

SECTION 07 4213.32

PERFORATED METAL PLATE WALL PANELS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Perforated [aluminum] [copper] [stainless steel] or [zinc alloy] metal plate wall panels.

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 9200 – Joint Sealants: Perimeter sealant.

1.03 DEFINITIONS

- A. Metal Plate Wall Panel Assembly: Metal plate wall panels, attachment system components, miscellaneous metal framing and accessories.

1.04 REFERENCE STANDARDS

- A. AAMA - American Architectural Manufacturers Association (www.aamanet.org)
 - 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 14(Errata 2015)
 - 2. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 13(Errata 2014) [Testing based on 2005 Edition]
- B. ASTM International (American Society for Testing and Materials; www.astm.org)
 - 1. ASTM B69 - Standard Specification for Rolled Zinc; 2013
 - 2. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011
 - 3. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015
 - 4. ASTM D523 - Standard Test Method for Specular Gloss; 2014
 - 5. ASTM D2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2015
 - 6. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011
 - 7. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 07(2015)
- C. LEED – Leadership in Energy and Environmental Design
- D. NAAMM – National Association of Architectural Metal Manufacturers
- E. SMACNA – Sheet Metal and Air Conditioning Contractor’s National Association
- F. PS - Voluntary Product Standard; National Institute of Standards and Technology (NIST)
 - 1. PS-1 – Structural Plywood; 2009

1.05 ADMINISTRATIVE REQUIREMENTS

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- A. Coordination: Coordinate panel assemblies with rain drainage, flashing, trim, stud back-up, soffits, and other adjoining work.
- B. Preinstallation Meeting:
 - 1. Attendees:
 - a. Owner.
 - b. Architect.
 - c. Installer.
 - d. Panel manufacturer's representative.
 - e. Structural support installer.
 - f. Installer's whose work interfaces with or affects wall panels including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule.
 - 3. Verify availability of materials, installer's personnel, equipment, and facilities needed to maintain schedule.
 - 4. Review means and methods related to installation, including manufacturer's written instructions.
 - 5. Examine support conditions for compliance with requirements, including alignment and attachment to structural members.
 - 6. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affects this Work.
 - 7. Review temporary protection requirements for during and after installation of this Work.

1.06 SUBMITTALS

- A. See Section 01 3000 – Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for each type of product indicated, include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal plate wall panel and accessory.
- C. Shop Drawings: Submit fabrication and installation layouts of metal plate wall panels; including details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 1. Provide distinction between factory-assembled, shop-assembled, and field-assembled work.
 - 2. Provide details of following items at full scale.
 - a. Manufacturer's standard sheet metal trims.
 - b. Components of wall panel construction, anchorage methods, and hardware.
- D. Coordination Drawings: Submit exterior elevations, drawn to scale, that have the following items shown and coordinated with each other, using input from installers of these items as follows:
 - 1. Metal plate wall panels and attachments.
 - 2. Girts.
 - 3. Wall-mounted items including doors, windows, louvers, and lighting fixtures.
 - 4. Penetrations of wall by pipes and utilities.
- E. Samples: Submit for each type of exposed finish required, and prepared on samples of size indicated below:
 - 1. **[Aluminum] [Copper] [Zinc Alloy] or [Stainless Steel]** Metal Plate Wall Panels: At least 2 inch by 3 inch.
- F. Test and Inspection Reports: Submit test and inspection reports on each type of wall panel system provided for project based on evaluation of comprehensive tests performed by qualified testing agency.
- G. Maintenance Data: Submit maintenance data for metal plate wall panels.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- I. Sustainable Design Submittals **[LEED Reports]**:
 - 1. 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.
 - 2. Submit documentation providing location of manufacturing.

