

## Section 07411

## METAL SIDING SYSTEM

1 PART 1 GENERAL

## 1.1 DESCRIPTION

## A. General:

1. Furnish all labor, material, tools, equipment and services for all preformed roofing/wall as indicated, in accord with the provisions of the Contract Documents.
2. Completely coordinate with work of all other trades.
3. See Division 1 for General Requirements.

## B. Related work specified elsewhere:

1. Structural steel: Section 05100.
2. Steel joists: Section 05200 or 05400.
3. Flashing and sheet metal: Section 07600.

[Specifier Note: Delete references to sections not used and add any references that become pertinent.]

## 1.2 QUALITY ASSURANCE

## A. Applicable standards:

1. 1996 Low Rise Building Systems Manual, Metal Building Manufacturers Association, Inc., Cleveland, OH, 1996.
2. Aluminum Design Manual - 2000 Edition, Aluminum Association, Washington, D.C., 2000.
3. ASTM A653, "Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process," American Society for Testing and Materials, 1998.
4. ASTM A792a, "Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process," American Society for Testing and Materials, 1997.
5. Cold-Formed Steel Design Manual, American Iron and Steel Institute, Washington, D.C., 1996.
6. Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design, American Institute of Steel Construction, Chicago, IL, 1989.

## B. Manufacturer's qualifications: Manufacturer shall have a minimum of ten years experience in manufacturing metal roofing/wall systems. Panels specified in this section shall be produced in a permanent factory environment with fixed-base roll-forming equipment. A letter from the

manufacturer certifying the manufacturer's qualifications shall accompany the product material submittals.

- C. The Installer shall meet the following minimum criteria:
1. Maintain a minimum \$250,000 general liability coverage for each loss.
  2. Maintain sufficient worker's compensation coverage, as mandated by law.
  3. Have no viable claims pending regarding negligent acts or defective workmanship on previously performed or current projects.
  4. Have not filed for protection from creditors under any state or federal insolvency or debtor relief statutes or codes.

### 1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Performance Testing:
1. Metal roofing systems shall be designed and in accordance with latest release of AISI. Metal roof system shall be designed to meet loading conditions per the applicable building code.

### 1.4 DESIGN REQUIREMENTS (as applicable to roof/wall system)

- A. General:
1. The METAL ROOFING/WALL SYSTEM shall be designed by the Manufacturer as a complete system. Members and connections not indicated on the drawings shall be the responsibility of the Contractor. All components of the system shall be supplied or specified by the same manufacturer.
- B. Design Loads:
1. Design load application shall be in accordance with [Specifier Note: (Choose one) IBC, MBMA, SBCCI, UBC, BOCA, ASCE-7 or an applicable national or local building code].
  2. Dead Loads
    - a. The dead load shall be the weight of the METAL ROOFING/WALL SYSTEM. Collateral Loads shall be as shown on the contract drawings. Collateral Loads shall not be applied to the roof/wall panels.
  3. Live Loads
    - a. The panels and concealed anchor clips shall be capable of supporting a minimum uniform live load of 20 psf.
  4. Snow Loads

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- a. The design ground snow loads shall be as defined on the contract drawings.
5. Wind Loads
    - a. The design wind speed for the metal roofing system shall be as defined on the contract documents.
  6. Rainfall Intensity:
    - a. All exterior gutters and downspouts shall be designed for rainfall intensity based upon a 5-year recurrence interval for a five-minute duration. All interior gutters, valleys and downspouts shall be designed for rainfall intensity based upon a 25-year recurrence interval based on a five-minute duration.
- C. Framing Members Supporting the METAL ROOFING/WALL SYSTEM
1. Any additions/revisions to framing members supporting the METAL ROOFING/WALL SYSTEM to accommodate the manufacturer/fabricator's design shall be the Contractor's responsibility, and shall be submitted for review and approval by the Engineer of Record. New or revised framing members and their connections shall be designed in accordance with AISC, AISI, and SJI design specifications. Deflection requirements shall be in accordance with the applicable building code, or as a minimum, the provisions of the AISC Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise-Buildings.
- D. Roof Panels: N/A
- E. Accessories and Their Fasteners
1. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces.
- 1.5 SUBMITTALS
- A. Installation Drawings:
1. Submit completed installation drawings and installation details by the manufacturer, to the architect (owner) for review. Do not proceed with manufacture prior to review and architectural approval of installation drawings. Do not use drawings prepared by the architect (owner) for installation drawings.
  2. Installation drawings shall show methods of installation, elevations and plans of roof and wall panels, sections and details, specified loads, flashings, roof curbs, vents, sealants, interfaces with all materials not supplied by the metal roofing system manufacturer, and proposed identification of component parts and their finishes.
- B. Calculations (All calculations noted below shall be reviewed and sealed by a Licensed Professional Engineer):
1. Submit engineering calculations defining cladding loads for all roof areas based on specified building codes, allowable clip loads, and required number of fasteners to secure the panel to the designated substructure.

2. Compute uplift loads on fasteners.
  3. Calculate holding strength of fasteners in accordance with submitted test data provided by Fastener Manufacturer based on length of embedment and properties of materials.
- C. Physical Samples:
1. Submit samples and color chips for all proposed finishes.
    - a. Submit one 12-inch long sample of panel, including clips.
    - b. Submit two 3-inch x 5-inch color chip samples in color selected by the architect (owner).
- 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING
- A. Delivery:
1. Deliver metal roofing system to job site properly packaged to provide protection against transportation damage.
- B. Handling:
1. Exercise extreme care in unloading, storing and installing metal roofing system to prevent bending, warping, twisting and surface damage.
- C. Storage:
1. Store all material and accessories above ground on well supported platforms. Store under waterproof covering. Provide proper ventilation of metal roofing system to prevent condensation build-up between each panel or trim/flashing component.

