**ARCHITECTURE**
**SECTION 05120**

# STRUCTURAL STEEL

## PART 1 - GENERAL

### 1.1 SECTION REQUIREMENTS

A. Structural Steel including connections.

1. Structural steel is to be left exposed, as a finished surface, in the majority of locations throughout the building. Additional preparation and priming of steel fabrications is required.

B. Comply with AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design," RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts," and AWS D1.1 "Structural Welding Code--Steel."

C. Submittals:

1. Product Data and material certificates.
2. Shop Drawings are to be developed by the manufacturer. Copies of structural design drawings will not be accepted.
3. Connection design to be stamped by engineer registered in the State of New Hampshire.

### 1.2. QUALITY ASSURANCE

A. FABRICATOR QUALIFICATIONS:

1. Fabricator shall be registered with and approved by authorities having jurisdiction.
A firm with minimum five years experience in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.
2. Fabricator must participate in the AISC Quality Certification Program and be designated an AISC-Certified Plant for Category: Category Cbd, complex steel building structures.

B. INSTALLER QUALIFICATIONS:

1. An experienced Installer with a minimum of five years experience, who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
2. Erection to comply with latest OSHA Erection Standards Subpart R, Steel Erection 1926.750-761, effective January 18, 2002.

1.3 PRE-ERECTION MEETING(S) shall be held, at the project site, prior to erection of structural steel. The attendees shall include:

General Contractor Project Manager and Superintendent
Erection Subcontractor and Foreman
Structural Engineer and/or Architect

## PART 2 - PRODUCTS

### 2.1 STRUCTURAL STEEL AND ACCESSORIES

A. Structural-Steel Shapes, Plates, and Bars: ASTM A 36, carbon steel.

B. Structural-Steel WF Beams: ASTM A 992, Grade 50, carbon steel.

C. Cold-Formed Structural-Steel Tubing: ASTM A 500, Grade B.

D. Anchor Rods: ASTM A 1554, Grade 36.

E. Bolts, Nuts, and Washers: ASTM A 325, Type 1, high-strength heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers, uncoated.

F. Shear Connectors: ASTM A 108, headed stud type, cold finished carbon steel, AWS D1.1, Type B.

G. Primer: Fast curing, universal modified alkyd, rust inhibiting, shop coat with good resistance to normal atmospheric corrosion. Primer shall comply with all federal standards for VOC, lead and chromate levels. Color - Grey.

H. Hot-Dip Galvanized Finish at Lintels: Where specified, apply zinc coating by the hot-dip process to structural steel in conformance with ASTM A 123

2.2 FABRICATION

A. Fabricate and assemble structural steel in shop to greatest extent possible according to AISC specifications and tolerance limits of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel. Fabricate architecturally exposed structural steel with exposed surfaces smooth, square, and free of surface blemishes, including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness.
1. Welds to be ground smooth.
2. Piece marks hidden or made with media that permits full removal after erection.

B. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.
1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.
2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
3. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC (The Society for Protective Coatings) Specifications as follows:
   a. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." Removal of all rust scale, mill scale, loose paint, and loose rust to the degree specified by blast cleaning. The substrate should have a pronounced metallic sheen and also be free of oil, grease, dirt, soil, salts, and other contaminants. Surface should not be buffed or polished smooth.

C. Shop Priming: Do not prime surfaces to be embedded in concrete or mortar or to be field welded. Primer paint shall be compatible with finish coats on architecturally exposed steel.
1. Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
   a. Stripe paint corners, crevices, bolts, welds, and sharp edges.
   b. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

D. Welding: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel." Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

## PART 3 - EXECUTION

3.1 ERECTION

A. Erect structural steel according to AISC specifications and within erection tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

B. Set base and bearing plates on wedges, shims, or setting nuts. Tighten anchor bolts, cut off wedges or shims flush with edge of plate, and pack grout solidly between bearing surfaces and plates.

C. Bolted Connections: Install and tighten nonhigh-strength bolts, unless high-strength bolts are indicated. Snug tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings—Allowable Stress Design and Plastic Design" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Welds to be ground smooth. Prepare and prime field fabrications for finish paint. Refer to shop fabrication criteria above.

E. Shear Connectors: Prepare steel surfaces as recommended by manufacturers of shear connectors. Use automatic end welding of headed stud shear connectors according to AWS D1.1 and manufacturers written instructions.

3.2 FIELD QUALITY CONTROL

B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Field welds will be visually inspected according to AWS D1.1.

E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360 degree flash or welding repairs to any shear connector.
2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

F. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.3 REPAIRS AND PROTECTION

A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

**END OF SECTION**