



Standard Test Method for Determination of the Impact Value (IV) of a Soil¹

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1. Scope

1.1 This test method covers the determination of the Impact Value (IV) of a soil either in the field or a test mold.

1.2 The standard test method, using a 4.5 kg (10 lbm) hammer, is suitable for, but not limited to, evaluating the strength of an unsaturated compacted fill, in particular pavement materials, soils, and soil-aggregates having maximum particle sizes less than 37.5 mm (1.5 in.).

1.3 By using a lighter 0.5 kg (1.1 lbm) hammer, this test method is applicable for evaluating lower strength soils such as fine grained cohesionless, highly organic, saturated, or highly plastic soils having a maximum particle size less than 9.5 mm (0.375 in.).

1.4 By performing laboratory test correlations for a particular soil using the 4.5 kg (10 lbm) hammer, IV may be correlated with an unsoaked California Bearing Ratio (CBR) or may be used to infer percentage compaction.

1.5 The values stated SI are to be regarded as the standard. The values stated in parentheses are given for information only.

1.6 *This standard may involve hazardous materials, operations, and equipment. 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.*

NOTE 1—The equipment and procedures contained in this test method are similar to those developed by B. Clegg in the 1970s at the University of Western Australia, Nedlands, Australia. Impact Value is also commonly known as Clegg Impact Value (CIV).

2. Referenced Documents

2.1 ASTM Standards:

D 653 Terminology Relating to Soil, Rock, and Contained Fluids²

D 698 Test Method for Laboratory Compaction Characteristics of Soils Using Standard Effort (12 400 ft lbf/ft³(600 kNm/m³))²

D 1556 Test Method for Density of Soil in Place by the Sand-Cone Method²

D 1557 Test Method for Laboratory Compaction Characteristics of Soils Using Modified Effort (56 000 ft lbf/ft³(2700 kNm/m³))²

D 1883 Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils²

D 2167 Test Method for Density of Soil in Place by the Rubber-Balloon Method²

D 2216 Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures²

D 2922 Test Methods for Density of Soil and Soil-Aggregates in Place by Nuclear Methods (Shallow Depth)²

D 2937 Test Method for Density of Soil in Place by the Drive-Cylinder Method²

D 3017 Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)²

D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction²

3. Terminology

3.1 *Definitions*—Except as listed below, all definitions are in accordance with Terminology D 653.

3.1.1 *impact value (IV), n*—the value expressed in units of tens of gravities (g) derived from the peak deceleration of a 4.5 kg (10 lbm) instrumented compaction hammer 50 mm (1.97 in.) in diameter free falling 450 mm (18 in.).

3.1.2 *light impact value (IV/L), n*—the IV derived from using a 0.5 kg (1.1 lbm) mass hammer 50 mm (1.97 in.) in diameter free falling 300 mm (12 in.).

3.1.3 *impact soil tester, n*—testing apparatus used to obtain an IV of a soil.

3.1.4 *target iv, n*—the desired strength, in terms of IV, to be achieved in the field for a particular material and construction process. This may also be referred to as *target strength*.

4. Summary of Test Method

4.1 The test apparatus is placed on the material to be tested either in a mold or on naturally occurring or compacted soil in the field. The hammer is raised to a set height and allowed to free fall. The instrumentation of the test apparatus displays a value in tens of gravities (g) of the peak deceleration of the hammer's impact as recorded by an accelerometer fitted to the top of the hammer body. A total of four blows of the hammer

¹ This test method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.08 on Special and Control Tests.

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² *Annual Book of ASTM Standards*, Vol 04.08.