

SPECIFICATIONS FOR

Metal Design Systems, Inc. *Featuring* **Metal Composite Panels**

Section 07430 Metal Composite Panels

[Based upon Metal Design Systems Series 42 using FR core metal composite material (MCM)]

1.00 GENERAL REQUIREMENTS

1.01 SCOPE OF WORK

- A. Provide a watertight Rout and Return Panel System with a recessed extruded silicone gasket in the panel joints, as detailed on the drawings. The panel system must consist of an MCM panel with semi-continuous extruded channels which attach directly to the wall structure and allows panels to float on top to the sub-framing.
- B. The panel system as detailed, shall consist of extrusion channels 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 wall panel system.
- 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 channels 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. Attachment method using clips attached with fasteners through the panel's return leg will not be allowed.
- 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.

1.03 SYSTEM PERFORMANCE

- 1. Composite panel system shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or national and the local building code. Panel systems which have not been pre-tested prior to bid date will not be acceptable.
 - a. Wind Load:
 - i. Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results.
 - ii. Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed $L/175$ or $3/4"$, whichever is less.
 - iii. Normal to the plane of the wall, the maximum panel deflection shall not exceed $L/60$.
 - iv. Maximum anchor deflection shall not exceed $1/16"$.
 - v. At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed $L/100$ of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed $1/16"$.
 - b. Air/Water System Test:

- i. Air Infiltration - When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cfm/ft² of wall area.
- ii. Water Penetration - Water Penetration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.
- iii. Dynamic Water Infiltration – System will show compliance with the requirements stated in the AAMA 501 Dynamic Water Infiltration test.

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.

G. NFPA 285 – Standard Fire Test Method for Evaluation for Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components

- 1. Specific MCM panel system tested as part of an assembly that has passed according to the NFPA 285 requirements.
- 2. Test report or evaluation report with shop drawing details must be submitted during submittal phase for acceptance by architect.
- 3. Report shall show compliance with NFPA 285-18 with horizontal joint line above window head within 36” and vertical joint line should extend upward within 13” from center of window.

1.03.1 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 42 composite wall panel assembly

B. Description

1. The system shall consist of MCM panels, and a system of custom aluminum extrusions of size and shape indicated on drawing as specified herein. The system must utilize a Rout and Return configuration and a system of custom aluminum extrusions of size and shape indicated on drawings and as specified herein. The panel system shall be non-directional/non-sequential type installation and shall allow for the indiscriminate removal of any panel without disturbing adjacent panels. The system must allow for the removed panel to be replaced in the original and tested method.
2. Panel joints are to be field sealed with manufacturer approved silicone sealant. Color is to be selected from manufacturers' standard colors.

C. Metal Composite Material (MCM)

1. Composite: Two sheets of metal 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. When face sheets are aluminum: 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). Color to be selected from manufactures standard colors.
5. Core
 - a). Thermoplastic

D. Panel System

1. Perimeter Channels: Extruded aluminum channels 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 MCM on all perimeters. "Continuous Edge Grip" is not acceptable.
 - b). Edges of MCM shall be supported by aluminum channels on all four sides.

- c). Minimum overall system is 1 1/8".
 - d). The MCM panel shall be held in place with stainless steel pins through the panel returns and engaged over the channel extrusion allowing the panel to free float for thermal expansion in all directions. Panel systems utilizing attachment methods which secure two edges of the panel to the structure will not be allowed.
 - e). Channels shall be mill finish.
2. Reveals at Panel Joints
- a). Joints shall be 1/2" wide nominal.
 - b). Extruded silicone gasket is to be inserted into the panel joint over a continuous bed of wet silicone. Seal gasket intersections with matching color wet silicone behind the exposed surface of the gasket. Wipe and clean any wet silicone that has come past the exposed surface of the gasket.
 - c). Joint sealant is to be approved by the panel manufacturer.
 - d). Gasket is to be recessed in the panel joint to provide a 3/8" deep reveal.

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 metal panel material and perimeter clips 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 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.

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 MCM _____ 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