

**SECTION 9.18  
THREE-CABLE GUIDE RAILING  
(I-BEAM POSTS)  
AND ANCHORAGES**

**9.18.01--Description:** This railing shall consist of three wire cables attached to American Standard Beam Posts, as indicated on the plan, installed in the locations indicated and in accordance with the dimensions and details shown on the plans or as ordered and in conformity with these specifications.

Anchorage shall consist of the necessary concrete anchors or "deadman," end posts with base plates, anchor assemblies, turnbuckle cable-end assemblies and spring cable-end assemblies (compensating device), singly or in combination, appurtenance hardware and the necessary excavation and backfill, all installed in the locations indicated or ordered in accordance with the dimensions and details shown on the plans or as ordered and in conformity with these specifications.

**9.18.02--Materials:** The materials for this work shall conform to the requirements of Article M.10.08 for wire rope, steel posts and plate anchors, fittings, and anchorages. The materials for reflective delineators shall conform to Article M.18.09.

**9.18.03--Construction Methods:** The posts shall be spaced as shown on the plans, set plumb and normal with the front faces at a uniform distance from the centerline of roadway.

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 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 AWS Structural Welding Code as supplemented and revised by the following:

Only a visual inspection of welds will be required.

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.

Line posts are to be driven into the ground as shown on the plans, unless otherwise ordered by the Engineer. Posts shall be driven by approved methods and equipment that will provide the posts in their final position free of any distortion and burring or any other damage.

The Contractor shall be required to furnish extra length posts at transition areas, and these posts shall be driven so as to provide the 50 mm nominal cover over the plate as required by the plans.

End posts are to be set in holes dug in thoroughly compact soil. The bottoms of dug holes shall be thoroughly rammed so that the posts have a stable foundation. Backfill for all dug holes shall be approved material and is to be machine-tamped in 100 mm layers in such a way as not to shift the posts from the correct alignment.

Should rock or boulders be encountered, a hole of sufficient size to set the post to the normal depth called for on the plans shall be drilled and back-filled with tamped sand.

Anchorage, plate anchors, cables, turnbuckle cable-end assemblies and spring cable-end assemblies (compensating device), singly or in combination, and all fittings shall be placed as indicated on the plans and in a workmanlike manner. The cable shall be drawn taut and fastened securely at both ends as shown on the plans. No punching, drilling, cutting or welding of posts, post plates or any hardware will be permitted after galvanizing.

After erection, galvanized cable, fittings, steel posts and plate anchors that have been abraded so that the base metal is exposed, threaded portions of all fittings and fasteners and the cut ends of all bolts shall be painted with two coats of zinc dust primer conforming to FS TTP-641B, Type II, or MIL P 21035.

After the rail has been erected, the Contractor shall install a reflectorized delineator on every other line post as shown on the plans and wherever the railing is parallel to, but not greater than 4 m from, the edge of the shoulder. Reflectorized delineators shall not be installed on railing installations or single posts where such installations are greater than 4 m from the shoulder. An object marker shall be installed at the end of the anchorage, Type II.

**9.18.04--Method of Measurement:** This work will be measured for payment as follows:

**1--Three-Cable Guide Railing (I-Beam Posts):** The length of cable railing to be included for payment shall be the number of meters from centerline to centerline of the most remote end post from the concrete anchor in End Anchorage, Type I, and from centerline to centerline of the end post to which the anchor rod is attached in End Anchorage, Type II. No deduction will be made for the overlap at intermediate anchorages.

**2--Anchorages:** The number of anchorages to be included for payment shall be the actual number of anchorages installed and accepted.

**9.18.05--Basis of Payment:** Payment for this work will be made as follows:

**1--Three-Cable Guide Railing:** This railing will be paid for at the contract price per meter for "Three-Cable Guide Railing (I-Beam Posts)," complete in place, which price shall include all materials, including reflectorized delineators and fittings, equipment, tools and labor necessary for complete installation, also all excavation, refilling and disposal of surplus material.

**2--Anchorages:** These will be paid for at the contract unit price each for "End Anchorage" of the type specified, complete in place, which price shall include concrete anchors, end posts with base plates, all cable and fastenings from end post to concrete anchor, anchor assemblies (compensating device), singly or in combination, all materials, fittings, equipment, tools and labor necessary for complete installation, also all excavation, refilling and disposal of surplus materials.

There will be no separate payment for the object marker at the end of the End Anchorage, Type II, but the cost shall be included in the contract bid price for "End Anchorage-Type II."

Drilling in rock or boulders and backfilling with tamped sand, where required for the installation of posts, will be paid for as "Extra Work" according to the provisions of Articles 1.04.05 and 1.09.04, as amended elsewhere herein.

Pay Item	Pay Unit
Three-Cable Guide Railing (I-Beam Posts)	m
End Anchorage (Type)	EA.