

SECTION 05 52 00

METAL RAILINGS

PART 1 –GENERAL

1.01 SECTION INCLUDES

- A. Metal Handrails.
- B. Steel Pipe.
- C. Steel Plate.

1.02 RELATED SECTIONS

- A. Metal handrails and railings related directly to metal stairs are specified in Section 05 51 00, Metal Stairs.
- B. Stainless steel handrails and railings are specified in Section 05 70 00, Decorative Metal.

1.03 MEASUREMENT AND PAYMENT

- A. Measurement: Metal handrails and railings will be measured for payment by the lump-sum method, acceptably fabricated and installed.
- B. Payment: Metal handrails and railings will be paid for at the indicated Contract lump-sum price as indicated in the Bid Schedule of the Bid Form.

1.04 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A36/A36M Standard Specification for Carbon Structural Steel
 2. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
 3. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 4. ASTM A143/A143M Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 5. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 6. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength

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7. ASTM A384/A384M Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
 8. ASTM A385/A385M Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
 9. ASTM A449 Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
 10. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts
 11. ASTM A780/A780M Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 12. ASTM D6386 Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
- B. National Association of Architectural Metal Manufacturers (NAAMM):
1. ANSI/NAAMM AMP 521 "Pipe Railing Systems Manual, Including Round Tube" (AMP: Architectural Metal Products)
- C. The Society for Protective Coatings (SSPC)/National Association of Corrosion Engineers (NACE):
1. SSPC-SP 1 Solvent Cleaning
 2. SSPC-SP 3 Power Tool Cleaning
 3. SSPC-SP 10/NACE No. 2 Near-White Blast Cleaning
 4. SSPC-SP 11 Power Tool Cleaning to Bare Metal

1.05 SUBMITTALS

- A. General: Refer to Section 01 33 00, Submittal Procedures, and Section 01 33 23, Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.
- B. Shop Drawings: Submit detailed Shop Drawings of metal handrails and railings, showing sizes, details of fabrication and construction, bends and radii, handrail brackets, locations of hardware, anchors, and accessories, and installation details.
- C. Product Data: Submit manufacturers' product data of railing system and railing components, handrails, and handrail brackets. Include corrosion-inhibitive shop coat painting system.

PART 2 – PRODUCTS**2.01 MATERIALS**

- A. Metal Handrails: Standard Steel Pipe, Architectural Handrail Grade, of diameter and sizes indicated. Exterior metal handrails shall be galvanized. Provide terminal safety returns for all stair handrails. Handrail brackets shall be galvanized malleable iron, manufactured for the purpose, for anchorage to concrete walls. Include all fittings and components, sleeves, hardware, backing plates, and accessories as required for complete and finished handrail installations.
- B. Steel Pipe: Pipe for railings, pipe supports, and pipe sleeves shall be seamless steel pipe, conforming to ASTM A53/A53M, Type S, Grade A, of diameters and sizes indicated. Special instructions shall be given the pipe manufacturer to provide Architectural Handrail Grade pipe.
- C. Plate: Steel plate for anchor plates shall be standard steel plate, conforming to ASTM A36/A36M, weldable quality.
- D. Welding Rod/Electrodes: Refer to Section 05 05 22, Metal Welding, for requirements.
- E. Anchors, Fasteners, and Accessories: Provide all required anchors, fasteners, miscellaneous components, and accessories as required for complete and finished railing installations. Bolts and studs, nuts, and washers shall conform with ASTM A307, A449, and A563, as applicable, and shall be galvanized in accordance with ASTM A153/A153M.
 - 1. Expansion Bolts: Where anchors are not included in the concrete construction, provide galvanized expansion type anchors with matching galvanized steel bolts or studs with nuts, of sizes as indicated or required. Provide washers under all bolt heads and nuts. Expansion bolts require approval of the Engineer before they may be installed in post-tensioned slabs. Expansion bolts will not be permitted for use on concrete curbs or along the edge of concrete or a concrete joint.
- F. Paint: Corrosion-inhibitive protective metal primer as herein specified under "Cleaning and Painting."
- G. Grout: Refer to Section 03 61 11, Non-Shrink Grout, for requirements.

