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Prof. R.W.Boulanger

Ross W. Boulanger

*Professor and Director of the Center for Geotechnical Modeling
University of California at Davis, California, USA*

Professor Towhata (Editorial Board) asked me, as the incoming chair of TC203 on Earthquake Geotechnical Engineering and Associated Problems, to provide some reflections on a focused aspect of geotechnical earthquake engineering. I picked the present topic, out of all the exciting developments in our field, because I believe the emergence of shared-use facilities represents an important benefit to our international community. I would also like to acknowledge Dr. Dan Wilson, Associate Director of our Center for Geotechnical Modeling (CGM), for his assistance in putting this note together.



Advances in large-scale geotechnical dynamic experimental facilities have played a major role in the advancement of geotechnical earthquake engineering over the past twenty five years. Experimental facilities have become more technologically advanced, experimental techniques have improved, inverse analysis methods for data processing have become routine, numerical modeling has improved, and the spirit of data and facility sharing has transformed the way the community does research. This note reflects on these developments in dynamic centrifuge modeling and their importance to our international community, using examples from the CGM at the University of California at Davis, which operates and maintains two dynamic centrifuges (1-m and 9-m radii) as part of the George E. Brown Jr. Network for Earthquake Engineering Simulation (NEES).

The scientific value of centrifuge tests has progressively increased as advances in technology and experimental procedures have enabled researchers to explore fundamental mechanisms in ever increasing detail. Advances in instrumentation and hardware have seen the number of sensors in a model test increase from dozens in the 1990s to routinely more than a couple hundred in the large centrifuge models today.

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Message from TC203 Chairman (CONTINUED)

Larger centrifuge models have enabled the construction of soil-structure systems with complex stratigraphic details or multiple structural models (Figure 1). In-flight characterization tools have enabled the tracking of shear wave velocities and cone or T-bar penetration resistances in soil profiles across multiple shaking events over several days in the case of some model tests (Figure 2). New camera technologies have made it possible to record multiple views at a fraction of the cost in years past. New containers and model preparation systems have enabled testing of a broader range of soil types, from soft silts to biologically treated sands.

These scientific and technological advances have, however, increased the number of researchers, time, and cost required to perform each test. In many cases, the more complex tests have been performed by multi-university teams working together on a common project. The trend toward larger teams working on more complex models reflects the general experience that the extra cost and effort is rewarded by results of greater scientific value.

Inverse analyses of high-resolution sensor data are now frequently used for interpreting physical mechanisms that could not otherwise have been measured. Inverse analyses of sensor data have been used to, for example: (1) define shallow foundation responses, including the interaction of axial, shear, and moment loads on the settlement, translation, and rotation responses during dynamic shaking (e.g., Gajan et al. 2005), (2) define cyclic stress-strain responses of soils (e.g., Kamai and Boulanger 2010), (3) define p-y responses between piles and liquefying soils (Wilson et al. 2000), and (4) define volumetric strains due to pore water flow (e.g., Malvick et al. 2008).



Figure 1: Centrifuge models of structure-soil-structure interaction problems with liquefying soil. (a) Several structures on shallow footings. High resolution and high speed cameras are used to monitor the structures while 150 sensors measure the model response. A servo-hydraulic actuator is used to drive a cone penetration test in flight. (b) Submerged transit tube with liquefying backfill. Dense pore pressure arrays define transient seepage patterns and non-contacting electro-magnetic position sensors track tube displacements. (Wilson and Allmond 2014)

The evaluation and validation of numerical simulation procedures against the results of centrifuge model tests has become more thorough with the increasing detail provided by the centrifuge tests and the inverse analyses of sensor data. The questions now become whether the numerical simulations can reproduce the more detailed patterns of dynamic response (e.g., pore pressures, displacements, accelerations) throughout the system as opposed to at a few points, as well as some of the interaction mechanisms quantified through the inverse analyses (e.g., foundation rocking, p-y reactions, localized loosening). Centrifuge tests have become more like well-documented case histories which will bear reexamination by many future researchers. Furthermore, the evaluation of numerical simulation procedures against sets of archived centrifuge test data covering a range of models and multiple input

Message from TC203 Chairman (CONTINUED)

ground motions provides an improved basis for identifying strengths, limitations, bias, and dispersion in simulation procedures.

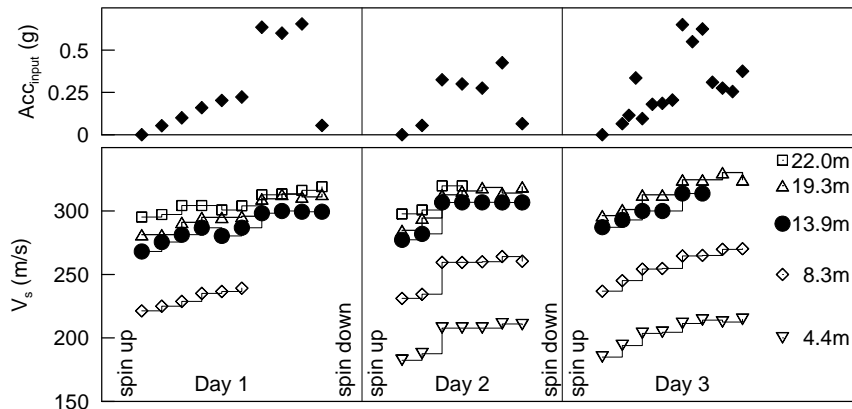


Figure 2: Chronology of shear wave velocity at five depths in a sand layer following successive shaking events with varying levels of peak base acceleration (Acc_{input}) (data from Trombetta et al. 2011). V_s increases with depth in the model due to the higher vertical effective stress. V_s increases with successive shaking events on Day 1, 2, and 3, with the increase attributed to a progressive increase in K_0 and thus mean effective stress and increasing D_r . V_s reduces from the end of Day 1 to the start of Day 2 and from the end of Day 2 to the start of Day 3, with the decrease attributed to the relief of lateral stresses when the model is spun down. The residual increase in V_s from Day 1 to 2 to 3 is attributed to the progressive increase in D_r . (Wilson and Allmond 2014)

The multiple roles of a single centrifuge model test can be illustrated with any number of recent examples. Consider the centrifuge test shown in Figure 3 which involved lateral spreading of two slopes toward a central channel; one slope was treated with geosynthetic drains and one was not. This was one of several centrifuge tests (Howell et al. 2012, Conlee et al. 2012) performed as part of the NEESR-GC project on Seismic Risk Mitigation for Port Systems. This specific centrifuge test was performed by researchers from five universities working together, with the experimental results archived and publicly distributed at NEEShub (Kamai et al. 2013). Inverse analyses of the sensor data (Figure 4) were used to investigate stress-strain responses and the progressive loosening of the liquefied sand immediately beneath the overlying clay crust (Figure 5; Kamai and Boulanger 2010). Numerical simulations, such as shown in Figure 6, were performed by four of the collaborating universities using different software programs and procedures (Kano et al. 2007, Vytiniotis 2009, Kamai and Boulanger 2013, Howell 2013). The open availability of the archived data set means that these data can be used by researchers around the world to evaluate their own numerical methods and procedures.

Another example of the power of data sharing for the international community is a data set from five centrifuge models of soil-pile-structure interaction in liquefying sands and soft clays performed in 1995-96 (e.g., Wilson et al. 1997). The data from these five tests were among the first data published by the CGM for others to use. This data set has been analyzed by more than 30 research teams from academic and consulting organizations spanning 14 countries in the nearly 20 years since the data was produced.

