SPECIFICATIONS FOR

Metal Design Systems
Featuring
Aluminum Composite Panels

Section 07430 Aluminum Composite Panels

(Based upon Metal Design Systems Series 30 using PE core aluminum composite material (ACM))

1.00 **GENERAL REQUIREMENTS**

1.01 SCOPE OF WORK

A. Provide a water shedding extrusion set panel system, as detailed on the drawings. The Return panel system must consist of an ACM panel with extruded channel / retention bar which attach directly to an integrated framing system, which allows panels to float on top to the sub-framing.

B. The panel system as detailed, shall consist of extruded perimeter extrusions, extruded retention bar as required and related flashings.

1.02 QUALITY ASSURANCE

A. General: The details show the preferred profiles and performance requirements. Provide a glazed and structurally sound, water tight 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 joint covers to provide the designed architectural appearance. 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 plus 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.

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, show 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 30 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 drawing as specified herein. The panel system shall utilize extruded aluminum base channels which capture the edge of the panel to provide a water shedding system with minimal water penetration.

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 exceed 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
            a). 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: Exposed aluminum extrusions which capture the edge of the panels as detailed on drawings, so as to provide the following essential features:
   a). The assembled panel system depth shall be approximately ½".

   b). Extrusions shall be powder coated to match or contrast the panel 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 aluminum composite panel material and perimeter extrusion so that the panel thickness at the joinery is as required by design. Completed panel shall be properly fabricated and designed so that 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. 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. Special considerations for design required. Contact Metal Design Systems Engineering.

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. 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 dumpsters.

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.

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

END OF SECTION