

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Structural steel framing
2. Structural steel framing required for support and framing of rooftop mechanical equipment.

1.2 PERFORMANCE REQUIREMENTS

- A. All detailing, fabrication, and erection shall conform to AISC specifications for "Design, Fabrication, and Erection of Structural Steel for Buildings", and the AISC "Code of Standard Practice for Steel Buildings and Bridges", latest edition.

1.3 SUBMITTALS

- A. Shop Drawings: Show complete details and schedules for fabrication and erection, including layout, special connections, jointing and accessories. Locate anchor bolts for installation in other work; furnish templates for bolt installation by others. Submit shop drawings prior to fabrication.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Owner will engage a qualified independent testing and inspecting agency to verify that the fabricator maintains detailed fabrication and quality control procedures according to IBC, Chapter 17.
1. Special inspection of fabricators facility will not be required if fabricator participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
- C. Comply with applicable provisions of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers to prevent mud and

debris accumulation on installed material and to protect steel members and packaged materials from corrosion and deterioration.

1. Store fasteners in a protected place in sealed containers with manufacturer's labels intact. Clean and relubricate bolts and nuts that become dry or rusty before use.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. See Structural General Notes in the drawings.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. See Structural General Notes in the drawings.

2.3 PRIMER

- A. Primer: Manufacturer's standard gray primer.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Do not begin fabrication prior to shop drawing approval by Engineer of Record.
- B. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges." Mark and match-mark units for field assembly.
- C. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.
- D. Vertical Stabilizer Plate: 6-inches by 6-inches. Extend a minimum of 3-inches below the bottom of the bottom chord. Provide a 13/16-inch diameter hole as an attachment point for guying cables. Provide on each column for steel joists and joist girders.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened.
- B. 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. Field Welds: AWS E70XX, low hydrogen electrodes.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces to be field welded.
 - 2. Members to be encased in concrete.
 - 3. Surfaces to receive sprayed fire-resistive materials.
 - 4. Top flanges of beams to receive composite shear connectors.
 - 5. Galvanized surfaces.
- B. 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.
 - 1. Structural Steel Unless Noted: Prepare steel surfaces per SSPC-SP3 "power tool cleaning" and paint with fabricator's standard prime coat.

2.8 SOURCE QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform shop tests and special inspections according to IBC, Chapter 17.
 - 1. Special inspections will be minimal if fabricator participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Cleaning of Steel: All installed material (especially materials used for exposed structure/ceiling as the final product) must be free of mud, dirt, oil, grease, or other debris. When possible, clean steel prior to or during erection.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- B. Provide minimum 3-inch concrete cover for steel below grade.
- C. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of base plate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.
- D. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- E. No modification that affects the strength of a member shall be made without the approval of the project structural Engineer of Record (EOR).

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened.
- B. Headed Composite Studs: Conform to the requirements of AWS D1.1:2002 sections 7.4 and 7.5. Test in accordance with AWS D1.1:2002 sections 7.6, 7.7, and 7.8 by a qualified testing agency. Submit copies of the test reports.
- C. 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" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- D. Splice members only where shown on final shop drawings.

3.4 FIELD QUALITY CONTROL

- A. Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections, including special inspections, and prepare test reports.
- B. Connections: Field welds and bolted connections will be subject to inspection.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- D. Additional inspections will be performed to determine compliance of corrected Work with the Contract Documents at Contractor's expense.

3.5 CLEANING, REPAIRS, AND PROTECTION

- A. Clean any remaining contaminates from installed material (especially areas with exposed structure/ceiling as the final product) to satisfaction of Owner so that no mud, dirt, oil, grease, or other debris is visible from the finish floor.
- B. Touch up rusted and abraded areas (and field welds if required) with prime paint after erection. Apply same type paint as used in shop.

END OF SECTION 05 12 00