The culture of sharing research facilities, as embodied in the shared-used nature of the NEES network, has made these technological advances available to the broader community and thereby multiplied their impacts on geotechnical earthquake engineering. For example, since 2000, our CGM has hosted researchers from 14 institutions across California and from 14 states outside California, as well as several international teams and numerous visiting scholars who collaborated on model testing. More than 30 projects have used our facilities under NEES, with 70% of the projects led by researchers outside of UC Davis. This is a dramatic increase in the use of the facility by outside users over pre-NEES operations.

Message from TC203 Chairman (CONTINUED)

Large-scale shared-use experimental facilities for geotechnical earthquake engineering have contributed to major advances over the past twenty five years and offer a basis for further advances in coming years. In particular, the cultural change in the research community toward more openly sharing experimental facilities and making archived experimental data publically accessible is an important development for our international community and is especially beneficial for those who may not otherwise have access to these types of experimental facilities or data. The field of geotechnical earthquake engineering has many pressing challenges ahead of us, including much to learn from recent devastating earthquakes around the world. International collaborations and exchanges that are made possible through avenues ranging from shared-use experimental facilities to the numerous activities of TC203 are essential for our collective success in effectively reducing earthquake hazards around the world.

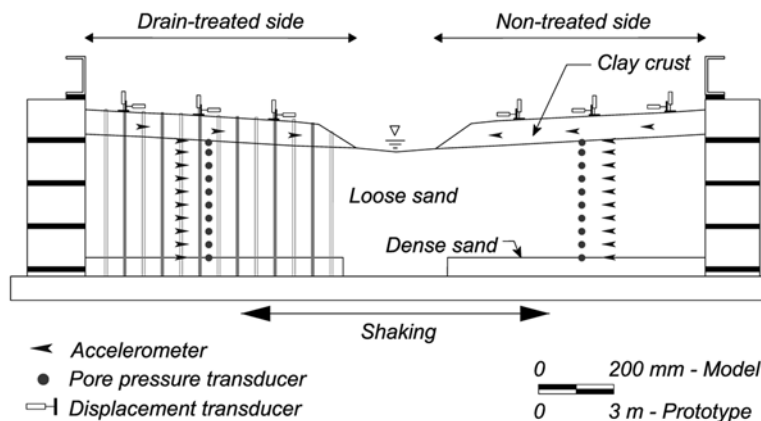


Figure 3: Cross section of model SSK01 involving lateral spreading of two slopes toward a central channel; the slope on the left is treated with geosynthetic drains, whereas the slope on the right is not. (Kamai and Boulanger 2013).

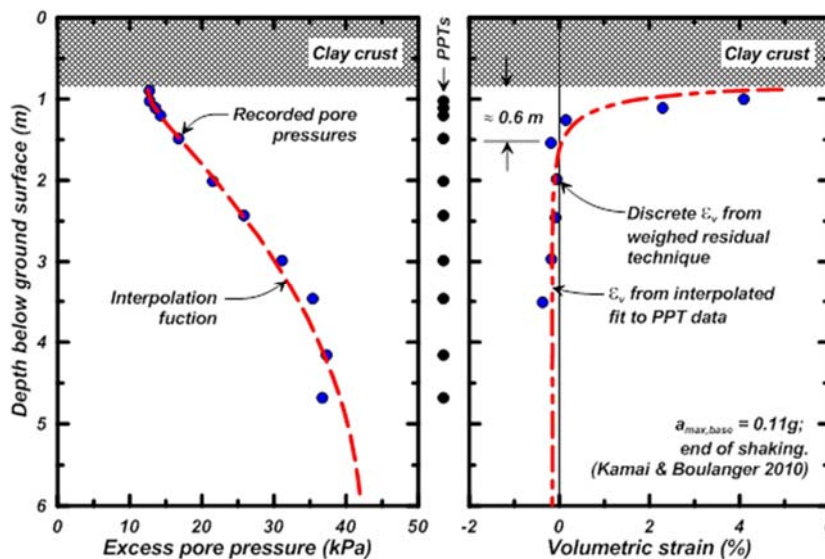


Figure 4: Dense arrays of pore pressure transducers on the right side of SSK01 (Figure 3) were used to calculate volumetric flow rates and changes in void ratio throughout the soil profile (Boulanger et al. 2012).

Message from TC203 Chairman (CONTINUED)



Figure 5. Photograph of strain concentration in the sand immediately below the clay crust on the non-treated side of the model shown in Figure 3 (Boulanger et al. 2012).

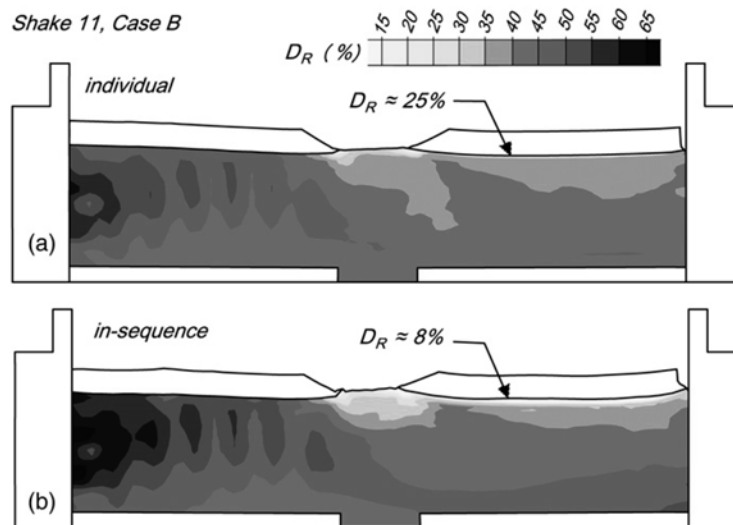


Figure 6: Numerical models of SSK01 were able to reproduce the loosening and concentrated strains in the sand immediately below the clay crust on the untreated side, as identified by the inverse analyses shown in Figure 4: (a) analysis of shaking event 11 alone, and (b) analysis of shaking event 11 in-sequence with previous events. (Kamai and Boulanger 2013)

Message from TC203 Chairman (CONTINUED)

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REPORT TO ISSMGE FOUNDATION ON CONFERENCE ATTENDANCE

ISSMGE Foundation provides financial supports to promising people so that they can experience international atmosphere. What follows is a report from one of such people.

Dr Sam Divall, City University London

The event for which the financial assistance was sought was the Eighth International Conference on Physical Modelling in Geotechnics (ICPMG2014) which took place in Perth, Australia, from Jan 14th - 17th, 2014. The majority of the conference took place at the University of Western Australia's main campus and was organised by the Centre for Offshore Foundation Systems (COFS) research group. The main theme of this conference was to communicate the latest developments in all aspects of geotechnical physical modelling to both academic and practitioner communities. I applied for a grant from the ISSMGE's Foundation Award while working on my post-doctoral position at City University London in order to enable me to attend this premier event in my research area.



(L) Prof Christophe Gaudin (outgoing chair of TC104)

The paper I submitted to the conference was based upon work carried out during my PhD studies concerning tunnel construction. Due to the popularity of the event, it was not possible for all submissions to be presented but I was invited to give a presentation on my paper. This was alongside many other excellent research projects from around the world.

