

713 STEEL SIGN STRUCTURES

713.01 DESCRIPTION

Work consists of furnishing, fabricating, galvanizing and erecting sign structures including horizontal trusses, maintenance catwalks, upright supports, base plates, and anchor bolts, as required in the contracts document and/or as directed.

Work also includes replacement of damaged pieces.

713.02 MATERIALS

Materials for Steel Sign Structures – [824.03](#)

Self-Anchoring Bolts per FSS-FF-S-325 for Group I, Type 2, Styles 1 and 2; Group II, Type 4, Class 1 and 2; or Group III, Types 1 and 2. Bolts shall be galvanized per [811.07](#) and be capable of withstanding a proof test load 4 times greater than design working load.

Epoxy Adhesive and Mortar per [822.08\(B\)](#) and [806.05\(C\)](#).

713.03 MILL AND SHOP PROCEDURES

Requirements of AASHTO M 160 shall be met at all times.

The Contractor shall verify all horizontal dimensions of the overhead truss sign structure span length before fabrication. Span lengths shown on plans are approximate only. All horizontal trusses shall be cambered to compensate for dead load deflections and to overcome the illusion of sag. Each truss shall be checked in the shop for alignment, sound welds and general workmanship.

The Contractor shall take the necessary steps to insure that errors, defects, omissions, unauthorized corrections made by flame cutting or grinding, defectively driven rivets, etc., are caught and corrected by acceptable methods at the earliest stage practicable.

The Contractor also shall make provisions to furnish and maintain at both the steel mill and fabrication shop, adequate space with drawing table, light and a telephone for the exclusive use of personnel performing mill and shop inspection for the District.

For rejected work and material under mill, shop and job site inspection, one reinspection for each instance of corrective action will be allowed at no cost to the Contractor. All costs associated with further re-inspection will be paid by the Contractor.

713.04 WELDING

Welding procedures will conform to [706.18](#), and/or as specified herein.

When evidence of record is accepted in lieu of required tests, the Contractor shall furnish the manufacturer's certification that the filler metal and shielding being used on the project were manufactured with the same material and process requirements as the filler metal and shielding used for the evidence of record procedure.

After welding has been completed and prior to galvanizing the assembly, mating surfaces of arm flange plates must meet the flatness requirements of AASHTO M 160.

713.05 TRANSPORTATION AND FIELD STORAGE

Loading, transportation, unloading and field storage of fabricated and rolled material shall be conducted so as to avoid injury and deformation of the metal. Damaged material shall be repaired or replaced by the Contractor at his expense, as determined by the Chief Engineer.

Special care shall be exercised and protective shimming, wrapping or other means employed to protect galvanized surfaces from mechanical damage due to handling, storage or erection procedures.

Marred or chipped areas in the galvanizing such as scratches, extending nearly to bare steel, raw edges, spotting, etc., considered to be minor from aesthetic or corrosion standpoint as determined by the shall be properly cleaned and carefully touched-up with a zinc rich paint, the delivered paint containing not less than 93 percent zinc by weight. Color of touch-up paint shall be a silver gray which will blend with galvanized surfaces. Yellow-green shades of zinc paint will not be permitted. Fineline scratches, however, will not require touch-up.

713.06 ERECTION METHODS

Sign structures shall not be erected until the support footings have cured and are properly backfilled. Before erection, bottom surfaces of base plates shall be given a pretreatment wash of either cold phosphate pretreatment or basic zinc-chromate- vinyl butyral wash coat and two field coats of primer per FSS TT-P-641, Type II.

Field drilling of holes in any part of sign structures is prohibited.

Upright sign structure members shall be erected truly vertical with the tops of each installation at the same elevation. Upright members shall be plumbed and brought to final grade by means of leveling nuts on the anchor bolts.

Horizontal cross members shall be erected so that beam clamps on each upright are at the same elevation; members shall be cambered to insure that after placement of signs, cross members will not appear to deflect below the horizontal. Horizontal cross members shall be erected at the proper height to insure that after placement of the sign, required minimum clearance between bottom of sign panel, sign light support or catwalk support, and highest point of roadway is provided.

After each overhead structure has been properly erected, grout meeting the requirements of [806.05\(E\)](#) shall be placed to completely fill the space under support base plates. Grout shall be neatly finished with beveled surfaces.

Grout shall contain no more water than needed to produce a workable, plastic mix.

713.07 ERECTION ON EXISTING STRUCTURES

Where it is necessary to attach a sign or sign support to an existing bridge or retaining wall, care shall be taken to prevent damage to the existing structure. All areas damaged as a result of Contractor operations shall be acceptably restored to their original condition by the Contractor at Contractor expense.

Bolt installation may be made at a temperature not lower than 35°F and only when temperature during cure period will not drop below 25°F.

(A) DRILLED ANCHOR HOLES. Anchor bolts shall be set in drilled holes.

Drilled anchor bolts holes shall be at least 1 inch larger in diameter than the bolts used. Holes shall be drilled in PCC and/or stone masonry to depth needed for proper anchorage.

Work includes cutting through reinforcing steel, if any, and use of diamond bits or other procedure to properly drill holes, plus repair of damage to anchorage area. Drilling templates shall be used to insure aligned holes. Holes shall be washed out to remove all residue, dried out, and bolts promptly mortared in the holes. Holes shall be protected from frost action.

(B) EPOXY-ANCHORED BOLTS. Bolts shall be clean and degreased with toluene.

Bolts may be installed by either: (1) pouring epoxy mortar to a predetermined level in the hole, then inserting bolt and working it up and down plus tapping lightly to insure embedment; or (2) inserting bolt and pouring epoxy mortar into the entire annular space between bolt and hole.

With either method, templates shall be used to secure bolts in proper position until the mortar cures.

(C) SELF-ANCHORING BOLTS. Self-anchoring bolt installations shall be made in holes drilled to proper dimensions to accommodate the type of self-anchoring bolt being used.

Self-anchoring bolts shall be inserted according to the manufacturer's recommendations.

713.08 MEASURE AND PAYMENT

The unit of measure for Steel Sign Structures will be the job, complete in place.

Payment for Steel Sign Structures will be made at the contract lump sum price for each sign structure, which payment will include furnishing anchorage units complete, drilled anchorages complete, grouting, galvanizing, base plate painting and all labor, tools, material, equipment and incidentals needed to complete specified work.

The Contractor also shall have bid a unit price per pound for Steel Sign Structures, which price will become the contract unit price for "adds" and "deducts" required and approved by the Chief Engineer due to field conditions, changes, etc.