SECTION 05 75 00 – DECORATIVE FORMED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the work of this Section in accordance with requirements of the Contract Documents.

B. Section Includes:

1. Aluminum closure and trim **MTL-01.**
2. Stainless steel panels, closures and trim **MTL-02**.
3. Stainless steel base **MB-01**.
4. Stainless steel millwork finish **MTL-03**.
5. Stainless steel sheet finish at columns
6. Metal plate column panel and trim panels **MTP-02**

C. Related Requirements:

1. Division 08, Section 08 44 13 “Glazed Aluminum Curtain Walls”.

1.2 ACTION SUBMITTALS

A. Product Data: Technical data for each type of product including finishing materials.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
    a. Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
    b. Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
        1) Include statement indicating costs for each product having recycled content.
    c. Regional Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.
        1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.
2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010 or v1.2 2017, using the applicable exposure scenario.
    a. For paints, and coatings, wet applied, include printed statement of VOC content, showing compliance with the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure for Architectural Coatings or the South Coast Air Quality Management District (SCAQMD) Rule 1113-2011.
    b. Adhesives and Sealants: For wet applied on-site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005, and rule amendment date of January 7, 2005.

C. Shop Drawings: Show fabrication and installation details for decorative formed metal.

1. Include plans, elevations, component details, and attachment details.
2. Indicate materials and profiles of each decorative formed metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

D. Samples: Submit samples for each type of exposed finish required, prepared on 6 inch (150 mm) square Samples of metal of same thickness and material indicated for the work.

E. Fabrication Engineering and Design Data Submittal: Submit for installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For decorative formed metal elements that house items specified elsewhere. Show dimensions of housed items, including locations of housing penetrations and attachments, and necessary clearances.

B. Qualification Data: Submit data for Installer, fabricator, organic coating applicator, anodic finisher, powder coating applicator, and professional engineer; when applicable.

C. Evaluation Reports: Submit ICC-ES reports for post installed anchors.

D. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Environmental Product Declarations

    a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.

2. Building Product Disclosure and Optimization - Material Ingredients

    a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

        1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
        2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
        3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
        4) Living Product Challenge
        5) Product Lens Certification
        6) USGBC approved program.

    b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:

        1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
        2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better

3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Entity having minimum 5 years documented experienced in producing decorative formed metal similar and sufficient production capacity to produce required units.

B. Installer Qualifications: Fabricator of products.

C. Mockups: Build mockups to verify selections, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups for the following types of decorative formed metal:

a. Each type of custom corner guards and end wall enclosure.
b. One (1) column clad with stainless steel sheet including finished base.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver decorative formed metal products wrapped in protective coverings and strapped together in suitable packs or in heavy duty cartons. Remove protective coverings before staining occurs or bonding to finished surfaces.

B. Store products on elevated platforms in a dry location.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, columns, beams, and construction contiguous with decorative formed metal by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fabrication Engineering and Design Data: Engage a qualified professional engineer, as defined in Section 01 33 16, “Fabrication Engineering Design Data,” to design decorative formed metal with attachment to building construction complying with requirements.

B. Structural Performance: Decorative formed metal items, including anchors and connections, shall withstand the effects of gravity loads and the following loads and stresses without

exceeding the allowable design working stress of materials involved and without exhibiting permanent deformation in any components:

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.

2.2 SHEET METAL

A. Low-Emitting Materials:

1. Architectural paints and coatings wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
2. All paints and coatings wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01, Section 01 81 13 "Sustainable Design Requirements - LEED v4 BD+C."
3. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
4. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01, Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."

B. Fabricate products from sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

C. Aluminum Sheet: Flat sheet complying with ASTM B209/B209M, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties of not less than Alloy 5005-H32.

D. Aluminum Plate: Comply with ASTM B209/B209M, alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards. Minimum aluminum yield strength shall be as required to comply with performance requirements, but not less than 25,000 psi.

E. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher leveled standard of flatness.

F. Miscellaneous Materials:

1. Gaskets: As required to seal joints in decorative formed metal and remain; as recommended in writing by decorative formed metal manufacturer.
    a. ASTM D 1056, Type 1, Class A, grade as recommended by gasket manufacturer to obtain seal for application indicated.
    b. Closed cell polyurethane foam, adhesive on two sides, release paper protected.
2. Sealants, Exterior: Elastomeric sealant complying with Section 07 92 00 “Joint Sealants” and as recommended in writing by decorative formed metal manufacturer.
3. Sealants, Interior: Nonsag, paintable sealant complying with Section 07 92 00 “Joint Sealants” and as recommended in writing by decorative formed metal manufacturer.
4. Filler Metal and Electrodes: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded or brazed and as necessary for strength, corrosion resistance, and compatibility in fabricated items.

a. Use filler metals matching color of metal being joined and will not cause discoloration.

5. Fasteners: Fabricated from same basic metal and alloy as fastened metal unless otherwise indicated. Do not use metals that are incompatible with materials joined.
   a. Provide concealed fasteners for interconnecting decorative formed metal items and for attaching them to other work unless exposed fasteners are unavoidable or are the standard fastening method; and approved by the Architect during Submittals review.
   b. Provide tamper resistant flat head machine screws for exposed fasteners unless otherwise indicated.
6. Structural Anchors: For applications indicated to comply with certain design loads, provide fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
7. Nonstructural Anchors: For applications not indicated to comply with design loads, provide fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
8. Anchor Materials:
   a. Material for Interior Locations: Carbon steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
   b. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
9. Backing Materials: Provided or recommended by decorative formed metal manufacturer.
10. Laminating Adhesive: Adhesive recommended by metal fabricator that fully bonds metal to metal, will prevent telegraphing and oil canning, and is compatible with substrate and noncombustible after curing.
11. Isolation Coating: Alkali resistant coating.

