SIMSG ISSMGE

ISSMGE Bulletin

Volume 7, Issue 3
May 2013

International Society for Soil Mechanics and Geotechnical Engineering
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INSIDE THIS ISSUE

MESSAGE FROM TC202 TRANSPORTATION GEOTECHNICS Chair; PROF. DR. ANTÓNIO GOMES CORREIA

We are glad to present TC202 Transportation Geotechnics, former TC3, renamed TC202 for the period 2010-2013, under Jean-Louis Briaud's Presidency.

The goal of TC202 should be considered a broad engineering unit bridging the gap between Pavement/Railway Engineering and Geotechnical Engineering. The main task is to promote co-operation and exchange of information and knowledge about the geotechnical aspects in design, construction, maintenance, monitoring and upgrading of roads, railways and airfields. It will also cover the related environmental aspects.

ISSMGE launches new website & GeoWorld, a network platform for geoprofessionals

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and its President Professor Jean-Louis Briaud are pleased to announce the launch of the new ISSMGE website (www.issmge.org), developed by Geoengineer.org (www.geoengineer.org), the International Information Center for Geoprofessionals under the auspices of the Board-level ISSMGE Innovation and Development Committee (IDC) chaired by Professor Dimitrios Zekkos. The new web site has an improved structure and layout and has also improved capabilities to host technical content. In addition, it already makes available at no cost over 8 webinars by leaders of the profession worldwide. ISSMGE, in co-operation with Geoengineer.org, also launched last year GeoWorld (www.mygeoworld.info). GeoWorld is a free online platform that supports professional networking among geoprofessionals. All geoprofessionals can join the more than 2,200 members of GeoWorld at no cost, and with minimum time and effort create a profile and expand their network!

From the Editor:
To benefit the voting decision, **the July Issue of ISSMGE Bulletin will present articles on 3 presidential candidates and 3 candidate cities of ICSMGE in 2017.**

MESSAGE FROM TC202
TRANSPORTATION GEOTECHNICS (Continued)

The committee counts on the participation of 43 members from 23 different countries around the world, covering several institutions from the academia and industry. The general objectives of TC202 Transportation Geotechnics are carried out through the main Task Forces of the Committee covering the following topics:

TF 1. Promote of use of non-traditional materials in embankments and structural layers.
Leaders: M. Winter and T. Edil.

TF 2. Reinforcement of geomaterials and its implications in pavement and rail track design.
Leaders: E. Tutumler and S-W Park.

TF 3. Earthworks design, technology and management: To extend the previous work on compaction.
Leaders: Jean-Pierre Magnan and A. Gomes Correia.

TF 4. Rail track substructures, including transition zones.
Leaders: W. Powrie, K. Muramoto and Buddhima Indraratna.

TF 5. Subsurface sensing for transportation infrastructure condition diagnostics amongst others.
Leaders: S. Nazarian and C. Lai.

TF 6. 2nd International Conference on Transportation Geotechnics (ICTG-2), Hokkaido, Japan, 10th to 12th September 2012. Chairman: Seiichi Miura; Secretary General: Tatsuya Ishikawa.
Leaders: T. Ishikawa and N. Yoshida

TF 7. Journal of "Transportation Geotechnics". Proposal to be worked by A. Gomes Correia, A. Loizos & E. Tutumluer.

TF 8. To promote TC202-sponsored sessions on Geotechnics for transportation infrastructures at ISSMGE- international, European and regional conferences on soil mechanics and geotechnical engineering, and to support special geotechnical, geoenvironmental and unsaturated soils conferences on transportation geotechnics.

TF 9. To cooperate actively with other technical committees whose field of activity involves important questions related with transportation geotechnics.

TF 10. Reports, Publications, Web.

TF 11. Meetings. Most of the work will be done mainly by e-mail, or by video conference if this is felt to be the most appropriate option.

Recent activities of TC202 address what follows:

The committee has organized several events, namely:

- Participation in the 3rd International Conference on GEDMAR2011 and 5thICGHE, from 18th to 20th May 2010, Semarang, Indonesia;
- Participation in the International Seminar-Course on Petrologic and Climates Aspects in the Behavior of Aggregates, organized by SCG with INGEOMINAS and under the auspices of TC202, on 18th and 19th November 2010, in Bogota, Colombia;
- Participation in the International Symposium on Testing and Specification of recycled Materials for Sustainable Geotechnical Construction (chair: T. Edil), from the 2nd to 4th February 2011, in Baltimore, USA. A special issue was published by ASTM International in Vol. 9, No. 2 and also in a STP 1540;
- Participation in the Short Course on Intelligent Compaction, by FHWA and Transtec Group at the Geohunan II Conference, 9th June 2011, Hunan, China;
- 1st TC202 General Meeting, during the XV ECSMGE, on 11th September 2011 (2: pm & 5: pm) at Megaron Athens International Conference Center, Athens, Greece;
- ISSMGE Webinar on Intelligent Compaction, lectured by Professor A. Gomes Correia and Professor George Chang, on 25th October 2011;
- Organization of the 2nd International Conference on Transportation Geotechnics (ISSMGE-TC202), from 9th to 12th September 2012, in Sapporo, Japan;
- Participation in the International Conference on Ground Improvement and Ground control: Transport Infrastructure Development and Natural Hazards Mitigation, from 30th October to 2nd November 2012, Wollongong, Australia;

MESSAGE FROM TC202
TRANSPORTATION GEOTECHNICS (Continued)

- 2nd TC202 General Meeting, on 9th September 2012, in Sapporo, Japan. In this meeting it was decided that the 3rd International Conference on Transportation Geotechnics (ISSMGE-TC202) will be held in Guimarães, Portugal. Another important decision was related with the TC202 **ISSMGE named lecture**. After this meeting all members committee have been contacted by email and voted on the name of **Ralph Proctor** (with 3 votes in other choices).

