SECTION 074213.19 - INSULATED METAL WALL PANELS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Foamed-insulation-core metal wall panels.

Laminated-insulation-core metal wall panels.

Honeycomb-core metal wall panels.

Refer to sections listed below for cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Sections listed below are for spec editor’s and design team coordination and are to remain as Editor’s Notes. Remove referenced specification sections within the body of the specification if not applicable to the project.

Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

Retain subparagraphs below if additional requirements are necessary; revise to include more specific information about conference.

Meet with Director’s Representative, Director’s Representative’s insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.

Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

Review methods and procedures related to metal panel installation, including manufacturer's written instructions.

Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.

Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.

Review temporary protection requirements for metal panel assembly during and after installation.

Review procedures for repair of metal panels damaged after installation.

Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

Include manufacturer’s installation instructions.

* + - * 1. Sustainable Design Submittals:
        2. Shop Drawings:

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.

Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs below for two-stage Samples.

* + - * 1. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

Include similar Samples of trim and accessories involving color selection.

* + - * 1. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.

Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

* + - * 1. Quality Control Submittals:

Qualification Data: For Installer.

Product Test Reports: For each product, tests performed by a qualified testing agency.

Field quality-control reports.

Sample Warranties: For special warranties.

* + - * 1. Contract Closeout Submittals:

Maintenance Data: For metal panels to include in maintenance manuals.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
         2. Benchmarks: Build Benchmarks to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

Retain first subparagraph below for large-scale Benchmark. Indicate portion of building represented by Benchmark on Drawings or draw Benchmark as separate element. Revise to suit Project or if larger Benchmark is needed for field performance testing.

Build Benchmark of typical metal panel assembly [**as shown on Drawings] <Insert size**>, including [**corner,] [soffits**,] supports, attachments, and accessories.

Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.

Retain first subparagraph below if Benchmarks are not only for establishing appearance factors.

Approval of Benchmarks does not constitute approval of deviations from the Contract Documents contained in Benchmarks unless Director’s Representative specifically approves such deviations in writing.

* + - 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. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
         4. Retain strippable protective covering on metal panels during installation.
      2. 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.
      3. COORDINATION
         1. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
      4. WARRANTY

When warranties are required, verify with Director’s Representative that special warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including rupturing, cracking, or puncturing.

Deterioration of metals and other materials beyond normal weathering.

Verify available warranties and warranty periods for metal panels.

Warranty Period: [**Two] <Insert number**> years from date of Substantial Completion.

* + - * 1. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

Usually retain "Exposed Panel Finish" subparagraph below for fluoropolymer or siliconized-polyester finishes; verify availability with manufacturer.

Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

Color fading more than 5 Hunter units when tested according to ASTM D2244.

Chalking in excess of a No. 8 rating when tested according to ASTM D4214.

Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Verify available warranties for metal panel finishes and insert number in "Finish Warranty Period" subparagraph below. A 20-year period is available for fluoropolymer finish and is the maximum included with manufacturers' published data; a 10-year period is usually available for siliconized polyester. Longer periods for premium finishes may be available.

Finish Warranty Period: [**20] [10] <Insert number**> years from date of Substantial Completion.

* + - * 1. Special Warranty: The one year period required by Paragraph 9.8 of the General Conditions is extended to 2 years for the Work in this Section. Refer to Supplementary Conditions.

Insert requirements for special weathertightness warranty if needed. Panel manufacturers do not typically offer such warranties on wall systems.

1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures.

* + - 1. PERFORMANCE REQUIREMENTS
         1. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E72:

Wind Loads: As indicated on Drawings.

Other Design Loads: [**As indicated on Drawings] <Insert loads**>.

Deflection Limits: For wind loads, no greater than [**1/180] [1/240] <Insert deflection**> of the span.

<Insert serviceability requirements>.

