are variations that should be considered:

1. Relocation of the utility.
2. Relocation of the substructure unit.
3. Protection of the substructure unit with sheeting.
4. Sheeting the utility trench.

5. Placing the utility in adequate encasement (sleeves or deflectors).
6. Placing the substructure on piles.
7. Require material composition of the utility to be ductile iron, prestressed concrete or steel (desirable in all cases).
8. Use of shut-off valves on both sides of the bridge (desirable in all cases).

This does not preclude other possibilities, which the designer or the utility engineer may have to offer.

### **15.5 EMERGENCY TEMPORARY INSTALLATIONS**

Temporary installations of an emergency nature may be placed on the sidewalk of a structure, but such installation must be either removed or replaced by a permanent out-of-sight installation within one year of the date of the temporary installation. Where sidewalks are not available, special consideration and study will be required to insure a safe and acceptable placement of the temporary installation.

Upon completion of the temporary installation, immediate steps shall be initiated to ensure that the temporary installation is removed or replaced within the time limit above and in a manner acceptable to the **CTDOT**.

### **15.6 HIGHWAY ILLUMINATION POLES** (Rev. 11/04)

If poles for highway illumination are needed within the non-access lines in the proximity of the structure, the location and type of poles shall be approved by the **CTDOT**.

Illumination poles routinely provided by manufacturers are intended to be mounted on fixed, ground mounted foundations. Mounting on non-fixed structures subject to deflection and vibration, such as bridge spans, may result in unacceptable movement or vibration of the pole, possibly resulting in structural failure of the pole or damage to lighting fixture. Therefore, mounting of illumination poles on bridge spans should be avoided whenever possible. If standard illumination poles must be mounted on the span, they should be mounted as near as possible to abutment or piers for spans up to 200 feet. For spans over 200 feet, they should not be mounted over 50 feet from abutment or pier locations. If illumination poles are required in areas outside these limits, they must meet one of the following criteria:

- Be of a non-standard design that has been specifically designed for placement on a moving structure, and be appropriate for the amplitude and frequency of the motion anticipated.
- Be of reduced height (under 30 feet mounting height) and certified by the manufacturer as appropriate for this application.

**15.7 HIGH VOLTAGE TRANSMISSION FACILITIES** *(Rev. 11/04)*

Long distance high voltage transmission facilities shall be the subject of a special study. Where aesthetics are a consideration, the placement of the facility underground should be considered. The final determination shall be weighed considering both the economics and aesthetics of the location in question. If required, the alternate proposals shall be referred to the Transportation Chief Engineer for final determination.