International Journal in Transportation Geotechnics to be published by Elsevier. Editors: A. Gomes Correia, Erol Tutumluer and Yunmin Chen (to be launched on 2014).

Upcoming activities

The upcoming events are as what follows:

- TC 202 Session on Transportation Geotechnics during the 18th Southeast Asian Geotechnical Conference "Geotechnical Infrastructure", 30th May 2013, in Singapore;
- TC 202 Workshop on Transportation Geotechnics during the 18th IC-ISSMGE, 5th September 2013, in Paris, France. A special issue will be prepared and published by ASCE in a Special Geotechnical Publication;
- TC 202 Session on Transportation Geotechnics on 18th IC-ISSMGE, 5th September 2013, in Paris, France;
- Participation in The GeoHubei International Conference, from 20th to 22nd July 2014, in Hubei, China;
- TC202 Meeting and Workshop on the XVI ECSMGE, 13th September 2015, in Edinburgh, UK;
- **3rd International Conference on Transportation Geotechnics (ISSMGE-TC202), from 4th to 7th September 2016, Guimarães, Portugal.**

2nd International Conference on Transportation Geotechnics in Sapporo as one of the remarkable activities of TC202

In 2012, the 2nd International Conference on Transportation Geotechnics (2nd ICTG) took place in the city of Sapporo, Japan from 10th September 2012 to 12th September 2012. It attracted 243 participants from 30 countries and 140 papers were presented. The conference theme of Transportation Geotechnics is recently attracting heavy concern from the engineering discipline because the transportation geotechnics is a new academic framework which pursues practical issues such as design, construction and maintenance management of transportation infrastructure like roads, railways, and airfields.

After the successful first ICTG held at the University of Nottingham, UK, in 2008 under the auspices of the International Technical Committee ISSMGE-TC3 "Geotechnics of Pavements" (currently ISSMGE-TC202), the 2nd ICTG was organized to establish new academic frameworks called "Transportation Geotechnics," focused more to practical issues such as design, construction and maintenance management of transportation infrastructure like roads, railways, and airfields. The main subjects of the 2nd ICTG were:

- Geotechnics for Pavement, Rail Track and Airfield
- Geomaterial, including Nontraditional Materials

MESSAGE FROM TC202
TRANSPORTATION GEOTECHNICS (Continued)

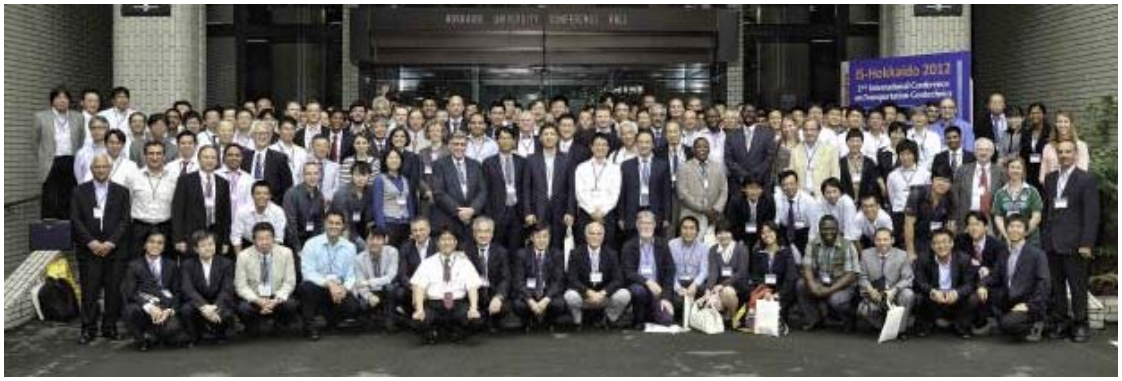
- Asphalt Mixtures and Hydraulically-bound Materials
- Earthworks for Transportation Facilities
- Application of Geosynthetics
- Laboratory Testing and In-situ Testing
- Modeling and Numerical Simulations
- Design, Construction and Maintenance
- Performance Evaluation and Quality Control
- Sustainability of Management and Rehabilitation
- Risk Assessment and Environmental Issues

The invited / Keynote Lecturers were: Prof. António Gomes Correia, University of Minho, Portugal; Prof. Seiichi Miura, Hokkaido University, Japan; Prof. Buddhima Indraratna, University of Wollongong, Australia; Prof. Fumio Tatsuoka, Immediate Past President of IGS, Japan; Prof. Erol Tutumluer, University of Illinois, USA; Prof. Hervé Di Benedetto, University of Lyon, France and Prof. Delwyn G. Fredlund, Golder Associates Ltd, Canada.

Contributed Papers
140 papers were orally presented in the technical sessions, including several special sessions organized in close liaison with ISSMGE-TC101 (Laboratory Stress-Strain Strength Testing of Geomaterials), ISSMGE-TC106 (Unsaturated Soils), and ISSMGE-TC216 (Frost Geotechnics) to discuss some specific issues essential for further developments of Transportation Geotechnics (i.e., unsaturated soils, frost geotechnics and advanced laboratory testing). The topics discussed include: asphalt mixtures and hydraulically bound materials, laboratory testing and in-situ testing, sustainability of management and rehabilitation and risk assessment and environmental issues, applications of geosynthetics in transportation geotechnics including rural road maintenance with geotextile, subbase reinforcement with geogrid, pavement drainage with geocomposite and seismic mitigation with geogrid. Prof. Jun Otani (Chairperson of IGS Technical Committee on soil reinforcement) introduced the on-going activities of the TC.

