

SECTION 05510
METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Steel stair frame of structural sections with closed risers.
- B. Pan to receive concrete fill stair treads and landings.
- C. Integral balusters and aluminum hand railing.
- D. Aluminum hand railing on walls.

1.2 REFERENCES

- A. ANSI A202.1 - Metal Bar Grating Manual for Steel and Aluminum Gratings and Stair Treads.
- B. ASCE 7-98 - American Society of Civil Engineers, Wind loads (Chapter 6 only)
- C. ASTM A36 - Structural Steel.
- D. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- E. ASTM A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated From Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip.
- F. ASTM A283 - Low and Intermediate Strength Carbon Steel Plates.
- G. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip process, Physical (Structural) Quality.
- H. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- I. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- J. ASTM E935 - Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
- K. ASTM E985 - Permanent Metal Railing Systems and Rails for Buildings.
- L. AWS A2.0 - Standard Welding Symbols.
- M. AWS D1.1 - Structural Welding Code.
- N. NAAMM - Metal Stairs Manual.
- O. NAAMM - Metal Bar Grating Manual.
- P. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.3 DESIGN REQUIREMENTS

- A. Florida Building Code.
- B. Design stair assembly in accordance with ASCE 7-98.
- C. Design handrails to support a 200-pound load applied at any point and in any direction. Design shall include support for 50 pounds per lineal foot load applied in any direction

1.4 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
- C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.5 QUALITY ASSURANCE

- A. Prepare work in accordance with ASTM E985.
- B. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.
- C. Welders' Certificates: Submit under provisions of Section 01300, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B Schedule 40.
- E. Sheet Steel: ASTM A446, Grade B Structural Quality with 0.25 oz/sq ft galvanized coating.
- F. Bolts, Nuts, and Washers: ASTM A325 or A307 galvanized to ASTM A153 for galvanized components.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure.
- H. Welding Materials: AWS D1.1; type required for welded materials.
- I. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
- J. Touch-Up Primer for Galvanized Surfaces: SSPC 20 Type I Inorganic zinc rich.

2.2 COMPONENTS

- A. Gratings: ANSI A202.1.
- B. Concrete for Treads and Landings: Portland Cement Type I, 3000 psi 28 day strength, with a 2" to 3" slump.

2.3 FABRICATION - GENERAL

- A. Fit and shop assemble components in largest practical sections for delivery to site.
- B. Fabricate components with joints tightly fitted and secured.
- C. Continuously seal jointed pieces by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications of same material and finish as fabrication, except where specifically noted otherwise.
- G. Accurately form components required for anchorage of stairs, landings and railings to each other and to building structure.

2.4 FABRICATION - PAN STAIRS AND LANDINGS

- A. Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.
- B. Prime paint components.

2.5 FABRICATION - UNIT STAIR TOWERS

- A. Fabricate self-supporting steel stair towers with formed treads and risers; steel channel stringers; landing platforms; sectioned for transport; corner structural support members designed to support full weight of complete stair tower plus design live load; with aluminum railings, newel posts, and balusters.
- B. Fabricate stair towers to height not exceeding 40' for transportation purposes; designed for stacking to height of building as a self-supporting structure.

2.6 FINISHES

- A. Prepare surfaces to be primed in accordance with SSPC SP 2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Do not prime surfaces in direct contact with concrete or where field welding is required.
- D. Prime paint items with one coat.
- E. Galvanized items to minimum 1.25-oz/sq ft zinc coating in accordance with ASTM A123.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers and struts required for connecting stairs to structure.
- C. Allow for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.
- E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.
- G. Obtain approval prior to site cutting or making adjustments not scheduled.
- H. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: ¼" per story, non-cumulative.
- B. Maximum Offset From True Alignment: ¼".

END OF SECTION