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1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with at least five years of documented experience.
- B. Installer: Company specializing in performing work of this section and approved by manufacturer.
 - 1. Install system in strict compliance with manufacturer's installation instructions.
- C. Anodized Finish Applicator: Provide either caustic (traditional) or eco-friendly (acid) etching technologies.
 - 1. Use fully automated, computer-controlled process lines for consistency of finish throughout project.
 - 2. Use documented production line quality control protocols in accordance with AAMA 611 test procedures.
- D. Source Limitations: Obtain each type of metal plate wall panel from single source and from single manufacturer.

1.08 MOCKUPS

- A. Mockups: Provide mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and to establish quality standards for fabrication and installation.
 - 1. Build mockup of typical wall panel assembly [**as shown on Drawings**] <insert size>, including [**corner,**] [**soffits,**] supports, attachments, and accessories.
 - a. Include at least four panels to represent a four-way panel joint and showing full 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 [**may**] or [**may not**] become part of completed Work if undisturbed upon Date of Substantial Completion.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling: Store materials in clean, dry, interior area in accordance with manufacturer's instructions.
- C. Deliver panels, components, and other manufactured items without damage or deformation.
- D. Protect panels during transportation, handling, and installation from weather, excessive temperatures and construction operations.
- E. Handle panels in strict compliance with manufacturer's instructions and recommendations, and in a manner to prevent bending, warping, twisting, and surface damage.
 - 1. Store panels vertically with top of panel down, storage of panels horizontally is not permitted.
- F. Store panels covered with suitable weather tight and ventilated covering.
- G. Provide storage of panels to ensure dryness, with positive slope for drainage of moisture.
- H. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.
- I. Remove strippable protective covering from [**aluminum**] [**copper**] or [**stainless steel**] panel prior to installation.
- J. Remove strippable protective covering from [**zinc alloy**] panel only after installation.

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. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before panel fabrication and indicate measurements on Shop Drawings.

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1. Coordinate with construction schedule.

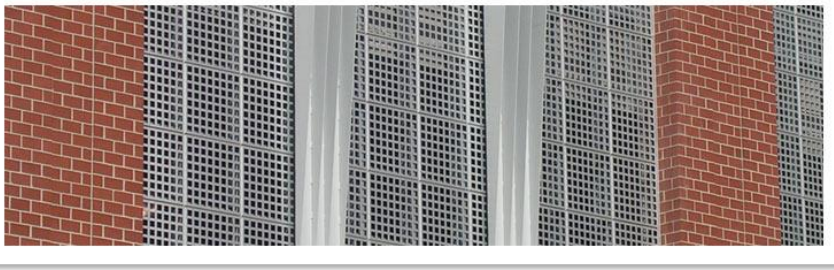
1.11 WARRANTY

- A. See Section 01 7800 - 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 one 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 plate wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Finish Warranty Period: [_____] 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 D2244.
 - 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 D4214.
 - 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 D523.
 - e. Salt Spray, Accelerated: At least 4,000 hours in accordance with ASTM B117.
 - f. Humidity Testing, Accelerated: At least 4,000 hours in accordance with ASTM D2247.
 3. Warranty Coverage: In accordance with AAMA 611 Class 1 anodized aluminum finish requirements.
 - a. Loss of Adhesion: Resists cracking, crazing, flaking, and blistering when forming and welding completed prior to finishing; post forming or welding voids warranty.
 - b. Fading, Loss of Color Retention: Loss of 5 Delta E units (Hunter) or less in accordance with ASTM D2244.
 - c. Chalking, Chalky White Powder on Panel Surface: Chalking at No. 8 or less in accordance with ASTM D4214.
 - d. Salt Spray, Accelerated: At least 3,000 hours in accordance with ASTM B117.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Dri-Design - Wall Panel System; Product Perforated Series
 1. Address: 12480 Superior Ct., Holland, Michigan 49424
 2. P.O. Box 1286 Holland, Michigan 49422-1286
 3. Phone: (616) 355-2970; Fax: (616) 355-2972; Website: www.dri-design.com
- B. Zinc Alloy - Plate Material Supplier.
 1. Umicore Building Products; Product Architectural Zinc, VMZINC®
 2. Address: 3120 Highwoods Blvd.; Suite 104, Raleigh, NC 27604
 3. Phone: (919) 874-7173; Fax: (919) 874-7140; Website: www.vmzinc-us.com
- C. Perforated Series System: Perforated wall panel system that allows for air flow.
 1. Style: **[Flat]** or **[Corrugated]**.



