

**SECTION 02293****CONCRETE SLOPE AND CHANNEL PROTECTION****02293.01 GENERAL****A. Description**

Concrete slope and channel protection shall include, but not necessarily be limited to, constructing slope and channel protection of cast-in-place concrete to the lines and grades shown on the Plans in accordance with the Contract Documents or as directed by the Engineer.

**B. Related Work Included Elsewhere**

1. Excavations; Section 02210, 02220, and 02230.
2. Dewatering; Section 02512.
3. Cast-in-place concrete; Section 03300.

**C. Quality Assurance**

The Engineer will inspect all materials and work to ensure compliance with the Contract Documents.

**D. Submittals**

Shop drawings and certificates of compliance requirements shall be as specified in Sections 02240.01, 02245.01, 03200.01, 03300.01, and 03310.01.

**02293.02 MATERIALS****A. Materials Furnished by the County**

The County will not furnish any materials for concrete slope and channel protection.

**B. Contractor's Options**

Not applicable.

**C. Detailed Material Requirements**

1. Borrow for backfill around the edge of the concrete slope and channel protection or replacement of unsuitable material shall be as specified in Section 02240.02.
2. Selected backfill for replacement of unsuitable material shall be as in Section 02245.02.

3. Portland cement concrete for concrete slope and channel protection shall be Mix No. 1 as specified in Section 03310.
4. Welded wire fabric shall be as specified in Section 03200.02.
5. Joint filler, preformed joint filler, form release compound, curing materials, and roofing paper shall be as specified in Section 03300.02.

**02293.03 EXECUTION****A. Excavation**

Excavation, including that for cutoff walls, shall be to the lines and grades shown on the Plans. The foundation upon which the slope and channel protection is to be placed shall be compacted to a firm, even surface that is acceptable to the Engineer. All soft and unsuitable material shall be removed and replaced with suitable material.

**B. Cast-in-Place Concrete**

Cast-in-place concrete slope protection shall be constructed in alternate strips so that construction joints are all in one direction and that tooled joints run perpendicular to the construction joints. The result shall be a checkerboard pattern having squares not less than 3 feet or more than 5 feet. The size of squares around curved surfaces shall be as directed by the Engineer. Square sizes for concrete channel protection shall be as indicated on the Plans or as directed by the Engineer. Cutoff walls shall be constructed as indicated on the Plans, or as directed by the Engineer.

**C. Forms**

Forms shall meet the requirements of Section 02660.02.

**D. Concreting**

Concrete shall be mixed in accordance with Section 03310.03. Volumetric batching and continuous mixing will be permitted on this work. Areas subject to the infiltration of water shall be dewatered in accordance with Section 02512.03 prior to placing the concrete. The concrete shall be spread, vibrated, or otherwise consolidated to secure maximum density as it is placed. It shall be struck off with an approved screed to the elevation of the top of the forms. The surface shall have a broomed finish. No plastering of the surface will be permitted. All outside edges and all joints shall be edged with a 1/4 inch edging tool.

**E. Curing**

Concrete shall be cured in accordance with Section 03300.03, and meet the requirements for cold weather construction in accordance with Section 02651.03.

**F. Backfill**

After the forms have been removed, backfills shall be made around the edges of the concrete slope and channel protection. Backfill shall be consolidated to the satisfaction of the Engineer.

**02293.04 METHOD OF MEASUREMENT****A. Concrete Slope and Channel Protection**

Measurement for concrete slope and channel protection will be made of the area of the finished surface. Area measurements will be made parallel to the foundation on which the concrete slope and channel protection is placed.

**B. Cutoff Walls**

Measurement for cutoff will be made of the length of cutoff wall constructed.

**C. Unsuitable Material**

The removal of unsuitable material below the subgrade for concrete slope and channel protection which is not attributed to the negligence of the Contractor will be measured as Class 2 Excavation. The replacement with suitable material shall be that excavated from other areas, borrow, or selected backfill as approved by the Engineer. Replacement of unsuitable material attributed to the negligence of the Contractor shall be with material acceptable to the Engineer at the Contractor's expense.

**02293.05 BASIS OF PAYMENT****A. Concrete Slope and Channel Protection**

Payment for concrete slope and channel protection will be made at the price bid per square yard. The price bid shall include all excavation, backfill, and disposal of surplus materials, and furnishing concrete and welded wire reinforcement fabric, and all materials, labor, tools, equipment, and incidentals necessary to complete the work.

**B. Cutoff Walls**

Payment for cutoff walls will be made at the price bid per linear foot. The price bid shall include all excavation, backfill, disposal of surplus materials, as well as furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work.

**C. Unsuitable Material**

Payment for removal of unsuitable material will be made at the price bid for Class 2 Excavation, which price shall include the cost of using suitable excavation as replacement material. When borrow or selected backfill is authorized as replacement material, payment will be made at the price bid for the respective items.