

## Section 617. — GUARDRAIL

### Description

**617.01** This work consists of constructing guardrail systems and modifying, removing, resetting, and raising existing guardrail systems.

**(a)** Guardrail systems are designated as follows:

- G1 — Cable guardrail
- G2 — W-beam (weak post)
- G3 — Box beam
- G4 — Blocked-out W beam standard barrier
- G9 — Blocked-out thrie beam standard barrier
- MB4 — Blocked-out W beam median barrier
- SBTA — Steel-backed timber guardrail/timber posts and block-out
- SBTB — Steel-backed timber guardrail/timber posts and no block-out
- CRT — W-beam guardrail and no blockout
- SBLG — Steel-backed log rail

**(b)** Steel guardrail types are designated as follows:

- I — Zinc-coated, 550 grams per square meter
- II — Zinc-coated, 1100 grams per square meter
- III — Painted rails
- IV — Corrosion resistant steel

**(c)** Steel guardrail classes are designated as follows:

- A — Metal thickness — 2.67 millimeters
- B — Metal thickness — 3.43 millimeters

**(d)** Terminal section types are designated as follows:

- G4-CRT — Cable releasing terminal
- G4-BAT — Back slope anchor terminal

- SBT-FAT-30— Flared anchor terminal, 30 feet long
- SBT-FAT-20— Flared anchor terminal, 20 feet long
- SBT-BAT — Back slope anchor terminal
- Flared — Straight or parabolic flared W beam terminal
- Tangent — Tangent W beam terminal

**Material**

**617.02** Conform to the following Section and Subsections:

Box beam rail	710.07
Concrete	601
Corrosion resistant steel rail	710.06(b)
Galvanized steel rail	710.06(a)
Guardrail hardware	710.10
Guardrail posts	710.09
Precast concrete anchors	725.11
Reflector tabs	710.10
Retroreflective sheeting, type III	718.01
Steel-backed timber rail	710.08
Welding	555.03
Wire rope or wire cable	709.02
Wood preservative treatment	716.03

**Construction Requirements**

**617.03 Posts.** Treat field cuts for wood posts with two coats of preservative applied with a brush or sprayer. Do not place field cuts in contact with the ground.

Where the pavement surface is within 3 feet of the guardrail face, install posts before placing the pavement surface.

Punch or drill pilot holes no more than 1/2 inch larger than the post dimensions. Drive the posts into the pilot holes and set the posts plumb. Backfill and compact around the posts with acceptable material.

Where it is not possible to maintain a 24-inch minimum distance between the back of the guardrail post and the top of a 1V:2H or steeper slope, increase the standard post length by 12 inches. Where an impenetrable object is encountered, use a short post with a concrete anchor, decrease the post spacing, or nest two rail elements as approved by the CO. Do not change the post lengths and spacings in terminal sections.

**617.04 Rail Elements.** Install the rail elements after the pavement adjacent to the guardrail is complete. Do not modify specified hole diameters or slot dimensions.

(a) **Steel rail.** Shop bend all curved guardrail with a radius of 150 feet or less.

Erect rail elements in a smooth continuous line with the laps in the direction of traffic flow. Use bolts that extend at least 1/4 inch but not more than 1 inch beyond the nuts. Tighten all bolts.

Paint all scrapes on galvanized surfaces that are through to the base metal with 2 coats of zinc-oxide paint.

(b) **Steel-backed timber rail.** Equally space bolts along the front face of the timber rail to match the holes in the steel backing. Align timber guardrail along the top and front of the timber rail.

Field cut timber rails to produce a close fit at joints. Treat field cuts with 2 coats of chromated copper arsenate.

When required, field drill holes in the steel backing on curved sections to correspond to the field cut wood rails at the joints. Do not use a torch to cut holes.

(c) **Log rail.** Construct log rail according to the plans.

**617.05 Terminal Sections.** Construct terminal sections at the locations shown. Terminal sections consist of posts, railing, hardware, and anchorage assembly necessary to construct the type of terminal section specified.

Where concrete anchors are installed, construct either cast-in-place or precast units. Do not connect the guardrail to cast-in-place anchors until the concrete has cured 7 days. Install end anchor cables tightly without slack.

When flared or tangent terminals are required, submit drawings from the manufacturer for the terminals according to Subsection 104.03.

When required by the contract, construct earth berms according to Section 204.

**617.06 Connection to Structure.** Construct connection to structure and, where required by the contract, reinforced concrete transition according to the plans.

**617.07 Removing and Resetting Guardrail.** Remove and store the existing guardrail, posts, and appurtenances. Remove and dispose of posts that are set in concrete. Replace all guardrail, posts, and hardware damaged during removal, storage, or resetting. Backfill all holes resulting from the removal of guardrail posts and anchors with granular material according to Section 209.

**617.08 Raising Guardrail.** Remove the existing guardrail and appurtenances. Replace and reset posts as needed. Replace all guardrail, posts, and hardware damaged during the removal and raising.

**617.09 Acceptance.** Material for guardrail will be evaluated under Subsections 106.02 and 106.03.

Construction of guardrail will be evaluated under Subsections 106.02 and 106.04.

Earth berm construction will be evaluated under Section 204.

Structural excavation will be evaluated under Section 209.

Welding will be evaluated under Section 555.

Concrete will be evaluated under Section 601.

### **Measurement**

**617.10** Measure the Section 617 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure guardrail, excluding terminal sections. Measure transition sections from G9 rail to G4 rail as G9 rail.

Measure removing and resetting guardrail and raising guardrail including reset terminal sections.

Measure replacement posts (except replacement posts for posts damaged by construction operations) used in the removing, resetting, or raising guardrail.

Measure earth berms under Section 204.

### **Payment**

**617.11** The accepted quantities will be paid at the contract price per unit of measurement for the Section 617 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.