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Role of Australian Standards in Geomechanics

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Summary Standards Australia form an integral part of the Geomechanics area with the development of Australian Standards through the transparency/consensus process. Each of the Standards has a history of development commencing from a demand for the Standard by industry. There is also international work in the area of geotextiles and a European Code on design rules for geotechnical design.

1. INTRODUCTION

Geomechanics is an important branch of engineering which is continuing its development. Standards Australia is part of this development by responding to industry demands to prepare standards on test methods, geotextiles, site investigation, piling, residential slabs and footings and guidelines on earthworks. These Standards have been prepared by the transparency/consensus process.

In preparing the Standards, the committees seek to base them on international and other national Standards. The work of the International Organisation for Standardisation is important in this regard.

2. STANDARDS AUSTRALIA

Standards Australia, is an independent not-for-profit organisation founded in 1922, whose primary role is to prepare standards through an open process of consultation and consensus in which all interested parties are invited to participate. Standards Australia is recognised by the Australian Government as the peak standards writing body in Australia through a memorandum of understanding signed in 1988. Standards Australia currently has some 6000 Australian Standards of which 2600 are referenced in Australian regulations. About 25% of these are in the building and construction area, i.e. of the 600 new and revised Standards prepared each year about 150 are in the building and construction area.

Standards Australia is also the Australian representative in ISO (the International Organisation for Standardisation) and the IEC (International Electrotechnical Commission).

3. HOW STANDARDS ARE PREPARED

Australian Standards are prepared and maintained through an open consensus process which ensures their integrity and their technical quality. At the

heart of this process are the technical committees. There are 1700 technical committees, each responsible for one or more of the 6000 Australian Standards currently published. The committees comprise a balanced representation of technical experts from government, industry, user associations, academe, and any other organisation with a direct interest in the Standards. Over 9000 such experts participate voluntarily in these committees, providing Australian Standards with their authority and acceptance in the community.

Committee participation is sought through nominating organisations representing various fields of interest.

It is the duty of the nominees of organisations as appointed committee members to ensure that their nominating organisations are kept informed of committee activities. They are required to represent the views of their nominating organisations at the technical committee meetings, not personal or company views.

4. INTERNATIONAL WORK

Standards Australia has a policy of adopting, where possible, international Standards. When considering a new project, committees will be provided with international Standards in the field and requested to review these and provide comments on why they are not suitable for use in Australia. This policy has been implemented to assist trade in goods and services and to ensure compliance with the World Trade Organisation agreement on Technical Barriers to Trade.

A technical committee is required to monitor international work in their field. Also, since Australia is increasingly participating in the development of international Standards, the technical committee will be responsible for developing the Australian position and briefing delegates to international meetings.

5. STANDARDS

The current published Standards for use in the Geomechanics area are as follows:

- AS 1289 Methods of testing soil for engineering purposes (55 test methods)
- AS 1726–1993 Geotechnical site investigations
- AS 2159–1995 Piling–Design and installation
- AS 2159 Suppl–1996 Piling–Design and Installation–Guidelines
- AS 2870 Residential slabs and footings
- AS 2870.1–1988 Construction
- AS 2870.1 Suppl–1989 Construction–Commentary
- AS 2870.2–1990 Guide to design by engineering principles
- AS 3704–1990 Geotextiles–Glossary of terms
- AS 3705–1990 Identification, marking and general data
- AS 3706–1990 Geotextiles–Methods of test (14 test methods)
- AS 3798–1990 Guidelines on earthworks for commercial and residential development

A Standard is presently being prepared on *Earth Retaining Structures (including reinforced soils)*.

With regard to the above published Standards, it is interesting to review their history.

AS 1289 was originally published as A89–1966 at the request of the National Association of Australian State Road Authorities. In the course of the preparation of A89, close account was taken of test methods published by American organisations and also the tests published by British Standards. The second edition was redesignated AS 1289–1977 and was a metric conversion. Since 1977 the revision of the Standard has been in the form of separate test methods.

