SECTION 057500 - DECORATIVE FORMED METAL

GENERAL

SUMMARY

Section Includes:

- Beam wraps.
- Closures and trim.
- Decorative-metal-clad doors and frames.
- Escalator enclosures.
- Filler panels.
- Lighting coves.
- Metal base.
- Mullion cladding.
- Pipe system covers.
- Pockets for window treatment.
- Window stools.

Related Requirements:

- Section 057000 "Decorative Metal" for decorative items made primarily from plate, bars, extrusions, tubes, castings, and other forms of metal, but which may include sheet metal components.
- Section 076100 "Sheet Metal Roofing" for items made of formed metal for roofing.
- Section 076200 "Sheet Metal Flashing and Trim" for items made of formed metal for flashings and trim.
- Section 077100 "Roof Specialties" for items made of formed metal for parapets and copings.

COORDINATION

Coordinate installation of anchorages for decorative formed metal items. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

Coordinate installation of decorative formed metal with adjacent construction to ensure that wall assemblies, flashings, trim, and joint sealants, are protected against damage from the effects of weather, age, corrosion, and other causes of deterioration.

PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

ACTION SUBMITTALS

Product Data: For each type of product, including finishing materials.

Sustainable Design Submittals:

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

- Include plans, elevations, component details, and attachment details.

Indicate materials and profiles of each decorative formed metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

Samples for Initial Selection: For products involving selection of color, texture, or design[**, including mechanical finishes**].

Samples for Verification: 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.

Delegated Design Submittal: 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.

INFORMATIONAL SUBMITTALS

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

Qualification Data: For [Installer] [fabricator] [organic-coating applicator] [anodic finisher] [powder-coating applicator] [and] [professional engineer].

Mill Certificates: Signed by stainless steel manufacturers certifying that products furnished comply with requirements.

Evaluation Reports: For post-installed anchors, from ICC-ES.

CLOSEOUT SUBMITTALS

Maintenance Data: For [mirrorlike stainless steel finish] [and] [statuary conversion coating copper-alloy finish] to include in maintenance manuals.

QUALITY ASSURANCE

Fabricator Qualifications: A firm experienced in producing decorative formed metal similar to that indicated for this Project and with a record of successful in-service performance as well as sufficient production capacity to produce required units.

Organic-Coating Applicator Qualifications: A firm experienced in successfully applying organic coatings of type indicated to metals of types indicated and that employs competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.

Anodic Finisher Qualifications: A firm experienced in successfully applying anodic finishes of type indicated and that employs competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.

Powder-Coating Applicator Qualifications: A firm experienced in successfully applying powder coatings of type indicated to metals of types indicated and that employs competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.

Installer Qualifications: Fabricator of products.

Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

Build mockups for the following types of decorative formed metal:

<Insert, in separate subparagraphs, description of each decorative metal type including mockup size>.

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

DELIVERY, STORAGE, AND HANDLING

Deliver decorative formed metal products wrapped in protective coverings and strapped together in suitable packs or in heavy-duty cartons. Remove protective coverings before they stain or bond to finished surfaces.

Store products on elevated platforms in a dry location.

FIELD CONDITIONS

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

PART 2 - PRODUCTS

SOURCE LIMITATIONS

For decorative metal items, obtain each color, grade, finish, type, and variety of metal from single source with resources to provide products of consistent quality in appearance and physical properties.

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design decorative formed metal, including attachment to building construction.

Structural Performance: Decorative formed metal items, including anchors and connections, are to 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:

Wind Loads on Exterior Items: [As indicated on Drawings] [**20 lbf/sq. ft. (957 Pa)**] [**30 lbf/sq. ft. (1436 Pa)**] <Insert specific loads>.

Seismic Performance: Exterior decorative formed metal items, including anchors and connections, are to withstand the effects of earthquake motions determined according to [**ASCE/SEI 7**] <**Insert requirement**>.

Component Importance Factor: 1.0.

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.

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

SHEET METAL

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

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Aluminum Sheet: Flat sheet complying with ASTM B209 (ASTM 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.

Galvanized-Steel Sheet: ASTM A653/A653M, G90 (Z275) coating, either commercial steel or forming steel.

Steel Sheet: [Uncoated, cold-rolled, ASTM A1008/A1008M, commercial steel, exposed] [or] [electrolytic zinc-coated, ASTM A879/A879M, with steel sheet substrate complying with ASTM A1008/A1008M, commercial steel, exposed].

Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, [**Type 304**] [**Type 316**], stretcher-leveled standard of flatness.

Bronze Sheet: ASTM B36/B36M, Alloy UNS C28000 (muntz metal, 60 percent copper) or Alloy UNS C23000 (red brass, 85 percent copper).

