

ARCHITECTURE

SECTION 05511

METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes steel stairs.
 - 1. Treads: Concrete filled. Refer to Section 03300 for concrete fill for stair treads and platforms..
 - 2. Handrails and Railings: See Division 5 Section "Handrails and Railings" for pipe and tube handrails and railings attached to metal stairs and to walls adjacent to metal stairs.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Metal Stairs: Capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved:
 - 1. Treads and Platforms of Metal Stairs: Uniform load of 100 lbf/sq. ft. (4.79 kN/sq. m) or a concentrated load of 300 lbf (1.33 kN) on an area of 4 sq. in., whichever produces the greater stress.
 - 2. Stair Framing: Stresses resulting from loads specified above in addition to stresses resulting from railing system loads.
 - 3. Deflection Limit: Maximum of L/360 or 1/4 inch, whichever is less, for treads, platforms, and framing members.
- B. Structural Performance of Handrails and Railings:
 - 1. Capable of withstanding the following structural loads without exceeding the allowable design working stress of materials involved:
 - a. Top Rail of Guards: Concentrated load of 200 lbf applied at any point and in any direction, and a uniform load of 50 lbf/ft. applied horizontally and concurrently with uniform load of 100 lbf/ft. applied vertically downward. Concentrated and uniform loads need not be assumed to act concurrently.
 - b. Handrails Not Serving as Top Rails: Concentrated load of 200 lbf applied at any point and in any direction, and a uniform load of 50 lbf/ft. applied in any direction. Concentrated and uniform loads need not be assumed to act concurrently.
 - c. Infill Area of Guards: Horizontal concentrated load of 200 lbf applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Load on infill area need not be assumed to act concurrently with loads on top rails.

1.3 SUBMITTALS

- A. Product Data: For metal stairs.
- B. Shop Drawings: Include plans, elevations, sections, details of installation, and attachments to other Work.
 - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 COORDINATION

- A. Furnish Setting Drawings, templates, and directions for installing anchorages, including concrete inserts. Deliver built-in anchorages, including concrete inserts, to Project site as needed to make progress and avoid delays.

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. Ferrous Metals: Provide materials with smooth, flat surfaces without blemishes.
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 2. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.
 - 3. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless otherwise indicated.
 - 4. Rolled-Steel Floor Plate: ASTM A 786/A 786M.
 - 5. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, commercial quality.
 - 6. Hot-Rolled Steel Sheet: ASTM A 569/A 569M, commercial quality.
- B. Fasteners: Zinc plated of type, grade, and class required by application indicated with coating complying with ASTM B 633, Class Fe/Zn 25 for exterior use, and Class Fe/Zn 5 where built into exterior walls.
- C. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664 and compatible with finish paint systems indicated.
- D. Concrete Fill: Comply with requirements in Section 03300 for normal weight concrete with a minimum 28 day compressive strength of 3000 psi (20 MPa).

2.2 FABRICATION

- A. General: Provide complete stair assemblies, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms.
 - 1. Shear and punch metals cleanly and accurately. Remove sharp or rough areas and ease exposed edges. Form bent-metal corners to smallest radius possible without impairing work.
 - 2. Weld connections using materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds and surfaces smooth and blended.
 - 3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
- B. Steel-Framed Stairs: Fabricate stringers of structural-steel channels, plates, or a combination of both. Construct platforms of structural-steel channel headers and miscellaneous framing members.
 - 1. Fabricate and join so bolts are not exposed on finished surfaces.
 - 2. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Risers, Sub-tread Pans, and Sub-platforms: Form from steel sheet of thickness necessary to support indicated loads, but not less than 0.0677 inch.
 - 1. At Contractor's option, provide metal-pan sub-treads filled with reinforced concrete during fabrication.
- D. Handrails and Railings: Comply with applicable requirements in Division 5 Section 05521 "Handrails and Railings."

2.3 FINISHES

- A. Comply with NAAMM'S "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish metal stairs after assembly to a smooth level 2 finish.

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1. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC SP 3, "Power Tool Cleaning."
2. Apply shop primer to prepared surfaces. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, and free from rack.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of galvanized units that are for bolted or screwed field connections.
- C. Attach handrails to wall with wall brackets.
 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
- D. 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.

END OF SECTION 05511