

SECTION 05600

ARCHITECTURAL METALWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Muntz-metal, or stainless steel-clad hollow metal doors and frames.
 - 2. Custom door pulls.
 - 3. Combination hall push-button stations.
 - 4. Metal reveals at wood paneling.
 - 5. Cast-metal rosettes at marble joints.
 - 6. Column Covers

- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 5 Section "Metal Fabrications" for metal fabrications made from heavy-gage ferrous metal for nonornamental purposes.
 - 2. Division 5 Section "Sheet Metal Fabrications" for metal fabrications made from sheet metal.
 - 3. Division 5 Section "Ornamental Handrails and Railings" for ornamental metal handrails fabricated from stock components.
 - 4. Division 8 Section "Custom Steel Doors and Frames" for Flush hollow metal doors and frames receiving Muntz metal cladding.
 - 5. Division 14 Section "Electric Traction Elevators" for elevator signal equipment components of combination hall push-button stations.

1.2 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

- B. Product data for each product used in ornamental metalwork, including finishing materials and methods.

- C. Prepare shop drawings under the supervision of a qualified professional engineer. Shop drawings shall show fabrication and installation of ornamental metalwork, including plans, elevations, details of components, and attachments to other units of Work. Indicate materials and profiles of each ornamental metalwork member, fitting, joinery, finishes, fasteners, anchorages, and accessory items.
 - 1. Include setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as a unit of work of other sections.
 - 2. For installed products indicated to comply with certain design loadings, include structural analysis data sealed and signed by a qualified professional engineer who was responsible for their preparations.

- D. Patterns, models or plaster castings made from proposed patterns for each design of custom casting required.

- E. Samples for initial selection in the form of manufacturer's color charts consisting of actual units or sections of units showing the range of colors expected and other finish characteristics available for each item indicated below.
 - 1. Ornamental metal work composed of color-or acid etched components.
 - 2. Ornamental metalwork items with a based-enamel coating.
 - 3. Ornamental metalwork items with a high-performance coating.

- F. Samples for verification of each profile and pattern of fabricated metal and each type of metal finish required, prepared on metal of same thickness and alloy indicated for final unit of Work. Where finished materials involve normal color and texture variations, include sample sets composed of two or more units showing the expected range of variations.
 - 1. Include 6-inch- (150-mm-) long samples of linear shapes.
 - 2. Include 6-inch- (150-mm-) square samples of plates.
 - 3. Include full-size samples of castings and forgings.
 - a. For custom castings, submit samples of previous work to show quality of finish, ability to reproduce detail, and color of cast metal.

- G. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

- H. Qualification data for firms and persons specified in the "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.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm with five years experience in successfully producing ornamental metalwork similar to that indicated for this Project and with sufficient production capacity to produce required units without delaying the Work.

- B. Installer Qualifications: Arrange for installation of ornamental metalwork specified in this Section by the same firm that fabricated it.

- C. Organic-Coating Applicator Qualifications: Firm experienced in successfully applying organic coatings of type indicated to aluminum extrusions and equipped with the following:
 - 1. A multistage cleaning and pretreatment system capable of complying with test requirements of AAMA standard referenced for type of coating indicated.
 - 2. Spray equipment required to apply a uniform coating.
 - 3. A preventive-maintenance program and good record-keeping.

- D. Anodic Finisher Qualifications: Firm experienced in successfully applying anodic finishes of type indicated, employing competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.

- E. Welding Standards: Comply with applicable provisions of AWS D1.1 “Structural Welding Code—Steel” and AWS D1.2 “Structural Welding Code—Aluminum.”
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and , if pertinent, has undergone recertification.
- F. Engineer Qualifications: Professional engineer legally authorized to practice in jurisdiction where Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of assemblies similar to this Project in material, design, and extent and that have a record of successful in-service performance.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section “Project Meetings.”

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store ornamental metalwork inside a conditioned area, away from uncured concrete and masonry, and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.
- B. Delivery and store cast metal products in wooden crates with sufficient excelsior to ensure that they will not be cracked or otherwise damaged.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Where ornamental metalwork is indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Where field measurements cannot be made without delaying the Work, General Contractor will guarantee dimensions and Ornamental Metal Supplier will proceed with fabricating ornamental metalwork without field measurements. General Contractor will coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Pre-Approved Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
- B. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Muntz Metal or Stainless Steel Clad Doors:
 - a. Big D Metalworks - (800) 299-9767 or (214) 638-8753
 - 2. Custom Castings:

- a. Alloy Casting Co., Inc.
 - b. Dempsey, Inc.
 - c. OMC Industries, Inc.
 - d. Robinson Iron
3. Ornamental Castings:
- a. Alloy Casting Co., Inc.
 - b. Architectural Iron Co.
 - c. Classic Iron Supply/Craft.
 - d. Colonial Castings, Inc.
 - e. Cullar/La Cuesta.
 - f. Dempsey, Inc.
 - g. Historical Arts & Casting, Inc.
 - h. Lawler Machine & Foundry Co., Inc.
 - i. Robinson Iron.
 - j. Tennessee Fabricating Co.
 - k. Texas Metal Industries, Inc.
 - l. Universal Manufacturing Co., Inc.
4. Stainless-Steel Wire Rope and Fittings:
- a. Seco South, Inc.

