

SECTION 05 51 00

METAL STAIRS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies steel stairs with railings.
- B. Types:
  - 1. Industrial stairs: Closed and open riser stairs.

1.2 RELATED WORK

- A. Wall handrails and railings for other than steel stairs: Section 05 50 00, METAL FABRICATIONS.
- B. 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-05.....Structural Steel
  - A47-99 (R2004).....Ferritic Malleable Iron Castings
  - A48-03.....Gray Iron Castings
  - A53-06.....Pipe, Steel, Black and Hot-Dipped Zinc-Coated  
Welded and Seamless
  - A307-07.....Carbon Steel Bolts and Studs, 60000 psi Tensile  
Strength
  - A653/653M-07.....Steel Sheet, Zinc Coated (Galvanized) or Zinc  
Alloy Coated (Galvannealed) by the Hot-Dip  
Process
  - A563-07.....Carbon and Alloy Steel Nuts
  - A1008-07.....Steel, Sheet, Cold-Rolled, Carbon, Structural,  
High-Strength, Low-Alloy
  - A786/A786M-00.....Rolled Steel Floor Plates
  - A1011-04.....Steel, Sheet and Strip, Strip, Hot-Rolled  
Carbon, Structural, High-Strength, Low-Alloy
- C. American Welding Society (AWS):

D1.1-04.....Structural Welding Code-Steel

D1.3-98.....Structural Welding Code-Sheet Steel

D. The National Association of Architectural Metal Manufacturers (NAAMM)  
Manuals:

Metal Bar Gratings (ANSI/NAAMM MBG 531-00)

AMP521-01.....Pipe Railing Manual, Including Round Tube

E. American Iron and Steel Institute (AISI):

2001.....Design of Cold-Formed Steel Structural Members

## 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 Grating treads in accordance with NAAMM Metal Bar Grating Manual.
- D. Design pipe railings in accordance with NAAMM Pipe Railing Manual for 900 N (200 pounds) in any direction at any point.

### 2.2 MATERIALS

- A. Steel Pipe: ASTM A53, Standard Weight, zinc coated.
- B. Steel Grating: Metal bar type grating NAAMM BG.
- C. Sheet Steel: ASTM A1008.
- D. Structural Steel: ASTM A36.
- E. Steel Floor Plate: ASTM 786.
- F. Steel Decking: Form from zinc coated steel conforming to ASTM A446, with properties conforming to AISI Specification for the Design of Cold-Formed Steel Structural Members.
- G. Steel Plate: ASTM A1011.
- H. Iron Castings: ASTM A48, Class 30.
- I. Malleable Iron Castings: ASTM A47.

### 2.3 FABRICATION GENERAL

- A. Stair assemblies shall be completely pre-fabricated off site, no welding or grinding producing sparks shall be performed within the historic mill building.
- B. 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.
- C. Welding:

1. No welding shall occur within historic mill building.
2. Structural steel, AWS D1.1 and sheet steel, AWS D1.3.
3. Where possible, locate welds on unexposed side.
4. Grind exposed welds smooth and true to contour of welded member.
5. Remove welding splatter.

D.Remove sharp edges and burrs with grinder off-site. No grinding that will produce sparks is allowed within historic mill building.

F.Fit stringers to head channel and close ends with steel plates bolted in place where shown.

G.Fit face stringer to newel post by tenoning into newel post, or by notching and fitting face stringer to side of newel where shown.

H.Shop Prime Painting: Prepare surface and apply primer as specified for ferrous metals in Section 09 91 00, PAINTING.

## 2.4 RAILINGS

A. Fabricate railings, including handrails, from steel pipe with flush welds.

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.

## 2.5 INDUSTRIAL STAIRS

A. Provide treads, platforms, railings, stringers and other supporting members as shown.

B. Treads and platforms of checkered steel floor plate:

1. Turn floor plate down to form nosing on treads and edge of platform at head of stairs.
2. Support treads and platforms with angles welded to plate.
3. Do not leave exposed fasteners on top of treads or platform surfaces.
4. Provide flat sheet steel risers for stairs with steel plate treads where shown.

## PART 3 - EXECUTION

### 3.1 STAIR INSTALLATION

A. Provide hangers and struts required to support the loads imposed.

- B. Perform any job site welding outside of structure. Pre-fabricated stair components have to be assembled in structure using bolted connections only..
- C. Set stairs and other members in position and secure to structure as shown in drawings.
- D. Install stairs plumb, level and true to line.
- E. 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 bolted connections, 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. Note restrictions prohibiting grinding capable of producing sparks apply within historic mill building.
- 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.

- - - E N D - - -