

SECTION 05500
METAL FABRICATIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish and install all metal fabrications as indicated on the Drawings and/or specified herein.
- B. Miscellaneous metal work shall include, but not be limited to, the following:
 - 1. Miscellaneous Steel Framing and Supports which are not a part of structural steel framework and as required to complete the Work.

1.02 RELATED WORK

- A. COLD-FORMED METAL FRAMING: Section 05400.

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following, except as otherwise indicated or specified:
 - 1. American Institute of Steel Construction (AISC):
 - a. AISC Code of Standard Practice for Steel Buildings and Bridges.
 - b. AISC Specification for Structural Buildings Allowable Stress Design and Plastic Design with Commentary.
 - 2. American National Standards Institute (ANSI):
 - a. Referenced Standards.
 - 3. American Society for Testing and Materials (ASTM):
 - a. Referenced Standards.
 - 4. American Welding Society (AWS):
 - a. AWS D1.1 Structural Welding Code - Steel.
 - 5. Steel Structures Painting Council (SSPC):
 - a. Referenced Standards.
- B. All welding shall be performed pursuant to AWS D1.1. All welding shall be performed by welders with current certificates for the type of weld being done. Special care shall be taken to keep welding electrodes free of moisture.
- C. Field measurements shall be taken prior to preparation of shop drawings and fabrication, where possible. Trimming and fitting shall be allowed for wherever taking field measurements before fabrication might delay the work.

- D. Items shall be preassembled in the shop to the greatest extent possible to minimize field splicing and assembly. Units shall be disassembled only as necessary for handling and shipping limitations. Disassembled units shall be clearly marked for reassembly.

1.04 SUBMITTALS

A. Shop Drawings:

- 1. Submit shop drawings for fabrication and erection of metal fabrications. Include plans, elevations, details of sections and connections, anchorages, and accessory items. Provide templates for anchor and bolt installations.

1.05 PRODUCT DELIVERY AND STORAGE

- A. Materials shall be delivered to the Site undamaged and shall be stored and protected from the elements by covering in plastic. All material damaged prior to Substantial Completion shall be removed from the Site and replaced at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metal Surfaces, General:

- 1. For metal fabrications work which will be exposed to view, only materials which are smooth and free of surface blemishes such as pitting, seam marks, roller marks, rolled trade names and roughness shall be used.

B. The following shall be used except where otherwise specified or required:

- 1. Steel plates, shapes and bars shall conform to ASTM A 36.
- 2. Steel pipe shall conform to ASTM A 53, Type S, Grade B, Schedule 40, black finish unless galvanizing is required.

2.02 FASTENERS

A. General:

- 1. Zinc-coated fasteners shall be used for exterior locations or where built into exterior walls wherever possible.
- 2. Fasteners and connections shall be welded wherever possible.
- B. Nuts and bolts shall be regular hexagon type conforming to ASTM A307, Grade A.
- C. Lag bolts shall be square head type conforming to ANSI B18.2.1.
- D. Machine screws shall be cadmium plated steel conforming to ANSI B18.6.3.
- E. Wood screws shall be flat head carbon steel conforming to ANSI B18.6.1.
- F. Washers shall be round, carbon steel conforming to ANSI B18.22.1.

- G. Masonry anchorage devices shall be expansion shields and epoxy set anchors (as indicated) conforming to ASTM E 488.
- H. Toggle bolts shall be tumble-wing type conforming to Federal Specification (FS) FF-B-588, type, class, and style as required.
- I. Lock washers shall be helical spring-type carbon steel conforming to ANSI B18.21.1.

2.03 PAINT (Coordinate with Division 9900)

- A. Shop Primer for Ferrous Metals: Manufacturer's or fabricator's standard, fast-curing, lead-and chromate-free, universal modified alkyd primer complying with performance requirements selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- B. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and complying with DOD-P-21035A (SH) or SSPC-Paint-20.
- C. Dissimilar Metals Coating: Provide Scotch-Clad Brand Protective Coating No. 1706 as manufactured by 3M Corp. or approved equal.

2.04 FINISHES (Coordinate with Division 9900)

- A. General:
 - 1. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designation of finishes.
 - 2. Finish metal fabrications after assembly.
- B. Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot-dip process in compliance with the following requirements:
 - 1. ASTM A 153 for galvanizing iron and steel hardware.
 - 2. ASTM A 123 for galvanizing both fabricated and un-fabricated iron and steel products.
- C. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exterior: SSPC-SP 6 "Commercial Blast Cleaning."
 - 2. Interior: SSPC-SP 3 "Power Tool Cleaning."
- D. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting.

2.05 FABRICATION

A. Miscellaneous Steel Framing and Supports:

1. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete the Work. Fabricate miscellaneous units to size, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate structural steel shapes, plates, and steel bars of welded construction, using mitered joints for field connection. Cut, drill, and tap units to receive hardware and similar items.
2. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units are required to be installed after concrete is placed. Except as otherwise indicated, space anchors 24 inches on center.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which the metal fabrications are to be installed. Do not proceed until the unsatisfactory conditions have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Materials of type, size and thickness shown shall be used, or if not shown, of required size and thickness to produce adequate strength and durability in the finished product. Metal shall be well formed to shape and size with sharp lines and angles.
- B. Exposed work shall be formed true to line and level with accurate angles and surfaces and straight sharp edges. Exposed edges shall be eased to a radius of 1/32 inch unless otherwise shown. Bent metal corners shall be formed to the smallest radius possible without causing grain separation, or otherwise impairing work.
- C. All corners and seams shall be welded continuously, complying with AWS recommendations. At exposed connections, exposed welds shall be ground smooth and flush to match and blend with adjoining surfaces.
- D. Shearing and punching shall leave clean, true lines and surfaces. Curved work shall be evenly sprung.
- E. Exposed connections shall be formed with hairline joints, flush and smooth, using concealed fasteners wherever possible. Exposed fasteners shall be of the type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts shall be used.
- F. Anchoring devices shall be fabricated and spaced to provide adequate support for the intended use.
- G. Metal fabrications shall be cut, reinforced, drilled and tapped, as required, to receive finish hardware and similar items.
- H. All steel fabrications to be installed in exterior locations (outside the building) shall be galvanized as specified.
- I. All metal fabrications shall be installed as shown on the Drawings, and adjusted to satisfactorily fulfill the use for which such is intended.

3.03 ADJUST AND CLEAN

- A. All exposed surfaces shall be left clean and free from all blemishes or discolorations after erection.

END OF SECTION 05500