2.02 FABRICATION

- A. Metal handrails and railings shall be fabricated by firms or shops experienced and skilled in the custom fabrication of architectural metal handrails and railings, and shall meet the quality requirements of NAAMM's Pipe Railing Systems Manual.
- B. Bends in rails shall be precision-formed to a smooth continuous radius by skilled workers. Work quality and finish shall be true to detail. Butt joints shall have internal

pipe sleeve or dowel. Ends shall be closed with similar materials, welded and ground smooth.

- C. Steel welded connections shall be made in accordance with applicable requirements of Section 05 05 22, Metal Welding. Welding shall be performed in the shop unless otherwise indicated. Welded joints of handrails and railings shall be ground and dressed smooth to match adjacent surfaces and so that the shape and profile of the item welded is maintained.
- D. Metal handrails and railings shall be prefabricated and preassembled in the factory or shop as far as practicable.

2.03 GALVANIZING

- A. Ferrous metal railings and related items on the exterior of the building, or as otherwise indicated, shall be galvanized, after fabrication, by the hot-dip process in accordance with ASTM A123/A123M and ASTM A385/A385M. Weight of zinc coating shall conform with requirements specified under "Weight of Coating" in ASTM A123/A123M.
- B. Safeguarding against steel embrittlement shall conform with applicable requirements of ASTM A143/A143M.
- C. Safeguarding against warpage and distortion of steel members shall conform with applicable requirements of ASTM A384/A384M.
- D. Shop galvanized metalwork necessitating field welding which in any manner removes original galvanizing shall be restored by galvanizing repair in accordance with ASTM A780/A780M.
- E. Bolts and screws for attachment of galvanized items shall be galvanized in accordance with ASTM A153/A153M, or of compatible, non-corrodable material.

2.04 CLEANING AND PAINTING

- A. Cleaning and painting shall conform to like requirements specified in Section 05 12 00, Structural Steel Fabrication, and Section 05 50 00, Metal Fabrications.
- B. All surfaces of metal handrails and railings shall be cleaned and treated to assure maximum paint adherence, prior to application of the shop prime coat, in accordance with SSPC-SP 1, SSPC-SP 3, SSPC-SP 10/NACE No. 2, SSPC-SP 11 as applicable for the type of substrate, exposure, and application.
- C. Ferrous metalwork shall be given a shop coat of rust-inhibitive metal primer as specified in Section 05 12 00, Structural Steel Framing, or other approved rust-inhibitive metal primer standard with the railing manufacturer. All surfaces of handrails and railings shall be spray-painted.
- D. Where galvanized surfaces are indicated to be painted, comply with cleaning and painting requirements of Section 05 50 00, Metal Fabrications.

- E. Coordinate with Section 09 91 00, Painting, for compatibility of the prime coat and finish coats of paint.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install metal handrails and railings as indicated and in accordance with the approved Shop Drawings, using workers skilled and experienced in the installation of the type of work involved. Conform with the installation requirements of NAAMM's Pipe Railing Systems Manual, as applicable.
- B. Install metal handrails and railings with accessories furnished by the railing fabricator as required for complete and finished railing installations.
- C. Installation of handrails and railings shall be in accordance with approved Shop Drawings, true and horizontal, perpendicular, or at the required angle, as the case may be, level and square, with angles and edges parallel with related lines of the building or structure.
- D. Field welding, where required, shall conform with requirements of Section 05 05 22, Metal Welding.
- E. Where railing base plates require grouting, conform with requirements of Section 03 61 11, Non-Shrink Grout, and Section 05 12 00, Structural Steel Framing, as applicable.

3.02 GALVANIZING REPAIR

- A. Galvanized surfaces which have become damaged from welding, handling, or installation shall be repaired immediately after installation with galvanizing repair material in accordance with ASTM A780/A780M.

3.03 FIELD PAINTING

- A. After installation, exposed painted surfaces, field welds, and other abraded or damaged primed surfaces shall be prepared as required and touched up with an additional coat of the same primers for ferrous and galvanized surfaces as hereinbefore specified for shop painting.
- B. Lightly sand and feather out such damaged surfaces so that paint touch-up becomes invisible. Spray-paint all touch-up work.
- C. Finish field painting is specified in Section 09 91 00, Painting.

END OF SECTION 05 52 00