

SECTION 07 [_____]

FORMED METAL WALL PANELS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Painted aluminum wall panel system

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 – Cold-Formed Metal Framing: Wall panel substrates support framing.
- B. Section 06 1000 – Rough Carpentry: Plywood substrate wall sheathing.
- C. Section 07 2500 – Weather Barriers: Air and moisture barrier required as part of metal wall panel assembly.
- D. Section 07 6200 – Sheet Metal Flashing and Trim: Field formed flashings and other sheet metal work.
- E. Section 07 9005 – Joint Sealers: Perimeter sealant.

1.03 DEFINITION

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete weather tight wall system.

1.04 REFERENCE STANDARDS

- A. AAMA - American Architectural Manufacturers Association (www.aamanet.org)
 - 1. AAMA 501.1 – Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2005
 - 2. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2009
 - 3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011 (Testing based on 2005 Edition)
- B. ASTM International (American Society for Testing and Materials; www.astm.org)
 - 1. ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011
 - 2. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2009
 - 3. ASTM D 523 - Standard Test Method for Specular Gloss; 2008
 - 4. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2011
 - 5. ASTM D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011
 - 6. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2007
 - 7. ASTM E 8/E 8M - Standard Test Methods for Tension Testing of Metallic Materials; 2009
 - 8. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
 - 9. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2010
 - 10. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2009
 - 11. ASTM E 1233 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential; 2006

- C. LEED – Leadership in Energy and Environmental Design
- D. NAAMM – National Association of Architectural Metal Manufacturers

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate panel assemblies with rain drainage, flashing, trim, stud back-up, soffits, and other adjoining work.
- B. Pre-installation Meeting:
 - 1. Attendees:
 - a. Owner.
 - b. Architect.
 - c. Installer.
 - d. Wall Panel Manufacturer's Representative.
 - e. Structural Support Installer.
 - f. Architect discretion to include suppliers and installers of interfacing/adjoining construction materials.

1.06 SUBMITTALS

- A. See Section [_____] – Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for each type of product indicated.
 - 1. Metal wall panel.
 - 2. Fasteners.
- C. Submittal Drawings: Submit dimensioned drawings for coordination and approval of metal wall panels.
 - 1. Include the following:
 - a. Exterior elevations to show the metal wall panels and wall sections drawn to scale
 - b. Exterior elevations to show sub-framing girts required for metal wall panel attachment drawn to scale
 - c. Include common construction datum such as column lines, radial grids, elevations, and other to assist with coordination. Ensure dimensions to panels and work points are locked to datum lines.
 - d. Wall-mounted items such as windows, doors, louvers, and lighting fixtures
 - e. Wall penetrations
 - f. Details shall be drawn at no less than 6" = 1'-0" scale for joints, edge and perimeter conditions, corners, trim, flashings, closures, accessories, special details, anchorages and attachment system.
 - 2. Provide distinction between factory-assembled and field-assembled work.
 - 3. Indicate all panel areas that require verified field dimensions for fabrication of materials.
- D. Installation Drawings: Drawings shall include exterior elevations with metal panel identification numbers to facilitate installation. Markings shall ensure a system that assigns a panel to a specific wall exterior and location.
 - 1. Elevations shall include panel grid and work point dimensions originating from strategic datum indicated in the submittal drawings.
 - 2. Include a bill-of-materials for quantities.
- E. Samples: Submit samples of size as follows:
 - 1. Material/Finish: Provide three pieces at least 2 inch by 3 inch for each type of exposed finish.
 - 2. Aluminum Metal Wall Panel: Submit three physical panels with finished face dimensions measuring no less than 8" x 12" to demonstrate shape and craftsmanship.
- F. Test and Evaluation Reports: Submit test reports or manufacturer letter certifying the metal wall panel will be designed and evaluated by an independent structural engineer to meet the structural performance requirements.
- G. Maintenance Data: Submit maintenance data for metal wall panels.
- H. Warranty: Submit warranties and ensure forms have been completed in Owner's name and registered with manufacturer.
 - 1. Samples warranties for factory workmanship and material/finish to be submitted in advance of submittal drawings.

- I. Sustainable Design Submittals [LEED Reports]:
 - 1. Submit documentation providing location of manufacturing and distance to project site.
 - 2. Submit documentation from manufacturer for amounts of pre-consumer and post-consumer recycled content for products specified, and include statement indicating costs for materials having recycled content after purchase or raw materials.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with at least ten (5) years of experience specializing in the manufacture of metal wall panels and products.
- B. Installer: Company specializing in performing work of this section and confirmed by the manufacturer as having demonstrated the ability to complete the work.
 - 1. Install system in strict compliance with manufacturer's final approved submittal drawings.
- C. Source Limitations: Obtain each type of metal wall panel from single source and from single manufacturer.

