



Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications¹

This standard is issued under the fixed designation D 2321; 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 provides recommendations for the installation of buried thermoplastic pipe used in sewers and other gravity-flow applications. These recommendations are intended to ensure a stable underground environment for thermoplastic pipe under a wide range of service conditions. However, because of the numerous flexible plastic pipe products available and the inherent variability of natural ground conditions, achieving satisfactory performance of any one product may require modification to provisions contained herein to meet specific project requirements.

1.2 The scope of this practice necessarily excludes product performance criteria such as minimum pipe stiffness, maximum service deflection, or long term strength. Thus, it is incumbent upon the product manufacturer, specifier, or project engineer to verify and assure that the pipe specified for an intended application, when installed according to procedures outlined in this practice, will provide a long term, satisfactory performance according to criteria established for that application. A commentary on factors important in achieving a satisfactory installation is included in Appendix X1.

NOTE 1—Specific paragraphs in the appendix are referenced in the body of this practice for informational purposes.

NOTE 2—The following ASTM standards may be found useful in connection with this practice: Practice D 420, Test Method D 1556, Method D 2216, Specification D 2235, Test Method D 2412, Specification D 2564, Practice D 2657, Practice D 2855, Test Methods D 2922, Test Method D 3017, Practice F 402, Specification F 477, Specification F 545, and Specification F 913.

NOTE 3—Most Plumbing Codes and some Building Codes have provisions for the installation of underground “building drains and building sewers.” See them for plumbing piping applications.

1.3 *This standard does not purport to address all of the safety problems, 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:

- D 8 Terminology Relating to Materials for Roads and Pavements²
- D 653 Terminology Relating to Soil, Rock, and Contained Fluids³
- D 698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
- D 2487 Test Method for Classification of Soils for Engineering Purposes^{3,4}
- D 2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)^{3,4}
- D 3839 Practice for Underground Installation of “Fiberglass” (Glass-Fiber Reinforced Thermosetting Resin) Pipe⁴
- D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils³
- F 412 Terminology Relating to Plastic Piping Systems⁴

3. Terminology

3.1 *General—Definitions used in this practice are in accordance with Terminologies F 412 and D 8 and Terminology D 653 unless otherwise indicated.*

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *foundation, bedding, haunching, initial backfill, final backfill, pipe zone, excavated trench width*—See Fig. 1 for meaning and limits, and trench terminology.

3.2.2 *aggregate*—a granular material of mineral composition such as sand, gravel, shell, slag or crushed stone (see Terminology D 8).

3.2.3 *deflection*—any change in the inside diameter of the pipe resulting from installation and imposed loads. Deflection may be either vertical or horizontal and is usually reported as a percentage of the base (undeflected) inside pipe diameter.

3.2.4 *dense-graded aggregate*—an aggregate that has a particle size distribution such that, when it is compacted, the

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² *Annual Book of ASTM Standards*, Vol 04.03.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ *Annual Book of ASTM Standards*, Vol 08.04.