



HB 160—2006 Soils testing



handbook
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Handbook

Soils testing

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PREFACE

GENERAL

Since the early 20th century, the testing of soils for engineering purposes has played a very important role in the construction of the infrastructure of Australia.

Standards Australia issued the first *Methods of testing soils for engineering purposes* in 1966 as the AS A89 series. These methods were revised in 1977 to take into account metrication and presented as the AS 1289 A-F series. In the 1990s, the methods were revised to take into account major changes in the soils testing industry and the series was reissued as the AS 1289 series. Since that time, continual revision of the test methods has taken place as technology and the construction industries have changed.

The Standards Australia committee responsible for the Methods of Testing Soils for Engineering Purposes (CE-009) decided in 1999 that a handbook was required to—

- assist in the education of undergraduate engineers in the use and application of the tests;
- assist geotechnicians seeking qualifications as soil testers; and
- provide background material and useful tips to practicing geotechnicians in over 400 Australian laboratories that perform the test.

Subsequently, Standards Australia appointed a subcommittee of soils practitioners involved in both geotechnical engineering design, contract management, engineering education and soils testing to compile the information presented in this Handbook. It is not comprehensive in that all methods are not fully covered due to limited time and resources; however, the subcommittee recommended that it be published in its present form to achieve the initial objectives. It was also considered that, since a limited number of practitioners and experts had been involved in its preparation, there would be a need for the document to be discussed, debated and revised in a few years.

This Handbook is intended to be of assistance to users of the 1289 series of tests, *Methods of testing soils for engineering purposes*. Users are encouraged to participate in any future revisions by offering constructive suggestions and criticism.

The terms used in this document are defined in AS 1289.0, *Methods of testing soils for engineering purposes, Part 0: General requirements and list of methods*.

THE NEED FOR TESTING

Soils testing is called for in the following documents:

- AS ISO/IEC 17025—*General requirements for the competence of testing and calibration laboratories*
 - AS 1726—*Geotechnical investigations*
- AS 1726 provides a guide to the samples and tests that are required for a geotechnical engineer to be able to provide adequate information about the soils at a proposed construction site. The nature and location of the sampling will depend on what engineering information is required.
- AS 2159—*Piling—Design and installation*
 - AS 2870—*Residential slabs and footings—Construction*
 - AS 2870 Supplement 1—*Residential slabs and footings—Construction—Commentary*
 - HB 28—*The design of residential slabs and footings—(Standards Australia)*
 - AS 3798—*Guidelines on earthworks for commercial and residential developments*

AS 3798 provides a guide to engineers as to what investigations are to be carried out (Chapter 2) and the type of materials that are required (Chapter 4).

- AS 5100—*Bridge design (all parts)*
- Austroads (2004)—*Pavement rehabilitation—A Guide to the design of rehabilitation treatments for road pavements* AP-G78/04
- Austroads (1998(a))—*Guide to stabilisation in roadworks*, Austroads, Sydney, 1998
- Austroads (2004)—*Pavement design—A Guide to the structural design of road pavements*, AP-G17/04
- Austroads (2004)—*Austroads pavement rehabilitation—A Guide to the design of rehabilitation treatments for road pavements*, AP-G78/04
- Austroads (2002)—*Mix design for pavement materials stabilised in situ (flow charts)* AP-T16/02
- ISO 17011 (2004)—*Conformity assessment—General requirements for accreditation bodies accrediting conformity assessment bodies*

The following situations should also be noted:

Local water and sewage authorities' specifications will call for certain properties of soils that will require testing to AS 1289.

Specifications for civil engineering works will typically contain requirements that certain tests be performed to provide a measure of assurance that the construction materials and processes meet the design requirements. The geotechnician will need to ascertain what tests are to be performed, other specification requirements and the frequency of sampling and testing prior to commencement of sampling.

Specifiers, designers, specification writers and geotechnicians will also need to be aware of a number of tests that are covered in AS 1141, *Methods for sampling and testing of aggregates* as this Standard may be called up in certain job specifications (see AS 1141.0, *List of methods*).

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