1.08 MOCKUPS

- A. Mockups: Provide mockups to demonstrate visual effects and to establish quality standards for fabrication and installation.
 - 1. Erect [Insert Size] mockup of typical wall panel assembly. Include [Insert Panel Detailing Features], sub-framing, attachments, and accessories.
 - a. Typical mockup shall include at least four panels and accessories, when installed, that demonstrate intersecting "horizontal" and "vertical" joints and showing full panel depth/thickness.
 - 2. Approval of mockups does not constitute approval of deviation from Contract Documents within mockups unless these deviations are approved by Architect in writing.
 - 3. Subject to compliance with requirements, approved mockups will not become part of completed Work if undisturbed upon date of Substantial Completion.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels during transportation, handling, and installation from weather, excessive temperatures and construction operations.
- B. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
 - 1. Deliver panels, components, and other manufactured items without damage or deformation.
 - 2. Include semi-permanent panel markings on a non-exposed surface.
- C. Storage:
 - 1. Store materials indoors if possible
 - 2. Cover materials with suitable weather tight and ventilated covering when outdoors.
 - 3. Provide storage of panels to ensure dryness, with positive slope for drainage of moisture.
 - 4. Do not stack panels horizontally, store wall panels vertically with the top edge down.
 - 5. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.
 - 6. Remove strippable protective covering from panel immediately upon installation.
- D. Handle panels in a manner to prevent bending, warping, twisting, and surface damage.

1.10 SITE CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.

- B. Coordination of Trades: Contractor shall coordinate all trades that interface with the metal wall panels to ensure locations of structural elements, windows, louvers, doors, and other elements are installed per the contract drawings and within tolerance prior to field measurements.
- C. Field Measurements: Contractor shall verify locations of structural members and wall opening dimensions by field measurements or high-resolution 3D point cloud scan.
 - 1. Contractor and Installer to coordinate with construction schedule.
 - 2. Contractor may instruct the factory to fabricate all panels to the dimensions shown on the approved submittal drawings if field measurement verification is not possible. This would be noted on the returned approved submittal drawings.
 - 3. Contractor may instruct the factory to fabricate all standard panels within the gird to the dimensions on the approved submittal drawings are withhold production of perimeter panels for field dimensions.
 - 4. Record field measurements on Submittal Drawings and submit to panel manufacturer before panel fabrication.
 - a. Manufacturer to submit to the Installer elevations identifying panels and a corresponding panel list noting panel dimensions for approval before fabrication.

1.11 WARRANTY

- A. See Section [_____] - Closeout Submittals, for additional warranty requirements.
- B. Wall System Warranty: Provide wall panel manufacturer warranty, agreeing to correct defects in manufacturing of materials within a two (2) year period after date of Substantial Completion.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration: Beyond normal weathering of wall system metals and other materials.
- C. Panel Finish Warranty: Provide panel finish manufacturer warranty, agreeing to repair finish of metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.
 - 2. Warranty Coverage: In accordance with AAMA 2605 for 70 percent PVDF resin on aluminum finish requirements.
 - a. Fading, Loss of Color Retention: Loss of 5 Delta E units (Hunter) or less in accordance with ASTM D 2244.
 - b. Chalking, Chalky White Powder on Panel Surface: Chalking at No. 8 or less for colors or No. 6 for white in accordance with ASTM D 4214.
 - c. Loss of Adhesion: Loss of 10 percent due to cracking, checking or peeling, or failure to adhere to bare metal.
 - d. Gloss Retention: 50 percent or less in accordance with ASTM D 523.
 - e. Salt Spray, Accelerated: At least 4,000 hours in accordance with ASTM B 117.
 - f. Humidity Testing, Accelerated: At least 4,000 hours in accordance with ASTM D 2247.

PART 2- PRODUCTS

2.01 MANUFACTURER

- A. NEXGEN Metal Design Systems – Mosaic+ Architectural Metal Wall Panel
Address: 22 Rutgers Road, Suite 201, Pittsburgh, PA 15205
Phone: (412) 458-3805
Email: info@nexgendesignsystems.com
Website: nexgendesignsystems.com
- B. Other manufacturers meeting the requirements of these specifications and drawings must be approved by the Architect prior to the bid date.

