**SECTION 07 4213**

**METAL PLATE WALL PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

A. Metal plate panels for interior and exterior walls, feature walls, screen walls, with related flashings and accessory components.

 B. Drained/back ventilated (D/BV) rain screen based system.

**1.02 RELATED REQUIREMENTS**

A. Section 05 4000 - Cold-formed Metal Framing: Wall panel substrate sheathing.

 B. Section 05 7500 - Decorative Formed Metal: Column Covers.

 C. Section 06 1000 - Rough Carpentry: Wall panel substrate sheathing.

 D. Section 06 1000 - Rough Carpentry: Air-water barrier behind wall panels.

 E. Section 07 2100 - Thermal Insulation.

 F. Section 07 2500 - Weather Barriers: Air-water barrier behind wall panels.

 G. Section 079200 - Joint Sealants: Sealing joints between metal wall panels system and adjacent construction.

H. Section 09 2116 - Gypsum Board Assemblies: Wall panel substrate sheathing.

**1.03 REFERENCE STANDARDS**

 A. C.AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding System; 2014**.**

B. D.AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015

 C. E.AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

 D. F.AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.

 E. G.AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

 F. H.AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

 G. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

 H. J.ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

 I. K.ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

 J. L.ASTM B69 - Standard Specification for Rolled Zinc, 2013.

 K. M.ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

 L. N.ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

 M. O.ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes; 2014.

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 N P.ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013

 O. Q.ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

 P. R.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; 2004 (Reapproved 2012).

 Q. S.ASTM E330.E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

 R. T. ASTM E331 - Standard Test Method or Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

 S. U.NAAMM AMP 500-06 - Metal Finishes Manual; 2006.

**1.04 PREINSTALLATION MEETINGS**

 A. Pre-installation Meeting; Convene one week before starting work related to installation of wall panels substrate.

 1. Require attendance of parties directly effecting work of this section, as follows:

 a. Architect.

 b. Owner.

 c. Contractor.

 d. Air-Water Barrier (AWB) Installation Superintendent.

 e. Wall Sheathing Installation Superintendent.

 f. Wall Cavity Insulation Installation Superintendent.

g. Landscape Architect - (if an integrated living wall option is selected).

 h. Electrician Superintendent (if an integrated lighting option is selected).

 2. Review procedures for coordinated installation of wall assembly components by multiple installers and to maintain proper air-water barrier (AWB) and panel substrate performance requirements.

**1.05 SUBMITTALS**

 A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

 B. Shop Drawings: Indicate dimensions, layout, joints, construction details, \_\_\_\_\_, and methods of anchorage.

 C. Samples: Submit two samples of wall panel and soffit panel, \_\_\_\_\_inch (\_\_\_\_\_mm) by \_\_\_\_\_inch (\_\_\_\_\_mm) in size illustrating finish color, sheen an texture.

 D. Source Quality Control Submittals.

 E. Field Quality Control Submittals.

 F. Manufacturer's Qualification Statement.

 G. Installer's Qualification Statement.

 H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

 I. Mockups: See Contract Documents for extent, size and quantity of Mockup Design(s).

**1.06 QUALITY ASSURANCE**

 A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

 B. Installer Qualifications: Company specializing in performing work of the type specified with minimum three years of documented experience.

 C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

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**1.07 MOCK-UP**

 A. Construct mock-up, \_\_\_\_\_feet (\_\_\_\_\_m) long by \_\_\_\_\_feet (\_\_\_\_\_m) wide; include wall panels, any integrated functions (planters, irrigation, drainage, lighting, perforations), attachments to building frame, associated air/water barrier materials, weep drainage system, sealants and seals, and related wall insulation in mock-up.

 B. Locate where directed.

 C. Mock-up may remain as part of the work.

**1.08 DELIVERY, STORAGE, AND HANDLING**

 A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

 B. Store prefinished material off ground and protected from weather; prevent twisting, bending, or abrasion, and provide ventilation to stored materials; slope metal sheets to ensure drainage.

