



Designation: D1143/D1143M – 20

Standard Test Methods for Deep Foundation Elements Under Static Axial Compressive Load¹

This standard is issued under the fixed designation D1143/D1143M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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

1. Scope*

1.1 The test methods described in this standard measure the axial deflection of an individual vertical or inclined deep foundation element or group of elements when loaded in static axial compression. These methods apply to all types of deep foundations, or deep foundation systems as they are practical to test. The individual components of which are referred to herein as *elements* that function as, or in a manner similar to, drilled shafts, cast-in-place piles (augered cast-in-place piles, barrettes, and slurry walls), driven piles, such as pre-cast concrete piles, timber piles or steel sections (steel pipes or wide flange beams) or any number of other element types, regardless of their method of installation. Although the test methods may be used for testing single elements or element groups, the test results may not represent the long-term performance of the entire deep foundation system.

1.2 This standard provides minimum requirements for testing deep foundation elements under static axial compressive load. Plans, specifications, and/or provisions prepared by a qualified engineer may provide additional requirements and procedures as needed to satisfy the objectives of a particular test program. The engineer in charge of the foundation design referred to herein as the engineer, shall approve any deviations, deletions, or additions to the requirements of this standard. (Exception: the test load applied to the testing apparatus shall not exceed the rated capacity established by the engineer who designed the testing apparatus).

1.3 Apparatus and procedures herein designated “optional” may produce different test results and may be used only when approved by the engineer. The word “shall” indicates a mandatory provision, and the word “should” indicates a recommended or advisory provision. Imperative sentences indicate mandatory provisions.

1.4 A qualified geotechnical engineer should interpret the test results obtained from the procedures of this standard so as

to predict the actual performance and adequacy of elements used in the constructed foundation.

1.5 A qualified engineer (qualified to perform such work) shall design and approve all loading apparatus, loaded members, and support frames. The geotechnical engineer shall design or specify the test procedures. 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. This standard also includes illustrations and appendices intended only for explanatory or advisory use.

1.6 *Units*—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 The gravitational system of inch-pound units is used when dealing with inch-pound units. In this system, the pound [lbf] represents a unit of force [weight], while the unit for mass is slug. The rationalized slug unit is not given, unless dynamic [$F=ma$] calculations are involved.

1.8 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026.

1.8.1 The procedures used to specify how data are collected, recorded and calculated in this standard are regarded as the industry standard. In addition, they are representative of the significant digits that should generally be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user’s objectives; and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of this standard to consider significant digits used in analysis methods for engineering data.

1.9 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

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.

Current edition approved Sept. 15, 2020. Published October 2020. Originally approved in 1950. Last previous edition approved in 2007 as D1143 – 07 (2013) ^{ϵ 1}. DOI: 10.1520/D1143_D1143M-20.

*A Summary of Changes section appears at the end of this standard