

SECTION 02751**STRAIN POLES****02751.01 GENERAL****A. Description**

Strain poles shall include, but not necessarily be limited to, furnishing and installing steel strain poles having round or multisided cross sections including concrete footings or foundations with anchor bolts, reinforcing steel, ground rods, conduit elbows, and miscellaneous hardware, as shown on the Plans or on the Standard Details 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. Signal poles and mast arms; Section 02746.

C. Quality Assurance

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

D. Submittals

1. Shop Drawing

Shop drawings shall be submitted as specified in the "General Provisions" for all strain poles. 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 in accordance with the "General Provisions" stating that the material requirements specified in Section 02751.02 have been met and that the fabrication workmanship has been inspected.

3. Guarantee

The manufacturer shall furnish the Engineer with all warranties on equipment and material offered by the manufacturer as normal trade practice.

02751.02 MATERIALS**A. Materials Furnished by the County**

The County will not furnish any materials for strain poles.

B. Contractor's Options

Alternate designs will be considered using two piece construction. Two piece construction shall have a minimum 18 inch overlap with one watertight transverse weld, smoothed to be inconspicuous. Any alternative two piece designs must be structurally equivalent to the poles required under this specification and incorporate a diameter at the base less than 13 inches. Bolt circle diameter shall be followed. Single straight pipe construction will not be accepted.

C. Detailed Material Requirements

1. General

Materials shall meet the minimum requirements as specified in the latest edition of the AASHTO Standard Specifications for Structural supports for Highway Signs, Luminaries and Traffic Signals except as modified herein.

2. Pole Shaft

Pole shaft shall be open hearth hot-rolled "0" or "00" gage steel meeting the requirements of ASTM A 595 Grade A or equal with a minimum yield strength of 55,000 psi galvanized to meet the requirements of ASTM A 123 or ASTM A 153. Multisided poles shall have a minimum of 8 sides.

Welding shall meet the requirements of the AWS structural welding code.

3. Anchor Bolts, Locking and Leveling Nuts

Anchor bolts, locking and leveling nuts shall meet the requirements of Section 02734.02.

4. Screws, Bolts, Nuts, and Washers

Screws, bolts, nuts, and washers shall be stainless steel Type 304.

5. Conduit Elbows

Conduit elbows shall meet the requirements of Section 02731.02 and Section 02734.03.

6. Steel Base Plates

Steel base plates shall meet the requirements of Section 02750.02.

7. Removable Ornamental Covers and Pole Caps

Removable ornamental covers and pole caps shall be made of cast iron meeting the requirements of ASTM A 126, Class A, or cast aluminum meeting the requirements of ASTM B 108, Alloy ANSI 356.0 T 6.

02751.03 EXECUTION

A. Fabrication

1. General

Each pole shall consist of a steel shaft with a steel anchor base, four (4) anchor bolts and a steel cap.

2. Monotube Poles

The shaft shall be fabricated of one length and shall have one longitudinal weld with no transverse welds in the fabrication of the shaft. The longitudinal weld shall be finished to form a smooth outside surface and the wall of the shaft shall be uniform in thickness throughout including the welded area. The shaft shall be round or multisided (less than 8 sides not acceptable) in cross section and be uniformly tapered from butt to tip approximately 1 inch diameter for each 7 feet in length (0.14 inches per foot). All poles shall be 12 inch diameter or the base 0 gauge single ply, or 00 gauge (two ply) or equal in thickness and round or multisided (less than 18 sides not acceptable) in cross section.

3. Anchor Base

All poles shall be supplied with an anchor base. The material shall be of sufficient size, strength and secured to the lower end of the shaft by two continuous electric arc welds. The base shall telescope the shaft with one weld on the inside of the base at the end of the shaft, while the other weld shall be on the outside at the top of the base and shall be such that the weld connection shall develop the full strength of the adjacent shaft to resist bending action. A 5/16 inch welded threaded grounding stud and nut shall be supplied.

4. Anchor Bolts

All poles shall be supplied with 4 anchor bolts. The anchor bolts shall be 1-3/4 inch diameter, 90 inches long for single-ply poles; and 2-1/4 inch diameter, 96 inches long for two-ply poles, with 9 inches of thread on the top and a 6 inch ell bend.

5. Handhole

A 4 inch by 8 inch handhole complete with frame, welded into the shaft, and cover shall be provided in a position, as noted, complete with a stainless steel captive chain and is to be held in place with two 1/4 inch 20 U.N.C. stainless steel screws.

6. Couplings

Poles shall be provided with 3 inch threaded blind half couplings as noted on the Standard Details. These couplings shall be factory installed. The couplings shall protrude 1/4 inch from the face of the pole and shall be welded to the pole surface. The locations of couplings shall be as noted on the Standard Details.

7. Anchor Bolt Covers

Four (4) removable ornamental covers shall be provided with each pole for attachment to the base by stainless steel hex head screws.

8. Caps

Each shaft shall be supplied with removable cap, fabricated from either galvanized steel or spun aluminum.

9. Cable Support

A "J" hook shall be welded near the top of the shaft for cable support.

B. Foundation

Concrete footings or foundations shall be constructed to the dimensions shown on the Plans and meet the requirements of Section 02734.03.

C. Installation

Pole installation shall be as specified in Section 02750.03.

02751.04 METHOD OF MEASUREMENT

Measurement for strain poles will be made of the number of each type and size specified and satisfactorily installed.

02751.05 BASIS OF PAYMENT

Payment for strain poles will be made at the price bid for the number of each type and size specified, furnished, and installed complete in place. The price bid shall include furnishing all concrete, anchor bolts, reinforcing steel, ground rods, ground wire, footing or foundations, pole, miscellaneous hardware, and all equipment, labor, and incidentals, necessary to complete this item of work as shown and specified in strict accordance with the Contract Documents.