 C. Prevent contact with materials that may cause discoloration or staining of products.

**1.09 WARRANTY**

 A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

 B. Correct defective work within a five-year period after Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

 C. Correct defective work within a five-year period after Date of Substantial Completion, including defects in water tightness and integrity of seals.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

 A. Basis of Design: Metalwërks Sculpted Integrated Wall Assemblies: <https://metalwerksusa.com/products/sculpted-3d>

 B. Other Acceptable Aluminum Plate Wall Panels:

 1.

 2.

 3. Substitutions: See Section 01 6000 - Product Requirements.

 C. Basis of Design: **Metalwërks Arcwall or Arcwall Advanced.**

 D. Other Acceptable Stainless Steel Plate Wall Panels:

 1. Metalwërks; Arcwall: [www.metalwerks.com/#sle](http://www.metalwerks.com/#sle)

 2. \_\_\_\_\_

 3. Substitutions: See Section 01 6000 - Product Requirements

**2.02 DESIGN CRITERIA**

 A. Metal Plate Wall Panels System: Factory fabricated prefinished metal panel system, site assembled. Provide exterior wall panels, and sub-girt framing assembly. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.

 B.

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 C. Design Pressures: Panels shall be designed to withstand the Design Wind Load specified herein as Positive \_\_\_\_\_ PSF & Negative \_\_\_\_\_PSF at typical zones and Posit eve \_\_\_\_\_PSF & Negative \_\_\_\_\_PSF at corner zones. Wind load testing shall be conducted in accordance with ASTME 300 to obtain the following results. 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. Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span. No permanent deformation of the panels system will be allowed.

 a. Indicate analysis of any additional integrated options for loading calculations such as Lighting and Planter with irrigation.

 D. Intermediate Panel Stiffeners: Provide as required by design loads applied to panels, and secured to rear face of panel with silicone based adhesive and of site and strength to maintain panel flatness; stiffener material is compatible with silicone.

 E. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to 100 degrees F (56 degrees C) seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.

 F. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

 G. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.

 H. Corners: Factory-fabricated in one continuous piece with minimum 2 inch (51mm) returns.

 I. Provide continuity of air/water barrier (AWB) seal at wall panel substrate and/or wall sheathing in coordinate with materials specified in Section 07 2500 and Section 06 1000.

**2.03 MANUFACTURED METAL PANELS**

 A. Metal Plate Wall Panels:

 1. Orientation: Veridical or Horizontal; style as indicated.

 2. Joint Layout: As indicated on drawings.

 3. Material: *Please Choose:* Aluminum, 0.125 inch (3.18 mm) minimum thickness.

 4. Material: Stainless steel, 16 gage, 0.063 inch (1.60mm) minimum thickness.

 5. Material: Zinc, 0.059 inch (1.50 mm) minimum thickness.

 6. Panel Width: \_\_\_\_\_inch (\_\_\_\_\_mm).

 B. Wall System Supports: Cee, zee, hats or tubular-shaped supports; engineered to attach wall panel system to face of building structural wall.

 1. Minimum 16 gage, 0.0598 inch (1.52 mm) thick formed G90 (Z275) galvanized steel sheet in accordance with ASTM A653.A653M.

 2. 8 gage, 0.125 inch (3.18mm) thick formed aluminum sheet or extruded aluminum

 shapes.

 C. Trim and Flashings: 22 gage, 0.0299 inch (0.76 mm) thickness and finish as metal panels; brake formed to required profiles.

 D. Fasteners: Provide of aluminum, cadmium plated steel, or stainless steel material.

**2.04 MATERIALS** *Please Choose:*

 A. Aluminum Plate: ASTM B209 (ASTM B209M), 3003 alloy, H14 temper.

 1. Surface Texture: Smooth

 B. Stainless Steel Plate: Alloy Type 304, in compliance with ASTM A666.

 1. Finish: No. 4 - Brushed in compliance with NAAMM AMP 500-06.

 2. Surface Texture: Smooth.

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 C. Zinc Plate: Alloy and temper as recommended by manufacturer for application in accordance with ASTM B69.

 D. Air/Water Barrier (AWB): Refer to Section 07 2500 for additional information.

 E. Substrate Wall Sheathing: Refer to Section 06 1000 for additional information.

 F. Substrate Wall Insulation: Refer to Section 07 2100 for additional information.

**2.05 FINISHES** *Please Choose:*

 A. Superior Performing Organic Top Coating: Complying with [AAMA 2605](http://www.aamanet.org/general.asp?sect=2&id=45) for testing, performance, and application procedures, and consisting of *Please Choose:* [two-coat,] thermally cured polyvinylidene fluoride (PVDF) system.

