

SPECIFICATIONS FOR

Metal Design Systems *Featuring* **Metal Wall Panels**

Section 07 42 13 Metal Wall Panels

(Based upon Metal Design Systems Series 80 using .080" aluminum sheet)

PART 1: GENERAL

1.01 SCOPE

A. SECTION INCLUDES

1. The extent of panel system work is indicated on the drawings and in these specifications.
2. Panel system requirements include the following components:
 - a. Aluminum sheet panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, related flashing adapters, and masking (as required) for a complete rain screen installation.
 - b. Parapet coping, column covers, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.
 - c. Interior panel system work that basically matches exterior panel system work.

B. RELATED WORK SPECIFIED ELSEWHERE

1. Cold-Formed Metal Framing: Division 5
2. Sheathing: Division 6
3. Insulation: Division 7
4. Weather Barrier: Division 7
5. Sheet Metal Flashing and Trim: Division 7
6. Joint Sealer: Division 7

1.02 REFERENCES

A. AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

1. AAMA 501.1-05: Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors using Dynamic Pressure.
2. AAMA 2605: Specification for High Performance Organic Coatings on Architectural extrusions and panels.

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS

1. ASTM B209 Standard Specifications for Aluminum and Aluminum Alloy Sheet and Plate.

2. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
3. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
4. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

1.03 QUALITY ASSURANCE

1. Metal wall panel fabricator shall have a minimum 5 years experience of metal panel work similar in scope and size to this project.
2. Installer shall be acceptable to the fabricator and shall have a minimum 5 years experience of metal panel work similar in scope and size to this project or shall be certified by the fabricator to have received installer training.
3. Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.
4. Maximum deviation from vertical and horizontal alignment of erected panels: 1/4" in 20' non-accumulative.
5. Panel fabricator/installer shall assume undivided responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.
6. Conduct pre-installation meeting to verify project requirements, substrate conditions, installation instructions, and warranty requirements.
7. Field Quality Control: Comply with panel system manufacturer's recommendations and guidelines for installation and field forming panels.

1.04 SYSTEM DESCRIPTION

A. SYSTEM TYPE

1. Provide a reveal joint **drained & back ventilated**, panel system which has been **pre-tested** to meet the specified performance requirements.

B. SYSTEM PERFORMANCE

1. Metal wall 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 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. Maximum anchor deflection shall not exceed 1/16".
 - iv. 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.
- c. Thermal Movement:
- i. System shall allow for free horizontal and vertical movement due to the expansion and contraction 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 procedures shall take into account the ambient temperature at the time of the respective operation.

1.05 SUBMITTALS

- A. SUBMITTALS SHALL BE IN CONFORMANCE WITH DIVISION 1 SUBMITTAL PROCEDURES SECTION
- B. COORDINATE SUBMITTALS, APPROVALS, CONSTRUCTION SCHEDULES AND LEAD TIME REQUIREMENTS TO AVOID CONSTRUCTION DELAYS.
- C. PRODUCT DATA
 - 1. Submit material and system manufacturer's product data.
- D. SAMPLES
 - 1. Submit manufacturer's color charts or chips illustrating full range of colors, finishes and patterns available for metal panels with factory applied finishes.
 - 2. In the case of custom color selections, submit 2 sets of draw down samples on aluminum substrate, not less than 3 inches x 5 inches of each color and finish selected for color approval.

- E. SHOP DRAWINGS
 - 1. Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.
- F. SYSTEM MANUFACTURER'S INSTRUCTIONS
 - 1. Submit system manufacturer's installation instructions.
- G. CLOSEOUT SUBMITTALS
 - 1. Submit manufacturer's warranty documents.
- H. ALTERNATE MATERIALS MUST BE APPROVED BY THE ARCHITECT PRIOR TO THE BID DATE
 - 1. Substitution requests must comply with the requirements of Division 1.

PART 2: PRODUCTS

2.01 PANELS

- A. ALUMINUM SHEET MATERIAL
 - 1. Aluminum alloy 3003-H14 (paint quality) conforming to ASTM B209
 - 2. Aluminum alloy 5005-H14 (anodize quality) conforming to ASTM B209
- B. THICKNESS
 - 1. Nominal - .080"
- C. FINISHES
 - 1. Factory Finish Organic Coating:
 - a. Panels shall be spray coated post fabrication with a superior performing organic coating system, multiple coat, thermally cured polyvinylidene fluoride system equal to or exceeding the requirements of AAMA 2605.
 - b. Color:
 - Standard color as selected by the owner / architect from manufacturer's color palette.
 - 2. The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

2.02 ATTACHMENT SYSTEM

- A. GENERAL
 - 1. Provide Series 80 metal wall panel assembly as manufactured by:

Metal Design Systems Inc.
4150 C Street SW, Cedar Rapids, Iowa 52404
319-362-7454 or sales@crmdsi.com

