

## SECTION 074113 - METAL ROOF PANELS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

1. Integral standing seam metal roof panels.
2. Metal soffit panels.
3. Metal roofing panel accessories.

##### B. Related Sections:

1. Division 05 Section "Steel Decking" for steel roof deck supporting metal roof panels.
2. Division 05 Section "Cold-Formed Metal Framing" for cold-formed metal framing supporting metal roof panels.
3. Division 07 Section "Fiberglass Sandwich Panel Assemblies" for translucent panel skylights interfacing with metal roof panels.
4. Division 07 Section "Sheet Metal Roofing" for custom-fabricated and on-site, roll-formed sheet metal flashing and drainage systems interfacing with roofing.
5. Division 07 Section "Roof Specialties" for pre-manufactured roof edge flashings and other roof specialties not part of metal roof panel assemblies.
6. Division 07 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

#### 1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

- B. Delegated Design: Design metal roof panel assembly using performance requirements and design criteria indicated.
1. Provide product data and test reports demonstrating ability of metal roof panel assembly to achieve performance standards indicated for actual project conditions.
- C. Water Penetration: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
1. Test-Pressure Difference: 20 percent of positive design wind pressure, but not less than 6.24 lbf/sq. ft. (300 Pa) and not more than 12.0 lbf/sq. ft. (575 Pa).
  2. Positive Preload Test-Pressure Difference: Greater than or equal to 15.0 lbf/sq. ft. (720 Pa) and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
  3. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.
- D. Structural Performance.
1. Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
    - a. Snow Loads: 30 lbf/sq. ft. (1436 Pa).
    - b. Wind loading criteria that follows.
    - c. Deflection Limits: Metal roof panel assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/240 of the span.
  2. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated and that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.
    - a. Wind Zone 1: For velocity pressures of 21 to 30 lbf/sq. ft. (1.00 to 1.44kPa): 60-lbf/sq. ft. (2.87-lPa) perimeter uplift force, 90-lbf/sq. ft. (4.31-kPa) corner uplift force, and 30-kPalbf sq. ft. (1.44-kPa) outward force.
  3. FMG Listing: Provide metal roof panels and component materials that comply with requirements in FMG 4471 as part of a panel roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
    - a. Fire/Windstorm Classification: Class 1A-90.
    - b. Hail Resistance: MH.
- E. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C).

## 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.
- B. Delegated Design Responsibility: Provide documentation attesting to ability of metal roof and soffit panel assemblies to achieve Performance Requirements indicated for actual project conditions.
- C. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
  - 1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):
    - a. Flashing and trim.
    - b. Snow guards.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Metal Roof and Soffit Panels: 12 inches (300 mm) long by actual panel width. Include fasteners, clips, battens, closures, and other metal roof panel accessories.
  - 2. Trim and Closures: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
  - 3. Accessories: 12-inch- (300-mm-) long Samples for each type of accessory.
- E. Qualification Data: For qualified Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- G. Field quality-control reports.
- H. Maintenance Data: For metal roof panels to include in maintenance manuals.
- I. Warranties: Samples of special warranties.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- C. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.
- D. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, metal roof panel Installer, metal roof panel manufacturer's representative, deck, purlin and rafter Installer, and installers whose work interfaces with or affects metal roof panels including installers of roof accessories and roof-mounted equipment.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
  - 4. Examine deck substrate, purlin and rafter conditions for compliance with requirements, including flatness and attachment to structural members.
  - 5. Review structural loading limitations of deck, purlins and rafters during and after roofing.
  - 6. Review flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
  - 7. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
  - 8. Review temporary protection requirements for metal roof panel assembly during and after installation.
  - 9. Review roof observation and repair procedures after metal roof panel installation.
  - 10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof and soffit panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof and soffit panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof and soffit panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof and soffit panel installation.

