

SECTION 33 4100

STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction 2023 Edition with latest addenda.

1.2 SUMMARY

- A. Section Includes:
  - 1. Requirements for furnishing and installing polyethylene pipe of all sizes and types, including but not limited to couplings, cleanouts, adapters and any additional fittings required to completely install the drainage pipe as indicated on the drawings.
  - 2. The work shall include but not be limited to excavation, backfill, compaction and all drain line connections from the building and drainage system.
  - 3. Building drain line connections shall include roof leaders as indicated on the drawings.
- B. Related Requirements:
  - 1. Section 31 0000 Earthwork
  - 2. Section 31 2300 Aggregate Materials

1.3 QUALITY ASSURANCE

- A. Corrugated polyethylene pipe shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the pipe.

1.4 SUBMITTALS

- A. In accordance with Section 01 3300 submit for review drawings showing the pipe dimensions reinforcement, joint, and other details for each type and class of pipe to be furnished for the project. All pipe furnished under the contract shall be manufactured only in accordance with the specifications and the reviewed drawings.

PART 2 - PRODUCTS

2.1 PIPE

- A. Materials shall conform to the appropriate section of the Rhode Island Standard Specifications.
- B. Pipe shall be rigid and have a smooth interior wall.

2.2 SYNTHETIC TURF FIELD UNDERDRAINS

- A. Underdrains shall be perforated pipes equivalent to the 12" Multi-Flow drain by Multi-Flow Drain Systems, or approved equal.

1. All fabric shall be removed from the pipes prior to installation.
2. All fittings and couplings shall be manufactured by the same approved manufacturer to ensure proper connections between systems.

### 2.3 JOINTS

- A. Materials shall conform to the appropriate section of the Rhode Island Standard Specifications.

### 2.4 INSPECTION, TESTS AND ACCEPTANCE

- A. Acceptance will be on the basis of tests of materials, absorption tests, plant load-bearing tests, pressure tests, and inspection of the complete product. The required tests are enumerated hereinafter. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the Engineer. Inspection may be made at the place of manufacture, or on the work site after delivery, or both, and the pipe shall be subject to rejection at any time due to failure to meet any of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. All pipe which is rejected shall be immediately removed from the project site by the Contractor.
- B. Tests and certified copies in triplicate of test results will be required for the materials and the finished pipe units as described herein. If less than 100 units of a given size and class of pipe are required, the Contractor may submit certified copies of tests made on identical pipe units made by the same manufacturer within the past year. If more than 100 units of a given size and class of pipe are required, the Contractor shall, at his own expense, engage the services of an acceptable independent testing laboratory to perform or witness all tests, other than mill tests on reinforcing steel and cement, and certify the results. In addition, the Owner reserves the right to have any or all pipe units inspected or tested, or both, by an independent testing laboratory at either the manufacturer's plant or elsewhere. Such additional inspection and/or tests shall be at the Owner's expense and shall be the test results of record.
- C. All pipe units to be tested shall be selected at random by the Engineer. Unless otherwise permitted, all load-bearing tests on pipe units shall be made in the presence of the Engineer.
- D. All tests shall be made in accordance with the latest applicable ASTM specifications.

## PART 3 - EXECUTION

### 3.1 HANDLING PIPE

- A. Each pipe unit shall be handled into its position in the trench only in such manner and by such means as is acceptable to the Engineer.
- B. The Contractor will be required to furnish suitable devices to permit satisfactory support of all parts of the pipe unit when it is lifted.

### 3.2 INSTALLATION

- A. Installation shall conform to the appropriate section of the Rhode Island Standard Specifications.
- B. Each pipe unit shall be inspected before being installed. Any pipe discovered to be defective either before or after installation shall be removed and replaced with a sound pipe.

- C. Except as otherwise indicated on the drawings, the pipe shall be supported by compacted crushed stone. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Unless otherwise directed. Screened gravel shall be as specified under Aggregate Materials.
- D. Suitable bell holes shall be provided, so that after placement only the barrel of the pipe receives bearing pressure from the supporting material.
- E. All pipe units shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work.
- F. Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments.
- G. Before any joint is made the unit shall be checked to assure that a close joint with the next adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber, or other unyielding object.
- H. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe unit together so that they will fit with a minimum open recess inside and outside and have tightly seated joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be pulled or cramped without the permission of the Engineer.
- I. Immediately after the pipe joint is completed, the position of the gasket in the joint shall be inspected using a suitable feeler gage furnished by the Contractor, to be sure it is properly put together and is tight. Joints in which the gasket is damaged or not properly positioned shall be pulled apart and remade using a new gasket.
- J. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.
- K. Details of gasket installation and joint assembly shall follow the directions of the manufacturer of the joint materials and of the pipe, all subject to acceptance by the Engineer. The resulting joints shall be watertight and flexible.
- L. After each pipe to be supported on crushed stone has been properly bedded, enough gravel shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes provided for jointing shall be filled with screened gravel and compacted, and then screened gravel shall be placed and compacted to complete the pipe bedding, as indicated on the drawings.
- M. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.
- N. At all times when pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs or by other suitable means. If water is in the trench when work is to be resumed, the plug shall not be removed until all conditions are suitable to prevent water, earth, or other material from entering the pipe.
- O. Pipelines shall not be used as conductors for trench drainage during construction.

3.3 CLEANING

- A. Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out pipelines and manholes, being careful to prevent soil, water, and debris from entering any existing pipe.

END OF SECTION