PURE+FREEFORM

754 Stillwater Rd
Mahtomedi, MN 55115
info@purefreeform.com
612.208.8347

3-Part CSI SPECIFICATION

SECTION 074213 - FORMED METAL WALL PANELS

RIVETLESS ALUMINUM PLATE WALL PANEL SYSTEM

NOTES TO SPECIFIER:

The following specification language is intended to assist design professionals in specifying Pure + FreeForm metal cladding products using the Construction Specification Institute's 3-part Section Format. Sample language is provided for articles in Part 1 - General, Part 2 - Products, and Part 3 - Execution. The sample language, article/ paragraph numbering and overall section format should be edited to fit the design firm's specifications and the design intent for the project.

Articles and paragraphs of this product specification assume the Project Manual will contain Division 01 documents, including close coordination with the following sections, as appropriate: 012500-Substitution Procedures, 013300-Submittal Procedures, 014300-Quality Assurance, 016200-Product Options, 016600-Product Storage and Handling Requirements, 017400-Cleaning and Waste Management, 017700-Closeout Procedures, 017800-Closeout Submittals. If the project manual does not contain these Division 01 sections, requirements may be provided by the specifier under the appropriate articles within this section.

The Pure + FreeForm Specification program is designed to simplify the specification process by customizing the specification per product(s) selected. **This specification MUST be reviewed further for minor additions and modifications that are required to complete the specification**. This content is provided to you "as is" without warranty of any kind either express or implied including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, title, non-infringement, security, or accuracy.

INSTRUCTIONS:

Contact your local Pure + FreeForm manufacturer's representative or Pure + FreeForm directly for assistance with specifications and detail coordination: www.purefreeform.com.
Optional items requiring selection by the specifier are noted below. Once selections are made and other options and brackets deleted, bold font and colored text should be reverted to match balance of document.

- Dimensional items to be reviewed by specifier are in **red**
- Color selections to be reviewed by specifier are in **blue**
- Sustainability requirements to be reviewed by specifier are in **green**

SECTION 074243 - RIVETLESS ALUMINUM PLATE METAL WALL PANEL SPECIFICATION

SPEC NOTE: Optional text is indicated by square brackets []. Delete unwanted items and square brackets in final specification.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pure + FreeForm Rivetless aluminum plate pressure equalized rainscreen.
2. Accessories including Z-girts, roof caps, drip flashing, jamb flashing through wall flashing, and all other architectural trims, fasteners and vapor and air barriers.

1.2 RELATED REQUIREMENTS BY OTHERS

A. Section 06 10 00 - Rough Carpentry.

B. Section 07 21 00 - Thermal Insulation.

C. Section 07 27 00 - Air Barrier.

D. Section 07 92 00 - Joint Sealants.

1.3 REFERENCE STANDARDS

A. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

1.4 TECHNICAL DATA

Applicable Standards for the Plate aluminum component of the PURE + FREEFORM RIVETLESS ALUMINUM PLATE METAL WALL PANEL RAINSCREEN TESTING AIR/WATER/WIND PERFORMANCE.

A. RAINSCREEN TESTING

1. AAMA 508-07 Compliant.

B. AIR/WATER/WIND PERFORMANCE AAMA 501.1-05 (Dynamic).

1. ASTM E 1233 (Modified).
2. ASTM E 283 (Static).
3. ASTM E 330 (Static).
4. ASTM E 331 (Static).

1.5 PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

A. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

If needed, insert list of conference participants not mentioned in Section 13100 "Project Management and Coordination."

Retain subparagraphs below if additional requirements are necessary; revise to include more specific information about conference.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel Pure and FreeForm’s representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including Pure and FreeForm’s written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor.

C. Delegated-Design Submittal: For metal panels indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs below for two-stage Samples.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: [12 inches (305 mm)] long by actual panel width. Include fasteners, closures, and other metal panel accessories.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

F. Qualification Data: For Installer.

G. Product Test Reports: For each product, for tests performed by a qualified testing agency.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

H. Field quality-control reports.

I. Sample Warranties: For special warranties.

J. Maintenance Data: For metal panels to include in maintenance manuals.

K. Sustainable Design Submittals:

1. Credit MR 4: Product Data indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content.

a. Include statement that indicates costs for each product having recycled content.

2. Credit MRc4.1: Material Ingredient Inventories: A material ingredient inventory is preferred; if available, submit a Health Product Declaration (HPD), Declare product label, or other acceptable material ingredient inventory in accordance with the LEED Submittals portion of 01 81 13 Sustainable Design Requirements.
3. Credit MR 5: Provide certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material to Project, by rail, by inland waterway, by sea and by all other means. Include statement indicating cost for each regional material, and fraction by weight that is considered regional.
4. Credit EQ 4.1: For adhesives and sealants, provide manufacturers' product data including printed statement of VOC content.

Red List Free products that do not contain any chemicals listed on the International Living Future Institute Red List. Pure+Freeform panels do not contain Red List chemicals.

