



Standard Test Method for Determining Deformability and Strength of Weak Rock by an In Situ Uniaxial Compressive Test¹

This standard is issued under the fixed designation D4555; 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 measurement of the deformability and strength of large in situ specimens of rock by a uniaxial compressive test. The test results take into account the effect of both intact material behavior and the behavior of discontinuities contained within the specimen block.

1.2 This test method does not cover which type of specimen should be tested or whether anisotropic factors should be considered. The specifics of the test program need to be developed prior to testing and possibly even before sampling. Such specifics would be dependent on the intended use of the data, as well as any budgetary constraints and other factors, which are outside the scope of this test method.

1.3 Theoretically there is no limit to the size of the test specimen; however, size will be controlled by the strength of the test specimen relative to the capacity of any loading apparatus and bearing capacity of the surface the apparatus must react against. Furthermore, the orientation and strength of discontinuities relative to the specimen geometry will be a factor limiting specimen size too.

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

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *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
- D2216 Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- D6026 Practice for Using Significant Digits in Geotechnical Data
- D6032 Test Method for Determining Rock Quality Designation (RQD) of Rock Core
- D7012 Test Methods for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures

3. Terminology

3.1 For definitions of terms used in this test method refer to Terminology D653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *rock quality designation, RQD*—a method for quantitatively describing the nature of a rock mass from core borings. RQD is obtained by measuring the total length of all unweathered pieces of core greater than or equal to 100 mm and dividing the total by the length of the particular core run. This quantity is expressed as a percent and is used to classify in situ rock. See Test Method D6032.

3.2.2 *average joint fragment volume*—the average size of discrete rock blocks delineated by joints (discontinuities) in the test specimen.

3.2.2.1 *Discussion*—Average joint fragment volume is similar to other rock mass rating factors such as block volume and

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

Current edition approved Jan. 15, 2010. Published March 2010. Originally approved in 1985. Last previous edition approved in 2005 as D4555 – 01 (2005). DOI: 10.1520/D4555-10.

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.