

SECTION 074113 FORMED METAL ROOF PANELS

PART 1 - GENERAL

* 1. RELATED DOCUMENTS
     1. Drawings and other Contract Documents, listed in the agreement between the Owner and Contractor, apply to this Section.
  2. SUMMARY
     1. Section includes exposed-fastener, metal roof panels.
  3. SUBMITTALS
     1. Product Data: For each type of product.
        1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
     2. Shop Drawings:
        1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
        2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not  less than 1-1/2 inches per 12 inches.
     3. Samples: For each type of exposed finish required, prepared on Samples of size indicated below.
        1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.
        2. Include similar Samples of trim and accessories involving color selection.
     4. Qualification Data: For Installer.
     5. Product Test Reports: For each product, for tests performed by a qualified testing agency.
     6. Field quality-control reports.
     7. Sample Warranties: For special warranties.
     8. Maintenance Data: For metal panels to include in maintenance manuals.
  4. QUALITY ASSURANCE

# Installer Qualifications: [An entity that employs installers and supervisors who are trained and approved by manufacturer.][Installer of sheet metal roofing for a minimum of 10 years documented experience.]

* + 1. Panel Manufacturer: Minimum of 10 years experience in manufacturing architectural roof panels in a permanent stationary indoor facility. Provide facility information if requested.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
     2. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
     3. Store panels in accordance with manufacturer’s recommendations.

# [Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment for damage and for completion of the consignment.]

* 1. FIELD CONDITIONS
     1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.
  2. COORDINATION
     1. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
     2. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leak proof, secure, and noncorrosive installation.
  3. WARRANTY
     1. Material and Workmanship Warranty: Manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
        1. Failures include, but are not limited to, the following:
           1. Structural failures including rupturing, cracking, or puncturing.
           2. Deterioration of metals and other materials beyond normal weathering.
        2. Warranty Period: Two years from date of Substantial Completion.
     2. Paint Finish Warranty from date of Substantial Completion.

# [30 years for Kynar type finish.]

* + 1. Installer’s Warranty: Submit installer's warranty, signed by Installer, covering the Work of this Section, including all components of wall panels for the following warranty period:
       1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

* 1. PERFORMANCE REQUIREMENTS
     1. Refer to Manufacturer’s product data for specific performance criteria.
        1. 1HR / 2HR / 3HR firewall assemblies UL U646 / U642 / U643
        2. UL Class A Fire
        3. UL 2218 Class 4 Hail
        4. ASTM E 283-04 Air leakage through exterior walls
           1. Secured at 60” on center spacing
           2. Secured to 16 ga metal studs
           3. Results: <0.1L cfm/sf @ 20.00 PSF
        5. ASTM E 330-02 Structural performance of exterior walls
           1. Secured at 60” on center spacing
           2. Secured to 16 ga metal studs
           3. Results: +60psf, -80.20 psf
        6. ASTM E 331-00 Water penetration of exterior walls
           1. Secured at 60” on center spacing
           2. Secured to 16 ga metal studs
           3. Results: No leakage at 20 psf
        7. Factory curving available down to 10’ radius
        8. Perforating available
        9. Mitred corners available
  2. MANUFACTURER Fabral® Facilities:

Jackson, GA 30233

Telephone: 800.884.4484 Website: [www.fabral.com](http://www.fabral.com/)

Grapevine, TX Telephone: 800.477.9066 Website: [www.fabral.com](http://www.fabral.com/)

Cedar City, UT

Telephone: 800.432.2725  Website: [www.fabral.com](http://www.fabral.com/)

* 1. EXPOSED-FASTENER, METAL ROOF PANELS

DEEP RIB IV, an exposed fastener panels that offers superior strength-to-weight ratio and spanning capabilities:

1. Galvalume Steel: AZ50 / AZ55Mar
   1. Material Gauge: **[ 22, 20 and 18 gauge available in Kynar, SMP and Vinyl Plastisol Finish]**
   2. Exterior Finish: As selected from manufacturer’s premium finishes.
   3. Color: As selected from manufacturer’s full range.
2. Aluminum:
   1. Material Thickness: [**0.032**][**0.040**][**0.050**] thick.
   2. Surface: [**Smooth, flat**] **[Stucco Embossed] [Perforated]** finish.
   3. Exterior Finish: As selected from manufacturer’s premium finishes.
   4. Color: As selected from manufacturer’s full range.
3. Rib Spacing: 12 inches o.c.
4. Panel Coverage: 24 inches
5. Panel Height: 4 inches.
   1. MATERIALS
      1. Metallic-Coated and Painted Steel Sheet aluminum-zinc alloy-coated steel sheet(Galvalume) complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
      2. ASTM A 792A Class AZ55 Clear Acrylic Coated for Unpainted.
      3. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
   2. MISCELLANEOUS MATERIALS
      1. Miscellaneous Metal Sub-framing and Furring: Provide manufacturer's standard sections as required for support and alignment of metal panel system.
      2. Panel Accessories: Provide components required for a complete, weather-tight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
      3. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to 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.
      4. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
      5. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.
         1. Sealant Tape: [**Insert Tape Here**]
         2. Joint Sealant: [**Insert Sealant Here**]
         3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.
   3. FABRICATION
      1. Provide panel profile, including major ribs for full length of panel.

* + 1. 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. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
       4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
          1. 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.
  1. FINISHES

* + 1. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
    2. Steel Panels and Accessories:
       1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. (STD 24-18 GA)
       2. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
       3. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. (STD for Mica)
       4. Three-Coat Metallic Fluoropolymer: AAMA 621. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
       5. Siliconized Modified Polyester (SMP): Primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.(standard on 26 ga)
       6. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
    3. Aluminum Panels and Accessories:
       1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
       2. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
       3. Mica Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. . (STD for Mica)
       4. Three-Coat Metallic Fluoropolymer: AAMA 2605. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
       5. Exposed Anodized Finish:
          1. Clear Anodic Finish: AAMA 611, [**AA-M12C22A41, Class I, 0.018 mm**] [**AA- M12C22A31, Class II, 0.010 mm**] or thicker.
          2. Color Anodic Finish: AAMA 611, [**AA-M12C22A42/A44, Class I, 0.018 mm**] [**AA-** **M12C22A32/A34, Class II, 0.010 mm**] or thicker.

PART 3 - EXECUTION

* 1. EXAMINATION
     1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
        1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
        2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
     2. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
     3. Proceed with installation only after unsatisfactory conditions have been corrected.
  2. PREPARATION
     1. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
  3. METAL PANEL INSTALLATION
     1. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
        1. Shim or otherwise plumb substrates receiving metal panels.
        2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
        3. Install screw fasteners in predrilled holes.
        4. Locate and space fastenings in uniform vertical and horizontal alignment.
        5. Install flashing and trim as metal panel work proceeds.
        6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
        7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
        8. Provide weather-tight escutcheons for pipe- and conduit-penetrating panels.
     2. Fasteners:
        1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
        2. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
     3. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
     4. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
        1. Lap ribbed or fluted sheets one full rib or as shown in manufacturers recommendations . Apply panels and associated items true to line for neat and weather-tight enclosure.
        2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
        3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
        4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
        5. Flash and seal panels with weather closures at perimeter of all openings.
        6. Watertight Installation:
           1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
           2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
           3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
     5. Accessory Installation: Install accessories with positive anchorage to building and weather-tight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
     6. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
        1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
        2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
  4. ERECTION TOLERANCES
     1. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
  5. FIELD QUALITY CONTROL
     1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
     2. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
     3. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
     4. Prepare inspection reports.
  6. CLEANING AND PROTECTION
     1. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
     2. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION