SECTION 074213.16 – MODULAR METAL WALL PANELS

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

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

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

Retain or delete this article in all Sections of Project Manual.

* + - 1. SUMMARY
				1. Section includes aluminum metal wall panels.
			2. PREINSTALLATION MEETINGS

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

* + - * 1. Preinstallation Conference:

If needed, insert list of conference participants not mentioned in Section 13100 "Project Management and Coordination."

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

Meet with Owner, Architect, Owner's insurer if applicable, metal panel Fabricator and Installer, metal sheet 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.

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 panels damaged after installation.

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

* + - 1. ACTION SUBMITTALS
				1. 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.

* + - * 1. Shop Drawings:

Formed metal panel system fabricator to provide shop drawings Including fabrication and installation layouts of panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.

Accessories: Include details of the flashing, trim and anchorage.

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

* + - * 1. Samples for Initial Selection: For each type of 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 required, prepared on Samples of size indicated below.

Aluminum Panels: Include fasteners, closures, and other aluminum panel accessories. Submit custom color samples in paint manufacturer's standard size.

* + - 1. INFORMATIONAL SUBMITTALS
				1. Product Test Reports: For each product, tests performed by a qualified testing agency.

Formed Metal Panel System’s Certified System Tests Reports: Certified system test reports showing system compliance with specific performance or third-party listing documenting compliance code section. In three subparagraphs below, retain only those systems required under scope of work for this Project and delete all others.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.
				2. Sample Warranties.
			1. 1.6 CLOSEOUT SUBMITTALS
				1. Maintenance Data: For metal panels to include in maintenance manuals.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + - 1. QUALITY ASSURANCE
				1. Fabricator Qualifications: Company specializing in fabricating products specified in this section with at least five years of documented experience.
				2. Installer: Company specializing in performing work of this section and approved by Fabricator.

Install system in strict compliance with Fabricator’s installation instructions.

* + - * 1. Source Limitations: Obtain each type of metal panel wall panel from single source and from a single Fabricator.
				2. Mockups: Provide mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and to establish quality standards for fabrication and installation.

Specifier Note: Edit following sub-paragraph for large scale mockup, indicate portion of building to represent mockup on Drawings, or indicate mockup as separate element on Drawings in compliance with project requirements.

Build mockup of typical wall panel assembly including supports, attachments, and accessories.

Specifier Note: Edit following sub-paragraph as required for water spray test and coordinate with PART 3 Field Quality Control requirements in compliance with project requirements.

Approval of mockups does not constitute approval of deviation from Contract Documents within mockups unless these deviations are approved by Architect in writing.

Subject to compliance with requirements, approved mockups [may] or [may not] become part of completed Work if undisturbed upon Date of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials to site in fabricator’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
				2. Storage and Handling: Store materials in clean, dry, interior area in accordance with manufacturer’s instructions.
				3. Deliver panels, components, and other fabricated items without damage or deformation.
				4. Protect panels during transportation, handling, and installation from weather, excessive temperatures and construction operations.
				5. Handle panels in strict compliance with fabricator’s instructions and recommendations, and in a manner to prevent bending, warping, twisting, and surface damage.

Store panels vertically with top of panel down, storage of panels horizontally is not permitted.

* + - * 1. Store panels covered with suitable weather tight and ventilated covering.
				2. Provide storage of panels to ensure dryness, with positive slope for drainage of moisture.
				3. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.
				4. Remove strippable protective covering from aluminum panel prior to installation.
			1. FIELD CONDITIONS
				1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to fabricator's installation instructions and warranty requirements.
			2. WARRANTY
				1. Warranty on Panel System Workmanship: Fabricator’s standard form in which fabricator agrees to provide labor required to repair or replace work which inhibits defects that result in deterioration or failure to perform as required.

Workmanship Warranty Period: 2 years from the date of Substantial Completion.

* + - * 1. Warranty on Panel Finishes: Submit the Manufacturer's standard form agreeing to furnish fabrication, labor and material to repair or replace MCM panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

Coverage includes:

Color fading more than (5) Delta E units when tested according to ASTM D 2244.

Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

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

Warranty Period: 20years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Avitru. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

* + - 1. PERFORMANCE REQUIREMENTS
				1. Structural Performance: Provide formed panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E330:

Industry-minimum design pressure is 30 psf (1.44 kPa) with ALUCOBOND tested to 40 psf (1.92 kPa).