2.02 PERFORMANCE REQUIREMENTS

- A. Metal Plate Wall Panel Assemblies: Comply with performance requirements without failure due to defective manufacturing, fabrication, installation, or other construction defects.
- B. Design, fabricate, and erect a dry joint, [aluminum] [copper] [stainless steel] or [zinc alloy] wall panel system without use of sealants, gaskets, or butyl tape

2.03 MATERIALS - ALUMINUM

- A. Aluminum Plate: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers design requirements.
 - 1. Aluminum Material: Tension-leveled, [flouropolymer PVDF painted finish 3003-H14 manganese alloy] or [anodized finish 5005-AQ manganese alloy].
 - 2. Thickness: 0.080 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] or [Color Anodized Finish].
- B. Panel Depth: 1-1/4 inch, nominal.
- C. Panel Size: As indicated on Drawings.
- D. Panel Joints: As indicated on Drawings.

2.04 MATERIALS – COPPER

- A. Copper Plate: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers performance requirements.
 - 1. Weight: [32 oz per sq ft] or [48 oz per sq ft].
 - 2. Finish: Bright copper.
- B. Panel Depth: 1-1/4 inch, nominal.
- C. Panel Size: As indicated on Drawings.
- D. Panel Joints: As indicated on Drawings.

2.05 MATERIALS – STAINLESS STEEL

- A. Stainless Steel Plate: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers performance requirements.
 - 1. Stainless Steel Material: [Type 304] or [Type 316].
 - 2. Thickness: 18 gage, 0.050 inch (1.27 mm).
 - 3. Finish: No. 4 Bright Polished.
- B. Panel Depth: 1-1/4 inch, nominal.
- C. Panel Size: As indicated on Drawings.
- D. Panel Joints: As indicated on Drawings.

2.06 MATERIALS – ZINC ALLOY

- A. Zinc Alloy Plate: Alloy and temper as recommended by manufacturer for application, Architectural Rolled Zinc, Type 1-Cut from Strip, in accordance with ASTM B69 and manufacturers performance requirements.
 - 1. Thickness: [1.0 mm (0.039 inch)] or [1.5 mm (0.059 inch)].
 - 2. Tensile Strength: Range of 14 to 38 ksi; ASTM B69.
 - 3. Hardness: Range of 54 to 74; in accordance with Rockwell tester for 15T scale; ASTM E18.
- B. Panel Depth: [1-1/4 inch, nominal] [_____] or [As indicated on Drawings].
- C. Panel Size: As indicated on Drawings.
- D. Panel Joints: As indicated on Drawings.
- E. Color:
 - 1. Preweathered Zinc:
 - a. Quartz Zinc, zinc with dark grey aspect.
 - b. Anthra Zinc, zinc with black aspect.
 - 2. Pigmented Preweathered Zinc:
 - a. Pigmento Blue, zinc with blue pigmented aspect.
 - b. Pigmento Red, zinc with red pigmented aspect.
 - c. Pigmento Green, zinc with green pigmented aspect.
 - d. Pigmento Brown, zinc with brown pigmented aspect.
 - 3. AZENGAR® Zinc:
 - a. Engraved zinc with matt aspect.

2.07 FABRICATION

- A. Fabricate and finish wall panels within manufacturer's facilities and fulfill indicated performance requirements demonstrated by laboratory testing.
 - 1. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide post-finishing of panels, paint aluminum wall panels only after completion of panel fabrication and ensure exposed edges are coated.
- C. Provide post anodizing of panels, anodize aluminum wall panels only after completion of panel fabrication and ensure exposed edges are anodic coated without crazing of surface at formed edges.

