

SECTION 05100
STRUCTURAL STEEL

05100.01 GENERAL

A. Description

Structural steel shall include, but not necessarily be limited to, furnishing and erecting structural steel in accordance with the Contract Documents, or as directed by the Engineer. Structural steel shall be fabricated and erected in accordance with the AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" and the "Code of Standard Practice for Steel Buildings and Bridges".

B. Related Work Included Elsewhere

Painting; Section 09900.

C. Quality Assurance

1. The Engineer will inspect all materials and work to ensure compliance with the Contract Documents.
2. Shop and field welds may be inspected in accordance with AWS D 1.1. Welds requiring repairs will be reinspected after repairs are made.
3. Field assembled bolted construction may be inspected in accordance with AISC "Specifications for Structural Joints Using A325 or A490 Bolts".

D. Submittals

1. Shop Drawings

Shop drawings shall be submitted as specified in the "General Provisions" for all structural steel. The shop drawings shall include the following information:

- a. Complete information necessary for the fabrication of the component parts of the structure or structures, including location, type and size of all bolts and shop welds. Welds shall be indicated by standard AWS welding symbols.
- b. Erection plans and details indicating required sequence of construction and temporary bracing where applicable.
- c. Surface finishes, shop paint system or other coating as specified in Section 05100.03 and/or 09900.03.

2. Certificates of Compliance

Certificates of compliance shall be submitted as specified in the "General Provisions" for all structural steel stating that the material furnished meets the requirements specified in Section 05100.02.

05100.02 MATERIALS**A. Materials Furnished by the County**

The County will not furnish any structural steel.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements**1. Structural Steel**

Carbon steel plates, shapes, and bars shall conform to requirements of ASTM A 36 unless otherwise noted on the Plans.

2. Bolts, nuts, and washers shall meet requirements of ANSI B 18.2.1 and B 18.2.2 and the following:

- a. Low carbon steel bolts and nuts shall conform to requirements of ASTM A 307.
- b. High strength carbon steel bolts, nuts, and washers for structural joints shall conform to requirements of ASTM A 325 only.
- c. Round washers other than those in contact with high strength bolt heads and nuts shall conform to requirements of ANSI B 27.3, Type B.
- d. Beveled washers shall be square, smooth, and sloped to make contact surfaces of bolt head and nut parallel.

3. Structural steel tubing in round, square, or rectangular tube shapes shall conform to requirements of ASTM A 501. Round pipe shall conform to the requirements of ASTM A 55, Grade B.

05100.03 EXECUTION**A. Design Criteria**

Design of connections not shown on the Plans shall be in accordance with requirements of "Specifications for the Design, Fabrication & Erection of Structural Steel for Buildings" of the AISC for the full strength of the member.

B. Fabrications

1. Fabricate and shop assemble work in accordance with AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", "Specifications for Architecturally Exposed Structural Steel", "Specification for Structural Joints using ASTM A 325 or A 490 Bolts".
2. Straighten rolled material, if necessary, before it is laid out for fabrication in a manner conforming to the mill tolerances provided in ASTM A 6, and by a process and in a manner which will not injure the material. Sharp kinks and bends will be cause for rejection of the material. Heat shrinking of low-alloy structural steel will not be permitted.
3. Perform shearing, flame cutting, and chipping carefully and accurately. Cut flame-cut edges of members by a mechanically guided torch or by hand, and remove all nicks. The radii of reentrant gas-cut fillets shall be not less than 3/4 inch and as much larger as practicable. Perform flame cutting in such a manner that metal being cut is not carrying stress. Finish exposed edge flame-cut by grinding.
4. Provide holes for connection of the work of other trades.
5. Weld in accordance with requirements of AWS D1.1. All welding shall be performed by welders who possess a current, valid AWS certificate. Shop connections may be bolted or welded. Field connections shall be made with high strength carbon steel bolts unless otherwise noted on the Plans.
6. All structural steel, except zinc-coated surfaces, surfaces to be embedded in concrete or mortar, or steel for temporary construction shall be shop painted in accordance with Section 09900.03.

C. Coating and Painting

1. Galvanizing
 - a. Products fabricated from rolled, dressed, and forged steel shapes, plates, and strip shall conform to requirements of ASTM A 123.
 - b. Iron and steel hardware shall conform to requirements of ASTM A 153.

- c. Hot dip coating on assembled steel products shall conform to requirements of ASTM A 386.
 - d. Prime coat for galvanized surfaces shall conform to requirements of FSS TT-P-641, Type I.
2. Painting shall be in accordance with Section 09900.03.

D. Delivery and Storage

1. Material shall be handled, shipped, and stored in a manner that will prevent distortion or other damage. Material shall be stored in a clean, properly drained location out of contact with the ground. Damaged material shall be replaced or repaired in an approved manner at no cost to the County.
2. Mark orientation on all members as well as piece mark.
3. Match mark all shop prefitted members.

E. Erection

1. General
 - a. Erection shall be in accordance with the AISC "Manual of Steel Construction" as modified herein. Erect steel members true and plumbing following match marks. Thoroughly clean surfaces to be joined.
 - b. Assemble joints using high strength steel bolts, unless otherwise indicated, in accordance with the AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts".
 - c. Perform field welding in accordance with AWS D1.1.
 - d. Do not make or enlarge holes by burning.
 - e. Provide temporary bracing sufficient to handle construction loads.
2. Field Assembly
 - a. Splice only where indicated.
 - b. Align and adjust members forming parts of a complete assembly after assembly and before fastening. Should parts not fit, notify the Engineer immediately.
3. Field paint exposed surfaces of steel work in accordance with requirements specified in Section 09900.

05100.04 METHOD OF MEASUREMENT

Structural steel will not be measured.

05100.05 BASIS OF PAYMENT

Structural steel will not be paid for as a separate item but is considered incidental to the work required in the construction of specific structures that will be paid for under various items indicated in the Proposal. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the required work.