

DIVISION 13 SPECIAL CONSTRUCTION**SECTION 13121 PRE ENGINEERED BUILDINGS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Pre-engineered, shop fabricated structural steel building frame.
- B. Insulated metal wall and sloped roof system including soffits, gutters and downspouts.
- C. Exterior doors.

1.2 RELATED SECTIONS

- A. Section 02223-Backfilling: Subgrade insulation at foundation perimeter.
- B. Section 03300-Cast-In-Place Concrete: Concrete footings, grade beams, and floor slab.
- C. Section 05120-Structural Steel.
- D. Section 05210-Steel Joist
- E. Section 07900 - Joint Sealers.
- F. Section 08111-Standard Steel Doors: Metal doors.
- G. Section 08112-Standard Steel Frames: Metal frames.
- H. Section 09900 - Painting: Finish painting of exterior primed steel surfaces.

1.3 REFERENCES

- A. AISC - Specification for Structural Steel for Buildings - Allowable Stress Design and Plastic Design.
- B. AISC - Quality Certification Program, Category MB.
- C. ASTM A36/A36M - Structural Steel.
- D. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- F. ASTM A307 - Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.
- G. ASTM A325/A325M - High Strength Bolts for Structural Steel Joints.
- H. ASTM A446/A446M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- I. ASTM A490/A490M - Heat Treated Steel Structural Bolts, Classes 150 ksi (1035 MPa) Tensile Strength.

- J. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- K. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- L. ASTM A525/A525M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- M. ASTM A529/A529M - Structural Steel with 42 ksi (290 MPa) Minimum Yield Point (1/2 in (12.7 mm) Maximum Thickness).
- N. ASTM A572/A572M - High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
- O. ASTM A792/A792M - Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
- P. ASTM C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
- Q. ASTM C1107 - Packaged, Dry, Hydraulic-Cement Grout (Non-shrink).
- R. AWS A2.0 - Standard Welding Symbols.
- S. AWS D1.1 - Structural Welding Code - Steel.
- T. MBMA (Metal Building Manufacturers Association) - Metal Building Systems Manual.
- U. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
- V. SSPC - Paint 20 Zinc Rich Coating.
- W. UL - Building Materials Directory - Roof Deck Construction.

1.4 SYSTEM DESCRIPTION

- A. Continuous beam frame.
- B. Bay Spacing: as shown on drawing.
- C. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, intermediate columns, braced end frames, end wall columns, and wind bracing.
- D. Secondary Framing: Purlins, girts, eave struts, flange bracing, clips, and other items detailed.
- E. Wall System: Preformed metal panels of vertical profile, with sub-girt framing/anchorage assembly, insulation, and accessory components.
- F. Roof System: Preformed metal panels of upslope parallel to eave profile, with sub-girt framing/anchorage assembly, insulation and accessory components.
- G. Roof Slope: 4 inches in 12 inches.

1.5 DESIGN REQUIREMENTS

- A. Thermal resistance of Calculated Wall System: R-value of 8.66.
- B. Thermal Resistance of Calculated Roof System: R-value of 8.66.

- C. Design members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable code.
- 1.6 SUBMITTALS FOR REVIEW
- A. Section 01300 - Submittals: Procedures for submittals.
 - B. Product Data: Provide data on profiles, component dimensions, and fastener.
 - C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, and loads; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, and method of installation ; framing anchor bolt settings, sizes, and locations from datum, and foundation loads; indicate welded connections with AWS A2.0 welding symbols; indicate net weld lengths; provide professional Engineers seal and signature.
- 1.7 SUBMITTALS FOR CLOSEOUT
- A. Section 01700 - Contract Closeout: Procedures for submittals.
 - B. Project Record Documents: Record actual locations of concealed components and utilities.
- 1.8 QUALITY ASSURANCE
- A. Perform Work in accordance with MBMA - Metal Building Systems Manual.
 - B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
 - C. Erector Qualifications: Company specializing in performing the work of this section approved by manufacturer.
 - D. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.
- 1.9 REGULATORY REQUIREMENTS
- A. Conform to applicable code for submission of design calculations as required for acquiring permits.
 - B. Cooperate with regulatory agency or authority and provide data as requested.
- 1.10 PRE-INSTALLATION MEETING
- A. Section 01039 - Coordination and Meetings: Pre-installation meeting.
 - B. Convene one week before starting work of this section.
- 1.11 WARRANTY
- A. Section 01700 - Contract Closeout.
 - B. Provide a five-year warranty to include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS - BUILDING SYSTEM

