

## SECTION 074213 FORMED METAL WALL PANELS

This suggested guide specification has been developed using the current edition of the Construction Specifications Institute (CSI) "Manual of Practice," including the recommendations for the CSI 3 Part Section Format and the CSI Page Format. Additionally, the development concept and organizational arrangement of the American Institute of Architects (AIA) MASTERSPEC Program has been recognized in the preparation of this guide specification. Neither CSI nor AIA endorse specific manufacturers and products. The preparation of the guide specification assumes the use of standard contract documents and forms, including the "Conditions of the Contract," published by the AIA.

## Part 1 - GENERAL

## 1.1 Summary

## A. Section Includes:

1. Manufactured metal panels for exterior walls with accessory components, flashing, and backup insulation.
2. Panel system requirements include the following components:
  - a. Aluminum panels with mounting system. Panel mounting system including anchorages, furring, fasteners, gaskets and sealants, related flashing adapters and masking for a complete installation.
  - b. Panel manufacturer recommends that system should include shop-installed aluminum stiffeners on all panels of 25 square feet or larger. Minimum stiffener recommendation is one per 25 square feet of panel area.
  - c. All flashing metal required shall be provided by the panel manufacturer.
  - d. System to be fabricated and installed per local code requirements.

## B. Related Sections:

1. 054000 "Cold-Formed Metal Framing"
2. 072100 "Thermal Insulation"
3. 072700 "Air Barriers"
4. 077100 "Roof Specialties"
5. 079000 "Joint Protection"

## 1.2 Quality Assurance

- A. It is recommended that fabrication and installation of metal panels shall be from a single source. If not single source, both panel fabricator and the installer must show proof of past successful collaboration.
- B. Coordinate fabrication schedule with construction progress as directed by the contractor to avoid delay of work.
- C. Maximum deviation from vertical and horizontal alignment of erected panels: 6 mm (1/4") in 6 m (20') non-accumulative.

## 1.3 References

## A. AAMA (American Architectural Manufacturers Association)

1. AAMA 508 - Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems
2. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems
3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels

## B. ASTM International (American Society for Testing and Materials)

1. ASTM E8 - Standard Test Methods for Tension Testing of Metallic Materials
2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
3. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
5. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

## C. National Fire Protection Association (Excludes Face Fastened Solution System)

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

## 1.4 Submittals

## A. Warranty

1. Fabricator/Installer shall provide a workmanship warranty to correct defects in water tightness and integrity of seals for a five year period after substantial completion.
2. Panel manufacturer shall provide a finish warranty to correct manufacturing defects in panel finish for a 30 year period after substantial completion.

## B. Samples – submit hand samples for each type of exposed finish required.

## C. Product Data – submit material descriptions, dimensions, and finishes for each type of metal panel and accessory component.

## D. Sustainable Performance Criteria

1. Identify and document the post-industrial and/or post-consumer recycled content by weight of metal panels and accessory materials.
2. Identify the origin of the VOC content in gm/L or lbs/gal for all adhesives, sealants, paints, and coatings applied indoors.

## 1.5 Performance requirements

## A. System Performance

1. Metal panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the architect and/or local building codes:
  - a. Wind Load – If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:
    - 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  $L/60$  of the full span.
    - iv. Maximum anchor deflection shall not exceed  $1/16$ ". At  $1\ 1/2$  times design pressure, permanent deflections of framing members shall not exceed  $1/100$  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 – If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:
    - i. Air Infiltration – When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cubic feet per minute per square foot of wall area.
    - ii. Water Infiltration – Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e., Dry Systems) 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.

## B. Product Performance:

1. Metal Wall Panel Assemblies: Comply with performance requirements without failure due to defective manufacturing, fabrication, installation, or other construction defects.
2. Fire Performance: ASTM E84 – Passed Class A

## C. Fire Performance :

Where required by governing code, provide fire retardant MCM that has been evaluated and is in compliance with code requirements specified herein. Metal Construction Association Page <http://www.metalconstruction.org>

1. Wall assemblies containing MCM System shall meet the requirements of the Intermediate Scale Multi-story test, NFPA 285, where required by code based for the design of this project.

## 1.6 Rainscreen Testing – fabricate and erect a dry joint, rainscreen system tested as installed in compliance with AAMA 508 and/or AAMA 509. Delivery, Storage, and Handling

- A. Follow Manufacturer's Recommendations.
- B. Store Material in accordance with panel manufacturer's recommendations.

## PART 2 - Products

## 2.1 Panels

## A. Metal Panels

1. Panels shall be Reynodual® Aluminum double-sheet panels as manufactured by Arconic Architectural Products LLC (AAP), 50 Industrial Boulevard, Eastman, Georgia 31023. Contact Eastman plant at 1-800-841-7774 or 478-374-4746 or at [www.arconicarchitecturalproducts.com](http://www.arconicarchitecturalproducts.com).
2. Other manufacturers are acceptable as long as they meet the same criteria as Reynodual in thickness, flatness, paint color, and paint warranty. Panels must be manufactured in the USA.
3. Aluminum Material:
  - a. Alloy – Two tension-leveled 3003-H14 skins bonded through AAP's products manufacturing process.
  - b. Thickness – nominal 0.059 in (1.51mm)
- B. Panel Thickness (3 mm) = 0.120"
- C. Panel Weight (3 mm) = 1.77 lb/ft<sup>2</sup>
- D. Panel Finishes:

AAP shall be Colorweld® 500 a fluoropolymer coating utilizing 70% PVDF resin.

