SECTION 05510 - METAL STAIRS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Steel pan stairs and landings, including steel railings and handrails with mounting brackets at steel stairs.

B. Related Sections:

1. Section 03300 - Cast-In-Place Concrete
2. Section 05120 – Structural Steel
3. Section 05500 – Miscellaneous Metals
4. Section 05520 – Railings and Handrails
5. Section 09900 - Painting

1.02 REFERENCE STANDARDS

A. Except as otherwise specified herein or shown on the Drawings, comply with the latest editions of all applicable codes and regulations including the applicable requirements of the following reference Standards and Codes which are hereby made a part of this Section, as they relate to the metal stairs.

1. BOCA Code, latest Edition.
2. The Occupational Health and Safety Administration (OSHA) Code of Federal Regulations(CFR), Volume 29.
3. American Society for Testing and Materials (ASTM):

a. A36 - Structural Steel.
b. A53 - Pipe, Steel, Black and Hot-dipped, Zinc Coated Welded and Seamless.
c. A120 - Black and Hot-dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses.
d. A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
e. A283 - Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality.
f. A307 - Carbon Steel Externally and Internally Threaded Standard Fasteners.
g. A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
h. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing or various Shapes.
i. A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
j. A526 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip

Process, Commercial Quality.

k. A575 - Merchant Quality Hot-Rolled Carbon Steel Bars.

l. A663 - Merchant Quality Hot-Rolled Carbon Steel Bars, Subject to Mechanical Property Requirements.

4. AISC: Design of Cold-Formed Steel Structural Members.
5. AWS: A5.1 Carbon Steel Covered Arc Welding Electrodes.
6. AWS: D1.1 Structural Welding Code – Steel.
7. SSPC: SP3 Power Tool Cleaning.

1.03 SUBMITTALS

A. Product Data: Manufacturer's technical data for products and processes not covered in shop drawings.

B. Shop Drawings: Show fabrication and installation details including cuts, copes, connections fasteners and welds. Include plans, elevations, sections, profiles of rails, fittings, connections, and anchors.

1. Provide templates for anchors and bolts installed by other trades.
2. Include structural computations or test results evidencing compliance with design loadings.

C. Certification:

1. Suppliers shall furnish certification attesting that materials meet specification requirements.
2. All submittals shall be dated and bear the signature and impressed seal of a Maine Registered Professional Engineer.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain metal stairs system from a single manufacturer.

B. Design Responsibility: Maine Registered Professional Engineer to prepare structural computations for metal stair system to determine compliance with structural performance requirements.

C. Qualification of welders: Properly certified for the type of work involved in compliance with applicable Code requirements and the testing laboratory.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Comply with standards indicated.

B. Structural Steel: ASTM A36.

C. Metal Pans: Risers and subtreads of 12 gauge steel formed from hot rolled steel, ASTM A526.

D. Sheet Steel: ASTM A526, commercial quality, galvanized sheet steel, ASTM A525, coating designation G90. Landings: Cold rolled Steel, ASTM A366, 12 gauge unless otherwise indicated.

E. Steel Plate: ASTM A36, except for plates to be bent or cold-formed.

1. Steel plates to be bent or cold-formed: ASTM A283, Grade C.

F. Steel Bars and Bar-size Shapes: ASTM A663 or ASTM A36.

1. Hot-rolled carbon steel bars and bar-sizes shapes: ASTM A575, grade as selected by fabricator.

G. Wire Fabric: ASTM A185. Welded wire fabric 2in.x 2in. mesh 12 gauge/12 gauge wire, galvanized. Tack weld to inside of steel pan treads.

H. Newel Post: Steel tube ASTM A500.

I. Steel Pipes: ASTM A53, type E, or S, Grade B, or ASTM A120 schedule 40.

J. Machine Bolts, Nuts and Washers: ASTM A307, Grade A.

K. Arc-welding Electrodes: AWS A5.1, E60XX or E70XX Series, as required for the conditions of intended use.

L. Handrail Brackets: Cast malleable iron or steel, standard product units of type indicated, complete with mounting plates and fasteners.

