



Standard Test Method for Water Content and Density of Soil in Place by Time Domain Reflectometry (TDR)¹

This standard is issued under the fixed designation D 6780; 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.

1. Scope

1.1 This test method may be used to determine the water content of soils and the in-place density of soils using a TDR apparatus.

1.2 This test method applies to soils that have 30 % or less by weight of their particles retained on the 19.0-mm ($\frac{3}{4}$ -in.) sieve.

1.3 This test method is suitable for use as a means of acceptance for compacted fill or embankments.

1.4 This test method may not be suitable for organic and highly plastic soils.

1.5 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D 6026.

1.5.1 The method used to specify how data are collected, calculated, or recorded in this standard is not directly related to the accuracy to which the data can be applied in design or other uses, or both. How one applies the results obtained using this standard is beyond its scope.

1.6 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.7 *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:

D 653 Terminology Relating to Soil, Rock, and Contained Fluids²

D 698 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 kg) Rammer and 12-in. (305-mm) Drop²

D 1556 Test Method for Moisture-Density of Soil In-Place by the Sand-Cone Method²

D 1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10 lb (4.54 kg) Rammer and 18-in. (457-mm) Drop²

D 2167 Test Method for Density of Soil In-Place by the Rubber-Balloon Method²

D 2216 Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures²

D 2922 Test Methods for Density of Soil and Soil Aggregate and Rock in Place by Nuclear Methods (Shallow Depth)²

D 2937 Test Method for Density of Soil In-Place by the Drive-Cylinder Method²

D 3017 Test Method for Water Content of Soil and Rock In-Place by Nuclear Methods (Shallow Depth)²

D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction²

D 4643 Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method

D 4718 Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles²

D 4753 Specification for Evaluating, Selecting, and Specifying Balances and Scales for Use in Soil and Rock Testing²

D 4914 Test Method for Density and Unit Weight of Soil and Rock in Place by the Sand Replacement Method²

D 4944 Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester Method²

D 4959 Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method²

D 5030 Test Methods for Density and Unit Weight of Soil and Rock in Place by the Water Replacement Method²

D 5080 Test Method for Rapid Determination of Percent Compaction²

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.08 on Special and Construction Control Tests.

Current edition approved April 10, 2002. Published August 2002.

² Annual Book of ASTM Standards, Vol 04.08.