SECTION 07412

METAL WALL PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes fabricated, field-assembled, concealed-fastener, lap-seam metal wall panels.

B. Related Sections include the following:
1. Division 5 Section "Cold-Formed Metal Framing" for secondary support framing supporting metal wall panels.
2. Division 6 Section "Rough Carpentry" for building paper behind metal wall panels and for pressure-treated blocking supporting metal wall panels at concrete and masonry walls.
3. Division 7 Section "Flashing and Sheet Metal" for roof edge strip, copings, flashings and other sheet metal work not part of metal wall panel assemblies.
4. Division 7 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.03 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide metal wall panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

B. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.04 SUBMITTALS

A. General: Submit in accordance with Section 01300.

B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory. Include storage and handling requirements and recommendations and installation methods.

C. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work. Details shall be at a scale not less than 1-1/2 inches per 12 inches.
1. Identify material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
4. Details of connections to adjoining work.

D. Samples: For each type of exposed finish required, prepared on Samples of size indicated below.
   1. Metal Wall Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal wall panel accessories.
   2. Fabricated Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.

E. Qualification Data: For Fabricator.

F. Qualification Data for Installer: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

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

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm with not less than 5 years experience in producing formed metal panels similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units and install them. Fabricator shall have a computer controlled metal break for forming metal panels and associated flashings.

B. Source Limitations: Obtain each type of metal used for fabricating wall panels and associated trim and flashings through one source from a single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Fabricated Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

E. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical window flashing system, including supporting construction cleats, seams, attachments, and accessories, around entire perimeter of window, showing quality of workmanship and the interface of air/vapor barrier, window flashing, counterflashing and tie-ins.
      a. Mockup shall be at Window 17 on south elevation of building.
      b. Complete mockup for review at preinstallation conference.
   2. Approval of mockups is for other material and construction qualities specifically approved by Architect in writing.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
   4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
   1. Meet with Owner, Architect, metal wall panel Fabricator/Installer, structural-support Installer, and installers whose work interfaces with or affects metal wall panels including installers of wood siding, 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 wall panel installation, including metal manufacturer's written instructions for handling zinc alloy materials.
   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 will affect metal wall panels.

6. Review temporary protection requirements for metal wall panel assembly during and after installation.
7. Review wall panel observation and repair procedures after metal wall panel installation.
8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection from dirt, road grime, and similar soiling and weather affects during transportation and handling.

B. Handling: Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage. Cover fork truck tines and use protected rigging lifting devices to protect panels from marring and damage.
1. Personnel handling materials shall wear clean gloves.

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

1.07 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturers' written instructions and warranty requirements.

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

1.08 COORDINATION

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.02 FABRICATOR AND INSTALLER

A. Metal Siding Fabricator:
1. Coastal Metal Service, 1120 W. Chestnut Street, Brockton, MA 02301; Contact: Chip McGowan, 508-580-8430.
2. Titan Roofing, Inc.; Contact: Bill Bernhardt, 413-536-1624.

B. Flashing and Trim Fabricator and Installer: LYMO Construction Co., Inc.; Contact: Dan Nadeau, (603) 626-8800.

2.03 PANEL MATERIALS

A. Zinc Sheet: Electrolytic, 99 percent pure zinc alloyed with 1 percent titanium and copper.
   1. Finish: Preweathered finish on front side and a protective, isolating coating on the back side.
   2. Products:
      a. Preweathered ProRoofing; Rheinzink America Inc.
      b. Quartz-Zinc with VM Zinc Plus; VM Zinc.

B. Aluminum Sheet (For Flashing, Soffit and Trim at Wood Siding): ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
   1. Anodized Finish: Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

C. Panel Sealants:
   1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
   2. Joint Sealant: ASTM C 920; elastomeric sealant; 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.
      a. Dow 795 with Dow Ethafoam SB backer rod.

D. Barrier Strip: ASTM D 1970, minimum of 40 mils thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied.
   1. Products:
      a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; Dri-Start "HR."
      b. Grace, W. R. & Co.; Vycor Ultra.

2.04 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating.
   1. Fasteners for Wall Panels: Self-drilling or self-tapping 410 stainless steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
   2. Exposed Fasteners: Stainless steel.
   3. Fasteners for Flashing and Trim: Stainless steel blind fasteners or self-drilling screws with hex washer head.
   4. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2.05 CONCEALED-FASTENER, METAL WALL PANELS

A. General: Fabricate metal wall panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for installation.

B. Reveal-Joint, Concealed-Fastener Metal Wall Panels: Formed with vertical panel edges and flat pan between panel edges; with narrow reveal joint between panels.
   1. Panel Thickness: Not less than 0.032 inch
   2. Panel Coverage: 8 inches.
   3. Panel Height: 1.0 inch.
   4. Reveal Joint: 3/8 inch (9.5 mm) wide.

2.06 ACCESSORIES

A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, sills, corner units, clips, flashings, sealants, gaskets, fillers, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.

B. Flashing and Trim (In Conjunction with Zinc Siding): Fabricate from preweathered zinc sheet with protective coating on back; material shall be not less than 0.0275 inch thick, 24 gage, unless otherwise noted. Provide flashing and trim 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, caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels.
   1. Hem edges of all metal accessories, concealing raw edges and back of sheets.

C. Flashing and Trim (In Conjunction with Wood Siding): Fabricate from aluminum sheet; material shall be not less than 0.040 inch thick, unless otherwise noted. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, framed openings, caps, soffits, reveals, and fillers.
   1. Hem edges of all metal accessories, concealing raw edges and back of sheets.

