

SECTION 07431  
ALUMINUM COMPOSITE WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Aluminum faced, thermoplastic core, composite wall panel system.
  2. Accessories including attachments, clips, sub girts, shims, and fasteners
  3. Factory applied coating system.

\*\*\*Edit related Sections to those referenced in body of specification section.\*\*

- B. Related Sections:
1. Section 04220 – Concrete Masonry Units
  2. Section 05400 – Cold Formed Metal Framing
  3. Section 07600 – Flashing and Sheet Metal
  4. Section 07900 – Joint Sealants
  5. Section 08520 – Aluminum Windows
  6. Section 08911 – Glazed Aluminum Curtain Wall

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
1. AAMA 2605 – Voluntary Specification Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  2. AAMA 501.1 – Voluntary Specification Performance Requirements and Test Procedures for Dynamic Water Infiltration
  2. AAMA 508-7 – Voluntary Specification Performance Requirements and Test Procedures for Pressure Equalized Rainscreen Wall Cladding Systems
- B. ASTM International (ASTM):
1. ASTM B 209 – Aluminum and Aluminum-Alloy Sheet and Plate.
  2. ASTM D 1781 – Standard Test Method for Climbing Drum Peel for Adhesives.
  3. ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  4. ASTM E 331 – Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  5. ASTM E 84 – Test Method for Surface Burning Characteristics of Building Materials.
  6. ASTM E 283 – Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

1.3 SYSTEM DESCRIPTION

- A. Thermoplastic core thermally bonded to aluminum alloy face sheets, including copings, soffits, and curved archways.

- B. Free-floating mechanical attachments, subgirts, and fasteners.
- C. Rout and return, dry (hidden) gasket joints. Wet sealed (caulked joint) systems not accepted.
- D. Rainscreen, pressure equalized, wall panel system design.
- E. System shall employ hidden thru wall flashing at horizontal reveals.

#### 1.4 DESIGN REQUIREMENTS

\*\*\*Edit to design requirements required for project.\*\*\*

- A. Components: Design and size to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of panel, conforming to IBC Chapter 16, wind speed [\_\_ mph] Exposure [\_\_\_\_]. Imp. Factor [\_\_\_\_].
- B. Wall Panel Deflection: L/60.
- C. Perimeter Framing Deflection: L/175.
- D. Thermal Movement: Design system to accommodate vertical and horizontal thermal movement of components without causing buckling, failure of joint seals, undue stress on fasteners, and oil canning when subject to seasonal temperature cycling. Systems that accommodate movement with enlarged/slotted attachment holes not accepted.
- E. Drainage: Design for positive drainage of water leakage and condensation to exterior of wall panel system, including gutter system at each horizontal joint. Systems that do not evacuate water from the cavity at every horizontal will not be accepted.
- F. Tolerance of Substructure: Design system to accommodate up to 1/4 inch in 10 foot variation out of plane. Accommodate tolerances of building structural framing.
- G. Seismic Design: Conform to IBC for Seismic Category [\_\_]. Allow for ( " ) movement in the panel joints.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Provide the following testing documentation. Testing documentation to be a maximum of 5 years old and must meet or exceed specified design and performance requirements, documented and certified by independent testing agency acceptable to Architect and building code officials.
- B. Air Leakage: Maximum 0.02 cfm per square foot of wall area at 6.24 psf, tested to ASTM E 283.
- C. Static Water Penetration: No uncontrolled water penetration under static pressure differential of 20 percent of inward acting design load at minimum 12 lbf/sf after 15 minutes, tested to ASTM E 331.
- D. Structural Performance: No permanent deformation at 150 percent of design pressure exceeding L/100 for frame and L/60 for material, tested to ASTM E 330.
- E. Dynamic Water Penetration: No uncontrolled water penetration under dynamic pressure differential of minimum 15 lbf/sf , tested to AAMA 501.1.

