

ITEM 08564.0501 M - STEEL FRAME PEDESTRIAN SUPERSTRUCTURE

DESCRIPTION:

General.

Under this work the Contractor shall fabricate, furnish and erect a structural steel frame pedestrian superstructure and other parts as shown on the plans and in accordance with the provisions of the contract documents.

Examine Contract Documents for requirements that affect Work of Section 564 - Structural Steel. Other specification Sections that directly relate to Work of this Section include, but are not limited to:

Section 594; Timber and Lumber
Section 568; Bridge and Culvert Railings

Submittals.

Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.

Shop Drawings.

Submit Shop Drawings prepared under the supervision of a Licensed Professional Engineer currently registered to practice in New York State, including complete details and schedules for fabrication and shop assembly of members, and details, schedules, procedures, and diagrams showing sequence of erection. Shop Drawings shall not be made by using reproductions of Contract Drawings. The Contractor is responsible for coordinating the design, fabrication and detailing of any special attachments which may be required for the mounting of lights, signs, or utilities on the bridge at the locations shown on the plans.

Structural steel members for which Shop Drawings have not been reviewed shall not be fabricated. Engineer's review shall cover general locations, spacings, and details of design. Omission from Shop Drawings of any materials required by the Contract Documents shall not relieve the Contractor of the responsibility of furnishing and installing such materials, even though such Shop Drawings may have been reviewed and returned.

Include details of cuts, connections, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld.

Provide setting drawings, templates, and directions for installation of anchor bolts and sleeves, and other anchorages to be installed by other trades.

Quality Assurance.

The Owner reserves the right to use ultrasonic inspection to verify adequacy of all welds. Materials and fabrication procedures are subject to inspection and test in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. Promptly remove and

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replace materials of fabricated components which do not comply.

Contractor's testing laboratory services: Qualifications for welding work; qualify welding operators in accordance with the AWS "Standard Qualification Procedure". Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests within previous twelve (12) months. If recertification of welders is required, retesting will be Contractor's responsibility.

Codes and Standards shall comply with the provisions of the following, except as otherwise indicated:

AISC Code.
AISC Specification.
AWS D1.1.

All steel fabrication shall meet the requirements of the SCM and the AASHTO Division II specifications, including pre-qualification of welders, and a Fracture Control Plan.

Structural steel fabricator shall have not less than five (5) years experience in the fabrication of structural steel for bridges.

Structural steel erector shall have not less than five (5) years experience in the erection of structural steel.

The fabricator shall be responsible for all errors of detailing, fabrication, and for the correct fitting of structural steel members.

Connections: All connections shall be shown, in detail, on Shop Drawings, subject to review of the Engineer.

Substitutions: Substitutions of Sections, or modifications of details, or both, and the reasons therefor, shall be submitted with the Shop Drawings for review. Submitted substitutions must be clearly identified and noted as such. Reviewed substitutions, modifications, and necessary changes in related portions of the work shall be coordinated by the fabricator and shall be accomplished at no additional cost to the Owner.

Templates: Shall be furnished by the fabricator with the instructions for the setting of anchor bolts and other anchorage.

Product Delivery, Storage, and Handling.

Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time not to delay that work.

Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

Do not store materials on structure in manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

Job Conditions.

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Coordinate erection of structural steel with the work of other trades.

MATERIALS:

The Contractor's attention is directed to §106-01, Source of Supply and Quality Requirements, with regard to advising the Departmental Representatives of the sources of proposed materials.

Materials for this work shall meet the requirements of the *New York State Steel Construction Manual (SCM)*, § 715-01 - Structural Steel, § 715-14 High Strength Bolts, Nuts and Washers, and modifications made herein.

Structural steel shall conform to ASTM A36M, unless otherwise indicated on the contract plans.

Steel Sheet: ASTM A366M, A570M, OR A611, grade required for design loading.

Structural Tubing conforming to ASTM A500, Grade B, unless otherwise indicated on the contract plans.

Posts, pickets and rails for Picket Fence Pedestrian Rail shall conform to ASTM A500, Grade B. All other materials for Picket Fence Pedestrian Rail shall conform with §710-23 of the Standard Specifications.

Certified copies of the results of tests conducted by the manufacturer shall be furnished to the Engineer in accordance with the requirements of §715-01, Structural Steel.

For fabrication of work which will be exposed to view only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

Fabricate and assemble structural assemblies in the shop to the greatest extent possible. Structural steel members shall be fabricated in accordance with AISC Specifications.

Paint shall comply with §572 of the Standard Specifications. Color shall be as specified on the contract documents.

Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

Welding electrodes shall conform to the requirements of AWS D1.1, suitable for the steel and intended service.