* + - * 1. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft when tested according to ASTM E283 at the following test-pressure difference:

Value in first option in "Test-Pressure Difference" subparagraph below is equivalent to a 25-mph (40-km/h) wind and is ASTM E283 default. Products tested to value in second option below, equivalent to a 50-mph (80-km/h) wind, are widely available. Revise to suit Project.

Test-Pressure Difference: [**1.57 lbf/sq. ft.] [6.24 lbf/sq. ft**.].

ASTM E331, in "Water Penetration under Static Pressure" paragraph below, indicates that "water contained within drainage flashings, gutters, and sills is not considered failure."

* + - * 1. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

Value in first option in "Test-Pressure Difference" subparagraph below is equivalent to a 34-mph (55-km/h) wind and is ASTM E331 default. Products tested to value in second option below, equivalent to a 50-mph wind (80-km/h), are widely available. Revise to suit Project.

Test-Pressure Difference: [**2.86 lbf/sq. ft.] [6.24 lbf/sq. ft**.].

* + - * 1. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Differential values (for aluminum in particular) in "Temperature Change (Range)" subparagraph below are suitable for most of the U.S.; revise to suit Project.

Temperature Change (Range): [**120 deg F, ambient; 180 deg F, material surfaces] <Insert temperature range**>.

* + - * 1. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

Subparagraphs below are examples only; revise to suit Project after verifying requirements of authorities having jurisdiction.

Retain "Fire-Resistance Characteristics" subparagraph below only where fire-resistance-rated wall construction is required and testing has demonstrated that adding insulated wall panels does not reduce fire resistance. Verify acceptability of such assemblies with authorities having jurisdiction.

Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E119.

Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which wall panel is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies.

Radiant Heat Exposure: No ignition when tested according to NFPA 268.

Potential Heat: Acceptable level when tested according to NFPA 259.

Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E84.

* + - 1. FOAMED-INSULATION-CORE METAL WALL PANELS
         1. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.

Closed-Cell Content: 90 percent when tested according to ASTM D6226.

Density: 2.0 to 2.6 lb/cu. ft. when tested according to ASTM D1622.

Compressive Strength: Minimum 20 psi when tested according to ASTM D1621.

Shear Strength: 26 psi when tested according to ASTM C273.

Copy paragraphs below and re-edit for each product.

Insert drawing designation for each product required. Use these designations on Drawings to identify each product.

* + - * 1. Exposed-Fastener, Foamed-Insulation-Core Metal Wall Panels <Insert drawing designation>: Formed with a raised, trapezoidal major rib at panel edge and two intermediate stiffening ribs symmetrically spaced between major rib and panel edge; designed for lapping side edges of adjacent panels and mechanically attaching to supports using exposed fasteners in side laps.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: [**0.022 inch] [0.028 inch] [0.034 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain "Backer Board" subparagraph below if required. A backer board provides additional impact resistance.

Backer Board: On back side of exterior facing.

Retain "Snap-on Batten" subparagraph below if required. A batten is optional with some manufacturers; verify availability.

Snap-on Batten: Same material, finish, and color as exterior facings of wall panels.

Panel Coverage: [**36 inches] <Insert dimension**> nominal.

Panel Thickness: [**3.0 inches] [4.0 inches] [5.0 inches**] <Insert dimension>.

Coordinate R-value in "Thermal-Resistance Value (R-Value)" subparagraph below with thickness selected in "Panel Thickness" subparagraph above.

Thermal-Resistance Value (R-Value): <**Insert R-value**> according to ASTM C1363.

* + - * 1. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels <Insert drawing designation>: Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: [**0.022 inch] [0.028 inch] [0.034 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain "Backer Board" subparagraph below if required. A backer board provides additional impact resistance.

Backer Board: On back side of exterior facing.

Retain "Snap-on Batten" subparagraph below if required. A batten is an optional feature with some manufacturers; verify availability.

Snap-on Batten: Same material, finish, and color as exterior facings of wall panels.

Panel Coverage: [**36 inches] [40 inches] <Insert dimension**> nominal.

