Administrative Report for TC-29, Laboratory stress-strain and strength testing of Geomaterials

Compte rendu sur la CT -29

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ABSTRACT
TC-29 has been active since the Osaka Conference. This report describes its Terms of Reference, work and achievements

RÉSUMÉ
Le commité CT-29 a été très productif depuis 2005. Le présent rapport expose ses protocoles, travaux et les résultats obtenus

1 INTRODUCTION

Technical Committee TC-29 of the ISSMGE was founded in 1994 by Professor M Jamiolkowski, after the successful 1st International Symposium on the Pre-failure Deformation Characteristics of Geomaterials held at Sapporo, Hokkaido, Japan. It has now completed four terms; two with Professor F. Tatsuoka as Chairman, and two with Professor R Jardine. Propfessor S Shibuya has been Secretary continuously since 1994. TC-29 after been very active over the last four years and it is proposed that its work should continue for a 5th term, carrying forward under a new leadership to organize the 5th International Symposium on the Deformation Properties of Geomaterials as part of its spread of new activities.

The following paragraphs re-summarize the Committee's Terms of Reference, list its Membership and its report its Activities. Reference is also made to important on-going activities and to possible future directions.

2 TERMS OF REFERENCE

The Terms of Reference agreed for TC-29 are as follows:

- To promote co-operation and exchange of information concerning research and developments in advanced laboratory geotechnical testing, including apparatus, techniques, data acquisition and interpretation.
- To encourage the application of advanced laboratory testing in research; in integrated site characterisation studies; and in ground modelling.
- To explore how advanced testing can be used most constructively in practical geotechnical engineering.
- To advance the above aims through collaboration with specialists working in laboratory and field testing, sampling, theoretical and numerical analysis, and in project engineering and full scale observation. This will involve close liaison with other ISSMGE Technical Committees.

3 MEMBERSHIP

The membership of TC-29 is as listed below:

Chairman:		
Prof.	Richard J. Jardine	UK
Secretary:		
Prof.	Satoru Shibuya	Japan
Core members:		
Dr.	David Airey	Australia
Dr.	Matthew Coop	UK
Prof.	Herve Di Benedetto	France
Prof.	Diego C.F. Lo Presti	Italy
Prof.	Junichi Koseki	Japan
Prof.	Glen Rix	USA
Prof.	Dias Rodriguez	Mexico
Prof.	Albert Sayão	Brazil
Members:		
Dr.	Laureta Sharra	Albania
Prof.	Fernand Marinho	Brazil
Dr.	Ron C.-K. Wong	Canada
Dr.	Dharma Wijewickreme	Canada
Prof.	Yangping Lao	China
Prof.	Sonija Zlatovic	Croatia
Prof.	Ivan Vrkljan	Croatia
Dr.	Jan Bohac	Czech Republic
Dr.	Tim Länsivaara	Finland
Dr.	Minna Karstunen	Finland
Dr.	J. Canou	France
Dr.	Ph. Reiffsteck	France
Dr.	Ir Philip Chung	Hong Kong
Dr.	J.H. Yin	Hong Kong
Dr.	B Moczar	Hungary
Dr.	Sitharam	India
Dr.	Fardin Jafarzadeh	Iran
Dr.	V Homjkov	Kazakhstan

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Dr.	D. Bukenbeava	Kazakhstan
Prof.	Choong Ki Chung	Korea
Prof.	You Seong Kim	Korea
Dr.	Dong Soo Kim	Korea
Dr.	Tara Nidhi Lohani	Nepal
Dr.	E.J. Den Haan	Netherlands
Prof.	A. Szymanski	Poland
Prof.	Antonio Gomes Correia	Portugal
Prof.	Antonio Viana da Fonseca	Portugal
Prof.	Anton Chirica	Romania
Prof.	Gerhard Heyman	South Africa
Prof.	Antonio Lloret	Spain
Dr.	D. Jesús Manzanas	Spain
Dr.	Ozer Cinicioglu	Turkey

4 ACTIVITIES

The final actions taken by TC-29 members at the Osaka ICSMGE involved the Chairman and Secretary preparing and delivering a General Report for Session 1.1 (Jardine 2006). The Committee also organized a well attended workshop where a 79 page report on its International Round-Robin Bender Element testing programme was presented and published by the members of the Japanese domestic TC-29 committee (Yamashita et al 2005). The full-paper version with more comprehensive interpretation of the test results will soon be published in Soils and Foundations, the Journal of the JGS (Yamashita et al, 2009). The Committee was reconvened with the same Chairman and Secretary after Osaka, with announcements and reports being made available on the dedicated website http://www.jiban.or.jp/e/tc29. Members were kept updated by numerous e-mails, and it is unfortunate that some, including some Core members, were unable to attend any meetings or correspond by other means. The Committee's work was advanced by a subset of active members.