One particular highlight was the guest lecture and tour by Professor White of UWA's O-tube facility, which models the fluid-structure-seabed interaction. This is a unique facility constructed to enable researchers to investigate the effect of water currents generated during cyclone events on offshore pipelines. The O-tube can simulate water currents oscillating at up to 2m/s at a very large scale. The facility was impressive not just because of the insight it gives into how offshore structures behave but also from a technical aspect.

The guest lecture by Professor Springman (ETH, Switzerland) describing an intricate test procedure performed within a drum centrifuge which injected material into a soil sample remotely in order to study methods of stabilising embankments. The lecture was impressive both from a technical standpoint and also the applicability of the results to real engineering projects.

However, the conference highlight was the first Schofield Lecture given by Professor Malcom Bolton. This was entitled 'Centrifuge Modelling: Expecting the unexpected'. This lecture contained five lessons for researchers undertaking investigations into geotechnical events using a centrifuge with anecdotes from his many years of experience. I was honoured to have been in the audience.

This conference has contributed hugely to my development as a geotechnical researcher. I was able to discuss future research aspirations with members of other institutions with vast experience in this field. The lessons learnt from the guest lectures, Schofield Lecture and laboratory tours will be influential at my home institution to further the research currently being undertaken.

Report to ISSMGE Foundation on Conference Attendance (CONTINUED)

Mr Andre Archer, Civil Engineering Department, University of Pretoria

The 8th ICPMG was jointly organised by the Centre for Offshore Foundation Systems (COFS) at The University of Western Australia and the ISSMGE TC104. The conference is held every 4 years and this conference was an enormous success, building on the previous ICPMG conference held at ETH Zurich. The setting for the conference was the beautiful campus of the University of Western Australia with the facilities providing a professional and comfortable atmosphere for all researchers attending.



Photo 1: Professor Malcolm Bolton presenting the 1st Schofield lecture

The conference commenced on Monday 13 January 2014 with a welcoming reception and on the 14th the opening ceremony was held after which the technical sessions commenced. The conference program was divided into plenary sessions, usually having a keynote of guest lecture, which was followed by parallel sessions where the delegates could decide which session to attend based on their interests. The 8th ICPMG also coincided with the 1st Andrew Schofield which was established to recognise distinguished members of the physical modelling community. Professor Malcolm Bolton presented the 1st Schofield lecture which was titled: "Centrifuge modelling: expecting the unexpected". The lecture was captivating and Professor Malcolm Bolton's vast experience with physical modelling ensured that the audience was given fruit for thought and to look physical modelling from a new perspective.

The social events of the conference included the welcome reception, a gala dinner, a reception after the Schofield lecture and an afternoon of socialising at the picturesque harbour city of Fremantle. The social events were a good break from the technical sessions where the more relaxed and entertaining side of the delegates came out.



Photo 2: Myself presenting my paper

A tour of the centrifuge at COFS did not disappoint as they showcased their impressive facility and physical modelling capabilities. It is notable that the work put into this facility can only produce high quality research and it is an encouragement for the future of physical modelling, not only at COFS, but also for the rest of the world.

The participation at the conference provided me with the opportunity to confer with likeminded professionals from all over the world and gave me a whole new perspective on the geotechnical physical modelling industry. The conference was an enormous success and the confidence I gained from attending and presenting my work will definitely assist me in becoming a better geotechnical researcher. I would like to thank the ISSMGE Foundation for providing me with part funding to attend the conference.

NEWS ON RECENT CONFERENCE

2nd International Conference GEOTEC HANOI 2013, on Geotechnics for Sustainable Development, in Hanoi, 28-29 November 2013

Two years ago, the first international conference GEOTEC HANOI 2011 with the theme “Geotechnics for Sustainable Development” was successfully organized in Hanoi. The conference’s main purpose was to provide a forum to interchange ideas, experience, and knowledge in the geotechnical area.

Continuing from the success of the first event, the conference is decided to be held every second year in Hanoi. The second conference, GEOTEC HANOI 2013, which was held on 28-29 November 2013 in Hanoi, was brilliantly successful with more than 500 attendees from 28 countries. 112 full papers were published in the conference proceeding; 84 papers were presented at the conference; and the remaining were shown by posters.

Hosting the conference are FECON Foundation Engineering & Underground Construction JSC, a leading geotechnical contractor in Vietnam, and Vietnamese Society for Soil Mechanics and Geotechnical Engineering (VSSMGE), with an invited international co-organizer, Asian Institute of Technology (AIT) from Thailand. The ambition of the organizers is to establish an international conference every second year in Vietnam, which can attract the leading experts both from Vietnam and around the world in the geotechnical areas that have been or will be developed in Vietnam. The event also aimed to help Vietnamese experts, engineers and contractors actively taking part in the sustainable development of the infrastructure in particular, and of the economy in general in Vietnam.

Five technical sessions addressed: 1) Foundations for high-rise buildings, 2) Underground projects in soft soil, 3) Soil improvement and reinforcement for infrastructure projects, 4) Monitoring and instrumentation for tunnels and excavations, and 5) Geotechnical modeling and numerical analysis.

The conference honored a giant figure in the geotechnical world, Prof. Sven Hansbo from Sweden, with his Honorable lecture “Deep compaction by heavy tamping, deep vibration and blasting”. Since 1979, Professor Hansbo has enormously devoted to the development of geotechnics in Vietnam. His name is also attached to the success of the cooperation between Vietnam and Sweden in the geotechnical field.

Five keynote lectures were entitled as what follows:

- 1) “Geotechnical challenges at super high-rise buildings”, Prof. Rolf Katzenbach (Germany);
- 2) “Management of settlements for an urban tunnel (Toulon, France)”, Prof. Alain Guilloux (France);
- 3) “Recent geosynthetic-reinforced soil structures for railways in Japan”, Prof. Fumio Tatsuoka (Japan);
- 4) “Smart Geo-Infrastructure - Opportunities for new sensor monitoring systems”, Prof. Kenichi Soga (UK);
- 5) “Examples for successful 3D finite element analysis in geotechnical engineering”, Prof. Helmut Schweiger (Austria).

The proceeding

The proceeding, which has an international registration number ISBN 978 604 82 0013 8, was very well edited with 112 papers from 27 countries and 84 presentations with international high-quality printing and hard-bounded. The proceeding consists of 950 pages and includes 112 papers in English. The CD Rom version is also provided, with the papers in pdf file with color figures/photos. The proceeding can be ordered through the conference website, <http://www.geotechn2011.vn> or email contact: secretariat@geotechn2011.vn; phung.long@gmail.com

NEWS ON RECENT CONFERENCE

2th International Conference GEOTEC HANOI 2013, on Geotechnics for Sustainable Development, in Hanoi, 28-29 November 2013 (CONTINUED)



Dr. Phung Duc Long, VSSMGE vice-president and chairman of conference scientific committee, opened the conference.



Mr. Pham Viet Khoa, FECON President and chairman of the conference, made welcome speech.

