

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Contractor supplied items.
 - a. Fabrications from steel and iron shapes, plates, bars, tubes, and pipe
 - 1) Miscellaneous steel framing and supports.
 - 2) Miscellaneous steel trim.
 - b. Fabrications from sheet metal
 - 1) Stainless steel column wraps
2. Contractor installed items:
 - a. Fabrications from steel and iron shapes, plates, bars, tubes, and pipe.
 - b. Fabrications from sheet metal.

1.2 SUBMITTALS

- A. Product Data: For fence fabric and bollard cover.
- B. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
1. Shop Drawings shall bear the seal of a professional engineer who is registered in the state the project occurs, and who is providing services as a specialty engineer.
 2. Templates: For anchors and bolts.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.
- B. Ferrous Metals:
1. Steel Plates, Shapes, Bars: ASTM A-36.
 2. Cold Formed Steel Tubing: ASTM A-500, Grade B.
 3. Steel Pipe: ASTM A-53, Type E or S, Grade B.

4. Structural Cold-Rolled Steel Sheets: ASTM A-611, Class 1, of grade required for design loading.
5. Galvanized Structural Steel Sheets: ASTM A-446, Coating Designation G90.
6. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 with No. 4 brushed finish.
7. Metallic-Coated-Steel Wire: Welded-wire fence fabric, hot-dip galvanized after fabrication. Weight of zinc coating shall be not less than 1.0 oz./sq. ft. (305 g/sq. m).
8. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - a. Size of Channels: 1-5/8 by 1-5/8 inches (41 by 41 mm).
 - b. Material: Galvanized steel, ASTM A 653/A 653M, commercial steel, Type B, with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.

C. Fasteners

1. General: Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
2. Cast-in-Place Anchors in Concrete: Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
3. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.
4. Threaded Rods: ASTM A36. Sizes and embedment as indicated on the Drawings.
5. Concrete Inserts: Malleable iron (ASTM A-47) or cast steel (ASTM A-27) inserts, with steel bolts, washers and shims; hot dip galvanized.
6. Expansion Anchors: Size, and embedment indicated on Drawings.
 - a. Manufacturer: Hilti, Inc. 800-879-8000.
 - b. Masonry Anchors: Sleeve anchors unless otherwise noted.
 - c. Concrete Anchors: Kwik Bolt 3 unless otherwise noted.
7. Epoxy Adhesive Anchors:
 - a. Basis of Design Product: ITW Ramset/Redhead; Epcon "Ceramic 6."

D. Miscellaneous Materials

1. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.
 - a. Color: Gray for metal fabrications in exposed ceiling area or other items not to receive a finish coat.
2. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for reglazing welds in steel.

3. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
4. Concrete fill: ASTM C 94 ready mix or prepackaged concrete. Proportion mix:
 - a. Minimum cement content **600 lbs./cu. yd. (356 kg./cu. m).**
 - b. Maximum aggregate sizes:
 - 1) Foundation: **1 inch (25.4 mm).**
 - 2) Pipe Fill: **1/2 inch (12.7 mm).**
 - 3) Maximum slump: **6 inches (152.4 mm).**

2.2 FABRICATION

A. General:

1. Do not begin fabrication prior to shop drawing approval.
2. Use materials of size and thickness shown or, if not shown, of required size, grade and thickness to produce strength and durability in finished product.
 - a. Weld corners and seams continuously; grind exposed welds smooth and flush.
 - b. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.
3. Inserts and Anchorages: Furnish inserts and anchoring devices to be built into other work for installation of miscellaneous metal items; coordinate delivery to job site to avoid delay.

B. Miscellaneous Framing and Supports: Fabricate of welded construction in as large units as possible. Drill and tap as required to receive hardware and similar items. Include required anchors for building into other work; spaced not more than **12 inches (304.8 mm)** o.c.

C. Miscellaneous Steel Trim: Fabricate to shapes and sizes as required for profiles shown and continuously weld joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.

D. Column Covers: Stainless steel with #4 finish, as detailed.

2.3 FINISHES

A. Steel and Iron Finishes:

1. Hot-dip galvanize items as indicated to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.
2. Shop Priming:
 - a. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing,

or masonry, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.
 - 1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.
 - 2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
 - 3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts and pack solidly with nonshrink, nonmetallic grout.
- C. Touch up surfaces and finishes after erection.
 - 1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.
 - 2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00