

SECTION 02760

STEEL LIGHTING STANDARDS

02760.01 GENERAL

A. Description

Steel lighting standards shall include, but not necessarily be limited to, furnishing and installing steel lighting poles, bracket arms, fittings, and reinforced concrete foundations as shown and detailed on the Plans and in accordance with the Contract Documents or as directed by the County Engineer.

B. Related Work Included Elsewhere

1. Electrical conduit and fittings; Section 02731.
2. Concrete foundations; Section 02734.
3. Luminaries and lamps; Section 02762.

C. Quality Assurance

1. General

The County Engineer will inspect all materials and work to ensure compliance with the Contract Documents.

2. Tests

In addition to the requirements specified in Section 05100.01, all 100% welds shall be ultrasonic tested which all other welds may be either visual or magnetic particle inspected as determined by the County Engineer.

D. Submittals

1. Shop Drawings

Shop drawings shall be submitted as specified in the "General Provisions" for all steel lighting standards. The shop drawings shall show the overall dimensions of the poles, details of construction, and include bolt circle data.

2. Certificates of Compliance

Certificates of compliance shall be submitted as specified in the "General Provisions" for all steel/aluminum lighting structures stating that the lighting structures conforming to AASHTO Standard Specifications for Structural Supports

for Highway Signs, Luminaries, and Traffic Signals, based on 90 mph wind loads, laminar weight of 70 pounds and laminar projected area of 3 square feet.

02760.02 MATERIALS**A. Materials Furnished by the County**

The County will not furnish any materials for steel lighting standards.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Cast Iron

Gray iron castings shall meet the requirements of ASTM A 48, Class 30B.

2. Galvanization

Galvanization shall meet all the requirements of ASTM A 123.

3. Hardware

Hardware shall conform to Section 909.09 of the "MSHA Standard Specifications for Construction and Materials, (1993)".

4. Conduit

Conduit shall meet all the requirements of Section 02731.02.

5. Pole Shaft

The steel shaft shall meet the requirements of ASTM A 595, Grade A. After forming and welding, the shaft shall have a smooth finish with only one longitudinal and no transverse welds. Poles shall be galvanized meeting the requirements of ASTM A 123.

6. Bracket Arm and Mounting Bracket

The steel bracket arm and mounting bracket shall meet the requirement of ASTM A 53, Schedule 40 and galvanized to meet the requirements of ASTM A 123.

7. Lighting Structures

Lighting structures shall conform to Section 950.07 of the "MSHA Standard Specifications for Construction and Materials, (1993)".

8. Stainless Steel Hardware

Stainless steel hardware shall conform to ASTM A167, Type 302.

02760.03 EXECUTION**A. General**

All fabrication and welding shall be conforming to Section 408 of the "MSHA Standard Specifications for Construction and Materials, (1993)". After forming and welding, the pole shall have a smooth finish with only one longitudinal and no transverse weld.

B. Installation

Lighting structures shall be installed as detailed on the Plans. Each lighting structures when fully assembled shall be installed in such a manner that the pole shall be vertical.

The breaker arm shall be secured to the poles as specified in the manufactures recommendations. Each bracket arm shall be perpendicular to the travel lane of the roadway, unless otherwise specified.

02760.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02760.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02761

ALUMINUM LIGHTING STANDARDS

02761.01 GENERAL

A. Description

Aluminum lighting standards shall include, but not necessarily be limited to, furnishing and installing low level aluminum lighting poles, bracket arms, fittings, and reinforced concrete foundations as shown and detailed on the Plans and in accordance with the Contract Documents or as directed by the County Engineer.

B. Related Work Included Elsewhere

1. Concrete foundations; Section 02734.
2. Electrical conduit and fittings; Section 02731.
3. Luminaries and lamps; Section 02762.

C. Quality Assurance

The County Engineer will inspect all materials and work to ensure compliance with the Contract Documents.

D. Submittals

1. Shop drawings shall be submitted as specified in the "General Provisions" for all aluminum lighting standards. The shop drawings shall show the overall dimensions of the poles, details of construction, and bolt circle data.
2. For Certificates of Compliance refer to Section 02760.01.D.2.

02761.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for aluminum lighting standards.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Aluminum Castings

Aluminum castings shall meet the requirements of ASTM B 26 or ASTM B 108, Alloy ANSI 356.0 T6.

2. Stainless Steel Hardware

Stainless steel hardware shall meet the requirements of ASTM A 167, Type 302.

