

## SECTION 05120 - STRUCTURAL STEEL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes structural steel.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components, including connections, splices, holes, welds, and bolts.
- C. Mill certificates.
- D. Welding certificates.

#### 1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category I, conventional steel structures.
- B. Comply with applicable provisions in AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design" and RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts".
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."

#### 1.4 STORAGE AND PROTECTION

- A. Store steel members off ground and protect steel members and packaged materials from erosion and deterioration.
- B. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Structural-Steel W Shapes: ASTM A 992/A992 M.

- B. Structural-Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M, carbon steel.
- C. Cold-Formed Structural-Steel Tubing: ASTM A 500, Grade B.
- D. Anchor Rods, Bolts, Nuts: **ASTM F 1554**, headed bolts, Type 1, heavy hex steel structural bolts and heavy hex carbon-steel nuts.
- E. Non-high-Strength Bolts, Nuts, and Washers: **ASTM F 1554**, carbon-steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers, uncoated.
- F. High-Strength Bolts, Nuts, and Washers: **ASTM A 325**, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers, uncoated.
- G. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.
- H. Nonmetallic, Shrinkage-Resistant Grout: Premixed, ASTM C 1107, of consistency suitable for application.

## 2.2 FABRICATION

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.
  - 1. Comply with fabrication tolerance limits in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel and architectural exposed structural steel.
  - 2. Shop install and tighten non high-strength bolts, except where high-strength bolts are indicated.
  - 3. Shop install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
    - a. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.
  - 4. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
- B. Shop Priming: Shop prime steel, except surfaces embedded in concrete or mortar, surfaces to be field welded, surfaces to be high-strength bolted with slip-critical connections, and surfaces to receive sprayed-on fireproofing.
  - 1. Surface Preparation: SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning."
  - 2. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than **1.5 mils**. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
- C. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process according to ASTM A 123 to structural steel indicated to be galvanized.

### 2.3 SOURCE QUALITY CONTROL

- A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and to prepare test reports. Comply with Part 3 "Field Quality Control" Article.

## PART 3 - EXECUTION

### 3.1 ERECTION

- A. Examination: Verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.
- B. Erect structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.
- C. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces before setting base and bearing plates. Clean bottom surface of base and bearing plates and set on wedges, shims, or setting nuts as required.
  - 1. Tighten anchor bolts, cut off wedges or shims flush with edge of base or bearing plate, and pack grout solidly between bearing surfaces and plates.
- D. Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- E. Install and tighten non high-strength bolts, except where high-strength bolts are indicated.
- F. Install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  - 1. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.
- G. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

### 3.2 CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
  - 1. Apply by brush or spray to provide a minimum dry film thickness of 1.5 mils.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A 780.

3.3 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and to prepare test reports.
  - 1. Correct deficiencies in or remove and replace structural steel that test reports and inspections indicate do not comply with specified requirements.
  - 2. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
  - 3. High-strength bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  - 4. In addition to visual inspection, welded connections will be tested and inspected according to AWS D1.1 procedures.

END OF SECTION 05120