2.07 FABRICATION

A. General: Custom fabricate sheet metal wall panels, trim, flashing, and accessories to comply with the details shown, the recommendations in SMACNA's "Architectural Sheet Metal Manual," and the recommendations of the metal manufacturer regarding design, dimensions, geometry, metal thickness, and other characteristics of installation indicated.

B. Fabricate metal wall panels and accessories at the fabrication shop to greatest extent possible. Comply with indicated profiles and with dimensional and structural requirements. Fabricate metal wall panels, trim, flashing and accessories using a computer controlled metal break for uniform profiles.
   1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.

C. Fabricate sheet metal wall panels, trim, and flashing to allow for expansion in running work sufficient to prevent buckling, damage, and deterioration of the Work. Form exposed sheet metal work to fit over substructure without excessive oil canning, buckling, and tool marks, true to line and levels indicated.

D. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with non-acidic sealant (concealed within joints).

E. Fabricate metal wall panels in one-piece, full-length sections without transverse seams, unless otherwise indicated.

F. Formed Sheet Metal Trim and Flashing: Provide the following special trims and flashings in addition to those required for a complete system:
   1. Corner Trim: SMACNA, similar to Figure 6.35A; one-piece corner to profile indicated; match zinc material and gage of panels.
   2. Ledge Flashing: Formed to detail with continuous edge clip; joint detail per Table 3-1, joint style J-10 and edge style E1; continuous barrier strip over blocking and down onto face of wall with coping edges lapped down to cover barrier strip; coping sloped to exterior of building; zinc, 0.0275 inch thick, 24 gage, minimum.
   3. Box Base Flashing: Formed to detail with continuous edge clip; zinc, 0.032 inch thick, 22 gage, minimum.
   4. Window Perimeter Flashing: Formed to detail; aluminum, 0.040 inch thick minimum, clear anodized finish, unless otherwise noted.
      a. Flashing at Window 17 shall be zinc, not less than 0.0275 inch thick, 24 gage.
      b. Note: Do not use zinc material in conjunction with red cedar siding. Materials are not compatible.
      c. Seal corners and laps to be permanently water tight. Coordinate proper tie into air/vapor barrier for a weather tight installation.
   5. Soffit Trim: Formed to detail; aluminum, 0.040 inch thick minimum, clear anodized finish.
   6. Louver Perimeter Flashing: Shop formed to detail, zinc, 0.0275 inch thick, 24 gage, minimum.
   7. Miscellaneous Flashing: Shop formed to detail, and as follows:
      a. Where Zinc Siding or Masonry is Adjacent Substrate: Zinc, 0.0275 inch thick, 24 gage, minimum.

b. Where Wood Siding is Adjacent Substrate: Aluminum, 0.040 inch thick minimum, clear anodized finish.
c. Note: Do not use zinc material in conjunction with red cedar siding. Materials are not compatible.

8. Roof edge strip, coping and scuppers specified in Section 07620.

G. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Flashing and trim shall be fabricated in 8 to 10 foot lengths.
2. Hem edges of all metal accessories, concealing raw edges and back of sheets.
3. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
4. Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
5. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
6. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
7. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.
   a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.08 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

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

C. 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 the 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.

PART 3 - EXECUTION

3.01 EXAMINATION

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

1. Examine primary and secondary 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 metal wall panel fabricator.
2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel fabricator.
3. If unacceptable conditions are encountered, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

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

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."
   1. Install sheet metal flashing and trim with minimum number of joints practical, using shop fabricated full-length pieces. Provide one piece flashing and trim using full-length pieces without joints where run is less than the 8 to 10 foot fabricated lengths. Do not use pieces less than 24 inches long.
      a. Sill Flashing at Openings: Provide one piece flashing, full width of opening except where opening exceeds available fabricated lengths. Provide sealed metal end dams at ends of sills. Sill flashings shall turn up on back side to form pan, directing water to the exterior. Coordinate required depth for turning up back leg with the aluminum store from subcontractor.

3.03 METAL WALL PANEL INSTALLATION, GENERAL

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to z-furring, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Field cutting of metal wall panels by torch is not permitted.
   2. Shim or otherwise plumb substrates receiving metal wall panels.
   3. Install barrier strips where wall panels will contact pressure-treated wood, non-galvanized steel, or cementitious construction.
   4. Rigidly fasten metal wall panels and allow end free movement due to thermal expansion and contraction.
   5. Install screw fasteners in predrilled holes.
   6. Locate and space fastenings in uniform vertical and horizontal alignment.
   7. Install flashing and trim as metal wall panel work proceeds.
   8. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

B. Fasteners: Use stainless-steel fasteners.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel fabricator. Do not use asphalt-saturated organic felt as a separator in conjunction with zinc fabrications.

3.04 FIELD-ASSEMBLED METAL WALL PANEL INSTALLATION

A. Metal Wall Panels: Fasten metal wall panels to supports with fasteners at each furring member.
   1. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Install panels in 10 foot lengths with expansion space between ends. Providing backer plate behind joints. Stager end joints at least 3 feet vertically, separating joints horizontally buy not less than 3 panels.

3.05 ACCESSORY INSTALLATION

A. General: 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 wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, SMACNA's "Architectural Sheet Metal Manual," and approved Shop Drawings. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
   1. Install exposed flashing and trim that is without excessive oil canning, 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 to result in waterproof and weather-resistant performance.

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

3.06 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4 inch in 20 feet, nonaccumulative, on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.07 CLEANING AND PROTECTION

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

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

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

END OF SECTION