Before the 2nd ICTG conference, three pre-conference workshops were held on:
Intelligent Compaction. Speakers: Prof. A. Gomes Correia, University of Minho, Portugal; Dr. David White, Iowa State University and Dr. Hiroshi Furuya, Obayashi Corporation.
Challenges in Transportation Geotechnics in Extreme Climates. Speakers: Dr. Seppo Saarelainen, Aalto University, Finland and Dr. Andrew Dawson, University of Nottingham, UK.
Geotechnical Challenges in Rail Track and its Transitional Zones. Speakers: Prof. Peter Woodward, Heriot-Watt University, UK; Prof. K. Giannakos, SALFO & Associates SA, Greece; Dr. Eduardo Fortunato, LNEC, Portugal; Dr. Yasuo Watanabe, East Japan Railway Company, Japan; Dr. Kenji Watanabe, Railway Technical Research Institute, Japan.

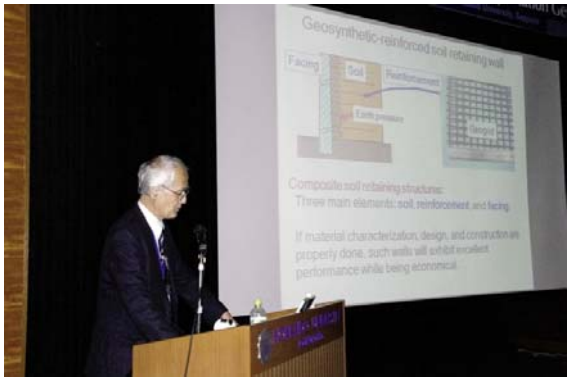
MESSAGE FROM TC202
TRANSPORTATION GEOTECHNICS (Continued)



Group photograph of participants of 2nd ICTG

Opening Ceremony of 2nd ICTG

Opening Ceremony: (from left to right)
Prof. Seiichi Miura, Dr. Toru Sueoka,
Prof. Hiroshi Saeki, Prof. António Gomes Correia,
Prof. Fumio Tatsuoka and Prof. Askar Zhussupbekov



Keynote lecture by Prof. Fumio Tatsuoka

MESSAGE FROM TC202

TRANSPORTATION GEOTECHNICS (Continued)

Welcome Party at the restaurant "ELM" in Hokkaido University

Banquet in Sapporo Grand Hotel

3rd International Conference on Transportation Geotechnics (3rd ICTG)

The next event of this series of conference is planned as what follows. Please save the date.

The Transportation Geotechnics International Conference series began under the auspices of ISSMGE-TC3 and was initiated in 2008 at the University of Nottingham, UK, as an International event designed to address the growing requirements of infrastructure for societies. The 2nd International Conference on Transportation Geotechnics took place in 2012, in Sapporo, Japan, under the ISSMGE-TC202 that follows the TC3 activities for the period 2009-2013. To continue the success of these conferences and the output of ISSMGE-TC202, the 3rd is scheduled for 2016, at Guimarães, Portugal. Following the previous ones, the challenges addressed by this conference will include a better understanding of the interactions of geotechnics on roads, rails, airports, harbours and other ground transportation infrastructure with the goal of providing safe, economic, environmental, reliable and sustainable infrastructures. The 3rd ICTG will be composed of workshops and several types of sessions, as well as a technical exhibition, to better disseminate findings and best practices. A special attention will be paid to the publication of all the peer-reviewed papers, some of them in specialised international journals. On behalf of the organizing committee I am honoured to invite you to the 3rd ICTG in the City of Guimarães, UNESCO World Heritage (September 4-7, 2016).

MESSAGE FROM TC202
TRANSPORTATION GEOTECHNICS (Continued)

Conference venue: University of Minho, vila Flor Cultural Centre

Contact:
Professor António Gomes Correia
University of Minho – School of Engineering – Centre of Territory, Environment and Construction
Campus de Azurém, 4800-058 Guimarães – PORTUGAL Tel.: (+351) 253 510 200 Fax: (+351) 253 510 217

ISSMGE President 1275 Days Report

Distinguished Colleagues, Dear Friends,

This is my forty second progress report after 1275 days as your President. Note that previous reports are on the ISSMGE web site at http://www.issmge.org/en/the-society/the-president/progress-reports. In this report, I will talk to you about our upcoming **webinar**, about the launch of the **e-Lexicon**, and about **publishing a case history in the ISSMGE case histories journal as a charitable contribution**!

Webinars. Our next free webinar will be on the topic of **Geophysical Tests for Geotechnical Site Characterization** and will be presented by **Sebastiano Foti** (Italy) on Wednesday 8May2013 at 3:00 pm, GMT Summer Time (London, GMT+01:00). **Professor Foti** is an international speaker on the topic and has received multiple awards for his work. Do not miss this webinar on a topic which is becoming increasingly important in Geotechnical Engineering. For further information check our web site : http://www.issmge.org/en/conferences-and-events/upcoming-webinars or contact my assistant, Theresa Taeger, at ttaeger@civilmail.tamu.edu. If you missed any of the webinars, you can access the ISSMGE web site at http://www.issmge.org/en/resources/recorded-webinars and listen to the recording at your leisure.