Four one-to-two day International events and one major Conference (IS-Atlanta 2008) have been held. A workshop is also being organized as part of the Alexandria ICSMGE in October 2009. These activities, which were organized in 4 continents and 5 countries, were announced on our website and advertised through the appropriate national and international channels. Brief summaries of each event, and the two full Committee meetings held over this interval, are given below.

London Symposium March 2006
The first TC- 29 event after Osaka Conference was held at Imperial College London on 20th March 2006, covering the advanced laboratory testing of stiff clays. This involved seven presentations covering aspects from micro-fossils, to establishing anisotropy through advanced HCA and stress path triaxial techniques, and field studies including the prediction of failure times in slopes made from the same materials. An international audience of around 100 academics and geotechnical engineers attended and the session preceded the Rankine Lecture given by Professor Robert Mair. Much of the material presented was published formally in the February 2007 Geotechnique volume, which formed a substantial part of the May 2007 Geotechnique Symposium in Print.

Hong-Kong Symposium June 2006
A second one-day International Symposium covering Advances in Laboratory Testing of Geomaterials was held on 3 June 2006 at the Hong Kong Polytechnic University. This event was jointly organized by Hong Kong Geotechnical Society and the Hong Kong Polytechnic University, under the auspices of TC-29 with the proceedings being edited by Yin (2006). The symposium provided a forum for researchers and practicing engineers to meet together and share ideas, achievements and experience, with the accent on New Developments and Applications. The TC-29 Chairman gave the first of the invited talks, followed by 11 further specialists drawn from the world and the local geotechnical community. There were approximately 200 attendees, mostly local geotechnical specialists.

London March 2007
Our third TC-29 symposium was held at Imperial College on 21st March 2007. The theme was New Perspectives on the Element Testing of Particulate and Discontinuous Geomaterials. Six presentations were offered by speakers from the UK, Italy and the USA, with an audience of over 100 academics and engineers who proceeded afterwards to the Rankine Lecture delivered by Professor Antonio Gens.

Kobe July 2008
A two day special event was held at the Kobe University Faculty of Engineering on 28th and 29th July. A full meeting of TC-29 was held first, with 12 members drawn from 10 member societies taking part. The meeting set out the plans for the year ahead and a proposed new TC-29 term to follow the 2009 Alexandria ICSMGE. Proposals for a new Secretary and Chairman were agreed unanimously, along with a location for a 5th International Symposium on the Deformation Properties of Geomaterials (IS Seoul 2011) and proposals for the founding of a named lecture to be incorporated into all future principal TC-29 IS events. The technical sessions that followed were open to local geotechnical specialists, around 25 of whom attended the two days of presentations, with 11 main talks being delivered. A site visit was organised to the impresisve site of the offshore Kansai Airport extension works. The social programme included a harbour cruise.

IS Atlanta - 2008
The most significant TC-29 activity over the past five years has been IS-Atlanta, the 4th International Symposium on the Deformation Properties of Geomaterials, which was held from 22nd to 24th September at the Georgia Institute of Technology. Over 200 participants were attracted to this premier event, coming from many countries. The broad themes focused on advances on field and laboratory characterization. A successful specialist one day event (Conference on the Behaviour of Interfaces) was organized by Professor D Frost in parallel with IS-Atlanta. The proceedings of both events are published by Millpress.

The IS-Atlanta papers fill two hard-bound volumes, with a CD version, that were edited by Professors Burns, Mayne and Santamarina of the Georgia Institute of Technology (Burns et al 2008). The volumes contain seven main Keynote Lectures, followed by the papers organized into specialist sessions on Natural Geomaterials and Reconstituted Soils; Cemented and Stabilized Soils; Instability and Localization; Rheology, Strain Rate and Ageing; Unsaturated and Frozen Geomaterials; Anisotropy; Scale and Spatial Variability; Laboratory Methods at Small Strain; Laboratory Methods for Large Strains; Field Methods; Analytical and Numerical Methods.

