

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, and reinforced concrete foundations as shown and detailed on the Plans and in accordance with the Contract Documents or as directed by the Engineer.

B. Related Work Included Elsewhere

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

C. Quality Assurance

1. General

The 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, all other welds may be either visual or magnetic particle inspected as determined by the 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 lighting standards stating that the lighting standards meet the NEMA test requirements specified in Section 02760.03.

3. Design Computations

The Contractor shall submit complete pole wing loading calculations based on the following:

- a. $P = 0.0025 (V)^2$
- b. gust factor = 30%
- c. height coefficient = 0.79

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. Steel Castings

Carbon steel castings shall meet the requirements of ASTM A 27, Grade 65-35.

2. Iron Castings

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

3. Galvanization

Galvanization shall meet all the requirements of ASTM A 123.

4. Hardware

a. Steel Bolts, Nuts, and Washers

Machine bolts, drift pin bolts, and similar threaded fasteners shall be mechanically or hot-dip galvanized. The coating shall meet the thickness, adherence, and quality requirements of ASTM A 153.

b. Bolts

Machine bolts, turn bolts, and drift bolts shall meet the requirements of ASTM A 307. The grade will be specified on the plans or in the "Special Provisions".

c. Drift Pins

Bolts used as drift pins shall be made of carbon tool steel having a Rockwell Hardness of C50 to C53 on the shank and C30 to C37 on the head.

5. Conduit

Conduit shall meet all the requirements of Section 02731.02.

6. Pole Shaft

The pole 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 or ASTM A 153.

7. Bracket Arm and Mounting Bracket

The bracket arm and mounting bracket shall meet the requirement of ASTM A 531, Schedule 40 and galvanized to meet the requirements of ASTM A 123 or ASTM A 153.

8. Steel Base Plate

The base plates shall be fabricated from steel meeting the requirements of ASTM A 588.

02760.03 EXECUTION

A. General

All fabrication and welding shall be in accordance with Division 5. The overall height dimension shall be achieved by a combination of shop welding and/or telescoping of one section into another.

B. Fabrication

1. Poles

Poles shaft shall be secured to the foundation by a steel base plate welded to the shaft. The shaft shall telescope the base and be welded by two continuous electric arc

welds, with one weld on the inside of the base plate at the end of the shaft and the other weld on the outside of the top of the base plate.

2. Welding

- a. All traverse welds, those joining one section to another, shall be 100% penetration.
- b. Longitudinal welds shall have a penetration of 60% except that portion that makes up the slip joint areas, plus 1 foot each side of the traverse welds, shall be 100% penetration.

3. Handhole

All poles shall be equipped with a reinforced handhole approximately 6 inches above the base.

4. Grounding Connection

A grounding connection capable of receiving a 1/2 inch x 13NC bronze threaded bolt shall be 12 inches above the base.

5. Bracket Arms and Lighting Standards

The bracket arms shall be secured to the shafts in accordance with the manufacturer's recommendations. Each bracket arm shall be oriented as shown on the Plans.

Lighting standards and brackets shall meet the NEMA test requirements for metals. Each lighting standard shall be capable of withstanding a 500 pound transverse load applied 18 inches from the top of the shaft without fracture and with maximum deflection of not more than 4.0% of shaft length. After removal of the load, the shaft shall have taken a permanent set of not more than 1/2 inch. Each bracket arm when attached to the shaft shall withstand a vertical load of 100 pounds and transverse load of 50 pounds applied to the luminaire end of the bracket arm without fracture or apparent deformation after the load is removed.

C. Installation

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

02760.04 METHOD OF MEASUREMENT

Measurement for steel lighting standards with bracket arms and reinforced concrete foundations will be made on a per each assembly basis in each bracket arm length category.

02760.05 BASIS OF PAYMENT

Payment for steel lighting standards with bracket arms will be made at the price bid per each assembly for the various bracket arm lengths specified, complete in place. The price bid shall include furnishing all materials, labor, equipment, reinforced concrete foundations, including excavation, backfill, conduit elbows, and incidentals necessary to complete this item of work as shown and specified in strict accordance with the Contract Documents.