

## TC Activity

### TC 28: Underground Construction in Soft Ground

In recent decades there has been a massive development of large cities throughout the world. Due to the lack of surface space and the need for extensive transport infrastructure systems, there is an increasing rapid growth in underground construction in these urban environments with significant tunnelling and excavation works.

Technical Committee TC 28 has a major commitment towards consolidating and sharing technical knowledge and experience in the investigation, design, analysis and construction of underground works in the urban environment, including tunnels, caverns and deep excavations. The main topics addressed by the committee are:

- Tunnelling in soft ground;
- Deep excavations;
- Monitoring the effects of underground works;
- Numerical analysis of tunnels and deep excavations, assessing both stability and induced movements and deformations;
- Protective measures, ground treatment, control of groundwater inflow and deformations (e.g. by compensation grouting);
- Safety, risk and hazard management.

The primary activity of TC28 is the organising of an international conference every three years. After the first symposium at New Delhi in 1994, symposia have subsequently been regularly organised: London (1996), Tokyo (1999), Toulouse (2002), Amsterdam (2005). These symposia, for all of which comprehensive proceedings have been produced containing the written papers, selected and reviewed by members of TC28, along with general reports and special lectures, thus provide a regular means of presenting information about the latest construction projects and research linked to the theme of Underground Construction in Soft Ground.

The next TC28 symposium is to take place in Shanghai in April 2008 and will be organised by the University of Tongji in Shanghai (HW Huang, & GB Liu) with the support of Hong Kong University of Science and Technology (CWW Ng). To date the organising committee has received more than 260 abstracts. Further information can be obtained on the conference website: <http://www.tc28-shanghai.org>.



Site visits during the TC28 International Symposium in Toulouse (2002)

TC28 is supporting a regional one-day workshop on 12th September 2007 to be held in Perth, Western Australia. This is being organised by Eric Hudson-Smith (TC28 core member representing Australia) with the support of the Australian Tunnelling Society (ATS). Further details can be found on the website: <http://www.ats.org.au/whatson.php>. TC28 also plans to hold a workshop in Budapest in 2008, to be organised by József Mecsí (core member representing Hungary). Two new activities have recently been launched by TC28 following the committee meeting held during the Amsterdam conference in 2005. The first concerns the creation of a database relating to tunnelling and deep excavation works and the second the preparation of guidelines for comparing field or physical model observations with numerical simulations.

#### Database for tunnelling and deep excavations

Databases relating to tunnelling and deep excavation works potentially have great benefit from modelling, validation and case study viewpoints. Experience in this field has shown that there are often many difficulties with such databases when they are created within the framework of committees or associations. A typical example is that the pre-established form to be completed by those compiling the database, is rarely compatible

with the information available from the actual working cases. There are also frequently issues relating to the maintenance of the database after its creation. It was decided at the meeting that a well-organised database could provide significant benefit to the committee, providing information from international sources. Therefore work has been initiated to set up a new database, taking into account recent developments that allow a more flexible organisation and identify key input information required. A group from INSA at Lyon (R. Kastner and F. Emeriault looking after the geotechnical aspects and R. Louis-Sydney the information technology aspects) have started creating this database. A working meeting concerning its organisation was held in Lyon in December 2006 with J. Standing, and an initial version is now available. This version will be provided to interested members of TC28 and presented and discussed at a meeting to be held at the forthcoming ECSMGE in Madrid for critical review and final implementation.

#### Guidelines for comparing field or physical model observations with numerical simulations

Currently many papers are published comparing numerical or theoretical simulations and predictions with data from field or physical model observations. These are often too basic. The intention with this second proposed theme is to write simple guidelines on this subject, e.g. taking into account basic scientific rules and making sure that sufficient information is provided so that the paper can be considered useful. A sub-committee is soon to be set up to take charge of the organisation of this activity and to progress this activity.

The next meeting of members of TC28 will take place on 27 September 2007 at the next 14th European Conference on Soil Mechanics and Geotechnical Engineering being held in Madrid.

*Reported by Richard Kastner, chairman of TC28 and Jamie Standing, secretary of TC28*

## TC Activity

### TC 35: Geo-Mechanics from Micro to Macro

The activity of TC35 in 2006 was concentrated on organizing the International Symposium on Geomechanics and Geotechnics of Particulate Media (IS-Yamaguchi 06) in Yamaguchi Japan.



Group photo of the symposium attendees

The International Symposium on Geomechanics and Geotechnics of Particulate Media (IS-Yamaguchi 06) was held on September 12-14, 2006, with the Faculty of Engineering, Yamaguchi University in Ube City, Japan serving as the main venue of the event. This symposium was sponsored by the Japanese Geotechnical Society (JGS) and the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), with the collaboration of ISSMGE Technical Committee on Geotechnics from Micro to Macro (TC-35), Japanese domestic TC35 and Yamaguchi University. The symposium was attended by 162 engineers, researchers and educators, including 38 overseas participants from 12 countries. The symposium, which focused on the particulate nature of soil from microscopic point of view to the macro-level, consisted of paper presentations and active discussions. For three days, the technical as well as special exchange programs proceeded very smoothly.

In the technical program, there were six technical sessions, three poster sessions, and three keynote addresses. Each technical session focused on a certain theme and selected papers were presented orally. The other papers were presented in a poster session, which was conducted in a style such that after a short presentation by the paper author, active discussions were conducted in front of each poster. The session topics were as follows: first day - engineering applications of microscopic evaluation of particles; second day - discrete element and continuum modeling of granular materials; and third day - micro and macroscopic characterization. Moreover, a booth exhibition was conducted in the lobby in front of the main hall by more than ten companies and enterprises to showcase their products.



Technical Session



Booth Exhibition



Symposium Banquet

For the exchange program, a welcome reception was staged on the night of September 11<sup>th</sup>, while a special session and symposium banquet were held on September 13<sup>th</sup> (refer to the photos). With particle characteristics and slope failure as keywords, the special session consisted of special lectures on case histories of slope failures in Hong Kong, the Philippines and Japan followed by a panel discussion. The special lectures were delivered by Prof. M. Bolton of Cambridge University (U.K.) who talked about slope failures in Hong Kong and centrifuge testing; Prof. H. Murata of Yamaguchi University (Japan) who explained the collapse of the Iwakuni Expressway embankment; and Dr. M. Gutierrez of Virginia Tech (U.S.A.) who presented the results of his discrete element modeling of the massive Leyte, Philippines landslide. For any of these case histories, the general consensus was that treating soil as a continuous body may be difficult, and it would be more appropriate to handle it as a set of either discontinuous or discrete bodies. Questions raised by the audience included whether predicting future disaster would be possible, and the lecturers suggested some prospects but cautioned that such undertaking may still be difficult under the present situation.

During the banquet, which was attended by several local personalities including the mayor of Ube City, the President of Yamaguchi University and the Dean of the Faculty of Engineering, great interactions were done by representatives of each country. "Noh", a traditional Japanese entertainment which has been registered as a World Heritage, was performed on the stage. In addition, there were magic shows, choral presentation and piano performances, all contributing to a happy and significant international exchange. The banquet was closed with the typical Japanese cheer "banzai sansho" by Prof. M. Bolton of Cambridge University and TC-35 Chairman.

*Reported by Masayuki Hyodo, secretary of TC35*