

**SECTION 05 52 13
PIPE AND TUBE RAILINGS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies stainless steel and painted steel railings, guard railings and handrails.

1.2 RELATED WORK

- A. Glass railings: Section 05 73 00, DECORATIVE METAL RAILINGS.
- B. Section 09 06 00, SCHEDULE FOR FINISHES.
- 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.
- C. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Laboratory Test Reports for Credit IEQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

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
 - A1008-07.....Steel, Sheet, Cold-Rolled, Carbon, Structural,
- 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 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. Sheet Steel: ASTM A1008.
- C. Structural Steel: ASTM A36.
- D. Iron Castings: ASTM A48, Class 30.
- E. Malleable Iron Castings: ASTM A47.
- F. Stainless Steel Tubing: ASTM A 554, Grade MT 304.
- G. Stainless Steel Pipe: ASTM A 312/A 312M, Grade TP 304.
- H. Stainless Steel Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.

- I. Stainless Steel Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304.
- J. Stainless Steel Bars and Shapes: ASTM A 276, Type 304.
- K. Stainless Steel Fittings: Type 304 stainless steel.
- L. Perforated Metal: Galvanized-steel sheet, ASTM A 653/A 653M, G90 (Z275) coating, commercial steel Type B, 0.1250 inch (3.18 mm) thick, pattern as indicated on the Drawings.
 - 1. Basis-of-Design Manufacturer: Provide product with perforations as manufactured by Diamond Perforated Metal Co.

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

2.4 STEEL 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.
- 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.
- E. Fabricate handrail brackets from cast malleable iron.
- F. Provide standard terminal fittings at ends of post and rails.
- G. Perforated-Metal Infill Panels: Fabricate infill panels from perforated metal made from galvanized steel.
 - 1. Edge panels with U-shaped channels made from metal sheet, of same metal as perforated metal and not less than 0.043 inch (1.1 mm) thick.
 - 2. Orient perforated metal with pattern as indicated on the Drawings.

2.5 STAINLESS STEEL HANDRAILS

- A. Fabricate from 38 mm (1-1/2 inches) and 41 mm (1-5/8 inch) outside diameter stainless steel as indicated on the Drawings. ~~tubing, ASTM A269, having a wall thickness of 1.6 mm (0.065 inch).~~
- B. Join sections by an internal connector to form hairline joints where field assembled.
- C. Fabricate with **bevels** and ~~continuous~~-welded connections as indicated on the Drawings.
- D. Fabricate brackets of stainless steel as indicated on the Drawings ~~to design shown.~~
- E. Fabricate **plates** of stainless steel as indicated on the Drawings. ~~sleeves at least 150 mm (6 inches) deep having internal dimensions at least 13 mm (1/2 inch) greater than external dimensions of post.~~
- F. **Grind welds to smooth seamless finish as indicated on the Drawings.**

2.6 FINISHES

- A. Steel Railings: Painted.
- B. Stainless Steel: Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 RAILING INSTALLATION

- A. Install standard terminal fittings at ends of posts and rails.
- B. **Steel Railings:** 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. **Stainless Steel Railings:** Anchor plates to concrete as indicated on the Drawings.
- D. Set rails horizontal or parallel to rake of stairs to within 3 mm in 3650 mm (1/8-inch in 12 feet).
- E. Set posts plumb and aligned to within 3 mm in 3650 mm (1/8-inch in 12 feet).

3.3 FIELD PRIME STEEL 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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