

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide mechanically connected aluminum handrails and railings as shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related Work:
 - 1. Documents affecting work under this section include, but are not limited to;
 - a. Section 01 00 00- General Conditions
 - b. Section 05 50 00- Metal Fabrications
 - c. Section 05 51 00- Metal Stairs
 - d. Section 05 52 00- Metal Railings
 - e. Section 09 90 00- Painting and Coating

1.2 SUBMITTALS

- A. Submit shop drawings, including:
 - 1. Manufacturer's specification and other data needed to prove compliance with the specified requirements.
 - 2. Fabrication, layout, installation, anchorage, and interface of the work of this section with the work of adjacent trades.
 - 3. Manufacturer's recommended installation procedures.

1.3 QUANTITY ASSURANCE

- A. Comply with OSHA and local building codes.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with no less than three years of experience.
- C. Railing shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guardrail System:
 - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction
 - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction
 - c. Uniform and concentrated loads need no be assumed to act concurrently
 - 2. Infill Area of Guardrail System:
 - a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
 - b. Uniform load of 25 lbf applied horizontally
 - c. Infill load and other loads need not be assumed to act concurrently.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials to job site properly marked to identify the structure for which they are intended and at such intervals to insure uninterrupted progress of the work. Marking shall correspond to markings indicated on the shop drawings.
- B. Pack all aluminum pipe in individual plastic sleeves to protect the finish.
- C. Store all members off the ground using pallets, platforms, or other supports.
- D. Do not store materials on the structure in a manner that might cause distortion or damage to the members of the supporting structure.

Part 2 – PRODUCTS

2.1 MANUFACTURERS

- A. BMC Mesh Rail by Breuer Metal Craftsmen Inc. phone: (920) 885-2828, fax: (920) 885-2822, email: craftsmen@breuermetal.com, or equal.

2.2 GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E 985 and applicable local codes.
- B. Design railing assembly, wall rails, and attachments to resist lateral force required by applicable code at any point without damage or permanent set. Test in accordance with ASTM E 935.
- C. Mechanically fastened aluminum railing:
 - 1. Mechanically fastened 1-1/2 Schedule 40 pipe and 1-1/2 Schedule 80 post pipe. Post spacing to be no more than 5'-0" and top rail shall be smooth and not interrupted along the distance of the guardrail.
 - 2. Use all internal fittings secured with stainless steel rivets.
 - 3. Provide expansion joints for rails at intervals of not more than 20 feet.
- D. Provide all railings with 4-inch high kickplate with maximum 3/8-inch clearance to walkway surface fabricated and finished from same material as the rails and shipped in mill lengths along with stainless steel fasteners.
- E. Use an in-line stainless steel base flange assembly with stainless steel anchor bolts for surface mounting posts to concrete.
- F. Use an aluminum side mount bracket assembly with stainless steel anchor bolts for side mounting posts.
- G. Embed posts 6-inches in concrete core drilled hole with Styrofoam plug and pre-drilled drain hole.

- H. Mount stainless steel base flange to stringers with stainless steel bolts and beveled washers
- I. Handrail: 1-1/2-inch extruded aluminum pipe. Provide where shown on Drawing
- J. Hinged Swinging Gate
 - 1. Components: Gate frame, stainless steel self-closing device, hinges, gate stops, and durable self-locking type latch. Fabricate components in conformance with OSHA minimum strength requirements.
 - 2. Of same design, material, quality, and workmanship to that of the guardrail system in which they will be installed.
- K. Mesh Panel Infill
 - 1. 2" x 2" x 0.25" aluminum lockcrimp weaved wire mesh.
 - 2. 1" x 1" x 1/2" 18GA aluminum formed channel frame, alloy 3003-H14
 - 3. Mechanically connected to guardrail with drain holes in lower corners of frame
 - 4. Space not to allow no larger than a 4" sphere to pass threow openings.
 - 5. Of same design, material, quality, and workmanship to that of the guardrail system in which they will be installed.

2.3 MATERIALS

- A. Aluminum
 - 1. Extruded Bar and Shapes: ASTM B 221, alloy 6063-T6
 - 2. Extruded Pipe and Tube: ASTM B 429, alloy 6005-T5, T4
- B. Stainless Steel
 - 1. Tubing: ASTM A 554, grade as follows:
 - a. Alloy 304
 - 3. Plate: ASTM A 167, grade as follows:
 - a. Alloy 304

2.4 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railing to other types of construction indicated and capable of withstanding design loadings.
 - 1. For aluminum railings, provide stainless steel of alloy 304.
- B. Cast-in-Place and Post-Installed Anchors: Fabricated from corrosion resistant materials with capability to sustain, without failure, the loads determined by local code requirements.

2.5 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory packaged, nonstaining, noncorrosive,

nongaseous grout complying with ASTM C 1107. Provide 9 grout specifically recommended by manufacturer for interior and exterior applications.

- B. Interior Anchoring Cement: Factory packaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Use for interior applications only.

2.6 ALUMINUM FINISHES

- A. Mill Anodized- Aluminum Association Specification M12-C22-A41, finish non specular as fabricated, chemical finish-medium matte, Architectural Class 1 clear 0.7 mil thick anodic coating.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Posts:
 - 1. Use a single, un-spliced pipe for each post.
 - 2. Do not locate anchor bolts less than 2-inch from concrete surface edges.
 - 3. Materials shall be plumb, square, level and anchored securely.
 - 4. Bituminous or epoxy paint shall be applied where aluminum is in contact with dissimilar surface.

- B. Rails:
 - 1. Use a continuous pipe length for top rails wherever possible with each single unspliced length attached to a minimum of three supports.
 - 2. Use a single unspliced length between supports for lower rails.
 - 3. Attach wall terminal fitting and brackets for rails to the mounting surface with stainless steel anchor bolts.
 - 4. Top horizontal rail should be set 42-inches from centerline to adjacent walking surface.
 - 5. Handrails and guardrails shall be constructed to prevent the through-passage of a sphere with the diameter of 4 inches or larger.

- C. Handrails:
 - 1. Set handrails 36-34 inches, measured vertically, above the nosing of the treads or above the finished floor of the landing or walking surface.
 - 2. Set lower rails 16-18 inches, measured vertically from centerline to centerline of the parallel top rail.
 - 3. Set handrails with minimum clear space of 1-1/2-inches between handrail and adjacent wall or surface.
 - 4. Extend handrails at least 12-inches beyond the top riser and at least one tread depth horizontally beyond the bottom riser at the slope of the stair flight.

END OF SECTION