MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**MARINE RAILING, STAINLESS STEEL**

DET:SLN 1 of 2 APPR:NAP:REL:11-28-22

**a. Description.** This work consists of designing, furnishing, and installing stainless steel marine railing as detailed herein and shown on the plans.

**b. Materials.** Design and construct railings, posts, and gates to support a concentrated load of 200 pounds applied at any point and in any direction along top and a uniform load of 50 pounds per foot along top applied in any direction. Design guardrails in accordance with *Article 13.8.2 of the AASHTO LRFD Bridge Design Specifications.*

Furnish machine bolts, at least 1/2 inch diameter, hex head, complete with washer and hex head tamper-proof nut with length not more than 1/4 inch beyond nut and consisting of Type 316L stainless steel in connection with stainless steel railings.

Furnish capsule anchors of Type 316L stainless steel, 1-inch diameter, shank length to obtain holding strength for load applied and for substrate, with washer and tamper-proof nuts as recommended by anchor manufacturer.

Furnish bolts of Type 316L stainless steel, 1-inch diameter, shank length to obtain holding strength for load applied and for substrate, with washer and tamper-proof nuts.

Furnish 1/8 inch thick neoprene pads at railing/post/gate connections.

Furnish non-shrink grout in accordance with subsection 1005.02 of the Standard Specifications for Construction for leveling post base plates.

Fabricate members without twists, bends, open joints, misalignment, or jagged edges, true to length for assembly without fillers. Accurately cut and fit miters and joints. Ensure the completed assembly is rigid and neat in appearance.

Furnish welding using coated electrode metallic arc or inert gas shielded arc methods of fusion welding to preserve, to fullest extent, describable qualities of stainless steel in accordance with *AWS D1.6 Structural Welding Code – Stainless Steel*. Join parts as closely as possible. Remove loose slag, scale, rust, grease, paint, and foreign material to expose clean surfaces for welding. Ensure welds are continuous and watertight at exterior members. Grind welds smooth with surfaces of welded members and remove burrs. Grind, brush, or polish welded surfaces to match adjacent factory finish.

Furnish stainless steel mechanical fasteners compatible with tubing material. Assemble anchor bars, threaded fasteners, and related components to develop tight, rigid connections. Use concealed fasteners.

Furnish railings and gates with smooth, uniform surfaces on the top and sides for entire length, without sharp corners, projections, or irregularities free from blemishes or defects that affect durability, strength, or appearance. Make cuts square and accurate for minimum joint gap, clean, straight, and free of chamfer from deburring, burrs, or nicks. Drill and countersink holes of correct size to receive fasteners. Tack weld tubing on river side to secure tubing and conceal weld from public view. Furnish weep holes in bottom of rails to prevent entrapment of water. Fabricate railings and gates in longest lengths possible. Furnish expansion joints as needed for minimum and maximum thermal loadings and installation temperature.

Furnish tubing for stainless steel railing, posts, and gates in sizes as shown on the plans of Type 316L, ornamental grade tubing in accordance with *ASTM A554,* 11 gauge for rails, 12 gauge forposts. Furnish related stainless steel parts in the same alloy as the tubing.

Acceptable *AISC* certified fabricator must be a company specializing in fabricating specified products with not less than 5 years of documented experience with projects of similar size and complexity. Submit documentation of experience with shop drawings. All railing and hardware components to be accepted based on general certification.

Submit shop drawings in PDF that clearly illustrate the dimensions and appearance of the marine railing to the Engineer for approval at least 14 calendar days prior to ordering any materials. Do not order any materials until approval of shop drawings is received from the Engineer.

**c. Construction.** Must conform to the following installation requirements.

Join components together with tight, even joints. Field verify site dimensions prior to fabrication and installation of marine railing. Ensure any changes to marine railing design due to site conditions are approved by the Engineer.

Core drill concrete seawall cap for tamper-proof capsule anchors. Level post base plates with non-shrink grout only when necessary or as directed by the Engineer. Secure as shown on the plans. Anchor and secure marine railing and components. Furnish and install lugs, connections, bearing plates, anchors, and bolts required for erection.

Anchor reinforcing bars or bolts in accordance with subsection 712.03.J of the Standard Specifications for Construction.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

**Pay Item Pay Unit**

Marine Railing, Stainless Steel Foot