2.3 FABRICATION

A. Shop Assembly: Preassemble decorative formed metal items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Coordinate dimensions and attachment methods of decorative formed metal items with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.

C. Form metal to profiles indicated, in maximum lengths to minimize joints. Produce flat, flush surfaces without cracking or grain separation at bends. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch- (12-mm-) wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch (1 mm) and support with concealed stiffeners.

D. Increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as needed to provide surface flatness equivalent to stretcher leveled standard of flatness and sufficient strength for indicated use.

   1. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.

E. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce decorative formed metal items as needed to attach and support other construction.

F. Provide support framing, mounting and attachment clips, splice sleeves, fasteners, and accessories needed to install decorative formed metal items.

G. Where welding or brazing is indicated, weld or braze joints and seams continuously. Grind, fill, and dress to produce smooth, flush, exposed surfaces in which joints are not visible after finishing is completed.

1. Use welding and brazing procedures that will blend with and not cause discoloration of metal being joined.

2.4 CLOSURES AND TRIM

A. Custom Enclosure and Trim: Form closures and trim from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction.

1. Aluminum Sheet: 0.063 inch (1.60 mm), minimum, and thickness required to comply with performance requirements.

a. **MTL-01** Finish: Moz Classic Anodized look finish to match American Airline Blue (C-100. M-35. Y-0. K-0.).

2. Stainless Steel Sheet: 0.062 inch (1.59 mm), minimum thickness; thickness as required to comply with performance requirements.

a. **MTL-02** Finish: Moz Classic Stainless Steel, Finish No. 4.

3. Closures and trim may be fabricated from prefinished metal sheet in lieu of finishing after fabrication provided unfinished edges are concealed from view and not exposed to weather. Metal to be mudded to smooth finish prior to finishing.

B. Conceal fasteners where possible; otherwise, locate where inconspicuous as possible. Size fasteners to support closures and trim, with fasteners spaced to prevent buckling or waviness in finished surfaces.

C. Drill and tap holes needed for securing closures and trim to other surfaces.

D. Incorporate gaskets where indicated or needed for concealed, continuous seal at abutting surfaces.

E. Miter or cope trim members at corners and reinforce with bent metal splice plates to form tight joints.

2.5 METAL BASE MB-01

A. Form metal base from metal of type and thickness indicated:

1. Stainless Steel Sheet:

a. Thickness: 0.050 inch (1.27 mm).
b. Finish: No. 4.
c. Height: As indicated on Drawings.

2.6 METAL FINISH, MILLWORK MTL-03

A. Form metal from metal of type and thickness indicated:

1. Stainless Steel Sheet:

a. Thickness: 0.050 inch (1.27 mm).
b. Finish: No. 4.

2.7 METAL PLATE COLUMN PANEL AND TRIM PANELS MTP-02

A. Form metal panels and trim of type and thickness indicated:

1. Aluminum Plate:

a. Thickness: 1/8 inch (3.2 mm)
b. Finish: Two-coat fluoropolymer finish system consisting of corrosion inhibitive primer and fluoropolymer color coat complying with AAMA 2604, with suspended mica flakes for mica colors, containing not less than 50 percent PVDF resin by weight in color coat in not less than 1.2 mils dry thickness. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
c. Color and Gloss: To match **EWS-01A** specified in Section 08 44 13 “Glazed Aluminum Curtain Walls”.

2.8 FINISH REQUIREMENTS

A. Complete mechanical finishes of flat sheet metal surfaces before fabrication where possible. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match sheet finish.

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

C. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.

D. Finish items indicated on Drawings after assembly.

E. 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.

F. Aluminum Finishes: Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

1. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
2. High Performance Organic Finish: Two coat fluoropolymer finish complying with AAMA 2604 and containing not less than 50 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Color and Gloss: Selected by Architect.

G. Stainless Steel Finishes:

1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
3. Directional Finishes: Run grain of directional finishes with long dimension of each piece.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and conditions affecting performance of decorative formed metal. Proceed with installation after correcting unsatisfactory conditions.

3.2 INSTALLATION

A. Locate and place decorative formed metal items level and plumb and in alignment with adjacent construction. Perform cutting, drilling, and fitting required to install decorative formed metal.

1. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where needed to protect metal surfaces and to make a weathertight connection.

C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers as indicated.

D. Install concealed gaskets, joint fillers, insulation, sealants, and flashings, as the work progresses, to make exterior decorative formed metal items weatherproof.

E. Install concealed gaskets, joint fillers, sealants, and insulation, as the work progresses, to make interior decorative formed metal items soundproof or lightproof as applicable to type of fabrication indicated.

F. Corrosion Protection: Apply bituminous paint or other permanent separation materials on concealed surfaces where metals would otherwise be in direct contact with substrate materials that are incompatible or could result in corrosion or deterioration of either material or finish.

G. Provide plywood backing for **MTL-01** and **MTL-03** as indicated on drawings.

3.3 ADJUSTING AND CLEANING

A. Unless otherwise indicated, clean metals by washing thoroughly with water and soap, rinsing with clean water, and drying with soft cloths.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0 mil (0.05 mm) dry film thickness.

C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 90 00 “Painting”.

D. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.4 PROTECTION

A. Protect finishes of decorative formed metal items from damage during construction period. Remove temporary protective coverings at time of Substantial Completion.

END OF SECTION