

Australian Standard®

AS 1289.1.1—2001

Methods of testing soils for engineering purposes
Method 1.1: Sampling and preparation of soils—
Preparation of disturbed soil samples for testing

This Standard incorporates Amendment No. 1 (November 2002) and Amendment No. 2 (October 2008). The changes required by the Amendments are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

METHOD

1 SCOPE

This Standard sets out a procedure for preparing disturbed samples, as received from the field, for testing in accordance with the series of tests listed in AS 1289.0.

The method does not cover procedures for sampling.

NOTES:

- 1 Sampling and preparation of soils are described in AS 1289.1.2.1.
- 2 The size of the samples from which disturbed soils samples are to be prepared depends on the tests that are to be carried out, and the maximum size and the relative proportion of coarse and fine material in the original soil.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

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| 1152 | Specification for test sieves |
| 1141 | Methods for sampling and testing aggregates |
| 1141.2 | Method 2: Basic testing equipment |
| 1289 | Methods of testing soils for engineering purposes |
| 1289.0 | Part 0: General requirements and list of methods |
| 1289.1.2.1 | Method 1.2.1: Sampling and preparation of soils—Disturbed samples—Standard method |
| 1289.2.1.1 | Method 2.1.1: Soil moisture content tests—Determination of the moisture content of a soil—Oven drying method (standard method) |
| 1289.2.1.2 | Method 2.1.2: Soil moisture content tests—Determination of the moisture content of a soil—Sand bath method (subsidiary method) |
| 1289.2.1.4 | Method 2.1.4: Soil moisture content tests—Determination of the moisture content of a soil—Microwave-oven drying method (subsidiary method) |
| 1289.2.1.5 | Method 2.1.5: Soil moisture content tests—Determination of the moisture content of a soil—Infrared lights method (subsidiary method) |
| 1289.2.1.6 | Method 2.1.6: Soil moisture content tests—Determination of the moisture content of a soil—Hotplate drying method (subsidiary method) |

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- 1289.3.1.1 Method 3.1.1: Soil classification tests—Determination of the liquid limit of a soil—Four point Casagrande method
- 1289.3.1.2 Method 3.1.2: Soil classification tests—Determination of the liquid limit of a soil—One point Casagrande method (subsidiary method)
- 1289.3.2.1 Method 3.2.1: Soil classification tests—Determination of the plastic limit of a soil—Standard method
- 1289.3.4.1 Method 3.4.1: Soil classification tests—Determination of the linear shrinkage of a soil—Standard method
- 1289.3.5.1 Method 3.5.1: Soil classification tests—Determination of the soil particle density of a soil—Standard method
- 1289.3.5.2 Method 3.5.2: Soil classification tests—Determination of the soil particle density of combined soil fractions—Vacuum pycnometer method
- 1289.3.6.1 Method 3.6.1: Soil classification tests—Determination of the particle size distribution of a soil—Standard method of analysis by sieving
- 1289.3.6.3 Method 3.6.3: Soil classification tests—Determination of the particle size distribution of a soil—Standard method of fine analysis using a hydrometer
- 1289.3.9 Method 3.9: Soil classification tests—Determination of the cone liquid limit of soil
- 1289.4.1.1 Method 4.1.1: Soil chemical tests—Determination of the organic matter content of a soil—Normal method
- 1289.4.2.1 Method 4.2.1: Soil chemical tests—Determination of the sulfate content of a natural soil and the sulfate content of the groundwater—Normal method
- 1289.4.3.1 Method 4.3.1: Soil chemical tests—Determination of the pH value of a soil—Electrometric method
- 1289.5.1.1 Method 5.1.1: Soil compaction and density tests—Determination of the dry density/moisture content relation of a soil using standard compactive effort
- 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 compactive effort
- 1289.6.1.1 Method 6.1.1: Soil strength and consolidation tests—Determination of the California bearing ratio of a soil—Standard laboratory method for a remoulded specimen
- 1289.6.7.1 Method 6.7.1: Soil strength and consolidation tests—Determination of permeability of a soil—Constant head method for a remoulded specimen
- 1289.6.7.2 Method 6.7.2: Soil strength and consolidation tests—Determination of permeability of a soil—Falling head method for a remoulded specimen
- 1289.6.7.3 Method 6.7.3: Soil strength and consolidation tests—Determination of permeability of a soil—Constant head method using a flexible wall permeameter
- 1289.6.8.1 Method 6.8.1: Soil strength and consolidation tests—Determination of the resilient modulus and permanent deformation of granular and unbound pavement materials

3 DEFINITIONS

For the purpose of this Standard, the definitions in AS 1289.0 apply.

4 APPARATUS

The following apparatus is required for the preparation of disturbed soil samples for testing:

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- (a) Balances with sufficient capacity and limit of performance to weigh sub-samples of up to 150 kg.
NOTE: Division of sub-samples for weighing purposes is acceptable.
- (b) Mortar and a rubber pestle (a rubber hardness of approximately Shore 87) or a mechanical device suitable for breaking up soil aggregates without reducing the size of the individual particles.
- (c) AS 1152 sieves 19 mm, 6.7 mm, 2.36 mm and 425 μm .
- (d) 10 mm screen.
NOTE: A commercial nominal 10 mm woven wire screen is acceptable.
- (e) Sample divider of the multiple-slot type (riffle box) as detailed in AS 1141.2 or rotary cone splitter (optional).
- (f) Thermostatically controlled drying oven capable of maintaining a temperature of 45°C to 50°C (optional).
- (g) Drying trays of suitable dimensions.

5 SAMPLE PREPARATION PROCEDURE

5.1 Preliminary preparation of soil

Reduce the size of soil clods as received by chopping, grating or crumbling until aggregations of soil pass a 10 mm screen, taking care not to crush individual particles. Recombine all particles retained on the 10 mm screen with the soil fraction and mix thoroughly.

NOTE: If the material is too wet to permit preliminary preparation, it should be air-dried or placed in an oven operating at a temperature not exceeding 50°C, until it is just dry enough to permit crumbling of the soil aggregation to enable sieving through the 10 mm screen.

5.2 Sample for determination of moisture content

If the moisture content of the natural soil as received is required, obtain, by splitting, a representative sub-sample of the following minimum quantity:

- (a) For fine-grained soil 30 g.
- (b) For medium-grained soil 300 g.
- (c) For coarse-grained soil 3 kg.

Then, determine the moisture content as described in AS 1289.2.1.1, AS 1289.2.1.2, AS 1289.2.1.4, AS 1289.2.1.5 or AS 1289.2.1.6, whichever is appropriate.

5.3 Sample for determination of liquid limit, cone liquid limit, plastic limit and linear shrinkage

5.3.1 General

Thoroughly mix the sample prepared in accordance with Clause 5.1.

Subdivide the sample by splitting, to obtain a representative sub-sample of sufficient size to provide the following amounts passing the 425 μm sieve:

- (a) Liquid limit of the soil by either of AS 1289.3.1.1 or AS 1289.3.9 and plastic limit by AS 1289.3.2.1 at least 300 g.
- (b) Liquid limit of the soil by either of AS 1289.3.1.2 and plastic limit by AS 1289.3.2.1 at least 100 g.
- (c) Linear shrinkage of the soil by AS 1289.3.4.1 at least 300 g.