AS 2159 was first published in 1978, and written in a form to be suitable for referencing in building regulations. The Building Code of Australia referenced the 1978 edition and references the 1995 edition. There is a Supplement to the 1995 edition which contains guidelines which the Committee considered helpful to designers and contractors.

The first edition of AS 1726, published in 1975 was prepared at the instigation of the National Committee of the Australian Geomechanics Society. The second edition included updated references and appendices. No technical changes were included. The 1993 edition was prepared in a form that will allow it to be called up in legislation.

AS 2870 was first published in 1986 in response to an Australia wide need for guidance on the design of slabs and footings for conditions commonly found in Australia. The Standard was revised in 1988 and separated into two parts.

AS 3704 to 3706 were published in 1990 following requests from users and manufacturers. At their time of publication they led the international scene in the development of geotextile test methods.

AS 3798 was first published in 1990 following identification of the need for guidance in the interpretation and application of AS 1289 to routine control testing and other relevant matters related to earthworks within commercial and residential development. The Standard was revised in 1996, to incorporate changes necessary from the publication of the AS 1289.5 series of test methods.

6. COMMITTEES

There are seven Standards Australia committees responsible for the Standards in Section 5. There are forty eight nominating organisations represented on the committees.

7. INTERNATIONAL

The International Organisation for Standardisation (ISO) Technical Committee 38, Subcommittee 21 titled *Geotextiles* has published the following International Standards:

- ISO 9862:1990 Geotextiles–Sampling and preparation of test specimens
- ISO 9863:1990 Geotextiles–Determination of thickness at specified pressures
- ISO 9864:1990 Geotextiles–Determination of mass per unit area
- ISO 10318:1990 Geotextiles–Vocabulary Bilingual edition
- ISO 10319:1993 Geotextiles–Wide-width tensile test
- ISO 10320:1991 Geotextiles -Identification on site
- ISO 10321:1992 Geotextiles–Tensile tests for joints/seams by wide-width.

The British Standards Institute holds the secretariat of this subcommittee. The subcommittee has 22 work items for the preparation of geotextile test methods. These work items are European Committee for Standardisation (CEN) draft that will be balloted in ISO under the Vienna Agreement.

8. EUROPEAN

The European Committee for Standardisation Technical Committee 250 and its nine subcommittees are responsible for the preparation of the Eurocodes, a set of 9 common unified design roles for building and civil engineering works.

The Eurocodes parts are in the first instance published as European prestandards (ENVs). After the ENV stage of 3 years, the ENVs are transformed into European Standards (EN).

Eurocode 7: *Geotechnical design* will have the following parts:

ENV 1997-1:1994	Part 1: General rules
ENV 1997-2	Part 2: Geotechnical design assisted by laboratory testing
ENV 1997-3	Part 3: Geotechnical design assisted by field testing

Eurocode 7 Part 1: *Design rules* was approved on 25 May 1993 as a prestandard. The following subjects are dealt with in the prestandard.

Section 1	General
Section 2	Basis of Geotechnical Design
Section 3	Geotechnical Data
Section 4	Supervision of Construction Monitoring and Maintenance
Section 5	Fill, Dewatering, Ground Improvement and Reinforcement.

Section 6	Spread Foundations
Section 7	Pile Foundations
Section 8	Retaining Structures
Section 9	Embankment and Slopes

9. CONCLUSIONS

Standards Australia has an important role to play in the Geomechanics area. As a standards writing body its role is to respond to industry demand for the preparation of Australian Standards. The transparency/consensus process is fundamental to users of Standards as they have confidence that the published Standard represents a balance of views by the experts in the field. The thrust of Australian Standards is more internationally based, however in the building and construction industry there is a distinct lack of international standards at present. However this is changing and Australia has the opportunity to take a lead in international development of Standards in the geomechanics area. We have technically sound Standards to use as a base, however there is considerable commitment involved in terms of resources. The industry needs to consider whether it wants to take up the challenge.

Some people in the geomechanics area are of the view that Standards, cannot address the particular nature of this area, and also stifle innovation and professional judgement. Standards should rather be seen as tools for all sections of the geomechanics area, that add to better decision making by the professionals involved.