Wind Loads: As indicated on Drawings.

Panel Deflection Limit: For wind loads, no greater than 1/60 of the span.

Framing Member Deflection Limits: For wind loads, no greater than 1/175 of the span.

Retain "Air Infiltration" and "Water Penetration under Static Pressure" paragraphs below for MCM panels that span openings between supports; usually delete for panels mounted on solid substrates.

* + - * 1. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of wall area when tested in accordance with ASTM E283 at a minimum test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).

Products tested to value below are equivalent to a 50-mph (80-km/h) wind.

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 to room side of assembly when tested for 15 minutes in accordance with ASTM E331 a minimum test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).

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.

* + - * 1. Thermal Movements: Locate expansion and contraction points to allow for free and noiseless thermal movements from surface temperature changes at a range of 20 deg F to 180 deg F (minus 29 to 82.2 deg C), material surfaces.

Retain "Fire Propagation Characteristics" Paragraph below if required. Tested products are not available from all manufacturers.

* + - * 1. Rainscreen Cladding Performance: Provide a modular metal wall panel system complying with one of the following rainscreen system tests per the architect’s discretion:

AAMA 509: Voluntary test method and specification for drained and back ventilated wall cladding systems.

AAMA 508: Voluntary test method and specification for pressure equalized wall cladding systems.

* + - 1. METAL WALL PANELS
				1. Formed Metal Wall Panel Systems: Provide factory coil coated and shop formed metal panels for the installation method indicated on the construction drawings. Include attachment components and accessories required.

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to require a specific product or a comparable product from manufacturers listed.

Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOLUX™ manufactured by 3A Composites USA Inc.

Approved Modular Metal Panel Systems By Approved Fabricators:

AL-DI by NorthClad Rainscreen Solutions ([www.northclad.com](http://www.northclad.com)).

CLADLOK by CEI Materials ([www.ceimaterials.com](http://www.ceimaterials.com)).

EC-300 by East Coast Metal Systems ([www.esmsinc.net](http://www.esmsinc.net)).

PX-5 by ACMpanelworx ([www.acmpanelworx.com](http://www.acmpanelworx.com))

VISTA by FORM Metal Systems ([www.formmetal.com](http://www.formmetal.com)).

Substitution: The proposed panel system must comply with the contract documents. Prior to the bid date, the requestor must provide a formal substitution request including detailed comparison to the specified systems, product data, performance test reports, and drawings. Approval is at the discretion of the Architect.

* + - * 1. Formed Aluminum Wall Panels: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers design requirements.

Aluminum Alloy: Tension-leveled, 3000 series alloy.

Panel Thickness: **[0.063 inch] [0.080 inch]**

Exterior Finish: Acceptable coating resins are polyvinylidene difluoride (PVDF), fluorinated ethylene vinyl ether (FEVE), super-durable polyester (SDP), siliconized polyester (SMP) & anodized. The number of coats and film thicknesses shall comply with the specified warranty period and specified basis-of-design finish(es):

Basis-of-design finish(es):

When colors are selected, insert color in subparagraphs below to suit Project.

Finish 1: <**Insert color**>.

Finish 2: <**Insert color**>.

Copy this article re-edit for each product.

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

* + - 1. MISCELLANEOUS MATERIALS
				1. Miscellaneous Metal Sub-framing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide Fabricator's standard sections as required for support and alignment of formed 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 rainscreen panel system including trim and flashing as indicated on the constructions drawings. Match material and finish of formed panels unless otherwise indicated.
				2. Flashing and Trim: Provide flashing and trim formed from same material as formed panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, end walls, framed openings, rakes, fasciae, and parapet caps.

Basis-of-Design Product: Subject to compliance with requirements, provide AXCENT™ manufactured by 3A Composites USA Inc.

Aluminum Trim: Formed with minimum 0.040-inch (1.00-mm-) thick, coil-coated aluminum sheet unless otherwise indicated on the construction drawings.

For "ALUCOBOND® Axcent™" trim colors, see [d371dyuip757b1.cloudfront.net/downloads/Alucobond\_Axcent\_Jan\_2015.pdf](https://d371dyuip757b1.cloudfront.net/downloads/Alucobond_Axcent_Jan_2015.pdf).

Basis-of-design Finish: To match formed wall panel system unless otherwise indicated in the construction drawings.