Brass Sheet: ASTM B36/B36M, Alloy UNS C26000 (cartridge brass, 70 percent copper).

Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 temper.

Titanium Sheet: ASTM B265, Grade 1.

MISCELLANEOUS MATERIALS

Gaskets: As required to seal joints in decorative formed metal and remain [**airtight**] [**weathertight**]; as recommended in writing by decorative formed metal manufacturer.

ASTM D1056, Type 1, Class A, grade as recommended by gasket manufacturer to obtain seal for application indicated.
Closed-cell polyurethane foam, adhesive on two sides, release paper protected.

Sealants, Exterior: Elastomeric sealant complying with Section 079200 "Joint Sealants" and as recommended in writing by decorative formed metal manufacturer.

Sealants, Interior: Nonsag, paintable sealant complying with Section 079200 "Joint Sealants" and as recommended in writing by decorative formed metal manufacturer.

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.

Use filler metals that will match the color of metal being joined and will not cause discoloration.

Fasteners: Fabricated from same basic metal and alloy as fastened metal unless otherwise indicated. Do not use metals that are incompatible with materials joined.

Provide concealed fasteners for interconnecting decorative formed metal items and for attaching them to other work unless [**otherwise indicated**] [**exposed fasteners are unavoidable or are the standard fastening method**].
Provide [**Phillips**] [**tamper-resistant**] [**square or hex socket**] flat-head machine screws for exposed fasteners unless otherwise indicated.

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**].

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**].

Anchor Materials:

Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941 (ASTM F1941M), Class Fe/Zn 5, unless otherwise indicated.
Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy [**Group 1 (A1)**] [**Group 2 (A4)**] stainless steel bolts, ASTM F593 (ASTM F738M), and nuts, ASTM F594 (ASTM F836M).

Sound-Deadening Materials:

Insulation: Unfaced, mineral-fiber blanket insulation complying with ASTM C665, Type I, and passing ASTM E136 test.
Mastic: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

Backing Materials: Provided or recommended by decorative formed metal manufacturer.

Laminating Adhesive: Adhesive recommended by metal fabricator that will fully bond metal to metal, will prevent telegraphing and oil-canning, and is compatible with substrate and noncombustible after curing.

Isolation Coating: Manufacturer's standard [alkali-resistant coating] [bituminous paint] [epoxy coating].

PAINTS AND COATINGS

Etching Cleaner for Galvanized Metal: Product formulated to remove grease and oil residue from metal surfaces and provide a clean, lightly etched surface to promote adhesion of coatings.

Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

Lacquer for Copper Alloys: Clear, acrylic lacquer specially developed for coating copper-alloy products.

Shop Primers: Comply with [Section 099113 "Exterior Painting."] [Section 099123 "Interior Painting."] [Section 099600 "High-Performance Coatings."]

Universal Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer compatible with topcoat.

Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

Epoxy Zinc-Rich Primer: Compatible with topcoat.

Shop Primer for Galvanized Steel: [Cementitious galvanized metal primer] [Vinyl wash primer] [Water-based galvanized metal primer].

Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

FABRICATION, GENERAL

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.

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.

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.

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.

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

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.

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

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.

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

BEAM WRAPS

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form beam wraps from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction.

Aluminum Sheet: [**0.063 inch (1.60 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Steel Sheet: [**0.060 inch (1.52 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

Stainless Steel Sheet: [**0.050 inch (1.27 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

Fabricate with calk stop angle to retain backer rod and sealant.

CLOSURES AND TRIM

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form closures and trim from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction[**, with weathertight joints at exterior installations**].

Aluminum Sheet: [**0.063 inch (1.60 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Steel Sheet: [**0.048 inch (1.21 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

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.

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

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

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

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

DECORATIVE-METAL-CLAD DOORS AND FRAMES

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Laminate metal sheets, of type and thickness indicated below, to faces of [**hollow-metal doors and frames**] [**and**] [**elevator entrances**] where indicated. Use adhesive that will fully bond metal to metal and that will prevent telegraphing and oil-canning.

Bronze Sheet: [**0.040 inch (1.02 mm)**] <Insert thickness>.

Finish: [Buffed finish, lacquered] [Hand-rubbed finish, lacquered] [Statuary conversion coating over satin finish, lacquered].

Brass Sheet: [**0.040 inch (1.02 mm)**] <Insert thickness>.

Finish: [Buffed] [Hand-rubbed] finish lacquered.

Stainless Steel Sheet: [**0.038 inch (0.95 mm)**] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

Titanium Sheet: [**0.025 inch (0.64 mm)**] <Insert thickness>.

