SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop fabricated ferrous metal items, galvanized, powder coated and prime painted.
2. Steel stair frame of structural sections, with pan to receive concrete fill stair treads and landings.
3. Balusters and handrailing.
4. Steel bollards.
5. Steel ornamental grilles.

1.2 SYSTEM DESCRIPTION

A. Design stair assembly to support live load of 100 lb/sq ft with deflection of stringer or landing framing not to exceed 1/240 of span.

B. Design handrail, guardrail, and attachments to resist forces as required by applicable building code. Apply loads non-simultaneously to produce maximum stresses.

1. Guard Top Rail and Handrail Concentrated Load: 200 pounds applied at any point in any direction.
2. Guard Top Rail Uniform Load: 50 plf applied in any direction.
3. Intermediate Rails, Panels, and Baluster Concentrated Load: 50 pounds applied to 1 sf area.
4. Guard Rail Openings: Less than 4” clear space.

1.3 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Submit drawings for structural components, including stairs and guardrails with the stamp of a registered Professional Engineer in the state the project is located.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.4 QUALITY ASSURANCE

A. Finish joints in accordance with NOMMA Guideline 1.

B. Design stairs and guardrails under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Steel Sections: ASTM A36/A36M.

B. Steel Plate: ASTM A36/A36M.

C. Tubing: ASTM A513, Type 5, minimum 50 ksi yield strength.

D. Hollow Structural Sections: ASTM A500, Grade B.

E. Steel Pipe: ASTM A53/A53M, Grade B Schedule 40.

F. Sheet Steel: ASTM A653/A653M, Grade 33 Structural Quality with galvanized coating.

G. Bolts: ASTM A307; Grade A or B; ASTM A325; Type 1.

1. Finish: Unfinished at interior applications. Hot dipped galvanized at exterior applications.

H. Nuts: ASTM A563 heavy hex type.

1. Finish: Unfinished at interior applications. Hot dipped galvanized at exterior applications.

I. Washers: ASTM F436; Type 1.

1. Finish: Unfinished at interior applications. Hot dipped galvanized at exterior applications.

J. Handrail Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast or machined steel.

K. Anchor Rods: ASTM F1554; Grade 55, weldable.

2.2 ACCESSORIES

A. Welding Materials: AWS D1.1.

B. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide.

C. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic.

D. Concrete and Reinforcement for Treads and Landings: Mesh type, Portland cement, as specified in Section 03 30 00 .

2.3 FABRICATION

A. General:

1. Fit and shop assemble items in largest practical sections, for delivery to site.
2. Continuously seal joined members by continuous welds.

3. 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.
4. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, consistent with design of component.
5. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication.
6. Accurately form components required for anchorage of stairs and landings and railings to each other and to building structure.
7. Exposed Welded Joints: NOMMA Guideline 1 Joint Finish 1.

B. Pan Stairs And Landings:

1. Fabricate stairs and landings with closed open risers and treads of metal pan construction, ready to receive concrete.
2. Form treads, landings, and risers with sheet steel stock.
3. Secure tread pans to stringers with clip angles; welded in place.
4. Form stringers with rolled steel channels. Weld facial plates to channels using steel sheet across channel toes.
5. Prime paint interior components.

C. Handrails:

1. Fit and shop assemble components in largest practical sizes, for delivery to site.
2. Grind exposed joints flush and smooth with adjacent finish surface.
3. Accurately form components to suit stairs and landings, to each other and to building structure.
4. Form balusters with ½ inch diameter square steel sections, welded to stringers.

D. Ornamental Grilles:

1. Fit and shop assemble components in largest practical sizes, for delivery to site.
2. Fabricate grilles as indicated on drawings.
3. Grind exposed joints flush and smooth with adjacent finish surface.
4. Finish with powder coat system after fabrication.

2.4 FINISHES

A. Prepare surfaces in accordance with SSPC SP 2

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

C. Shop prime items with one coat. Do not prime surfaces in direct contact with concrete or where field welding is required.

D. Galvanizing for Components: ASTM A123/A123M; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication.

E. Galvanizing for Fasteners, Connectors, and Anchors:
1. Hot-Dipped Galvanizing: ASTM A153/A153M.
2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

F. Powder Coating for Components: ASTM D 3451-06, color as selected.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

A. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads and provide temporary bracing to maintain indicated alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

D. Obtain approval prior to site cutting.

E. Install flat steel plate at top of stair stringers to close gap between stringer and adjacent walls.

F. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

3.4 FIELD QUALITY CONTROL

A. Welding: Inspect welds in accordance with AWS D1.1.

…END OF SECTION 05 50 00