



Standard Test Method for Determining In Situ Modulus of Deformation of Rock Mass Using Flexible Plate Loading Method¹

This standard is issued under the fixed designation D4395; 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 the preparation, equipment, test procedure, and data reduction for determining in situ modulus of deformation of a rock mass using the flexible plate loading method.

1.2 This test method is designed to be conducted in an adit or small underground chamber; however, with suitable modifications it could be conducted at the surface.

1.3 This test method is usually conducted parallel or perpendicular to the anticipated axis of thrust, as dictated by the design load.

1.4 Time-dependent tests not covered by this standard can be performed but are to be reported in another standard.

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

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 inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 The references appended to this standard contain further information on this test method.

1.8 *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.* For specific precaution statements, see Section 8.

2. Referenced Documents

2.1 ASTM Standards:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D2113 Practice for Rock Core Drilling and Sampling of Rock for Site Exploration

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

D4394 Test Method for Determining In Situ Modulus of Deformation of Rock Mass Using Rigid Plate Loading Method

D4403 Practice for Extensometers Used in Rock

D4879 Guide for Geotechnical Mapping of Large Underground Openings in Rock

D5079 Practices for Preserving and Transporting Rock Core Samples

D5434 Guide for Field Logging of Subsurface Explorations of Soil and Rock

D6026 Practice for Using Significant Digits in Geotechnical Data

D6032 Test Method for Determining Rock Quality Designation (RQD) of Rock Core

3. Terminology

3.1 For terminology used in this test method, refer to Terminology D653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *deflection*—movement of the plate, mortar pad, or rock in response to and in the same direction as the applied load.

3.2.2 *flexible plate*—theoretically, a plate having no stiffness.

3.2.3 *load*—total force acting on the rock face.

3.2.4 *peak-to-peak modulus of deformation*—the slope of stress - strain curve line connecting the peaks of the curves obtained from successive pressure cycles (see Fig. 1).

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.12 on Rock Mechanics.

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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.