Finish: [Dull] [Bright] matte.

ESCALATOR ENCLOSURES

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form escalator enclosures from metal of type and thickness indicated below. Coordinate size of enclosures, location of cutouts, and method of attachment to adjoining construction.

Stainless Steel Sheet: [**0.062 inch (1.59 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

Bronze Sheet: [**0.081 inch (2.05 mm)**] [Thickness required to comply with performance requirements] <Insert thickness>.

Finish: [Buffed finish, lacquered] [Hand-rubbed finish, lacquered] [Statuary conversion coating over satin finish].

FILLER PANELS

Form filler panels for closing ends of partition systems and for other applications indicated. Form from two sheets of metal of type and thickness indicated below, separated by channels formed from the same material, producing a panel of same thickness as [**partitions**] [**mullions**] unless otherwise indicated. Incorporate reveals, trim, and concealed anchorages for attaching to adjacent surfaces.

Galvanized-Steel Sheet: [**0.064 inch (1.63 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Steel Sheet: [**0.060 inch (1.52 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

Filler panels may be fabricated from prefinished metal sheet in lieu of finishing after fabrication provided unfinished edges are concealed from view.

Fill interior of panel with sound-deadening insulation permanently attached to inside panel faces.

Adhesively attach gaskets to filler panel edges where they abut mullions or glazing. Use 1-inch- (25-mm-) square material, unless otherwise indicated, set approximately 1/4 inch (6 mm) into channeled edge of filler panel.

Attach gaskets to all edges of panels that abut adjacent surfaces to form a continuous seal. Use compressible gaskets or mastic sealing tape, applied to center of panel edges to be concealed from view, unless otherwise indicated.

Do not mechanically fasten filler panels to mullions.

LIGHTING COVES

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form lighting coves from metal of type and thickness indicated below. Coordinate size of coves, location of cutouts for electrical wiring, and method of attachment to adjoining construction.

Aluminum Sheet: [**0.063 inch (1.60 mm)**] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Steel Sheet: [**0.048 inch (1.21 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

Fabricate light coves with [hairline butt joints] [tapered edges for taping and spackling].
Provide [mitered corners, factory welded with backplates] [factory endcaps].
Lighting coves may be fabricated from prefinished metal sheet in lieu of finishing after fabrication provided unfinished edges are concealed from view.

METAL BASE

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form metal base from metal of type and thickness indicated below:

Aluminum Sheet: [**0.063 inch (1.60 mm)**] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Stainless Steel Sheet: [**0.050 inch (1.27 mm)**] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

MULLION CLADDING

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form mullion cladding from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction.

Aluminum Sheet: [**0.063 inch (1.60 mm)**] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Stainless Steel Sheet: [**0.050 inch (1.27 mm)**] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

PIPE SYSTEM COVERS

<Double click here to find, evaluate, and insert list of manufacturers and products.>

Form pipe system covers from metal of type and thickness indicated below. Coordinate size of covers, location of cutouts for piping, and method of attachment to adjoining construction.

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Steel Sheet: [**0.048 inch (1.21 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

POCKETS FOR WINDOW TREATMENT

Form pockets from metal of type and thickness indicated below, with end closures. Coordinate dimensions and attachment methods with window treatment equipment, window frames, ceiling suspension system, and other related construction to produce a coordinated, closely fitting assembly.

Aluminum Sheet: [**0.063 inch (1.60 mm)**] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**].

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Steel Sheet: [**0.048 inch (1.21 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Powder coat].

Pockets for window treatment may be fabricated from prefinished metal sheet in lieu of finishing after fabrication provided unfinished edges are concealed from view.

Reinforce pockets for attaching window treatment equipment and hardware, or increase metal thickness.

Divide continuous pockets with built-in partitions located to separate adjoining drapery and blind units, to coincide with window mullions, and to receive filler panels at ends of partitions.

WINDOW STOOLS

Form window stools from metal of type and thickness indicated below, with end closures:

Aluminum Sheet: [**0.063 inch (1.60 mm)**] <Insert thickness>.

Finish: [Baked enamel or powder coat] [Siliconized polyester] [High-performance organic coating] [Mill] [Clear anodic] [Color anodic].

Galvanized-Steel Sheet: [**0.052 inch (1.32 mm)**] <Insert thickness>.

Finish: [Factory primed] [Baked enamel] [Siliconized polyester] [High-performance organic coating] [Powder coat].

Stainless Steel Sheet: [**0.050 inch (1.27 mm)**] [1.3 mm] <Insert thickness>.

Finish: [No. 2B] [No. 4] [No. 6] [No. 7] [No. 8].

Bronze Sheet: [**0.051 inch (1.29 mm)**] <Insert thickness>.