NEWS ON RECENT CONFERENCE

2th International Conference GEOTEC HANOI 2013, on Geotechnics for Sustainable Development, in Hanoi, 28-29 November 2013 (CONTINUED)



Prof. Sven Hansbo from Sweden



Prof. Rolf Katzenbach from Germany

NEWS ON RECENT CONFERENCE

International Conference of FEIC on Strategic Issues of Engineering Education (Madinah, Saudi Arabia)

The immediate past Vice-President of ISSMGE for Asia, Prof. Askar Zhussupbekov, attended the International Conference of the Federation of Engineering Institutions of Islamic Countries (FEIC) on Strategic Issues for Engineering Education with a presentation entitled: “The Engineering Education of Modern Experience of Pile Foundations for High-Rise Buildings and Facilities in the City of Astana”, which took place in Madinah (Saudi Arabia) on 24-27, December 2013. It attracted about 300 participants from Egypt, Pakistan, Malaysia, Kazakhstan, Jordan, Uzbekistan, Australia and Saudi Arabia.



Madinah, Saudi Arabia

The Kazakhstan delegation consisted of Prof. Zhussupbekov as well as representatives from the geotechnical group of Kazakhstan National Technical University “KazNTU”, the National Engineering Academy of Republic Kazakhstan (NEA RK), the Kazakhstan Geotechnical Society (KGS), the Design Academy “KazGOR” and Kazakhstan University for Innovation and Telecommunication Systems (KAZIITU).

Prof. Zhussupbekov attended the Meeting of the Council and the General Assembly of Federation of Engineering Institutions of Islamic countries (FEIC) where the new President of FEIC for 2013-2014 was elected. Chairman of the Engineering Council of Saudi Arabia and well-known Engineer, Hamid Al-Shagavi, was elected as the President.



Kazakhstan delegation in Madinah, Saudi Arabia

NEWS ON RECENT CONFERENCE

International Conference of FEIC on Strategic Issues of Engineering Education (Madinah, Saudi Arabia) (CONTINUED)



Prof. Askar Zhussupbekov and FEIC President (2013-2014) Hamid Al-Shagavi



Members of Council Meeting of FEIC, Madinah, Saudi Arabia

Prof. Zhussupbekov also visited King Saudi University (KSU) in Riyadh (the Capital of Saudi Arabia). He visited the Department of Civil Engineering and the Laboratory of Expansive Soil of College Engineering, and talked with the members of geotechnical group: Prof. Abdullah I. Al-Mhaidib (Dean of Quality in King University Saud Arabia), Associate Professor of Geotechnical Engineering, Dr. Abdulhafiz Omar S. Al-Shanawy (Head of Department of Civil Engineering of KSU), Prof. Khalid I. Al-Humazi (Dean of College Engineering of KSU) and Dr. Tamer Y. El Kaly (Assistant Professor, Bugshan Research Chair in Expansive Soil, KSU).



Left to right: Dean of Quality at King Saudi University, Prof., Abdullah Al-Mhaidib, Prof. Askar Zhussupbekov and Dean of Faculty of Civil Engineering Prof. Khalid Al-Humaizi

Dean of Quality at KSU, Professor on Geotechnical Engineering Abdullah Al-Mhaidib, was invited by Prof. Askar Zhussupbekov to deliver a series of lectures on pile foundations for Doctoral and Master Students in the L.N. Gumilyov Eurasian National University, Astana, Kazakhstan in 2014.

NEWS ON RECENT CONFERENCE

International Conference of FEIC on Strategic Issues of Engineering Education (Madinah, Saudi Arabia) (CONTINUED)



Visiting the geotechnical laboratory at King Saudi University



Dean of Quality at King Saudi University, Prof. Abdullah I. Al-Mhaidib

Professor Al-Mhaidib was an invited speaker in the International FEIC Conference with a presentation: "Engineering Education in the Kingdom of Saudi Arabia: Status and Challenges".

The Organizing Committee of the International FEIC Conference organized a special tour - UMRAH (minor pilgrimage) in Makkah, Saudi Arabia for the participants of the conference.



In Makkah, Saudi Arabia

JOURNAL OF THE SOUTHEAST ASIAN GEOTECHNICAL SOCIETY

Southeast Asian Geotechnical Society

Journal of the SOUTHEAST ASIAN GEOTECHNICAL SOCIETY (SEAGS) & ASSOCIATION OF GEOTECHNICAL SOCIETIES IN SOUTHEAST ASIA (AGSSEA) sponsored by ASIAN INSTITUTE OF TECHNOLOGY (AIT)

The Geotechnical Engineering Journal with ISSN 0046-5828 is now published by the Southeast Asian Geotechnical Society since 1970 and distributed to members, subscribers and others on a worldwide basis since 1970. Currently the Journal is published four times a year in March, June, September and December and an annual hard volume is published to contain all the papers in December. This procedure is adopted to keep the entire cost as low as possible and to avoid mailing and other expenses as much as possible. Since 2011, a number of themes oriented Issues were produced which really have excellent papers. The Guest Editors for the latest Issue of March 2014 are Prof. Buddhima Indraratna and Dr. Cholachat Rujikiatkamjorn on Geotechnics for Advancing Transport Infrastructure which resulted from keen discussion among various experts, for highlighting the key geotechnical issues encompassing modern transport infrastructures.

GEOTECHNICAL

ENGINEERING



AGSSEA



AIT

Asian Institute of Technology

This special issue includes a dozen invited papers from around the globe, including numerical and analytical methods, design parameters, field and laboratory testing, and case studies. Details of the Table of Contents are:

- 1: Geosynthetic-reinforced soil structures for railways: twenty five year experiences in Japan by *F. Tatsuoka, M. Tateyama, J. Koseki and Yonezawa, T.*
- 2: Enhancement of Rail Track Performance through Utilisation of Geosynthetic Inclusions by *Buddhima Indraratna, Sanjay Nimbalkar, and Cholachat Rujikiatkamjorn*
- 3: Railway Track Transition Dynamics & Reinforcement Using Polyurethane GeoComposites by *P. Woodward, O. Laghrouche and A. El-Kacimi*
- 4: How to Overcome Geotechnical Challenges in Implementing High Speed Rail Systems in Australia by *H. Khabbaz and B. Fatahi*
- 5: Maintenance Model for Railway Substructure by *Ali Ebrahimi, James M. Tinjum, and Tuncer B. Edil*
- 6: Dynamic Behavior of Railway Ballasted Track Structures in Shaking Table Tests and Seismic Resistance Performance Evaluation in Japan by *T. Ishikawa, S. Miura and E. Sekine*
- 7: Mechanical Properties of Polyurethane-Stabilized Ballast and Infrastructure Materials by *A. Keene, J.M. Tinjum, and T.B. Edil*
- 8: Dependency of cyclic plastic deformation characteristics of unsaturated recycled base course material on principal stress axis rotation by *A. Inam, T. Ishikawa, and S. Miura*
- 9: Transport infrastructures on sensitive clays susceptible to flow slides by *V. Thakur and S. Degago*
- 10: Cement Stabilization for Pavement Material in Thailand by *S. Horpibulsuk, A. Chinkulkijniwat, A. Suddepong, and A. Neramitkornburee*
- 11: Stone columns field test: monitoring data and numerical analyses by *Marcio Almeida, Bruno Lima, Mario Riccio, Holger Jud, Maria Cascão, Felipe Roza*

Technical Note:

Numerical Analysis of Response of Geocell Confined Flexible Pavement
by *G. L. Sivakumar Babu and Ram Babu*

Journal of the Southeast Asian Geotechnical Society
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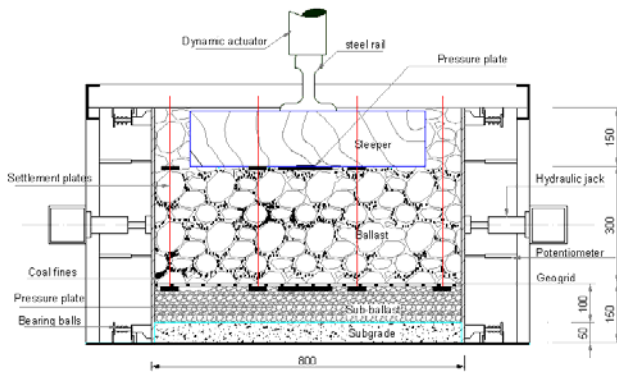


Fig. 1 High Speed Rail Process Simulation Apparatus, (Indraratna *et al*, 2014)



Fig. 2 Track displacement Monitoring (Indraratna *et al*, 2014)

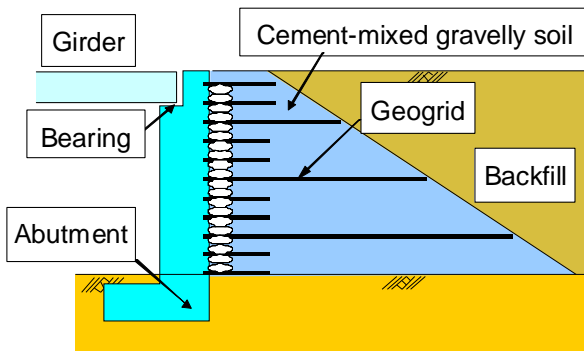


Fig.3 Geosynthetic Reinforced Soil Structure (GRS) in High Speed Rail (Tatsuoka *et al*, 2014)



Also, brief details of the other Theme Issues from 2011-2013 are given below: They too have excellent papers.

Year 2011:

March: Ground Improvement: Prof. Jie Han;

June: Piled & Piled Raft Foundations: Prof. Tatsuori Matsumoto & Prof. Der Wen Chang;

September: Deep Excavations & Tunnels: Prof. Chang Yu Ou;

December: Soil Behaviour: Dr. Dariusz Wanatowski

Journal of the Southeast Asian Geotechnical Society (CONTINUED)

Year 2012:

March: Unsaturated Soil Behaviour: Prof. Charles W Ng & Dr. Apiniti Jotisankasa

June: Geotechnical Earthquake Engineering: Prof. Ikuo Towhata Prof. Der Wen Chang & Dr. Ivan Gratchev

September: Environmental Geotechnics and Sanitary Landfills: Prof. Malek Bouazza

December: In-situ Testing: Tom Lunne & Prof. Don de Groot

Year 2013

June: Modelling Soil Behaviour: Prof. Akira Murakami

September: Geotechnical Analyses: Prof. Fusao Oka & Prof. Helmut F. Schweiger

December: Ground Improvement (Honouring Prof. Bergado): Prof. Chai Jin-Jun & Prof. Shui-Long Shen

Additionally, Special Country Issues are planned for 2015- 2016 for the first time to describe the on-going intense geotechnical activities covering AGSSEA Member countries: Thailand, Taiwan, Hong Kong, Malaysia, Singapore & Indonesia.

Finally, on the occasion of the 50th Anniversary in 2017: special Issues are planned as:

Prof. Kazuya Yasuhara, Dr. Farrokh Nadim, NGI & Prof. Heinz Brandl on

Climate Change, Hazards and Innovative Methods in Energy Saving Geotechnical Construction;

Prof. Robert Mair, Prof. K Y. Yong & Prof. Zhao Jian on Geotechnical Advances in

Underground Transport;

Prof. Poul Lade, Prof. Akira Murakami and Prof. Helmut Schweiger on

Soil Models in Geotechnical Analyses;

Prof. Harry G Poulos, Prof. Masaki Kitazume & Prof. Chang Yu Ou on

Research & Practice in Foundations & Deep Ground Improvement Techniques;

Prof. Jie Han, Prof. Tatsuoka & Prof. Ben Leshinsky on Ground Improvement;

Prof. Ikuo Towhata, Prof. Der Wen Chang & Prof. C.W. Lu on

Earthquake Related Hazards & Mitigation

The membership in SEAGS and the Subscription fees are very low and summarised as:

Individual Membership Groups within SEAGS: SOIL ENGINEERING (US\$ 50/year) ; ENGINEERING GEOLOGY (US\$ 55/year) ; ROCK MECHANICS AND MINING ENGINEERING (US\$ 60/year; *Multiple section members are entitled to the following discounts:* Any two sections discounts = US\$ 10.-

All three sections discounts = US\$ 25.-

FOR LIFE MEMBERSHIPS, THE FEES ARE AS FOLLOWS:-

- 1: For a person who is 60 years old and above, five times of original annual membership fee
- 2: For a person who is 55 but less than 60 years old, [(60-present age) +5] times annual regular
- 3: For a person who is less than 55 years old, ten times of the original annual membership fee.

COMPANY MEMBER [Entrance: US\$200 Subscription: US\$ 500/ year]:

This membership is for private firms and up to two memberships

INSTITUTION MEMBER [US\$ 2,000/year]:

The Institution Member refer to professional association or organization which can enjoy up to ten memberships

Full details on paper submission as well as application forms for membership and subscription and mode of payments can be found in:

<http://www.seags.ait.ac.th/>

FROM ICE PUBLISHING

International Journal of Physical Modelling in Geotechnics has been accepted for inclusion in key research index ISI Web of Science. The journal, from ICE Publishing, will now be indexed retrospectively from Volume 11(1) 2011, with an Impact Factor following in September 2014. The journal's inclusion follows the substantial contribution of departing Editor Professor David Muir Wood, University of Dundee, UK. The journal will be edited from January 2014 by Dr Jonathan Knappett of the same institution.

Quote from the new Editor:

"The journal of physical modelling being accepted into Web of Science is a really exciting development, as the editorial panel and I are well aware that this has been a significant limitation in the past on attracting a good number of high quality papers. On behalf of the panel and the whole physical modelling community I would like to profoundly thank David and the staff at ICE Publishing for all of their hard work and perseverance in securing the journal's inclusion.

"As we move forward, the journal will continue to provide fast review and rapid publication, and we hope that the journal's indexing will allow sustainable growth in the size of the journal, and therefore opportunities for publication. We certainly encourage all of our colleagues conducting any sort of geotechnical physical modelling to submit their papers to the journal, particularly (but by no means exclusively) where they relate to new modelling techniques. 2014 will also see themed issues around the recent quadrennial TC 104 International Conference on Physical Modelling in Geotechnics, held at the University of Western Australia in January. Please do keep up to date with the latest content and updates at <http://www.icevirtuallibrary.com/content/serial/ijpmg>."