A. Manufacturers:

1. American buildings Company.
2. No substitutions permitted: Refer to Section 01600..

2.2 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M.
- B. Structural Tubing: ASTM A500, Grade B.
- C. Plate or Bar Stock: ASTM A529/A529M.
- D. Anchor Bolts: ASTM A307 galvanized to ASTM A153.
- E. Bolts, Nuts, and Washers: ASTM A325, galvanized to ASTM A153.
- F. Welding Materials: AWS D1.1; type required for materials being welded. Primer: SSPC 20, Red Oxide.
- G. Grout: ASTM C1107, 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 two days and 7000 psi in 28 days.

2.3 MATERIALS - WALL AND ROOF SYSTEM

- A. Sheet Steel Stock: Match existing.
- B. Insulation: Roll glass fiber type, faced with reinforced white vinyl, UL flame spread classification of 25 or less where exposed, friction fit, 3 inches thick.
- C. Joint Seal Gaskets: Manufacturer's standard type.
- D. Fasteners: Manufacturer's standard type, galvanized to ASTM A153 2.0 oz/sq ft, finishes to match adjacent surfaces when exterior exposed.
- E. Bituminous Paint: Asphaltic type.
- F. Sealant: as specified in Section 07900, non-staining, elastomeric, skinning.
- G. Roof Curbs: Insulated metal same as roofing, 24 gauge, designed for imposed equipment loads, anchor fasteners to equipment, counterflashed to metal roof system.
- H. Trim, Closure Pieces, Caps, Flashings, Rain Water Diverter, fascia, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.4 METAL DOOR AND FRAME

- A. Doors: Specified in Section 08111.
- B. Frames: Specified in Section 08112

2.5 FABRICATION - WALL AND ROOF SYSTEMS

- A. Siding: Minimum 26 gauge metal thickness, profile and color as required to match existing.
- B. Roofing: Minimum 26 gauge metal thickness, profile and color as required to match existing.
- C. Girts/Purlins: Rolled formed structural shape to receive siding, and roofing.
- D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles. Back brace mitered internal corners with 24 gauge thick sheet.
- E. Expansion Joints: Same material and finish as adjacent material where exposed, 24 gauge thick, manufacturer's standard brake formed type, of profile to suit system.
- F. Flashings, Closure Pieces, Facia, Infills, Caps, and: Same material and finish as adjacent material, profile to suit system.
- G. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.
- H. Ventilator: Sheet steel, galvanized, rotary design, 20-inch nominal size.

2.6 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts profile and size indicated to collect and remove water. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.7 FINISHES

- A. Framing Members: Clean, prepare, and shop prime to SSPC Manual requirements. Do not prime surfaces to be field welded.
- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone paint finish, color to match existing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of 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.

- B. Provide for erection and wind loads. 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 ERECTION - WALL AND ROOFING SYSTEMS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners.
- G. Install insulation and vapor retarder utilizing manufactures standard attachment method.
- H. Install sealant and gaskets to prevent weather penetration.

3.4 ERECTION - GUTTER AND DOWNSPOUT

- A. Rigidly support and secure components. Joint lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Apply bituminous paint on surfaces in contact with cementitious materials.
- C. Slope gutters minimum 1/8 inch/ft.
- D. Install splash pads under each downspout.

3.5 INSTALLATION - ACCESSORIES

- A. Install doorframe, and door in accordance with manufacturer's instructions.
- B. Seal wall and roof accessories watertight and weather tight with sealant in accordance with Section 07900.

3.7 TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Siding and Roofing: 1/8 inch from true position.

END OF SECTION