

## SECTION 07412

### PREFORMED METAL SIDING

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Insulated Metal Siding: Provide nominal 3-1/2 inch thick fluted-profile field-assembled thermal-insulated metal siding to the extent shown.
2. Provide siding in maximum lengths practicable to eliminate or minimize the number of end laps. For walls 30 feet or less in height, provide metal siding in full 1-piece continuous lengths without end laps. For walls over 30 feet in height where end laps are approved, provide die-set ends on sheets for flush overlap.
3. All siding for this project, including exterior sheets, liner panels, subgirts, flashings, copings, trim members, closures, fasteners and other required items, shall be provided by a single manufacturer.

###### B. Related Work Specified in Other Sections

1. Structural steel building framing - Division 5.
2. Miscellaneous metal fabrications - Division 5.
3. Flashing and Sheet Metal – Division 7.
4. Sealant and caulking of joints at perimeter of preformed metal siding abutting other construction – Division 7.
5. Decorative painting of preformed metal siding on the interior of the building - Division 9.
6. Pre-engineered Building – Division 13.

###### C. Related Work Performed Under Other Contracts

1. Structural steel building framing – Structural Steel Contract

##### 1.2 PERFORMANCE REQUIREMENTS

###### A. Design Criteria

1. Provide metal siding having maximum deflection of 1/120 of clear span, per AISI “Specifications for the Design of Light Gage Cold-Formed Steel Structural Members” based on resistance to inward wind pressure and outward suction pressure of not less 20 psf, unless greater wind load value is noted on Drawings.
2. When tested in test chamber of size to accommodate panels equal in height to maximum clear span and approximately 12 feet wide, at each application of pressure for a series of 6 such applications for each test, based on exterior siding sheet, siding shall conform to the following:
  - a. Air Infiltration, per ASTM E 283. Maximum 0.02 cfm per square foot of wall area at air pressure difference of 1.57 lbf/psf.

- b. Water Penetration per ASTM E 331. No visual evidence of water penetration per AAMA 501-83, at air pressure difference of 20% of positive design wind pressure with a minimum of 6.24 lbf/psf.
3. For steel sheet, wherever a specific gage is specified in this Section, followed by a minimum thickness in inches, the minimum inch thickness shall govern, based on bare, uncoated sheet. There shall be no tolerance under the specified minimum inch thickness.

### 1.3 SUBMITTALS

- A. Furnish submittals for items that are identified in this Section by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Division 1 General Requirements for definition of codes for types of submittals and the administrative requirements governing submittal procedure. General submittal requirements pertaining to this Section are specified herein under this Article.
- B. Prepare and submit completely detailed Shop Drawings. Show completely dimensioned structural frame and erection layouts, openings in walls, any special framing details, details at corners, building intersections, expansion joints, trim, and flashing. Also indicate materials, gage or thickness, profiles, widths, lengths, special cuts, locations and types of flexible and metal closures, location and erection of subgirts, typical location and type of fasteners, and information necessary for adjacent work.
- C. Submit, attesting that pressure-release fasteners are designed to fail at pressure specified and that fasteners are FM Approved and Listed.
- D. *Structural Calculations [C]*: If specified manufacturer and product are not submittal, submit structural calculations for preformed metal siding system certifying to its conformance to the design criteria. Calculations and certification shall be prepared by a structural engineer licenses in the State of New York for product substitution.

### 1.4 QUALITY ASSURANCE

- A. Requirements Of Regulatory Agencies
  1. Use materials and methods of installation to produce installed siding that complies with wind load requirements of governmental authorities having jurisdiction, unless different requirements are noted on the Structural Drawings or specified herein.
  2. Use FM Approved and Tested fasteners for securement of siding in areas designated or noted as “pressure-release siding” or “blow-out panels”.
- B. Installer Qualifications: The Work of this Section shall be carried out by an approved installer having specialized in this Work as its primary business for at least 5 years and having performed satisfactorily Work of this type and scope.
- C. Engineer Qualifications: Verification of preformed metal siding systems by a professional engineer licensed in the area of jurisdiction where the project is located and experienced in product systems specified.