In what follows is a partial list of articles that were published in 2013:

Bender elements and system identification for estimation of V_s

By Waleed El-Sekelly; Vicente Mercado; Tarek Abdoun; Mourad Zeghal; Hesham El-Ganainy

Pile response in sand: experimental development and study

By Alain Le Kouby; Jean Claude Dupla; Jean Canou; Roméo Francis

Large-scale soil-structure physical model (1g) - assessment of structure damages

By Marwan Al Heib; Fabrice Emeriault; Matthieu Caudron; Luyen Nghiem; Boramy Hor

Experimental evaluation of stress concentration ratio of model stone columns strengthened by additives

By Mohammed Y. Fattah; Kais T. Shlash; Maki J. Al-Waily

Water supply to a geotechnical centrifuge

By Paul Shepley; Malcolm D. Bolton

Scaling issues in centrifuge modelling of monopiles

By Rasmus Tofte Klinkvort; Ole Hededal; Sarah M Springman

Centrifuge tests investigating the influence of pile cross-section on pile driving resistance of open-ended piles

By Sascha Henke; Britta Bienen

Unsaturated soil interacting with a rotating model wall

By Thanh Vo; Adrian R. Russell

Comparison of failure modes below footings on carbonate and silica sands

By Jelke Dijkstra; Christophe Gaudin; David J. White

Development of a combined *VHM* loading apparatus for a geotechnical drum centrifuge

By Youhu Zhang; Britta Bienen; Mark J. Cassidy

Development of a laboratory-scale pressuremeter

By Grey Johnston; James Doherty; Barry Lehane

EVENT DIARY

ISSMGE EVENTS

Please refer to the specific conference website for full details and latest information.

2014

Wave Propagation and Soil Stiffness: Particle-Continuum Duality Workshop

Date: Thursday 20 March 2014 - Friday 21 March 2014

Location: Clifton House, Bristol, United Kingdom

Language: English

Organizer: TC101 and TC105

Contact person: Dr Erdin Ibraim & Dr Catherine O'Sullivan

E-mail: erdin.ibraim@bristol.ac.uk ; cath.osullivan@imperial.ac.uk

Website: <http://www.bris.ac.uk/engineering/events/2013/98.html>

GeoShanghai 2014

Date: Monday 26 May 2014 - Wednesday 28 May 2014

Location: Shanghai,,China

Language: English

Organizer: Tongji University

Contact person: Xiong Zhang

Address: Department of Civil & Environmental Engineering, University of Alaska Fairbanks, 99775, Fairbanks, AK, United States

Phone: +1(907)474-6172

Fax: +1(907)474-6030

E-mail: xzhang11@alaska.edu

Website: www.geoshanghai2014.org

TC207 Conference on "Soil-Structure Interaction: Retaining Structures"

Date: Monday 16 June 2014 - Wednesday 18 June 2014

Location: St. Petersburg State Transport University, Saint Petersburg, Russia

Language: English

Organizer: TC207 Soil-Structure

Contact person: Michael Lisyuk

Address: Izmaylovsky prosp. 4, of. 414,190005, Saint Petersburg, Russia

Phone: +7-812-339-35-87

Fax: +7-812-575-36-25

E-mail: lisyuk@gmail.com

Website: <http://www.TC207SSI.org>

Geohubei International Conference 2014

Date: Sunday 20 July 2014 - Tuesday 22 July 2014

Location: Three Georges Dam, Hubei, China

Language: English

Organizer: Geohubei International Conference 2014

Contact person: Dr. Guodong Zhang

Address: Three Gorges University,

E-mail: geohubei.adm@gmail.com

Website: <http://geohubei2014.geoconf.org>

EVENT DIARY

ISSMGE EVENTS (CONTINUED)

2nd International Conference on Information Technology in Geo-Engineering

Date: Monday 21 July 2014 - Tuesday 22 July 2014

Location: Durham University, Durham, United Kingdom

Language: English

Organizer: Professor David Toll

Contact person: Dr Ashraf Osman

Address: School of Engineering and Computing Sciences, Durham University, DH1 3LE, Durham, United Kingdom

Phone: +44 191 334 2425

Fax: +44 191 334 2408

E-mail: icitg@duram.ac.uk

Website: www.icitg.dur.ac.uk

TC204 ISSMGE International Symposium on "Geotechnical Aspects of Underground Construction in Soft Ground" - IS-Seoul 2014

Date: Monday 25 August 2014 - Wednesday 27 August 2014

Location: Sheraton Grande Walkerhill, Seoul, Korea

Language: English

Organizer: TC204 of ISSMGE and Korean Geotechnical Society

Contact person: Prof. Chungsik Yoo

Address: 300 Chun-Chun Dong, Jang-An Gu, 440-746, Suwon, Kyong-Gi Do, Korea

Phone: +82-32-290-7518

Fax: +82-32-290-7549

E-mail: csyoo@skku.edu

International Symposium on Geomechanics from Micro to Macro (TC105)

Date: Monday 01 September 2014 - Wednesday 03 September 2014

Location: Cambridge University, Cambridge, United Kingdom

Language: English

Organizer: TC105

Contact person: Professor Kenichi Soga

Address: University of Cambridge, Department of Engineering, Trumpington Street, CB2 1PZ, Cambridge, U K

Phone: +44-1223-332713

Fax: +44-1223-339713

E-mail: ks207@cam.ac.uk

XV Danube-European Conference on Geotechnical Engineering

Date: Tuesday 09 September 2014 - Thursday 11 September 2014

Location: Vienna University of Technology, Vienna, Austria

Language: English and German

Organizer: ASSMGE & Vienna University of Technology, Institute of Geotechnics

Contact person: Armin Steurer, Gerda Pflieger

Address: Vienna University of Technology, Institute of Geotechnics, Karlsplatz 13/220-2,A-1040, Vienna, Austria

Phone: +43 1 58801 22101

Fax: +43 1 58801 22199

E-mail: igb@tuwien.ac.at

Website: <http://www.decge2014.at>

EVENT DIARY**ISSMGE EVENTS (CONTINUED)****10th International Conference on Geosynthetics (10ICG)**

Date: Sunday 21 September 2014 - Thursday 25 September 2014

Location: Estrel Convention Center, Berlin,, Germany

Language: English

Organizer: DGGT / German IGS Chapter

Contact person: Gerhard Braeu

Address: Baumbachstrasse 7, 81245, Muenchen, Germany

Phone: +49 89 289 27139

Fax: +49 89 289 27189

E-mail: g.braeu@bv.tum.de

7th International Congress on Environmental Geotechnics

Date: Monday 10 November 2014 - Friday 14 November 2014

Location: Melbourne Convention and Exhibition Centre, Melbourne, Victoria, Australia

Language: English

Organizer: Engineers Australia

Contact person: Hayley Le Gros

Address: WSM, 119 Buckhurst Street, Vic 3205, Melbourne, Victoria, Australia

Phone: 61 3 9645 6322

E-mail: 7iceg2014@wsm.com.au

Website: www.7iceg2014.com

Geohazards 2014 International Symposium on Geohazards: Science, Engineering and Management

Date: Thursday 20 November 2014 - Friday 21 November 2014

Location: Kathmandu, Nepal

Language: English

Organizer: Nepal Geotechnical Society

Secretary:

Contact person: Dr. Netra Prakash Bhandary

Address: Dept. Civil Environmental Eng, Ehime University, 790-8577, Matsuyama, Ehime, Japan

Phone: +81-89-927-8566

Fax: +81-89-927-8566

E-mail: netra@ehime-u.ac.jp

Website: <http://www.ngeotechs.org/ngs/index.php/geohazards-2014>

7th International Conference on Scour and Erosion (ICSE-7)

Date: Tuesday 02 December 2014 - Thursday 04 December 2014

Location: Rendezvous Grand Hotel Perth, Scarborough, Perth, Western Australia

Language: English

Organizer: ISSMGE TC213 / University of Western Australia

Contact person: Liang Cheng

Address: M051, 35 Stirling Highway, 6009 Perth, Wesern Australia

Phone: +61 8 6488 3076

Fax: +61 8 6488 1018

E-mail: liang.cheng@uwa.edu.au

Website: <http://www.2014icse.com/index.html>

EVENT DIARY**ISSMGE EVENTS (CONTINUED)****2015**

12th Australia and New Zealand Conference on Geomechanics - The Changing Face of the Earth: Geo-Processes & Human Accelerations

