

SPECIFICATIONS FOR
Metal Design Systems, Inc.
Featuring
Aluminum Composite Panels

Section 07430 Aluminum Composite Panels

(Based upon Metal Design Systems Series 10 using PE core aluminum composite material (ACM))

1.00 GENERAL REQUIREMENTS

1.01 SCOPE OF WORK

- A. Provide a watertight Rout and Return Wet panel system, as detailed on the drawings. The Rout and Return Wet panel system must consist of an ACM panel with offset extruded clips. These clips attach directly to an integrated framing system or solid sheeting, which allows panels to float on top to the sub-framing.
- B. The panel system as detailed, shall consist of clip attachment at perimeter, extruded stiffeners (if required), related flashings, (where drawings indicate they are to be furnished under this section, sealants between jamb panels and previously installed adjacent construction, and other miscellaneous accessories that are required for a complete watertight installation.

1.02 QUALITY ASSURANCE

- A. General: The details show the preferred profiles and performance requirements. Provide a watertight and structurally sound, self-draining wall panel system with minimal water penetration.
- B. Substitutions: Any proposed system shall be compatible with adjacent materials and components such that the assembly as a whole will function satisfactorily, and shall include extruded aluminum perimeter clips to provide the designed architectural reveal. Modifications to structure or other components required by the proposed substitution shall be clearly delineated in the submittal and all resulting costs shall be included as part of the bid.
- C. Fabrication History: Fabricator shall assume undivided responsibility for all components of the panel work and shall provide engineered support as required to demonstrate the ability to perform said work.
- D. Performance Requirements: Work of the Section shall conform to all applicable codes and regulations.
 - 1. Design Criteria
 - a). Make allowances for free and noiseless vertical and horizontal thermal movement due to the contraction and expansion of component parts, for an ambient temperature range from minus 20 degrees F to plus 180 degrees F. Buckling, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement of component parts will not be permitted. Fabrication, assembly and erection procedure shall take into account the ambient temperature range at the time of the respective operation.
 - 2. Wind Loads
 - a). Assemblies herein specified shall be designed for flexural, shear and torsional stresses for the following positive and negative wind pressures acting normal to the plane of the assemblies. Loading design shall be based on latest Uniform Building Code but in no case less than 20 pounds per square foot with 25 pounds per square foot corner pressure.
 - 3. Pressure and Load
 - a). Normal to the plane of the wall between structural supports, deflection shall be limited to 1/175 of the span at the perimeter framing members and 1/60 of the span within the panel itself.
 - b). At connection points of framing members to anchors, anchor deflection in any direction shall not exceed 1/16". Where connection points are not clearly defined, maximum anchor deflection shall not exceed 1/16".
 - c). Stresses must take into account interaction and in no case shall allowable values exceed the yield stress.

- d). At 1.5 times design pressure, permanent deflections of framing members must not exceed 1/1000 of the span length, and components must not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

E. Flatness Criteria

1. Maximum 1/8" in 15'-0" on panel in any direction for assembled units (non-accumulative).

F. General Approval

1. Composite panel manufacturer shall have an engineered report.

1.03 TESTS

A. Bond Integrity Test: When in accordance with ASTM D 1781-76 for bond integrity, simulating resistance to de-lamination (No other best procedure is acceptable):

1. Peel strength: 33.6 in lb/in (min)

B. Fire Performance

1. ASTM E84-79 - Maximum value flame spread 0, smoke developed 0.
2. UBC 17-5 - No flame spread along interior face or penetration through the wall assembly.
3. ASTM 162 - No surface flaming.

1.04 SUBMITTALS

A. Submittal: Submit pertinent catalog details and calculations, as required.

B. Samples: Submit 8" x 8" sample of panel system in specified finish, if available, fabricated into units representative of the actual calculations.

C. Shop Drawings: Submit CAD generated shop drawings showing profiles of panel units, details of forming, joint supports, anchorages, trim, flashings, sealants and accessories. Show details of weatherproofing at edge terminations, elevations, and layout of entire work.

1.05 PRODUCT HANDLING

A. After acceptance of panels on a given elevation, protection shall be the responsibility of the General Contractor.

2.00 PRODUCTS

2.01 SPECIFIED MANUFACTURER

A. General

1. Metal Design Systems, Inc. Series 10 composite wall panel assembly
4150 C Street SW Cedar Rapids, Iowa 52404
319-362-7454 or sales@crmdsi.com.

B. Description

1. The system shall consist of ACM panels, and a system of custom aluminum extrusions of size and shape indicated on drawings and as specified herein. The panel shall utilize aluminum clips on a solid sheeting surface. Erection shall be non-directional not requiring side-to-side/bottom-to-top sequential installation. System shall allow for indiscriminate removal of any panel without removing any adjacent panel.

C. Aluminum Composite Material (ACM)

1. Composite: Two sheets of aluminum sandwiching a core of extruded thermoplastic, formed in a continuous process with no glues or adhesives between dissimilar materials. Total composite thickness is 4mm.
2. Face Sheets: 0.020" thick aluminum (alloy to be 3003 for coil-coated sheet or 5005 for anodized).
3. Finish: Exterior surfaces shall be coil coated with FEVE or PVDF based resin which meets or exceeds AAMA 2605-02 testing for durability. In particular, the coating must have successfully passed the following or equal tests:
 - a). Humidity Resistance
 - I. Test Method: ASTM D-2247

No formation of blisters when subjected to condensing water fog at 100% relative humidity and 100 degree Fahrenheit for 3000 hours.