## 1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

## 1.9 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, purlins and rafters, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

## 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, cracking, or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 10 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Weathertight Warranty Period: Minimum five (5) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
  2. Surface: Smooth, flat finish.
  3. Exposed Coil-Coated Finish:
    - a. 2-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.
  4. 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 (0.013 mm).
- B. Panel Sealants:
  1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
  2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
  3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

### 2.2 MISCELLANEOUS METAL FRAMING

- A. Miscellaneous Metal Framing, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized or coating with equivalent corrosion resistance unless otherwise indicated.
  1. Hat-Shaped, Rigid Furring Channels; Cold-Rolled Furring Channels; Z-Shaped Furring and other shapes required to engage and secure metal roof panels to roof base structure.

- B. Fasteners for Miscellaneous Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

## 2.3 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.4 METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panel assembly designed to be installed by covering vertical side edges of adjacent panels with battens and mechanically attaching panels to supports using concealed clips. Include battens and accessories required for weathertight installation.
- B. Integral-Standing-Seam Metal Roof Panels (MP-1 on Drawings): Formed with integral ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and lapping and interconnecting side edges of adjacent panels.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD Integral Standing Seam, Roof Panels by Petersen Aluminum Corporation, or comparable product by one of the following:
    - a. AEP-Span.
    - b. Architectural Building Components.
    - c. Architectural Roofing and Siding, Inc.
    - d. ATAS International, Inc.
    - e. CENTRIA Architectural Systems.
    - f. Copper Sales, Inc.
    - g. Dimensional Metals, Inc.
    - h. Fabral.
    - i. Fashion, Inc.
    - j. IMETCO.
    - k. MBCI; a division of NCI Building Systems, L. P.
    - l. McElroy Metal, Inc.
    - m. Merchant & Evans.
    - n. Metal-Fab Manufacturing, LLC.
    - o. Metal Sales Manufacturing Corporation.

2. Panel Material: Zinc-coated (galvanized) steel sheet, 0.028-inch (0.71-mm) nominal thickness.
  - a. Exterior Finish: 2-coat fluoropolymer.
  - b. Color: To match original color of existing roof panels on nearby hospital building and as selected by Architect from manufacturer's full range.
3. Clips: One piece.
  - a. Material: 0.064-inch- (1.63-mm-) nominal thickness, zinc-coated (galvanized) steel sheet.
4. Sealant: Factory applied on each side of battens.
5. Panel Coverage: 12 inches (305 mm).
6. Batten Height: 1.5 inches (38 mm).

## 2.5 METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Metal Soffit Panels: Match profile and material of metal wall panels.
  1. Finish: Smooth.
  2. Sealant: Factory applied within interlocking joint.
- C. Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and flat pan between panel edges; with flush joint between panels.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD Flush Panel Soffit by Petersen Aluminum Corporation, or comparable product by one of the following:
    - a. AEP-Span.
    - b. Architectural Building Components.
    - c. ATAS International, Inc.
    - d. Berridge Manufacturing Company.
    - e. CENTRIA Architectural Systems.
    - f. Copper Sales, Inc.
    - g. Dimensional Metals, Inc.
    - h. Englert, Inc.
    - i. Fabral.
    - j. Innovative Metals Company, Inc.
    - k. MBCI; Div. of NCI Building Systems.
    - l. McElroy Metal, Inc.
    - m. Merchant & Evans Inc.
    - n. Metal-Fab Manufacturing, L.L.C.
    - o. Metal Sales Manufacturing Corporation.
    - p. Petersen Aluminum Corporation.

- q. Ultra Seam Incorporated.
  - 2. Material: Zinc-coated (G 90 hot-dipped galvanized) steel sheet, 0.028-inch (0.71-mm) nominal thickness.
    - a. Exterior Finish: 2-coat fluoropolymer.
    - b. Unexposed Surface: Polyester washcoat with dry film thickness of 0.3 mils.
    - c. Color: As selected by Architect from manufacturer's full range.
  - 3. Panel Coverage: 18 inches (457 mm) around vestibules; 11 inches (279 mm) on underside of roof of Porte-cochere.
  - 4. Panel Height: 1.0 inch (25 mm).
- D. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
- 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
  - 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  - 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- E. Flashing and Trim: Formed from same material as roof panels, prepainted with coil coating, minimum 0.018 inch (0.45 mm) thick. Provide flashing and trim 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 roof panels.