1. When colors are selected, insert color in subparagraphs below to suit Project.
	* + - 1. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of formed panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
				2. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in formed panels and remain weathertight; and as recommended in writing by formed panel manufacturer.
			1. FABRICATION
				1. Fabricate formed metal panel joints to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensions as indicated on the construction drawings.
				2. Fabricate curved formed metal panels as indicated on the drawings with a continuous radius utilizing concealed, backside welding to be completed before post finishing to match the prefinished panels. Segmented panels with excessive panel joints are not acceptable.
				3. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations or 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 non-expansion, 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 provided by others is acceptable. Variation in appearance from different production batches of finish effects including but not limited to anodized, brushed coil, mica flake, metallic flake, and texture is expected.
				3. Allowable finishes for Formed Metal Panels and Accessories: See basis-of-design finish selection and warranty requirements. Prepare, pretreat, and apply coatings to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Coil Coated Finishes:

PVDF Fluoropolymer: AAMA 2605. Containing not less than 70 percent PVDF resin by weight in color coat.

FEVE Fluoropolymer: AAMA 2605. F 100 percent fluorinated ethylene vinyl ether resin in color coat.

SDP Super-durable Polyester: AAMA 2605. Containing carboxyl or hydroxyl functional resin in the color coat.

SMP Siliconized Polyester: AAMA 2604. Containing silicone-modified, polyester-enamel in the color coat. .

Anodized Finish

Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 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 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 assemblies penetrating metal panels to verify actual locations of penetrations relative to seam locations of formed panels before installation.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION
				1. Miscellaneous Supports: Install sub framing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal panel manufacturer's written recommendations.
			2. MODULAR METAL PANEL INSTALLATION

For ALUCOBOND's "Material Fabrication Manual," see [d371dyuip757b1.cloudfront.net/downloads/Alucobond-How%20To-FabricationGuide-4.18.pdf](https://d371dyuip757b1.cloudfront.net/downloads/Alucobond-How%20To-FabricationGuide-4.18.pdf).

* + - * 1. General: Install metal panels in accordance with Fabricator's written instructions in orientation, sizes, and locations indicated on Drawings. 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 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.

* + - * 1. Fasteners:

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 fabricator.

Usually, retain "Attachment Assembly, General" Paragraph below with either "Installation" Paragraph or one of "Clip Installation," "Subgirt-and-Spline Installation," "Track-Support Installation," or "Rainscreen-Principle Installation" paragraphs below.

* + - * 1. Attachment Assembly, General: Install attachment assembly required to support metal wall panels, including sub girts, perimeter flashing components, , and panel clips as indicated in the construction drawings.

Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar material joinery, and panel system joint seals.

Retain "Panel Installation" Paragraph below for Fabricator's standard installation method, or delete and retain one of "Clip Installation," "Subgirt-and-Spline Installation," "Track-Support Installation," or "Rainscreen-Principle Installation" paragraphs.

* + - * 1. Panel Installation: Attach metal wall panels to supports at locations, spacings, and with fasteners to achieve performance requirements specified.

Edit subparagraphs below to suit Project.

* + - * 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 assembly including trim, corners, and related items. Provide types indicated by metal panel Fabricator; or, if not indicated, provide types recommended in writing by metal system Fabricator.

* + - * 1. 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 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.

Expansion Provisions: Provide for thermal expansion of exposed trim. Space movement joints at a maximum of 10 feet (3 m). 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 (25 mm) deep, filled with mastic sealant (concealed within joints).

* + - 1. PROJECT CONDITIONS
				1. Substrate Tolerances: The General Contractor is responsible for providing a substrate with a tolerance of 1/4 inch in 20.0 feet (6mm in 6m), on level, plumb, and location control lines as indicated and within 1/8 inch (3mm) offset adjoining faces of alignment of matching profiles.
			2. FIELD QUALITY CONTROL

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

* + - * 1. Testing Agency: The owner may employ and pay a qualified independent testing agency to performed field quality control. Retesting of materials and installations failing to meet specified requirements shall be done at the contractor’s expense.
				2. Prepare test and inspection reports.
			1. CLEANING AND PROTECTION

For ALUCOBOND's "Cleaning Guide," see [d371dyuip757b1.cloudfront.net/downloads/Alucobond%20Cleaning%20Data%20Sheet.pdf](https://d371dyuip757b1.cloudfront.net/downloads/Alucobond%20Cleaning%20Data%20Sheet.pdf).

* + - * 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 fabricator. 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 074213.16