

## 807-T-217 HIGH PRESSURE SODIUM LUMINAIRES

(Adopted 01-19-17)

**Description**

This work shall consist of furnishing and installing high pressure sodium roadway, underpass, and high mast luminaires in accordance with 105.03.

**Materials**

Lamps supplied for luminaires shall be electrically compatible with the luminaires. Luminaires shall include the lamp ballast. The ballast shall be integrally built in and of the constant wattage regulator type of sufficient size to operate the designated lamp at the required voltage. The ballast shall provide satisfactory lamp performance to 20°F with an input voltage variation of  $\pm 10\%$  of the rated operating voltage specified. Luminaires shall be a single, self-contained device, not requiring on-site assembly for installation. Power consumption, wattage, shall not exceed that which is indicated on the plans.

Underpass and post top mounted luminaires shall be protected against salt spray and conform to ASTM B117, 2,000 hrs time horizon.

Luminaires shall include vandal shields when installed on an underpass or signs on bridge brackets and when otherwise specified. The vandal shield shall be made of a tough durable plastic, such as Lexan, mounted in a rugged galvanized steel or aluminum frame, and shall withstand severe impact without being damaged or allowing the refractor to be damaged. It shall be fastened securely to the luminaire so it cannot be removed from the outside and shall not interfere with the light distribution pattern. It shall protect the face of the refractor and if ventilation is necessary, the ventilating apertures shall be arranged so that they do not admit a probe of a diameter greater than 1/4 in.

Luminaires shall include gasketing that will completely seal out dust, moisture, and insects from the interior of the optical assembly and retard the formation of an undesirable film from gaseous vapors on the interior of the optical assembly. The optical assembly shall be rated at IP 66 or better in accordance with ANSI/IEC 60529 while ballasts and surge protection devices shall be rated at IP 65 or better.

All internal components shall be adequately supported to withstand mechanical shock and vibration. Luminaires shall be tested in accordance with ANSI C136.31, 2G loading or ANSI C136.31, 3G loading for luminaires on bridges. Testing about all axes shall be accomplished with a single luminaire.

Total Harmonic Distortion, THD, of the ballast shall not exceed 20% as verified by ANSI C82.6.

**(a) Roadway Lighting Luminaires**

Roadway lighting luminaires shall have a precision-cast aluminum housing with weatherproof finish. They shall have a strong, easily operated, positive latch on the street side of the housing with a hinge and a safety catch that prevents accidental unhinging on the house side of the refractor or lens holder. They shall include a four bolt slipfitter capable of adapting to a 2 in. mounting bracket that is adjustable  $\pm 5^\circ$  for leveling.

Luminaires shall have a high impact, heat-resistant, glass, prismatic refractor; a precision-cast, aluminum refractor holder with weatherproof finish, a detachable highly specular aluminum reflector; and an adjustable socket in both horizontal and vertical directions capable of producing lighting patterns to meet all the requirements of the American Standard Practice for Roadway Lighting as sponsored by the IESNA and as shown on the plans.

Luminaire weight shall not exceed 53 lbs and its projected area shall not exceed 2.4 sq ft.

**(b) Underpass Luminaires**

Underpass luminaires shall have the same requirements as roadway luminaires except they shall have vandal shields and the ballast shall meet the same requirements except it may be mounted separately near the luminaire as shown on the plans.

**(c) High Mast Luminaires**

The luminaires shall be in accordance with the American Standard Practice for Roadway Lighting by the Illumination Engineering Society and shall produce lighting patterns as shown on the plans. The lamp in the high mast luminaire shall be supported at both ends with mechanical spring grips or other means to hold the lamp secure against vibration. The sockets shall be mogul sized and porcelain enclosed. The luminaire housing shall be an enclosed aluminum unit with an aluminum reflector and borosilicate glass refractor.

**Construction Requirements**

Luminaire installation shall consist of the physical placing of the luminaire. Each installation shall include the furnishing and placing of the lamp as designated.

