



Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines¹

This standard is issued under the fixed designation C 969; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice covers procedures for testing installed precast concrete pipe sewer lines using either water infiltration or exfiltration acceptance limits to demonstrate the integrity of the installed materials and construction procedure.

1.2 A complete metric companion to this practice has been developed—C 969M; therefore, no metric equivalents are presented in this practice.

NOTE 1—The owner should specify the following: who will conduct, observe, and furnish labor, furnish material and measuring devices, and pay for the tests; who is responsible for determining local groundwater conditions; and which test is to be conducted, that is, an infiltration test or an exfiltration test.

NOTE 2—Test criteria presented in this practice are similar to those in general use. Pipe, 24-in. diameter or larger, may be accepted by visual inspection when testing for infiltration.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

C 822 Terminology Relating to Concrete Pipe and Related Products²

3. Terminology

3.1 *Definitions*—For definitions of terms relating to concrete pipe, see Terminology C 822.

4. Summary of Practice

4.1 Determine the groundwater conditions surrounding the section of sewer to be tested and select the type of test to be conducted.

4.2 For the infiltration test, the amount of water leaking into the sewer line is measured, and the rate of infiltration is

determined. If the rate is less than or equal to the allowable limit, the section of sewer tested is acceptable.

4.3 For the exfiltration test, the sewer line is filled with water to the recommended test head and the rate of water loss is determined. If the rate is less than or equal to the allowable limit, the section of sewer tested is acceptable.

5. Significance and Use

5.1 This is not a routine test. The values recorded are applicable only to the sewer being tested and at the time of testing.

6. Preparation of the Sewer Line

6.1 The sewer line should be free of debris prior to testing.

6.2 The manholes, the ends of the branches, laterals, wyes and stubs to be included in the test shall be plugged. All plugs shall be secured to prevent leakage blowout due to testing pressure.

7. Procedure

7.1 Infiltration Testing:

7.1.1 Conduct testing from manhole to manhole or between more than two manholes. The length of main tested shall not exceed 700 ft.

7.1.2 Stop all dewatering operations and allow the groundwater to return to its normal level. Infiltration testing should not be used unless the groundwater level is at least 2 ft above the crown of the pipe for the entire length of the test section.

7.1.3 Plug all pipe outlets discharging into the upstream manhole.

7.1.4 Measure the groundwater elevation and determine the average head over the test section.

7.1.5 Measure infiltration leakage at the outlet of the test section. Because leakage allowances are small, measurements are best made by either timing the filling of a small container of known volume, or by directing flow into a container for a specified time and measuring the content, or by using small weirs.

7.1.6 If the measured rate of leakage is less than or equal to the allowable leakage in accordance with 8.1, the section of sewer tested is acceptable.

7.1.7 If the test section fails, it may be repaired and retested

¹ This practice is under the jurisdiction of ASTM Committee C13 on Concrete Pipe and is the direct responsibility of Subcommittee C13.09 on Methods of Test.

Current edition approved July 15, 1994. Published September 1994. Originally published as C 969–82. Last previous edition C 969–82 (1990)¹.

² *Annual Book of ASTM Standards*, Vol 04.05.