

DIVISION 7
DRAINAGE STRUCTURES, STORM SEWERS,
SANITARY SEWERS, WATER MAINS, AND CONDUITS

7-01 DRAINS

7-01.1 Description

This Work consists of constructing drain pipe and underdrain pipe in accordance with the Plans, these Specifications and Standard Plans, at the locations staked.

7-01.2 Materials

Materials shall meet the requirements of the following sections:

Gravel Backfill for Drains	9-03.12(4)
Concrete Drain Pipe	9-05.1(1)
Zinc Coated (Galvanized) or Aluminum Coated (Aluminized) Corrugated Iron or Steel Drain Pipe	9-05.1(2)
Corrugated Aluminum Alloy Drain Pipe	9-05.1(3)
Polyvinyl Chloride (PVC) Drain Pipe, <u>Couplings and Fittings</u>	9-05.1(5)
Corrugated Polyethylene (PE) Drain Pipe, <u>Couplings and Fittings</u> (up to 10-inch)	9-05.1(6)
Corrugated Polyethylene (PE) Drain Pipe, <u>Couplings and Fittings</u> (12-inch through 60-inch)	9-05.1(7)
Perforated Concrete Underdrain Pipe	9-05.2(2)
Zinc Coated (Galvanized) or Aluminum Coated (Aluminized) Corrugated Iron or Steel Underdrain Pipe	9-05.2(4)
Perforated Corrugated Aluminum Alloy Underdrain Pipe	9-05.2(5)
Perforated Polyvinyl Chloride (PVC) Underdrain Pipe, 8-inch diameter maximum	9-05.2(6)
Perforated Corrugated Polyethylene (PE) Underdrain Pipe (up to 10-inch)	9-05.2(7)
Perforated Corrugated Polyethylene (PE) Underdrain Pipe (12-inch through 60-inch)	9-05.2(8)

Drain pipes may be concrete, zinc coated (galvanized) corrugated iron, aluminum coated (aluminized) corrugated iron, zinc coated (galvanized) steel, aluminum coated (aluminized) steel, corrugated aluminum alloy, polyvinyl chloride (PVC), or corrugated polyethylene (PE) at the option of the Contractor unless the Plans specify the type to be used.

Underdrain pipe, other than AASHTO M 36 Type III Class IV, shall be perforated. They may be concrete, bituminized fiber, zinc coated (galvanized) corrugated iron, aluminum coated (aluminized) corrugated iron, zinc coated (galvanized) steel, aluminum coated (aluminized) steel, corrugated aluminum alloy, polyvinyl chloride (PVC), or corrugated polyethylene (PE) at the option of the Contractor unless the Plans specify the type to be used.

It is not necessary that all drain or underdrain pipes on any one project be of the same kind of material; however, all contiguous pipe shall be of the same kind.

7-01.3 Construction Requirements

A trench of the dimensions shown in the Plans or as specified by the Engineer shall be excavated to the grade and line given by the Engineer.

7-01.3(1) Drain Pipe

Drain pipe shall be laid in conformity with the line and grades as shown in the Plans. The drain pipe shall be laid with soiltight joints unless otherwise specified. Concrete drain pipe shall be laid with the bell or larger end upstream. PVC drain pipe shall be jointed with a bell and spigot joint using a flexible elastomeric seal as described in Section 9-04.8. The bell shall be laid upstream. PE drain pipe shall be jointed with snap-on, screw-on, bell and spigot, or wraparound coupling bands as recommended by the manufacturer of the tubing.

7-01.3(2) Underdrain Pipe

When underdrain pipe is being installed as a means of intercepting ground or surface water, the trench shall be fine-graded in the existing soil 3-inches below the grade of the pipe as shown in the Plans. Gravel backfill shall be used under the pipe. Gravel backfill shall be placed to the depth shown in the Plans or as designated by the Engineer. All backfill shall be placed in 12-inch maximum layers and be thoroughly compacted with 3 passes of a vibratory compactor for each layer. The Contractor shall use care in placing the gravel backfill material to prevent its contamination.

Class 2 perforations shall be used unless otherwise specified. When Class 1 perforations are specified the perforated pipe shall be laid with the perforations down. Upon final acceptance of the Work, all drain pipes shall be open, clean, and free draining. Perforated pipe does not require a watertight joint. PVC underdrain pipe shall be jointed using either the flexible elastomeric seal as described in Section 9-04.8 or solvent cement as described in Section 9-04.9, at the option of the Contractor unless otherwise specified in the Plans. The bell shall be laid upstream. PE drainage tubing underdrain pipe shall be jointed with snap-on, screw-on, bell and spigot, or wraparound coupling bands, as recommended by the manufacturer of the tubing.

7-01.4 Measurement

The length of drain or underdrain pipe will be the number of linear feet of completed installation measured along the invert. Pipe placed in excess of the length designated by the Engineer will not be measured or paid for.

Excavation of the trench will be measured as Structure excavation Class B or Structure excavation Class B including haul by the cubic yard as specified in Section 2-09.

Gravel backfill for drains will be measured by the volume placed within the neatline limits of Structure excavation Class B.

7-01.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

“Drain Pipe ____ In. Diam.”, per linear foot.

“Underdrain Pipe ____ In. Diam.”, per linear foot.

“Gravel Backfill for Drain”, per cubic yard.

“Structure Excavation Class B”, per cubic yard.

“Structure Excavation Class B Incl. Haul”, per cubic yard.