Non-shrink grout shall be pre-mixed non-shrinking, high strength grout. Compressive strength in 28 days shall be 35 MPa minimum, but in no case less than the specified strength of the adjacent concrete. Manufacturer shall provide evidence that the material meets the requirements of COE CRD-C 621 (588). Grout permanently exposed to view shall be nonoxidizing; metallic grout may be used in other locations. All surfaces to receive the grout shall be free from laitance, oil, grease, dust, loose particles or other foreign material and prepared in strict accordance with manufacturers recommendations. If in the opinion of the Engineer the material is determined to be unsuitable for Department work, the material will be rejected.

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When the use of timber and/or lumber is called for on the contract plans, the timber and/or lumber shall meet all applicable requirements of Section 594 - Timber and Lumber, §594-2 Materials.

When Asphalt Roofing Materials are specified in the contract plans, the Asphalt Roofing Materials shall conform to ASTM D226 and D312.

CONSTRUCTION DETAILS:

All structural steel work, including, but not limited to: fabrication, inspection, transportation, and erection shall be done in accordance with the provisions of the SCM, except the design and fabrication of welded tubular connections shall be in accordance with the current ANSI/AWS/D1.1 - Structural Welding Code.

Erector must examine areas and conditions under which structural steel work is to be installed, and notify Engineer of unacceptable conditions or conditions detrimental to proper and timely completion of work.

When Picket Fence Pedestrian Railing is specified, the Picket Fence Pedestrian Rail shall be installed as shown on the plans.

When plans indicate the use of timber and/or lumber, the applicable requirements of Section 594 - Timber and Lumber, §594-3 Construction Details shall apply.

Fatigue sensitive details should be avoided, and out of plane bending details should be eliminated. Fillet welds should only be used to transfer shear, and Complete Penetration Groove Welds (CPGW) or Slip Critical Bolted Connections should be used to transfer moment. All field connections for the frame and floor system shall be through the use of high strength bolts.

Unless indicated otherwise on the plans, all railings shall be designed for pedestrian use in accordance with AASHTO specifications.

Erection.

Comply with AISC Specification and Code, and as herein specified.

Furnish anchor bolts and other anchorage required for securing the structural steel to foundations and other in-place work. Anchor bolts shall be set in accordance with §565-3.03 Setting Anchor Bolts.

Set structural steel accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Perform necessary adjustments to compensate for discrepancies in elevation and alignment.

Level and plum individual members of structure within specified AISC tolerances.

Establish required leveling and plumbing measurements at mean operating temperature of structure. Make allowances for the difference between temperature at time of erection and mean temperature at which time the structure will be when completed and in service. Where parts cannot be assembled or fitted properly as a result of errors in fabrication or of deformation due to handling or transportation, such condition shall be immediately reported to the Engineer along with proposed method of correction. The straightening of bends

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or warps shall be done by approved methods. Bent or damaged heat-treated parts will be rejected.

Testing Laboratory Services For Quality Control.

Inspect all structural steel during fabrication and during and after erection for conformance with Contract Documents and Shop Drawings.

Shop inspection shall include:

- Examination of all steel for straightness and alignment.
- Examination of all fabricated pieces and checking of same with erection plans and detail drawings.
- Examination of all shop welding.
- Examination of all fabricated pieces for proper cleaning.

Field inspection shall include:

- Proper erection of all pieces.
- Plumbness of structure and proper bracing.
- Proper welding.

Qualifications of Welders: Provide the testing laboratory with names of welders to be employed on work, together with certification that welders have passed qualification tests within the last year using procedures covered in AWS D1.1.

Inspection of field welds shall be in accordance with AWS D1.1.

METHOD OF MEASUREMENT:

The method of measurement for the structure shall be lump sum for the completed structure in place. No measurement will be taken.

BASIS OF PAYMENT:

The price bid shall include the cost of furnishing all labor, materials and equipment necessary to complete the work.

Additional items that shall be included in the price bid and shall be the Contractor's responsibility are as follows:

Steel: Additional work as per the requirements of §564-5.02. In addition, the cost of all materials, labor and equipment necessary for the mounting of lighting fixtures, signs, or utilities on the bridge at the locations indicated on the contract plans, which are not included under other items of the contract, shall be included in the price bid for this item.

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When the use of timber and/or lumber is indicated on the plans, the cost of furnishing all spikes, nails, screws, timber connectors, bolts, nuts, washers, hardware, preservative treatment and other required materials together with the labor and equipment necessary to complete the work shall be included in the price bid for this item.

When Built-Up Asphalt Roofs are specified on the plans, the cost of providing all labor, equipment and materials necessary to complete the work shall be included in the price bid for this item.

When painting of the superstructure or appurtenances is specified on the plans, the cost of providing all labor, equipment and materials necessary to complete the work, shall be included in the price bid for this item.

When Picket Fence Pedestrian Rail is specified on the plans, the cost of providing all labor, equipment and materials necessary to complete the work shall be included in the price bid for this item.