

**SECTION 13 34 00
FABRICATED ENGINEERED STRUCTURES**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Pre-engineered, shop-fabricated structural steel building with formed purlin framing.

1.3 REFERENCES

- A. AISI - Specification for Structural Steel for Buildings - Allowable Stress Design and Plastic Design
- B. AISC - Quality Certification Program, Category MB
- C. ASCE 7 – Minimum Design Loads for Buildings and Other Structures
- D. ASTM A36/A36M – Standard Specification for Carbon Structural Steel
- E. ASTM A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- F. ASTM A153/A153M – Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
- G. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
- H. ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- I. ASTM A446 – Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
- J. ASTM A490 – Standard Specification for Structural Bolts, Alloy Steel, Heat Treated 150 ksi Minimum Tensile Strength
- K. ASTM A500/A500M – Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- L. ASTM A501 – Standard Specification Hot Formed Welded and Seamless Carbon Steel Structural Tubing
- M. ASTM A525 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements
- N. ASTM A529/A529M – Standard Specification for High Strength Carbon Manganese Steel of Structural Quality
- O. ASTM A572/A572M – Standard Specification for High-Strength Low Alloy Columbium-Vanadium Structural Steel
- P. ASTM A792/A792M – Standard Specification for Steel Sheet, 55% Aluminum Zinc Alloy Coated by the Hot-Dip Process
- Q. ASTM C1107/C1107M – Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)
- R. AWS A2.0 - Standard Welding Symbols
- S. AWS D1.1 - Structural Welding Code and D1.3 - Structural Welding Code, Sheet Steel
- T. MBMA (Metal Building Manufacturers Association) - Metal Building Systems Manual
- U. SSPC (Steel Structures Painting Council) - Steel Structure Painting Manual
- V. SSPC - Paint 20 Zinc Rich Coating
- W. UL - Building Materials Directory - Roof Deck Construction

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- X. FBC - Florida Building Code
- Y. FFPC - Florida Fire Prevention Code

1.4 SYSTEM DESCRIPTION

- A. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, intermediate columns, braced end frames, end wall columns and wind bracing.
- B. Secondary Framing: Purlins, girts, eave struts, flange bracing, sill supports, clips and other items detailed.
- C. Roof System: Provide pre-formed metal panels with sub-grit framing/anchorage assembly, insulation, liner sheets, and accessory components.

1.5 DESIGN REQUIREMENTS

- A. Design and construction shall comply with the following:
 - 1. Florida Building Code
 - 2. ASCE 7 – Minimum Design Loads for Buildings and other Structures
 - 3. American Institute of Steel Construction (AISC) "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings"
- B. Wind velocity in accordance with ASCE 7, Risk Category III, and Exposure C.
- C. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to temperature range.
- D. Size and fabricate members free of distortion or defects detrimental to appearance or performance.

1.6 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 - Submittals Procedures
- B. Product Data: Provide data on profiles, component dimensions, fasteners, and warranty.
- C. Shop Drawings:
 - 1. Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers and loads.
 - 2. Wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, method of installation; framing anchor bolt settings, sizes and locations from datum and foundation loads.
 - 3. Indicate welded connections with AWS A2.0 welding symbols; indicate net weld lengths; provide professional seal and signature from a Florida Professional Structural Engineer.
- D. Manufacturer's Instructions: Indicate preparation requirements and anchor bolt placement.
- E. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- F. Section 01 77 00 - Contract Closeout, Procedures for Submittals.
- G. Project Record Documents: Contractor shall record actual locations of concealed components and utilities.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with AISC Category MB – MBMA maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.
- C. Erector Qualifications: Company specializing in performing the work of this section with minimum 5-years documented experience and approved by manufacturer.
- D. Design structural components, develop shop drawings, perform shop, and site work under direct supervision of a Florida Professional Structural Engineer experienced in design of this work.

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1.8 REGULATORY REQUIREMENTS

- A. Conform to code for submission of design calculations, reviewed shop, and erection drawings as required for acquiring permits. Submit shop drawings for review by SDPBC Building Department for review and approval.
- B. Cooperate with regulatory agency or authority and provide data as requested.

1.9 PRE-INSTALLATION MEETING

- A. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.
- B. Convene two weeks before starting work of this section.

1.10 WARRANTY

- A. Section 01 77 00 - Contract Closeout.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store prefabricated components, sheets, panels, and other manufactured items in a method to prevent damage or deformation.
- B. Stack materials on platforms or pallets, covered with tarpaulins, or other suitable weather-tight ventilated covering.
 - 1. Store the materials so water will drain freely off and away.
 - 2. Do not store materials with other materials that might cause staining.

PART 2 PRODUCTS

2.1 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M, A529/A529M, and A572/A572M
- B. Structural Tubing: ASTM A500/A500M, Grade B, and A501
- C. Plate or Bar Stock: ASTM A529/A529M
- D. Anchor Bolts: ASTM A307
- E. Bolts, Nuts and Washers: ASTM A325
- F. Welding Materials: AWS D1.1; type required for materials welded
- G. Primer: SSPC 20, Red Oxide
- H. Grout: ASTM C1107/C1107M, Non-shrink type, premixed compound consisting of non-metallic aggregate, cement, water reducing, and plasticizing agents, capable of developing minimum compressive strength of 2400 psi in two days and 7000 psi in 28 days.

2.2 MATERIALS

- A. Fasteners: Manufacturer's standard type, galvanized to ASTM A153/A153M, 2.0-oz/sq ft, finish to match adjacent surfaces when exterior exposed.
- B. Bituminous Paint: Asphaltic type
- C. Sealant: Manufacturer's standard type, non-staining, elastomeric, skinning
- D. Metal Mesh: Galvanized steel wire, woven
- E. Roof Curbs: Insulated metal same as roofing, designed for imposed equipment loads, anchor fasteners to equipment, counter flashed to metal roof system.
- F. Trim, Closure Pieces, Caps, Flashings, Rain Water Diverter and Fascia Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.3 FABRICATION - FRAMING

- A. Fabricate members in accordance with AISC Specification for plate, bar, tube or rolled structural shapes.
- B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.
- C. Provide framing for ventilator and other openings.

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2.4 FINISHES

- A. Framing Members: Clean, prepare and prime to SSPC Manual requirements.
- B. Do not prime surfaces to be field welded.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 – Project Management and Coordination: Verify existing conditions before starting work.
- B. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.

3.2 ERECTION - FRAMING

- A. Erect framing in accordance with AISC Specification and approved shop drawings.
- B. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions and surfaces not shop primed.

3.3 TOLERANCES

- A. Framing Members shall be no more than 1/4" from level and 1/8" from plumb.
- B. Siding and Roofing: Maximum 1/8" from true position.

3.4 FINISHING

- A. Clean all exposed surfaces in preparation for field painting.
- B. Grind smooth all burrs, sharp edges, and items which may be dangerous to children that are below 6' 8" AFF,
- C. Touch-up primer and prepare all exposed surfaces for painting.
- D. Field paint all exposed elements in compliance with Section 09 90 00.

3.5 CLEAN UP

- A. Clean area and leave facility in a usable condition.

END OF SECTION