SECTION 440
UNDERDRAINS

440-1 Description.

Construct underdrains, underdrain cleanout structures, underdrain inspection boxes and underdrain outlet pipes. Use any one of the types of pipe listed in 440-2, unless a particular type is specifically required. Use only perforated pipe, and do not use open joints.

440-2 Materials.

Meet the following requirements:

Concrete Pipe	Section 449
Filter Aggregate	Section 902
Corrugated Steel Pipe	Section 943
Corrugated Aluminum Pipe	Section 945
Polyvinyl-Chloride Pipe	Section 948
Corrugated High Density Polyethylene Pipe	Section 948
Corrugated Polypropylene Pipe	Section 948
Steel Reinforced Polyethylene Ribbed Pipe	Section 948
Filter Fabric Sock	Section 948
Geotextile Fabrics	Section 985

Use bitumized-fiber pipe only when called for in the Contract Documents.

440-3 Excavating Trench.

Excavate the trench carefully, to the depth required to permit the pipe to be laid to the grade required, and to the dimensions shown in the Plans.

440-4 Laying Pipe.

440-4.1 General: Bed the pipe firmly on the bottom of the trench, with the perforations down and joints securely made.

440-4.2 Corrugated Steel Pipe - Protection of Coating: Handle corrugated steel pipe in such a way that the zinc or aluminum coating will not be bruised or broken. Do not use pipe showing bruises or breakage of the zinc or aluminum coating.

440-4.3 Protection of Drain Inlet: Protect the influent end of the pipe in a manner which will prevent any soil from entering the drain.

440-4.4 Lateral Connections: Make lateral connections with prefabricated wyes, tees, elbows, etc., as required.

440-4.5 Underdrain Inspection Box: Construct underdrain inspection boxes in accordance with Standard Plans, Index 440-002 and the Plans.

440-4.6 Underdrain Cleanout Structures: Construct underdrain cleanout structures of in-line wye fittings and stub for access where called for in the Plans.

440-5 Placing Filter Material and Backfilling.

440-5.1 Placing Material: After laying the pipe and obtaining the Engineer’s approval, backfill the trench with filter material to the lines shown in the Plans.

440-5.2 Compaction of Filter Material and Protection of Pipe: Place and compact the filter material around the pipe and for the full width of the trench, in layers not exceeding 6 inches in thickness. Take special care to avoid displacement or damage to the pipe.

440-5.3 Backfill Above Filter Material: For all types of pipe, backfill the portion of the trench above the filter material with suitable pervious material. Place and compact the material in layers not exceeding 4 inches in thickness.

440-6 Type V Underdrain Construction.

To prevent clogging of Type V underdrain from construction sediments, initially excavate the associated stormwater facilities to rough grade. After the contributing drainage area is stabilized, construct the underdrains and excavate the stormwater facilities to achieve the final elevation.

440-7 Method of Measurement.

The quantities to be paid for will be the length, in feet, of underdrain, which includes underdrain cleanout structures, measured in place, along the centerline and gradient of the underdrain, completed and accepted. The quantities to be paid for will be the length, in feet, of outlet pipe measured in place, along the centerline and gradient of the outlet pipe, completed and accepted. The quantity of underdrain inspection boxes to be paid for will be the number completed and accepted.

440-8 Basis of Payment.

Price and payment will be full compensation for all the work, including all materials and all excavation except the volume included in the items for the grading work.

Payment will be made under:

Item No. 440- 1-	Underdrain - per foot.
Item No. 440- 70-	Underdrain Inspection Box - each.
Item No. 440- 73-	Underdrain Outlet Pipe - per foot.