3. Aluminum Shaft and Bracket Arm

Aluminum shaft and bracket arm shall be spun from one piece of extruded tubing meeting the requirements of ASTM B 241, 6000 series alloy. The shaft and bracket shall be cold worked to form the required taper.

4. Anchor Base Plate

Anchor base plate shall meet the requirements of ASTM B 209, 6000 series alloy.

5. Lighting Structures

Lighting structures shall conform to Section 950.07 of the "MSHA Standard Specifications for Construction and Materials, (1993)".

6. Conduit

Conduit shall meet the requirements of Section 02731.

02761.03 EXECUTION**A. General**

All welding shall be metallic-arc-consumable-electrode-inert-gas-shielded process. After welding, the entire assembly shall be precipitation heat treated to the T 6 temper by any approved method and rotary sand finished.

All aluminum poles shall be furnished with internal vibration dampening devices.

B. Installation

Lighting structures shall be installed as detailed on the Plans. The bracket arm shall be secured to the poles as specified in the manufacture's recommendations. Each bracket arm shall be perpendicular to the travel lane of the roadway unless otherwise specified.

02761.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02761.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02762

LUMINARIES AND LAMPS

02762.01 GENERAL

A. Description

This work shall consist of furnishing and installing luminaries, lamps and the necessary mounting hardware of the type and size shown on the Plans and in accordance with the Contract Documents or as directed by the County Engineer.

B. Related Work Included Elsewhere

1. General electrical work; Section 02730.
2. Electrical cable, wire, and connectors; Section 02735.

C. Quality Assurance

1. Inspection

The County Engineer will inspect all materials and work to ensure compliance with the Contract Documents.

2. Illumination Testing

Prior to aiming the luminaries, the Contractor shall energize all units for a 12-hour "burn-in" period. All defective lamps, ballasts, and luminaries shall be replaced.

The average minimum horizontal foot-candles measured at ground level and the uniformity ratio shall be as specified in the "Special Provisions". The Contractor shall provide all services and perform all tests which are specified or required to demonstrate that the luminaries are installed and operating properly in the presence of the County Engineer.

The Contractor shall provide the services of the lighting fixtures manufacturer's field representative to test and demonstrate that the lighting installation is in compliance with the Contract Documents.

Testing shall consist of ground-level measurement of lighting intensities at locations selected by the County Engineer based on the computer print-out. All test results shall be recorded in red ink on an approved copy of the computer print-out.

D. Submittals

1. Shop Drawings

Shop drawings shall be submitted as specified in the "General Provisions" for all luminaries. The shop drawings shall include general product information, dimensional data, mounting procedures, wiring diagrams, parts list, and such other information as is specified in Section 02730.01 or as may be required to verify compliance with these Specifications.

The lighting system manufacturer shall provide a computer derived lighting layout showing point-by-point foot candle levels for the luminary assembly at the locations specified in the "Special Provisions" or as shown on the Plans. The manufacturer shall also supply drawings showing the aiming point location of each luminary.

2. Certificates of Compliance

Certificates of compliance shall be submitted as specified in the "General Provisions" for all luminaries and lamps stating that the materials furnished meet the requirements specified in Section 02762.02, the National Electrical Code, and NEMA Publication FL-1.

3. Manufacturer's Guarantee

a. Luminaries

Luminaries assemblies shall be warranted in writing by the manufacturer for a period of 2 years. Any parts that are defective shall be replaced free of any material or labor charges to the County.

b. Aiming Alignment

Aiming alignment of luminary assemblies shall be warranted in writing for a period of 5 years.

02762.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for luminaries.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. General

All hardware shall be corrosion resistant and compatible with the item being installed. Luminaries, lamps and all necessary mounting hardware shall be produced by the same manufacturer.

2. Luminaries and Lamps

Luminaries and lamps shall conform to Section 950.12 of the "MSHA Standard Specifications for Construction and Materials, (1993)".

02762.03 EXECUTION**A. General**

Luminaries and lamps shall be installed as shown on the Plans or as directed by the County Engineer.

B. Arm Mounted Luminaries

Luminary mounting shall be installed on the respective structures and adjusted as shown on the Plans or as specified in the Contract Documents. The socket positions shall be adjusted to provide the required photometric performance.

C. Cleaning

After installation has been completed and prior to 30 days performance test, refractors and reflectors shall be cleaned with a product approved for use by the manufacture.

D. Mounting

The luminaries and lamps assembly shall be mounted as indicated in the Contract Documents and in accordance with the manufacturer's instructions.

02762.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02762.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE