

SECTION 074243
COMPOSITE WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire retardant, NFPA 285 approved, prefinished, composite panel, wet glazed panel system.
 - 2. System for CMP (CWP) cladding at building façade including: soffits, and overhanging "canopies".
- B. Related Requirements: Comply with following:
 - 1. Metal Finishes: Section 050510.
- C. Related Sections:
 - 1. Section 018113 – Sustainable Design Requirements
 - 2. Section 018116 – VOC Limits and Product Emissions
 - 3. Section 721000 – Thermal Insulation
 - 4. Section 727000 – Air Barriers
 - 5. Section 074213 – Metal Wall Panels.
 - 6. Section 076000 - Flashing and Sheet Metal.
 - 7. Section 079200 - Joint Sealants.
 - 8. Section 084413 - Glazed Aluminum Wall Systems.
- D. This Project is a registered US Green Building Council "LEED" project.
 - 1. Select materials to maximize use of recycled materials.
 - 2. Select locally or regionally fabricated products wherever possible.

1.2 SYSTEM DESCRIPTION

- A. System Requirements:
 - 1. Rout and Return Wet: Panel system with reveal joint consisting of silicone sealant over backer rod as specified in Section 079200 - Joint Sealants. System utilizes rainscreen principal.
 - a. Horizontal panel system requires waterproof underlayment.
 - 2. Employ registered professional engineer to engineer each component.
- B. Design Requirements:
 - 1. Manufacturer: Responsible for designing system, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
 - 2. Drawings: Diagrammatic and are intended to establish basic dimension of units, sight lines, and profiles of units.
 - 3. Provide concealed fastening except where specifically identified.
 - 4. Attachment Considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connections.
 - 5. Design to resist wind loading in accordance with building code and ASCE 7.
 - 6. Provide NFPA 285 rated system.
- C. Performance Requirements: Certify compliance with requirements specified in Section 018317 and as listed below, based on manufacturer's test data for testing conducted by independent laboratory. If current test results not available, conduct testing to certify compliance.
 - 1. Maximum Perimeter Framing Deflection: Normal to plane of wall between supports, deflection of secured perimeter framing members shall not exceed L/175 or 3/4 inch, whichever is less.
 - 2. Maximum Panel Deflection: Not exceed L/60 of full span normal to plane of wall.
 - 3. Maximum Anchor Deflection: Not exceed 1/16 inch.
 - 4. Maximum Permanent Deflection of Framing Members: Not exceed L/100 of span length at 1-1/2 times design pressure and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16 inch.

5. Bond Integrity: When tested for bond integrity, ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of bond between core and skin nor cohesive failure within core, based on following values.
 - a. Bond Strength: 214 PSI (Vertical Pull)
 - b. Peel Strength:
 - 1) 22.5 inch pound/inch dry.
 - 2) 22.5 inch pound/inch after 8 hours in water at 200° F.
 - 3) 22.5 inch pound/inch after 21 days soaking in water at 70° F.
6. Tolerances
 - a. Panel Bow: Maximum 0.8 percent of panel dimension in width and length for 72 inch panel.
 - b. Maximum deviation from panel flatness shall be 1/8 inch in 5 feet on panel in each direction for assembled units. (Non-accumulative)
- D. Interface With Adjacent Systems:
 1. Integrate design and connections with adjacent construction.
 2. Accommodate allowable tolerances and deflections for structural members in installation.
 3. Coordinate concealed fastening with flashings and cavity closures without the need to extend or modify cavity closures or flashing.

1.3 SUBMITTALS

- A. General: Submit in accordance with Section 013300.
- B. Product Data: Submit following:
 1. Product data for entire system, including panels, gaskets, seals, gutters, weeps, flashings, and finishes.
- C. Shop Drawings: Submit for installation of system, including grain direction, panel fabrication, jointing, corners, flashing, seals, gaskets, gutters, weeps, copings, fascia, soffits, and accessories.
 1. Submit detail drawings of panel connections, gasket details, and gutter and weep details.
 2. Provide full size details.
 3. Stamped by professional engineer.
- D. Samples: Submit minimum 12 by 12 inch in size illustrating composition and each finish color.
- E. Informational Submittals: Submit following packaged separately from other submittals:
 1. Design calculations for system indicating compliance with design requirements.
 2. Test Reports: Certified test reports showing compliance with performance requirements.
 3. NFPA 285 approvals.
- F. LEED Data: Provide special submittals conforming to Section 018113 - Sustainable Design Requirements for the following:
 1. Recycled Content: For all materials with recycled content, provide letter from manufacturer indicating percentages of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product provided under this Section.
 2. Regional Materials: Provide letter from manufacturer indicating the location of manufacture, extraction and harvest of all materials provided under this Section. Include statement indicating costs for each product provided under this Section.
 3. EPDs: Provide details of third party verified Environmental Product Declaration (EPD) from manufacturer.
 4. HPDs: Provide Chemical Inventory information of the product disclosing contents up to 0.1% (1000 ppm) through publicly available Manufacturer Inventory with CASRN numbers or complete Health Product Declaration (HPD) or Cradle to Cradle Certification.
- G. Closeout Submittals: Submit warranty in accordance with Section 017800.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Furnish each product from one manufacturer, unless otherwise acceptable to Architect.
- B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section with minimum five years experience.