A full TC-29 Committee meeting was held at the end of IS Atlanta, with 7 members drawn from 6 member societies and additional invited local observers. The members present endorsed the plans set out at Kobe for a fifth TC-29 term to follow the 2009 Alexandria ICSMGE. Proposals made by the Chair for a new Secretary and Chairman were agreed unanimously, along with a location for a 5th International Symposium on the Deformation Properties of Geomaterials (IS Seoul 2011)

The 5th International Symposium on the Deformation Properties of Geomaterials is to be held in Seoul between 31st August and 3rd September 2011. The Conference Chairman is Hong-Taek Kim (President of Korean Geotechnical Society) and the General Secretary is Dong-Soo Kim (Professor, KAIST). IS-Seoul is being co-ordinated with a Special edition of the Japanese Geotechnical Society's Journal Soils and Foundations and abstracts are being called for both 'Journal' and 'Conference' style papers with an abstract submission date in February 2010. Further details are given on the Website:

http://www.isseoul2011.org.

The overarching areas of interest at IS Seoul have now been set by the local organisers and their scientific committee as:

- Research and developments in advanced laboratory geotechnical testing, including apparatus, techniques, data acquisition and interpretation.
- Applications of advanced laboratory and field testing to integrated site characterization and ground modelling.
- Practical engineering applications through collaborations with specialists working in laboratory and field testing, sampling, theoretical and numerical analysis, and in project engineering and full scale observation.

With the following specific themes:

Experimental Investigations from very small strains to beyond failure

- Laboratory and Field Methods Data Interpretation and Geotechnical Imaging
- Multi scale problems in geomechanics (micro-to-macro strain)
- Advanced sampling

Interpretation of ground deformation based on field observation and case history

- Integrated site characterization for ground deformation
- Performance evaluation of geotechnical structure
- New field methods for measurements of ground deformation

Behaviour, characterisation and modelling

- Physical and Numerical Modeling
- Anisotropy and Localization
- Time Effect (Ageing and Viscous Effects), Cycling
- Various Geomaterials including:
  - Unsaturated Soils,
  - Cemented and Stabilized Soils,
  - Frozen Soils including Hydrate,
  - Mixtures (Soils with Inclusions)

5 BISHOP LECTURE

A notable feature of IS Seoul will be the first Bishop Lecture. The lecture, which is dedicated to celebrating the contribution Professor A. W. Bishop to advanced geotechnical laboratory testing, was proposed by the TC-29 Secretary, Professor Shibuya. Further details of Bishop's work and contributions are given on the Imperial College archive website:

http://www.cv.ic.ac.uk/SkemArchive/index.htm

Professor Shibuya's proposal was endorsed unanimously by both a vote of members present and by an e-mail ballot. The proposed protocols and guidelines for the future lecture were agreed as follows:

- Distinguished geotechnical engineers will be invited by TC-29 to deliver the lecture.
- Invitations will ne made on the basis of the lecturers' contribution to advanced laboratory testing that advances geotechnical practice.
- The lectures are to be given at future TC-29 principal events on a four year cycle. The first talk is to be given at IS-Seoul in 2011.

6 FUTURE ACTIVITIES

The most important future activity that involves TC-29 members is the IS-Seoul Conference and launching of the Bishop Lecture. These activities will follow on from IS-Atlanta (2008), Lyon (2003), Torino (1999), Hokkaido (2004) as well as the 1997 London Geotechnique Symposium-in-Print. Other activities and possible revision to the Committee's Terms of Reference may be decided by the incoming Committee and its Chairman. Current proposals include a suggestion from Professor Lo-Presti for a post-Alexandria specialist workshop in Pisa on Bender Element Test Interpretation.

7 SUMMARY

TC-29 has been highly active and productive over the last four years, striving to meet the aims set out in its Terms of Reference. The conferences and workshops organized by TC-29 have promoted co-operation and exchange of information on advanced laboratory geotechnical testing, including apparatus, techniques, data acquisition and interpretation.

TC-29 has also sought, through participation in conferences and meetings held by other groups (and through our practice) to encourage the application of advanced laboratory testing in research, integrated site characterisation studies and ground modelling. Great emphasis has been placed in our work on the constructive use of advanced testing in practical geotechnical engineering. Our work has involved collaborating with other specialists working in field testing, sampling, theoretical and numerical analysis, project engineering and full scale observation.

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