## 2.6 SNOW GUARDS

- A. Snow Guards: Prefabricated, noncorrosive units designed to be installed without penetrating metal roof panels, and complete with predrilled holes, clamps, or hooks for anchoring.
  - 1. Surface-Mounted, Metal, Stop-Type Snow Guards (on Roof of Porte Cochere only): Formed-sheet aluminum stops designed for attachment to pan surface of metal roof panel using construction adhesive, silicone or polyurethane sealant, or adhesive tape.
    - a. Basis-of-Design Product: Subject to compliance with requirements, provide Metal Snow Guards by Sno-Gem, Inc., or comparable product submitted to Architect for his consideration and approval.
  - 2. Material: Manufacturer's standard thickness aluminum.

3. Size: 3.5" x 3.5."
4. Finish: Fluoropolymer finish to match that for metal roof panels.

## 2.7 FABRICATION

- A. Fabricate and finish metal roof and soffit panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weathertight and minimize noise from movements within panel assembly.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the 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. End Seams for Other Than Aluminum: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
  3. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
  4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
  5. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

## 2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary roof and soffit 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.
- C. Examine solid roof substrates to verify that panel joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
- D. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- E. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof and soffit panel support members and anchorage according to metal roof panel manufacturer's written instructions.
  - 1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

### 3.3 METAL ROOF PANEL INSTALLATION, GENERAL

- A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
- B. Thermal Movement. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Pre-drill panels for fasteners.
  - 1. Point of Fixity: Fasten each panel along a single line of fixing located at ridge.

2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- C. Install metal roof panels as follows:
1. Commence metal roof panel installation and install minimum of 300 sq. ft. (27.8 sq. m.) in presence of factory-authorized representative.
  2. Field cutting of metal panels by torch is not permitted.
  3. Install panels perpendicular to steel decking.
  4. Locate and space fastenings in uniform vertical and horizontal alignment.
  5. Provide metal closures at rake edges, rake walls and each side of ridge and hip caps.
  6. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
  7. Install ridge and hip caps as metal roof panel work proceeds.
  8. End Splices: Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
  9. Install metal flashing to allow moisture to run over and off metal roof panels.
- D. Fasteners:
1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
- E. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- F. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.
- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.
1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
  2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

### 3.4 METAL ROOF PANEL INSTALLATION

- A. Batten-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each batten-seam joint at location, spacing, and with fasteners recommended by manufacturer.
  - 1. Install clips to supports with self-drilling fasteners.
  - 2. Apply battens to metal roof panel seams, fully engaged to provide weathertight joints.

### 3.5 METAL SOFFIT PANEL INSTALLATION

- A. In addition to complying with requirements of "Metal Wall Panel Installation, General" Article, install metal soffit panels to comply with the requirements of this article.
- B. Metal Soffit Panels: Provide metal soffit panels full width of soffits. Install panels perpendicular to support framing.
  - 1. Flash and seal panels with weather closures where metal soffit panels meet walls and at perimeter of all openings.

### 3.6 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. 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 excessive oil canning, 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 to result in 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 (3 m) with no joints allowed within 24 inches (600 mm) 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 (25 mm) deep, filled with mastic sealant (concealed within joints).

- C. Gutters: Custom Integral gutter metal fabrication. See Division 5 Section "Sheet Metal Flashing and Trim."

### 3.7 SNOW GUARD INSTALLATION

- A. Stop-Type Snow Guards: Attach snow guards to metal roof panels with adhesive, sealant, or adhesive tape, as recommended by manufacturer. Do not use fasteners that will penetrate metal roof panels.

1. Provide One row of snow guards beginning 16 inches up from edge of gutter to centerline of row, with each snow guard centered between panel ribs.

### 3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

### 3.9 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.10 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113