 1. Chemically etch metal panels using appropriate cleaner in accordance with

 manufacturer's written instructions.

 2. Primer: Apply acid resistant primer to cleaned aluminum metal plate; thickness range

 of 0.20 mils, 0.0002 inch (0.005 mm) to 0.30 mils, 0.0003 inch (0.0076 mm).

 3. PVDF Resin Color Coating: At least 70 percent polyvinylidene fluoride (PVDF) based;

 thickness range of 0.80 mils, 0.0008 inch (0.02 mm) to 1.20 mils, 0.0012 inch (0.03

 mm) and applied by metal finisher certified by coating manufacturer.

 4. [three coat ] with PVDF Resin Clear Top Coating: Applied to provide additional protection to finish, at least 0.80 mils, 0.0008 inch (0.02 mm) thick, and at least 70 percent polyvinylidene fluoride (PVDF) based.

 5. [four coat] Barrier Coating: Exotic color applied to protect aluminum from ultraviolet (UV) penetration; coating formulations as required by manufacturer.

 6. Color: As selected by Architect from manufacturer's standard line.

 B. Class 1 Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

 C. Class 1 Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.

 D. Back Side Coating: Panel manufacturer's standard wash coat.

 E. Powder Coat Options.

**2.06 ACCESSORIES**

 A. Gaskets: manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

 B. Sealants: Comply with ASTM C920, and refer to Section 07 9200 for additional requirements.

 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

 3. Seam Sealant: Factory-applied, non-smoking, non-drying type.

 C. Extruded Aluminum: Comply with ASTM B221 (ASTM B221M).

 D. Fasteners: Manufacturer's standard type to suit application; cadmium coated metal with soft neoprene washers.

 1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.

 E. Field Touch-up Paint: As recommended by panel manufacturer.

 F. Bituminous Paint: Asphalt based.

 G. Column Covers: Refer to Section 05 7500.

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**2.07 SOURCE QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

 A. Verify that substrate framing members are ready to receive panels.

 B. Verify that air/water barrier (AWB) has been properly installed over substrate, refer to Section 07 2500 for additional information.

**3,02 PREPARATION**

 A. Install wall support system in accordance with engineered calculations fastened to substrates, shimmed and leveled to uniform plane, and spaced at intervals indicated.

**3.03 INSTALLATION**

A. Install panels on walls and soffits in accordance with manufacturer's instructions and approved shop drawings.

 B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint or other approved isolating method; allow time to properly dry prior to wall panel installation.

 C. Fasten panels to substrate structural supports; aligned, level and plumb.

 D. Provide expansion and control joints where indicated.

 E. Use concealed fasteners unless otherwise indicated and approved by Architect.

 F. Seal and place gaskets to prevent weather penetration; maintain neat appearance.

**3.04 TOLERANCES**

A. Maximum offset from true alignment between adjacent members butting or in-line: 1/16 inch (1.6 mm)

 B. Maximum Variation from plane or location indicated on drawings 1/4 inch (6.4 mm).

**3.05 FIELD QUALITY CONTROL**

 A. See Section 01 4000 - Quality Requirements, for additional requirements.

 B.. Barrier Wall Water-Spray Test: Test assembled area as directed by Architect for water penetration prior to any wall support system installation in accordance with AAMA 501.2.

 1. Repeat testing after installation of wall support system and sealed penetrations with designated seal method.

 C. Do not cover installed air/water barriers until required inspections have been completed.

 D. Obtain approval of installation procedures by air/water barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

 E. Take digital photographs of each portion of installation prior to covering up.

**3.06 CLEANING**

 A. Remove site cuttings from finish surfaces.

 B. Remove protective material from wall panel surfaces.

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 C. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

 D. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

 E. Upon Completion of installation, thoroughly clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

**3.07 PROTECTION**

 A. Protect installed products from damage unit Date of Substantial Completion.

**END OF SECTION**

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