

## **440 UNDERDRAINS.**

**(REV 5-9-02) (FA 7-11-02) (1-03)**

SECTION 440 (Pages 449-451) is deleted and the following substituted:

### **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:

Filter Aggregate .....	902-4
Concrete Pipe .....	Section 449
Corrugated Steel Pipe .....	Section 943
Corrugated Aluminum Pipe .....	945-1
Clay Pipe .....	947-2
Polyvinyl-Chloride .....	948-1
Corrugated Polyethylene Pipe .....	948-2
Filter Fabric Sock .....	948-3
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 coating will not be bruised or broken. Do not use pipe showing bruises or breakage of the zinc 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 the Roadway and Traffic Design Standard Index No. 245 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 on 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 [150 mm] 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 [100 mm] 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 [meters], 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 [meters], 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-	Underdrains - per foot.
Item No. 2440- 1-	Underdrains - per meter.
Item No. 440- 70-	Underdrain Inspection Box - each.
Item No. 2440- 70-	Underdrain Inspection Box - each.
Item No. 440- 73-	Underdrain Outlet Pipe - per foot.
Item No. 2440- 73-	Underdrain Outlet Pipe - per meter.