Working drawings shall be submitted in accordance with 105.02 and for each luminaire model submitted shall include:

1. Luminaire specifications and data sheets.
2. Test report verifying UL 1598 compliance.
3. Test report indicating compliance with ANSI C136.31, 2G or 3G requirements.
4. Test reports indicating the IP rating specified herein are met in accordance with ANSI/IEC, International Electrotechnical Committee, standard 60529.
5. Report of testing performed in accordance ANSI C82.6 indicating that the Total Harmonic Distortion does not exceed the limit specified herein.

Certifications and test reports shall be issued by a laboratory that is either listed as a National Recognized Testing Laboratory on the U.S. Department of Labor's website or is accredited by the National Voluntary Laboratory Accreditation Program, NVLAP.

Working drawings for luminaires shall also include the Illumination Engineering Society of North America, IESNA, photometric distribution file if the file number varies from what is indicated on the plans. The IESNA photometric distribution file shall be in either Visual, developed by Acuity Brands Lighting, or AGi32 from Lighting Analysis, Inc.

A non-prorated manufacturer's written warranty, against loss of performance, defects in materials and defects in workmanship, shall be

provided to and in favor of the Department. The warranty shall cover a period of five years from the date of installation of the luminaire. The warranty shall cover all components of the luminaire, including but not limited to ballast and light source. Loss of performance is defined to include, but is not limited to, the luminaire or any of its components falling out of compliance with specification. The warranty shall stipulate that replacement luminaires shall be shipped to the appropriate Department District Office, at no cost to the Department, within 30 days after the manufacturer's receipt of failed luminaires. Warranty documents shall include the manufacturer's name, address to which failed luminaires are to be shipped for replacement, contact person and contact person's telephone number and e-mail address. Warranty documents shall be submitted to the Engineer with the type C certification.

**(a) Roadway Luminaires**

Each luminaire shall be leveled in both directions in the horizontal plane after the light pole has been erected and adjusted. Rotary adjustment of the mast arm and vertical adjustment of roadway luminaires to obtain an installed level position in both directions shall be accomplished by means of the bolted saddle arrangement used to attach the luminaires to the mast arm. Lamp socket positions may be shown on the plans by type of Illuminating Engineering Society of North American, IES, light pattern. The specified lamp socket position shall be used to obtain the desired light pattern delivery. Proper connections shall be made to provide ballast operation at the voltage being supplied. Replacements needed because of faulty or incorrect voltage connections shall be made with no additional payment.

**(b) Underpass Luminaires**

Underpass luminaires shall be mounted on the vertical side surfaces of bridge bent structures or suspended by means of pendants supported by angle-iron struts or clips fastened to the structural beam members of the bridge. All parts of the pendent pipe assembly shall be hot-dipped galvanized after threads are cut. Silicone caulking compound shall be applied to the threads during assembly of the pendent. Underpass luminaires may require separately mounted ballasts which shall be installed in close proximity to the luminaires. Underpass luminaires shall be connected to a phase conductor and a neutral conductor. The luminaires shall be alternately connected to opposite phase conductors to balance the load. Conductor splicing will only be allowed in junction boxes, in-ground handholes, and circuit breaker enclosures.

**(c) High Mast Luminaires**

The aiming of the luminaires shall be as shown on the plans. When the aiming process is being done the luminaire shall be oriented to conform to its raised position and the ring properly tethered to prevent rotation during the aiming adjustment. The long axis of the luminaire shall be parallel to the aiming direction indicated on the plans.

**Method of Measurement**

Luminaire will be measured by the number of units installed.

**Basis of Payment**

Luminaire will be paid for at the contract unit price per each for the type and wattage specified.

Payment will be made under:

Luminaire, High Mast, High Pressure Sodium, \_\_\_\_\_ Watt.....EACH

Luminaire, Roadway, High Pressure Sodium, \_\_\_\_\_ Watt.....EACH  
Luminaire, Underpass, High Pressure Sodium, \_\_\_\_\_ Watt.....EACH

The cost of lamps, ballast, optical systems, weatherproof housings, surge protection devices, and electrical connections shall be included in the cost of luminaire.

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