M. Shop Paint primer: (Interior application only, refer to section 09900 for exterior exposed steel paint system).

1. Tnemec No. 10-1009 Gray Metal Primer.
2. Rust-Oleum No. 7086 Quick Dry Zinc Chromate Gray Metal Primer.
3. No. SR-50 or SR-51 Steelcote Universal Primer by Steelcote Mfg. Co.
4. Zinc Chromate primer No. 13800 by Devoe Paint Co.
5. Heavy Duty RIP Primer No. 1-0900 or No. 1-0969, by Southern Coatings & Chemical Co., Inc.

N. Miscellaneous Materials: As necessary to complete work.

2.02 FABRICATION

A. General:

1. Fabrication of steel channels, hanger rods, steel pan treads, risers and landings, galvanized steel pipe, steel plate, clip angles, and closure plate, with bolted and welded connections to form steel pan stairs as indicated and in accord with approved shop drawings.

B. Pipe Railing and Handrail:

1. Fabricate from 1-1/2" o.d. standard steel pipe to shapes and dimensions indicated on Drawings.
2. Insure that runs of horizontal pipe on opposite sides of posts are in the same plane, both vertically and horizontally.
3. Make joints flush with concealed seamless fittings. Accurately cut, miter, weld and grind smooth to flush surfaces.
4. Cap top and exposed bottom of posts.
5. Make bends to preserve the contour of the pipe.
6. Install as follows:

a. To hollow walls: Provide cast brackets of stock design. Provide 1-1/2 inch clearance between railing and wall. Return handrail ends to within 1/8 inch of wall. Secure each bracket to wall with machine bolts and steel back-up plate welded across a minimum of three studs or tapcons on masonry walls.
b. Steel stair railings: Weld or bolt railings and newels to stringers as detailed. At top of stairs continue railings to walls as indicated.

C. Paint refer to section 09900

PART 3 EXECUTION

3.01 INSPECTION

A. Examine surfaces for conditions that will adversely affect execution, performance and quality of work.

B. Correct unsatisfactory conditions before proceeding with the work.

C. Verify governing dimensions and conditions at the job site before commencing erection work.

3.02 FABRICATION

A. Fabricate work to field measurements whenever possible. When fabrication must precede construction and field measurements are not practical, make sure construction conforms to fabricated dimensions. Ill fitting work due to failure to coordinate will not be accepted.

B. Aesthetics: Fabricate all work to accurately express the character and detail indicated on the Drawings and approved shop drawings.

C. Welding: Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of the exposed side. Clean exposed welded joints.

1. Unless specified, detailed, or approved otherwise on shop drawings, weld all shop connections and all field connections.
2. Unless otherwise approved, grind exposed welds smooth and flush to match and blend with adjoining surfaces.

D. Fit-up: Mill joints to a tight, hairline fit. Cope or miter corner joints.

3.03 INSTALLATION

A. Install manufactured items in accord with manufacturer's instructions and approved shop drawings.

B. Set all work accurately to lines and levels, plumb and secure.

C. Install members, bolts, anchors, and inserts to be covered, inserted or built-in, as the work progresses.

D. Perform all cutting, drilling and fitting required for the installation of work specified.

E. Where cutting, welding and grinding are required for proper fitting and jointing of the work, restore finishes to match original shop applied finish.

F. Where field welding is required and approved, conform to requirements of AWS.

G. Upon completion of the work, touch up minor abrasions and defects. Work damaged or defaced to the extent that in the opinion of the Owner constitutes an unsightly condition may not be corrected by field touching up. Invisible field repair, removal and shop refinishing, or replacement will be required.

3.04 CLEANING AND ADJUSTMENT

A. Protect work after installation use temporary covers. Before final acceptance, clean work, adjust fastenings and anchors that have worked loose, restore finishes soiled, damaged, or defaced during construction.

END OF SECTION