

**970.81 Basis of Payment.**

Bituminous damp-proofing will be paid for at the contract unit price per square meter of surface under the item for Bituminous Damp-Proofing, complete in place.

**970.82 Payment Item.**

970.	Bituminous Damp-Proofing	Square Meter
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**SECTION 975**

**METAL BRIDGE RAILINGS**

**DESCRIPTION**

**975.20 General.**

Work under this item shall consist of furnishing and erecting metal bridge railing in accordance with the design and in close conformity with the lines and grades shown on the plan or as established by the Engineer.

**MATERIALS**

**975.40 General.**

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Bridge Railing, Aluminum	M8.13.0
Bridge Railing, Galvanized	M8.13.1
Rubber-Cotton Duck	M9.16.1
Galvanizing	M7.10.0

The Contractor will be required to submit specifications showing the chemical and physical analyses to the Department Inspector for approval.

**CONSTRUCTION METHODS**

**975.60 Shop Drawings.**

After the Contract is awarded, the Contractor shall furnish the Engineer with complete detail or shop drawings of the proposed work in accordance with the requirements of Subsection 5.02. No material for the bridge railings shall be fabricated before the approval of the detail or shop drawings by the Engineer.

**975.61 Welding.**

Fabrication of Metal members can only be performed by fabricators who are approved by the Department as specified in Subsection 960.61. Steel components shall be blast cleaned prior to fabrication. The blast cleaning shall conform to the steel Structures Painting Council Surface Preparation Specification "Near-White Blast Cleaning," SSPC-

SP10. Aluminum components shall be cleaned of any foreign matter. In assembly and during welding, the component parts of built-up members shall be held by sufficient clamps or by other adequate means to keep parts straight and in close contact.

Welding and fabrication of steel shall conform to the AASHTO Standard Specifications for Highway Bridges and the ANSI/AASHTO/AWS D1.5 Bridge Welding Code. If the members are tubular sections, the fabrication and welding shall conform to AASHTO and the ANSI/AWS D1.1 Structural Welding Code-Steel. Welding and fabrication of aluminum shall conform to AASHTO and the ANSI/AWS D1.2 Structural Welding Code Aluminum.

#### **975.62 Setting Railing.**

The three-rail aluminum and steel posts shall be plumb except when the grade is less than 1.50% and then they shall be set normal to the grade. One-rail aluminum and steel posts shall be set to normal grade. Longitudinal members shall follow the grade of the coping. In setting up the railing, care shall be taken to insure proper level and alignment in order to prevent springing or bending of the railing during erection. Where required on curves the rails shall be accurately formed to the required radius.

Steel base plates shall be set on a 3 millimeter thick rubber-cotton duck bearing pad. If additional shimming of the plates is required, the shims shall be of the same material as base plates. The edges of the base plate shall be caulked to make a water tight joint.

The bottom of the aluminum post plate shall be thoroughly coated with an aluminum impregnated caulking compound conforming to Federal Specification TT-C-00598A and shall be grey in color. Where shims are required for aluminum posts, such shims shall be made from fully annealed aluminum alloy sheets or plates.

All anchor bolts shall have between 10 millimeters and 15 millimeters of exposed thread after nuts have been properly tightened.

#### **975.63 Galvanizing.**

All bolts, screws, nuts, rods, and washers shall be galvanized in accordance with AASHTO M 232 and the Supplemental Specifications. Stainless steel studs shall not be galvanized. The posts, base plates, backing panel components, splice tubes, and structural tubing shall be galvanized after fabrication in accordance with AASHTO M 111. Backing panels should not be galvanized fully assembled, since field adjustment may be required, i.e., by racking, to align panels with the rail connections.

The galvanizing bath shall contain nickel (0.05% to 0.09% by mass).

Galvanized members requiring shop assembly shall be welded and drilled prior to galvanizing.

#### **975.64 Bridge Rail Coatings.**

Aluminum bridge railing shall not be painted unless specified.

Prior to applying a coat over the galvanizing, the fabricator shall ensure that all rails are smooth and without sharp protrusions that would present an injury hazard to pedestrians. Also, all welds shall be cleaned thoroughly in accordance with good practice and shall have a suitable surface to accept the primer.

A two coat painting system shall be applied by the Galvanizer in his/her own facility within twelve hours of galvanizing the railing components.

The prime coat material shall be a polyamide epoxy applied to a minimum dry film thickness of 76.2 micrometers and force cured as given below for the finish coat.

The finish coat material shall be a two component, catalyzed aliphatic urethane applied by airless spray to a minimum dry film thickness of 76.2 micrometers.

Unless otherwise specified, the color shall be dark bronze which will match Color Number 10045 of the Federal Standard 595B, "Colors Used in Government Procurement". The fabricator shall submit to the Engineer for approval paint chips of the intended color prior to any work being done under this heading.

All finish coat material shall be applied under conditions within the following tolerances:

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|-------------------------|------------------------|
| A. Air Temperature:     | 10 °C min., 30 °C max. |
| B. Surface Temperature: | 10 °C min., 35 °C max. |
| C. Humidity:            | 65% max.               |

The finish coat shall be cured in a booth capable of maintaining 65 °C for two to four hours.

**975.65 Touch Up and Repairs.**

Should any damage occur to the galvanized coating during shipping or handling at the job site, the Contractor shall repair and touch up any damaged areas to the satisfaction of the Engineer and the following.

Touch up of galvanizing before finish coat is applied shall be accomplished by applying a galvanizing repair paint in accordance with Section M7.04.11. The dry film thickness of the applied repair paint shall not be less than 76.2 micrometers. Applications shall be in accordance with the Manufacturer's instructions.

Field touch up procedures shall conform to the recommendations of the Galvanizer. Touch up of the finish coat shall be by applying a coating of a two part urethane, as supplied by the Galvanizer, to achieve a dry film thickness of at least 76.2 micrometers. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as primer. Allow the primer to dry for at least four hours.

The Contractor shall also use the touch up paint material to paint the galvanized hardware used in the field erection of the railing that has not been finish coated previously.

**975.66 Inspection.**

Inspection may be done at the mill and/or fabricating plant by the Engineer or the Engineer's representative (verification inspector). The Contractor shall give sufficient notice to the Engineer when the work will begin so that the Department may arrange for inspection. No material shall be shipped to a project until the verification inspector affixes his/her stamp to the material. Material shipped without such stamp shall be rejected and immediately removed from the job-site.

**COMPENSATION**

**975.80 Method of Measurement.**

Metal bridge railings will be measured by the meter along the line and grade of the railing for the distance from outside to outside of metal end posts above the base plates or outside to outside of top rail, whichever is greater. Curved portion of railings shall be measured along the centerline of the top rail.

**975.81 Basis of Payment.**

Metal bridge railings will be paid for at the contract unit price per meter under the item of railing required, complete in place.

**975.82 Payment Items.**

975.1	Metal Bridge Railing (1 Rail), Aluminum (Type AL-1)	Meter
976.1	Metal Bridge Railing (3 Rail), Aluminum (Type AL-3)	Meter
976.2	Metal Bridge Railing (3 Rail), Steel (Type S3-PL2) - Galvanized	Meter

**SECTION 983**

**REVETMENT**

**DESCRIPTION**