

SECTION 26 56 00  
EXTERIOR LIGHTING

## PART 1 - GENERAL

## 1.1 DESCRIPTION

This section specifies the furnishing, installation, and connection of exterior luminaires, poles, and supports.

## 1.2 RELATED WORK

- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.
- B. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low voltage power and lighting wiring.
- C. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- D. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings, and boxes for raceway systems.
- E. Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION: Underground hand holes and conduits.

## 1.3 QUALITY ASSURANCE

- A. Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

## 1.4 SUBMITTALS

- A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. Shop Drawings:
  - 1. Clearly present sufficient information to determine compliance with drawings and specifications.
  - 2. Include electrical ratings, dimensions, mounting, details, materials, required clearances, terminations, wiring and connection diagrams, photometric data based on mounting height, ballasts, poles, luminaires, lamps, and accessories. Include electronic photometric files in IES format, or provide link (URL) to manufacturer's website that contains photometric data for each specific fixture used, excluding wall pack fixtures.
- C. Manuals: Two weeks prior to final inspection, submit four copies of operating and maintenance manuals to the Contracting Officer's Representative/COR. Include technical data sheets, wiring and

connection diagrams, and information for ordering replacement lamps, ballasts, and parts.

D. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Contracting Officer’s Representative/COR.

- 1. Certification by the manufacturer that the materials are in accordance with the drawings and specifications.
- 2. Certification by the contractor that the complete installation has been properly installed and tested.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.

B. Aluminum Association Inc. (AA):

AAH35.1-06.....Alloy and Temper Designation Systems for Aluminum

C. American Association of State Highway and Transportation Officials (AASHTO):

LTS-5-09 .....Structural Supports for Highway Signs, Luminaires and Traffic Signals

D. American Concrete Institute (ACI):

318-05 .....Building Code Requirements for Structural Concrete

E. American National Standards Institute (ANSI):

C81.61-09 .....Electrical Lamp Bases - Specifications for Bases (Caps) for Electric Lamps

F. American Society for Testing and Materials (ASTM):

A123/A123M-09 .....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A153/A153M-09.....Zinc Coating (Hot-Dip) on Iron and Steel Hardware

B108-03a-08 .....Aluminum-Alloy Permanent Mold Castings

C1089-06 .....Spun Cast Prestressed Concrete Poles

G. Federal Aviation Administration (FAA):

AC 70/7460-IK-07.....Obstruction Lighting and Marking

AC 150/5345-43F-06.....Obstruction Lighting Equipment

H. Illuminating Engineering Society of North America (IESNA)

HB-9-00.....Lighting Handbook

- RP-33-99.....Lighting for Exterior Environments
- LM-79-08.....Approved Method for the Electrical and  
Photometric Measurements of Solid-Sate Lighting  
Products

I. National Electrical Manufacturers Association (NEMA):

- C78.43-07 .....Electric Lamps - Single-Ended Metal-Halide  
Lamps
- C78.1381-98.....Electric Lamps - 70-Watt M85 Double-Ended  
Metal-Halide Lamps

J. National Fire Protection Association (NFPA):

- 70-08 .....National Electrical Code (NEC)

K. Underwriters Laboratories, Inc. (UL):

- 496-08 .....Lampholders
- 773-95.....Plug-In, Locking Type Photocontrols for Use  
with Area Lighting
- 1029-94.....High-Intensity-Discharge Lamp Ballasts
- 1598-08 .....Luminaires

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

2.2 LUMINAIRES

- A. Per UL 1598 and NEMA C136.17. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat, and safe cleaning and relamping.
- B. Light distribution pattern types shall be as shown on the drawings.
- C. Incorporate ballasts in the luminaire housing, except where otherwise shown on the drawings.
- E. Lamp sockets for high intensity discharge (H.I.D) fixture shall have locking-type porcelain enclosures in conformance to the applicable requirements of ANSI C81.61 and UL 496.
- F. Pre-wire internal components to terminal strips at the factory.  
Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.
- G. Provide manufacturer's standard finish, as scheduled on the drawings.
- H. Luminaires shall carry factory labels, showing complete, specific lamp and ballast information.

### 2.3 LAMPS

A. Install the proper lamps in every luminaire installed. B. Lamps shall be general-service, outdoor lighting types.

B. Metal-Halide Lamps: NEMA C78.43 or NEMA C78.1381.

### 2.4 METAL HALIDE CORE AND COIL BALLASTS

A. Shall be pulse start constant-wattage autotransformer (CWA) type.

B. Ballasts shall have individual overcurrent protection in each ungrounded supply conductor.

C. Power factor shall be not less than 90%.

D. Ballast shall have allowable line voltage variations of  $\pm 5\%$  for linear reactor type and  $\pm 10\%$  for CWA, with a maximum 20% lamp wattage regulation spread.

E. Ballast shall have a minimum starting temperature of  $-40^{\circ}$  F [ $-40^{\circ}$  C].

F. Lamp current crest factor shall be 1.8 or less, in accordance with lamp manufacturer recommendations.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer's recommendations.

B. Pole Foundations:

1. Excavate only as necessary to provide sufficient working clearance for installation of forms and proper use of tamper to the full depth of the excavation. Prevent surface water from flowing into the excavation. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath, and the end of conduit.

2. Set anchor bolts according to anchor-bolt templates furnished by the pole manufacturer.

3. Install poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.

4. After the poles have been installed, shimmed, and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 0.375 in [9 mm] inside diameter through the grout, tight to the top of the concrete base to prevent moisture weeping from the interior of the pole.

C. Install lamps in each luminaire.

D. Adjust luminaires that require field adjustment or aiming.

3.2 GROUNDING

- A. Ground noncurrent-carrying parts of equipment, including metal poles, luminaires, mounting arms, brackets, and metallic enclosures, as specified in Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially-treated or lined connectors suitable and listed for this purpose.

3.3 ACCEPTANCE CHECKS AND TESTS

- A. Verify operation after installing luminaires and energizing circuits.

3.4 WASTE WATER STORAGE TANK

- A. Mount Class I Division I Group D luminaire at the top of tank as shown on the drawings.

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