

SECTION 05120

STRUCTURAL STEEL

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03342 - Insulating Cellular Concrete.
2. 05210 - Steel Joists.
3. 09900 - Painting.

1.02 REFERENCES

A. America Society for Testing and Materials (ASTM):

1. A36/A-96 Specification for Carbon Structural Steel.
2. A53-96 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. A123-89a Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. A307-94 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
5. A325-96 Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
6. A385-80(96) Practice for Providing High Quality Zinc Coatings (Hot Dip).
7. A490-93 Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
8. A500-93 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
9. A501-93 Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

1.03 QUALITY ASSURANCE

A. Florida Building Code (FBC).

B. American Institute of Steel Construction, Inc., (AISC):
Manual of Steel Construction, Eighth Edition.

1. Specification for Design, Fabrication and Erection of

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- Buildings.
 - 2. Code of Standard Practice for Steel Buildings and Bridges.
 - 3. Structural Joints Using ASTM A325 or ASTM A490.
 - C. American Welding Society (AWS); Structural Welding Code, AWS D1.1.
 - D. Steel Structures Painting Council (SSPC).
 - E. Where requirements of AWS are in conflict with requirements of AISC, requirements of AISC shall take precedence.
- 1.04 SUBMITTALS
- A. Submit both shop and erection drawings with indexes for structural steel for review before starting work.
- PART 2 PRODUCTS
- 2.01 MATERIALS
- A. Rolled Shapes and Plates: ASTM A36.
 - B. Anchor Bolts: ASTM A307, with regular series hexagonal head nuts, unless otherwise specified, hot dipped galvanized where noted.
 - C. Nuts and Bolts Except Anchor Bolts: ASTM A325, washers as required. Bolts connecting galvanized members shall also be galvanized.
 - D. Electrodes: E70 or F7 Series, as appropriate.
 - E. Shop Paint: Manufacturer's standard, compatible with finish coats. Refer to Section 09900.
 - F. Structural Tubing: ASTM A500, Grade B, Fy=46KSI.
 - G. Pipe: ASTM A501, Fy=36 ksi or ASTM A53, type E or S, Grade B, Fy=35 ksi.
- PART 3 EXECUTION
- 3.01 INSPECTION
- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion

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of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Unless otherwise specified, comply with AISC specifications and "Standards" for fabrication and erection.
- B. Connections:
 - 1. Shop connections shall be welded or bolted at the option of the Contractor, unless otherwise indicated.
 - 2. Field connections shall be bolted except where specifically indicated to be welded. Field moment connections may be welded.
 - 3. Bolts shall be ASTM A325, friction type, unless otherwise indicated.
 - 4. Connections shall be as generally indicated where the complete connection is shown.
 - 5. Connections not detailed will be designed by the Contractor for the controlling stresses indicated using AISC requirements.
 - 6. Minimum connection is two 3/4" diameter ASTM A325, bolts or equivalent in weld, (15.5K).
 - 7. For framed connections in non-composite construction and for beams without concentrated loads, where reactions are not indicated, design the connection for one-half of the total uniform load capacity of the beam shown in "Tables for Allowable Loads on Beams", AISC.
 - 8. Where moment connection or continuous framing is indicated, design connections for the moment indicated, but not less than 50 percent of the moment capacity, however, where the design moment is not given, design the connection for 100 percent of the moment capacity. Moment connections shall be Type 1, rigid frame.
 - 9. Columns shall be detailed as indicated, bearing surfaces shall be finished (planed).
 - 10. Moment connections, shop or field, shall not have bolts through the top flange plates to avoid interference with the metal decking.
 - 11. Stiffened seats, unless indicated, are not allowed unless the Contractor verifies architectural clearances are maintained and interferences with any elements of the building will not occur.
- C. Shop Cleaning: Clean steel to the requirements of SSPC-SP2.

- D. Shop Painting: Shop paint steel except steel intended to be encased in concrete and steel to be hot dipped galvanized.
- E. Erection Marks:
 - 1. Column marks shall be the column number assigned on the structural drawings supplemented by tier or level number.
 - 2. Beam marks shall be prefixed by floor or level number.
- F. Hot Dip Galvanize After Fabrication: According to ASTM A123, ASTM A385, and ASTM A123, all steel exposed to the weather, namely _____ . Erect those members with galvanized ASTM A325 bolts. Seal weld all members to be hot dipped galvanized.
- G. Camber: Shop or mill camber beams indicated.

3.03 TESTING

- A. The Board may elect to inspect work in shop or field or both by nondestructive means as specified.
 - 1. Contractor shall make no claim for extra work or delay using as a basis the inspection of work by the Board.
- B. Welding Inspection:
 - 1. Inspector designated by the Board will assume the duties and responsibilities of "Inspector" specified in Chapter Six of AWS D1.1-79.
 - 2. Acceptance Criteria:
 - a. Visual: AWS D1/1, Para.3.7 and 8.15.
 - b. Radiographic, Ultrasonic, Magnetic Particle, and Dye Penetrant: AWS D1.1, Para.8.15.
 - c. Where more than one type of testing is used, acceptance criteria is "passing" all testing procedures used.
 - 3. Inspector will spot inspect by ultrasonic means, 100 percent (one spot per weld) of all tension groove welds and 50 percent of all compression groove welds shop and field.
 - a. Where metal thickness is less than 5/16", radiographic spot testing will be used.

4. Inspector will inspect welds by visual rules.
 5. Inspector may use radiographic means where ultrasonic testing is not feasible.
 6. Inspector may supplement any testing with dye penetrate, magnetic, radiographic, or ultrasonic plans.
 7. Contractor shall be responsible for associated costs of inspections including handling, surface preparation and repair of discontinuities.
- C. Provide ladders or other appropriate means for inspecting personnel to properly gain access to field joints.
- D. Bolting Inspection: Inspector will test bolts both in the shop and in the field by methods specified in "Structural Joints Using ASTM A325 or ASTM A490 Bolts".

END OF SECTION