e-Lexicon. I am very pleased to announce the official launch of the Electronic Lexicon or e-Lexicon of ISSMGE on our web site at http://www.issmge.org/en/lexicon. You may recall that the Lexicon was started around 1953 with the translation of geotechnical engineering terms in three languages: English, French, and German. This was very quickly recognized as a very valuable resource and had reached 8 languages by 1981 (5th edition). It had stayed that way until about 3 years ago when I asked **Dimitrios Zekkos** and the Innovation and Development Committee (IDC) to transform the paper copy into an electronic and addressable excel spread sheet and if at all possible increase the number of languages before the end of my Presidency. **Professor Zekkos** and IDC delivered again and we now have an e-Lexicon on our web site with 12 languages. Note that the e-Lexicon was a huge amount of work and is a great example of team work across country borders by many member societies and enabled by a platform developed by Geoengineer.org where I wish to recognize **Kostis Tsantilas**. All those who contributed to making this electronic project a success are acknowledged at http://www.issmge.org/en/resources/lexicon. If for some reason you prefer the 1981 hard copy version, a pdf file of that wonderful red book is on the web site as well. You will find some of the early history of the Lexicon in that red book. The e-Lexicon includes a web-based application that allows users to query the database and find the translation of a total of 1590 geotechnical terms in 12 languages, specifically: English, French, Spanish, Turkish, Chinese (traditional and simple), German, Japanese, Portuguese, Russian, Persian (Farsi), and Finnish. This is an important tool which will allow geotechnical engineers worldwide to translate geotechnical terms in a systematic and more “standardized” manner. Member countries interested in translating the terms in their language and incorporating these terms in the e-Lexicon, should contact the Chair of the IDC, **Dimitrios Zekkos**, at zekkos@geoengineer.org. Different languages across the world are a barrier to communication; this huge amount of e-Lexicon work has made a small dent in diminishing that problem.

ISSMGE President 1275 Days Report (Continued)

Give to those who need help: publish a case history in the IJGCH: In life you have your financial potential and your intellectual potential. You can give to others in need using either one of these two resources. Publishing a case history in the International Journal of Geo-engineering Case Histories can be your intellectual gift to your fellow geotechnical engineers in developing countries. Indeed, in such countries it is difficult for engineers to purchase the expensive though precious top Journals in the world. Since the IJGCH is a free on line Journal (another idea of **Dimitrios Zekkos**), it is easily accessible by anyone regardless of income; in that respect publishing case histories in IJGCH is your intellectual gift to them. Yes, the IJGCH does not yet have the rating that other prestigious journals have acquired over time but it is progressing and will get there. Do consider publishing a case history in the IJGCH as a gift to your less fortunate fellow geotechnical engineers.

Best wishes,

Jean-Louis BRIAUD, PhD, PE
President of ISSMGE

ISSMGE President 1305 Days Report

Distinguished Colleagues, Dear Friends,

This is my forty third progress report after 1305 days as your President. Note that previous reports are on the ISSMGE web site at http://www.issmge.org/en/the-society/the-president/progress-reports if you need them. In this report, I will talk to you about our upcoming webinar, the results of the recent Board meeting at Texas A&M University, including the ISSMGE Awards recipients.

Webinars. Yesterday, we had another very successful webinar by **Sebastiano Foti** (Italy) on **Geophysical Tests for Geotechnical Site Characterization**. Our next free webinar will be presented by **Harry Poulos** (Australia) on Thursday morning 25July2013 (Sydney time) on the topic of "**Meeting the Challenges of Foundation Design for Tall Buildings**". I will send you more precise information on the time of this webinar in my next progress report. You can also find further information on our web site http://www.issmge.org/en/conferences-and-events/upcoming-webinars or by contacting my assistant, **Theresa Taeger**, at ttaeger@civilmail.tamu.edu. If you missed any of the webinars, you can access the ISSMGE web site at http://www.issmge.org/en/resources/recorded-webinars and listen to the recording at your leisure.

Board meeting. The ISSMGE Board met at Texas A&M University recently for a full day meeting. We have a great team of Board members and this gives me a chance to acknowledge their contribution to our society and to mention their names under the photo at the bottom of this email. I selected some of the most important items discussed during the meeting.

1. Decision on the ISSMGE Awards (discussed separately below)
2. Decision on setting up the ISSMGE Foundation as a separate entity from ISSMGE to simplify a number of things
3. Decision on authors copyrights. Here the Board voted to accept the recommendation of **Rainer Massarsch'** task force on copyrights. Basically the ISSMGE position is now that the author gives the publisher the right to publish but retains the copyrights. The details will soon be posted on our web site.
4. Reports by the Board Level Committees (Young members, Corporate Associates, Membership, Innovations, Public Relations, Awards).
5. Report on the progress of the Paris 18th ICSMGE in September.

ISSMGE President 1305 Days Report (Continued)

6. Decision on his or her in the By-laws. The By-Laws have been revised to be gender neutral. This will require a vote of the Council in Paris on 1 September 2013 during the 18th ICSMGE.

Awards decisions. As you may recall, I noticed around 2010 that our Society gave very few awards (5 every 4 years). So we created the Awards Committee (AWAC) to solve that and we now have up to 12 every 4 years. **Francois Schlosser,** chair of AWAC (France) and **Esve Jacobs**, Secretary of AWAC (South Africa) and their committee members worked long and hard to establish the new awards, organize the nomination process, collect the nominations, and make recommendations to the Board. The Board made the final decisions on who would receive the awards but before I tell you who was selected, let me say that I very much appreciate all the work that was done by the people and the societies nominating very deserving members of our profession. Without you and without your work there would be no awards and no one would be proud to win. It is a competition and there can be only one winner but winning is only as valuable as the competition you faced and believe me there was a lot of very tough competition in these awards. Of course that made the awards committee recommendations and the Board decisions very tough but in the end here are the winners. They all have been previously contacted.

- Outstanding Technical Committee: TC on Engineering Practice of Risk Assessment and Management (Chair **K.K. Phoon**, Singapore).
- Outstanding Geotechnical Project: Korea - Busan-Geoje Fixed Link Immersed Tunnel by **Daewoo Company**.
- Outstanding Member Society. The New Zealand Society (President **Gavin Alexander**).
- Outstanding Innovator: **Dimitris Zekkos** (USA).
- Outstanding Young Geotechnical Engineer. **Guillermo Narsilio** (Argentina – Australia).
- Young Member Awards. **Cholachat Rujikiatkamjorn** (Australia) and **Greg Siemens** (Canada).
- Outstanding Public Relations. **Marc Ballouz** (Lebanon).
- Outstanding paper in the Int. J. Geoeng. Case Hist. **Burland J.B., Jamiolkowski M.B., Viggiani C.,** (2009), Leaning Tower of Pisa: Behaviour after Stabilization Operations.