Finish: [Buffed finish, lacquered] [Hand-rubbed finish, lacquered] [Statuary conversion coating over satin finish].

Weld seams at end closures.

Braze seams at end closures.

Apply sound-deadening [**insulation**] [**mastic**] to underside of window stools.

GENERAL FINISH REQUIREMENTS

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.

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

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

Finish [items indicated on Drawings] <Insert product> after assembly.

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.

ALUMINUM FINISHES

Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker.

Color Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm] or thicker.

Color: [Champagne] [Light bronze] [Medium bronze] [Dark bronze] [Black] <Insert color>.
[Match Architect's sample] [As selected by Architect from full range of industry colors and color densities].

Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Siliconized Polyester Finish: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

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.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Superior-Performing Organic Finish: [**Two**] [**Three**] [**Four**]-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

GALVANIZED-STEEL SHEET FINISHES

Preparing Galvanized Items for Factory Priming: Thoroughly clean galvanized decorative formed metal of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

Preparing Galvanized Items for Factory Finishing: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

Repairing Galvanized Surfaces: Clean welds and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply shop primer to prepared surfaces of items unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm). Prepare, treat, and coat metal to comply with resin manufacturer's written instructions.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Siliconized-Polyester Coating: Immediately after cleaning and pretreating, apply manufacturer's standard epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

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.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Superior-Performing Organic Finish: [**Two**] [**Three**] [**Four**]-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

STEEL SHEET FINISHES

Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."

Pretreatment: Immediately after cleaning, apply a conversion coating of type suited to organic coating.

Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply shop primer to prepared surfaces of items unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm). Prepare, treat, and coat metal to comply with resin manufacturer's written instructions.

Color and Gloss: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and gloss>.

STAINLESS STEEL FINISHES

Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

Run grain of directional finishes with long dimension of each piece.

Bright, Cold-Rolled, Unpolished Finish: No. 2B.

Directional Satin Finish: No. 4.

Dull Satin Finish: No. 6.

Satin, Reflective, Directional Polish: No. 7.

Mirrorlike Reflective, Nondirectional Polish: No. 8 finish.

When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

COPPER-ALLOY FINISHES

Lacquered Buffed Finish: M21-O6x (Mechanical Finish: buffed, smooth specular; Coating: clear, organic, air dried, as specified below).

Clear, Organic Coating: Lacquer specified for copper alloys, applied by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil (0.025 mm).

Lacquered Hand-Rubbed Finish: M31-M34-O6x (Mechanical Finish: directionally textured, fine satin; Mechanical Finish: directionally textured, hand rubbed; Coating: clear, organic, air dried, as specified below).

Clear, Organic Coating: Lacquer specified for copper alloys, applied by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil (0.025 mm).

Lacquered Medium-Satin Finish: M32-O6x (Mechanical Finish: directionally textured, medium satin; Coating: clear, organic, air dried, as specified below).

Clear, Organic Coating: Lacquer specified for copper alloys, applied by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil (0.025 mm).

Lacquered Fine-Matte Finish: M42-O6x (Mechanical Finish: nondirectional finish, fine matte; Coating: clear, organic, air dried, as specified below).

Clear, Organic Coating: Lacquer specified for copper alloys, applied by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil (0.025 mm).

Statuary Conversion Coating over Satin Finish: M31-C55 (Mechanical Finish: directionally textured, fine satin; Chemical Finish: conversion coating, sulfide)[**, with color matching Architect's sample**].

Statuary Conversion Coating over Satin Finish, Lacquered: M31-C55-O6x (Mechanical Finish: directionally textured, fine satin; Chemical Finish: conversion coating, sulfide; Coating: clear, organic, air dried, as specified below)[**, with color matching Architect's sample**]:

Clear, Organic Coating: Lacquer specified for copper alloys, applied by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil (0.025 mm).

TITANIUM FINISHES

General: Fabricate items from finished titanium sheet, taking care not to damage finish during fabrication. Protect finish as needed during fabrication by applying a strippable, temporary protective covering.

Dull Matte Finish: Pickled and annealed.

Bright Matte Finish: Vacuum annealed.

PART 3 - EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative formed metal.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

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.

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.

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.

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

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

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.

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.

Install decorative-formed-metal-clad doors and frames to comply with requirements specified in Section 081113 "Hollow Metal Doors and Frames."

ADJUSTING AND CLEANING

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

Clean copper alloys according to metal finisher's written instructions in a manner that leaves an undamaged and uniform finish matching approved Sample.

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.

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

Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."] [Section 099600

"High-Performance Coatings."] [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."]

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.

PROTECTION

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

END OF SECTION 057500