2.2 METALS

- A. General: Provide metals free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required:
- 1. Extruded Bars and Shapes: ASTM B 221 (ASTM B 221M), 6063-T6.
 - 2. Extruded Pipe and Tubes: ASTM B 429, 6063-T6.
 - 3. Drawn Seamless Tubes: ASTM B 483 (ASTM B 483M), 6063-T832.
 - 4. Plate and Sheet: ASTM B 209 (ASTM B 209M), 6061-T6.
 - 5. Die and Hand Forgings: ASTM B 247 (ASTM B 247M), 6061-T6.
 - 6. Castings: ASTM B 26/B 26M, A356-T6.
- C. Copper Alloys, Bronze,: Provide copper alloy of type and form indicated to comply with the following requirements.
- 1. Extruded Shapes: ASTM B 455, alloy UNS No. C38500 (Architectural bronze).
 - 2. Plate and Bars: ASTM B 36/B, alloy UNS NO. C28000 (Muntz metal, 60 percent copper.)
 - 3. Seamless Pipe: ASTM B 43, alloy UNS No. C23000 (red brass, 85 percent copper).
 - 4. Seamless Tubes: ASTM B 135 (ASTM B 135M), alloy UNS No. C23000 (red brass, 85 percent copper).

5. Composition Bronze Castings: ASTM B 62, alloy UNS No. C83600 (85-5-5-5 or composition bronze).
 6. Sand Castings: ASTM B 584, alloy UNS No. C86500 (No. 1 manganese bronze).
- D. Copper Alloys, Brass: Provide copper alloy of type and form indicated to comply with the following requirements:
1. Extruded Shapes: ASTM B 249 (ASTM B 249M), alloy UNS C36000 (free-cutting brass).
 2. Plate and Bars: ASTM B 36/B 36M, alloy UNS No. C26000 (cartridge brass, 70 percent copper).
 3. Seamless Tubes: ASTM B 135 (ASTM B 135M), alloy UNS No. C26000 (Cartridge brass, 70 percent copper).
 4. Sand Castings: ASTM B 584, alloy UNS No. 85200 (high copper yellow brass).
- E. Stainless Steel: Grade and type designated below for each form required:
1. Tubing: ASTM A 554, grade as follows:
 - a. Grade MT 304.
 - b. Grade MT 316.
 2. Pipe: ASTM A 312/A 312M, grade as follows:
 - a. Grade TP 304.
 - b. Grade TP 316.
 3. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
 4. Castings: ASTM A 743/A 743M, Grade CF 8M.
 5. Plate: ASTM A 167, type as follows:
 - a. Type 304
 - b. Type 316.
 6. Bar Stock: ASTM A 276.
 - a. Type 304.
 - b. Type 316.
 7. Wire Rope: 1-by-19 cable made from wire conforming to ASTM A 492, Type 316.
 8. Wire Rope: Specially fabricated 1-by-19 cable that is drawn through a die after laying to produce a smooth outer surface; made from wire conforming to ASTM A 492, Type 316.
- F. Steel and Iron: Provide steel and iron in the form indicated complying with the following requirements.
1. Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501.
 2. Steel Plate, Shapes and Bars: ASTM A 36/A 36M.
 3. Gray Iron Castings: ASTM A 48, Class 30.

4. Malleable Iron Castings: ASTM A 47 (ASTM A 47M), grade as recommended by fabricator for type of use indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications, and as required for color match, strength, and compatibility in the fabricated items.
- B. Fasteners: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
 1. Provide concealed fasteners for interconnection of ornamental metalwork components and for their attachment to other work, except where otherwise indicated.
 2. Provide concealed fasteners for interconnection of ornamental metalwork components and for their attachment to other work except where exposed fasteners are unavoidable or are the standard fastening method.
 3. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- C. Cast-in-Place and Post-Installed Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
 1. Cast-in-place anchors.
 2. Chemical anchors.
 3. Expansion anchors.
 4. Undercut anchors.
- D. Wire Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to the minimum breaking strength of the wire rope with which they are used.
- E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide group specifically recommended by manufacturer for interior and exterior applications.
- F. Shop Primer for Ferrous Metal: Fast-curing, lead-free, universal modified-alkyd primer complying with performance requirements of FSTT-P-664, selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- G. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, complying with DOD-P-21035 or SSPC-Paint 20.
- H. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