- F. Pressure Equalized Rainscreen Performance: No streaming water or droplets/mist on more than 5% of the cavity moisture barrier, maximum differential between the cavity and cyclic wind pressure shall not exceed 10% of the maximum test pressure, tested to AAMA 508-07.
- G. Structural Performance: Test to 50% and 100% design load (25 PSF min pos/neg), retest to ASTM 331, no uncontrolled water penetration under static pressure differential of 20 percent of inward acting design load at minimum 12 lbf/sf after 15 minutes.
- H. Seismic Racking (Lateral Elastic): Test to two directions for three cycles (3/4"), retest to ASTM 331, no uncontrolled water penetration under static pressure differential of 20 percent of inward acting design load at minimum 12 lbf/sf after 15 minutes.
- I. Seismic Racking (Lateral MAX): Test to two directions for three cycles (3") with no visible damage, cracking, buckling or fastener pullout.

#### 1.6 SUBMITTALS

- A. Submit under provisions of Section 01330.
- B. Shop Drawings: Show thickness and dimensions of panels, panel profile, layout, fastening and anchoring methods, details, and locations of joints and gaskets.
- C. Product Data: Manufacturer's panel profiles, dimensions, characteristics, structural properties, and fire-rating performance criteria.
- D. Design and Performance Data: Fabricator's system including standard drawings, details, and design. Indicate seismic, thermal, environmental, and structural characteristics of system.
- E. Panel Samples: Minimum 8 inch by 8 inch in specified thickness, including attachment extrusions, clips, subgirts, fasteners, closures, and other panel accessories
- F. Color Samples: Panel material finished to specified color and finish.
- G. Fabricator Instructions:
  - 1. Include installation instructions, technical bulletins, and other product data.
  - 2. Include instructions for substrate requirements, special handling criteria, installation sequence, perimeter conditions, cleaning procedures, and conditions requiring special attention.
  - 3. Test Reports: Meet or exceed specified design and performance requirements, documented and certified by independent testing agency acceptable to Architect and building code officials.
- H. Structural Calculations for Panel System: Stamped registration seal and signed by licensed structural engineer, licensed in State/Province of [\_\_\_\_\_].
- I. Fire Rating: Indicate that composite panel material is approved by (city, county, state) Department of Planning and Design (DPD).
- J. Sample Warranty: Meet or exceed provisions specified by this Section.

#### 1.7 QUALITY ASSURANCE

- A. Single Source Responsibility:

1. Provide design and fabrication of wall panel system under responsibility of fabricator including composite panels, attachments, clips, girts, fasteners, and other accessories.

#### 1.8 QUALIFICATIONS

- A. Manufacturer:
  1. Company specializing in manufacturing composite panel products specified by this Section.
  2. Able to document minimum 10 years experience.
- B. Fabricator:
  1. Company specializing in designing, engineering, and fabricating work of this Section.
  2. Able to document minimum 7 years experience. Submit project contact information. Owner, General Contractor, Architect names and phone numbers. Project addresses.
  3. Approved by panel manufacturer as qualified to perform work of this Section.
- C. Installer:
  1. Company specializing in installing work of this Section.
  2. Able to document minimum 3 years experience. Submit project contact information. Owner, General Contractor, Architect names and phone numbers. Project addresses.
  3. Trained and authorized by wall panel system fabricator as qualified to perform work of this Section.

#### 1.9 MOCK-UP

- A. Provide under provisions of Section 01450.
- B. Construct mock-up, including outside corner condition showing complete system assembly including joint sealant.
- C. Construct size and type and locate as directed by Architect.
- D. Conduct testing by Owner's independent testing laboratory, at Owners cost, to verify performance requirements as specified this Section for air and water tightness of joints.
- E. Incorporate accepted mock-up into Work.

#### 1.10 PRE-INSTALLATION CONFERENCE

- A. Arrange, in accordance with Section 01312.
- B. Attendance: GC/CM, installer, Owner, Architect, manufacturer's representative, and those requested to attend.
- C. Meeting Time: Minimum 2 weeks prior to beginning work of this Section and work of related Sections affecting work of this Section.
- D. Location: Project Site.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Conform to provisions of Section 01651 and manufacturer's instructions.
- B. Deliver in manufacturer's protective packaging with protective strippable film and identifying labels intact.

