

ITEM 677

ELECTRICAL CONDUITS FOR TRAFFIC SIGNAL INSTALLATION

677.1 Description. Unless otherwise shown on the drawings, all conductors shall be in conduit except when in metal poles. All conduits and fittings shall be of the sizes and types shown on the drawings. Each section of conduit shall bear evidence of approval of Underwriter's Laboratories.

The contractor may, at his own expense, use conduit of larger size than specified on the drawings providing that the larger size is used for the entire length of the conduit run.

Conduit terminating in posts or pedestal bases shall extend vertically approximately 2 inches above the concrete foundation. Field bends in rigid metal conduit shall have a minimum radius of 12 diameters of the nominal size of the conduit.

677.2 Installation. Each length of galvanized rigid metal conduit, where used, shall be reamed and threaded on each end and couplings shall be made up tight. White-lead paint or equal shall be used on threads of all joints.

PVC conduit shall be joined by solvent-weld method in accordance with the conduit manufacturers recommendation. No reducer couplings shall be used unless specifically indicated on the drawings.

All conduits and fittings shall have the burrs and rough places smoothed and shall be clean and free of obstructions before the cable is installed. Ends of the conduits shall be capped or plugged until installation of cable.

Upon request of the Engineer, the contractor shall draw a full-time metal brush, attached by swivel joint to a pull tape through "metal conduit" and a special template having a diameter not less than 75 percent of the inside diameter through PVC conduits to insure that the conduit is clean and free from obstructions. A nylon or non-metal pull tape shall be used in pulling cable and conductors through PVC conduit. Metal tapes will not be permitted in PVC conduit. The conduits shall be placed as shown on the drawings or as directed by the Engineer.

Unless otherwise shown on the drawings or directed by the Engineer, conduit placed in an open trench shall be placed at least 24 inches deep.

Conduit placed for concrete encasement shall be secured and supported in such a manner that the alignment will not be disturbed during placement of the concrete. No concrete shall be placed until all of the conduit ends have been capped and all box openings closed.

PVC conduit which is placed under existing pavement, sidewalks, and driveways shall be placed by first providing a void through which the PVC conduit shall be inserted. The void may be accomplished by either boring or jacking a mandrel. Metal conduit which is to be placed under existing pavement, sidewalks, and driveways shall be placed by jacking or boring (no boring or pushing will be allowed for conduits less than 1-1/2" in diameter).

Existing conduit which has been placed in position on the job site by others for this installation shall be checked to see that there are no obstructions in the conduit prior to threading the wire through. Any such obstructions shall be cleared without damage to the conduit, prior to installing cable.

Conduit runs shall be installed in such a manner as to minimize the accumulation of moisture at low points and pockets.

The components parts of conduits systems shall, in general, be of like material. Where dissimilar metals are used together, suitable provisions shall be made to prevent galvanic action.

The ends of all conduit runs shall be closed immediately after installation to prevent the accumulation of water, dirt and other foreign material. Conduit shall be swabbed out where necessary before conductors are pulled in. Bends may be either factory or field made.

677.3

Materials.

- A. Rigid Steel Conduit. When rigid metal galvanized conduits are specified or shown on the drawings, all conduits, including elbows, couplings and nipples, shall be standard weight schedule 40 zinc-coated steel rigid threaded conduit (Hot-Dip Galvanized), with the following requirements:

| <u>Nom. Size (Inches)</u> | <u>External Diameter (Inches)</u> | <u>Internal Diameter (Inches)</u> | <u>Wall Thickness (Inches)</u> | <u>Threads Per Inch</u> | <u>Feet/ Bundle</u> | <u>Weight (lbs./100')</u> |
|---------------------------|-----------------------------------|-----------------------------------|--------------------------------|-------------------------|---------------------|---------------------------|
| 1/2 | .840 | .622 | .109 | 14 | 50 | 79 |
| 3/4 | 1.050 | .824 | .113 | 14 | 50 | 105 |
| 1 | 1.315 | 1.049 | .133 | 11-1/2 | 50 | 130 |
| 1-1/4 | 1.660 | 1.380 | .140 | 11-1/2 | 30 | 201 |
| 1-1/2 | 1.900 | 1.610 | .145 | 11-1/2 | 30 | 249 |
| 2 | 2.375 | 2.067 | .154 | 11-1/2 | 10 | 332 |
| 2-1/2 | 2.875 | 2.469 | .203 | 8 | 10 | 527 |
| 3 | 3.500 | 3.068 | .216 | 8 | 10 | 682 |
| 3-1/2 | 4.000 | 3.548 | .226 | 8 | 10 | 831 |
| 4 | 4.500 | 4.026 | .237 | 8 | 10 | 972 |
| 5 | 5.563 | 5.047 | .258 | 8 | 10 | 1314 |
| 6 | 6.625 | 6.065 | .280 | 8 | 10 | 1745 |

B. PVC Conduit. When polyvinyl chloride conduits are specified or shown on the drawings, all conduits, including elbows, couplings, and nipples shall be a minimum of schedule 40 PVC conduit, with the following requirements:

| <u>Nom. Size (Inches)</u> | <u>External Diameter (Inches)</u> | <u>Internal Diameter (Inches)</u> | <u>Wall Thickness (Inches)</u> | <u>Weight (lbs./100')</u> |
|---------------------------|-----------------------------------|-----------------------------------|--------------------------------|---------------------------|
| 1/2 | .840 | .622 | .109 | 16 |
| 3/4 | 1.050 | .824 | .113 | 21 |
| 1 | 1.315 | 1.049 | .133 | 31 |
| 1-1/4 | 1.660 | 1.380 | .140 | 42 |
| <u>Nom. Size (Inches)</u> | <u>External Diameter (Inches)</u> | <u>Internal Diameter (Inches)</u> | <u>Wall Thickness (Inches)</u> | <u>Weight (lbs./100')</u> |

| | | | | |
|-------|-------|-------|------|-----|
| 1-1/2 | 1.900 | 1.610 | .145 | 50 |
| 2 | 2.375 | 2.067 | .154 | 67 |
| 2-1/2 | 2.875 | 2.469 | .203 | 107 |
| 3 | 3.500 | 3.068 | .216 | 140 |
| 3-1/2 | 4.000 | 3.548 | .226 | 169 |
| 4 | 4.500 | 4.026 | .237 | 199 |

677.4 Measurement and Payment. Electrical Conduit for the Traffic Signal Installation shall not be paid for directly, but shall be incidental to other work.

There are no line codes for this Item.

END OF ITEM 677