5. Red List Free Products.

    a. Declare Label: Include The Living Future Institute label indicating Red List Free declaration status.

1.7 QUALITY ASSURANCE

A. Wall Panel Manufacturer Qualifications: Minimum 10 years' experience in metal fabrication and supplying metal wall panel systems.

B. Metal Wall Panel Installer Qualifications: Minimum 10 years' experience installing commercial metal wall panel systems.

C. Mockups:

1. Provide a mock-up on building consisting of complete cladding system, including but not limited to metal furring, panels, securement devices, sealants, and moldings for approval. Cladding finish and moldings to be of finish and color as designated by the Architect.
2. Location of mock-up to be as directed by Architect. Size to be four panels minimum in a 2 over 2 configuration. Alternate pattern can be requested by Architect.
3. Modify mock-up as necessary for Architect approval. Mock-up may and may not remain in place as part of completed work. Mock-up to represent standard for completed work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

Exposing product to direct sunlight with the protective cover applied may result in baking the cover to the product surface making it difficult to remove.

D. Protective Covering:

1. Retain strippable protective covering on panels before and during installation.
2. Protect panels from direct sunlight and extreme heat before installation.
3. Remove strippable protective covering immediately after panels are installed.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws. Insert requirements for special weathertightness warranty if needed. Panel manufacturers do not typically offer such warranties on wall systems.

A. Special Warranty: Pure and FreeForm’s standard form in which Pure and FreeForm agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two (2) years from date of Substantial Completion.

When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

B. Special Warranty on Panel Finishes: Manufacturer’s standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

Usually retain "Exposed Panel Finish" Subparagraph below for fluoropolymer finish; verify availability with manufacturer.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Verify available warranties for metal composite material panel finishes and insert number in "Finish Warranty Period" Subparagraph below. A 20-year period is available for fluoropolymer finish and is the maximum included with manufacturers' published data. Longer periods for premium finishes may be available.

2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design. Coordinate section location in project manual.

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal panel attachment to building structure [and subframing system].

B. Design, fabricate and install an ALUMINUM PLATE pressure equalized rainscreen panel system to the following standards & requirements:

    1. The ALUMINUM PLATE panel design MUST be 100-percent free of all fasteners in both the panel face and panel perimeter. All mounting hardware must also be fully concealed with color matched splines utilizing the same paint technology as Pure + FreeForm LLC.
    2. Only a Progressive System (independent panel, one-from-another), using sliding male-female clip components, which are held to the panels perimeter extrusion, without the use of rivets or screws, meets the description of the panel design. This design must enable a single panel to be independently removed and re-installed.
    3. Any ALUMINUM PLATE panel system not meeting the standards & requirements outlined above (1.07.1.1; 1.07.1.2), or any panel system utilizing a track or grid layout, or one that involves a “picture frame style” post-painted extrusion incorporating a face panel, or one that utilizes adhesives in place of mechanical fasteners in the panel design, are NOT considered as equal or comparable in design or performance.

C. Structural Performance: Aluminum plate panel system to be designed to the following loads, based on testing in accordance to ASTM E 330-14:

1. Wind Load: Maximum Pressure achieved: **[insert value].**
2. Specified Design Load: **[insert value].**
3. Positive Loading Net Deflection: **[insert value].**
4. Negative Loading Net Deflection: **[insert value].**
5. Air Infiltration: Air leakage of not more than 0.06 cfm/ lbs/ft² (0.3 L/s per sq. m) when tested according to ASTM E 283-04 at the following test- pressure difference:

    a. Test-Pressure Differential : Infiltration 75 Pa @ 1.57 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²)300 Pa @ 6.24 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²).

6. Water Penetration under Static Air Pressure: No uncontrolled water penetration when tested according to ASTM E 331-02 at the following test- pressure difference over a period of 15 continuous minutes:

    a. Test-Pressure Differential: Maximum Pressure achieved = 20 lbs/ft² @ 957 Pa

D. Thermal Movements: Aluminum plate panel system has been designed to accommodate vertical and horizontal thermal movement of components, preventing buckling, opening of joints and other detrimental effects when subjected to seasonal temperature cycles. Systems that incorporate enlarged holes or loose fitting attachments to accommodate for thermal fluctuations, are NOT considered as equal or comparable in design or performance.

Differential values (for aluminum in particular) in "Temperature Change (Range)" Subparagraph below are suitable for most of the U.S.; revise to suit Project.

1. Temperature Change (Range): 120 deg F 67 deg C, ambient; 180 deg F 100 deg C, material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Manufacturers: Provide metal panels and accessories manufactured by Pure and FreeForm, LLC; www.purefreeform.com.

B. Source Limitations: Obtain all components of formed metal wall panels, including wall panel material, extrusions, and accessories from single manufacturer.

