

SECTION 05 51 00

METAL STAIRS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing metal stairs and intermediate landings at Parking Structure, First Floor of the Hall of Justice, and as required by Code.
- B. Related Sections:
 - 1. Metal railings are specified in Section 05 50 00.
 - 2. Abrasive stair nosings are specified in Section 05 50 00.

1.02 SUBMITTALS

- A. Product Data: Include information on materials, components, fabrication, and installation instructions.
- B. Shop Drawings: Include layout and erection drawings, including setting and template drawings for items built into the structure.
- C. Engineering Calculations: Furnish calculations substantiating that work complies with design criteria and required structural and safety requirements and ADA requirements. Calculations shall be prepared and signed by a structural engineer licensed in the State of California.
- D. LEED Submittals:
 - 1. Credit IEQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D.
 - a. Furnish the LEED Online Credit Template listing all the paints and coatings used in the building, stating they comply with the VOC and chemical component limits of GS-11 requirements.

1.03 QUALITY ASSURANCE

- A. Fabricator: Regularly providing metal stairs of type required for not less than 5-years.
- B. Structural Design: Fabricator shall provide structural engineering design and calculations for metal stairs, developed and signed by a civil or structural engineer registered in State of California.
 - 1. Stairs and platforms shall support a minimum uniform live load of 100-psf with a safety factor as required by code and individual stair treads shall support a 300-pound concentrated load placed in a position which would cause maximum stress.
 - 2. Lateral Load: 25-percent of live load plus dead load of stair. Maximum lateral deflection 1/8-inch horizontal displacement.
- C. Welders performing welding on stairs shall be qualified in conformance with AWS D1.1.
- D. Installer shall have a minimum of 2-years experience in the satisfactory installation of metal stairs.

1.04 ENVIRONMENTAL QUALITY ASSURANCE

- A. Credit IEQ 4.2: Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria:
 - 1. Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed VOC content limits established in Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
 - a. Flats: 50 g/L
 - b. Non-Flats: 150 g/L
 - 2. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
- B. Applicable LEED Credits:
 - 1. Credit IEQ 4.2 – Low-Emitting Materials - Paints and Coatings.

1.05 COORDINATION

- A. Metal stair surfaces furnished to the Project site primed or galvanized and not to be covered by an applied floor covering will be painted as specified in Section 09 91 00.
- B. Specified primer shall be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09 91 00.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: For surfaces exposed to view, use materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Steel Plates, Shapes and Bars: ASTM A36.
- C. Structural Steel Sheet: ASTM A570, hot-rolled; or ASTM A611, Class 1, cold-rolled, Grade A.
- D. Galvanized Structural Steel Sheet: ASTM A446, G90, Grade A.
- E. Gray Iron Castings: ASTM A48, Class 30.
- F. Malleable Iron Castings: ASTM A47, grade selected by fabricator.
- G. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported stairs.
- H. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A153.
- I. Fasteners:
 - 1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select type, grade and class required.
 - 2. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.

3. Plain Washers: Round, carbon steel, FS FF-W-92.
4. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

J. Paint:

1. Metal Primer Paint: SSPC Paint 2.
2. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel.

2.02 FABRICATION, GENERAL

A. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

1. Ease exposed edges to a radius of approximately 1/32-inch.
2. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

B. Weld corners and seams continuously, complying with AWS recommendations. Grind exposed welds smooth, flush and imperceptible to match and blend with adjoining surfaces.

C. Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized, as follows:

1. ASTM A153 for galvanizing iron and steel hardware.
2. ASTM A123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars and strip 0.0299-inch thick and heavier.

D. Shop Painting:

1. Shop paint metal stairs, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces.
2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2 or SSPC SP-3, or SSPC SP-7.
3. Remove oil, grease and similar contaminants in accordance with SSPC SP-1.
4. Brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2.0-mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
5. Apply one shop coat to fabricated metal items; apply 2-coats to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.
6. Primer shall be smooth and suitable for application of finish paint specified in Section 09 91 00.

2.03 METAL STAIRS

A. General:

1. Join pieces together by welding.
2. Provide complete stair assemblies including metal framing, hangers, columns, struts, clips, brackets, bearing plates and other components necessary for support of stairs and platforms and to anchor the stairs on the supporting structure.

B. Stair Framing:

1. Fabricate stringers of structural members. Provide closures for exposed ends of stringers.
2. Construct platforms of structural steel channel headers and miscellaneous framing members.
3. Bolt or weld headers to stringers, and framing members to stringers and headers; fabricate and join with concealed bolts.
4. Where masonry walls support steel stairs, provide temporary supporting struts designed for erection of steel stair components before installation of masonry.

C. Stair Summary:

1. Closed riser and concrete filled treads and landings.
 - a. Form metal pans of hot-rolled or cold-rolled carbon steel sheet.
 - b. Form metal pans of exterior stairs of galvanized carbon steel sheet.
 - c. Weld risers and subtreads to stringers; locate welds on side of metal pans to be concealed by concrete fill.
 - d. Provide landings of configuration and construction of same metal as risers and treads, thicknesses required to support design loading. Attach landings to framing members with welds.
 - e. Finish interior stairs with shop-applied primer as specified.
 - f. Abrasive nosings are specified in Section 05 50 00.

D. Railings and handrails are specified in Section 05 50 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install metal stairs plumb and true to line in accordance with reviewed Shop Drawings.
- B. Stair treads shall be uniformly spaced throughout each flight; treads and intermediate landings shall be level.

3.02 CLEANING

- A. Following installation, clean metal stairs and leave in a condition suitable for the installation of concrete fill in treads.

END OF SECTION