2.02 PERFORMANCE REQUIREMENTS

- A. Metal Wall Panel Assemblies: Comply with performance requirements without failure due to defective manufacturing, fabrication, installation, or other construction defects.
- B. Delegated Design: Design metal wall panel assembly to include comprehensive engineering analysis by a qualified professional engineer using performance requirements and criteria indicated by Wind Resistance Analysis: The Manufacturer shall employ the services of an engineering consultant to perform this analysis in accordance with ASCE 7-10 indication the wind loads that will be anticipated.
- C. Design, fabricate, and erect a dry joint aluminum wall panel system without use of sealants, gaskets, or butyl tape, tested as installed in compliance with the following.
 - 1. Air Infiltration: 0.12 cfm per sf of wall area, tested at 1.57 psf (25 mph) in accordance with ASTM E 283.
 - a. Maintain air/water barrier leakage rate at 0.11 to 0.13 cfm per sf at 1.57 psf when tested in accordance with ASTM E 283 in compliance with AAMA 508 criteria.
 - 2. Water Penetration:
 - a. Static: Pass water penetration test under static pressure when tested in accordance with ASTM E 331 at a differential of 10 percent of inward acting design load, with 15 psf pressure differences for at least 15 minutes with 5 gal per sf per hour of water applied.
 - b. Dynamic: Pass water penetration test under dynamic pressure of 6.24 psf in accordance with AAMA 501.1.
 - 3. Structural: Provide systems tested in accordance with ASTM E 330.

2.03 MATERIALS

- A. Aluminum Sheet: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers design requirements.
 - 1. Aluminum Material: Tension-leveled, [fluoropolymer PVDF painted finish, 3003-H14 alloy or equal] or [anodized finish, 5005-AQ alloy].
 - 2. Nominal Thickness: [0.050 inch] or [**0.063 inch**].
 - 3. Weight: Less than 2 lbs per sf.
 - 4. Finish: [Two-Coat Fluoropolymer] [Three-Coat Fluoropolymer] [Four-Coat Fluoropolymer] [Two-Coat Mica Fluoropolymer] [Clear Anodized Finish]
- B. Panel Depth: [1.5 inches nominal] or [2.25 inches nominal] or [3 inches nominal]
- C. Panel Size: As indicated on Drawings and as shown on the approved submittal drawings.
Maximum panel size 42 inches x 144 inches conditional upon selected material finish
- D. Panel Joints: As indicated on Drawings and as shown on the approved submittal drawings.
 - 1. [5/8 inches] or [3/4 inches]

2.04 FABRICATION

- A. Fabricate wall panels within manufacturer's facilities and fulfill indicated performance requirements.
 - 1. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide aluminum wall panel with "cap-over" folds at corners where the panels is bent to form reveals.
- C. Provide post-finishing of panels, paint aluminum wall panels only after completion of panel fabrication unless working from pre-coated coils.

2.05 FINISHES

- A. Comply with NAAMM's - Metal Finishes Manual for Architectural and Metal Products, for recommendations of designating finishes.

- B. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride (PVDF) resin system.
 - 1. Two-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 2. Three-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 3. Two-Coat Mica Fluoropolymer: AAMA 2605, fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 4. Four-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat, barrier coat, and clear coats. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
- C. Clear Anodized Finish: AAMA 611, Class I, clear anodic coating not less than 0.7 mils thick.
- D. Field Touch-Up Materials: As recommended by coating applicator for field application.

2.06 ACCESSORIES

- A. Metal Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fascia, mullions, sills, corner units, flashings, and similar items. Match material and finish of panels unless otherwise indicated.
- B. Provide integral drainage system and manufactures standard extrusions at termination of dissimilar materials.
- C. Flashing and Trim: Match material, finish, and color of adjacent wall panels.
 - 1. Thickness: At least 0.040 inch.
 - 2. Refer to Section [_____].
- D. Panel Fasteners: Designed to withstand design loads. Include neoprene washer.
 - 1. Stainless steel fasteners
- E. Sub-Girts: Galvanized, provide size and gage in accordance with project requirements.
 - 1. Furring Channel: Provide Hat, C, U or Z type as recommended by manufacturer.
 - 2. Flat Strap: At least 14 gauge thick.
 - 3. Refer to Section [_____].
- F. Substrate Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I, at least 3/4 inch thick.
 - 1. Refer to Drawings and Section [_____] for requirements.
- G. Weather Barriers: Provide climate specific weather barrier with performance characteristics for air penetration, water vapor transmission, and water penetration resistance.
 - 1. Refer to Section [_____] for requirements.
- H. Sealants: As recommended by metal panel manufacturer for openings within wall panels, penetrations, and perimeter conditions.
 - 1. Refer to Section [_____] for requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, and Work areas and conditions with Installer present for compliance with requirements for installation tolerances, wall panel supports, and other conditions affecting performance of this Work.
- B. Examine wall framing to verify that girts, angles, channels, studs, and other structural wall panel support members and anchorage have been installed within alignment tolerances required by wall panel manufacturer.

