

## SECTION 658 TRAFFIC SIGNALS

### 658.1 Description

- (1) This section describes furnishing and installing traffic signal faces and pedestrian signal faces at the locations the plans show.

### 658.2 Materials

#### 658.2.1 Signal Mounting Hardware

- (1) Protect all brackets/clamps used for assembling and mounting traffic signal or pedestrian signal faces against atmospheric conditions. Use weather tight brackets/clamps. For all threaded signal face support hardware use 1-1/2 inch (38 mm) I.P.S.
- (2) Use an approved type of pole or standard vertical mounting brackets/clamps for signal faces from an approved manufacturer.
- (3) Use nipples of 1-1/2 (38mm) inside diameter, zinc coated, rigid metal conduit to complete the raceway from a pole or standard mounting bracket/clamp to the traffic or pedestrian signal face. Use nipples long enough to accommodate full depth threading into the head mounting lock nut in order to tighten the face, but that do not interfere with reflector closure. Thread the nipple into the mounting bracket/elbow until tight. Use approved pinnacle type hardware from an approved manufacturer to close the unused 1-1/2 inch (38 mm) openings in signal faces and bracket ends.
- (4) Use a 1-1/2 inch (38 mm) (I.P.S.) approved type of neoprene/rubber washers from an approved manufacturer to seal the top of a face, or the top of the top face in an array of face, to the upper mounting bracket to keep moisture out of the face.
- (5) For traffic signal face mounting lock nuts, use hex, zinc coated, malleable iron. ASME B16.14-1991 current for lock nut threading. Use 1/2-inch (13 mm) thick lock nuts that measure 2-1/2 inches (64 mm) outside flat to flat.
- (6) For rigid metallic zinc coated conduit nipples, use steel, 1-1/2 inch (38 mm), I.P.S. NPT, length as required.
- (7) When required, use corrosion resistant poly bracket shims.

#### 658.2.2 Traffic Signal Faces

- (1) Furnish the housing, door, visor, and terminal strip in housing conforming to the current revised standard for Adjustable Face, Vehicle Traffic Control Signal Heads, issued by the Institute of Transportation Engineers except as modified below. Use only new materials.
- (2) Anchor terminal blocks in the signal faces to the compartment with threaded screws. Use 18 AWG wire terminal screws in the terminal blocks.
- (3) For vehicular signal indications use doors sized for 12 inch (300 mm) or 8-inch (200 mm) nominal diameter lenses.
- (4) Furnish vehicular traffic signal faces made of an approved polycarbonate resin. Polycarbonate signal face housing and door shall be manufactured from virgin material only. Reclaimed material is unacceptable. The signal face housing shall be federal highway yellow unless the contract specifies otherwise.
- (5) Manufacturers certification of signal face material as specified shall be included with the materials list. Manufacturers certification shall be signed and notarized by a duly authorized officer of the signal manufacturing company. This certificate shall accompany the materials list.

#### 658.2.3 Backplates

- (1) Backplates shall be flat, dull black polycarbonate and shall project 5 inch (125 mm) beyond all sides of the signal housing and be securely mounted on the signal housing. Self tapping screws used to mount backplates to traffic signal faces shall be stainless steel.

#### 658.2.4 Pedestrian Signal Faces

- (1) Furnish the housing, door, visor, and terminal strip in housing conforming to ITE standards for adjustable face vehicle traffic control signal heads, except as modified below. Use only new materials.
- (2) Anchor terminal block in the pedestrian signal face to the housing with threaded screws. Use 18 AWG wire terminal screws in the terminal block.

- (3) Furnish pedestrian signal face made of an approved polycarbonate resin. Polycarbonate pedestrian signal face housing and door shall be manufactured from virgin material only. Reclaimed material is unacceptable. The pedestrian signal face housing shall be federal highway yellow unless the contract specifies otherwise.
- (4) Manufacturers certification of pedestrian signal face material as specified shall be included with the materials list. Manufacturers certification shall be signed and notarized by a duly authorized officer of the signal manufacturing company. This certificate shall accompany the materials list.

#### **658.2.5 Pedestrian Push Buttons**

- (1) Furnish freeze proof type pedestrian push buttons made by an approved manufacturer. Band a standard R 10-3b series sign directly above each push button. Include a directional arrow or arrows on the sign as the plans show.

