

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 1289.6.9.1—2000

Methods of testing soils for engineering purposes

Method 6.9.1: Soil strength and consolidation test—Determination of stiffness of soil—
Clegg impact value (CIV)

RECONFIRMATION NOTICE

Technical Committee CE-009 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 13 June 2013.

The following are represented on Technical Committee CE-009:

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NOTES

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Methods of testing soils for engineering purposes

Method 6.9.1: Soil strength and consolidation test—Determination of stiffness of soil—Clegg impact value (CIV)

1 SCOPE

This Standard sets out a method for determining the stiffness of soil in the field, in terms of the Clegg impact value (CIV), based on the deceleration of a free-falling mass.

2 APPLICATION

The test method is suitable for evaluating the stiffness of an unsaturated compacted fill, in particular pavement materials, soils and soil-aggregates having particle sizes less than 37.5 mm.

CIV is one of the properties used to evaluate the stiffness of a layer of soil up to about 150 mm in thickness and, by inference, to indicate the compaction condition of this layer.

This test method provides immediate results in terms of CIV and may be used for the process control of pavement or earth fill activities, where the avoidance of delays is important and where there is a need to assess variability when statistically based quality assurance procedures are being used.

This test method does not provide results directly as a percentage of compaction but rather as a stiffness index value from which compaction may be inferred for the particular moisture conditions.

This method may be used to monitor strength changes during a compaction process or over time due to seasonal, environmental or traffic changes.

NOTE: The equipment and procedures contained in this test method are similar to those developed by B. Clegg at the University of Western Australia. PAPER: CLEGG, B., 1976, An impact testing device for in-situ base course evaluation. Proc 8th ARRB Conf 8 (8), pp 1-6, Perth, Australia. (6 pages)

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1289 Methods of testing soils for engineering purposes

1289.5.2.1 Method 5.2.1: Soil compaction and density tests—Determination of the dry density/moisture content relation of a soil using modified compaction effort

4 DEFINITIONS

For the purpose of this Standard the following definition shall apply:

4.1 Clegg impact value (CIV)

A value expressed in units of tens of gravities derived from the peak deceleration for the impact device as described in this method.

5 APPARATUS

5.1 General

Apparatus shall consist of an impact device as detailed in Clause 5.2 and an operational check ring as detailed in Clause 5.3. A typical configuration is shown in Figure 1.

NOTE: The apparatus detailed in this Clause has been found to be satisfactory; however, alternative designs may be employed provided that the essential requirements of the apparatus and test procedure are followed.

5.2 Impact device

The impact device shall consist of the following:

- (a) A free falling mass with a total mass, when fitted with an accelerometer and handle assembly, of 4.55 ± 0.05 kilograms, comprising the following components:
 - (i) Cylindrical steel body similar to the rammer specified in AS 1289.5.2.1 with a diameter of 50 ± 1 mm. The impact face of the free-falling mass shall be manufactured of hardened steel, and shall be planar.
 - (ii) An accelerometer rated at not less than 5000 gravities with a $\pm 2\%$ tolerance of amplitude linearity over the operational range of the apparatus. It shall be fastened according to the manufacturer's instructions to the top of the free-falling mass. It should be covered by a protective cap, to which is typically coupled a tubular handle terminating in a T-piece.
- (b) Electronic instrumentation as follows:
 - (i) Filtered to limit the frequency below 7 kHz.
 - (ii) Able to hold and display the peak deceleration of the free falling mass upon impact.
 - (iii) Capable of reading from zero to 100 ± 2 CIV units. Where CIV fractions or units of gravity are displayed, the value shall be rounded down in all instances to the nearest CIV unit.

NOTES:

- 1 The instrumentation may be either included in the handle T-piece, or be connected by means of a coaxial cable.
 - 2 The accelerometer in the free-falling mass and its instrumentation are pre-tuned to each other. Ensure that these components are correctly matched before use since it is highly likely that swapping them between apparatus may result in incorrect results being displayed.
- (c) A Guide tube, to control the vertical fall of the mass and control the height of drop. It shall satisfy the following requirements:
 - (i) The tube shall be of close enough fit to control the vertical fall, but shall not restrict the free fall of the mass. The inside diameter shall be 3mm greater than the diameter of the free falling mass.
 - (ii) Drop height shall be 455 ± 5 mm, measured from the underside of the strike face to the underside of the guide tube base, when the mass is in the raised position.