

SECTION 074213.23 - METAL COMPOSITE MATERIAL WALL 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 MCM wall panels.

1.3 DEFINITIONS

- A. MCM: Metal Composite Material is two sheets of smooth aluminum continuously thermo-bonded to a solid Fire Retardant (FR) core under precise temperature, pressure, and tension.
- B. DBVR: Drained and back-ventilated rainscreen system is designed to drain and dry cavity entering water through drainage channels, weeps, and air ventilation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference.
 1. Meet with Owner, Architect, Owner's insurer if applicable, MCM panel Fabricator and Installer, MCM sheet manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects MCM panels, including installers of doors, windows, and louvers.
 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. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 4. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect MCM panels.
 5. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 6. Review temporary protection requirements for MCM panel assembly during and after installation.
 7. Review procedures for repair of panels damaged after installation.
 8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. MCM system fabricator to provide shop drawings including fabrication and installation layouts of MCM panels; details of edge conditions, joints, panel profiles, corners, attachment assembly, trim, flashings, closures, and accessories.
 - 2. Accessories: Include details of the flashing, trim and anchorage, at a scale of not less than 1-1/2 inches per 12 inches (1:10).
- C. Samples for Initial Selection: For each type of MCM panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. MCM Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other MCM panel accessories. OR: Submit custom color samples in paint manufacturer's standard size.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, tests performed by a qualified testing agency.
 - 1. MCM Manufacturer's Material Test Reports: Certified test reports showing compliance with specific performance or third-party listing documenting compliance to comparable code sections IBC 1407.14 and IBC 1703.5.
 - 2. MCM System Fabricator's System Tests Reports: Certified system test reports showing system compliance with specific performance or third-party listing documenting compliance code section. Base performance requirements on MCM provided.
 - a. DBVR System: Tested to AAMA 509.
- B. Field quality-control reports.
- C. Sample Warranties

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For MCM panels to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. MCM Manufacturer Qualifications: An entity that has successfully manufactured MCM at a domestically located factory for a minimum of 5 years.
- B. MCM Fabricator Qualifications: An entity that has successfully fabricated and assembled MCM panels and approved by the MCM manufacturer.
- C. MCM Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by MCM Fabricator.
- D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for MCM fabrication and installation.
 - 1. Build mockup of typical MCM panel assembly including supports, attachments, and accessories.
 - 2. Water-Spray Test: If applicable, Conduct water-spray test of mockup of MCM panel assembly, testing for water penetration in accordance with AAMA 501.2.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, MCM panels, and other manufactured items so as not to be damaged or deformed. Package MCM panels for protection during transportation and handling.
- B. Unload, store, and erect MCM panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack MCM panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store MCM panels to ensure dryness, with positive slope for drainage of water. Do not store MCM panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Remove strippable film from return legs during individual panel installation. Retain strippable protective covering on MCM panels until the installation of a building face or panel area is complete.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of MCM panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.11 COORDINATION

- A. Coordinate MCM panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.12 WARRANTY

- A. Refer to Manufacturer's standard terms and conditions.
- B. Material Warranty: Submit the Manufacturer's standard form agreeing to furnish fabrication, labor and material to repair or replace MCM that exhibits defects within the specified warranty period.

1. Coverage Includes:

- a. Delamination of metal bond to the fire retardant core.

2. Warranty Period: 10 years from date of Substantial Completion

- C. Workmanship Warranty: Submit the Fabricator/Installer's standard form agreeing to furnish fabrication, labor and material required to repair or replace work which exhibits workmanship defects within the specific warranty period.

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

- D. 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.

1. Coverage includes:

- a. Color fading more than (5) Delta E 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 the paint to adhere to the bare metal substrate.

2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide MCM panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E330:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Panel Deflection Limit: For wind loads, no greater than 1/60 of the span.
 - 3. Framing Member Deflection Limits: For wind loads, no greater than 1/175 of the span.

- B. 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 test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- C. Water Penetration under Static Pressure: No water penetration to room side of assembly when tested for 15 minutes in accordance with ASTM E331 at a test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- D. 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.
- E. Fire Propagation Characteristics: MCM wall assembly passes NFPA 285 testing.
- F. Rainscreen Cladding Performance:
 - 1. AAMA 509: Dynamic water penetration classification no greater than W2 or 1.0oz/ft² and air flow ventilation classification no less than V1 or 6.0 cfm/ft².