- C. Fabricator Qualifications: Company specializing in fabricating work specified in this Section with minimum five years experience.
- D. Installer Qualifications: Certified acceptable to manufacturer with experience on at least five projects of similar nature in past five years.
- E. Certifications:
 1. Manufacturer's certification that Installer is approved to perform work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with Section 016000.
- B. Packing, Shipping, Handling, and Unloading: Protect finish panel faces, including plastic sheet protection wrap.
- C. Acceptance at Site: Inspect each panel and accessory as delivered and confirm that finish is undamaged. Do not accept damaged panels.
- D. Storage and Protection: Comply with manufacturer's printed requirements.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Comply with manufacturer's written requirements under which products can be installed.

1.7 WARRANTY

- A. Special Warranty: Prepare and submit in accordance with Section 017800.
 1. Warrant installed system and components to be free from defects in material and workmanship for period of 10 years.
 - a. Include coverage against leakage and damages to finishes.
 2. Factory Finish: 20-year Warranty Stating Finish will be:
 - a. Free of fading or color change in excess of 5 Delta E units, ASTM D2244;
 - b. Will not chalk in excess of numeral rating of 8 for colors and 6 for whites, ASTM D4214;
 - c. Include coverage for cracking, crazing, fading in excess of Vertical 5 and Non-vertical 5.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Reynobond FR, ALCOA, Eastman GA 31023.
 2. Alucobond FR, Alcan Composites USA, Inc., Chesterfield, MO 63017.
 3. Alpolic FR, Mitsubishi Chemical, Chesapeake, VA 23320
 4. Vitrabond/FR (Fire Retardant) ACP, Fairview Architectural, Bloomfield CT 06002
 5. Accepted Substitute in accordance with Section 012500.

2.2 MATERIALS

- A. LEED Requirements:
 1. Recycled Content: This product shall be selected to maximize recycled content where possible. Recycled content is defined as the post-consumer recycled content plus one-half of the pre-consumer recycled content.
 2. Regional Materials: To the greatest extent possible all materials shall be extracted, harvested and manufactured regionally within a radius of 100 miles of the project site.
 3. EPDs: Product shall be selected to have a third-party verified Environmental Product Declaration which conforms to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
 4. HPDs: This product shall be selected to have material ingredients disclosed up to 0.1% (1000 ppm).
- B. Composite Panels:

1. The product shall be selected with a preference towards maximizing recycled content. Recycled content is defined as the post-consumer recycled content plus one-half of the pre-consumer recycled content.
 - a. Recycled Content- Aluminum Composite Panels: Provide aluminum with 10% to 50% minimum recycled content.
 2. To the greatest extent possible all materials shall be extracted, harvested and manufactured regionally within a radius of 100 miles of the project site.
 3. NFPA 285 complying panel.
 4. Fire-retardant aluminum faced panel with FR core.
 - a. Overall Panel Thickness: 0.157 inches.
 - b. Aluminum Face and Backer Sheet Thickness: 0.0197 inches.
 - c. Aluminum Alloy: ASTM B209 alloy 3003 at coated finish.
- C. Composition: Two sheets of aluminum sandwiching core of extruded FR material formed in continuous process with no glues or adhesives between dissimilar materials. Products laminated sheet by sheet or in batch process using glues or adhesives between materials shall not be acceptable.
- D. Fire Resistance Requirements, Panels and Joints:
1. ASTM E84: Maximum Flame Spread 15; Smoke Developed 30.
 2. ASTM E162: No surface flaming.
 3. UL 1715: No flame spread along interior face or penetration through wall assembly.

2.3 ACCESSORIES

- A. Perimeter Seals: Comply with Section 072700 Air Barriers.
- B. Flashings: Comply with Section 076000 Sheet Metal Flashing and Trim.
- C. Panel Stiffeners: As recommended by panel system manufacturer.
- D. Silicone Sealant and Backer Rod: Comply with Section 079200 - Joint Sealants.
- E. Applied snap trim where indicated. Consisting of concealed anchors and pressure lock applied cover. Finish to match panel face.
- F. Where panels meet paving, metal plate panels shall be fabricated from 1/8 inch (min) stainless steel plate to form a base, and shall be fabricated to match panels above. Finish shall be directional brushed number 4 finish, with grain at abutting panels oriented similarly.
- G. Rain Drips: Extruded aluminum bar-stock; finish to match panel face – blind attached to panels.
- H. Air/Weather resistive barrier and continuous insulation: NFPA 285 tested complying with Section 072700 and 072100, including insulation.
- I. Fasteners and Subframing: As recommended by panel system manufacturer. Match panel finish where exposed fasteners cannot be avoided.
- J. High Temperature Waterproof Underlayment Membrane: Self-adhering rubberized asphalt tape.
 1. Locations: Horizontal panels and under coping caps.
 2. Capable of being applied at temperature of 25 degrees F.
 3. Provide high temperature type for used under metal copings.
 4. Thickness: 30 mils minimum.
 5. Permeance: 0.1 perms.
 6. Puncture Resistance: ASTM E514, 40 pounds-force, minimum.
 7. Tensile Strength of Membrane: ASTM D412, 600 PSI, minimum.
 8. Pliability: 180 degree bend over 1 inch at 25 degrees F.
 9. Primer: Manufacturer's required surface primer.
 10. Acceptable Products and Manufacturers:
 - a. Blueskin PE 200 HT, Henry.
 - b. Rainproof High Softening Point, Protecto Wrap Company.
 - c. Ice and Water Shield HT, GCP Applied Technologies.
 - d. CCW MiraDRI WIP 300 High Temperature, Carlisle Coatings and Waterproofing,

