

722 - SIGN STRUCTURES AND BRIDGE MOUNTED SIGN ATTACHMENTS

SECTION 722

SIGN STRUCTURES AND BRIDGE MOUNTED SIGN ATTACHMENTS

722.1 DESCRIPTION

Fabricate and erect bridge mounted sign attachments and sign structures to support signs over or adjacent to highways and streets as designated in the Contract Documents. The structures consist of:

- footings, including electrical grounding and conduit sleeves, when applicable;
- vertical support poles;
- vertical end support units;
- overhead trusses;
- structural attachment assembly;
- truss type arm; and
- maintenance walkway.

Remove, modify and reset the existing sign structures as designated in the Contract Documents.

BID ITEMS

UNITS

Bridge Mounted Sign Attachment (*)(**)	Linear Feet
Butterfly Overhead Sign Structure (*)(**)	Linear Feet
Cantilever Sign Structure (*)(**)	Linear Feet
Overhead Sign Structure (*)(**)	Linear Feet
Overhead Sign Structure (Mast Arm Type) (*)(**)	Linear Feet
Overhead Sign Structure (Single Tapered Tube) (*)(**)	Linear Feet
Remove and Reset Sign Structure (***)	Each
Reset Sign Structure (***)	Each
Sign Structure Modification (***)	Each
* Size or Size Group	
** Type of Material	
*** Station	

722.2 MATERIALS

a. General. Provide new, unweathered materials of the type, and complying with the sizes, dimensions and tolerances shown in the Contract Documents.

Submit shop drawings according to **subsection 105.10**. Include a "cutting list" or "shop bill" that provides the piece mark length, outside diameter and wall thickness of each piece used in the fabrication of the structure. Provide an erection sketch, detailing the location of each piece in the final assembly. Do not perform any fabrication until the approved shop drawings are in the hands of the Inspector and fabricator, and the Engineer has authorized fabrication. Any purchase of materials before fabrication authorization is at the Contractor's risk. Changes to approved shop drawings are subject to the approval of the Engineer. Submit revised sheets of the same size as those originally approved.

Mark each bundle or package of material with letters, numbers or a combination of letters and numbers that are identified in the test report for that material. Mark each piece of material with letters, numbers or a combination of letters and numbers that are identified in the shop drawings. The marking must be legible, but not noticeable after erection of the structure.

b. Fabrication.

(1) Shop Welding. Perform welding and repairs according to the applicable requirements of the latest versions of AWS D1.1, "Structural Welding Code – Steel" and AWS D1.2, "Structural Welding Code – Aluminum".

(2) Dye Penetrant (DP) Testing. DP testing according to ASTM E 165 of welded flanges and base plates is required. The Engineer will accept the DP tests according to AWS D1.1 for steel, and AWS D1.2 for aluminum. DP testing must be witnessed by the Engineer.

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(3) Test Loading. Test loading of fabricated trusses is required only when inspection indicates the fabrication to be of doubtful or unacceptable quality requiring repairs before acceptance. Test load the structure to demonstrate the adequacy of the repair. The Contractor will bear the cost of test loading.

c. Electrical Equipment and Materials. Provide the electrical equipment and materials shown in the Contract Documents.

Submit to the Engineer for approval a schedule of electrical equipment and materials proposed for installation before beginning construction. Include catalog cuts, diagrams, drawings and other descriptive data required by the Engineer.

d. Concrete and Grout.

(1) Concrete for Footings. Provide Grade 3.5 concrete that complies with **DIVISION 400**.

(2) Grout. Provide non-shrink cementitious grout that complies with **DIVISION 1700**.

e. Reinforcing Steel. Provide Reinforcing Steel that complies with **DIVISION 1600**.

722.3 CONSTRUCTION REQUIREMENTS

a. General. Do not damage the existing cables and conduits. If necessary, relocate the existing cables and conduits to clear the footing locations. Repair or replace existing cables and conduits damaged during construction of the footings.

If temporary signs interfere with the erection of the permanent signs, relocate the temporary signs to the locations determined by the Engineer.

When "Contractor Construction Staking" is not shown as a bid item, the Engineer will stake the locations of sign structure footings. For each footing location, the Engineer will provide the Contractor with the vertical measurement from the crown grade of the pavement to the top of the footing.

Erect the bridge mounted sign attachments and sign structures according to the Contract Documents.

If removing, modifying or resetting sign structures, do not damage the existing sign structures. Repair or replace, as directed by the Engineer, sign structures damaged through the negligence of the Contractor.

b. Concrete Footings. Construct the concrete footings according to the Contract Documents. When placing the concrete, consolidate the concrete in the footings by rodding and vibrating. Allow the concrete footings to cure a minimum of 4 days before attaching the sign structures.

c. Sign Structures.

(1) Bolted Joint Connections. Before assembling the sign structures, use a soft wire brush to clean the contact surfaces of the bolted connections. Remove all corrosion and coatings, except galvanizing. Wipe the cleaned contact surfaces with rags soaked with acetone, xylol or toluol. Remove excess solvent from the contact surfaces using clean, dry rags.

Assemble the sign structures according to the Contract Documents. Seal all bolted joints immediately, using a sealant intended for this purpose, and applied according to the sealant manufacturer's recommendations.

(2) Attachment to Anchor Bolts. Place the sign structure with anchor plate on the anchor bolts. After all signs are mounted on the structure, and the sign pole (or bridge support) is plumb, tighten the top and bottom anchor bolt nuts and lock nuts. Fill the gap between the top of the footing and the bottom of the anchor plate with concrete grout according to the details in the Contract Documents.

(3) Overhead Truss. In erection of the truss, allow the dead load deflection to take place before fully tightening all the connectors. Fully tighten the vertical portion which clamps the column in all corners, but tighten only the top of 1 end of the horizontal portion of the truss-to-end-support connector while the truss is fully suspended from the crane. The rest of the truss-to-end supports shall be fully tightened after the dead load of the truss is being supported by the connectors, but still attached to the crane with a slack line. Erect the signs within 24 hours of erecting the truss.

(4) Dissimilar Materials. Whenever dissimilar materials are to be in permanent contact, provide an insulating barrier of alkali resistant asphalt paint or equivalent.

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d. Electrical Work. Comply with all Local, State and Federal ordinances.

(1) Conduit. Install conduit entrances through the concrete footing as indicated in the Contract Documents. Place temporary screwed caps on the conduit ends.

(2) Grounding. Ground all structures and sign bridges as detailed in the Contract Documents. Measure the resistance of the installed grounding system; the Engineer will observe the testing. The grounding system must have less than 25 Ω resistance to ground.

722.4 MEASUREMENT AND PAYMENT

The Engineer will measure bridge mounted sign attachments, butterfly overhead sign structures, cantilever sign structures and overhead sign structures by the linear foot.

The Engineer will measure each sign structure, bridge mounted sign attachment, removal and resetting of a sign structure and modification of a sign structure.

Payment for each "Bridge Mounted Sign Attachment", "Butterfly Overhead Sign Structure", "Cantilever Sign Structure", "Overhead Sign Structure", "Overhead Sign Structure (Mast Arm Type)", "Overhead Sign Structure (Single Tapered Tube)", "Remove and Reset Sign Structure", "Reset Sign Structure" and "Sign Structure Modification" at the contract unit prices is full compensation for the specified work.