This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D4543 – 08$^{\varepsilon 1}$

Standard Practices for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerances[1]

This standard is issued under the fixed designation D4543; 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.

ε[1] NOTE—Editorially corrected 5.1 in April 2017.

1. Scope*

1.1 These practices specify procedures for laboratory rock core test specimen preparation of rock core from drill core and block samples for strength and deformation testing and for determining the conformance of the test specimen dimensions with tolerances established by this practice. Cubical, rectangular, or other shapes are not covered by this practice. However, some of the information contained with in this practice and in standard Test Method C170 may still be of use to preparing other test specimen shapes.

1.2 Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort (Note 1) and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted.

NOTE 1—Best effort in surface preparation refers to the use of a well-maintained surface grinder, lathe or lapping machine by an experienced operator in which a reasonable number of attempts has been made to meet the tolerances required in this procedure.

1.3 This practices covers some, but not all of the curatorial issues that should be implemented. For curatorial issues that should be followed before and during specimen preparation refer to Practices D5079 and to the specific test standards in 2.1 for which the specimens are being prepared.

1.4 This practice also prescribes tolerance checks on the length-to-diameter ratio, straightness of the elements on the cylindrical surface, the flatness of the end bearing surfaces, and the perpendicularity of the end surfaces with the axis of the core.

1.5 The requirement for specifying the moisture condition of the test specimen is also stated. However, the requirements in the specific test standards in 2.1 should be followed too.

1.6 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this standard.

1.6.1 The practices/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 generally should 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 design.

1.7 *Units*—The dimensional values stated in either inch-pound units or SI units are to be regarded as standard, such as 4 to 12 in. or 100 to 300 mm. 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. (Note, when mass measurements are added to determine densities or unit weights, add the following.)

1.7.1 Only the SI units are used for mass determinations, calculations and reported results. However, the use of balances or scales recording pounds of mass (lbm) shall not be regarded as nonconformance with this standard.

[1] These practices are under the jurisdiction of ASTM Committee D18 on Soil and Rock and are the direct responsibility of Subcommittee D18.12 on Rock Mechanics.

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

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