2.4 FABRICATION, GENERAL

- A. Form ornamental metalwork to required shapes and sizes, with true curves, lines, and angles. Provide components in sizes and profiles indicated, but not less than required to comply with requirements indicated for structural performance.
- B. Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Drill and tap for required fasteners, unless otherwise indicated. Use concealed fasteners wherever possible.
- C. Comply with AWS for recommended practices in shop welding and brazing. Provide welds and brazes behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded and brazed joints of all flux, and dress all exposed and contact surfaces to #1 finish per NOMMA Guideline 1: Joint Finishes.
- D. Mill joints to a tight, hairline fit. Cope or miter corner joints. Form joints exposed to weather to exclude water penetration.
- E. Provide castings that are sound and free of warp, cracks, blow holes, or other defects that impair strength or appearance. Grind, wire brush, sandblast, and buff casting to remove seams, gatemarks, casting flash, and other casting marks.
- F. Finish exposed surfaces to smooth, sharp, well-defined lines and arises.
- G. Assemble items in the shop to the 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. Use connections that maintain structural value of joined pieces.
- H. Make up wire rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so that maximum amount is available for tensioning wire ropes. Tag wire rope assemblies and fittings to identify installation locations and orientations for coordinated installation.

2.5 FABRICATING MUNTZ-METAL OR STAINLESS STEEL-CLAD DOORS AND FRAMES

- A. Laminate 0.0403-inch- (1.0-mm-) thick Muntz metal or stainless steel sheets to outside face of hollow metal doors and frames (specified in Division 8 Section "Custom Steel Doors and Frames") at locations and to comply with details indicated. Use adhesive recommended by metal fabricator that will fully bond metal to metal and that will prevent telegraphing and oil-canning.

2.6 FABRICATING CUSTOM DOOR PULLS

- A. Fabricate custom door pulls from stainless-steel or muntz metal bar stock of profile indicated, fabricated to shapes indicated. Form curves by bending to produce uniform curvature of radiuses indicated; maintain profile of member throughout entire bend without buckling, twisting, or otherwise deforming exposed surfaces. Where radiuses of bends are too small to avoid buckling, grind bars after bending to restore original profile. Drill and tap door pulls to receive through bolts for attachment to doors.
- B. Fabricate backing plates for custom door pulls from 1/8-inch (3.2-mm) stainless-steel or muntz metal sheet. Cut to shape indicated and bevel edges at a 45 degree angle for ½ thickness of metal. Drill and countersink holes where indicated for screws and bolts.

- C. Provide units with oval-head through bolts for mounting pulls and with oval-head machine screws for mounting backing plates. Provide bolts and screws of metal to match that of door pulls.

2.7 FABRICATING COMBINATION HALL PUSH-BUTTON STATIONS

- A. Fabricate units of Muntz metal or stainless steel to comply with details indicated. Coordinate with requirements of Division 14 Section "Electric Traction Elevators" to provide integrated, closely fitted assemblies containing emergency sign, and hall push-button station.
 - 1. Provide units with emergency pictograph signs indicated that in case of fire, occupants shall not use elevators and that stairways are the approved method of exit. Provide signs of clear, acrylic sheet with the design matching the example in Appendix H of ASME/ANSI A 17.1, silk screened on rear surface. Make signs 5 inches (125 mm) wide by 8 inches (200 mm) high and mount in cutouts of combination unit faceplates so that they are flush with the faceplates.
 - 2. Make cutouts in faceplates of units for push buttons of elevator hall push-button station. Coordinate locations and sizes of cutouts so that additional faceplate is not required for push-button station and so that faces of push buttons are flush with fronts of faceplates.

2.8 FABRICATING METAL REVEALS

- A. Fabricate reveals for wood paneling. Secure metal reveals with appropriate adhesive agent as recommended by Manufacturer.

2.9 FABRICATING CAST-METAL ROSETTES

- A. Fabricate cast-metal rosettes to design indicated from cast bronze. Drill and tap castings for threaded mounting studs.
 - 1. Provide custom castings to match design indicated.
 - 2. Manufacturer's stock castings may be considered, provided deviations are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.
 - 3. The Drawings indicated the cast-metal rosette designs required and are based on the products of one manufacturer. Castings produced by other manufacturers may be