2.2 MCM WALL PANELS

- A. MCM Wall Panel Systems: Provide shop formed and assembled MCM panels formed into profiles for the installation method indicated on the constructions drawings. Include attachment assembly components, panel stiffeners, and accessories required.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOBOND® PLUS manufactured by 3A Composites USA Inc. or comparable product:
 - a. Arconic Architectural Products.
 - b. Mitsubishi Chemical Composites.
- B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch- (0.50-mm-) thick aluminum sheet facings.
 - 1. Panel Thickness: 4mm (0.157")
 - 2. Core: Fire retardant.
 - 3. 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):
 - a. Basis-of-design finish(es) :
 - 1) Finish 1: <Insert color>.
 - 2) Finish 2: <Insert color>.
 - 4. Peel Strength: 22.5 in-lb/in. (100 N x mm/mm) when tested for bond integrity in accordance with ASTM D1781.
 - 5. Fire Performance: Flame spread less than 25 and smoke developed less than 450, in accordance with ASTM E84.

C. Attachment Assembly Components: formed from extruded aluminum or other compatible material per the construction drawings and in compliance with all required performance testing..

1. Basis-of-design Product:

- a. ALUCOBOND® EasyFix™ 90°/135° Joint Profile
 - 1) Finish: AAMA 611 Black Anodized Class 1
 - 2) Clip Length: 3"
 - 3) Rail Length: 12'
- b. ALUCOBOND® EasyFix™ 90° End Joint Profile
 - 1) Aluminum 6063-T6
 - 2) Finish: AAMA 611 Black Anodized Class 1
 - 3) Clip Length: 3"
 - 4) Rail Length: 12'

2. Rail Length: 12' ALUCOBOND® EasyFix™ 90° End Joint Profile

- a. Aluminum 6063-T6
- b. Finish: AAMA 611 Black Anodized Class 1
- c. Clip Length: 3"
- d. Rail Length: 12'

2.3 MISCELLANEOUS MATERIALS

A. 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 MCM panel system.

B. Panel Accessories: Provide components required for a rainscreen panel system including trim and flashing components as indicated on the construction drawings. Match material and finish of MCM panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as MCM 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.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOBOND® AXCENT™ manufactured by 3A Composites USA Inc. or comparable product by one of the following:

- a. Arconic Architectural Products.
- b. Mitsubishi Chemical Composites.

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

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

- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of MCM panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in MCM panels and remain weathertight; and as recommended in writing by MCM panel manufacturer.

2.4 FABRICATION

- A. General: Fabricate and finish MCM panels and accessories to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensions as indicated on the drawings.
- B. 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.
 - 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. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces provided by others is acceptable. Variance in appearance from mica flake, metallic flake, and texture is expected.

C. Allowable finishes for Aluminum 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.

1. Coil Coated Finishes:

- a. PVDF Fluoropolymer: AAMA 2605. Containing not less than 70 percent PVDF resin by weight in color coat.
- b. FEVE Fluoropolymer: AAMA 2605. Containing 100 percent fluorinated ethylene vinyl ether resin in color coat.
- c. SDP Super-durable Polyester: AAMA 2605. Containing carboxyl or hydroxyl functional resin in the color coat.
- d. SMP Siliconized Polyester: AAMA 2604. Containing silicone-modified, polyester-enamel in the color coat..

2. Anodized Finish:

- a. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- b. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, MCM panel supports, and other conditions affecting performance of the Work.
 1. 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 MCM wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by MCM wall panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and assemblies penetrating MCM panels to verify actual locations of penetrations relative to seam locations of MCM panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install sub framing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and MCM panel manufacturer's written recommendations.

3.3 MCM PANEL INSTALLATION

- A. General: Install MCM 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 MCM panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving MCM panels.
 2. Flash and/or seal MCM 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 MCM panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as MCM panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of MCM panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 1. 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.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by MCM panel manufacturer.
- D. Attachment Assembly, General: Install attachment assembly required to support MCM wall panels including sub girts, perimeter trim and flashing components and panel clips As indicated on the construction drawings.
- E. Panel Installation: Attach MCM wall panels to supports at locations, spacings, and with fasteners to achieve performance requirements specified.
- F. Accessory Installation: 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 MCM panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by MCM panel Fabricator; or, if not indicated, provide types recommended in writing by MCM system Fabricator.

- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, or 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 are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof 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 (605 mm) 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 (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

- A. 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.
- B. Field Measurements: Verify locations of wall framing members and wall opening dimensions by field measurements prior to the fabrication of the MCM system. Field measurements to be acquired once all substrate materials and adjacent materials are installed to use as-built data to submit "As Built Shop Drawings" with required adjustments to panel dimensions and layouts.

3.5 FIELD QUALITY CONTROL

- A. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- B. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

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

END OF SECTION 074213.33