  1. Color: To be chosen from AAP, Reynobond® standard series one, two or three colors.
  2. Coating: Shall be factory applied on a continuous-process paint line. Coating shall consist of a 0.2 mil (approx.) prime coat and a 0.8 mil (approx.) finish coat containing 70% PVDF resins. (If Colorweld® 500XL, coating shall consist of a 0.2 mil (approx.) barrier prime coat, a 0.80 mil (approx.) color coat, containing 70% PVDF resins and a 0.5 mil (approx.) clear coat containing PVDF resins.) Nominal dry film thickness is 1.50 mils.

## 2.2 Panel Fabrication

### A. Tolerances

1. Panel Bow: Shall not exceed 0.8% of panel overall dimension in width or length.
2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.
3. Panel Lines: Breaks and curves shall be sharp and true, and surfaces free of warps or buckles.
4. Flatness: Panels shall be visually flat.
5. Panel Surfaces: Shall be free of scratches or marks caused during fabrication.

### B. System Characteristics

1. Plans, elevations, details, characteristics and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
2. Systems must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
3. Fabricate panel system to dimension, size and profile indicated on the drawings based on a design temperature of 68°F (20°C).
4. Fabricate panel system to avoid thermal strain. The installation detailing shall be such that the panels remain flat regardless of temperature changes and at all times remain air- and watertight.
5. The finish side of the panel shall have a removable protective film applied prior to fabrication, which shall remain on the panel during fabrication, shipping and erection to protect the surface from damage.

### C. System Type (select from the following)

1. Rout-and-Return Wet System: Fabricator and installer must provide an engineered system including testing documentation, clips, fasteners, anchors, spacers, trim, flashings, sealant, etc.
2. Rout-and-Return Dry System: Fabricator and installer must provide an engineered pressure relief system including testing documentation, extruded perimeter frame; drainage gutter; all extrusions, clips, fasteners, anchors, spacers, trim, flashings, gaskets, sealant, etc.
3. Rainscreen Metal Panel System: Fabricator and installer must provide an engineered pressure relief system including testing documentation, extruded perimeter frame; drainage gutter; all extrusions, clips, fasteners, anchors, spacers, trim, flashings, gaskets, sealant, etc.

## 2.3 Accessories

- A. Extrusions, formed members, sheet and plate shall conform with ASTM B209 and the recommendations of the manufacturer.
- B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
- C. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.
- D. Fabricate flashing materials from 0.040" minimum thickness aluminum sheet provided by panel manufacturer to match the adjacent curtain wall/panel system where exposed. Post-painted spray-applied flashings are not acceptable. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bead of non-hardening sealant.
- E. Fasteners (concealed/non-corrosive): Fasteners as recommended by system fabricator and installer.
- F. Weather barriers shall provide water penetration, water vapor transmission, and air penetration resistance according to the local requirements. Seal any holes in the weather barrier with manufacturer approved materials and methods.

## PART 3 - Execution

### 3.1 Inspection

- A. 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.
- B. Surfaces to receive panels shall be structurally sound as determined by a registered engineer.

### 3.2 Installation

- A. Erect panels plumb and level.
- B. Attachment system shall allow for the free vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -40°F (-29°C) to +180°F (+82°C). Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement are not permitted. Fabrication, assembly and erection procedure shall account for the ambient temperature at the time of the respective operation.
- C. Panels shall be erected in accordance with an approved set of shop drawings.
- D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
- E. Conform to panel fabricator's instructions for installation of concealed fasteners.
- F. Do not install component parts that are observed to be defective, including warped, bowed, dented, scraped and broken members.
- G. Do not cut, trim, weld or scrape component parts during erection in a manner that would damage the finish, decrease strength or result in a visual imperfection or a failure in performance. Return component parts that require alteration to shop for refabrication, or for replacement with new parts.
- H. Separate dissimilar metals; use appropriate gaskets and fasteners to minimize corrosive or electrolytic action between metals.

## 3.3 Adjusting and Cleaning

- A. Remove and replace panels damaged beyond repair as a direct result of panel installation. After installation, panel repair and replacement shall become the responsibility of the general contractor.
- B. Repair panels with minor damage.
- C. Remove masking film (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation shall become the responsibility of the general contractor.
- D. Any additional protection, after installation, shall be the responsibility of the general contractor to remove.
- E. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- F. Final cleaning shall not be part of the work of this section.

END OF SECTION 074213

## Disclaimer

Laws and building and safety codes governing the design and use of AAP's products, and specifically aluminum composite materials, vary widely. It is the responsibility of the owner, the architect, the general contractor, the installer and the fabricator/transformer, consistent with their roles, to determine the appropriate materials for a project in strict conformity to all applicable national, regional and local building codes and regulations. REYNODUAL IS COMBUSTIBLE; IT COULD CATCH FIRE AND BURN. SEE AAP WEBSITE FOR PRODUCT WARNINGS. ANY LABORATORY TESTING INFORMATION PROVIDED BY AAP APPLIES ONLY TO THE PARTICULAR PRODUCT OR ASSEMBLY TESTED AND DOES NOT NECESSARILY REPRESENT HOW PRODUCTS WILL ACTUALLY PERFORM IN USE.

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