- D. ULI classification for use as a component of a non-load bearing metal siding system per ASTM E 119 and indicated by designations in the UL “Fire Resistance Directory”
- E. Provide data from a qualified testing agency of criteria specified in the previous article “Performance Requirements”.
- F. Mockups:
  - 1. At the beginning of the work for each particular type of application, the Contractor shall install the approved metal siding system to a sample area to enable the Owner’s Representative to inspect the Contractor’s methods of installation, workmanship and finished work. The sample areas will be designated by the Owner’s Representative, but will not be less than 50 square feet. Work is to be continued only after the Contractor has received written approval of the inspected sample areas from the Owner’s Representative. All subsequent work shall conform to the approved sample areas in every respect.

## 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store units at the site off the ground and in proper sequence to expedite installation.
- B. Bundles or stacks of metal sheets shall not exhibit any form of sticking between sheets. Apply manufacturer’s standard anti-stick process, or any other suitable system to assure compliance with this anti-stick requirement. Use anti-stick compound or ply that is readily removable and does not adversely affect the finished surfaces.

## 1.6 WARRANTIES

- A. General Warranty: Special warranties specified below shall not negate the Owner’s right that the Owner may have under prevailing local laws, or any other requirements of the Contract Documents. The special warranties specified below are in addition to other warranties and are concurrently applicable to other warranties made by the contractor by other requirements of the Contract Documents.
- B. Polyvinylidene Fluoride Finish Warranty: Furnish to the Owner in an approved form, warranting the polyvinylidene fluoride finish will be nonfacing, nonconvertible, nonchalking, nonblistering, noncracking and permanently a part of the metal surface for a period of twenty years after acceptance of the building. State in the guarantee that any items showing failure during the guarantee period will be replaced or refinished to the original condition, at no cost to the Owner.

## PART 2 PRODUCTS

### 2.1 INSULATED METAL SIDING

- A. System
  - 1. *Insulated Metal Siding [D]*: Provide field-assembled system having an overall nominal thickness of 3-1/2 inches, consisting of 1-1/2 inch deep interior liner panel, 1-1/2 inch

thick thermal insulation, metal subgirts, and 1-1/2 inch deep profiled exterior siding sheet, complete with closures and metal trim.

B. Exterior Siding Sheet

1. Metal and Gage:
  - a. Galvanized steel sheet, 20 gage, design thickness .0358 inch, minimum thickness .034 inch (before any embossing and coating), formed to profile specified.
  - b. Aluminum sheet, minimum .050 inch thick (before embossing and coating), formed to profile specified.
2. Finish on Exterior Side of Exterior Sheet:
  - a. Polyvinylidene Fluoride Finish as specified.
3. Finish on Interior Side of Exterior Sheet:
  - a. Prime Paint Finish as specified.
4. Exterior Sheet Profile: 1-1/2 inch deep, 12 inch wide, concealed-fastener type.
  - a. Centria IW-21A, or other approved manufacturer to match existing building exterior panel profile.

C. Interior Liner Panel

1. Metal and Gage:
  - a. Galvanized steel sheet, 20 gage, design thickness .0358 inch, minimum thickness .034 inch (before any embossing and coating), stucco embossing optional, formed to profile specified.
2. Finish on Exposed Side of Liner Panel:
  - a. Polyester Paint Finish as specified.
3. Finish on Concealed Side of Liner Panel:
  - a. Prime Paint (polyester paint) Finish as specified.
4. Liner Profile: 1-1/2 inch deep, 24 inch wide panels with flat unperforated face, with male and female interlocking nesting edges, female edge factory-calked, of same manufacturer as the exterior siding sheet:
  - a. Centria L-2V or V-Liner 24, or other approved manufacturer to match existing building liner panel.

