

## **SECTION 07 42 43**

### **ALUMINUM COMPOSITE MATERIAL (ACM) SYSTEM (Revised AD-2)**

#### **PART 1 - GENERAL**

##### **1.1 QUALITY ASSURANCE**

- A. ASTM Standards:
  - 1. ASTM-E84.
  - 2. ASTM-C297.
  - 3. ASTM-D2794.
  - 4. ASTM-D1308.
- B. Aluminum Association Standards:
  - 1. AA-C22-A41.
  - 2. AA-C22-A44.
- C. American Society of Civil Engineers:
  - 1. ASCE-7, current edition.
- D. National Coil Coaters Association (NCCA):
  - 1. NCCA II-6.
  - 2. NCCA II-12.
  - 3. NCCA II-16.
- E. Fabricator Qualifications:
  - 1. Five years experience in cladding fabrication.
- F. Installer Qualifications:
  - 1. Franchised or certified by cladding manufacturer.

##### **1.2 MOCK-UP WALL**

- A. Construct Mock-up Wall assembly on site for Architect review:
  - 1. 4 x 6 FT minimum to include standard horizontal, vertical joints as well as end conditions where occurs at dissimilar materials.
  - 2. Assembly may be built into permanent construction provided area is readily identifiable during construction.
  - 3. Mock-up Wall to include:
    - a. Connection to adjacent construction.
    - b. Inside corner.
    - c. Outside corner.
    - d. Joint detail.
  - 4. Mock-up Wall constitutes standard of quality for balance of cladding work.
  - 5. If not acceptable, reconstruct.
  - 6. Do not proceed with work until sample wall approved by Architect.

##### **1.3 WARRANTY**

- A. 20-year warranty against failure of PVDF finish.

##### **1.4 SUBMITTALS**

- A. Shop Drawings:
  - 1. Installation details.
- B. Product Data.

- C. Samples:
  - 1. Manufacturers complete range of PVDF colors for selection.
  - 2. Three 12 x 12 IN samples of panel in finish selected by Architect.
  - 3. Sealant colors.
- D. Project Information:
  - 1. Test reports.
- E. Contract Closeout Information:
  - 1. Warranty.
  - 2. Maintenance data.
- F. LEED Information:
  - 1. LEED Credits MR 4.1 and 4.2, Recycled Content: Product data indicating percentages by weight of post-consumer and post-industrial recycled content for products having recycled content; include statement indicating costs for each product having recycled content.
  - 2. LEED Credits MR 5.1 and 5.2, Regional Materials: For products and materials required to comply with requirements for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Acceptable Manufacturers:
  - 1. Aluminum Composite Material (ACM):
    - a. Base:
      - 1) Alcan Composites USA, Inc. (Alucobond).
    - b. Optional:
      - 1) Alply; Tech Wall.
      - 2) Alcoa-Reynolds Metals.
      - 3) Mitsubishi.
  - 2. Fabricator of Panels:
    - a. Base:
      - 1) Universe Corp.
    - b. Optional:
      - 1) Alply; Tech Wall.
      - 2) Other Fabricators approved by listed Manufacturers.
  - 3. Installers:
    - a. As approved by listed Manufacturers.
  - 4. Silicone Sealants:
    - a. Base:
      - 1) Dow Corning.
  - 5. PVDF Coating (factory-applied):
    - a. Base:
      - 1) Morton International; Fluoroceram.
    - b. Optional:
      - 1) PPG Architectural Finishes.
      - 2) ICI Dulux Paint Centers.
- B. Aluminum Composite Material (ACM) System:
  - 1. Fabricate panels from two sheets of aluminum, permanently bonded to thermoplastic core.
  - 2. Form in continuous process to dimensions indicated with no glues or adhesives between dissimilar materials.
  - 3. Aluminum face sheets: Alloy compatible with finish.