- C. Verify that weather barrier has been installed over sheathing or substrate to prevent air infiltration or water penetration.
- D. Examine rough-in for components and systems penetrating wall panels to coordinate actual penetration locations relative to wall panel joint locations prior to installation.
- E. Installer is to submit a written inspection report of wall substrate conditions to Architect, Contractor, and wall panel manufacturer prior to installation.
 - 1. Identify dimensions in conflict with the approved submittal drawings.
- F. Proceed with wall panel production and installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Miscellaneous Framing: Install sub girt, base angles, sills, furring, and other wall panel support members and provide anchorage in accordance with ASTM C 754 for gypsum panel type substrates and panel manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install wall panels in accordance with manufacturer's submittal drawings and installation instructions as provided.
 - 1. Wall panels consist of single sheets of metal formed with interlocking gutter and drainage system integral/joined to the panel with single horizontal attachment for dry-joint rainscreen assembly. Vertical attachment methods shall depend on panel orientation, size, and performance requirements.
 - 2. Allow for secondary drainage flashing, brackets, joint sealants or gaskets to manage the drainage of wall when called for by the manufacturer's approved drawings.
 - 3. J channels may be incorporated for perimeter terminations when shown on the approved drawings.
 - 4. Attach wall panels using progressive interlocking method, engaging bottom of panel in top of previous panel working bottom up, and left to right unless directed otherwise by submittal drawings.
 - 5. Install wall panels with single top attachment.
- B. Install wall panels for orientation, sizes, and locations as indicated on Drawings.
- C. Install wall panels with proper anchorage and other components for this Work securely in place.
- D. Install wall panels with provisions for thermal and structural movement.
- E. Install shims to plumb substrates as necessary for installation of wall panels.
- F. Install weather tight seals at perimeter of wall panel openings.
 - 1. Test for proper adhesion on small unexposed area of solid surfacing prior to use.
 - 2. Refer to Section [_____].
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions.
 - 1. Provide concealed fasteners where possible, and set units true to line and level as indicated.
 - 2. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 3. Install flashing and trim as wall panel Work proceeds.
- H. Install weather tight escutcheons for pipe and conduit penetrating exterior walls.
 - 1. Use of sealants, gaskets, butyl tape at penetrations as detailed in the final approved submittal drawings is allowed.
- I. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by wall panel manufacturer.
- J. Install attachment system to support wall panels and with provisions to provide a complete weather tight wall system, including sub girts, extrusions, flashings and trim.

1. Include attachment to supports and trims at locations using dissimilar materials.
 2. Do not apply sealants to joints, unless noted otherwise on Drawings or Shop Drawings.
 3. Install starter at wall base and areas where cut panels are shown.
- K. Install accessories with positive anchorage to building and weather tight mounting and provisions for thermal expansion, and coordinate installation with flashings and other components.
1. Install components required for a complete wall panel assembly including trim, copings, flashings and other accessory items.
- L. Weather Barrier: Install weather barrier behind wall panels and over substrate in accordance with requirements of Section [_____].
- M. Provide written certification from installer that all work was completed per the approved drawings.

3.04 TOLERANCES

- A. Shim and align wall panel units with installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level, plumb, and location lines as indicated.

3.05 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to assist with the initial wall panel installation to include accessories and inspect completed metal wall panel installation.
1. Provide service on the mockup and on the initial 300 SF of actual work.
 2. Provide written field report within ten (5) working days of the last day of site work.
- B. Installer shall remove and replace metal wall panels where inspections indicate that they do not comply with specified requirements.
- C. Perform additional inspections, at Contractor's expense, to verify compliance of replaced wall panels or necessary additional work with specified requirements.
- D. Installer shall to prepare and submit progress reports weekly to the Contractor and Manufacturer until completion. Include total panels installed, crew size, and areas covered.

3.06 CLEANING

- A. Upon completion of wall panel installation, clean finished surfaces as recommended by panel manufacturer.
- B. Upon completion of wall panel installation, clear any weep holes and drainage channels of obstructions and dirt.

3.07 PROTECTION

- A. Protect installed products from damage during subsequent construction work by other trades.
- B. Replace wall panels damaged or deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION