

**ITEM 606.37----10 M - WOOD POST BLOCKED-OUT CORRUGATED BEAM GUIDE RAILING  
(CONTROLLED OXIDIZING)**

**ITEM 606.3705--10 M - WOOD POST BLOCKED-OUT CORRUGATED BEAM GUIDE  
RAILING (CONTROLLED OXIDIZING) (SHOP CURVED)**

**ITEM 606.3710--10 M - ANCHORAGE UNITS FOR WOOD POST BLOCKED-OUT  
CORRUGATED BEAM GUIDE RAILING (CONTROLLED OXIDIZING)**

**ITEM 606.3715--10 M - WOOD POST BLOCKED-OUT CORRUGATED BEAM GUIDE  
RAILING CONNECTIONS TO WALLS - DEPARTURE ENDS  
(CONTROLLED OXIDIZING)**

**ITEM 606.3730--10 M - HEAVY STEEL POST BLOCKED-OUT CORRUGATED BEAM GUIDE  
RAILING (CONTROLLED OXIDIZING)**

**ITEM 606.3735--10 M - HEAVY STEEL POST BLOCKED-OUT CORRUGATED BEAM GUIDE  
RAILING (CONTROLLED OXIDIZING) (SHOP CURVED)**

**DESCRIPTION:**

The Contractor shall furnish and install weathering corrugated steel beam guide railing, anchorage units, and connections to walls at the departure end, at locations shown on the plans and where directed by the Engineer.

This specification is to provide a weathering steel guide railing system that, in a reasonable time period after erection, will develop a uniform, permanent, and tightly adhering protective oxide.

**MATERIALS:**

General.

1. Beams and Hardware. Corrugated beams, terminal sections, and all accessory components and hardware shall be fabricated as shown on the plans. Bolt holes in the beam at the post hole and elsewhere, as necessary, shall be enlarged or slotted to permit expansion and contraction and to facilitate erection. The beams shall be straight, unless otherwise required by the plans or specifications, and of uniform section. The edges shall be rolled to eliminate sharp edges.

Weathering corrugated beams shall meet the requirements of ASTM A606, Type 4. The minimum yield point and elongation of the steel shall be 345 MPa and 22% in 50 mm gage length respectively. Any portion of weathering steel corrugated beam section which is to be buried in soil shall be galvanized. The galvanizing shall extend a minimum of 150 mm above the ground surface. At the Contractor's option, galvanized corrugated beams conforming to Subsection 710-20 may be used for corrugated beams, which are to be buried in soil.

When shop curving of corrugated beams is required, the radius of curvature shall be stamped into the base metal of the beam. The stamping shall be on the back, at or near both ends of the beam, and in a location where it will be visible to a worker after erection.

Terminal sections shall be galvanized and shall meet the requirements of Subsection 710-20.

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Bolts; nuts; and washers for post, and mounting bracket connections shall be galvanized. Bolts shall be ASTM F568 Class 4.6, nuts shall be ASTM A563M and washers wherever used shall be ASTM F844.

Certified copies of the test results conducted by the manufacturer of the base metal for the physical and chemical requirements shall be furnished for all steel in the manner and form requested by the Department.

2. Wood Posts and Offset Blocks. Wood posts and offset blocks shall meet the provisions of material Subsection 710-13. Wood posts and offset blocks shall be as detailed on the plans and shall be surfaced on four sides. The timber dimensions shown on the plans are nominal dimensions.

3. Concrete. Concrete shall meet the requirements specified for Class A Concrete in Section 501. If the concrete is precast, it shall meet the requirements of Subsection 704-03 of the Standard Specifications.

4. Welding. Fabrication welding shall comply with the subsection "Welding" in the New York State Steel Construction Manual, except that radiographic inspection will not be required.

5. Galvanizing. Galvanizing shall conform to Subsection 719-01. The galvanizing type shall be as indicated on the plans.

6. Preparation and Painting of Galvanized Components. All galvanized components shall be painted in accordance with Section 657 Painting Galvanized and Aluminum Surfaces.

Anchorage Units. Anchor plates, anchor rods and hardware, and galvanized mounting brackets shall conform to ASTM A36. Reinforcement for the anchor shall conform to Subsection 709-01, "Bar Reinforcement, Grade 420."

Connections to Walls. Expansion anchors shall be as indicated on the plans.

Steel Post Guide Railing. Galvanized steel posts and galvanized base plates shall conform to ASTM A36.

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Anchor bolts and hardware shall conform to Subsection 723-60. The grout for anchor bolts shall conform to the requirements of Subsection 701-05 "Concrete Grouting Material."

Epoxy for base plate seats shall conform to Subsection 721-05 "Epoxy Repair Paste." The epoxy material is to be mixed with Mortar Sand conforming to the requirements of Subsection 703-03, at a ratio of 1:1 by volume. No work shall be done when the ambient and concrete surface temperatures are below or are expected to fall below a minimum temperature of 10°C.