- C. Store in well ventilated space under cover, off ground, protected from direct sunlight, weather, moisture, soiling, and marring of surface.
  - 1. Protect panels from temperatures exceeding 120 degrees F.
  - 2. Slope stored panels for positive drainage of water and condensation.
- D. Handle to prevent twisting, bending, and abrasion. Prevent contact with materials which may cause discoloration or staining.

#### 1.12 PROJECT CONDITIONS

- A. Field Measurements: Verify actual conditions prior to fabrication and show on Shop Drawings.

#### 1.13 COORDINATION

\*\*\*Edit sections to include coordination and sequencing as needed for completion of work \*\*\*

- A. Conform to Section 01311 for coordination with work of other Sections.
- B. Field dimensions, Shop Drawings, and fabrication with critical path of construction Progress Schedule as necessary to meet lead time and avoid delays.
- C. Work of related Sections interfacing with work of this Section as necessary to maintain watertight integrity of building envelope, including curtain wall, masonry, and flashing systems.
  - 1. Section 04220 for concrete masonry construction interface.
  - 2. Section 08911 for curtain wall interface.
- D. Section 05400 for backing and support for work of this Section.

#### 1.14 WARRANTY

- A. Conform to Warranty provisions specified Section 01778.
- B. Finish Coating System: Standard 20 year materials Warranty against fading, crazing, and chalking of coating system.
- C. Panel Manufacturer: Standard 5 year materials Warranty against delamination of panels and defective materials.
- D. Panel System Fabricator: 2 year fabrication Warranty for conformance to design and performance and requirements.
- E. Installer: 2 year workmanship Warranty for watertightness.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS/FABRICATORS

- A. Composite Panel Manufacturers:
  - 1. Alcan Composites, Inc., ALUCOBOND Wall Cladding.
    - a. Voice Mail 1-800-254-2284 Ext 2238, Tel (916) 427-8811 (Jim Vann CSI).
    - b. Tel 1-800-626-3365 (Head Office)
  - 2. Mitsubishi Chemicals America Inc., ALPOLIC Composite Materials Division.
  - 3. Reynolds Metal Company, Reynobond FR Aluminum Composite Material,

- B. Composite Panel System Fabricator:
  - 1. Keith Panel Systems, Tel (604) 987-4499 Fax (604) 987-4742, Email: [mail@keithpanel.com](mailto:mail@keithpanel.com). Web: [www.keithpanel.com](http://www.keithpanel.com) Basis of Design for performance and appearance. System:[**Select system**] KPS System A Plus, KPS System A, KPS System B.
  - 2. No equals or alternates will be accepted without prior review and approval by pre-bid addendum to specification.
- C. Substitution Requests: Submit for approval under provisions of Section 01631 20 days prior to the bid date.

## 2.2 COMPOSITE WALL PANEL MATERIALS

- A. Core: Thermoplastic material conforming to performance and design requirements when fabricated into thermally bonded composite assembly. Submit data regarding which type of core is suitable according to the project condition.
- B. Face Sheets: ASTM B 205, 3105 aluminum alloy, 0.020 inch (0.51 mm) thick.
- C. Physical Characteristics: Resistance to delamination.
  - 1. Peel Strength: 22.5 inch-pound per inch, tested to ASTM D 1781.
- D. Fire Rating: Tested to ASTM E 84.
  - 1. Flame Spread: 10.
  - 2. Smoke Developed: Maximum 0.
- E. Panel Thickness: 4mm.

## 2.3 ACCESSORIES

- A. Attachments, Clips, and Girts: As instructed by manufacturer.
- B. Pop Rivets: Stainless steel and as instructed by manufacturer to prevent galvanic action.
- C. Screw Fasteners: Type S, self drilling, self tapping framing screws, stainless steel with carbide head, as instructed by manufacturer to suit application.
- D. Shims: As instructed by manufacturer.
- E. Joint Sealant: Non-exposed areas only. Sealant and backer rod as specified Section 07900, and as instructed by manufacturer to contact metal to metal and metal to masonry.
- F. Isolation Accessories: Isolation tape, pads, or coatings as necessary to prevent galvanic action between dissimilar metals.