2.3 MATERIALS

A. Aluminum plate panels.

1. PURE + FREEFORM RIVETLESS ALUMINUM PLATE METAL WALL PANEL SYSTEM, Pressure Equalized Rainscreen.

    a. Thickness: **[2 mm] [3 mm]**
    b. Panel Depth: 1.75” from face of panel too substrate.
    c. ALUMINUM PLATE material supplied by Pure + FreeForm LLC

d. Manufacturer's standard, as shown on drawings, and as follows:

1) Z-girts: 18 ga.; 16 ga. steel galvanized to ASTM A653 G90.
2) Aluminum Extrusions: Mill finish (6061-T6).

2.4 MISCELLANEOUS MATERIALS

A. Panel Accessories: Provide components required to fulfill performance requirements, including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

2.5 FABRICATION

A. Aluminum Plate Wall Panels

1. ALUMINUM PLATE Panel Formed Panel: Comprised of 3mm plate aluminum alloy 3004 H32

B. Fabrication Method: Rout and return system utilizing a CNC cutting table with automatic pressure foot to control cutting depth and vacuum bed for sheet support.

C. Fabricated Panel Tolerances

1. Length: Plus 1.6 mm (0.062 inch).
2. Width: Plus 1.6 mm (0.062 inch).
3. Depth: Plus or minus 0.2 mm (0.008 inch).
4. Panel Bow: 0.8 percent maximum of panel length or width.
5. Squareness: 5 mm (0.2 inch) maximum.

D. Rainscreen Panels: Provide for positive drainage of condensation and water entering at joints to exterior face of wall in accordance with "Rain Screen Principles". Panels to have drainage holes in bottom of each panel measuring 10 mm (3/8") diameter on 610mm (24") centres, to AAMA 508-07.

For best results, Pure +Freeform uses Lumiflon fluoropolymer coatings. Text shown below is an example. Revise or insert additional testing requirements in five fluoropolymer subparagraphs below if performance levels indicated in AAMA 2605 are insufficient.

2.6 FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

For best results, Pure +Freeform uses Lumiflon fluoropolymer coatings. Text shown below is an example. Revise or insert additional testing requirements in five fluoropolymer subparagraphs below if performance levels indicated in AAMA 2605 are insufficient.

B. FEVE Fluoropolymer: AAMA 2605. Offset gravure, direct print fluoropolymer finish system containing 100 percent fluoroethylene vinyl ether (FEVE) resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Basis-of-Design Product, FEVE Resin:

    a. Lumiflon by Asahi Glass Company (AGC)

2. Application: Panels and accessories.
3. Exposed Surfaces:
4. Color: [Panel manufacturer’s standard color as selected by Architect] [Custom color as selected by Architect].
5. Texture: Manufacturer’s standard [“Exterior Clear Coat”] [“Extreme Gloss Matte”] [“High Gloss”] [“Matte”] [“Satin”] [“Ultra Matte”].

C. Polyvinylidene fluoride/ polyvinylidene difluoride (PVDF) resin finishes are NOT accepted.

D. Film finishes are NOT accepted.

E. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

Retain one or both subparagraphs below.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by Pure +Freeform.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by Pure +Freeform.

Retain subparagraph below with subparagraph above for systems that depend on air- or water-resistive barriers to prevent air infiltration or water penetration.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Surfaces to receive panel system barrier to be sound, dry, clean, and free from oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas to provide an even plane.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and Pure and FreeForm's written recommendations.

B. Protect adjacent work areas and finished surfaces from damage by this Section of Work.

3.3 INSTALLATION

A. General: Install metal panels according approved submittal drawings in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Aluminum Plate Panels

1. Install panels plumb, level and true, and in accordance with manufacturer’s written instructions.
2. Anchor panels securely in place in accordance with fabricator’s approved shop drawings.
3. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels not to exceed 6.4 mm (0.25”) in 6.1 m (20 feet), non-cumulative.

C. Rainscreen-Principle Installation: Install using manufacturer's standard assembly with vertical channel that provides support and secondary drainage assembly, draining at base of wall. Notch vertical channel to receive support pins. Install vertical channels supported by channel brackets or adjuster angles and at locations, spacings, and with fasteners recommended by manufacturer. Attach metal plate wall panels by inserting horizontal support pins into notches in vertical channels and into flanges of panels. Leave horizontal and vertical joints with open reveal.

1. Install metal plate wall panels to allow individual panels to be installed and removed without disturbing adjacent panels.
2. Do not apply sealants to joints unless otherwise indicated.

D. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by Pure and FreeForm; or, if not indicated, provide types recommended by Pure and FreeForm.

E. Flashing and Trim: Comply with performance requirements, approved submital drawings, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 SITE QUALITY CONTROL

A. Upon Owner's request, provide wall panel fabricator's site service or periodic site visit to inspect product installation in accordance with fabricator's instructions.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in Pure and FreeForm's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by Pure and FreeForm. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

1. Repair panels with minor damage so that repairs are not discernible at a distance of 3.1m (10'-0").

D. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

3.6 WASTE MANAGEMENT

A. Remove from site damaged panels, packaging, temporary coverings, protective film and other debris resulting from the Work of this Section.

END OF SECTION 074243