## 2 PART 2 PRODUCTS; T13A

### 2.1 MATERIALS

- A. Metal wall panel.
1. Profile: 3 inch high rib x 24] inch wide panel.
  2. Minimum Thickness: Panel to meet all specified design loads.
  3. Panel Base Material:
    - a. Galvanized steel sheet, G90, conforming to ASTM A653
    - b. Galvalume(r) steel sheet, AZ50, conforming to ASTM A792 for painted and unpainted panels.
    - c. Galvalume(r) steel sheet, AZ55, conforming to ASTM A792 for unpainted panels.
  4. Texture:
    - a. Smooth.

5. Finish:
  - a. Selected from manufacturer's complete standard offering.
  - b. Factory Color Finish:
    - 1) Fluoropolymer coating produced with minimum 70% PVDF resin.

## 2.2 Miscellaneous Materials

### A. Fasteners:

1. Fasteners for steel roof panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon-capped steel, type and size specified below, or as otherwise, approved for the applicable requirements. Fasteners for aluminum roof panels shall be aluminum or corrosion resisting steel. Fasteners for structural connections shall provide both tensile and shear ultimate strengths of not less than 750 pounds per fastener. Fasteners for accessories shall be the manufacturer's standard. Exposed roof fasteners shall be sealed or have sealed washers on the exterior side of the covering to waterproof the fastener penetration. Washer material shall be compatible with the screw head; have a minimum diameter of 3/8-inch for structural connections; and gasket portion of fasteners or washers shall be neoprene or other equally durable elastomeric material.
2. Fastener Color to match panel color.

### B. Components:

1. Components shall be compatible with the roof panel furnished. Flashing, trim, metal closure strips, caps, gutters, downspouts, roof curbs, and similar metal components shall not be less than the minimum thickness specified by the METAL ROOFING SYSTEM Manufacturer. Exposed metal components shall be finished to match the panels or trim, as furnished. Molded closure strips shall be closed-cell or solid-cell synthetic rubber or neoprene, or polyvinyl chloride pre-molded to match configuration of the covering and shall not absorb or retain water.

### C. Sealants:

1. All tape sealant is to be a pressure sensitive, 100 percent solid, sealing tape with a release paper backing. Provide permanently elastic, non-sagging, non-toxic, non-staining tape sealant approved by the METAL ROOFING SYSTEM Manufacturer.
2. The METAL ROOFING SYSTEM Manufacturer shall approve all joint sealant that will come into contact with the METAL ROOFING SYSTEM.

## 2.3 FABRICATION

- A. Panels shall be produced by a Manufacturer meeting the requirements of section 1.02B.
- B. Fabricate trim, flashing and accessories to Manufacturer's specified profiles.

## 2.4 PREFABRICATED CURBS AND EQUIPMENT SUPPORTS

- A. General: Provide the Manufacturer with the dimensions, weights and model number of the units to be supported by the curb(s).

- B. Fabricate curbs of structural quality aluminum, Galvalume...., or hot-dipped galvanized sheet. Curbs shall have welded joints unless a two-piece curb is required. Provide integral base plates and water diverters/crickets. Front base plate shall be extended up-slope from the beginning of the water diverter. Curbs shall be designed for a compatible installation with the panel system.
- C. Curbs shall be constructed to match the roof slope and provide a mounting surface as required by the rooftop unit manufacturer.

## 2.5 PREFABRICATED PIPE FLASHINGS

- A. Pipe flashings, provided by metal roofing manufacturer shall provide a weathertight joint at projections through the roof. Pipe flashings shall have an aluminum-flanged base ring.

## 3 PART 3 EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examination:
  - 1. The Contractor shall verify installed work of other trades that such work is complete to a point where the roofing system installation may commence.
  - 2. Verify that the substructure installation is in accordance with the approved shop drawings and METAL ROOFING SYSTEM Manufacturer's requirements. This specifically includes verifying that secondary structural members and/or decking are installed to meet performance requirements. Coordinate with METAL ROOFING SYSTEM Manufacturer to ensure that the substructure is installed to accommodate the appropriate fastener spacing.
- B. Discrepancies:
  - 1. In event of discrepancy, notify the architect (owner).
  - 2. Do not proceed with installation until discrepancies have been resolved.

### 3.2 INSTALLATION

- A. Install the METAL ROOFING SYSTEM in accordance with manufacturer's instructions and approved installation drawings.
- B. Locate and space all exposed fasteners in accordance with the METAL ROOFING SYSTEM Manufacturer's recommendations. Use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the neoprene washer.
- C. Avoid placing pipe penetrations through the panel seams.
- D. Do not allow panels or trim to come into contact with dissimilar materials (i.e. copper, lead, graphite, treated lumber, mortar, etc.). Water run-off from these materials is also prohibited.
- E. Comply with METAL ROOFING SYSTEM Manufacturer's approved installation drawings, instructions and recommendations for installation of roof curbs. Refer to METAL ROOFING SYSTEM Manufacturer's standard installation details.

### 3.3 CLEANING, PROTECTION

- A. Dispose of excess roofing materials and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the architect (owner), any work that becomes damaged prior to final acceptance.
- D. Touch up minor scratches and abrasions per the METAL ROOFING SYSTEM Manufacturer's recommendations.

...END OF SECTION