The awards will be given at the Awards Luncheon in Paris at the 18th ICSMGE on 2 September 2013.

ISSMGE President 1305 Days Report (Continued)

The ISSMGE Board

Standing and from left to right are **Samuel Ejezie** (Vice President for Africa), **Ikuo Towhata** (Appointed board member and Editor in Chief of the ISSMGE Bulletin), **Ivan Vanicek** (Vice President for Europe), **Roger Frank** (Appointed board member), **Charles Ng** (Appointed board member), **Roberto Terzariol** (Vice President for North America). Sitting and from left to right are **Askar Zhussupbekov** (Vice President for Asia), **Michael Davies** (Vice President for Australasia, first vice president and treasurer), **Neil Taylor** (Secretary General), Jean-Louis Briaud (President), **Pedro Pinto** (Past President and Editor in chief of the Int. Jour. of Geo-engineering Case Histories), and **Gabriel Auvinet** (Vice President for North America).

Best wishes,
Jean-Louis Briaud
President of ISSMGE
International Society for Soil Mechanics and Geotechnical Engineering

FROM MEMBER SOCIETY
SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING
Geotechnical Division

BACKGROUND

In 1947 the Soil Mechanics and Foundation Engineering Division of the South African Institute of Civil Engineers was founded by Prof J E Jennings. The division consisted of 53 members. The aim of the Division was to promote co-operation amongst scientists and engineers, interchange of knowledge, ideas and results of research and practical work in the sphere of Soil Mechanics and Foundation Engineering and its practical applications in South Africa. The name of the Division changed from "Division of Soil Mechanics and Foundation Engineering" to the "Geotechnical Division" in 1986 to include other specialist fields such as geosynthetics and rock mechanics. The Geotechnical Division's involvement in the ISSMGE includes Vice Presidents for Africa in Prof J. Jennings, B. Kantley, L. Wilson, G. Donaldson and most recently Dr P. Day. The division currently consists of 474 members and 22 committee members.

ACTIVITIES OF THE DIVISION

The SAICE Geotechnical Division hosts various events throughout the year, including conferences, seminars, short courses, technical events and evening lectures. Some notable events hosted by the Division include,

- The Problem Soils Seminar
- 12th African Regional Conference (Durban) and 15th African Regional conference (Maputo, Mozambique), in collaboration with the Mozambican Geotechnical Society.
- The Conference on Mining and Industrial Waste Management is hosted every 4 years since 1988.
- Young Geotechnical Engineers Conferences is hosted every 3 years since1990.
- Various evening lectures and short courses.

The Jennings Lecture was introduced in 2001 to celebrate the significant contribution of the late Professor J E Jennings to geotechnical engineering in South Africa. This is the most prestigious event in geotechnical engineering in South Africa and is presented annually. Recent lectures include John Burland (2012), Roger Frank (2011), and most recently, KK Phoon (2013).

In addition to the various events, the Geotechnical Division works in conjunction with the South African Bureau of Standards (SABS) to produce geotechnical related construction specifications.

As recognition for the contribution of the Geotechnical Division members, the division presents three awards annually,

- The Barry van Wyk Award was instituted to honour the memory of Dr Barry van Wyk, who had contributed significantly to geotechnical engineering in South Africa, both as a teacher and a practitioner. The award is presented to the author or authors of the best final-year dissertation on a geotechnical topic at a South African University or University of Technology. Nominations for the award are called for, but it is awarded only when the standard is considered suitably high enough to warrant this prestigious award.
- The Jennings Award is made to honour the late Prof J E Jennings and the outstanding role he played in the development of geotechnical engineering in South Africa. It takes the form of a certificate, which is given to the author of a meritorious publication that is relevant to geotechnical engineering in South Africa published either in South Africa or internationally. The award is presented only when there is a worthy recipient.

The South African Geotechnical Medal was instituted by the Division in 1989 as a life-time achievement award to honour members of SAICE who made a significant contribution to geotechnical engineering in South Africa. It may be awarded posthumously.

FROM MEMBER SOCIETY

SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING

Geotechnical Division (Continued)

INTERESTING PROJECTS IN SOUTH AFRICA
GAUTRAIN

The Gautrain is a high speed railway system that is 80km in length connecting Johannesburg, Pretoria and the OR Tambo International Airport. Fifteen kilometers was constructed in tunnel between Park in central Johannesburg and Marlboro Gardens, with eight deep shafts and three underground stations. The balance of the link, with seven further stations, was constructed above ground on earth embankments and within cuttings requiring a total of 6 million m^3 of earthwork and on 15km of viaducts and bridges.