**CONSTRUCTION DETAILS:**

General. All component parts shall be erected in the position and manner indicated on the plans and in a manner approved by the Engineer.

Steel posts shall be placed by excavating.

Wood posts shall be placed by excavating or by using vibratory driving or impact driving equipment approved by the Engineer. Post driving will be permitted only if alignment and grade tolerances are met and providing no damage is done to the posts during installation. Damaged or misaligned posts shall be removed and redriven or replaced by the Contractor as directed by the Engineer. To facilitate driving, the base of the wood posts may be tapered as shown in the plans.

Post and anchor excavations shall be backfilled, and backfilled material compacted in accordance with Subsection 203-3.15, "Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables."

All posts shall be aligned to a tolerance of 6 mm for plumb and grade line.

Shop curved corrugated beam guide railing will be required when the railing is to be erected on a radius of 45 m or less. When shop curving is required, the rail element shall be shop worked to the radius that the guide railing will be installed on.

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In order to develop the inherent properties of weathering steel to its maximum the Contractor shall remove all mill scale from the surfaces of the fabricated components that will be exposed to view from the roadway. All surfaces are to be free of mud, grease, oil and paint. Special efforts must be extended when either material or finished product is in storage or transit, to prevent water stains and surface discoloration that will interfere with the uniform and sound weathering of the base metal.

Care shall be taken in the field erection of the barrier system to avoid surface scratches and gouges. The Contractor is put on notice that cleanliness is most important in obtaining the early and uniform weathered surface. Where soilage is too severe to be removed by hand cleaning, the soiled areas shall be cleaned by other methods such as power brush cleaning in a manner approved by the Engineer.

In order to give the galvanized components the same rustic appearance as the weathered corrugated beam, all galvanized surfaces exposed to traffic shall be prepared and painted in accordance with Section 657 Painting Galvanized and Aluminum Surfaces.

At the Contractor's option, the galvanized parts may be painted before installation and any damage to the exposed painted surfaces repainted after erection in accordance with Section 657 Painting Galvanized and Aluminum Surfaces.

Upon completion of the installation of the guide rail system components, the Contractor shall restore the area to its original state. This may require the Contractor to repave, resod, reseed and mulch all areas disturbed during the guide rail installation, including the areas adjacent to the anchor unit installation.

Connection to Walls. Holes for the expansion anchors shall be carefully drilled. Any damage caused to the wall shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the State.

In addition to painting the exposed galvanized surfaces, all surfaces of the section of weathering corrugated beam connecting to the wall shall be painted prior to erection in accordance with Section 657 Painting Galvanized and Aluminum Surfaces.

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After erection, any damage to the painted surfaces shall be repainted in accordance with Section 657 Painting Galvanized and Aluminum Surfaces.

Steel Post Guide Railing. Base plates for posts shall be anchored as shown on the plans. Where drilling and grouting is required, the Contractor shall take care to prevent damage to the concrete structure. The proposed construction method and equipment for drilling and grouting of holes shall be submitted to the Engineer for approval before drilling and grouting operations begin.

**METHOD OF MEASUREMENT:**

Wood Post and Steel Post Guide Railing. The guide railing will be measured by the number of meters, measured along the axis of the railing and between its extreme outer limits as shown on the Plans. Shop curved guide railing will be measured by the number of meters, measured along the axis of the curved railing. Shop curved guide railing is defined as that which will require shop working in accordance with the requirements of this specification and not that curvature which may be attained by springing or bending in the field.

Anchorage Units and Connections to Walls. Approach anchorage units and connections to walls will be measured by the number furnished and installed.

**BASIS OF PAYMENT:**

The unit price bid for each item shall include the cost of all labor, materials, and equipment necessary to complete the work, including paint, concrete, reinforcement, excavation, backfill, removal and replacement of damaged or misaligned posts, and the costs of bending any rail element to the required curvature.

Payment for Wood Post Blocked-Out Corrugated Beam Guide Railing (Controlled Oxidizing) and Wood Post Blocked-Out Corrugated Beam Guide Railing (Controlled Oxidizing) (Shop Curved) shall include the unit price bid and the measured quantity multiplied by the payment factor for post spacing listed in the following

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table:

PAYMENT FACTORS FOR WOOD POST GUIDE RAILING

Post Spacing Center to Center	Payment Factor
1905 mm	1.0
953 mm	1.8

Unless otherwise indicated on the plans, the cost of restoring any disturbed areas, including paving, sodding, seeding, and mulching, shall be included in the unit price bid.

Progress payments will be made for the various items paid by meter for Wood Post and Steel Post Blocked-Out Corrugated Beam Guide Railing when the guide railing is erected in the position and manner indicated on the plans and in a manner approved by the Engineer, exclusive of restoration of disturbed areas and final alignment. Payment will be made, at the unit price bid, for 90% of the quantity erected. The balance of the quantity erected will be paid for upon proper repair of the disturbed areas and alignment of the guide railing to the specified tolerance.