

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE

A. Shop Drawings

1. Include information necessary for fabrication and erection of component parts of structure.
2. Indicate location, type, and size of bolts and welds distinguishing between shop and field connections.
3. Detail splices.

B. Test Reports

1. Submit mill test reports for structural steel.

C. Certificate

1. Submit welders qualifications certified by qualified testing laboratory.

1.02 QUALITY ASSURANCE

A. Welding Requirements

1. Welders shall be qualified in accordance with AWS D1.1.
2. Welds shall be pre-qualified or qualified in accordance with AWS D1.1.
3. Certify to qualification of welds and welders.

1.03 HANDLING

- A. Avoid bending and other damage to structural steel members and connection material in handling.
- B. Store on skids above ground to keep clean and drained.

1.04 UNIT PRICES

- A. No separate payment will be made for work required under this section. Contractor will include all costs of the requirements of this section in the appropriate bid item(s) on the bid form.

PART 2 PRODUCTS

## 2.01 MATERIALS

- A. Plates, Bars, and Structural Shapes: ASTM A36, Grade B.
- B. Structural Pipe: ASTM A53, Type E or S, Grade B; or ASTM A501.
- C. Structural Tubing: ASTM A500, Grade B.
- D. Stainless Steel Bars and Shapes: ASTM A276 , Type 316 or Type 316L for welded items.
- E. Bolts: ASTM A307 or A325, as shown on Drawings.
- F. Stainless Steel Bolts, Screws and Studs: ASTM F 593, Type 316.
- G. Stainless Steel Nuts: ASTM F594, Type 316.
- H. Washers: Comply with ASTM requirements for bolts used.
- I. Filler Metal for Welding:
  - 1. Welding electrodes for manual shielded metal arc welding - AWS A5.1 or A5.5.
  - 2. Bare electrodes and granular flux used in submerged-arc process - F60 or F70 complying with AWS A5.17.
  - 3. E60S or E70S electrodes used in gas metal-arc process - AWS A5.18.
  - 4. E60T or E70T electrodes used in flux-corded-arc process - AWA A5.20.
- J. Grout
  - 1. Nonmetallic, premixed, and nonshrink, COE CRD-C621.
  - 2. Bleed free at 25 sec. flow cone fluidity, COE CRD-621.
  - 3. Acceptable products:
    - a. "Masterflow 713", Master Builders Co.
    - b. "Supreme Grout", Gifford-Hill and Co.
    - c. "Crystex", L and M Construction Chemicals, Inc.
    - d. "SikaGrout 212", Sika Corporation

## 2.02 PROTECTIVE COATING

- A. Structural Steel, Galvanized:

1. Steel: ASTM A123 with minimum coating of 2 oz. per sq ft of zinc.
2. Bolts, nuts, and washers in steel exposed to weather: ASTM A153, chase threads after galvanizing, galvanize bolts used with galvanized material.
3. Touch-up coating:
  - a. One coat 1.0 to 1.5 mils dry film thickness, zinc-rich compound.
  - b. Acceptable products:
    - 1) "Galvanox", Subox, Inc.
    - 2) "PPG Zinc Rich (non-Catayzed) 97-671/672", Pittsburgh Paint Company.
    - 3) "Z.R.C.", ZRC Products Company.

B. Structured Steel, Stainless

## 2.03 FABRICATION

- A. Fabricate structural steel in accordance with AISC S326.
- B. Coordinate holes, clips, loose lintels, tie rods, temporary anchors, and attachments with other trades.

## PART 3 EXECUTION

### 3.01 ERECTION

- A. Erect structural steel in accordance with AISC S326.
- B. High Strength Bolts:
  1. High-strength bolted connections: Friction type.
  2. Use high strength bolts with suitable identifying mark placed on top of head before leaving factory.
  3. Use "Turn-of-the-Nut" method to tighten nuts.
  4. Mark bolts that have been completely tightened with identifying symbol.
- C. Welding
  1. Technique, appearance, quality of welds, and methods used in correcting defective work shall comply with AISC S326 and AWS D1.1.
- D. Setting Plates and Column Base Plates

1. Set leveling plates and similar items solid in specified grout in compliance with manufacturer's recommendations.
- E. Washers and Nuts:
1. Provide beveled washers where required to match sloping surfaces of connection material.
  2. Upset bolt threads or tack weld nuts to bolts to prevent backing-off of nuts.
- F. Structural steel members having splices not detailed on shop drawings will be rejected.
- G. Burning holes in structural steel members is prohibited.

3.02 FIELD QUALITY CONTROL

- A. Materials and workmanship shall be subject to inspection in mill, shop, and field.
- B. Correction of Defective Welds.
1. Repair weld areas containing defects and make additional tests of repaired areas.
  2. If 10 percent or more of welds made by one welder contain defects requiring repair, 100 percent radiographic inspection of welder's work will be required at Contractors expense.

END OF SECTION