

SECTION 02700

SEWERAGE AND STORM DRAINAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide labor and materials to complete the sanitary and storm drainage as shown on the Drawings and/or herein specified.
 - 1. Sewer lines.
 - 2. Storm drain lines and underdrains.
 - 3. Trench insulation.
 - 4. Geotextile filter fabric.
 - 5. Repair of existing utilities damaged by the work.
 - 6. Cast-in-place concrete encasement for utility lines and pipes.
- B. Terminate site utility pipes and conduits at the building foundation wall for connection to building utilities.

1.02 RELATED SECTIONS IN OTHER DIVISIONS

- A. Section 03300: Cast-In-Place Concrete.

1.03 SUBMITTALS

- A. Submit manufacturer's product literature and Shop Drawings for approval on materials in accordance with Section 01300.
- B. Certified copies of test results.
- C. As-built records of pipe location, depth, services, and repairs.

PART 2 - PRODUCTS

2.01 SEWER PIPE

Use ductile iron pipe (D.I.), class 50, conforming to ANSI 21.51, with push-on single gasket joints. Pipe inside shall have a cement lining of twice the thickness specified in ANSI 21.4 and a double asphalt sealcoat. Outside of pipe shall be bituminous coated.

2.02 SEWER SERVICE CONNECTIONS

- A. Use forty-five degree wyes, tee-wyes, or gasketed saddles, appropriate adaptors, fittings, and end plug. Tap main with core drill in the upper half of the pipe. Do work in accordance with City Public Works Department approval.

2.03 STORM DRAINS

- A. Polyvinylchloride (PVC), conforming to ASTM D3034, maximum ratio of outside diameter to wall thickness of 35 (SDR-35). Watertight push-on couplings with flexible O-ring gasket, conforming to ASTM D3212.

2.04 UNDERDRAINS

- A. Use One of the Following for Underdrains:
 - 1. Polyvinylchloride (PVC), Type PS-46 conforming to ASTM F-789 or PSM (SDR 35) conforming to ASTM D-3034 perforated with two rows of 1/2-inch diameter holes. Gasketed push-on joints.

2. Corrugated polyethylene drainage pipe, heavy-duty grade, perforated, conforming to AASHTO M252 and ASTM F 405. Pipe must be marked as "Heavy-Duty" conforming to ASTM F405, or pipe stiffness of 30 psi at 5% deflection, maximum of 5% elongation.
 3. PVC "S & D" pipe conforming to ASTM D-2729, perforated with two rows of 1/2" holes.
- B. Provide cleanout risers to finish grade outside the building with threaded covers. Grease threads on cover. Provide cleanout plug inside a cast iron or aluminum handhole and cover, set flush to walkway or drive pavement, where cleanout is in a hard surface area. Neehah Foundry model R-1978 series, or approved equal.
- C. Inside the building, provide cleanouts as specified in Section 15400, Plumbing.

2.05 GEOTEXTILE DRAINAGE FABRIC

- A. Polypropylene or Polyester Non-woven, Needle-punched Drainage Fabric with the Following Minimum Properties:

Weight	4.5 oz/sy	Water Flow Rate	280 gpm/sf
Thickness	60 mils	Coef of Permeability	0.2 cm/sec
Tear Strength	50 lbs	Equiv. Opening Size	70-100 sieve

- B. Mirafi 140N, Terra Tex - SD, Trevira 1115, AEF 480, or approved equal.

2.06 TRENCH INSULATION

- A. Extruded polystyrene with a "K" factor of 0.18, with 2.2 lb./cu. ft. density, and 30 psi compressive strength, manufactured by Dow Chemical, or approved equal.

PART 3 - EXECUTION

3.01 EXCAVATION AND BACKFILL

- A. Conforming to the appropriate portions of Section 02200, Earthwork.

3.02 SEWER AND STORM PIPING

- A. Lay pipe on stable bedding beginning at the downstream end and proceeding upstream with the bell end of the pipe upstream. Provide adequate trench drainage to prevent pipe floatation and insure proper bedding compaction.
- B. Provide 4 foot wide layer of 2-inch thick rigid foam insulation on bedding material 2-inches above top of pipe, where depth of cover over the top of pipe is less than 4.5 feet.
- C. Provide 4 foot wide layer of 2-inch thick rigid foam insulation on bedding material 6-inches above or below sewer pipe, where it crosses a storm drain pipe with less than 4.5 feet of separation.
- D. Coordinate work on municipal utility lines and within street right-of-way with municipal sewer department, MDOT, and public works department.

3.03 SEWER SERVICE LINE

- A. Install wye or tee-wye fitting and additional service line from the main to an existing service line within right-of-way limits; or for new service lines to the right-of-way limits or as directed by the Architect. Sewer service lines for existing services shall be laid at a uniform grade from the sewer to the point of connection with the existing service lines. All sewer service lines for future use shall be laid at a uniform grade of one-

eighth inch per foot unless otherwise authorized by the Architect. Pipe used for reconnections shall be of the same diameter as the existing line. Where water lines are to be crossed, service pipe joints shall be spaced such that no joint falls within ten feet of the centerline of the existing, or proposed water line. All connections shall be made with appropriate adaptors.

3.04 UNDERDRAINS

- A. Set drains in crushed stone bedding surrounding pipe, with perforations on the bottom half of the pipe. Slope pipe uniformly to drain. Fully wrap stone bedding with Geotextile fabric. Compact to 95% maximum density around pipe.

END OF SECTION