

**SECTION 02292**  
**CONCRETE DITCHES**

**02292.01 GENERAL**

**A. Description**

Concrete ditches shall include, but not necessarily be limited to, the construction of concrete ditches 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. Excavation; Sections 02210, 02220, and 02230.
2. 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, 03300.01, and 03310.01.

**02292.02 MATERIALS**

**A. Materials Furnished by the County**

The County will not furnish any materials for concrete ditches.

**B. Contractor's Options**

The Contractor may use either steel or wooden forms.

**C. Detailed Material Requirements**

1. Borrow for backfill around the edge of concrete ditches, or replacement of unsuitable material, shall be as specified in Section 02240.02.
2. Selected backfill for replacement of unsuitable material beneath concrete ditches shall be as specified in Section 02245.02.
3. Portland cement concrete for concrete ditches shall be Mix No. 2 as specified in Section 03310.

4. Joint filler, preformed joint filler, form release compound, and curing materials shall be as specified in Section 03300.02.

**02292.03 EXECUTION****A. Excavation**

Excavation and the preparation of the subgrade shall be in accordance with Sections 02210.03 and 02610.03 respectively.

If concrete ditches are to be constructed on fill, the fill shall be compacted to 95% of the maximum density as specified in Section 02260.03, Article D.

**B. Forms**

Forms may be either steel or wooden and shall extend to the full depth of the concrete. All forms shall be straight and of sufficient strength to resist pressure of the concrete without displacement. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until removal.

Before concrete is placed against the forms, they shall be cleaned and coated with a form release compound each time they are used. Forms shall not be stripped until the concrete has set for a minimum of 12 hours, and every precaution shall be taken to avoid damaging the concrete.

**C. Concrete**

1. When the subgrade is dry, it shall be moistened with as much water as it can absorb. The concrete shall be mixed in accordance with Section 03310.03. Volumetric batching and continuous mixing will be permitted on this work. Concrete shall be deposited on the subgrade in successive batches to the full width of the ditch. It shall be thoroughly spaded along the edges and shall be tamped to eliminate voids. It shall be struck off with an approved screed to the elevation of the top of the forms and then be floated with a wooden float.
2. 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.

**D. Joints**

Joints shall be constructed in sections no longer than 30 feet nor shorter than 4 feet. The joints shall be either bulkhead or weakened plane construction. Weakened plane joint shall be either tooled or sawed to a minimum depth of 2 inches. Expansion joints shall be constructed to coincide with expansion joints in contiguous concrete pavements. Joints shall be filled.

**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, the area around the edges of concrete ditches shall be backfilled and consolidated to the satisfaction of the Engineer.

**02292.04 METHOD OF MEASUREMENT****A. Concrete Ditches**

Measurement for concrete ditches will be made of the area of the finished surface at the normal thickness of 5 inches unless otherwise noted on the Plans.

**B. Unsuitable Material**

The removal of unsuitable material below the subgrade will be measured as Class 2 Excavation in accordance with Section 02210.04. The replacement with suitable material shall be from other areas, borrow, or selected backfill as directed by the Engineer.

**C. Slope Anchors and Toe Walls**

Measurement for slope anchors and toe walls will be made of the length of slope anchor and/or toe wall satisfactorily constructed measured along the surface of the ditch.

**02292.05 BASIS OF PAYMENT****A. General**

1. Payments will be made at the unit prices bid. The prices bid shall include furnishing all labor, tools, equipment, and materials necessary to satisfactorily complete the work as shown.
2. Payment will be made for contingent items when ordered by the Engineer. Payment will be as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

**B. Concrete Ditches**

Payment for concrete ditches will be made at the price bid per square yard. The price bid shall include all excavation, backfill, disposal of surplus materials, and furnishing concrete for paving and toe walls.

**C. Unsuitable Materials**

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 material obtained on-site as replacement material.

**D. Slope Anchors and Toe Walls**

Payment for constructing slope anchors and toe walls will be made at the price bid per linear foot. The price bid shall include excavation, backfill, disposal of surplus material, furnishing and placing all concrete and reinforcing steel, and furnishing all materials, labor, tools, equipment and incidental necessary to complete the work.

END OF SECTION