

SECTION 33 40 00 - STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.01 DESCRIPTION OF WORK: Furnish and install storm sewer system as shown on the Drawings. This includes:

- A. Underdrain pipe/foundation drain and associated cleanouts
- B. Storm drain culvert piping
- C. Reinforced concrete drainage structures
- D. PVC drain basins
- E. Trench Drains

1.02 REFERENCES:

- A. Specification Sections:
 - 1. Earth Moving: Refer to Section 31 20 00
 - 2. Erosion and Sedimentation Controls: Refer to Section 31 25 13
- B. State of Maine Department of Transportation "Standard Specifications – Revision of December 2002"
- C. State of Maine Department of Transportation "Supplemental Specifications – Corrections, Additions & Revisions to Standard Specifications – Latest Edition"

1.03 SUBMITTALS:

- A. Manufacturer's product data and installation instructions.
- B. Certified copies of tests on pipe units.
- C. Construction Records: Record depth and location of the following:
 - 1. Structure locations and elevations
 - 2. Repairs to existing pipes.
 - 3. Underdrain pipe locations and connection points to storm drainage system, and elevations.

Record neatly in a permanently bound notebook and submit at Substantial Completion. Provide access to records for ENGINEER at all times. Submit copies to ENGINEER on a weekly basis.

- D. Buoyancy calculations stamped by a professional engineer for all buried drainage structures, including catch basins, manholes, and drain basins.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS:

- A. General: Provide fittings of same type and class of materials as pipe. Fitting must have single piece gasket.
- B. Underdrain Pipe shall be perforated SDR 35 PVC pipe. Coiled pipes shall not be used.
- D. Storm drain pipe shall be SDR 35 PVC. PVC pipe used for storm drainage shall conform to all aspects of ASTM specification D3034-73A and/or ASTM Specification F789.

2.02 PRECAST CONCRETE STRUCTURES

- A. Base Sections: Precast monolithic construction with steps.
- B. Barrel Sections: Precast with steps.
- C. Top Sections: Precast eccentric cone with steps.
- D. Steps: Polypropylene reinforced with steel rod. Meet OSHA requirements, minimum width 16-inches. Cast into concrete.
- E. Pipe to Structure Connections: Connections shall be watertight, expandable pipe sleeve with adjustable expansion ring equal to Press-Boot by Press-Seal Gasket Corp., Fort Wayne, Indiana.
- F. Joints Between Precast Sections: Watertight, shiplap-type seal with two rings of one-inch diameter butyl rubber sealant.
- G. Inverts: Provide inverts as shown on the Drawings. Configuration to be as required by connecting pipes and as shown on Drawings.
- H. Outlet Control Structure: Provide precast concrete structure with perforations as shown in the Construction Drawings.

2.03 FRAMES, COVERS, AND GRATES

- A. Material: Cast iron, ASTM A48 Class 30, or Bronze as shown on the Drawings
- B. Provide frames, covers and grates as identified on the Drawings

2.04 MISCELLANEOUS:

- A. Area Drain: Area drains shall be as detailed on the Construction Drawings and shall be Nyloplast drain basins, or equal. Area drains shall have ductile iron integrated frame and grate or solid cover or Bronze drop-in grate as identified on the Construction Drawings. Provide anti-floatation as identified on the Construction Drawings
- B. Paver Trench Drain: Paver slot drains shall be located as identified on the Construction Drawings. Pave slot drains shall be by ACO Technologies, or approved equal. See Landscaping Drawings for additional model information for drain and grate.
- B. Marking Tape: Lineguard III by Tri-Sales, Inc., 2-inch wide, green; detectable with magnetic locators, or approved equal.

- C. Rigid Insulation: Extruded closed-cell rigid foamed polystyrene, 2-inch thickness, width of trench, Styrofoam HI-60, by Dow Chemical, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF GRAVITY PIPE AND FITTINGS:

- A. Methods: Install in accordance with manufacturer's recommendations. Use a laser beam for line and grade unless otherwise permitted by the ENGINEER. Secure each length of pipe with bedding before placing next length. Plug open ends when work is suspended. Bed pipe as shown on Drawings. A 30-inch minimum cover over the top of PVC pipe and DI pipe should be provided before the trench is wheel-loaded.
- B. Grade and Line:
 - 1. Lay pipe to line and grade shown on the Drawings. If grade is not shown, determine elevations of start and finish points for each run of pipe. Lay pipe to a uniform grade between these points.
 - 2. Line and grade may be adjusted by the ENGINEER as required by field conditions.
- C. Conditions: Lay pipe in the dry. Do not use installed pipe to remove water from work area.
- D. Flush and clean all pipe and remove all debris and materials. Flushing and cleaning methods approved by ENGINEER. Gravity flushing is not acceptable.
- E. Underdrain: All work shall conform to the Drawings and MDOT SECTION 605 – UNDERDRAINS
- F. Foundation Drain: Provide 4-inch diameter, perforated PVC pipe around perimeter of proposed building. Wrap drain in minimum of 6 inches of crushed stone bedding and nonwoven filter fabric as detailed.

3.02 INSTALLATION OF MANHOLES/CATCH BASINS:

- A. Placement: Place precast bases and structures on compacted bedding material so bottom of structure is plumb and pipe inverts are at proper elevations. Place manhole barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink grout. Construct manhole inverts in accordance with Drawings.
- B. Joints: Follow manufacturer's instructions for sealing joints between precast sections. Provide two rings of 1 inch diameter butyl rubber sealant. Point joints inside and out with butyl caulk.
- C. Frame and Covers:
 - 1. Set to final grade as shown on the Drawings and as specified. Provide adequate temporary covers to prevent accidental entry until final placement of frame and cover is made.
 - 2. Use two rings of 1 inch diameter butyl rubber sealant between frame and rubber riser. Provide downward force to frame so as to compress the joint, provide a watertight seal, and prevent future settlement. Point compressed joint with butyl rubber caulk sealant.

3. Set manhole frames and covers to final grade only after pavement base course has been applied, or after final grading of gravel roads.
- D. Inverts: As specified in paragraph 2.02G of this section.
 - E. Steps: Replace any steps that are out of plumb and proper horizontal placement.
 - F. Frost Barriers: Wrap each manhole to the maximum excavation depth or not less than 6 feet below grade, with a minimum of four layers of 6 mils each of the polyethylene.
 1. Clean manhole exterior of all dirt and remove any protrusions.
 2. Apply a 6-inch wide vertical strip of bituminous waterproofing adhesive from the top of manhole to the greatest excavation depth, but not in excess of 6 feet.
 3. Start poly wrap at adhesive strip and proceed around manhole continuously, overlapping adhesive strip a minimum of 24 inches on the final layer.
 4. Tuck and pleat poly at top in a continuous manner, minimizing size of folds. Extend poly past top of manhole frame and temporarily tuck remainder inside frame, until final backfill and paving.
 5. Paved areas: Cut poly flush with manhole rim after pavement is in place.
 6. Unpaved areas: Pull loose ends of poly together, remove excess air and tie off end with galvanized wire. Bury with manhole below grade.

3.03 MISCELLANEOUS:

- A. All other drainage systems shall be installed per manufacturer's instructions and per the Construction Drawings.

3.04 INSULATION:

- A. Install as shown on Drawings.

END OF SECTION 334000