Date: Sunday 22 February 2015 - Wednesday 25 February 2015:

Location: Wellington, New Zealand

Contact person: Amanda Blakey

E-mail: secretary@nzgs.org

XVI African Regional Conference on Soil Mechanics and Geotechnical Engineering - Innovative Geotechnics for Africa

Date: Monday 27 April 2015 - Thursday 30 April 2015

Location: Hammamet, Tunisia

Language: English and French

Organizer: ATMS

Contact person: Mehrez Khemakhem

Phone: +216 25 956 012

E-mail: organisation@cramsg2015.org

Website: www.cramsg2015.org

ISFOG 2015

Date: Wednesday 10 June 2015 - Friday 12 June 2015

Location: Holmenkollen Park Hotel Rica, Oslo, Norway

Language: English

Organizer: NGI

Contact person: Vaughan Meyer - NGI

Address: PO Box 3930 Ullevaal Stadion, N-0806, Oslo, Norway

Phone: +47 22 02 30 00

Fax: +47 22 23 04 48

E-mail: isfog2015@ngi.no

Website: www.isfog2015.no

XVI European Conference on Soil Mechanics and Geotechnical Engineering

Date: Sunday 13 September 2015 - Thursday 17 September 2015

Location: Edinburgh International Conference Centre, Edinburgh, Scotland, United Kingdom

Language: English

Organizer: British Geotechnical Association

Contact person: Derek Smith

Address: Coffey Geotechnics Limited, the Malthouse, 1 Northfield Road, Reading, Berkshire, RG1 8AH, Reading, UK

Phone: +44 1189566066

Fax: +44 1189576066

E-mail: derek_smith@coffey.com

Website: <http://www.xvi-ecsmge-2015.org.uk/>

EVENT DIARY

ISSMGE EVENTS (CONTINUED)

Workshop on Volcanic Rocks & Soils

Date: Thursday 24 September 2015 - Friday 25 September 2015

Location: Isle of Ischia, Italy

Language: English

Organizer: Associazione Geotecnica Italiana (AGI)

Contact person: Ms. Susanna Antonielli

Address: Viale dell'Università 11, 00185, Roma, Italy

Phone: +39 06 4465569 - +39 06 44704349

Fax: +39 06 44361035

E-mail: agi@associazionegeotecnica.it

Website: www.associazionegeotecnica.it

6th International Conference on Earthquake Geotechnical Engineering

Date: Monday 02 November 2015 - Wednesday 04 November 2015

Location: Christchurch, New Zealand

Contact person: Prof. Misko Cubrinovski

The 15th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering -New Innovations and Sustainability-

Date: Monday 09 November 2015 - Friday 13 November 2015

Location: Fukuoka International Congress Center, Fukuoka, Kyushu, Japan

Language: English

Organizer: The Japanese Geotechnical Society

Contact person: Toshifumi Mukunoki

Address: 2-39-1 Kurokami, Chuou-ku, Kumamoto, JAPAN,860-8555,Kumamoto,,Japan

Phone: +81-96-342-3535

Fax: +81-96-342-3535

E-mail: 15tharc@kumamoto-u.ac.jp

Website: <http://www.jgskyushu.net/uploads/15ARC/>

XV Pan American Conference on Soil Mechanics and Geotechnical Engineering

Date: Sunday 15 November 2015 - Wednesday 18 November 2015

Location: Hilton Hotel, Buenos Aires, Buenos Aires, Argentina

Language: Spanish - Portuguese - English (simultaneous translation)

Organizer: Argentinean Society for Soil Mechanics and Geotechnical Engineering

Contact person: Dr. Alejo Oscar Sfriso

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Phone: +541143425447

Fax: +541143423160

E-mail: presidente@saig.org.ar

Website: www.panam2015.com.ar

EVENT DIARY**ISSMGE EVENTS (CONTINUED)****2016**

NGM 2016, The Nordic Geotechnical Meeting
Date: Wednesday 25 May 2016 - Saturday 28 May 2016
Location: Harpan Conference Centre, Reykjavik, Iceland
Language: English
Organizer: The Icelandic Geotechnical Society
Contact person: Haraldur Sigursteinsson
Address: Vegagerdin, Borgartún 7, IS-109, Reykjavik, Iceland
Phone: +354 522 1236
Fax: +354 522 1259
E-mail: has@vegagerdin.is
Website: <http://www.ngm2016.com>

3rd ICTG International Conference on Transportation Geotechnics
Date: Sunday 04 September 2016 - Wednesday 07 September 2016
Location: Vila Flor Cultural Centre and University of Minho, Guimaraes,, Portugal
Language: English
Organizer: Host: Portuguese Geotechnical Society and University of Minho
Secretary:
Contact person: Prof. A. Gomes Correia (Chair)
Address: University of Minho, School of Engineering, 4800-058, Guimarães, Portugal
Phone: +351253510200
Fax: +351253510217
E-mail: agc@civil.uminho.pt
Website: <http://www.webforum.com/tc3>

NON-ISSMGE SPONSORED EVENTS**2014**

Workshop on Levee and Coastal Rehabilitation Practices
Date: Wednesday 12 February 2014 - Thursday 13 February 2014
Location: Hyatt Regency, Miami, FL, United States
Language: English
Organizer: Deep Foundations Institute
Contact person: Mary Ellen Bruce
Address: P.O. Box 178, 15367, Venetia, PA, USA
Phone: (724) 942-4220
Fax: (724) 260-0582
E-mail: mebruce@dfi.org

EVENT DIARY

DFI-EFFC International Conference on Piling and Deep Foundations

Date: Wednesday 21 May 2014 - Friday 23 May 2014

Location: Stockholmsmässan, Stockholm,, Sweden

Language: English

Organizer: DFI & EFFC

Contact person: Deep Foundations Insitute

Address: 326 Lafayette Ave, 07506, Hawthorne, New Jersey, United States

Phone: 9734234030

Fax: 9734234031

E-mail: staff@dfi.org

Website: <http://www.regonline.com/builder/site/Default.aspx?EventID=1221506>

8th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE14) (

Date: Tuesday 17 June 2014 - Friday 20 June 2014

Location: Delft University of Technology, Delft,, Netherlands, The

Language: English

Organizer: Prof. Michael Hicks

Contact person: Mrs. Hannie Zwiers

Address: Delft University of Technology, Faculty of Civil Engineering & Geosciences. Stevinweg 1, 2628, CN Delft, the Netherlands

Phone: +31 15 2788100

E-mail: info@numge2014.org

Website: <http://www.numge2014.org>

International Conference in Geotechnical Engineering - ICGE-Colombo 2015

Date: Monday 10 August 2015 - Tuesday 11 August 2015

Location: Colombo, Colombo, Sri Lanka

Language: English

Organizer: Sri Lankan Geotechnical Society

Contact person: Eng. K. L. S. Sahabandu

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FOR FURTHER DETAILS, PLEASE REFER TO THE WEBSITE OF THE SPECIFIC CONFERENCE

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The Foundation of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) was created to provide financial help to geo-engineers throughout the world who wish to further their geo-engineering knowledge and enhance their practice through various activities which they could not otherwise afford. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals.