4. Face sheet thickness: 0.50mm.
  5. Alloy, temper and mill finish as recommended by panel manufacturer for strength, forming, welding and application of finish indicated, but no less than strength and durability properties specified in ASTM-B209.
  6. Minimum Thickness of Composite Panel sheet-goods:
    - a. 0.236 IN.
  7. Finish:
    - a. PVDF Coating (factory-applied):
      - 1) Minimum 70 percent PVDF coating.
      - 2) Color:
        - a) To be selected by Architect.
- C. Joints (route-and-return dry seal):
1. 2 IN route and return.
- AD-2: Section 07 42 43: Revise paragraph 2.1.C.2.
2. ~~Dry-Wet~~ joint system.
  3. Factory-attached male/female joining extrusions mechanically attached to panels in shop.
  4. 1/2 IN sealant joint w/backer rod.
  5. Color: To be selected by Architect.
- D. Structural Criteria:
1. Design panel system to handle wind pressures, snow pressures, ice loads and seismic design forces as required by Building Code as locally adopted:
    - a. Panel Deflection (normal): Not more 0.01 times the least panel dimension, at full design pressure(s) and load(s).
    - b. Panel Deflection (ultimate): No disengagement, failure or gross permanent distortion of any component at 1.5 times design load(s).
    - c. Maximum Deflection of Framing Members supporting panels:
      - 1) At full design pressure: Not more than 1/175 for spans 13 FT or less and 1/240 + 0.25 IN for spans exceeding 13 FT.
    - d. At pressures less than design pressure: Not more than 1/360 or 1/8 IN whichever is less.
  2. Stiffen panels as required to handle the specified pressures and loads:
    - a. Where stiffeners are attached to panels with structural silicone:
      - 1) Minimum glue line thickness: 0.25 IN.
      - 2) Minimum sealant bond bite: Determined by calculation.
- E. Thermal Movement Criteria:
1. Design system and anchorage to provide fully for expansion and contraction caused by surface temperature ranging from -25 to 145 Deg F without causing buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects.
- F. Performance criteria of PVDF Coating:
1. No metal/primer corrosion or delamination under following conditions:
    - a. After 1,000 HR at 160 Deg F and 100 percent relative humidity.
    - b. After 2-1/2 HR in a 275 PSF, 212 Deg F autoclave.
    - c. After 500 cycles from 0 to 180 Deg F, at exterior face, holding 15 minutes at each extreme.
- G. Test for water leakage based on differential test pressure amounting to 20percent of specified performance pressure required relative to complete module of metal panel system:
1. Water leakage: No evidence of uncontrolled leakage of water when tested in accordance with AAMA 501.1.
- H. Test for Air Leakage:
1. Not to exceed 0.09 CFM/FT<sup>2</sup> when tested to ASTM-E283 at a static pressure differential of 6.24 PSF.

- I. Extrusions:
  - 1. Aluminum alloy 6063-TS.
- J. Fasteners:
  - 1. Non-magnetic stainless steel or other non-corrosive metal fasteners to be compatible with system components.
  - 2. Provide Phillips head screws unless otherwise indicated.
  - 3. Provide Allen socket head fasteners at removable panels.
  - 4. Fastening system to be non-ferrous concealed in finished work.
- K. Expansion joints:
  - 1. Elastomeric, weather-resistant, flexible closure fabrication.
- L. Silicone Sealants:
  - 1. Comply with Section 07 92 13 and the following:
    - a. Moisture-curing silicone.
    - b. Compatible with aluminum and PVDF finishes.
    - c. Color:
      - 1) As selected from manufacturers standard line of colors.
    - d. Backer Rod: Closed cell foam rod.
- M. Subgirts and Supports:
  - 1. Aluminum subgirts and intermediate support items as required for installation.

## **2.2 PANEL FABRICATION**

- A. General:
  - 1. Fabricate panels to approximate dimensions and profiles indicated.
    - a. Adjust as required based on actual field dimensions.
    - b. Allow for thermal expansion/contraction between panels and structure.
    - c. Design panels to withstand structural loads indicated.
- B. Fabrication Tolerances:
  - 1. Shop assemble panels to tolerances specified.
  - 2. Panel lines: Sharp, true and free from warp or buckle.
  - 3. Perform shop tests in manufacturer's factory to insure that panel dimensions, square-ness and bow are within specified tolerances:
    - a. Panel bow: 0.2 percent of panel dimension in width and length up to 1/8 IN maximum.
    - b. Width or length: Plus/minus 1/32 IN up to 48 IN and plus/minus 1/16 IN when greater than 48 IN.
    - c. Thickness: Plus/minus 0.02mm.
    - d. Square-ness: Not greater than 3/16 IN difference between diagonal measurements.
    - e. Camber: No greater than 1/32 IN.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Verify suitability of substrate to receive installation.
- B. Installation constitutes acceptance of responsibility for performance.

### **3.2 ERECTION**

- A. Install support system, metal panels, fasteners, trim, sealant and related components in accordance with final erection drawings and approved shop drawings:
  - 1. Erect with concealed fasteners.
  - 2. Provide for necessary structural and thermal movement.

- B. Install on properly prepared substrate:
  - 1. Provide blocking and bracing required for panel system.
  - 2. Repair damaged substrate material prior to installation of this system.
- C. Access Panels and Doors:
  - 1. Locate where required by Section 26 00 10, or where indicated on drawings.
  - 2. See Section 08 31 16 for product description.

### **3.3 PROTECTION**

- A. Provide required temporary closures and flashings to maintain weather integrity, during and after erection.
- B. Clean exposed surfaces promptly after installation:
  - 1. Comply with panel manufacturer's specifications for cleaning.

**END OF SECTION**