

## SECTION 02410 - SUBSURFACE DRAINS

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## SECTION 02410 - SUBSURFACE DRAINS

### PART 1 - GENERAL

#### 1.01 WORK INCLUDED

- A. Furnishing and installing pipes, conduits, or tubing underdrains.
- B. Furnishing and placing permeable material and filter fabric.

#### 1.02 RELATED WORK

- A. Section 02400, "*Storm Sewer System*"

#### 1.03 REFERENCE STANDARDS

- A. State Specifications
- B. American Society for Testing and Materials (ASTM)

#### 1.04 QUALITY ASSURANCE

Not used

#### 1.05 MEASUREMENT AND PAYMENT

- A. Underdrain shall be paid for at the contract price per linear foot for the various sizes, types, thickness', and coatings of, as designated in the Bid Schedule.
- B. The contract price per linear foot for pipe underdrains shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in installing pipe underdrains complete in place, including excavation, filter fabric, permeable material, welded metal covers, outlets and risers, and structure backfill, as required, and as shown on these Plans and specified herein and in the Special Provisions.

### PART 2 - MATERIALS

#### 2.01 SUBDRAIN PIPE

- A. Pipe materials shall conform to Section 68-1.02, "*Materials,*" of the *State Specifications*.

## 2.02 UNDERDRAIN OUTLETS AND RISERS

- A. Underdrain outlets and underdrain terminal risers shall conform to Section 68-1.023, "*Underdrain Outlets and Risers*," of the *State Specifications*.

## 2.03 BACKFILL MATERIAL

- A. Permeable material, for use in backfilling trenches around and over subdrains, pipes, and behind retaining walls, shall conform to Section 68-1.025, "*Permeable Material*," of the *State Specifications*.

## 2.04 GEOTEXTILE

- A. Geotextiles for use in subdrains or as directed by the Engineer shall be of non-woven needle-punched construction and consist of long chain polymeric fibers composed of polypropylene, polyethylene, or polyimide. The fibers shall be oriented into a multi-directional stable network. The geotextile shall conform to Section 88-1.03, "*Filter Fabric*," of the *State Specifications*.
- B. The geotextile shall be furnished in a protective wrapping which shall protect the fabric from ultra-violet radiation and from abrasion due to shipping and handling.

## PART 3 - EXECUTION

### 3.01 LAYING AND PLACEMENT

- A. The drain pipe and filter material shall be placed as shown on the plans or as determined by the Engineer. Unless otherwise directed by the Engineer, perforated pipe shall be laid with the perforations at the bottom. Corrugated metal pipe sections shall be joined with couplers.
- B. Subsurface drains shall be placed to the depths, lines, and grades shown on the plans and as directed by the Engineer. Subsurface drains shall discharge to a suitable outlet as defined in the field by the Engineer or as shown on the plans.
- C. After excavating the subsurface drain trench, but before placing the drain pipe, a minimum of six inches (6") of permeable material shall be placed on the trench bottom. The filter material shall be rounded to conform to the curvature of the pipe so that the pipe is carefully bedded. The trench shall then be backfilled to the top of the pipe, and backfill should be tamped or hand-wedged into place to provide firm support at the sides of the pipe. In general, the installation shall follow the guidelines of ASTM D 2774, "*Recommended Practice For Underground Installation of Thermoplastic Pressure Piping*," except that compaction of the filter material in the trench shall not be required.
- D. The Contractor shall, at his expense, replace pipes damaged during the installation of subsurface drains, as well as pipes not placed at the lines and grades called for on the plans or as determined by the Engineer.

- E. The geotextile fabric shall be placed in the manner and at the locations shown on the plans. The surface to receive the fabric and/or the trench into which the fabric is to be placed shall be prepared to a smooth condition free of obstructions and debris.
- F. The geotextile shall be covered with a permeable material within one week or less of its placement. Should the fabric be damaged during the construction, the torn or punctured section shall be repaired by placing a piece of fabric that is large enough to cover the damaged area and to meet the overlap requirement. Adjacent borders of the geotextile shall be overlapped a minimum of twelve inches (12"), or sewn. The preceding roll shall overlap the following roll in the direction the material is being placed.

### 3.02 CLEANOUTS

- A. Cleanouts or access structures shall be provided as shown on the plans, at ends of the pipes and at junctions and connections of pipelines, and/or as directed by the Engineer. Junction angles should be no steeper than forty-five degrees ( $45^{\circ}$ ) where cleanout pipes connect to the subdrain pipes. Cleanouts shall be provided with caps and shall be marked with stakes or otherwise for identification and location.
- B. Cleanout boxes shall be similar to cleanout boxes for sanitary sewers or as approved by the Engineer.

End of Section