

## Section 618. — CONCRETE BARRIERS AND PRECAST GUARDWALLS

### Description

**618.01** This work consists of constructing and resetting concrete barrier and precast concrete guardwall systems.

### Material

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

Concrete class A(AE)	552
Guardrail hardware	710.10
Hydraulic cement	701.01
Precast concrete barrier	725.11(b)
Preformed joint filler	712.01(b)
Reinforcing steel	709.01

### Construction Requirements

**618.03 General.** Excavate and backfill according to Section 209. Construct barriers and guardwalls that meet crash test requirements of NCHRP Report 350, *Recommended Procedures for Safety Performance and Evaluation of the Highway Features*.

**618.04 Concrete Barriers.** Concrete barriers may be cast-in-place, slip-formed, or precast according to Section 552. Finish the sides and top according to Subsection 552.16(a).

**(a) Cast-in-place.** Hand form or saw contraction joints 5 millimeters wide and 50 millimeters deep at 6-meter intervals. Saw as soon as possible after the concrete has set sufficiently to preclude raveling during sawing, but before shrinkage cracking occurs. Decrease the depth of the saw cut at the edge adjacent to the pavement to prevent pavement damage.

Place 19 millimeters preformed joint filler in all construction joints. Cut the joint filler to fit the cross-sectional area at structures and barrier construction joints. Tool construction joint edges. Seal joints according to Subsection 501.11.

**(b) Slip-formed.** Do not touch the barrier extruded concrete surface as it leaves the slip-form machine except to immediately remove offsets and fins by light troweling.

Make adjustments in the operation to correct any condition causing surface blemishes larger than 1/2 inch. Do not use water on the completed barrier to correct imperfections.

**(c) Precast.** Precast barriers in section lengths. Prepare the barrier foundation so it does not vary over 1/4 inch when a 10-foot straightedge is laid along the centerline of the barrier. Align the joints and connect adjacent sections.

Use cast-in-place barrier where transitions, split barriers, or gaps shorter than 10 feet require it. At each joint between precast and cast-in-place barrier, provide hardware in the cast-in-place section to tie its end to the abutting precast section.

#### **618.05 Precast Concrete Guardwall.**

**(a) Fabrication.** A full-size sample of the guardwall will be provided at a specified location. Fabricate the guardwall to match the sample's shape, color, and texture. The guardwall shall also conform to the following:

- (1)** Fabricate in a precast concrete production facility certified by the National Precast Concrete Association and according to the Association's *Manual of Quality Control*.
- (2)** Formulate the facing mixes, backing mixes, and structural concrete backup to produce concrete mix designs of similar aggregate-cement ratios to minimize differences in shrinkage factors and coefficients of thermal expansion and contraction. Formulate using hydraulic cement, limestone, quartz, mica, and silicious stones in such proportions as to match the sample.
- (3)** Use epoxy coated reinforcing steel at locations where the reinforcing steel is less than 2 inches from the exposed surface.
- (4)** Cast the segments straight and true to a line in strong permanent composite molds of steel, plastic resins, concrete, or rubber.
- (5)** Cast the facing mixes a minimum of 1 inch thick. Ensure a good bond between facing and backup mixes.
- (6)** Provide 4 lifting inserts in unexposed areas. Provide removable caps for the lifting inserts to allow for future segment replacement.

**(b) Test section.** Demonstrate the ability to match the sample by fabricating a 10-foot, full-scale guardwall test section and delivering it to the location of the sample for comparison. If the test section is not in reasonably close conformity to the sample, fabricate another test section according to (a) above. Test sections that do not match the sample may not be used in the wall installation.

**(c) Installation.** After the test section is approved, produce the guardwall sections to match the approved test section. Prevent damage to the segments during fabrication, handling, delivery, and installation. Repair or replace all damaged sections. Prepare the foundation and place the sections. Use backer rods and joint sealant in the section joints to match the false joints.

At 100-foot intervals and at low points in the guardwall, dig outlet ditches and fill them with 6 inches of aggregate conforming to AASHTO M 43, number 57.

**618.06 Terminal Sections.** Where barrier is being constructed next to roadway lanes open to traffic, connect an approved temporary terminal section to the barrier at the end of each day.

Construct permanent graded berms according to Section 204.

**618.07 Resetting Barrier.** Reset barrier and terminal sections according to Subsections 618.03 and 618.06. Store barrier sections in an approved location when resetting cannot immediately follow removal.

**618.08 Acceptance.** Material for concrete barrier and precast guardwall (except concrete and reinforcing steel) will be evaluated under Subsections 106.02 and 106.03.

Construction of concrete barriers and precast concrete guardwalls will be evaluated under Subsections 106.02 and 106.04.

Concrete barrier and precast concrete guardwall appearance will be evaluated under Subsection 106.02.

Precast concrete guardwall test sections will be evaluated under Subsection 106.02.

Concrete will be evaluated under Section 552.

Reinforcing steel will be evaluated under Section 554.

### **Measurement**

**618.09** Measure the Section 618 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure concrete barrier and precast concrete guardwall excluding terminal sections.

Measure reset barrier in the relocated position including terminal sections.

Measure earth berms under Section 204.

**Payment**

**618.10** The accepted quantities will be paid at the contract price per unit of measurement for the Section 618 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.