## 2.2 MATERIALS

- A. Galvanized Steel Sheet: Structural quality per ASTM A 653, Grade 37 minimum, hot-dipped galvanized per ASTM A 924.
- B. Aluminum Sheet: Aluminum Association "Alclad" 3003H154 alloy, per ASTM B 209, with stucco-embossed surface.
- C. Sub-Girts: Minimum 16 gage steel sheet per ASTM A 653, hot-dipped galvanized to Coating Designation G-90, Minimized Spangle and Chemically treated, formed to hat-shape sections or other shapes as standard with siding manufacturer.
- D. Angle Closures: ASTM A 36 steel, hot-dipped galvanized per ASTM A 653 to Coating Designation G-90, Minimized Spangle and Chemically treated, of section sizes and weights to meet project requirements.

- E. Fasteners: Use manufacturer's standard items, but conforming to the following minimum requirements:
  - 1. Exposed Fasteners: Type 305 stainless steel shank, self-drilling or self-drilling and tapping sheet metal screws with stainless steel and neoprene washer, and plastic-coated hex-head or separate head cap to match color of siding. Use 3/4" long for flashings and accessories, 1" or longer as required for siding sheets. Use neoprene washer of 1/32" to 1/16" thick, Shore A durometer of 60 to 90 and with anti-oxident additive.
  - 2. Concealed Fasteners: No. 14 x 1", minimum, cadmium-plated steel self-tapping screws.
- F. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- G. Joint Sealing Material:
  - 1. Sealant Tape: Pressure-sensitive, 100% solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1.2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.
  - 3. For field-sealed joints, use sealant as specified in Sealants And Calking, Division 7.
- H. Thermal Insulation: Un-faced semi-rigid glass fiber insulation Type 1 per ASTM C665, incombustible type with a flame spread rating of 25 or less per ASTM E 84, of same width as liner panel, minimum 1-1/2 inch thick and minimum 1.65 pcf density, to achieve a U-factor thermal insulating value of 0.15 or better.
- I. Protective Coatings:
  - 1. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4 mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- J. Provide siding with factory applied strippable film.

## 2.3 FINISHES

- A. Prime Paint Finish
  - 1. Baked-on Rust-inhibitive Prime Paint: Siding manufacturer's standard finish not less than 0.5 mil dry film thickness (0.2 mil prime and 0.3 mil finish) each side suitable for field painting.
    - a. Provide manufacturer's standard primer color.
    - b. Except color on exposed surfaces shall be "off-white".
  - 2. Finish shall meet the following performance requirements:
    - a. *Salt Spray Test [T]*: When subjected to a salt fog spray test per ASTM B 117 for 250 hours, blistering shall not exceed 5% No. 6 blisters in the field (ASTM D 1654). No more than 1/16" creep corrosion and tape off from area scribed to base metal.

B. Baked Enamel Finish

1. *Baked Enamel Finish [S]*: Siding manufacturers standard finish system, consisting of cleaning, conversion coating, prime coating, and finish coating, with minimum total dry film thickness of 1.0 mil (0.2 mil primer and 0.8 mil finish). Oven-cure prime coat prior to finish coat application. Provide finish coat of acrylic polyester or silicone polyester or equivalent polyester resin coating, factory-applied and oven-cured.
  - a. Provide color to match existing building, per approved samples.
2. Finish shall meet the following performance requirements:
  - a. *Salt Spray Test [T]*: When subjected to a salt spray (fog) test performed per ASTM B 117 for 500 hours, blistering shall not exceed 5% No. 6 blisters in the field (ASTM D 1654). No more than 1/16" creep corrosion and tape off from area scribed to base metal.

