SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Aluminum ships' ladders, exterior steps, landing, handrails and guardrails.
2. Delegated design.

B. Related Requirements:

1. Section 08 11 13 “Hollow Metal Doors and Frames”

1.3 COORDINATION

A. Coordinate installation of metal fabrications that are anchored to or that receive other work.

1.4 SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

B. Delegated-Design Submittal: For ships’ ladders, exterior steps, landings, handrails and guardrails. Including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For professional engineer.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, to design ships' ladders, exterior steps, landings, handrails and guardrails.

B. Code Conformance: Design of ships' ladders, exterior steps, landings, handrails and guardrails to meet requirements of current Oregon Structural Specialty Code.

C. Structural Performance of Aluminum Ladders:

1. Aluminum ladders, steps, landings, guardrails and handrails shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
2. Secure fabrications to existing structure to prevent movement. Attachments to be watertight.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.

C. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

D. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.5 LADDERS, STEPS, LANDINGS, HANDRAILS AND GUARDRAILS

A. Fabricate of open-type construction with channel stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.

1. Ladder treads shall be not less than 5 inches exclusive of nosing and riser height shall not be more than 9-1/2 inches.
2. Stair treads shall not be less than 11 inches exclusive of nosing and riser height shall not be more than 7 inches.
3. Fabricate including railings and guardrails from aluminum.
4. Minimum clear width at and below handrails shall be 20 inches or more per Drawings.
5. Fabricate treads and platforms from aluminum plank grating. Limit openings in gratings to no more than 1/2 inch in least dimension.

B. Detail at Roofing: At vertical supports bearing on roof surface provide dispersed bearing surfaces that do not penetrate existing roof membrane. Provide protection pads compatible with roofing between fabrication bearing points and existing roofing.

C. Finishes:
1. As-Fabricated Mill Finish: AA-M12.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Fastening to In-Place Construction: Secure steps and ladders to prevent movement and to support loads. Provide fasteners where metal fabrications are required to be fastened to in-place construction. Connections to be watertight.

END OF SECTION 05 50 00