



Designation: D6760 – 16

Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing¹

This standard is issued under the fixed designation D6760; 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 covers procedures for checking the homogeneity and integrity of concrete in deep foundation such as bored piles, drilled shafts, concrete piles or augercast piles. This method can also be extended to diaphragm walls, barrettes, dams etc. In this test method, all the above will be designated “deep foundation elements.” The test measures the propagation time and relative energy of an ultrasonic pulse between parallel access ducts (crosshole) or in a single tube (single hole) installed in the deep foundation element. This method is most applicable when performed in tubes that are installed during construction.

1.2 Similar techniques with different excitation sources exist, but these techniques are outside the scope of this test method.

1.3 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#).

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

1.5 This standard provides minimum requirements for crosshole (or single hole) testing of concrete deep foundation elements. Plans, specifications, provisions, or combinations thereof prepared by a qualified engineer, and approved by the agency requiring the test(s), may provide additional requirements and procedures as needed to satisfy the objectives of a particular test program.

1.6 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.7 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.8 *Limitations*—Proper installation of the access ducts is essential for effective testing and interpretation. The method does not give the exact type of flaw (for example, inclusion, honeycombing, lack of cement particles, etc.) but rather only that a flaw exists.

1.9 *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*:²

D653 [Terminology Relating to Soil, Rock, and Contained Fluids](#)

D1143 [Test Method for Piles Under Static Axial Compressive Load](#) (Withdrawn 2005)³

D3740 [Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction](#)

D4945 [Test Method for High-Strain Dynamic Testing of Deep Foundations](#)

D5882 [Test Method for Low Strain Impact Integrity Testing of Deep Foundations](#)

D6026 [Practice for Using Significant Digits in Geotechnical Data](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *access ducts, n*—preformed steel tubes, plastic tubes (for example, PVC or equivalent), or drilled boreholes, placed in the concrete to allow probe entry in pairs to measure pulse transmission in the concrete between the probes.

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.11 on Deep Foundations.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.