C. Polyvinylidene Fluoride Finish (Kynar)

1. *Polyvinylidene Fluoride Finish (Kynar) [S]*: Baked resin finish system to match existing building siding color, consisting of cleaning, conversion coating, prime coating, and finish coating, with minimum total dry film thickness of 1.0 mil (0.2 mil primer and 0.8 mil finish). Oven cure prime coat prior to finish coat application.
2. Provide finish coat containing not less than 70% Kynar 500 or Hylar 5000 resin, factory applied and oven-cured, per specifications and requirements of Kynar or Hylar basic resin manufacturer and coating manufacturer.
  - a. Akzo Coatings Trinar
  - b. Valspar Fluropon
  - c. PPG Duranar
3. Finish Color:
  - a. Finish color to match existing building siding color, per approved samples.
4. *Polyvinylidene Fluoride Finish Performance Requirements [T]*: Finish shall meet the following performance requirements.
  - a. Gloss: Per ASTM D 523; 20 to 30 on 60 degree gloss meter.
  - b. Abrasion Resistance: Per ASTM D 968 with falling sand; coefficient of abrasion average of 70.
  - c. Adhesion: Per ASTM D3359; no finish removal after 1/16 inch cross-hatching to bare metal, impacting to point of metal rupture, and subjecting to application and quick removal of cellophane tape.
  - d. Salt Spray Test: Per ASTM B 117 for 1000 hours; with non or few No. 8 blisters in field and no more than 1/8" creep corrosion.
  - e. Humidity Test: Per ASTM D 2247 at 100% humidity for 1000 hours; no softening or color change, and no blisters.
  - f. Impact Test: Per ASTM D 2794 Gardner Impact tester when subjected to 160 in./lbs. and 9/16 inch ball; no loss of adhesion.
  - g. Color Retention: Per ASTM D2244; maximum of 5 units change.
  - h. Chalk Resistance: Per ASTM D659; minimum rating of 8.

## 2.4 CLOSURES, FLASHING AND TRIM

### A. Closures

1. Closure Strips: Per materials specified in item 2.5.H, provide flexible premolded to fit profile of siding sheet, to seal off voids between siding and adjacent construction, for installation in concealed locations such as at top and bottom ends of siding sheets where shown and where required for weather tightness.
2. Metal Closure Strips: Provide fabricated to profile of siding sheet, to seal off voids between siding and adjacent construction where rubber type closure strips cannot be used. Fabricate of same metal, gage and finish as exterior siding sheets.

### B. Flashings And Trim

1. *Metal Flashing and Trim Members [D]*: Fabricate of same metal, gage and finish as exterior siding sheets. Provide members in minimum 10 foot lengths, with lapped and sealed weathertight expansion-contraction connections between lengths. Incorporate drips at lower edge of members exposed to rain run-off. Hem or double-back exposed free edges to engage separate slip-type clips.
2. Fabricate flashing and trim members to provide a complete neat-appearing finished weathertight installation, including the following:
  - a. Trim at external and internal corners of siding.
  - b. Trim at top and bottom edges of siding.
  - c. Jamb, head, and sill closure trim at all openings such as doors, windows, louvers, etc.
  - d. Trim at building wall expansion joints.
  - e. Metal copings at roof top edge of siding.
  - f. Metal scuppers and trim for same.
  - g. Downspouts where shown.
3. *Flashings, Copings, Scuppers, and Downspouts [D]*: Fabricate items as shown, per applicable requirements of SMACNA "Architectural Sheet Metal Manual", and approved shop drawings.
4. Provide trim sheets with strippable film on face side.

- ### C. Corners: Corners shall be fabricated from flashing material matching siding and fastened with pop rivets.

## 2.5 DISSIMILAR MATERIALS ISOLATION

- ### A. Where aluminum comes in contact with other materials and metals, insulate the contact surfaces of aluminum. Use aluminum bituminous coating, brushable non-hardening butyl coating, insulating tape or other system standard with the siding manufacturer and approved by the Owner's Representative.

