

Australian Standard®

AS 1289.1.3.1:2015

Methods of testing soils for engineering purposes

Method 1.3.1: Sampling and preparation of soils—Undisturbed samples—Standard method

1 SCOPE

This Standard outlines considerations and specifies procedures for taking undisturbed samples of soils for routine investigation purposes, and specifies a procedure for packing and forwarding the samples for examination and testing.

Undisturbed samples taken in accordance with this Standard are generally suitable for strength, consolidation, reactivity and total suction tests. Classification, chemical, density and strength tests on remoulded specimens are normally performed on disturbed samples, sampled in accordance with AS 1289.1.2.1.

Sampling of specimens for California Bearing Ratio tests on undisturbed samples is covered in AS 1289.6.1.2.

The selection of the type of sampling device to be used, the technique to be applied and the location of sampling sites is not covered by this Standard. Random selection of sampling sites, when required, is covered by AS 1289.1.4.1 or AS 1289.1.4.2.

NOTE: The sampling technique may be chosen according to the conditions, for there is no universal sampler suitable for all conditions. The three main factors to be considered are sampler type, sampler size and operating technique.

A range of samplers is necessary to cope with varying soil types. Generally the type of sampler will be chosen according to soil conditions, but the purpose for which the sample is to be used will also influence the choice.

The choice of sampler size is generally a compromise between quality and cost. Larger sizes are preferred in that the disturbance is proportionately less and also the sample is likely to be more representative, particularly in structured soils. However, costs increase with size, particularly with rotary methods of drilling. It is preferable to standardize on one size sampler so that where more than one sampler type is necessary in an investigation, the test results can be more directly related.

The technique used for any particular sampler may need to be varied according to the soil conditions, and also to the purpose for which the samples are required.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- 1289 Methods of testing soils for engineering purposes
- 1289.0 Part 0: Definitions and general requirements
- 1289.1.2.1 Method 1.2.1: Sampling and preparation of soils—Disturbed samples—Standard method
- 1289.1.4.1 Method 1.4.1: Sampling and preparation of soils—Selection of sampling or test sites—Random number method
- 1289.1.4.2 Method 1.4.2: Sampling and preparation of soils—Selection of sampling or test sites—Stratified random number method
- 1289.6.1.2 Method 6.1.2: Soil strength and consolidation tests—Determination of the California Bearing Ratio—Standard laboratory method for an undisturbed specimen
- 1289.6.3.1 Method 6.3.1: Soil strength and consolidation tests—Determination of the penetration resistance of a soil—Standard penetration test (SPT)

3 APPARATUS

3.1 Sampling apparatus

3.1.1 General

The sampling apparatus to be used will depend upon the soil being sampled and the amount of disturbance permitted in the soil. This method does not define the criteria for the selection of sampler types.

All samplers shall have space into which excess material can pass if the sampler is overdriven or if there is some undetected loose material present.

For routine testing of undistributed soils, the following nominal sample tube sizes are preferred:

- (a) 75 mm diameter.
- (b) 63 mm diameter.
- (c) 50 mm diameter.
- (d) 38 mm diameter.

3.1.2 General definitions

The proportions of a sampler may be specified by its area ratio, inside clearance, outside clearance (see Figure 1) and internal length.

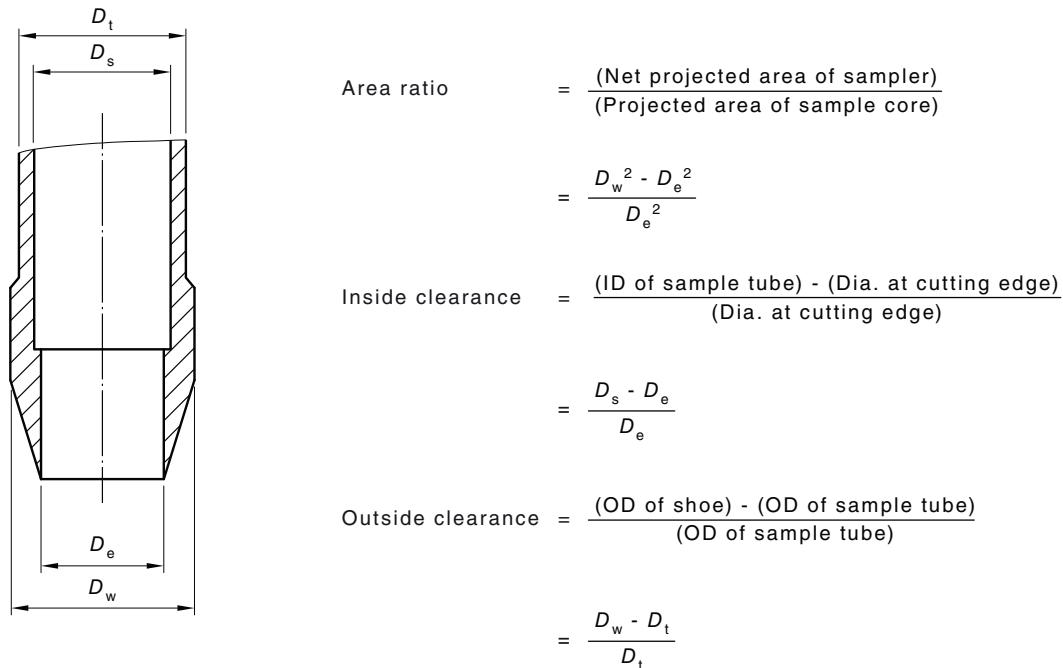


FIGURE 1 SAMPLER PROPORTIONS

3.1.3 Open-drive samplers

3.1.3.1 General

An open-drive sampler shall consist of an open-ended tube of sufficient rigidity to enable the tube to be pushed into the soil being sampled. Escape ports to permit escape of water or air shall be fitted to the top of the tube and shall have an area of not less than 25% of the cross-sectional area of the sample. A non-return valve shall be fitted to the escape ports to remove the water load from the top of the sample.

The sampling tube shall be capable of being fitted with a sampler head which will permit the penetration of the sampling tube. The attachment of the sampler head shall be concentric and coaxial to the tube to assure uniform application of the force to the tube by the insertion equipment. The attachment of the sampler head to the sample tube shall also permit the rotation and extraction of the sample tube.

3.1.3.2 Thin-walled sampler

A thin-walled sampler consists of a tube with a bevelled cutting edge machined directly on to the tube. The sampler shall meet the following requirements:

- The area ratio shall not exceed 10%.
- The cutting edge shall be machined with the bevel on the outer edge of the tube making an angle not exceeding 15° to the axis of the tube with a land not wider than 0.5 mm at the cutting edge.
- The inside clearance shall not exceed 1% of the diameter at the cutting edge.
- The internal length of the sample tube shall not exceed 10 sample diameters.
- The inside of the tube shall be smooth and free from pitting.

3.1.3.3 Composite samplers

A composite sampler shall consist of a hardened cutting shoe screwed on to the lower end of the sampling tube. The area ratio shall not exceed 25% and the inside clearance shall be not greater than 2% of the diameter at the cutting edge.