SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies structural steel shown and classified by Section 2, Code of Standard Practice for Steel Buildings and Bridges.

1.2 RELATED WORK

A. Painting: Section 09 91 00, PAINTING.

B. Steel Decking: Section 05 31 00, STEEL DECKING.

1.3 QUALITY ASSURANCE

A. Fabricator and erector must maintain a program of quality assurance in conformance with Section 8, Code of Standard Practice for Steel Buildings and Bridges. Fabricate work in an AISC certified Category Conventional Steel Structures fabrication plant.

B. The controlling contractor must ensure that the steel erector is provided written notification required by 29 CFR 1926.752, before authorizing the commencement of steel erection; provide copy of this notification to the RE/COR.

C. Pre-Installation Conference: Convene a meeting on site, after submittals are received and approved but before any work, to review drawings and specifications, submittals, schedule, manufacturer instructions, site logistics and pertinent matters of coordination, temporary protection, governing regulations, tests and inspections; participants to include RE/COR and all parties whose work is effected or related to the work of this section.

1.4 TOLERANCES

A. Hold fabrication tolerances for structural steel within limits established by ASTM A6, by Section 7, Code of Standard Practice for Buildings and Bridges, and by Standard Mill Practice - General Information (AISC Steel Construction Manua), except as follows:

1. Elevation tolerance for column splice points at time member is erected is 10 mm (3/8 inch).
2. Elevation tolerance for top surface of steel beams and girders at connections to columns at time floor is erected is 13 mm (1/2 inch).
3. Elevation tolerance for closure plates at the building perimeter and at slab openings prior to concrete placement is 6 mm (1/4 inch).

1.5 DESIGN

A. Connections: Use details consistent with the details shown on the Drawings, supplementing where necessary.

1.6 REGULATORY REQUIREMENTS

A. AISC 360: Specification for Structural Steel Buildings - LRFD Specification for Structural Steel Buildings.

B. AISC: Code of Standard Practice for Steel Buildings and Bridges.

1.7 SUSTAINABILITY REQUIREMENTS

A. Materials in this section may contribute towards contract compliance with sustainability requirements.

1.8 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop and Erection Drawings: Complete.

C. Certificates:

1. Structural steel.
2. Steel for all connections.
3. Welding materials.
4. Shop coat primer paint.

D. Test Reports:

1. Welders' qualifying tests.

E. Design Calculations and Drawings:

1. Connection calculations signed and sealed by a Registered Engineer in the State of Puerto Rico, if required.

F. Record Surveys.

1.9 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

B. American Institute of Steel Construction (AISC):

AISC 303-10	Steel Buildings and Bridges
AISC 360-10	Structural Steel Buildings

C. American National Standards Institute (ANSI):

B18.22.1-03	Plain Washers
B18.22M-05	Metric Plain Washers

D. American Society for Testing and Materials (ASTM):

A6/A6M-13	General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A36/A36M-12	Carbon Structural Steel
A53/A53M-12	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A123/A123M-12	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A242/A242M-04(2009)	High-Strength Low-Alloy Structural Steel
A283/A283M-12a	Low and Intermediate Tensile Strength Carbon Steel Plates
A307-12	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
A325-10	Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
A490/A490M-12	Heat-Treated Steel Structural Bolts 150 ksi Minimum Tensile Strength
A500/A500M-10a	Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A501-07	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
A992/A992M-11	Structural Steel Shapes

E. American Welding Society (AWS):

D1.1/D1.1M-10	Structural Welding Code-Steel

F. Research Council on Structural Connections (RCSC) of The Engineering Foundation:
Specification for Structural Joints Using ASTM A325 or A490 Bolts (2000)

G. Military Specifications (Mil. Spec.):

MIL-P-21035	Paint, High Zinc Dust Content, Galvanizing, Repair (2003)

H. Occupational Safety and Health Administration (OSHA):

29 CFR Part 1926	Safety Standards for Construction

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel: ASTM A36 and A992.

B. Structural Tubing: ASTM A500, Grade B.

C. Structural Tubing: ASTM A501.

D. Steel Pipe: ASTM A53, Grade B.

E. Bolts, Nuts and Washers:

1. High-strength bolts, including nuts and washers: ASTM A325.
2. Bolts and nuts, other than high-strength: ASTM A307, Grade A.
3. Plain washers, other than those in contact with high-strength bolt heads and nuts: ANSI Standard B18.22.1.

F. Anchor Rods: ASTM F1554, Grade 36

G. Zinc Coating: ASTM A123.

H. Galvanizing Repair Paint: Mil. Spec. MIL-P-21035.

PART 3 - EXECUTION

3.1 CONNECTIONS (SHOP AND FIELD)

A. Welding: Welding in accordance with AWS D1.1. Make welds only by welders and welding operators who have been previously qualified by tests as prescribed in AWS D1.1 to perform type of work required.

B. High-Strength Bolts: High-strength bolts tightened to a bolt tension not less than proof load given in Specification for Structural Joints Using ASTM A325 or A490 Bolts. Perform tightening with properly calibrated wrenches, by turn-of-nut method or by use of direct tension indicators (bolts or washers). Tighten bolts in connections identified as slip-critical using Direct Tension Indicators or the turn-of-the-nut method. Twist-off torque bolts are not an acceptable alternate fastener for slip critical connections.

3.2 FABRICATION

A. Execute fabrication in accordance with Chapter M, Specification for Steel Buildings - Load and Resistance Factor Design.

3.3 SHOP PAINTING

A. General: Shop paint steel with primer in accordance with Section 6, Code of Standard Practice for Steel Buildings and Bridges.

B. Shop paint for steel surfaces is specified in Section 09 91 00, PAINTING.

C. Do not apply paint to following:

1. Surfaces within 50 mm (2 inches) of joints to be welded in field.
2. Surfaces which will be encased in concrete.
3. Surfaces which will receive sprayed on fireproofing.

4. Top flange of members which will have shear connector studs applied.

D. Zinc Coated Finish (Hot Dip Galvanized): Provide per ASTM A123 (after fabrication).

E. Touch-up (after erection): Clean and wire brush any abraded and other spots worn through zinc coating, including threaded portions of bolts and welds and touch-up with galvanizing repair paint.

3.4 ERECTION

A. General: Erect structural steel framing in accordance with Section 7, Code of Standard Practice for Steel Buildings and Bridges.

B. Temporary Supports: Provide temporary support of structural steel frames during erection in accordance with Section 7, Code of Standard Practice for Steel Buildings and Bridges.

3.5 FIELD PAINTING

A. After erection, touch-up steel surfaces specified to be shop painted. After welding is completed, clean and prime areas not painted due to field welding.

B. Finish painting of steel surfaces is specified in Section 09 91 00, PAINTING.

3.6 SURVEY

A. Upon completion of finish bolting or welding on any part of the work, and prior to start of work by other trades that may be supported, attached, or applied to the structural steel work, submit a certified report of survey to RE/COR for approval. Prepare reports by Registered Land Surveyor or Registered Civil Engineer as specified in Section 01 00 00, GENERAL REQUIREMENTS; specify that location of structural steel is acceptable for plumbness, level and alignment within specified tolerances specified in the AISC Manual.

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