## PART 3 EXECUTION

### 3.1 INSTALLATION

#### A. General

1. Field erect this work per approved Shop and Erection Drawings, the published instructions and safety precautions of the manufacturer, as shown, and as specified in this Section.
2. Furnish and install clip angles, clips and similar retainer or fastener items to precast concrete, masonry and structural framing, as required for installation of this work.
3. Erect sheets true and plumb, in alignment with horizontal and vertical edges of the building, and anchor securely in place. Install all work to allow for thermal movement. Protect sheets from damage due to abuse or undue impact; do not install sheets that are bent, dented, chipped and otherwise defective.
4. Where sheets terminate at door frames or other opening frames, provide sheet metal jamb trim. Install sheets with over-lap side joints with lap leeward of the prevailing wind, and with not less than 1 full lap. Install exterior siding with end lap to match offset end lap as standard with the manufacturer, but not less than 2 inches.
5. Install exposed fasteners and perform button-punching to produce, neat, straight horizontal rows of uniformly spaced fasteners. Use concealed fasteners where possible; limit exposed fasteners to approved locations.
6. Welding of metal panel siding to wall framing is not permitted.

#### B. Insulated Metal Siding

1. Fasten interior liner panels at not over 12 inches O.C. to exterior side of structural supports, with flat face against supports, per manufacturer's printed directions. Butt ends of sheets together.
  - a. At interlocking side joints: Force male and female edges of adjacent sheets together to provide a tight seal of the factory-installed joint sealing material.
  - b. At overlapping side joints: Apply sealant between overlaps of adjacent sheets to provide a tight seal.
2. Install sub-girts at siding manufacturer's indicated spacing but at not over 48 inches o.c. Secure subgirts to legs of interior liner sheet with siding manufacturer's recommended fastening system. If fasteners are exposed on the interior of the building, cap with caps of color to match color of interior liner sheet.
3. Fasten the exterior sheets to subgirts at spacing recommended by the siding manufacturer. Provide additional fasteners in side laps to secure adjacent sheets to each other, as recommended by the siding manufacturer but at not over 48 inches o.c. Do not expose fasteners in the interior of the building.
  - a. Seal overlap joints with a continuous bead of sealant.
  - b. Seal interlocking joints by inserting male rib into female rib to effect a seal of the factory-installed joint sealing material.

#### C. Closures, Flashing, And Trim

1. Install all closures, flashing and trim as required to produce a neat, finished, weathertight installation. Provide proper sealant-sealed end laps in all long runs to allow for thermal movement and to remain weathertight. Secure all such members per manufacturer's

recommendations, but at minimum 12 inches o.c. Bed exposed flashing and trim, and members subject to rain penetration, in sealant.

- a. Copings: Install at top edge of siding as shown. Secure hemmed free edges by hooking over concealed continuous metal cleats. Secure back edge to wall by approved means. Lap and seal all joints.
  - b. Scuppers: Construct in siding as indicated.
  - c. Wall Expansion Joints: Install metal trim at joints as required.
  - d. Downspouts: Install where and as shown; lap joints in direction of flow. Secure downspouts to wall. Seal all joints.
2. Install premolded closures at top and bottom ends of siding materials, at cap flashings, and above sill or ledge flashings to keep building weathertight; and, vermin and insect protected.
  3. Set closures in place with a dab of sealant to keep closure from falling out when metal flexes.
  4. Remove strippable film from siding as sheets are installed.

### 3.2 CLEANING AND TOUCH-UP PAINTING

- A. Upon completion of siding installation, clean all surfaces of siding so as to be free from mud, dirt, abrasions and other surface blemishes. Re-finish all abraided surfaces to match finish, using materials and methods as recommended by the siding manufacturer and that are fully compatible with the original finish system. Repaired surfaces shall be uniform and free from variations in color and surface texture from that of adjacent, like surfaces. If repaired sheet is not acceptable to Owner's Representative, remove sheet and replace with a new sheet.

END OF SECTION

Revision History	
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