

ITEM 686

ROAD ILLUMINATION ASSEMBLIES
(ON TRAFFIC SIGNAL POLES)

686.1 Description. This item shall govern for the materials and equipment used and for the installation of high pressure sodium (HPS) roadway illumination assemblies done in conjunction with traffic signal projects as shown on the drawings. The term "assembly", as used herein, shall constitute the complete assemblage of parts, equipment and miscellaneous items, except foundation, erected as provided in the drawings and in accordance with these specifications, forming a complete and independent lighting unit.

All materials furnished, assembled, fabricated or installed under this item shall be of the latest design and in strict accordance with the details shown on drawings. Materials and equipment shall comply with the applicable provisions of the National Electrical Code and National Electrical Manufacturers Association Standards.

Poles and mast arms shall be designed to carry the luminaire described herein, and shall meet the applicable requirements of the SP-100 and LUM-A standard details shown in the Traffic Standard drawings.

686.2 Luminaires. The luminaire housing shall be cast or drawn from a nonferrous alloy and shall be free of cracks and excessive porosity. All nuts, screws, clips, washers and attaching hardware shall be made of stainless steel or shall be electro-zinc plated minimum thickness of 0.002 inch, with olive drab or yellow chromate conversion coating. Cadmium plating will not be considered a highly corrosion resistant material. All threading surfaces used in the housing shall be lubricated with silicone grease.

The slipfitter shall adapt to 2-inch mast arms and securely clamp the luminaire to the mast arm. A positive means of vertical adjustment shall be incorporated either internally or externally that will permit adjustment of the luminaire to any uptilt position between the level position and fifteen degrees above horizontal.

The luminaire shall be equipped with resilient gaskets that provide and maintain a positive seal against weather and other contaminants for either the optic assembly or the entire luminaire.

The luminaire shall be designed to permit ready removal of refractor or lens from the luminaire but shall provide a positive means of preventing an unintentional separation.

The latch or latches shall provide a positive means of maintaining closure of the luminaire.

The optic assembly shall be provided with a reflector having sufficient strength to prevent being distorted during routine operations.

The optic assembly shall be provided with a means of supporting the lamp near the end opposite the socket, to protect the arc tube from vibration damage.

The refractor or lens shall be crystal clear and shall be constructed of high impact-resistant tempered glass. It may either have completely smooth surfaces or be equipped with refracting prisms.

Routine servicing shall require the use of no more than one hand tool.

The socket shall be rigidly attached to a high grade porcelain base which shall extend and completely enclose the metal shell that will positively resist the removal of the lamp.

686.3

Photometrics. The 400 watt luminaire, when mounted 40 feet above the midpoint of either long side of a rectangular area measuring 200 feet by 50 feet, shall provide a measured minimum intensity of 0.1 footcandle at any point on the surface of this area. Light intensities measured in the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.7 footcandles in any 10 foot interval along the aforementioned line from 10 to 70 feet on both sides of the luminaire.

The uniformity factor "F" shall not be less than 7.0 when calculated from the equation:

$$F = L \frac{(I \text{ min.})}{I \text{ max.}}$$

Where: F = the uniformity factor

L = 200'

I min. = minimum measured intensity within the rectangle

I max. = maximum measured intensity within the rectangle

Those luminaires designated in the drawings and material list for mounting a photo-sensitive control element shall include a locking-type mounting receptacle in accordance with EEI-NEMA standards. The receptacle shall be pre-wired to the terminal board.

Lamps shall be 400 watt clear high pressure sodium with rated average life of not less than 24,000 hours.

686.4 Ballast. Ballast shall be regulated output type mounted within the luminaire housing and designed to operate 400 watt high pressure sodium.

The ballast shall operate from a multiple 120-240 volt circuit. The ballast shall be pre-wired to the lamp socket and terminal board for 240 volt operation.

The power factor of any ballast when tested at the circuit voltage indicated in the drawing shall be less than 90 percent. During fluctuation of primary voltage up to plus and minus 13%, the input wattage to the ballast shall not fluctuate more than 10%.

Luminaires or ballasts shall permanently and clearly indicate the manufacturer's name, lamp type, catalog number, voltage rating, and connection diagram.

Luminaires shall not have receptacle for photo-control and shall be supplied for direct wiring to external control circuits. Luminaires shall not be supplied with shorting caps or photoelectric control.

686.5 Lamps. Lamps shall be 400 watt clear high pressure sodium with rated average life of not less than 24,000 hours.

Lamps shall be capable of normal operation when mounted in any position between level and 20 degrees above horizontal (base down).

686.6 Submittal. Shop drawings shall be submitted directly to the Traffic Engineer. The Traffic Engineer will review the general design features of the Road Illumination Assemblies. The Traffic Engineer will then refer all four copies of the shop drawings to the Project Engineer for review and approval .

686.7 Construction Methods.

A. General. The installation as a whole shall be carried out in conformance with the requirements stated herein and as shown on the drawings, and shall present a neat and workmanlike finished appearance.

B. Installing Fixtures. The installation of all luminaires shall conform to the recommendations of the manufacturer and, unless otherwise specified, shall be mounted in a level position.

C. Wire and Cable Installation. All conductor cables shall be installed in continuous lengths, without splices, from terminal to terminal. Terminals for lighting shall be located in the luminaire housing and the controller cabinet only, or as indicated on the drawings.

686.8 Measurement and Payment. Road Illumination Assemblies shall be paid for by each assembly installed, including all mounting hardware required.

There are line code(s), description(s), and unit(s) for this item.

NOTE: This specification requires other Standard Specification

Item 680 – Steel Mast Arm & Steel Strain Pole Assemblies

END OF ITEM 686