

600 INCIDENTALS

ITEM 606 - GUARDRAIL

- 606.01 Description
- 606.02 Material
- 606.03 Setting Posts
- 606.04 Erecting Rail Elements
- 606.05 Guardrail Rebuilt
- 606.06 *Impact Attenuators*
- 606.07 Method of Measurement
- 606.08 Basis of Payment

606.01 Description. This work shall consist of the construction or reconstruction of guardrail, *guardrail posts, bridge terminal assemblies, end terminals, and impact attenuators*, in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the Engineer.

Guardrail shall be deep beam rail Type 4, Type 5 or Type 5A. *Appurtenances shall include bridge terminal assemblies, end terminals, and impact attenuators.*

The construction of the various types of guardrail shall include the furnishing, assembling, and erecting of all component parts and materials, complete in place, at the location shown on the plans or as directed, *and in accordance with the manufacturer's recommendations, where applicable.*

Standard design (single faced) guardrail of the type shown on the plans shall be erected unless otherwise specified. Barrier design guardrail (*double faced*) shall be erected when called for on the plans.

606.02 Materials. Steel posts, rails, *bolts, fittings, and other accessories* shall be galvanized. Specific materials shall be as follows:

Deep beam rail.....	710.06
Galvanizing, hardware.....	711.02
Pressure treated guardrail posts and <i>blockouts</i>	710.14
Steel guardrail posts.....	710.15
<i>Guardrail post</i>	710.16
Concrete, <i>Class C or S</i>	499, 511
Reinforcing steel.....	509.02

606.03 Setting Posts. *Set or drive posts plumb in a manner that prevents battering or distorting of posts. Trim posts that are set or driven more than 1 inch (25 mm) above grade. Treat trimmed posts with a preservative material specified in 712.06.* Holes drilled through the pressure treated posts and spacer blocks shall be pressure treated

with preservative material specified in Section 712.06 by a device capable of exerting at least 30 pounds per square inch (207 kPa) pressure. Post holes shall be backfilled with acceptable material placed in layers and thoroughly compacted.

For Type 4 guardrail, posts shall be spaced at 12 feet 6 inches (3.8 m) on centers measured along the centerline of the rail, except at the anchor assembly and at the bridge terminal. Type 4 guardrail will be constructed without *blockouts*, except at the anchor assembly. Type 4 guardrail barricades shall be constructed with standard terminals at each end.

For Type 5 guardrail, posts shall be spaced at 6 foot 3 inches (1.9 m) on centers measured along the centerline of the rail. Type 5 guardrail shall be constructed with *blockouts*, anchor assemblies or bridge terminals. Type 5 guardrail barricades shall be constructed with standard terminals at each end and without *blockouts*.

For Type 5A guardrail, posts shall be spaced at 3 feet 1 1/2 inches (.95 m) on centers measured along the centerline of the rail, and shall be constructed with *blockouts*. Type 5A guardrail barricades shall be constructed with flared end section at each end and without *blockouts*.

606.04 Erecting Rail Elements. *Erect standard design (single-faced) guardrail of the type shown on the plans. Erect barrier design (double-faced) guardrail as shown on the plans.*

Erect rail elements in a manner resulting in a smooth, continuous installation. Use shop-curved rail on curves with radii from 5 to 70 feet (1.5 to 22.4 m).

Except where otherwise required, such as expansion joint bolts, draw bolts tight. Tighten bolts through expansion joints as tight as possible without preventing the rail elements from sliding past one another longitudinally. Provide bolts long enough to extend at least 1/4 inch (6 mm) beyond the nuts.

Do not use splice bolts that extend more than a 1/2 inch (13 mm) beyond the nuts. For double-faced guardrail, provide bolts that extend from 1/4 inch to 1 inch (6 mm to 25 mm) beyond the nuts.

Fabricate all metal in the shop. Do not perform burning or welding in the field. The Engineer may approve making holes in the field, but only for special details in exceptional cases. The Engineer may approve field punching, cutting, and drilling if the Contractor demonstrates that its methods do not damage the surrounding metal.

Repair galvanized surfaces that have been abraded such that the base metal is exposed, including threaded portions of all fittings and fasteners, and cut ends of bolts as specified by ASTM A 780.

Erect guardrail so that the bolts at expansion joints are located at the centers of the slotted holes. Splice the rail elements by lapping in the direction of traffic. Ensure that the plates at each splice make contact throughout the area of the splice.

606.05 Guardrail Rebuilt. *As shown on the plans, existing guardrail salvaged under Item 202 shall be rebuilt at the locations specified. Unless otherwise shown on the plans, rebuild units of the same type and spacing of members as the existing guardrail.*

For re-erecting, obtain the rail element from specified salvage sources. Furnish the following new materials: posts, blockouts, bolts, washers, and incidental hardware as necessary to complete the guardrail, except: (1) existing steel posts and blockouts that are not damaged and have a good galvanized coating may be reused, and (2) guardrail splice bolts that are undamaged and were not removed during salvage may be reused.

606.06 Impact Attenuators. *Before installing the attenuator, make all corresponding shop drawings from the manufacturer available for the Engineer's inspection. Include installation drawings and instructions with the shop drawings that completely describe the attenuator system.*

Grade the top of each foundation at the same elevation as the adjacent travel lane and/or paved shoulder.

Adjust the location of the anchors to avoid pavement joints.

606.07 Method of Measurement. *Guardrail, new or rebuilt, of the type specified, will be measured by the linear foot (meter) from center to center of end posts, excluding anchor assemblies, except where end connections are made to masonry or steel structures, in which case measurement will be to the center of the normal post bolt slot. If rail element is used across a bridge, the measurement of guardrail will be to the first post off the bridge.*

Anchor assemblies and transition sections of the type specified will be the actual number furnished and erected complete.

Bridge terminal assemblies of the type specified will be the actual number of each assembly furnished and erected complete.

Guardrail posts of the type specified will be the actual number of post furnished and erected complete.

Impact attenuators of the type specified by the number of each furnished and erected complete.

606.08 Basis of Payment. *The accepted quantities will be paid for at the contract unit price as follows:*

Item	Unit	Description
606	Linear Foot (Meter)	Guardrail, Type ____
606	Linear Foot (Meter)	Guardrail, Barrier Design, Type ____
606	Linear Foot (Meter)	Guardrail Rebuilt, Type ____
606	Each	Anchor Assembly, Type ____
606	Each	Anchor Assembly, Type ____
		Barrier Design
606	Each	Transition Section
606	Each	Bridge Terminal Assembly, Type ____
606	Each	Guardrail Posts
606	Each	<i>Impact Attenuator, Type ____</i>