



## 02722

### Sanitary Sewerage Systems

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### A. Summary

This section contains the design criteria for exterior sanitary sewer systems. [Section 15150: Sanitary or Laboratory Waste and Vent Piping](#) contains the design criteria for internal sanitary sewer system piping.

### B. System Design and Performance Requirements

1. Separate all combined sanitary and storm sewer systems as part of any new building project. Sanitary and storm sewer systems must be placed five feet from building walls. Sanitary and storm sewer system pipes must be separated by at least three feet.
2. All work with the City of New Haven right-of-way, including connection to public sewer mains, must meet WPCA sanitary district requirements.
3. The minimum slope on all service pipes must be 0.4%.
4. All mains that collect more than one service line must be at least 8" in diameter.
5. All service lines from buildings must be at least 4" in diameter.
6. Place at least two, but not more than five, 2" concrete adjusting rings on all sanitary sewer system manholes, before placing the manhole castings.
7. Stamp the words "Sanitary Sewer" on all manhole casting covers.
8. Install manholes wherever sanitary sewer pipe must bend. Clean-outs are not allowed for exterior sanitary sewerage.
9. Place sanitary sewer piping at least 10' horizontally and/or 18" vertically from all water distribution lines.



### C. Submittals

Submit the following design and construction documents to Yale University.

#### 1. Design Documents

- Plan and profile views of all design drawings
- Pipe sizing calculations

#### 2. Construction Documents

Before starting construction, submit:

- A list of materials
- Manufacturer specifications and installation procedures

### D. Manufacturers

Subject to compliance with the design requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to the Campbell Foundry Co. (manhole castings and covers).

### E. Materials

1. All exterior sanitary sewer pipe must be polyvinyl chloride (PVC) SDR 35, with gasket watertight joints, that meets the requirements of ASTM D3034.
2. All manholes must be pre-cast, reinforced concrete with aluminum- or plastic-covered steel rungs.
3. Manhole castings must be cast iron that meets ASTM A48, Class 25 B requirements for frames and 30 B requirements for covers.

### F. Preparation

1. In conjunction with Yale University, prepare a shutdown procedure document, before starting construction, that outlines scheduling and notification requirements.
2. When connecting to the public sewer main, contact the WPCA for approval. A permit is required from the WPCA to connect to their public sewer main and for all work within the City of New Haven right-of-way.



### G. Installation Guidelines

Where possible, provide a uniform pipe bedding of suitable on-site material. If suitable material is not available, backfill the trench with sand. Using a material similar to the bedding, backfill the entire trench width evenly in 6" lifts to 6" above the top of the pipe. Compact the lifts to at least a 95% Standard Proctor density, meeting ASTM D1556 standards at optimum moisture (or as recommended by the soils engineer). Backfill the remaining trench in lifts not to exceed 12" up to the sub-grade height for the surface condition encountered. Compact the lifts to a 95% Standard Proctor density, meeting ASTM D1556 standards at optimum moisture (or as recommended by the soils engineer). Backfilling and compacting above the sub-grade must be determined by the soils engineer or by the recommended paving design for the project.

### H. Quality Control

Work on exterior sanitary sewer systems must conform to the following quality control standards.

#### 1. Testing Laboratory

Yale University will retain the services of a qualified, independent testing laboratory to perform soil compaction tests, as directed, during construction.

#### 2. Testing Methodology and Extent

Mandrel and exfiltration tests must be performed on all sanitary sewer system piping before acceptance by Yale University. Plugging the lower end of the pipe at a manhole, filling the upstream manhole to 4' with water, and checking for leaks constitutes an exfiltration test. Leakage cannot exceed 0.15 gal/inch per 100' of pipe for one hour.