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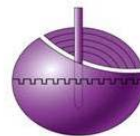
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- d. The Chinese Institution of Soil Mechanics and Geotechnical Engineering - CCES
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The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) is pleased to announce the publication of another new issue of the International Journal of Geoengineering Case Histories (<http://casehistories.geoengineer.org>).

The papers included in Issue #3, Volume #2 are the following:

Paper Title: Flat Jack Method for Measuring Design Parameters for Hydraulic Structures of the Koyna Hydro Electric Project in India, pp. 182-195

Authors: Keshav Ral Dhawan



Abstract: The paper presents two different projects: The first involves a case with limited rock cover on a side of an excavated surge shaft located near a steep slope. The second involves the assessment of design parameters of an existing masonry dam for use as input in dynamic analysis. The induced stresses in the surge shaft of Koyna Hydro Electric Project (K.H.E.P.) stage-IV were measured with flat jack. These tests were first performed in a 4 m diameter pilot shaft and after the shaft was excavated to its full diameter of 22.70 m. The stresses increased from 3.96 MPa to 5.09 MPa, when the 4m-diameter surge shaft was expanded to its full diameter of 22.70 m, in the case where significant rock mass cover existed at EL 651.00 m. However stress

reduction or no variation in the induced stress was measured in the portion of insufficient rock cover. In the second case, to determine the design parameters of Kolkewadi masonry dam of K.H.E.P stage-III, flat jack tests were conducted at the upstream side of Kolkewadi masonry dam in masonry of 1:4 and 1:3 and at downstream sloping side in masonry of 1:5. It is impractical and difficult to obtain mechanical properties of masonry in laboratory from the extracted core samples, due to intrinsic nonhomogeneity of the material. The brick/stone and mortar layers caused anisotropic behavior of masonry. Average deformation modulus for 1:3 masonry was 32.8 GPa. Similarly, the average deformation modulus for the 1:4 and 1:5 masonry was 19.0 and 13.7 GPa respectively and were adopted for the dynamic analysis. Induced stresses in the masonry dam were found to be nearly equal to the overburden.

Download here: <http://casehistories.geoengineer.org/volume/volume2/Issue 6/IJGCH 2 3 1.html>

Paper Title: Large Diameter Long Bored Piles in the Mekong Delta, pp. 196-207

Authors: Bengt H. Fellenius, Nguyen Minh Hai



Abstract: Static loading tests, O-cell tests, were performed on two long, strain-gage instrumented, bored piles in HoChiMinh City, Vietnam, where a series of twelve apartment towers were to be constructed. The test piles were constructed to 76 and 91 m depth and tested to maximum O-cell loads of 10 and 18 MN, respectively. For both piles, the O-cell level was placed at a depth of about 20 % of the pile length above the pile toe. The soil profile consisted of very soft organic clay to about 10 to 15 m depth underlain by firm to stiff clayey soil to about 25 to 45 m depth. Hereunder, the soil

consisted of a compact to dense sandy silt. Neither of the tests was able to fully engage the shaft resistance of the piles above the O-cell level, but did so below the O-cell level. Back-calculation of the load distributions determined from the strain-gage measurements showed the shaft resistance, even where fully mobilized, to be very small: the beta-coefficient applied in an effective stress analysis was only about 0.13 to 0.14. The evaluations of shaft resistance development showed a maximum shear resistance to occur after a movement of only 3 to 4 mm, after which the response became plastic and strain-softening. The toe resistance was very low because the construction had left soil debris at the bottom of the drilled hole. Ongoing regional settlement leads to concerns about the possibility for the production piles to have a similarly low toe resistance. This would locate the neutral plane of the shorter piles in settling soil and create a downdrag situation for the piled foundation.

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ISSMGE's International Journal of Geoengineering Case Histories(Continued)

Paper Title: The July 10 2000 Payatas Landfill Slope Failure, pp. 208-228

Authors: Navid H. Jafari, Timothy D. Stark, Scott Merry

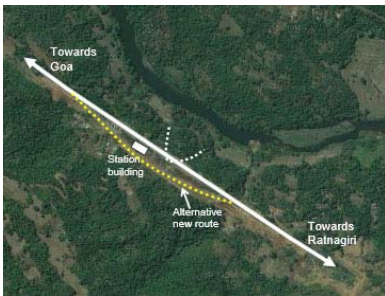


Abstract: This paper presents an investigation of the slope failure in the Payatas landfill in Quezon City, Philippines. This failure, which killed at least 330 persons, occurred July 10th 2000 after two weeks of heavy rain from two typhoons. Slope stability analyses indicate that the raised leachate level, existence of landfill gas created by natural aerobic and anaerobic degradation, and a significantly over-steepened slope contributed to the slope failure. The Hydrologic Evaluation of Landfill Performance (HELP) model was used to predict the location of the leachate level in the waste at the time of the slope failure for analysis purposes. This paper presents a description of the geological and environmental conditions, identification of the critical failure surface, and slope stability analyses to better understand the failure and present recommendations for other landfills in tropical areas. In addition, this case history is used to evaluate uncertainty in parameters used in back-analysis of a landfill slope failure.

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Paper Title: Embankment Failure in Residual Soils at Nivsar, Ratnagiri, pp. 229-251

Authors: Ashish Juneja, Deblina Chatterjee, Rajendra Kumar



Abstract: The Nivsar Yard embankment was constructed by the Konkan Railways in 1994. Near to the station building, the 22m high embankment runs parallel to the Kajali River for a stretch of about 100m. This stretch has experienced failure and settlement related problems since the record-breaking July 2005 rainfall. Corrective ground improvement measures were implemented immediately after the monsoon. However, these measures were inadequate because the failure-surface reappeared during the following monsoon. The failure-surface mirrored the shape and size of the failure observed in 2005. Since then after nearly every monsoon, the embankment has moved

despite precautionary measures taken by the railway to arrest the movement. The hydrogeological and geotechnical properties which affect slope stability are first discussed. The stability of the embankment is then evaluated at 5-sections drawn along the slope. Two cases are considered. In the first case, the stability of the unreinforced slope is calculated. In the second case, calculations are done using the slope reinforced with soil nails and micropiles installed in 2005 and 2007. The design railway loading and the water level position during the dry and wet season were also taken into account in the stability analysis. The safety factor during the wet season was observed to be less than unity in 4 out of 5 sections for both cases. In each case, the critical circle passed through the toe of the embankment and mirrored the field observations. In 2010-11, the rail tracks were realigned to bypass the failure surface. The stability of the slope was reinvestigated and considered to be safe under the new loads. Irrespective of the above change in the rail alignment, the cumulative settlement of the embankment has also reduced since the 2009 monsoon.

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About the Journal:

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From the editor of ISSMGE Bulletin

There is some confusion about case-history articles in this fantastic journal and those in Bulletin. As the editor of Bulletin, I would clarify the differences between them. Bulletin is something like a magazine that emphasizes simplicity, clarity, and speed. Hence, there is no peer review and I do my best to improve the submitted draft quickly so that the readers may get the latest information from the article. The articles are usually short and nice photographs are considered important. In contrast, the International Journal of Geoengineering Case Histories seeks for high quality as an academic journal with good peer reviews. Thus, the two publications of ISSMGE are different but work together as evidenced by many Bulletin articles that are invited to be re-submitted to the journal after their quality is improved and more information is added.