

**SECTION 05 51 00  
METAL STAIRS**

SPEC WRITER NOTES:

- 1. Use this section only for NCA projects
- 2. Delete between // \_\_\_\_\_// if not applicable to project.
- 3. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
- 4. Occupational Safety and Health Administration (OSHA) requires a stair to areas where a mechanic must go up or down different levels to service equipment.
- 5. Consider open riser stairs with grate treads on exterior service areas.
- 6. Do not use "ships Ladders" or spiral stairs.

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Section specifies steel stairs with railings.
- B. Closed riser stairs with concrete filled treads and platforms.

**1.2 RELATED WORK**

- A. Concrete fill for treads and platforms: Section 03 30 00, CAST-IN-PLACE CONCRETE.
- B. Wall handrails and railings for other than steel stairs: Section 05 50 00, METAL FABRICATIONS.
- C. Requirements for shop painting: Section 09 91 00, PAINTING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Show design, fabrication details, installation, connections, material, and size of members.

**1.4 APPLICATION PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation.
- B. American Society for Testing and Materials (ASTM):
  - A36/A36M-19.....Structural Steel
  - A47/A47M-99(2022)e1 ....Ferritic Malleable Iron Castings
  - A48/A48M-22 .....Gray Iron Castings

- A53/A53M-22 .....Pipe, Steel, Black and Hot-Dipped Zinc-Coated  
Welded and Seamless
- A653/A653M-22.....Steel Sheet, Zinc Coated (Galvanized) or Zinc  
Alloy Coated (Galvannealed) by the Hot-Dip  
Process
- A1008/A1008M-21a .....Steel, Sheet, Cold-Rolled, Carbon, Structural,  
High-Strength, Low-Alloy
- A1011/A1011M-18a .....Steel, Sheet and Strip, Strip, Hot-Rolled  
Carbon, Structural, High-Strength, Low-Alloy

C. American Welding Society (AWS):

- D1.1-10.....Structural Welding Code-Steel
- D1.3-08.....Structural Welding Code-Sheet Steel

D. American Iron and Steel Institute (AISI):

- 2016.....Design of Cold-Formed Steel Structural Members

SPEC WRITER NOTE:

1. Detail of stairs required.
2. Straight stairs, parallel, without  
newel post are preferred without stair  
well exceeding 100 mm (4-inches) in  
width.
3. See NAAMM stair manual.

**PART 2 - PRODUCTS**

**2.1 DESIGN CRITERIA**

- A. Design stairs to support a live load of 500 kg/m<sup>2</sup> (100 pounds per square foot).
- B. Structural design, fabrication and assembly in accordance with requirements of NAAMM Metal Stairs Manual, except as otherwise specified or shown.
- C. Design pipe railings in accordance with NAAMM Pipe Railing Manual for 900 N (200 pounds) in any direction at any point.
- D. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

SPEC WRITER NOTE: Update material requirements to agree with applicable requirements (Types, grades, classes, and other related items) specified in the referenced Applicable Publications.

**2.2 MATERIALS**

- A. Steel Pipe: ASTM A53, Standard Weight, zinc coated.

- B. Sheet Steel: ASTM A1008.
- C. Structural Steel: ASTM A36.
- D. Steel Floor Plate: ASTM 786.
- E. Steel Decking: Form from zinc coated steel conforming to ASTM A653, with properties conforming to AISI Specification for the Design of Cold-Formed Steel Structural Members.
- F. Steel Plate: ASTM A1011.
- G. Iron Castings: ASTM A48, Class 30.
- H. Malleable Iron Castings: ASTM A47.

### 2.3 FABRICATION GENERAL

- A. Fasteners:
  1. Conceal bolts and screws wherever possible.
  2. Use countersunk heads on exposed bolts and screws with ends of bolts and screws dressed flush after nuts are set.
- B. Welding:
  1. Structural steel, AWS D1.1 and sheet steel, AWS D1.3.
  2. Where possible, locate welds on unexposed side.
  3. Grind exposed welds smooth and true to contour of welded member.
  4. Remove welding splatter.
- C. Remove sharp edges and burrs.
- D. Fit stringers to head channel and close ends with steel plates welded in place where shown.
- E. Fit face stringer to newel post by tenoning into newel post, or by notching and fitting face stringer to side of newel where shown.
- F. Shop Prime Painting: Prepare surface and apply primer as specified for ferrous metals in Section 09 91 00, PAINTING.

SPEC WRITER NOTE: Provide guard railings not less than 1060 mm (42-inches) high.

### 2.4 RAILINGS

- A. Fabricate railings, including handrails, from steel pipe with flush.
  1. Connections may be standard fittings designed for welding, or coped or mitered pipe with full welds.
  2. Wall handrails are provided under Section 05 50 00, METAL FABRICATIONS.
- B. Return ends of handrail to wall and close free end.
- C. Provide standard terminal castings where fastened to newel.
- D. Space intermediate posts not over six feet on center between end post // or newel post //.

- E. Fabricate handrail brackets from cast malleable iron.
- F. Provide standard terminal fittings at ends of post and rails.

SPEC WRITER NOTES:

- 1. Use closed riser stairs accessible to public.
- 2. Design treads to receive rubber treads with riser sloped to meet tread nosing.

## 2.5 CLOSED RISER STAIRS

- A. Provide treads, risers, platforms, railings, stringers, headers and other supporting members.
- B. Fabricate pans for treads and platforms, and risers from sheet steel // Fabricate pans for platforms from steel decking where shown //.
- C. Form risers with sanitary cove.
- D. Fabricate stringers, headers, and other supporting members from structural steel.
- E. Construct newel posts of steel tubing having wall thickness not less than 5 mm (3/16-inch), with forged steel caps and drops.

## PART 3 - EXECUTION

### 3.1 STAIR INSTALLATION

- A. Provide hangers and struts required to support the loads imposed.
- B. Perform job site welding and bolting as specified for shop fabrication.
- C. Set stairs and other members in position and secure to structure as shown.
- D. Install stairs plumb, level and true to line.
- E. Provide steel closure plate to fill any gap between the stringer and surrounding shaft wall. Weld and finish with prime and paint finish of adjoining steel.

### 3.2 RAILING INSTALLATION

- A. Install standard terminal fittings at ends of posts and rails.
- B. Secure brackets, posts and rails to steel by welds, and to masonry or concrete with expansion sleeves and bolts, except secure posts at concrete by setting in sleeves filled with commercial non-shrink grout.
- C. Set rails horizontal or parallel to rake of stairs to within 3 mm in 3650 mm (1/8-inch in 12 feet).
- D. Set posts plumb and aligned to within 3 mm in 3650 mm (1/8-inch in 12 feet).

**3.3 FIELD PRIME PAINTING**

- A. When installation is complete, clean field welds and surrounding areas to bright metal, and coat with same primer paint used for shop priming.
- B. Touch-up abraded areas with same primer paint used for shop priming.
- C. Touch up abraded galvanized areas with zinc rich paint as specified in section 09 91 00, PAINTING.

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