Panel Thickness: [**1.0 inch] [1.5 inches] [2.0 inches] [2.5 inches] [3.0 inches ] [4.0 inches] [5.0 inches] <Insert dimension**>.

Coordinate R-value in "Thermal-Resistance Value (R-Value)" subparagraph below with thickness retained in "Panel Thickness" subparagraph above.

Thermal-Resistance Value (R-Value): <**Insert R-value**> according to ASTM C1363.

* + - 1. LAMINATED-INSULATION-CORE METAL WALL PANELS
         1. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and core material laminated or otherwise securely bonded to facing sheets during fabrication without use of contact adhesives, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.
         2. Wrapped-Edge, Laminated-Insulation-Core Metal Wall Panels <Insert drawing designation>: Formed with flush exterior panel facing wrapped over panel edges; designed for independent installation by mechanically attaching [**panels to supports using staggered, concealed side clips engaging panel edges] [through extended panel edges to supports using concealed fasteners**]; with [**sealant] [gasketed**] joints.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: [**0.028 inch] [0.034 inch] [0.040 inch] [0.052 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.032 inch] [0.040 inch] [0.050 inch] [0.063 inch] [0.080 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative’s from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Core Material: [**Manufacturers' standard.][Board insulation of the following type**:]

Retain "Polyisocyanurate Insulation," "Extruded-Polystyrene Board Insulation," or "Molded-Polystyrene Board Insulation" subparagraph below.

Polyisocyanurate Insulation: Closed cell, modified polyisocyanurate foam using a non-CFC blowing agent, board type, with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Closed-Cell Content: 90 percent when tested according to ASTM D6226.

Extruded-Polystyrene Board Insulation: ASTM C578, Type IV, 1.60-lb/cu. ft. minimum density, unless otherwise indicated; with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Molded-Polystyrene Board Insulation: ASTM C578, [**Type I, 0.9 lb/cu. ft.] [Type II, 1.35 lb/cu. ft., Class 2 or 3, Grade 3]**, with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Retain "Backer Board" subparagraph below if required. A backer board provides additional impact resistance.

Backer Board: [**0.125-inch-] [0.250-inch-**] thick hardboard behind exterior facing for increased impact resistance.

Retain steel clips in "Clips" subparagraph below for steel wall panels; retain stainless-steel clips for aluminum panels.

Clips: Manufacturer's standard one piece, formed from [**zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet] [stainless steel**].

Gaskets: Extruded, dry seal silicone.

Sealant: Manufacturer's standard silicone.

Panel Thickness: [1**.0 inch] [2.0 inches] [3.0 inches] [4.0 inches] [5.0 inches] [6.0 inches] <Insert dimension**>.

Coordinate R-value in "Thermal-Resistance Value (R-Value)" subparagraph below with thickness retained in "Panel Thickness" subparagraph above.

Thermal-Resistance Value (R-Value): <**Insert R-value**> according to ASTM C1363.

* + - * 1. Shiplap-Edge, Laminated-Insulation-Core Metal Wall Panels <Insert drawing designation>: Formed with flush exterior panel facing and with shiplap edges; designed for sequential installation by mechanically attaching panels to supports using concealed clips and fasteners; with factory-applied [**sealant] [gaskets**] inside laps.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755..

Nominal Thickness: [**0.028 inch] [0.034 inch] [0.040 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.032 inch] [0.040 inch] [0.050 inch] [0.063 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Core Material: [**Manufacturers' standard.][Board insulation of the following type**:]

Retain "Polyisocyanurate Insulation," "Extruded-Polystyrene Board Insulation," or "Molded-Polystyrene Board Insulation" subparagraph below.

Polyisocyanurate Insulation: Closed cell, modified polyisocyanurate foam using a non-CFC blowing agent, board type, with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Closed-Cell Content: 90 percent when tested according to ASTM D6226.

