

SECTION 02610
SUBGRADE PREPARATION

02610.01 GENERAL

A. Description

Subgrade preparation shall include, but not necessarily be limited to, preparation, protection, and maintenance of the subgrade before construction of any succeeding courses in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. General excavation; Section 02210.
2. Embankment; Section 02260.
3. Underdrain installation; Section 02510.
4. Spring control; Section 02511.
5. Dewatering; Section 02512.

C. Quality Assurance

1. The Engineer will inspect all materials and work to ensure compliance with the Contract Documents.
2. Quality assurance for related earthwork shall be as specified in Sections 02210.01 and 02260.01.

D. Submittals

1. Shop Drawings

Shop drawings shall be submitted as specified in the "General Provisions" for all soil stabilization fabric furnished. The shop drawings shall include general product information and a tabulation of the physical properties of the fabric.

2. Certificates of Compliance

Certificates of compliance shall be submitted as specified in the "General Provisions" for the soil stabilization fabric stating that the soil stabilization fabric meets the materials requirements specified in Section 02610.02.

3. Submittals for earthwork materials for subgrade preparation shall be as specified in Section 02260.01.

02610.02 MATERIALS**A. Material Furnished by the County**

The County will not furnish any materials for subgrade preparation except as is available on the site within the limits designated on the Plans by sections, gradelines, and/or contour lines.

B. Contractor's Options

The Contractor may use suitable materials obtained from General, Structure, Borrow, Trench, and other excavations for subgrade preparation.

C. Detailed Material Requirements

1. Soil Stabilization Fabric

- a. The soil stabilization fabric shall be a fabric consisting of long chain polymeric filaments or yarns, such as polypropylene, polyethylene, polyester, polyamide, or polyvinylidene-chloride, formed into a stable network.
- b. The fabric shall be inert to chemicals commonly encountered in soil and to hydrocarbons.
- c. The fabric shall be resistant to mildew, rot, and ultraviolet light exposure.
- d. The fabric shall conform to the following test criteria:

<u>Test and Method</u>	<u>Specification Limits</u>
Grab Tensile Strength ASTM D 1682 lbs. min.	115
Tensile Elongation ASTM D 1682 % min.	50
Burst Strength ASTM D 3786 psi min.	190
Trapezoidal Tear Strength ASTM D 1117 lbs. min.	45

2. Earth Materials

The earth materials to be used in the subgrade shall be acceptable soils encountered in the various classifications of excavation on the Project, including borrow excavation, or other specially designated materials which may be specified.

02610.03 EXECUTION**A. General**

After roadway and site excavations and embankments have been completed and the requirements for rough subgrading as described in Section 02210.03 have been met, the subgrade shall be fine graded and compacted.

B. Removal and Replacement of Unsuitable Material

All soft and unstable material and any other portions of subgrade which will not properly compact, or serve the purpose intended, shall be removed, disposed of, and replaced with specified material. The replacement material shall be compacted to a density of not less than 95%, under paved areas and roadway shoulders, and not less than 90%, under areas not intended to support vehicles, of the maximum dry density determined in accordance with AASHTO T 180, Method C or D as applicable.

C. Soil Stabilization Fabric

1. Where shown on the Plans, or directed, soil stabilization fabric shall be installed in conjunction with subgrade preparation.
2. The subsoil shall be prepared to the lines and grades shown on the Plans. All protruding sharp objects shall be removed from the subsoil prior to placing the fabric. Where sections of the fabric adjoin one another, the sections shall be overlapped 3 feet in the direction in which the overlay material will be spread.
3. Embankment or borrow material shall be back dumped onto the fabric and spread and compacted in lifts in accordance with Section 02260.03.

D. Subgrade Control

The subgrade surface shall be brought to line and grade and shaped to the cross section indicated on the Plans. A string line and grade stakes shall be set for subgrade control on each side of the proposed construction with fixed controls not to exceed 25 foot spacing. The finished subgrade under paved areas shall not deviate more than 1/2 inch from grade thus established, and shall be compacted and smoothed over its full width by use of an approved smooth-faced, steel-wheeled roller. In locations where rolling is not feasible, compaction by mechanical tampers or vibratory compactors will be required.

E. Bleeder Ditches

The Contractor shall at all times maintain adequate open bleeder ditches along the subgrade to keep it thoroughly drained. Bleeder ditches will not be measured or paid for separately but will be considered as incidental to the subgrade preparation.

F. Subgrade Maintenance

Maintenance of subgrade shall be the responsibility of the Contractor. The Contractor will be required to take precautionary measures to prevent damage by heavy loads or equipment. Any defects or damage shall be repaired or replaced at the Contractor's expense before placement of any succeeding courses.

1. Subgrade Restoration

Should an extended period of time expire between original preparation and final covering, all restoration shall be at the Contractor's expense.

2. Subgrade Approval

No subsequent cover or surfacing material shall be deposited upon a frozen subgrade nor until the subgrade has been accepted by the Engineer in writing.

G. Permanent Subgrade Underdrains

1. Where shown on the Plans, or directed, permanent subgrade underdrains shall be constructed under paved areas. Subgrade underdrains shall be constructed as specified in Section 02510.03 and shall extend through the shoulder or median from the edges of the road pavement to a side ditch, embankment slope, or other approved outlet.

2. Locations, unless otherwise specified, shall be at low points and spaced at 25 foot intervals for a distance of 125 feet on each side of the low points; then at intervals of 100 feet to within 125 feet of the summit.

3. After placing of pavement courses and before completion of the shoulder or median areas, trenches shall be cut and shaped 24 inches wide, backfilled to the underside of shoulder material and to the underside of specified topsoil thickness in the median or graded areas using selected backfill as specified in Section 02245.02. The bottom of the trench at the end adjacent to the paved area shall be at least 2 inches below subgrade wherever it is possible to provide a proper gradient and outlet for a drain at that elevation.

02610.04 METHOD OF MEASUREMENT**A. Subgrade Preparation**

Measurement for subgrade preparation and the work described herein will not be made but will be considered as incidental to and included in other bid items of the Contract.

B. Soil Stabilization Fabric

1. Measurement for soil stabilization fabric will be made of the finished area of fabric satisfactorily installed.

2. No measurement will be made for soil stabilization fabric damaged due to the fault or negligence of the Contractor, nor for overlap area required by these Specifications.

C. Subgrade Underdrains

Measurement for subgrade underdrains will be made in accordance with Section 02510.04.

02610.05 BASIS OF PAYMENT**A. General**

1. Payment will be made at the unit price and/or lump sum prices bid. The prices bid shall include furnishing all labor, tools, equipment, and materials necessary to complete the work as shown and specified, in strict accordance with the Contract Documents and accepted by the Engineer.
2. Payment will be made for contingent items when ordered by the Engineer. Payment will be made as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

B. Subgrade Preparation

Payment for subgrade preparation will not be made under this heading but will be considered as incidental to and included in other bid items of the Contract. When compaction by means of mechanical tampers or vibratory compactors is ordered or permitted, the work will not be paid for as Tamped Fill under any circumstances even when the Proposal includes an item for Tamped Fill.

C. Soil Stabilization Fabric

Payment for soil stabilization fabric will be made at the price bid per square yard of fabric acceptably installed.

D. Subgrade Underdrains

Payment for subgrade underdrains will be made in accordance with Section 02510.05.

END OF SECTION