### **658.3 Construction**

#### **658.3.1 Signal Mounting Hardware**

- (1) Under the Signal Mounting Hardware bid items, furnish and install mounting hardware necessary to attach pedestrian and traffic signal faces to standards, poles, and trombone arms.
- (2) Seal all voids between mounting brackets and poles by using silicon or rubberized caulking or similar material as the engineer approves.
- (3) Install approved sealing or closure pinnacles with neoprene/rubber washers in all topside holes of upper signal face head mounting brackets. Plug bottom holes on bottom mounting brackets with approved sealing or closure pinnacles.
- (4) If using 2 brackets with 2 mounting holes in each bracket, only use the upper hole of the top bracket to bolt the bracket to a pole or standard. Band the lower end of the upper bracket and the lower bracket to the pole or standard using 3/4 inch (19mm) wide, 0.025 inch (0.63 mm) thick, stainless steel bands. Use stainless steel clips.
- (5) Mount brackets banded to poles or standard so that the traffic signal assemblies are immovable. Mount all other traffic signal and pedestrian assemblies so that they are immovable.
- (6) Furnish stainless steel hex head cap screw 3/8 inch-24 NF (M10 x 1.25) mounting bolts. Drill and tap the pole or standard to match. Do not extend the bolt more than 1/4 inch (6 mm) through the wall, into the interior cavity of the pole or standard. Use a stainless steel flat washer sized to properly cover the bolt hole in the bracket and a stainless steel lock washer with each bolt.

#### **658.3.2 Traffic Signal Faces**

- (1) Under the Traffic Signal Face bid items, furnish and install traffic signal faces, including the installation of LED lenses. Install LED lenses per the manufacturers recommendations.
- (2) Use the cut away or tunnel type visors as the plans show.
- (3) Furnish the door face and visor in dull black unless the contract specifies otherwise.
- (4) Cover with hood or turn away all traffic signal faces from the view of the traveling public until the signal is accepted for use and activated.

#### **658.3.3 Backplates**

- (1) Furnish and install backplates on all signal faces as the plans show.

#### **658.3.4 Pedestrian Signal Faces**

- (1) Under the Pedestrian Signal Face bid item, furnish and install the pedestrian signal faces including the installation of LED lens. Install LED lens per the manufacturers recommendations.
- (2) Use the cut away or tunnel type visors as the plans show.
- (3) Furnish the door face and visor in dull black unless the contract specifies otherwise.
- (4) Cover or turn away all pedestrian signal faces from the view of the traveling public until the signal is accepted for use and activated.

#### **658.3.5 Pedestrian Push Buttons**

- (1) Under the Pedestrian Push Buttons bid item, furnish and install pedestrian push buttons.

- (2) Provide a 3/4-inch (19 mm) diameter push button mounting hole for wiring purposes in standards or poles. De-burr the holes after sawing and before installing the wire.
- (3) Plug the opening in the bottom of the pedestrian push button with a threaded pipe plug. Drill a 1/4-inch (6 mm) diameter hole in the plug for drainage purposes. Use IMSA 50-2 loop lead-in cable to wire the push button to the conductors in the base.

**658.4 Measurement**

- (1) The department will measure the Traffic Signal Face bid items, the Pedestrian Signal Face bid items, the Backplates bid items, and Pedestrian Push Buttons as each individual unit acceptably completed.
- (2) The department will measure the Signal Mounting Hardware bid items as a single lump sum unit for each intersection acceptably completed.

**658.5 Payment**

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
658.0100 - 0199	Traffic Signal Face (size) (vertical or horizontal)	EACH
658.0200 - 0290	Backplates Signal Face (# section) (size)	EACH
658.0300	Backplates Signal Face 12-8-8	EACH
658.0400 - 0499	Pedestrian Signal Face (inch)	EACH
658.0500	Pedestrian Push Buttons	EACH
658.5069	Signal Mounting Hardware (location)	LS

- (2) Payment for the Signal Mounting Hardware bid items is full compensation for providing all mounting hardware, including spacers, necessary to attach pedestrian and traffic signal faces to standards, poles, trombone, or monotube arms.
- (3) Payment for the Traffic Signal Face bid items is full compensation for providing signal faces including installation of L.E.D. lens.
- (4) Payment for the Backplates Signal Face bid items is full compensation for providing backplates and mounting screws.
- (5) Payment for the Pedestrian Signal Face bid items is full compensation for providing pedestrian signal faces including installation of L.E.D. lens.
- (6) Payment for Pedestrian Push Buttons is full compensation for providing pedestrian push buttons, pipe plugs, mounting hardware, signs, banding, and wiring.
- (7) The department will pay for wiring from the signal face terminal strip to the underground feeder cables at the top of the concrete base separately under the appropriate Cable Traffic Signal bid item as specified in 655.5.