Extruded-Polystyrene Board Insulation: ASTM C578, Type IV, 1.60-lb/cu. ft. minimum density unless otherwise indicated; with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Molded-Polystyrene Board Insulation: ASTM C578, [**Type I, 0.9 lb/cu. ft.] [Type II, 1.35 lb/cu. ft., Class 2 or 3, Grade 3**], with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Retain "Backer Board" subparagraph below if required. A backer board provides additional impact resistance.

Backer Board: [**0.125-inch-] [0.250-inch-]** thick hardboard behind exterior facing for increased impact resistance.

Retain steel clips in "Clips" subparagraph below for steel wall panels; retain stainless-steel clips for aluminum panels.

Clips: Manufacturer's standard one piece, formed from [**zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet] [stainless steel**].

Gaskets: Extruded, dry seal silicone.

Sealant: Manufacturer's standard silicone.

Panel Thickness: [**1.0 inch] [2.0 inches] [3.0 inches] [4.0 inches] [5.0 inches] [6.0 inches] <Insert dimension**>.

Coordinate R-value in "Thermal-Resistance Value (R-Value)" subparagraph below with thickness retained in "Panel Thickness" subparagraph above.

Thermal-Resistance Value (R-Value): <**Insert R-value**> according to ASTM C1363.

* + - * 1. Framed-Edge, Laminated-Insulation-Core Metal Wall Panels <Insert drawing designation>: Formed with flush exterior panel facing and integral, extruded edge members; designed for independent installation by mechanically attaching panels to supports through edge framing using concealed fasteners; with gasketed joints.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: [**0.028 inch] [0.034 inch] [0.040 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.032 inch] [0.040 inch] [0.050 inch] [0.063 inch] [0.080 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Core Material: [**Manufacturers' standard.][Board insulation of the following type:**]

Retain "Polyisocyanurate Insulation," "Extruded-Polystyrene Board Insulation," or "Molded-Polystyrene Board Insulation" subparagraph below.

Polyisocyanurate Insulation: Closed cell, modified polyisocyanurate foam using a non-CFC blowing agent, board type, with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Closed-Cell Content: 90 percent when tested according to ASTM D6226.

Extruded-Polystyrene Board Insulation: ASTM C578, Type IV, 1.60-lb/cu. ft. minimum density unless otherwise indicated; with a maximum flame-spread index of 25 and a smoke-developed index of 450.

Molded-Polystyrene Board Insulation: ASTM C578, [T**ype I, 0.9 lb/cu. ft.] [Type II, 1.35 lb/cu. ft., Class 2 or 3, Grade 3**], with maximum flame-spread index of 25 and smoke-developed index of 450.

Retain "Backer Board" subparagraph below if required. A backer board provides additional impact resistance.

Backer Board: [**0.125-inch] [0.250-inch**] thick hardboard behind exterior facing for increased impact resistance.

Edge Members: Extruded aluminum, not less than 0.063-inch wall thickness.

Gaskets: Extruded, dry seal silicone.

Panel Thickness: [**1.0 inch] [2.0 inches] [3.0 inches] [4.0 inches] [5.0 inches] [6.0 inches] <Insert dimension**>.

Coordinate R-value in "Thermal-Resistance Value (R-Value)" subparagraph below with thickness retained in "Panel Thickness" subparagraph above.

Thermal-Resistance Value (R-Value): <**Insert R-value**> according to ASTM C1363.

* + - 1. HONEYCOMB-CORE METAL WALL PANELS
         1. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and honeycomb-core material laminated or otherwise securely bonded to facing sheets during fabrication without use of contact adhesives or pinch rollers, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.
         2. Wrapped-Edge, Honeycomb-Core Metal Wall Panels <**Insert drawing designation**>: Formed with flush exterior panel facing wrapped over panel edges; designed for independent installation by mechanically attaching [**panels to supports using staggered, concealed side clips engaging panel edges**] [**through extended panel edges to supports using concealed fasteners]; with [sealant] [gasketed**] joints.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755..

