

**SECTION 074113  
METAL ROOF PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Standing Seam Metal Roof Panels.
  - 1. Architectural roofing system of preformed steel panels.
  - 2. Flashing and trim adjacent to or part of architectural preformed steel panel roofing system.
  - 3. Refer to locations shown on drawings.
- B. Accessories and underlayment as required for complete installation.
- C. Gutters and downspouts adjacent to or part of architectural preformed steel panel roofing system.

**1.02 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.
    - a. Include installation instructions.
  - 3. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
  - 1. Include accessories.
  - 2. Include project-specific details.
  - 3. Show work to be field-fabricated or field-assembled.
  - 4. Show interface with other work.
  - 5. Show all proposed seam and joint locations.
  - 6. Do not use architect's drawings as shop drawings.
  - 7. Scale of shop drawing details not less than 1-1/2" = 1'-0".
  - 8. Show drawings, text and dimensions in black and white at a clear legible scale and size.
    - a. Color drawings that are not clearly legible will be returned without review.
  - 9. Include structural analysis signed and sealed by qualified structural engineer, indicating compliance of roofing system to specified loading conditions.
  - 10. Show roof panel layout on shop drawings. Include full panels and dimensions of cut panels. Comply with layout as indicated on drawings or as specified.
- D. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches (305 mm) square, representing actual roofing metal, thickness, profile, color, and texture.
  - 1. Include typical panel joint in sample.
  - 2. Include typical fastening detail.
- F. Manufacturer Qualification Statement: Provide documentation showing metal roof panel fabricator is accredited under IAS AC472.
- G. Qualification Data: For Installer.
- H. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than twenty years of documented experience.

- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least ten years of documented experience.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Provide strippable plastic protection on prefinished roofing panels for removal after installation.
- B. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

#### **1.05 WARRANTY**

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of twenty years from Date of Substantial Completion.
- C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of twenty years from Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design:
  - 1. Metal Roof Panels: R Panel manufactured by McElroy Metal Company, or equal.
  - 2. Substitutions: See Section 016000-Product Requirements.

#### **2.02 ARCHITECTURAL METAL ROOF PANELS**

- A. Architectural Metal Roofing: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.
- B. Profile: Major longitudinal ribs 1 1/4" (32 mm) deep, spaced 12" (305 mm) on center; minor longitudinal ribs centered between major ribs, spaced 4" (102 mm) on center panel; normal-run where ribs protrude from panel plane, viewed from exterior, reverse-run where ribs recede from panel plane, viewed from exterior.
- C. Size: 36" (914 mm) cover width, lengths indicated on drawings.
- D. Metal Panels: Factory-formed panels with factory-applied finish.
  - 1. Steel Panels:
    - a. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 (AZM150) coating.
    - b. Steel Thickness: Minimum 24 gage.
  - 2. Texture: Smooth.
  - 3. Length: Full length of roof slope, without lapped horizontal joints.

#### **2.03 SECONDARY FRAMING**

- A. Miscellaneous Secondary Framing: Light gage steel framing incidental to structural supports; fabricated from steel sheet.
- B. Framing Material: ASTM A 1011/A 1011M, Designation SS steel sheet.
  - 1. Profile: Manufacturer's standard cee, zee, asymmetrical zee, hat channel, plain channel, single slope eave strut, double slope eave strut, and angle.
  - 2. Thickness: 12 gage, 0.1046 inch (2.657 mm).
  - 3. Finish: Galvanized per ASTM A653/A653M, G90.
- C. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.

#### **2.04 FABRICATION**

- A. Panels: Provide factory or field fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.
- B. Joints: Provide captive gaskets, sealants, or separator strips at panel joints to ensure weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

## 2.05 FINISHES

- A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat aluminum coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss as indicated on drawings.
- B. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss as indicated on drawings.

## 2.06 ACCESSORIES

- A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, as indicated or as required for project, and similar sheet metal items of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
  - 1. Flashing and Trim: Provide flashing and trim, formed from same material and manufacturers run as metal roof panels, required to seal against weather and provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
  - 2. Gutters: Formed from same material and manufacturer's run as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches on center, fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.
    - a. Gutter Profile: Square.
    - b. Provide continuous exterior-grade perforated gutter guard, concealed from view.
  - 3. Downspouts: Formed from same material and manufacturer's run as roof panels unless indicated otherwise on drawings. Fabricate in 10-foot- long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters. Furnish gutter supports spaced a maximum of 36 inches on center, fabricated from same metal as gutters.
- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.
- C. Weatherseal: Manufacturer's standard as required for watertight warranty.
- D. Sealants:
  - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
  - 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
  - 3. Seam Sealant: Factory-applied, non-skinning, non-drying type.
- E. Underlayment: Self-adhering rubber-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil (1 mm) total thickness; with strippable release film and woven polyolefin top surface.
  - 1. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.

2. Sheet Thickness: 40 mil, 0.040 inch (1.02 mm) minimum total thickness.
3. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
4. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
5. Water Vapor Permeance: 0.1 perm (5.72 ng/Pa s sq m), maximum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
6. Minimum Thermal Stability:
  - a. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
  - b. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
7. Building paper or felt is not allowed.
8. Manufacturers:
  - a. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Henry Company; Blueskin PE200HT: [www.henry.com/#sle](http://www.henry.com/#sle).
    - 2) Polyglass USA, Inc; Polystick MTS Self-Adhered High Temperature Roof Underlayment: [www.polyglass.us/#sle](http://www.polyglass.us/#sle).
    - 3) Soprema Lastobond Shield HT.
    - 4) Substitutions: See Section 016000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Broom clean wood sheathing prior to installation of roofing system.
- B. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.
- C. Remove protective film from surface of roof panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.
- D. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.
- E. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

### **3.03 FABRICATION**

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using factory set, non-adjustable portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
  1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
  - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

### **3.04 INSTALLATION**

- A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
  1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
  2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
    - a. Install panels with alignment as indicated on drawings.
      - 1) If layout is not indicated, center panels in area. Provide equally cut panels along perimeter as required for a centered layout. Do not use full panels at one side and work towards the other side resulting in a randomly cut panel.
- B. Accessories: Install all components required for a complete roofing assembly, including flashings, trim, moldings, closure strips, preformed crickets, caps, rib closures, ridge closures, and similar roof accessory items.
- C. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
  1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.
  2. Incorporate concealed clips at panel joints, and apply snap-on battens to provide weathertight joints.
  3. Provide sealant tape or other approved joint sealer at lapped panel joints.
  4. Install sealant or sealant tape, as recommended by panel manufacturer, at end laps and side joints.

### **3.05 CLEANING**

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

### **3.06 PROTECTION**

- A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

**END OF SECTION 074113**