

SECTION 9.10 METAL BEAM RAIL

9.10.01--Description: The railing shall consist of a single or double line of rail elements fastened to steel posts, with or without rub rail, and the appropriate treatment at fixed objects, bridge parapets and terminal ends as shown on the plans. It shall be erected in the locations given and fabricated in accordance with the locations, designation, dimensions and details shown on the plans or as ordered by the Engineer.

The alteration or conversion of the existing metal beam rail to the type specified shall be accomplished in conformity with the lines, grades, dimensions and details shown on the plans or as ordered by the Engineer.

9.10.02--Materials: The materials for metal beam rail shall conform to the requirements of Article M.10.02.

The metal beam rail delineators shall conform to M.18.09 for the encapsulated lens reflective sheeting and M.18.13 for the sheet Aluminum bracket.

All undamaged existing rail elements and posts shall be re-used to construct the railing as indicated on the plans or as directed by the Engineer.

Any parts of the existing railing, to be used in the conversion, which are damaged or missing shall be replaced with new parts conforming to the requirements of this specification.

9.10.03--Construction Methods: The steel posts, with the exception of end anchor posts, shall be driven. Where rock or boulders are encountered in driving, this material shall be removed so as to make a hole of sufficient size to permit the setting of the post. The post shall then be set, and the area adjacent to the post shall be backfilled and thoroughly compacted before the driving of the posts. Wood posts and end anchor post, where required, shall be set in dug holes; and the area adjacent to the post shall be backfilled and thoroughly compacted. Any surplus material remaining after the completed installation shall be removed by the Contractor.

The Contractor is cautioned that within the limits of any project, buried cable for illumination or utilities, which may be energized, may be present.

In driving steel posts, suitable driving caps and equipment shall be provided to prevent battering or injury to the posts and to prevent the galvanizing on the posts above the ground line from being scratched, defaced or damaged.

The posts shall be located as shown on the plans, set plumb and in alignment with the rail or rail treatments. Where required, the brackets, rub rails, back-up rails and rail elements shall then be erected to produce a smooth, continuous rail as shown on the plans. The terminal sections, rub rails and rail elements shall be lapped in the direction of traffic where possible.

Whenever metal beam rail or rail treatments are being constructed adjacent to roadways open to traffic, the Contractor shall complete the installation to and including the designed terminal treatment at the close of each day's work so as to prevent any hazard that would be caused by leaving an exposed end of the beam rail or rub rail.

On long runs or other locations where it is not practical to complete the installation to and including the designed terminal treatment, the Contractor shall use temporary methods for terminating the beam rail so as to minimize any hazard by lowering the rail end to the ground and providing adequate anchorage of the same by bolting, securing, burying, etc.

The Contractor shall submit to the Engineer for approval details of his proposed methods for the temporary terminal treatment of the end section. No work shall be performed adjacent to the areas open to traffic until approval is given.

The Contractor shall be required to furnish extra length posts at transition areas or where field conditions warrant. These posts shall be of such length that the minimum depth in the ground, as shown on the plans, shall be maintained.

In the welding of steel plates to the steel posts, the welds shall be of the size and shape as shown on the plans and shall conform to the applicable requirements of the current Specifications for Welded Highway and Railway Bridges of the AWS as supplemented and revised by the following:

1. Only a visual inspection of welds will be required.
2. The Engineer will make a visual inspection of welds. All welds shall have no visual cracks nor be defective in any way and shall be formed in a neat and workmanlike manner. Any weld found unacceptable by the Engineer shall be corrected by the Contractor at no additional cost.

Before final erection, all galvanized elements which have been cut or worked so as to destroy the zinc coating and cause the base metal to be exposed shall have the exposed base metal thoroughly cleaned and painted with one coat of zinc dust-zinc oxide paint and a finish coat of aluminum paint.

9.10.04--Method of Measurement:

1. Metal Beam Rail (Type): The length of metal beam rail measured for payment will be the number of linear meters of accepted rail of the type or designation installed, measured along the top rail to the nearest meter, between the centers of the end posts in each continuous section, plus the terminal length of rail at bridges.
2. Convert Metal Beam Rail to Metal Beam Rail (Type): The conversion of existing metal beam rail to the type specified will be the number of linear meters of accepted rail installed measured along the top rail to the nearest meter, between the centers of the posts in each continuous section.

9.10.05--Basis of Payment: Metal beam rail will be paid for at the contract unit price per meter for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials, fittings, rub rail, back-up rail, posts, metal beam rail delineators, equipment, tools and labor incidental to the installation of the rail. The price also includes the furnishings and installation of the terminal elements fastened to bridge parapets and all equipment, tools and labor incidental thereto.

Conversion of the existing metal beam rail will be paid for at the contract unit price per linear meter for "Convert Metal Beam Rail to Metal Beam Rail (Type)" complete in place, which price shall include materials (excluding new parts for damaged or missing parts), fittings, posts, rail elements, delineators, equipment, tools and labor incidental to the conversion of the existing railing.

Payment for authorized new parts, which replace damaged or missing parts, will be at the applicable contract unit prices, or in their absence, as extra work in accordance with Article 1.04.05.

Removal of existing metal beam rail required for the conversion to the type rail specified will be included in the cost per linear meter to convert. Also included in this item will be all necessary backfilling and disposal of surplus material. Surplus material not needed for the conversion shall become the property of the Contractor.

Drilling in or removal of rock or boulders and backfilling with suitable material when required for the installation of posts will be paid for as "Extra Work" according to the provisions of Article 1.04.05 and 1.09.04.

Pay Item	Pay Unit
Metal Beam Rail (Type)	m
Convert Metal Beam Rail to Metal Beam Rail (Type)	m