Nominal Thickness: [**0.028 inch] [0.034 inch] [0.040 inch]**.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.032 inch] [0.040 inch] [0.050 inch] [0.063 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain one of two honeycomb core subparagraphs below; aluminum cores are used for applications that require noncombustible construction.

Kraft-Paper Honeycomb Core: Manufacturer's standard phenolic-resin impregnated paper, with not less than 15 percent resin content by weight and chemically treated for fire resistance; with maximum 1/2-inch cell size.

Aluminum Honeycomb Core: Manufacturer's standard 0.003-inch- thick, commercial-grade aluminum with maximum 3/4-inch cell size.

Retain steel clips in "Clips" subparagraph below for steel wall panels; retain stainless-steel clips for aluminum panels.

Clips: Manufacturer's standard one piece, formed from [**zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet] [stainless steel]**.

Gaskets: Extruded, dry seal silicone.

Sealant: Manufacturer's standard silicone.

Retain first option in "Panel Thickness" subparagraph below only for glazed-in and spandrel panels; second and third options may be used for glazed-in and spandrel panels or wall panels; fourth and fifth options are available only for aluminum honeycomb-core metal wall panels.

Panel Thickness: [**0**.**25 inch] [1.0 inch] [2.0 inches] [3.0 inches] [4.0 inches] <Insert dimension**>.

* + - * 1. Shiplap-Edge, Honeycomb-Core Metal Wall Panels <**Insert drawing designation**>: Formed with flush exterior panel facing and with shiplap edges; designed for sequential installation by mechanically attaching panels to supports using concealed clips and fasteners; with factory-applied [**sealant] [gaskets**] inside laps.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: [**0.028 inch] [0.034 inch] [0.040 inch**].

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.032 inch] [0.040 inch] [0.050 inch] [0.063 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain one of two honeycomb core subparagraphs below; aluminum cores are used for applications that require noncombustible construction.

Kraft-Paper Honeycomb Core: Manufacturer's standard phenolic-resin-impregnated paper, with not less than 15 percent resin content by weight and chemically treated for fire resistance; with maximum 1/2-inch cell size.

Aluminum Honeycomb Core: Manufacturer's standard 0.003-inch thick, commercial-grade aluminum with maximum 3/4-inch cell size.

Retain steel clips in "Clips" subparagraph below for steel wall panels; retain stainless-steel clips for aluminum panels.

Clips: Manufacturer's standard one piece, formed from [z**inc-coated (galvanized) steel or aluminum-zinc alloy-coated steel] [stainless stee**l].

Gaskets: Extruded, dry seal silicone.

Sealant: Manufacturer's standard silicone.

Panel Thickness: [**1.0 inch] [1.25 inches] [2.0 inches] <Insert dimension**>.

* + - * 1. Framed-Edge, Honeycomb-Core Metal Wall Panels <**Insert drawing designation**>: Formed with flush exterior panel facing and integral, extruded edge members; designed for independent installation by mechanically attaching panels to supports through edge framing using concealed fasteners; with gasketed joints.

Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

Nominal Thickness: 0.028 inch.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

Thickness: [**0.040 inch] [0.063 inch**].

Surface: [**Smooth, flat] [Embossed**] finish.

Exterior Finish: [**Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Siliconized polyester] [Clear anodized] [Color anodized] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Interior Finish: [**Siliconized polyester] <Insert finish**>.

Color: [**As indicated by manufacturer's designations] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain one of two honeycomb core subparagraphs below; aluminum cores are used for applications that require noncombustible construction.

Kraft-Paper Honeycomb Core: Manufacturer's standard phenolic-resin-impregnated paper, with not less than 15 percent resin content by weight and chemically treated for fire resistance; with maximum 1/2-inch cell size.

Aluminum Honeycomb Core: Manufacturer's standard 0.003-inch- thick, commercial-grade aluminum with maximum 3/4-inch cell size.