2.4 MISCELLANEOUS METAL FRAMING

- A. Subframing: C- or Z-shaped sections fabricated from 0.0598-inch bare steel thickness, shop-painted, cold-formed, metallic-coated steel sheet.
- B. Zee Clips: 0.079-inch bare steel thickness, cold-formed, galvanized steel sheet.
- C. Base or Sill Angles or Channels: 0.079-inch bare steel thickness, cold-formed, galvanized steel sheet.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C645.
 - 1. Minimum Base Metal Thickness: 0.0179 inch.
 - 2. Depth: As indicated.
- E. Cold-Rolled Furring Channels: 0.0538-inch bare steel thickness, with minimum 1/2-inch-wide flange.
 - 1. Depth: As indicated.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch.
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch-diameter wire, or double strand of 0.0475-inch-diameter wire.
- F. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated. Z Furring to be designed to retain insulation tight to the sheathing and air barrier.
- G. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates. All penetrations through the air barrier to be sealed with compatible material as recommended by the air barrier manufacturer.

2.5 FABRICATION

- A. Fabricate panels with rout and return edges.
 - 1. Provide sharp edges with maximum 1/8 inch radius; reinforce and seal corners.
 - 2. Provide hidden stiffeners and reinforcing if necessary to maintain flat panels or custom shapes as indicated on Drawings.
 - 3. Fabricate panels for wet sealant joints.
 - 4. Fabricate panels to sizes and shapes indicated.
 - 5. Fabricate panels to maintain uniform joint sizes with adjacent panels.
 - 6. Provide rain drips in continuous runs where indicated.
 - 7. Adhere base to panel faces at consistent height with tight butt joints uniformly spaced between base sections.

2.6 FINISH

- A. Fluoropolymer (PVDF) Coating: In accordance with Section 050510.
- B. Colors:
 - 1. **CMP (CWP)-01:** Alpolic 'SOG GREY'
 - 2. **CMP (CWP)-02:** Alucobond 'Dusty Charcoal'
 - 3. **CMP (CWP)-03:** Alpolic 'MICA MCU CHMPGN'
 - 4. **CMP (CWP)-04:** Alpolic 'MTLC DCX CPPR'

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine conditions and proceed with work in accordance with Section 017300.
- B. Confirm that system back-up is even, smooth, sound, clean, dry, and free from defects.

3.2 PREPARATION

- A. Waterproof Underlayment Membrane at Canopies and Copings:
 - 1. Clean substrate of dirt, dust, and materials which may impair adhesion.
 - 2. Apply primer, when required, in accordance with manufacturer's requirements.
 - 3. Apply to top of parapet wall under coping and gravel stops.

4. Apply to entry substrates below horizontal panels.
5. Install without fishmouths and wrinkles.
6. Press tape into firm contact with substrate.
7. Lap membrane ends minimum of 2 inches.

3.3 INSTALLATION

- A. Composite Panels: Erect panel system in accordance with Section 017300, and approved shop drawings, plumb, level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction and adjacent surfaces.
- B. Anchor panels securely. Allow for thermal movement and for connection to structure.
- C. Install with concealed fastener system, including panels, and weep system, flashing, copings, entry canopy, and related components. Maintain uniform joint widths. At Rout and Return Wet System, install backer rod and sealant in accordance with Work of Section 079200 - Joint Sealants.
- D. Site Tolerances: Maximum deviation from vertical and horizontal alignment of erected panels: 1/4 inch in 20 feet non-accumulative.
- E. Adhere base to panel faces at consistent height with tight butt joints uniformly spaced between base sections.

3.4 CLEANING

- A. General: Comply with Section 017400.
 1. Clean as recommended by manufacturer. Do not use materials or methods which may damage finished surfaces or surrounding construction.

3.5 PROTECTION

- A. Protect finished work in accordance with Section 017300.

3.6 QUALITY CONTROL

- A. Panel installation to be tested using procedure AAMA 501.2 at a location selected by the architect. A minimum of 100 SQ FT of panel area to be tested spraying each panel joint as required by the test procedure. Each test failure will require repairs, re-test with one additional area to be tested.

END OF SECTION