

Design Standards Letter

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Section/Plan No.: **D8-01, P901.05, P901.25, Pay Items**

Subject: **Highway Lighting Control Stations - Pull Boxes Signal Post Bases**

Body

Highway Lighting Control Stations:

The Maintenance and Traffic Division has asked that we discontinue the installation of pole mounted lighting control stations due to difficulties encountered with maintenance. The attached English and metric special sheets have been developed for base mounted control stations and separate power supplies. Until the standard plans are revised, these sheets should be included in the plans when lighting control stations are used. Standard plans 901.05 through 901.25 are being eliminated. If other types of control station designs are desired they should be submitted to the Design Division for approval. Use the following guidelines for these power supplies and control stations. The attached sheet shows typical layouts.

Power supply assemblies are located about two to four feet (0.6 m to 1.2 m) inside the right-of-way line unless the utility pole providing service is located on the right of way. In that case, the power supply assembly should be located as close as possible to the utility pole. If required, the control station can be located remotely from the power supply. The control station should be located as close as possible to the lighting system and at a location that is easily accessible to maintenance and traffic personnel. Clear zone requirements should also be used in determining control station location.

The power supplies can supply power to systems with only lighting or systems with lighting and signals. Pay items 901-86.10 through 901- 86.23 are used for these power supplies. The power supply type, the voltage and the need for signal power is designated by the pay item selected. Pay items 901-22.30 and 901-22.31 are used for the control stations. Where signal pole lighting is used, these control stations and power supplies are not used.

A rigid conduit run is installed from the power supply to the control station. Three single conductor power cables are required for the control station. The minimum

size wire is #2 AWG (35 mm²). Larger cables may be required due to voltage drop. Section 8-01.7(1) of the Design Manual contains formulae for computing wire size and voltage drop.

In systems with more than one lighting branch circuit a pull box should be installed at the lighting control station. Rigid conduit containing the cables for branch circuits is installed from the control station to this pull box.

Pull Boxes:

The attached pull box special sheet is being included with all jobs specifying pull boxes for signals or lighting. This drawing is also included in the metric special sheets. It is important that the plans clearly specify the type of pull box needed. For lighting, the pull boxes are specified on the 2B sheets. For signals, pull boxes are specified on the D-37A sheet. The lighting pay items for Pull Box Type A and Pull Box Type B and the signal pay items for Pull Box Type I and Pull Box Type II have been replaced and should no longer be used. The current pay items specify the type (concrete or preformed) and class of pull box (i.e. Class 1 or Standard). The type of drain is specified in the plans.

A concrete pull box is specified when placed in the travel way, auxiliary lanes, or shoulders. Preformed pull boxes are used at locations out of the travel way of vehicles, behind curb or guard rail, or in non-mountable islands. In impervious soil, a pull box with a concrete bottom (Type II drain) is used with a two inch (50 mm) pipe drain to an adjacent ditch, slope, or drain structure. Both concrete and preformed pull boxes can be installed with Type II drains. Three types of Type II drains can be used depending on the adjacent drainage features. Type A is used where there are no adjacent drainage features. Type B is used where the pull box is adjacent to a ditch or slope. Type C is used where the pull box is adjacent to a storm sewer. Regardless of the type of soil, if the conduit system is adjacent to any ditch, slope, or drainage structure, at least one pull box in the system should have a Type II drain into the adjacent drainage feature.

The elevation of the signal controller or lighting control station must be higher than the elevation of any pull box in the conduit run. Pull boxes are not installed in drainage ditches.

The number of pull boxes is kept to minimum. Pull boxes are used, however, at each end of a rigid conduit line under pavement for lighting and signals, except where the conduit run terminates in a service pole or power supply. Pull boxes are to be located a minimum of five feet (1.5 m) from the outside edge of the appurtenances they serve. This is to provide a minimum amount of working area and clearance for conduit elbows and bends.

Pull boxes are sized according to the following criteria:

The smallest preformed pull box is a Class 1 pull box. These boxes are used at locations with twenty-two or fewer entering conductors. These boxes would typically be used for detector lead-ins and terminal boxes for mast arms at the end of a run and are typically the boxes used for lighting. Where required, a standard concrete pull box is used.

When there are more than twenty-two but less than sixty-nine entering conductors a Class 2 preformed pull box is used. This box will more than likely be the most frequently used preformed pull box. Where required, a standard concrete pull box is used.

When there are sixty-nine or more entering conductors a Class 3 preformed pull box is used. Where required, a double concrete pull box is used.

Bases for Signal Posts With Mast Arms Longer Than 44 feet (13.4 m):

The department currently allows signal mast arms up to 54 feet long (16.5 m). Our current standard plans only show bases for mast arms up to 44 feet (13.4 m). The attached special detail has been developed for use with these longer mast arms. This detail should be included in the signal plans for jobs with these longer signal mast arms until the standard plans are revised. This detail is available on CAD.

If you have any questions, please call Rick Bennett at 751-1409.

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Attachments