Edge Members: Extruded aluminum, not less than 0.063-inch wall thickness.

Gaskets: Extruded, dry seal silicone.

Panel Thickness: [**1.0 inch] [2.0 inches] [3.0 inches] <Insert dimension**>.

* + - 1. MISCELLANEOUS MATERIALS
         1. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653, G90 coating designation or ASTM A792, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

Retain panel accessories, flashing, and trim as required and coordinate with those specified in Section 076200 "Sheet Metal Flashing and Trim."

* + - * 1. Panel Accessories: Provide components required for a complete, weathertight 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.

Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.

Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

Retain "Backer Board" paragraph below to provide increased impact resistance. Revise to insert other backer boards such as plywood if required.

* + - * 1. Backer Board: Hardboard complying with ANSI A135.4, Class 1 tempered, [**1/8 inch] [1/4 inch**] thick unless otherwise indicated.
        2. 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, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

Insert requirements for explosion-relief panels, including special fasteners, cables, and supports, if required. Verify availability with manufacturers.

* + - * 1. 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.
        2. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

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 wide and 1/8 inch thick.

Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

* + - 1. FABRICATION
         1. 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.
         2. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

Retain first paragraph below if gaskets or sealants are factory installed.

* + - * 1. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
        2. Honeycomb-Core Metal Wall Panels: Fabricate panels using manufacturer's standard thermosetting structural adhesive in a lamination process that bonds panel under minimum 10-psi pressure. Use of contact adhesives with pinch-roll process is unacceptable.

Panel Bow Tolerance: Not more than 0.5 percent of panel width or length.

* + - * 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.

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.

Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.

Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

* + - 1. FINISHES
         1. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
         2. 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 not acceptable. 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.
         3. Steel Panels and Accessories:

Retain one exposed fluoropolymer or siliconized-polyester finish from subparagraphs below. Verify availability of finishes for products specified. If retaining more than one, indicate location of each on Drawings or by inserts. To obtain a proprietary finish system, insert names of coating manufacturers and products.

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.

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.

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.

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.

FEVE Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Siliconized Polyester: Epoxy 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.

Finish in "Concealed Finish" subparagraph below is frequently used as a factory finish for interior surfaces.

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.

* + - * 1. Aluminum Panels and Accessories:

Retain one fluoropolymer, siliconized-polyester, or anodized finish from subparagraphs below. Verify availability of finishes for products specified. If retaining more than one, indicate location of each on Drawings or by inserts. To obtain a proprietary finish system, insert names of coating manufacturers and products.

Revise or insert additional testing requirements in five fluoropolymer subparagraphs below if performance levels indicated in AAMA 2605 are insufficient. See Evaluations.

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.

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.

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.

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.

FEVE Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Siliconized Polyester: Epoxy 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.

Exposed Anodized Finish:

Retain one of two options in "Clear Anodic Finish" subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

Clear Anodic Finish: AAMA 611, [**AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm**] or thicker.

Retain one of two options in "Color Anodic Finish" subparagraph below. Verify availability with manufacturers.

Color Anodic Finish: AAMA 611, [**AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm**] or thicker.

1. 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.

Retain one or both subparagraphs below.

Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

Retain subparagraph below with subparagraph above for systems that depend on air- or water-resistive barriers to prevent air infiltration or water penetration.

Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

* + - * 1. 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.
        2. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION
         1. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.
      2. 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.

Shim or otherwise plumb substrates receiving metal panels.

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.

Install screw fasteners in predrilled holes.

Locate and space fastenings in uniform vertical and horizontal alignment.

Install flashing and trim as metal panel work proceeds.

Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.

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.

Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

* + - * 1. Fasteners:

Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

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.

* + - * 1. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
        2. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.

Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.

Retain subparagraph below if joint-sealant work is part of this Section.

Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

* + - 1. INSULATED METAL WALL PANEL INSTALLATION
         1. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.

Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.

Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

Provide metal-backed washers under heads of exposed fasteners on weather side of insulated metal wall panels.

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.

Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.

Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.

Retain subparagraph below if required; coordinate with products retained in Part 2.

Apply snap-on battens to exposed-fastener, insulated-core metal wall panel seams to conceal fasteners.

* + - * 1. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.

Install clips to supports with self-tapping fasteners.

* + - * 1. Laminated-Insulation-Core Metal Wall Panels:

Retain one installation method from four subparagraphs below that corresponds to products selected in Part 2.

Wrapped-Edge Panels: Mechanically attach wall panels to supports using staggered, concealed side clips engaging wrapped panel edges. Install clips to supports with self-tapping fasteners. Seal joints with [**backer rod and sealant] [manufacturer's standard gaskets**].

Wrapped-Edge Panels: Mechanically attach wall panels through extended edge of panels to supports using self-tapping fasteners. Seal joints with [**backer rod and sealant] [manufacturer's standard gaskets**].

Shiplap-Edge Panels: Mechanically attach wall panels to supports using staggered, concealed side clips engaging tongue-and-groove panel edges. Install clips to supports with self-tapping fasteners.

Horizontal Joints: [**Maintain reveal joint of consistent width] [Seal joints with backer rod and sealant] [Seal joints with manufacturer's standard gaskets**].

Vertical Joints: [**Maintain reveal joint of consistent width] [Seal joints with backer rod and sealant] [Seal joints with manufacturer's standard gaskets**].

Framed-Edge Panels: Mechanically attach wall panels through integral, extruded edge members to supports using self-tapping fasteners. Seal joints with manufacturer's standard gaskets.

* + - * 1. Honeycomb-Core Metal Wall Panels:

Retain one installation method from four subparagraphs below that corresponds to products selected in Part 2.

Wrapped-Edge Panels: Mechanically attach wall panels to supports using staggered, concealed side clips engaging wrapped panel edges. Install clips to supports with self-tapping fasteners. Seal joints with [**backer rod and sealant] [manufacturer's standard gaskets**].

Wrapped-Edge Panels: Mechanically attach wall panels through extended edge of panels to supports using self-tapping fasteners. Seal joints with [**backer rod and sealant] [manufacturer's standard gaskets**].

Shiplap-Edge Panels: Mechanically attach wall panels to supports using staggered, concealed side clips engaging tongue-and-groove panel edges. Install clips to supports with self-tapping fasteners.

Horizontal Joints: [**Maintain reveal joint of consistent width] [Seal joints with backer rod and sealant] [Seal joints with manufacturer's standard gaskets**].

Vertical Joints: [**Maintain reveal joint of consistent width] [Seal joints with backer rod and sealant] [Seal joints with manufacturer's standard gaskets**].

Framed-Edge Panels: Mechanically attach wall panels through integral, extruded edge members to supports using self-tapping fasteners. Seal joints with manufacturer's standard gaskets.

* + - * 1. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

* + - * 1. 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. Install work with laps, joints, and seams that are permanently watertight.

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 to achieve waterproof performance.

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 waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

* + - 1. FIELD QUALITY CONTROL
         1. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

Retain "Water-Spray Test" paragraph below to check system's resistance to water penetration. Revise indicated test-area requirements to suit Project.

* + - * 1. Water-Spray Test: After installation, test area of assembly [**shown on Drawings] [as directed by Director’s Representative] <Insert area**> for water penetration according to AAMA 501.2.

Retain "Manufacturer's Field Service" paragraph below to require a factory-authorized service representative to perform tests and inspections.

* + - * 1. Manufacturer's Field Service: Engage a Company Service Advisor to test and inspect completed metal wall panel installation, including accessories.

Metal wall panels will be considered defective if they do not pass test and inspections.

* + - * 1. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
        2. Prepare test and inspection reports.
      1. 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. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
         3. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.19