

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1. DESCRIPTION OF WORK

This specification covers the furnishing of materials, equipment, and labor to fabricate, deliver, and erect **structural and** miscellaneous metal herein specified and as shown on the design drawings.

2. WORK INCLUDED IN THIS SECTION

- A. Anchorage.
- B. Gratings and Walkways.
- C. Railings.
- D. Miscellaneous Angles, Plates, and Shapes.
- E. Shop Painting.
- F. Ladders.
- G. Stairs.
- H. Safety Nosings.
- I. **Structural steel, joists and decking.**

3. PRODUCT DELIVERY, STORAGE AND HANDLING

Materials shall be delivered to the site in a dry and undamaged condition, stored out of contact with the ground, and under a watertight covering, permitting good air circulation. **Primer** touch-up paint shall be used wherever necessary to prevent formation of rust on ferrous metal items. **Furnish temporary erection bracing as needed until the structure is fully connected.**

4. COMPLETENESS OF MISCELLANEOUS METAL WORK

Each item of miscellaneous metal work shall be completed with required anchorages, nuts, bolts, screws, and such accessories necessary for its proper installation and for correlation with adjoining work.

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PART 2 - PRODUCTS

1. MATERIALS

A. Miscellaneous and Structural Steel:

Furnish and install steel angles, channels, plates, lintels, anchors, and other miscellaneous steel items as indicated on the drawings or required for installation of other items.

B. Conform to ASTM Specifications A 36 for structural steel and A 27 for cast steel. Architectural and miscellaneous steel, not otherwise indicated or specified, shall be mild steel. **Refer to structural drawing for standards applicable to bar joists, decking and structural steel.**

C. Furnish necessary rivets, bolts, nuts, washers, anchor rods, lugs, etc. for complete fabrication and erection of all work under this section.

D. Nonshrink, Nonferrous Grout:

CE CRD C588, minimum 7500 psi compressive strength.

E. Painting:

Miscellaneous **and structural** metal items which are exposed to view or are on the exterior shall be painted in accordance with Section 09900. Paint, unless otherwise stated. Ferrous metal, not to be finish painted, shall have one coat of rust inhibitive primer. Touch-up shop paint after installation. Aluminum shall not be painted.

F. Aluminum Grating:

Grating shall be banded on all sides and around openings and shall be provided with holddown anchors.

G. All poured-in-place concrete stairs shall have non-slip nosing, six (6) inches less than the overall length of steps.

(1) Nosings shall be three (3) inches wide, five (5) abrasive filled ribs, such as Type 131 by Wooster Products, Inc.

(2) All steel stairs nosings shall be bolted to steel pan return. At concrete stairs "time saver anchors" as manufactured by Wooster Products, Inc., shall be used.

H. Aluminum pipe railings shall comply with ASTM B221, alloy 6063-T6. Provide 1-1/2" nominal diameter, as detailed on the drawings.

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I. **Railing Connections:**

Cope intersection of rails and posts; weld joints and grind smooth; butt weld end-to-end joints. Weld corners and seams continuously and grind smooth and flush.

K. **Stairs:**

- (1) Aluminum or steel stairs, complete with structural or formed channel stringers, metal-pan cement-filled treads, landings, columns, handrails, and necessary bolts and other fastenings shall conform to the following requirements:
- (2) Exposed ends of stringers shall be closed. Stair treads and risers shall be twelve (12) gauge aluminum **unless noted**. Metal pan for concrete fill shall be supported on angle cleats welded to stringers.
- (3) Installation: Anchor bolts, grating fasteners, washers, and all parts or devices necessary for proper installation shall be furnished and installed. Lock washers shall be used under nuts.
- (4) **Comply with NAAMM Voluntary Standard for Metal Stairs AMP 510.**

2. **FABRICATION**

A. Fabrication of finished members shall be in accordance with best practice for items involved, as set forth in the AISC Code and NAAMM Standards. Sections shall be well formed to shape and size with sharp, well defined lines and angles. Exposed welding on finished surfaces shall be ground smooth or chipped and wire brushed. Holes for bolts and screws shall be drilled. Fastenings shall be concealed insofar as is feasible, and work shall be shop fitted and shop fitted and shop assembled ready for erection, where practicable. Ease exposed edges to a radius of approximately 1/32".

B. Cleaning of material shall be performed before fabrication.

C. Provide clips, brackets, and other devices and connections so work can be assembled in a neat substantial manner. Thickness of metal and detail of assembly and support shall provide ample strength and stiffness. Joints exposed to water shall be formed to exclude water or to drain.

D. Miscellaneous metal work shall be fabricated in accordance with approved shop drawings. Exposed work shall be finished smooth with even, close joints and neat connections. Profiles shall be true to detail, clean, straight, and sharply defined. Metal shall be free from defects impairing strength, durability, and appearance, and of sufficient strength to withstand required loads.

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E. Cutting and Drilling: Provide holes for fabrication and for attachment of other work. Holes for rivets and screws shall be drilled and countersunk.

F. Shop paint items not specified to be galvanized or aluminum after fabrication.

- (1) Surfaces which will not be accessible after erection shall be given a prime coating of not less than 2.0 mils dry film thickness.
- (2) Other surfaces to be painted shall be given one (1) coat of primer.
- (3) Remove scale, rust, and other deleterious materials before applying shop coat. Clean heavy rust and loose mill scale in accordance with SSPC SP-3. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1.
- (4) Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.

PART 3 - EXECUTION

1. GENERAL

A. Standards referred to herein include those of the American Society for Testing and Materials (ASTM); American Welding Society (AWS); American Institute of Steel Construction (AISC); American National Standards Institute, Inc. (ANSI); National Association of Architectural Metal Manufacturers (NAAMM); and Occupational Safety and Health Act of 1970 (OSHA). The current edition as of date of this specification shall apply.

B. Templates, Setting Diagrams, and Instructions: Furnish these items for setting of anchors, attachment to structural elements of building, and for proper installation and fastening to adjacent items.

C. Field Measurement: Verify all dimensions, locations, and elevations of anchors, bolts, plates, and similar items, and be fully responsible for proper fitting of all miscellaneous metal work under this section. Identify these dimensions on shop drawings.

D. Items shall be proportioned to meet requirements specified herein, and to support any dead and live loads which may normally be imposed unless specific live loads are indicated on the drawings.

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E. Anchor bolts shall be fabricated to the shapes and dimensions indicated on the drawings and shall conform to the applicable provisions of ASTM A307. All anchor bolts shall be provided with nuts and washers suitable for use with the respective bolting materials.

2. INSTALLATION

A. Erection shall be plumb, square, straight and true, accurately fitted and with tight joints and intersections. Work shall be braced, reinforced, and anchored in place. Work shall comply with OSHA requirements.

B. Dissimilar Metals: Where dissimilar and incompatible metals or other materials may come in contact, they shall be permanently separated by means of gaskets or other approved methods. Aluminum surfaces in contact with concrete shall have a 16 mil coating of asphalt base paint.

C. Supports and Anchors: Supporting members, fastenings, framing, hangers, bracing, brackets, straps, bolts, angles, and similar items required to set or connect miscellaneous metal items shall be provided. Include suitable anchors, expansion shields and other fastenings required for attachment to concrete.

D. Falsework: Provide necessary guys, braces, and falsework for temporary support of any part of work and remove as soon as work is self-supporting, but not before required inspections have been made.

E. All aluminum handrails set in concrete shall use PVC sleeves as detailed on the drawings.