B. SYSTEM DESCRIPTION

1. Provide a reveal joint drained & back ventilated panel system providing the following essential features:
 - a. System must consist of aluminum sheet formed into pans with 1” long edges at the perimeter and a system of custom aluminum extrusions which interlock in tongue and groove fashion.
 - b. System must direct water that has entered the panel cavity to the exterior side at the bottom of the wall.
 - c. System must consist of 1/2” wide x 1/2” deep reveal vertical and horizontal joints between the panels.
 - d. Overall system depth shall be minimum 2” using 2-1/4” as design depth to allow for +/- shim tolerance.
 - e. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
 - f. System must provide a series of matching perimeter trims and closures to allow for field cutting of panels to accommodate construction variances.
2. Aluminum Extrusions
 - a. Sub-frame members shall be extruded from 6063 aluminum alloy.
 - b. Extrusions exposed to view shall be factory finished with a coating that meets or exceeds the values expressed in AAMA 2605 where relevant to extrusion coatings.
 - c. Color: Extrusions exposed to view shall be painted to match the panel color.

2.03 ACCESSORIES

A. FASTENERS

1. Provide fasteners approved by the system manufacturer.
2. Provide fasteners of the appropriate type according to the substrate to which the system is to be attached.
3. Space fasteners per the system manufacturer’s recommendations or sufficiently to meet the specified performance requirements.
4. Provide fasteners of sufficient diameter to meet the specified performance requirements.
5. Provide fasteners of sufficient length to properly engage in the structural members.

B. AIR/MOISTURE BARRIER

1. Install the wall panel system over an air/moisture barrier appropriate for the application behind a rain screen cladding system specified elsewhere.
2. Treat system penetrations (fasteners, etc.) through the air/moisture barrier according to barrier manufactures recommendations.
3. Provide tape, flashing or other products which are approved by the barrier manufacturer as required to properly drain the wall panel system.

C. FLASHING

1. Provide flashing fabricated from minimum 0.032" thick aluminum sheet.
2. Where exposed to view, finish shall match the adjacent panels.
3. Provide a lap strip under flashings at abutted conditions with lapped surfaces sealed with a full-bed of non-hardening sealant.
4. Fabricate and install flashing in accordance with SMACNA standards.

D. MISCELLANEOUS MATERIALS

1. Provide sealants within the panel system according to the system manufacturer's recommendations.

2.04 PANEL FABRICATION

A. TOLERANCES

1. Fabricated panel tolerances:
 - a. Width: +/- 0.04 inch/3 feet (1mm/m).
 - b. Length: +/- 0.04 inch/3 feet (1mm/m).
 - c. Bow: Maximum 0.5% length or width.
 - d. Square: Maximum 0.2 inch (5.1mm).
2. Panel Dimensions: Field modification to panels shall be allowed at end conditions and where necessary.
3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
4. Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70°F.
5. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses.

PART 3: EXECUTION

3.01 PANEL DELIVERY, STORAGE AND HANDLING

1. Exercise care in unloading, handling and installing panels to prevent damage.
2. Inspect crates and contents for damage upon delivery. Report any damage to the freight carrier within 24 hours of receipt.
3. Store panels in well-ventilated space out of direct sunlight.
4. Do not store panels in any enclosed space where ambient temperature can exceed 120 degrees F.
5. Avoid contact with any other materials that might cause staining, denting or other surface damage.

3.02 INSPECTION

1. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify 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.
2. Surfaces to receive panels shall be structurally sound as determined by a registered Architect/Engineer.
3. Prior to installation of the wall panel system, verify air/moisture barrier has been installed according to the manufacturer's instructions.

3.03 INSTALLATION

1. Erect panels plumb, level, and true to line.
2. Install panels according to the panel system manufacturer's installation guidelines.
3. Panels shall be erected in accordance with an approved set of shop drawings.
4. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
5. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded, and broken members.
6. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.
7. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
8. All panel penetrations shall be field cut by the trade requiring the penetration or shall be coordinated by such trade with the panel installation contractor at the time of installation.
9. Installation Tolerances:
 - a. Maximum deviation from horizontal and vertical of installed panels: $\frac{1}{4}$ " in 20', non-accumulative.
 - b. Maximum deviation from panel edge and face alignment: $\frac{1}{16}$ ".

3.04 ADJUSTING AND CLEANING

1. Remove and replace panels damaged beyond repair as a direct result of the panel installation.
2. Repair panels with minor damage such that repairs are not discernable from a distance of 10 feet.
3. Remove masking as soon as possible after installation.
4. Protection from damage by other trades after installation, shall be the responsibility of the General Contractor.
5. Make sure drainage channels are unobstructed and free of dirt and sealants.
6. Final cleaning shall not be part of the work of this section.

Part 4: END OF SECTION