Rev. 3/17

TECHNICAL SPECIFICATION 300
DRAINAGE, CULVERTS, UNDERDRAINS, AND COLLECTOR PIPING

300.1 SCOPE OF WORK

This technical specification covers the furnishing of all labor, materials, testing, submittals, tools, and equipment, necessary to excavate, lay and join drainage, culverts, underdrain, and collector piping systems and fittings, place warning tape and tracing wire, backfill and compact trenches, as shown on the plans or as directed by the Engineer. Work under this item also includes all handling of water, trench wall support, and breaking into and connecting proposed drainage systems to new or existing drainage systems or structures.

300.2 MATERIALS

Materials used for the construction of the drainage, culvert, underdrain, or collector piping systems shall conform to Form 817, Section M.08.01. Joints in concrete pipe shall be preformed plastic gaskets or flexible watertight, rubber-type gaskets conforming to the requirements of Form 817, Section M.08.01.

Sand used for bedding shall meet the requirements of Form 817, Section M.08.03.

Gravel, when specified, shall meet the requirements of Technical Specification 205 – "Bank Run Gravel".

Crushed stone shall meet the requirements of Form 817, Section M.02.05, ¾-inch crushed stone.

Backfill material for RCP pipe installation: Wherever reference is made on the Drawings or in the Specifications to suitable material, suitable backfill material, and suitable fill material, the material shall be mineral soil substantially free from organic materials, topsoil, wood, trash, and other objectionable materials which may be compressible or which cannot be properly compacted. It shall not contain rocks or lumps larger than six (6) inches in largest dimension, and not more than 15 percent of the rocks or lumps shall be larger than 2 1/2 inches in largest dimension. Further, it shall not contain granite blocks, broken concrete, masonry rubble, or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice, and frozen soil will not be permitted.

Backfill material for plastic pipe installation: ¼-inch crushed stone shall conform to the requirements of Section M.02.05 of the DOT specifications.

Geotextiles, when specified shall meet the requirements of Form 817, Section M.08.01.19.

Drainage locator tape and #10 solid tracing wire, XLPUSE, for underdrain and collector systems shall comply with details as shown on the drawings.

300.3 SUBMITTALS

The following submittals shall be submitted to the Engineer for review and approval prior to installation:

- Material certifications for total length of pipe to be used
- Gradation test results for sand
- Gradation test results for gravel
- Gradation test results for crushed stone
- Gradation test results for backfill
- Manufacturer(s) cut sheet(s) for geotextile(s)
- Manufacturer(s) cut sheet(s) for locator tape and #10 solid tracing wire

300.4 CONSTRUCTION METHODS

All pipe shall be properly stored and protected to prevent damage. Any material deemed unsuitable by the Engineer shall be immediately removed from the project site. When pipe is being installed, all trenches shall be kept dry. Pipes and fittings shall be laid accurately to the required line and grade using laser beam techniques unless otherwise approved by the Engineer. Pipe shall be uniformly supported along its entire length on bedding material as described and shown on the details. Pipe shall be properly haunched and tamped against its sides to firmly hold it in place. All other backfill shall be suitable material as approved by the Engineer. If the excavated materials are not approved for backfill by the Engineer, or if unsuitable materials need to be excavated and removed, the Contractor shall provide suitable backfill materials from outside sources, if no other suitable materials are available from the project. Warning tape shall be installed 12 to 18 inches above the pipe and #10 tracing wire shall be installed on all underdrain and collector piping. Further detailed construction methods shall be in accordance with Form 817, Section 6.51.

All trenches shall be thoroughly compacted utilizing a method approved by the Engineer. In all trench areas, compaction density shall not be less than 95% of the dry density achieved by AASHTO T180, Method D. If any of the compaction tests fail, the Contractor shall, at no cost to the Town, recompact and retest the area until uniform test results are acceptable.

If the plans indicate, or the Engineer approves a combined underdrain and collector piping system, the installation and materials shall conform to the requirements of the underdrain installation.

300.5 MEASUREMENT

Measurement for this item will be based on the actual number of linear feet of the various sizes and types of pipes, completed and accepted in place, measured from the interior face of a structure to the interior face of a structure or to the exterior face of a terminating pipe length. Measurement for backfill provided from sources outside the project limits only, shall be by the cubic yard measured in place.

300.6 PAYMENT

Payment for pipe will be based on the contract unit price per Linear Foot of pipe. Payment for backfill and ¾" crushed stone, if required, will be based on the contract unit price per Cubic Yard. All items to be completed and accepted in place including all labor, materials, testing, submittals, tools, and equipment necessary to complete the work as specified.

Removal and disposal of any unsuitable materials shall be paid under Technical Specification 105 – "Excavation, Placement and Disposal of Surplus Material". Backfilling with suitable materials shall be paid under Technical Specification 205 – "Bank Run Gravel". Payment for excavation is only applicable for removal of unsuitable materials below the specified trench depth. Payment for backfill is for replacement of all unsuitable materials, but only if suitable materials are not available on the project site.

PAY ITEM	**PAY UNIT**
(Size-type) Pipe	L.F.
Backfill (type)	C.Y.
¾" Crushed Stone	C.Y.