

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
STEEL STRAIN POLE

SIG:EMS

1 of 3

APPR:MJF:REL:06-07-23
FHWA:APPR:06-20-23

a. Description. This work consists of furnishing, fabricating, and erecting a traffic signal steel strain pole as shown on the plans, in accordance with the standard specifications, and as specified herein. This special provision is for an anchor base type (six anchor bolt system) strain pole and includes all other associated hardware required to complete the work.

b. Material. Furnish material in accordance with sections 906, 908 (as modified by 20SP-908A - Miscellaneous Metal Products Revisions), and 921 of the Standard Specifications for Construction and this special provision.

Material specifications for the strain pole are included in Table 1.

Table 1: Material Specifications

Component	Specification
Pole Tube	<i>ASTM A572/A572M, Grade 50, ASTM A572/A572M, Grade 65 or ASTM A595/A595M, Grade A</i>
Base Plate	<i>ASTM A36/A36M</i>
Bottom Steel Template	<i>ASTM A36/A36M</i>
Hand Hole Frame	<i>ASTM A705/A705M, ASTM A572/A572M, Grade 50 or ASTM A572/A572M, Grade 65</i>
Hand Hole Cover	<i>ASTM A1011/A1011M Grade 36</i>
Stainless Steel Hardware	<i>AISI 300 SERIES (18-8)</i>
"ANCO" Lock Nuts or Equivalent	<i>ASTM A563 GR DH</i>
Flat Washers	<i>ASTM F436/F436M</i>

Ensure bolts, nuts, and washers meet subsection 906.07 of the Standard Specifications for Construction.

Blast clean fabricated components with a nominal thickness greater than 1/2 inch to remove mill scale and welding slag before galvanizing. For components with a nominal thickness of 1/2 inch or less, blast cleaning can be waived if the galvanizer inspects the material and provides a written statement to the fabricator that blast cleaning is not required. Otherwise blast cleaning is required.

Acceptance of strain pole is based on general certification in accordance with the *MQAP Manual*.

c. Strength Requirements. Furnish a strain pole capable of withstanding combined shear force and moment as specified in Table 2 applied at the base of the pole without exceeding the elastic limit. A strain pole connected to a tie-off span is a pole in which any of the connecting span or tether wires connects to a tie-off. Ensure that the deflection of the pole does not exceed

0.40 inch per 100 pounds of transverse load applied at the same point.

Table 2: Loads for Strength Requirements

Pole Height	Strain Pole Not Connected to Tie-off Span		Strain Pole Connected to Tie-off Span	
	Shear	Moment	Shear	Moment
30 feet	23.8 kips	521 kip-ft	26.5 kips	542 kip-ft
36 feet	25.5 kips	679 kip-ft	29.7 kips	730 kip-ft
40 feet	26.1 kips	790 kip-ft	30.3 kips	858 kip-ft

d. Fabrication. Fabricate and weld in accordance with section 707 of the Standard Specifications for Construction, except as modified herein.

Ensure the strain pole is hot-dip galvanized in accordance with subsection 716.03.B.4 of the Standard Specifications for Construction. If strain poles are required to have a duplex coating, ensure the coating is in accordance with 20SP-716A - Coating of Galvanized Lighting, Signal, Sign, and Miscellaneous Support Structures.

Submit shop drawings in accordance with subsection 707.03.A of the Standard Specifications for Construction.

Perform nondestructive testing of welds in accordance with subsection 707.03.D.12 of the Standard Specifications for Construction except ensure MT inspection frequency of fillet welds is increased to 25 percent. Fillet welds used to secure the strain pole cap do not require MT.

1. Base plate warpage must not exceed 1/16 inches per foot.
2. Tolerance for overall length of strain pole is $\pm 1/8$ inch. Tolerance for sweep and camber of strain pole 1/8 inch per 10 foot. Tolerance for twist of strain pole is ± 10 degrees.
3. Strain pole wall must be single-ply.
4. Strain pole must be round or 12-sided.
5. Strain poles cannot have more than two longitudinal welds. Transverse welds are prohibited.
6. Provide a hand hole opening and cover. Weld a reinforcing frame to the pole for the hand hole opening. Ensure the placement of the hand hole does not reduce the strength of the pole. Securely fasten the handhole cover using stainless steel hex head cap screws or by an approved locking device.
7. Longitudinal seam welds must have 60 percent minimum penetration or fusion except full penetration groove welds are required for a minimum of 6 inches from tube to baseplate.

e. Erection. Ensure anchor bolts are pretensioned using the Turn-of-Nut (TON) method in accordance with subsection 810.03.N.2 of the Standard Specifications for Construction (as modified by 20SP-810H - Permanent Traffic Signs and Supports Revisions).

Furnish the Engineer 5 work days notification prior to the start of installation so they may witness

or monitor the Contractor's activities.

f. Construction. Ensure all work is in accordance with subsection 810.03 and sections 818 and 820 of the Standard Specifications for Construction and the contract.

Perform repairs to galvanized surfaces in accordance with subsection 716.03.E of the Standard Specifications for Construction.

g. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item

Pay Unit

Strain Pole, Steel, 6 bolt, Size __Each

Strain Pole, Steel, 6 bolt, Size __ includes furnishing all materials, fabrication, shop cleaning, galvanizing, shipping, and erection.

No extension of time or additional compensation will be granted due to obtaining the proper AISC certifications and/or endorsements required for this project.

Construction of the foundation will be included in other items.