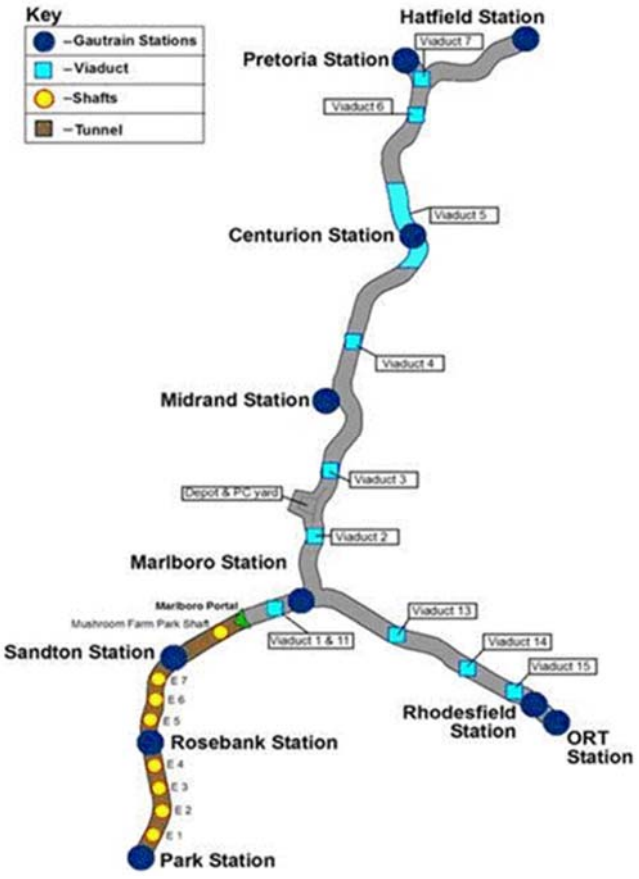


Figure 1 – Schematic presentation of Gautrain route

FROM MEMBER SOCIETY
SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING
Geotechnical Division (Continued)

Route geology

The tunnel section of the route was constructed through very strong Halfway House granite and Witwatersrand quartzite/shale formations. Very high rock strengths of up to 480 MPa were anticipated.

The above ground section North of the tunnel portal at Marlboro Gardens was constructed over granite, andesite, quartzite, shale and the particularly challenging dolomites.

The dolomite challenge

Between Centurion and Pretoria, in the northern section of the route, the rail alignment traverses about 16km of dolomitic ground of which 5.8km will be on viaducts with the remaining portion constructed at ground level.

The dolomite stratum below the Gautrain route is 2500 million years old. The current topography and ground conditions have developed very slowly over a very long period of time making them distinctive in character, with landforms, processes and geohazards that are unlike those on most dolomitic / limestone terrains elsewhere in the world.

As a result of their chemical composition the dolomites are susceptible to natural erosion by dissolution resulting from the percolation of rainwater and flow of sub-surface water which commences with the enlargement of natural joints in the bedrock. The long period of weathering (which may have lasted 1300 million years) has resulted in the formation of a thick and complex residual soil mantle of manganese-rich residuum known as Wad overlying the rock. Wad is a low density, weak material that is highly erodable and compressible. The long process of solution weathering has not affected the silica (chert) component of the dolomite sequence resulting in the very strong chert remaining in the wad in discrete bands ranging from several millimeters to a meter thick.

The bedrock topography of the strong dolomite rock, below the weathered material, consists of a succession of rock pinnacles. These pinnacles are generally between 10m and 20m tall, but variations in bedrock of up to 30m or more can be found in boreholes drilled 10m apart. The depth of the solid rock can range from a few meters below the ground surface to depths greater than 100m. In Figure 2 below rock pinnacles are shown exposed close to the surface in a local quarry. This photograph clearly shows the extreme change in rock level over a short distance.

Figure 2: Dolomite Pinnacle Exposure in Quarry

FROM MEMBER SOCIETY
SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING
Geotechnical Division (Continued)

Floaters, or very large boulders of solid rock, are also present; these are isolated blocks of detached dolomite that are now surrounded by soil.

The challenge to construction

The challenges of constructing the rapid rail link over the dolomites were numerous.

One of the major challenges was to ensure the quality of the viaduct foundations along the route underlain by dolomite. The foundation systems selected overcame the defined geohazards, including extreme variability of rock level, the effect of the very loose wad material overlying the rock containing large boulders and extremely strong chert layers and also the effect of sinkholes which can occur where surface or ground water is incorrectly managed.

The design of such foundation systems required a thorough understanding of the properties of the soils and rock. Obtaining parameters for design has been a unique challenge for the project team as development on such ground conditions has, in the past, been kept to a minimum. The dolomite soils are highly heterogeneous comprising both very soft and very hard material. In situ testing and obtaining representative samples for laboratory testing is not easily accomplished and current practice is to rely to a great extent on past experience.

To overcome these challenges and to ensure a robust and buildable foundation solution Bombela Civil Joint Venture has brought together a team of international and local South African experts in the fields of geology, ground investigation, foundation design and construction.

Investigation works

The difficulty to investigate, sample and test the materials for geotechnical design is increased by the materials variability with the most sensitive materials often found at considerable depth above and below the ground water table.

Ground investigations at project feasibility and preliminary design stages were carried out using a combination of gravimetric surveys and boreholes drilled by conventional percussive methods together with remote techniques including airborne geophysical techniques (EM & Magnetic), localised refraction and electrical surveys.

For the detailed design ground investigation phase it was therefore recognised that a significant effort would have to be made to obtain reliable geotechnical data for design of the sensitive viaduct structures. The basis of the detailed design investigation was to employ numerous robust investigation techniques in an attempt to obtain consistency between methods and hence a consistent site wide representative data set. This includes Reverse Circulation and Symmetrix drilling used in combination with remote sensing techniques. The viaduct ground investigation works were carried out by Dura Soletanche Bachy – Geomechanics Joint Venture who operated, at the peak of production, 5 drilling rigs to meet the tight project program. More than 450 boreholes were drilled during the first phase over a period of 7 months.

The section of the route through the dolomites outside the Centurion CBD was investigated by a second drilling team, namely DGS Drilling Consortium, a JV formed between Franki Africa, Geomechanics and Duma Investments. The additional investigation included more than 100 percussion boreholes and 35 rotary core holes.