- b). Salt Spray Resistance
 - I. Test Method: ASTM B-117; expose coating system to 3000 hours, using 5% NaCl solution.
 - i. Corrosion creepage from scribe line: 1/8" max. (1.6mm).
 - ii. Minimum blister rating of 8 within the test specimen field.
- c). Weather Exposure
 - I. Outdoor
 - i. Ten year exposure at 45 degree angle facing south Florida exposure.
 - ii. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244
 - iii. Maximum chalk rating of 8 in accordance with ASTM D-659.
 - iv. No checking, crazing, adhesion loss.
- 4. Color
 - a). Select from standard color chart or submit request for custom color.
- 5. Core
 - a). Thermoplastics.
- D. Panel System
 - 1. Perimeter Edge Trim: Extruded aluminum offset clips which integrate to the continuous sub-system as detailed on drawings, so as to provide the following essential features:
 - a). Rout and return of the ACM on all perimeters. "Continuous Edge Grip" is not acceptable.
 - b). Return leg of ACM shall be supported by aluminum clips on all four sides.
 - c). Maximum overall system thickness can vary as required by design.
 - d). The ACM panel shall be held in place by a fastener to the clip base into wall.
 - e). Clips shall be mill finish.
 - 2. Stiffeners (if required)
 - a). Extruded aluminum sections secured to the return leg of the panel and bonded to rear face of ACM with silicone, and of sufficient size and strength to maintain flatness of the panel within the specified tolerances. Stiffeners shall have a mill finish.
 - 3. Sealant Systems
 - a). Sealants within the panel system shall be per manufacturer's standards. Sealant color shall be selected by owner or owner's representative.
 - 4. Reveals at Panel
 - a). Joints shall be 1/2" wide, nominal.
 - b). Joints will be glazed or caulked and tooled to a smooth slightly concave shape.
 - c). Joints can be same color as panels or accent color.
- E. Flashings
 - 1. Fabricate flashing from aluminum sheet in matching color; where exposed to view, finish to match adjacent panels. Provide lap strip under flashing at abutted conditions; with lapped surfaces sealed with a full-bed of non-hardening sealant.

2.02 FABRICATION

- A. Fabricate panel units to dimensions indicated on the drawings based on an assumed design temperature of 70 degrees F.
- B. Fabricate panels in sizes shown using composite aluminum panel material and perimeter clips so the panel thickness at the joinery is as required by design. Completed panel shall be properly fabricated and designed so no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the installed panels shall remain flat due to temperature changes and at all times remain water and wind tight. Oil canning of panel surface is not acceptable.
- C. Shop fabricate units ready for erection. If not shop assembled, pre-fabricate components at the shop as required for proper and expeditious field assembly.
- D. Design, fabricate, assemble, and erect wall panel units.
- E. Where drawings indicate, factory curve panels to required radius.
- F. If required, provide stiffeners adhered to rear face of panels and mechanically fastened to panel return log, with spacing as required by specific job wind loading.

3.00 EXECUTION

3.01 DELIVERY AND STORAGE:

- A. Delivery: Deliver fabricated units and component parts identified per erection drawings.
- B. Protection of Surfaces: Protect surfaces from damage during shipping and erection. Inspect work for damage upon delivery - no damaged work permitted on job site.
- C. Storage: Coordinate with General Contractor for storage space.
- D. Panel Penetrations: All panel penetrations shall be field cut by the trade involved or coordinated with the panel installers at time of installation.

3.02 INSPECTION

- A. Examine supporting structure and conditions under which the work is to be erected, and notify the Contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.03 INSTALLATION - ERECTION

- A. General
 - 1. Do not install component parts, which are observed to be defective, including warped, bowed, dented, abraded and/or broken members.
 - 2. Do not cut, trim, weld, or braze component parts during erection, in a manner which would damage finish, decrease strength, or result in a visual imperfection or a failure in performance of wall panels. Return component parts which require alteration to shop for re-fabrication, if possible, or for replacement by new parts.
 - 3. Metal Separation: Apply a coat of bituminous paint, concealed on one or both surfaces wherever dissimilar metals would otherwise be in contact. Use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
 - 4. (Optional) Install structural support system provided under this Section. Align properly to receive wall system. Support system to be installed to the same tolerance as required of the panel system.
 - 5. Anchor component parts of the metal wall securely in place, allowing for necessary thermal structural movement.

3.04 CLEANING AND PROTECTION

- A. After installation of panels on a given elevation, any additional protection shall be the responsibility of the General Contractor.
- B. Deposit all trash from panel shipping crates in General Contractor's furnished debris boxes.

C. Make sure perimeter sealants have been installed next to adjacent perimeter materials.

D. Remove protective film at time of panel installation.

3.05 PANEL REPLACEMENT (Optional)

A. Owner shall be provided with _____ sheets of ACM _____ X _____.

ADDITIONAL NOTES FOR SPECIFICATION WRITER

1. Other possible additions to this specification may include:

A. Structural stud or tube system for support of wall system.

B. Window system that integrates with panel system having NO exposed sealants between panel and window units (Contact Metal Design Systems).

2. Parapet flashing may be excluded from this section and included in sheet metal section.

END OF SECTION