

SECTION 617

RAILINGS

617.1-DESCRIPTION:

This work shall consist of furnishing, constructing, and erecting a pipe railing or other fabricated metal railing of the type specified, on a bridge, wall, or other structure, in accordance with these Specifications and in reasonably close conformity with the lines, grades, dimensions, and sections shown on the Plans.

617.2-MATERIALS:

Materials shall conform to the applicable requirements of Division 700.

All ferrous pipe used for railing shall be wrought iron, and fittings for pipe railing shall be in accordance with the requirements for malleable iron castings in 709.10.

Caulking compounds, for use on surfaces where aluminum is in contact with other metal except stainless steel, shall be as approved by the Engineer.

Elastomeric bearing pads shall conform to the requirements of 715.15.

Mortar for grouting anchor bolts shall be of the following proportion by weight: one part nonshrink aggregate, one part silica sand (702.1), and one part Type I cement (701.1).

CONSTRUCTION METHODS

617.3-LINE AND GRADE:

The line and grade of railing shall conform to that shown on the Plans and not follow any unevenness in the structure. All railing posts shall be vertical.

617.4-PIPE RAILING:

Pipe railing shall be built in accordance with details shown on the Plans.

617.5-FERROUS METAL RAILING:

617.5.1-Fabrication and Erection: Fabrication and erection of ferrous metal railing shall be done in accordance with the applicable requirements of 615. In the case of welded railing, all exposed joints shall be finished by grinding or filing, after welding, to provide a neat appearance.

Railings shall be carefully adjusted prior to fixing in place to insure proper matching at abutting joints and correct alignment and camber throughout their length. The railing shall be so fabricated as to allow for minor adjustments in both horizontal and vertical directions. In the bottom of the sealed end, a ½ in. (12 mm) hole for drainage shall be provided.

617.5.2-Painting: Ferrous metal railing shall be given one shop coat of paint and two coats of paint after erection. Painting shall conform to the

requirements for painting metal structures in 615. No painting is required on railing or posts where galvanizing is specified on the Plans.

617.6-ALUMINUM RAILING:

617.6.1-Fabrication and Erection: Post base castings shall be accurately set and the bolts tightened to obtain full bearing on the base. Additional aluminum shims shall be furnished to permit adjustment in the field to assure compliance with the grade and alignment shown on the Plans.

Material ½ in. (12 mm) thick or less may be sheared, sawed, or milled. Material over ½ in. (12 mm) thick shall be sawed or milled. Cut edges shall be true, smooth, and free from excessive burrs or ragged breaks. Reentrant cuts shall be filleted by drilling prior to cutting. Flame cutting will not be permitted. Welding will not be permitted except as specifically called for in the Contract.

Rivet or bolt holes shall be drilled or subpunched 3/16 in. (4 mm) smaller than the nominal diameter of the fastener and reamed to size. The finished diameter of holes shall not be more than seven percent greater than nominal diameter of the fasteners. Anchor bolt holes and slotted bolt holes to take care of expansion shall be provided as called for on the Plans.

617.6.2-Protection: Where aluminum alloys, except anchor bolts, come in contact with materials other than aluminum and stainless steel, the surfaces in contact shall be protected as follows:

- i. The contact surfaces shall be thoroughly coated with a suitable caulking compound when in contact with other metals except stainless steel.
- ii. Elastomeric bearing pads shall be placed under each post. The pad shall cover the entire contact area between the post and concrete and shall be neatly trimmed to the shape of the post base. The pads shall meet the requirements of Section 715.15.

617.6.3-Finishing: After the concreting has been completed, the aluminum bridge railing shall be thoroughly cleaned, removing any accumulation of oil, grease, dirt, or other foreign materials. An approved solvent cleaner may be used. Where mechanical means are used to remove stains, grease, minor scratches, etc., the resulting finish shall be uniform in appearance over the entire tube. Tubing for a single structure shall present the same uniform finish at time of final acceptance.

Finished tubing shall be free from grease and stains, gouges, dents and burrs, and shall have a minimum of rubs, scratches, and minor extrusion marks from the dies.

617.7-GROUTING OF ANCHOR BOLTS:

Where anchor bolts for railing brackets or posts on concrete are not cast-in-place during the original pour, they shall be grouted in place with mortar as specified in 617.2

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617.8-METHOD OF MEASUREMENT:

The quantities of work done will be measured by the linear foot (meter) of "Pipe Railing", "Ferrous Metal Railing", or "Aluminum Railing", as the case may be, complete in place and accepted, which will be determined by the overall length as shown on the Plans, or as authorized by the Engineer. When metal railing is used with concrete posts, the pay length for the railing will be the sum of all the net lengths between posts.

Reinforcing steel required in concrete posts for "Ferrous Metal Railing" will be measured and paid for as provided in 602.

Concrete posts for "ferrous Metal Railing" will be measured and paid for as provided in 601.

617.9-BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for at the contract unit prices bid for the items listed below, which prices and payments shall be full compensation for furnishing all the materials and doing all the work described in a workmanlike and acceptable manner, including all the labor, tools, equipment, supplies, and incidentals necessary to complete the work.

617.10-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
617001-*	PIPE RAILING	LINEAR FOOT (METER)
617002-*	FERROUS METAL RAILING	LINEAR FOOT (METER)
617003-*	ALUMINUM RAILING	LINEAR FOOT (METER)

* Sequence number

**SECTION 618
CAST BRONZE AND ROLLED COPPER-ALLOY
EXPANSION PLATES**

618.1-DESCRIPTION:

This work shall consist of furnishing and erecting cast bronze or rolled copper-alloy expansion plates, to be used as friction type expansion or bearing plates, in accordance with the details and dimensions shown on the Plans and in accordance with this Specification.

618.2-MATERIALS:

Materials shall conform to the requirements specified in the following Subsections of Division 700: