

SECTION 05500
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Items scheduled at the end of this section.

B. Related Sections:

1. Section 03600 - Grout: Grouting Under Base Plates and Bearing Plates.
2. Section 05120 - Structural Steel.
3. Section 05210 - Steel Joists.
4. Section 05300 - Metal Decking.
5. Section 05400 - Cold Formed Metal Framing.

1.2 REFERENCES:

- A. Steel: Meet requirements of AISC "Specifications for Architecturally Exposed Structural Steel", latest edition.
- B. Welding: Meet requirements of AWS "Structural Welding Code", D1.1, latest edition.
- C. Stairways: Meet requirements of standard construction details of "Metal Stairs Manual" of the National Association of Architectural Metal Manufacturers.
- D. All railings, stairs, and ladders shall meet requirements of OSHA, IBC, and UFAS.

1.3 DEFINITIONS:

A. Metal Fabrications:

1. Synonymous with miscellaneous metals.
2. Metal fabrications for items fabricated from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.

- B. Architecturally Exposed Structural Steel: As used under this section, includes all metal fabrications exposed to view.

1.4 SUBMITTALS:

A. Shop Drawings:

1. Submit shop drawings for custom fabricated items, including:

- a. Profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories.
- b. Erection drawings, elevations and details.
- c. Welded connections using standard AWS welding symbols.

B. Product Data: Submit product data for manufacturer's stock items.

C. Certifications:

1. Submit current welder's certification qualified in accordance with AWS D1.1.
2. Submit certification by fabricators that handrails and stairs have been designed by a structural engineer licensed in the State of Colorado.

D. LEED MRc5: Regional Materials

Provide a statement from the manufacturer stating the materials provided were manufactured within a 500 mile radius of the project. Include location.

E. LEED MRc4: Recycled Content

Provide a statement from the manufacturer including recycled content percentage, by weight, and whether the recycled content is post-consumer or post-industrial.

1.5 QUALITY ASSURANCE:

A. Fabricator Qualifications: Experienced in fabrication of miscellaneous steel.

B. Welder Qualifications: Welding shall be done only by certified welding operators currently qualified according to AWS D1.1.

C. Engineer Qualifications:

1. Professional engineer licensed to practice in the State of Colorado and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this project.

D. Design Criteria:

1. Refer to University's campus standard details, following this section.

- a. Exterior railings.
2. Steel stairs:
- a. Minimum Uniform Load: 100 psf.
 - b. Minimum Concentrated Load: 300 lbs at any point.
 - c. Engineer of Record shall approve/design connections.
3. Handrails:
- a. Minimum Uniform Load: 50 plf.
 - b. Minimum Concentrated Load: 200 lb at any point.
 - c. Engineer of Record shall approve/design connections.

PART 2 - PRODUCTS

2.1 MANUFACTURED ITEMS:

A. Steel Lintels:

- 1. Masonry openings over 16" in width shall have steel lintels.

B. Steel Opening Frames:

- 1. Openings in metal floor and roof decks greater than 10" in any direction, shall be supported on all four sides by a steel frame spanning between steel joists or other deck supports.

C. Steel Stairs:

- 1. Pan Tread Channel Stringer Stairs:
 - a. 14 Gage Pans (minimum): Fill sub-treads and platforms with concrete topping.
- 2. Grate Tread Channel Stringer Stairs: Industrial-type steel tread stairs.
 - a. 14 gage, 2" depth channel "Grip Strut Safety Grating" as manufactured by McNichols Co. or approved substitute.

D. Tubular Steel Railings:

- 1. Size: Fabricated from 1-1/4" NPS round steel pipes with steel balusters.

VERIFY STEEL RAILING DESIGN ALTERNATIVES WITH THE CAMPUS ARCHITECT.

2. Railings:

- a. Balusters Set in Concrete:
 - Pipe sleeves 6" long and 1/4 inch clear of balusters.

- b. Set balusters in sleeves, pack with non-shrink, non-metallic grout.
- c. Weld balusters to steel stringers.

3. Brackets:

- a. Secure to walls with malleable iron wall brackets and end fittings.
- b. Brackets with 1-1/2" wall clearance. Installed railing shall conform to UFAS requirements.
- c. Space brackets 5 feet o.c., maximum, or as required to support design loads.

B. Steel Ladders:

- 1. Side Rails: Fabricated from 3/16-inch steel bar.
- 2. Rungs: 1-inch steel pipe at 12" o.c., minimum, welded to side rails.
- 3. Width: 20-inches minimum width, spaced 7-inches minimum from wall.
- 4. Maximum unbraced vertical length is 6 feet.
- 5. Comply with ANSI A14.3 requirements.

C. Floor Grating:

- 1. Support grating on galvanized steel angles with universal clip fastener. Clip bolt shall be galvanized.
- 2. Type: Welded carbon steel grating capable of supporting 150 psf at a span to be determined by the design consultant and agreed to by the University for each particular application. Galvanize after fabrication with G90 coating per ASTM A386.

2.2 FABRICATION:

- A. General: Fabricate in accordance with details and reviewed shop drawings, all miscellaneous items of metal work indicated or as necessary to complete the work. Verify dimensions on site prior to shop fabrication.
- B. Welding: Comply with latest American Welding Society standards. Miter and cope intersections and weld all around. Remove spatter, grind exposed welds to blend, and contour surfaces to match those adjacent.

2.3 SHOP PAINTING:

- A. Clean ferrous metal of scale, rust, oil, moisture, and dirt before applying paint.
 - 1. Paint all metal black unless otherwise noted.

- A. Apply one shop coat of Tnemec 10-99 long-oil alkyd primer or approved substitute to ferrous metals after fabrication. Apply two shop coats to ferrous metals that will be inaccessible after erection.

EPOXY AND URETHANE FINISHES MAY BE APPROPRIATE IN SOME LOCATIONS AT DESIGNER'S DISCRETION.

- B. Painting specified here does not count as a coat for finish painting.

- C. Omit shop painting on surfaces embedded in concrete or requiring field welding.

D. LEED EQc4.2: Low-Emitting Materials

Paint applied after metal fabrication is on site must not have VOC levels that exceed the VOC and chemical component limits of Green Seal's Standard GS-11 requirements.

PART 3 - EXECUTION

3.1 SCHEDULE:

- A. This section includes, but is not specifically limited to metal fabrications and components listed in the following schedule:
1. Miscellaneous anchor slots, sleeves, bolts, brackets, clips, inserts, imbeds, gratings, tubing, bar stock, plates and other items not distinctly specified under other sections.
 2. Loose steel angle lintels.
 3. Steel stairs.
 4. Handrail brackets, handrails, and guard rails.
 5. Steel ladders.
 6. Angle bracing for hollow metal door and window frames.
 7. Steel opening frames.
 8. Expansion control items.

END OF SECTION 05500