

**05606.310601 M - CONCRETE BARRIER WITH INTEGRALLY CAST STONE MASONRY VENEER, TL3**

**05606.310602 M - CONCRETE BARRIER WITH INTEGRALLY CAST STONE MASONRY VENEER, TL3**

**DESCRIPTION.**

This work shall consist of furnishing and installing a reinforced portland cement concrete barrier with a stone masonry facing as indicated in the contract documents. The barrier system shall be certified as having passed NCHRP 350 crash testing at Test Level 3.

The Barrier shall be fabricated precast concrete units with an integrally cast masonry stone facing of the type, color, dimension, and pattern as shown in the contract documents. Only minor masonry repair and masonry work at the unit end sections in constructing joints will be allowed at the site where the barrier is installed.

**MATERIALS.**

Materials shall meet the following requirements of the Standard Specifications:

Portland Cement Concrete - General	501
Stone Masonry	560-2
Cement Based Grout Materials for Shear Keys	701-06
Precast Concrete - General	704-03
Precast Concrete Barrier	704-05
Epoxy Coated Bar Reinforcement, Grade 420	709-04
Coating Type Protective Sealer	717-04

Stone Masonry shall be from a Department approved source or approved stockpile, and of the type and color indicated on the plans. The stone dimensions shall be as follows:

- Design depth - 150 mm, minimum allowable depth of 100 mm
- Height shall be greater than or equal to 1.5 multiplied by the depth, minimum height - 150 mm
- Minimum length - 200 mm, not to exceed three times the depth

Stone faces shall have no spalls nor excessive pitting. The finish shall be split face as defined by Table 560-1 of the Standard Specifications. The degree of roughness of exposed faces shall be measured with a straight edge supported between adjacent projections on the stone face. The maximum joint face and depth between stones shall be 25 mm.

The walls shall be vertical or near vertical with a maximum slope of 1:16.

The minimum 28 day concrete compressive strength for the barrier core shall be 28 MPa. Epoxy coated reinforcement shall be as shown on the plans. The grout for Keyways to connect barrier sections at the ends, when required, shall be grouted using an approved list material for §701-06 Cement Based Grout Materials for Shear Keys.

The Basis of Acceptance requirements of 704-03 shall apply to the precast components.

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The exposed concrete surfaces on the top of the barrier shall be sealed to prevent water infiltration between the integrally cast masonry stones and the concrete core. The sealant used shall be an approved list material for §717-04.

The Contractor shall provide evidence of NCHRP 350 Test Level 3 crash testing compliance for the barrier. Any modifications to the FHWA approved system, beyond those detailed in the contract documents, must be approved by the FHWA.

The stone masonry shall be placed in the specified pattern and integrally cast into each precast unit. The stones shall be offset to prevent continuous vertical joints. The stones shall be placed in a neat and skillful manner.

**CONSTRUCTION DETAILS.** Provide a three meter sample section of barrier at a location designated by the Engineer. Do not construct additional barrier before the sample is approved. If acceptable to the Engineer, the Contractor may show for approval, a representative barrier system previously installed in lieu of the sample section of barrier. Upon approval of the sample barrier, the Contractor shall furnish and install barrier to conform with the approved sample barrier or the approved alternate barrier.

**Inspection, Storage and Handling of Barrier Sections.** The precast sections will be inspected at the installation site for the following:

- Damage during shipment
- Conformance to the material requirements
- Quality of the placement of the stone masonry
- Dimensional tolerances under 606-3.05 A Precast Concrete Barrier

An additional inspection will be made prior to placement of the barrier sections to determine any damage during storage.

**Installation of Barrier Sections**

**A. Excavation and Backfill.** The requirements specified in §206-3 Construction Details under Section 206 Trench, Culvert and Structure Excavation, shall apply. The bottom of the barrier shall have a full and even bearing on the surface under it. After the barrier is in place, the excavation shall be backfilled in accordance with §203-3.15 Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables.

**B. Placement of Barrier.** Sections shall be installed to form a longitudinal barrier, true to line and grade on prepared, compacted subbase, as specified in the contract plans.

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If required on plans, weep holes for drainage shall be provided.

**C. Joints.** Barrier sections shall be installed and sealed as per the details of the TL3 approved system. The Contractor shall use joint details provided by the manufacturer of the TL3 approved barrier and approved by the Department.

**Repair of Damaged Sections.** Barrier sections that are damaged or disturbed prior to acceptance of the contract shall be repaired, realigned or replaced as directed by the Engineer. Sections which cannot be satisfactorily repaired or do not meet dimensional tolerance as determined by the Engineer will be rejected and shall be replaced with acceptable sections. The party responsible for bearing the cost of repair or replacement work will be determined by the Department according to Section 107-09 Damage.

**METHOD OF MEASUREMENT.** This work will be measured as the number of meters, to one tenth of the meter, of the stone clad precast concrete barrier actually furnished and installed, as specified in the contract documents. The measurement will be taken along the centerline of top of the barrier. Measurement will not include any sample barrier sections not incorporated into the work.

**BASIS OF PAYMENT.** The unit price bid shall include the cost of all labor, materials and equipment necessary to satisfactorily complete the work, including the cost of shear keys and protective sealer.