SECTION 05 51 16

METAL STAIRS

PART 1 - GENERAL

1.01 Section Includes

A. Steel stair frame of structural sections with closed and open risers.

B. Open grate and checkered plate stair treads.

1.02 Related Sections

A. Section 05525 – Aluminum Railings.

1.03 References

A. ASTM A36 – Carbon Structural Steel.

B. ASTM A123 –Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

1.04 Design Requirements

A. Fabricate stair assembly to support live load of 100 psf with deflection of stringer or landing frame not to exceed 1:240 of span.

B. Railing assembly and attachments to resist a lateral force of 250 pounds applied in any direction toward the rail included in an arc of 180 degrees centered over the top of the rail without damage or permanent set.

1.05 Submittals

A. Submit shop drawings.

B. Indicate on shop drawings, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.

1.06 Quality Assurance

A. Perform work in accordance with AWS D1.1.

PART 2 - PRODUCTS

2.01 Materials

A. Steel Sections: ASTM A36, galvanized.

B. Steel Sheet: Structural, galvanized.

C. Bolts, Nuts, and Washers: Steel, galvanized.

D. Galvanize to ASTM A123.

2.02 Fabrication - General

A. Fit and shop assemble components in largest practical sections, for delivery to site.

B. Continuously seal joined pieces by continuous welds.

C. Grind exposed joints flush and smooth. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications.

2.03 Fabrication – Open Grating Stairs

A. Fabricate treads of serrated steel bars, welded to supports; reinforce underside with angles.

B. Form stringers with steel channels.

2.04 Fabrication – Checkered Plate Stairs

A. Form stairs with checkered steel plate; galvanized finish. Weld to stringer support clips. Bend nosing to a radius and return down.

PART 3 - EXECUTION

2.01 Installation

A. Install components plumb and level. Accurately fitted, free from distortion or defects.

B. Provide anchors for connecting stairs to structure.

C. Allow for erection loads, and for sufficient temporary bracing until completion of erection and installation of permanent attachments.

D. Field weld components in accordance with AWS D1.1.

E. Field bolt and weld to match shop bolting and welding.

F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

G. After erection prime welds, abrasions, and surfaces not shop primed, except surfaces in contact with concrete.

END OF SECTION

SECTION 05 52 13

HANDRAILS AND RAILINGS

PART 1 - GENERAL

1.01 Section Includes

A. Furnishing and installation of metal handrails and railings

1.02 References

A. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

B. National Ornamental & Miscellaneous Metals Association - Voluntary Joint Finish Standards.

1.03 Submittals

A. Submit shop drawings for all railing systems, including splices and attachments. Identify location of railing systems. Indicate railing systems in related and dimensional position with elevations and details at scale. Show all details and dimensions not governed by field conditions. Indicate all required field dimensions. Indicate materials.

1.04 Structural Requirements

A. Railing system shall withstand a minimum concentrated load of 250 pounds applied in any direction toward the rail included in an arc of 180 degrees centered over the top of the rail.

PART 2 - PRODUCTS

2.01 Materials

A. Structural Tubing: ASTM A501.

2.02 Railing System

A. Railing system shall be permanently anchored.

2.03 Fabrication

A. Form rail-to-end post connections and all changes in rail direction by mitered joints.

B. Cut pipe square and remove burrs from all exposed cut edges.

C. Form elbow bends and wall returns to uniform radius, free from buckles and twists, with smooth finished surface, or use prefabricated bends.

D. Locate intermediate rails equally spaced as per code requirements between top rail and finish floor or nosing line of tread.

E. Close exposed ends of pipe and tubing by welding metal closure in place or by use of prefabricated fittings.

F. For posts set in concrete, furnish matching sleeves or inserts not less than five inches long.

G. On posts set on stair stringers, weld posts directly to stringer or weld plate to bottom of post for bolting.

H. Welding
   1. Accurately miter and cope intersections of posts and rails and weld all around.
   2. Weld to Match NOMMA Type 2.

I. Provide vent/drain holes at ends of all closed sections of pipe for galvanized or anodized railing systems.

J. Fabricate joints that will be exposed to the weather so as to exclude water, or provide weep holes where water may accumulate.

K. Provide maximum post spacing as indicated on the Drawings.

2.04 Finish

A. Powder Coated Finish: Finely ground particles of pigment and resin, electrically charged, sprayed on, and cured in an oven.

B. Color: As selected from manufacturer's standard.

PART 3 - EXECUTION

3.01 Preparation

A. Supply items to be cast in concrete.

B. Prepare surrounding construction to receive railing system installations to comply with manufacturer's requirements.

2.02 Installation

A. Install railing system in accordance with the contract drawings and approved shop drawings.

B. Install posts in pipe sleeves preset and anchored in concrete.

C. Coat ends of pipe to be set in concrete with asphaltic material.

D. Fill annular space between post and sleeve with nonshrink, nonmetalic grout. Leave top of grout ¼-inch above surface, sloped to drain.

E. Set posts plumb.

F. Align rails so that variations from level for horizontal members, and from parallel with rake of steps and ramps for sloping members do not exceed ¼-inch in 12 feet.

G. Adjust, level and securely install railing system components. Avoid springing assembled system components into place.

H. Provide for thermal contraction and expansion at maximum 20-foot intervals.

I. Locate joints a distance of six inches from posts.

END OF SECTION