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Geotechnical Division (Continued)

In addition to all the drilling works performed specialised testing has also been carried out, some being the first example of such testing in dolomitic conditions in the world. These tests include Cone Penetration Testing (CPT) carried out by Prof. E. Rust from Pretoria University, Pressuremetre Testing carried out under the supervision of Soletanche Bachy and Continuous Surface Wave testing carried out by Prof. G. Heymann also from Pretoria University. All 3 techniques were implemented to further add to the characterization of geotechnical design parameters particularly from the very soft wad materials and the more stiff clay and chert layers.

One of the major design challenges was to obtain large but undisturbed samples of the very soft/loose wad material from depth for laboratory testing. Previous investigations have managed to obtain and test samples from surface exposures but from depth the only samples recovered have been those from the percussive drilling air flush which were not suitable for sophisticated testing. For Gautrain this challenge was overcome by utilizing a powerful auger rig equipped with a 900 m flight which was able to excavate down to 20m in the wad materials. Safe access to the hole for testing and sampling was achieved using a full depth steel casing with windows cut in the side together with safety lines and emergency air supplies.

A series of full scale tests were undertaken namely:

- Load test in the Centurion area. The test comprises loading the ground using 1,000 stacked concrete blocks each weighing 10 ton. As loading progresses measurements of the settlement of the blocks are made to better understand the overall response of the ground to the loading.
- Pile load tests, where 15m long piles are installed into the ground and loaded both vertically and horizontally with measurement made of pile deflection and stress in the pile reinforcement. Back analysis of this data provides reliable geotechnical parameters for the detailed design.
- Grouting trials have also been carried out to verify the methods and efficiency of injecting the ground with a grout to fill up existing voids in the rock and overlying deposits. Various drill hole layouts and different consistencies of grout have been used to achieve optimal performance in addition to the implementation of sophisticated grout parameter recorder instrumentation and post treatment testing using loading, pressuremeter and CPT.

Figure 3 – Full Scale Loading Test

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Geotechnical Division (Continued)

Underground works

The underground section of the Gautrain is approximately 15 kilometers long with the majority constructed using drill and blast tunneling technique.

Several holes are drilled into the rock. These are then filled with explosives. The explosives are detonated. The explosion causes the rock to collapse and this lengthens the distance of the tunnel. The circular shape of the tunnel is achieved by carefully calculating the position and the depth of each hole to be drilled. The shape of the tunnel is also affected by the timing of each explosion. The drill and blast process is repeated until the desired length of the tunnel is reached.

Due to the complex underground conditions south of Rosebank along Oxford Road, the underground section was constructed using a Tunnel Boring Machine (TBM). Geology in this area is affected by a high water table as well as different degrees of hard rock, sand and soft, water clogged soil and required custom built Mixed Face Earth Pressure Balance Shield TBM for Gautrain. The TBM, named Imbokodo, will bore a three kilometre long tunnel with an excavated diameter of 6.8m and a minimum ground cover of 15m at some places.

Foundation solutions

Various foundation types are utilized over the dolomite section depending on the local geological conditions encountered:

Where bedrock occurs at shallow depth, conventional pad footings on dolomite bedrock/pinnacles with the use of a specially constructed mass concrete “mattress” are considered. Foundation proofing (by means of small diameter probe drilling) is required to ensure that founding takes place on rooted bedrock in all instances.

In areas of deeper bedrock (either above or below the water table) the following solutions are considered:

- Viaduct pier founded on a raft bearing onto the in situ soil, with grouting of voids and cavities to reduce the risk of sinkhole occurrence to an acceptable level.
- Viaduct pier founded on a raft located on a dynamically compacted soil mattress overlying lower dolomite residuum improved by means of grouting of voids and cavities to reduce the risk of sinkhole occurrence to an acceptable level.
- Viaduct pier founded on a piled raft bearing onto lower lying dolomite residuum with grouting of voids and cavities to reduce the risk of sinkhole occurrence to an acceptable level.
- End-bearing piles socketed into hard dolomite bedrock.
- Large diameter shaft socketed into hard dolomite bedrock.

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Raft Foundations

So-called raft foundations are essentially large pad footings "floating" in a soil mass (as opposed to sitting on bedrock). Often the soil mass is subjected to some form of pre-treatment to improve its density and strength (see below) or the raft may in fact itself be piled with the piles extending down to a more competent founding horizon. Different raft foundations options are considered as follows:

- Raft spanning between pinnacles (possibly with concrete infilling between pinnacles);
- Raft on improved soil (bedrock less than 15 m below ground) and grouting of voids and cavities to reduce the risk of sinkhole formation;
- Raft (with or without soil improvement) and grouting of voids and cavities to reduce the risk of sinkhole formation;

Methods of soil improvement applied include:

- Conventional mechanical roller compaction,
- Dynamic compaction. Compaction of the ground by repeated lifting and dropping of purpose made steel pounders by means of a crane.
- Preloading. Preloading is achieved by applying a surcharge load on the soil using concrete blocks. The surcharge loads are similar to those that would be imposed by an actual viaduct foundation. The surcharge typically comprises 1000 concrete blocks each weighing about 10 tons and specially manufactured for the purpose.

Pile Foundations

This type of foundation consists of circular reinforced concrete piles socketed into the hard dolomite bedrock. Piled foundations to rock are generally not favoured in dolomitic conditions due to serious installation constraints relating to the presence of chert bands and hard rock "floaters" within the dolomite residuum and also due to the depth and pinnacled nature of the bedrock. Nonetheless, in areas where space is a significant constraint (e.g. road intersections, close to roads or other major services) the use of piles to rock is considered.

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Geotechnical Division (Continued)

Shafts

In several instances on the balanced cantilever viaducts (where the foundation loads are higher due to their greater spans) 7m diameter shafts have been excavated down to bedrock. These are concrete lined and socketed into the hard dolomite bedrock up to 30m below surface.