**G.** Vapor Barrier Tape and Building Paper: As specified Section 09253 [06100].

## 2.4 FABRICATION

- A. Shop fabricate composite wall panels in sizes and joint configurations to accommodate field installation tolerances. Reinforce with stiffeners where applicable to meet design requirements.
- B. Shop fabricate curved panels to uniform radius free of irregularities.

- C. Where final dimension cannot be established by field measurements, make allowances for field adjustment.
- D. Form panel lines, breaks, and angles with routed back-cut break form corners for sharp edges in one continuous panel return, free from warp and buckle, and with no displacement of aluminum sheet or protrusion of core.
- E. Encapsulate panel edges with mitered aluminum edging with hairline joints matching finish of face panel. Exposed fasteners at edges not accepted.
- F. Fabricate panels with gutter system to weep moisture out of panel system at each horizontal panel joint.
- G. Form sections true to shape, accurate in size, square, and free from distortion or defects.

## 2.5 FINISHES

- A. Exposed Aluminum: PPG Duranar, PVDF, minimum 70 percent Kynar 500, or Hylar 5000 resin content, factory applied baked-on finish, conforming to AAMA 2605.
- B. Uncoated exposed metal not accepted. Touch up uncoated metal for smooth, finished appearance matching color and gloss level of adjacent finish.
- C. Field Touch-up Paint: PPG Corafon ADS, air-dry system, fluorocarbon resin coating matching color and texture of finish coating.
- D. Wall Panel Color: from Alucobond Standard "Classic Palette" range.
- E. Sheen: 30 percent.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify conditions ready to receive work of this Section before beginning installation.
- B. Verify substrate framing members suitable for installation ready to receive wall panel system.

### 3.2 PREPARATION

- A. Shim metal framed framing members and supports as necessary to provide level and plumb substrate for fastening panels.
- B. Vapor Barrier Tape: Apply tape continuously over gypsum sheathing joints, stud lines, and wall openings as specified Section [06100] [09253].
- C. Building Paper: Install over gypsum sheathing as specified Section 09253 [06100].

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and provisions of Contract Documents.
- B. Install dry set system with weeps to channel and carry internal water to exterior of system.

- C. Permanently fasten and anchor composite wall panel system to metal cold rolled wall framing system using manufacturer=s anchors, clips, and girts.
- D. Install composite wall panel aligned, level, and plumb, within specified tolerances.
- E. Use concealed fasteners and clip attachments.
- F. Install backer rod and silicon joint sealant as necessary for permanent, watertight joints at interfacements with adjacent construction, as specified Section 07900.
- G. Isolate aluminum from dissimilar metal, as required to prevent galvanic action.
- H. Remove protective film immediately following installation of wall panels.

#### 3.4 TOLERANCES

- A. Maximum Offset From Alignment Between Adjacent Wall Panels: 1/16 inch.
- B. Maximum Variation from Horizontal and Vertical Plane: 1/4 inch in 20 foot, non-accumulative.

#### 3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service:
  - 1. Make periodic visits and final inspection by manufacturer's authorized product representative as necessary to verify conformance to manufacturer's instructions and Warranty provisions.
  - 2. Promptly notify Architect of non-conforming work.

#### 3.6 ADJUSTING

- A. Make adjustments to wall panel installations not conforming to specified tolerances.
- B. Field touch-up damaged finishes to match color and finish of factory applied panel finish.
- C. Replace work which cannot be repaired so that repairs are not discernable at distance of 10 foot.

#### 3.7 CLEANING

- A. Dry-wipe panels as work progresses.
- B. Leave installation clean, free from residue and debris resulting from work of this Section.

END OF SECTION