2.08 FINISHES

- A. Comply with NAAMM's - Metal Finishes Manual for Architectural and Metal Products, for recommendations of designating finishes.
- B. Field Touch-Up Materials: As recommended by coating manufacturer for field application.

2.09 FINISHES - ALUMINUM

- 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.

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4. Four-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat and clear coats. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
- C. Color Anodized Finish: AAMA 611, Architectural Class I, color anodized coating of 0.0007 inch (0.7 mils) minimum thickness.
 1. Color: [**Champagne**] [**Light bronze**] [**Medium bronze**] [**Dark bronze**] [**Extra dark bronze**] [**Black**] [**Copper**] or [_____].
- D. Clear Anodized Finish: AAMA 611, Architectural Class I, clear anodized coating of 0.0007 inch (0.7 mils) minimum thickness.
- E. Field Touch-Up Materials: As recommended by coating manufacturer for field application.

2.10 ACCESSORIES

- A. Metal Plate Wall Panel Accessories: Provide components required for a complete metal plate 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 07 6200.
- D. Panel Fasteners: Designed to withstand design loads, with at least 7/16 inch diameter head and neoprene washer.
 1. [**Aluminum**] [**Stainless Steel**] or [**Zinc Alloy**] Wall Panel Material: Provide stainless steel fasteners, or coated fastener approved by panel manufacturer or project wall consultant.
 2. [**Copper**] Wall Panel Material: Provide copper, stainless steel, or hardware-bronze fasteners, or coated fastener approved by panel manufacturer or project wall consultant.
- 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 gage, 0.0747 inch (1.90 mm) thick.
 3. Refer to Section 05 4000.
- F. Substrate Wall Sheathing: Plywood, PS-1, Grade C-D, Exposure I, at least 5/8 inch thick.
 1. Refer to Drawings and Section 06 1000 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 07 2500 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. Proceed with installation only after unsatisfactory conditions have been corrected.

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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 C754 for gypsum panel type substrates and panel manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install wall panels in accordance with manufacturer's installation instructions, including pressure equalized rainscreen installation method and installation guidelines.
 - 1. Wall panels consist of single sheets of metal formed with interlocking gutter and drainage system integral to the panel with single horizontal attachment for dry-joint rainscreen assembly.
 - 2. Use of secondary drainage channels, brackets, support pins, joint sealants or gaskets to manage the drainage of wall panel system is not permitted.
 - 3. Attach wall panels using progressive interlocking method, engaging bottom of panel in top of previous panel working bottom up, and left to right.
 - 4. Install wall panels with single top attachment in pre-punched holes to allow individual panels to move due to thermal expansion.
 - 5. Do not compromise internal gutter.
 - 6. Installers shall wear gloves and long sleeve shirts to prevent oils on fingers and skin from leaving marks on zinc alloy surfaces.
 - a. Use mineral oil approved by zinc alloy supplier to remove finger prints.
 - 7. To limit damage due to galvanic action on metal panels from water flowing over surfaces, install metals in the following order from top to bottom; aluminum, zinc, galvalume, lead, and copper.
- 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 07 9200.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA - Architectural Sheet Metal Manual.
 - 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.
- 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 extrusion at base course and at cut panel locations.
- 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 07 2500.

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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. Testing Agency: **[Owner will engage]** or **[Engage]** a qualified independent testing agency to perform field tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
- D. Perform additional tests and inspections, at Contractor's expense, to verify compliance of replaced wall panels or necessary additional work with specified requirements.
- E. Prepare test and inspection reports.

3.06 CLEANING

- A. Upon completion of wall panel installation, clean finished surfaces as recommended by panel manufacturer.
- B. Clean zinc surfaces of fingerprints immediately with wall panel manufacturer approved mineral oil.
- C. Upon completion of wall panel installation, clear weep holes and drainage channels of obstructions and dirt.

3.07 PROTECTION

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

END OF SECTION