RESEARCH AND DEVELOPMENT

The Department of Civil Engineering of the University of Pretoria acquired a 150g-tonne centrifuge. The centrifuge model platform measures 0.9m x 0.8m with unobstructed headroom of 1.3m. The radius, measured from the centrifuge axis to the model platform, is 3 m. This is the first geotechnical centrifuge in sub-Saharan Africa and is currently the largest in the southern hemisphere.

The centrifuge was manufactured by the French company Actidyn, located just outside Paris. The centrifuge was transported from France by sea and was delivered to Durban harbour from where it was transported to Pretoria by train. From the freight depot it was transported to UP by a crane truck. The 16-ton machine was offloaded in front of the heavy machine laboratories where it was hauled into position under an existing crane beam before being lifted and then lowered into the civil engineering laboratory basement.

Due to the dangers associated with accelerating models weighing up to 1 ton to 150 times earth's gravity, the centrifuge was installed in a heavily reinforced concrete chamber. The containment walls were designed to absorb an impact associated with catastrophic failure of the centrifuge's hinges, implying an impact load from 1 ton mass released at 240km/h. The reinforced concrete chamber was designed by Jones & Wagener Consulting Civil Engineers and was constructed by Stefanutti Stocks. In addition, the reinforcement steel was donated by Steeledale Reinforcing, the special shuttering by Wiehahn Formwork and Scaffolding, and the special high-slump concrete by Lafarge. The electricity supply to the centrifuge was designed by Claassen Auret Incorporated, and the cooling system by Spoormaker & Partners.

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The centrifuge chamber is closed off with a curved door, manufactured from stainless steel by the technical staff of the civil engineering laboratories. The purpose of this door is to complete the circular circumference of the centrifuge chamber, and its function is therefore primarily aerodynamic in nature. Due to its light construction, a second steel-reinforced containment wall was constructed outside this door to ensure the safety of persons working in the centrifuge laboratory. A roller shutter door prevents access to the main centrifuge door during operation. The centrifuge is powered by two electric motors with a combined maximum power consumption of 120kW. As all the heat from the drive motors will be released in the centrifuge chamber during operation, a cooling system of equal capacity was installed. Cold air is introduced to the centrifuge chamber via a circular opening in the roof, and air is extracted from the floor of the chamber before being cooled and circulated back into the chamber.

Testing of soil models on the geotechnical centrifuge is accomplished with the aid of remote-controlled actuators, and observations are made using a state-of-the-art data acquisition system. The centrifuge is equipped with electric slip rings, as well as hydraulic and pneumatic lines, via a slip ring stack rated to 10 Bar. This can be used to control various types of actuators to carry out many kinds of experiments during physical model studies on the centrifuge. The data acquisition system was developed and manufactured by the Centre for Offshore Foundations Systems located at the University of Western Australia in Perth. The system has a total of 24 channels, which can log a variety of instrument types up to a frequency of 1MHz for short periods. Data logged at slower frequencies, or data from, for example onboard cameras, can be streamed in real time via a fibre-optic rotary network connection or a standard wireless link to the data acquisition computers located in an adjacent control room.

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Geotechnical Division (Continued)

Existing and planned research includes the following:

- The study of dolomitic sinkholes to assess the effects of these sinkholes on various foundation types and structures. Scope also exists to investigate sinkhole rehabilitation methods. New sinkholes open up regularly in the Centurion area and need to be closed quickly to limit danger to the public. During the construction of the Gautrain viaduct through Centurion, large-scale surcharge trials were carried out to measure the compressibility of the dolomitic soils on which the viaduct had to be founded. The back analysis of the settlement measurements was a complex undertaking that required many assumptions to be made. The behaviour of the surcharge loads will now be modeled in the geotechnical centrifuge, which will entail settlement and soil compressibility being measured and compared. This may have important applications for future projects when construction has to be carried out on dolomitic soils.
- Another common problem in civil engineering is one that relates to urban water distribution systems. Such systems often rely on large diameter, thin-walled, buried pipelines. The stability of such pipes, when buried in trenches or under fill embankments, requires further research. The University is investigating to what extent the load imposed on these pipes by the ground can cause deformations on the pipes, and how this pressure influences the stability of the soil-pipe system.
- The machine will also enhance the Department of Civil Engineering's seismic investigation techniques, which were developed at the University to measure the small-strain stiffness of soil by means of seismic methods. These techniques are now used routinely by many consulting engineers in the design of foundations. However, the correct compressibility that should be used in the calculation of foundation settlement is yet to be researched.

REHABILITATION OF ROAD FOLLOWING THE OCCURANCE OF SINKHOLES

A 15km section of the N14 north of Carletonville was closed and traffic diverted along existing roads following the occurrence of a number of sinkholes on the road shoulder. Three sinkholes occurred on the road shoulder between late December 2007 and early January 2008. Two sinkholes (each about 10m in diameter) formed on either side of a box culvert and another on the opposite side of the road (about 4m in diameter) from the former sinkholes.

The two sinkholes that formed on either side of the culvert:
Preliminary work

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Geotechnical Division (Continued)

A surface reconnaissance in the vicinity of the sinkholes was undertaken and exploratory drilling was carried out in the sinkhole area. The drilling results confirmed the presence of cavities in the weathered stratum (dolomite residuum) above the groundwater level. No mitigating factors are present. Several sinkholes that cannot be attributed to concentrated surface water ingress have occurred in the area, indicating that draw-down of the groundwater level has possibly taken place. Potential trigger mechanisms therefore include surface water ingress, lowering of the groundwater level, and gravity. According to the terminology in use, two inherent susceptibility classes occur across the rehabilitation area:

- A medium likelihood for large sinkholes (HSC 4)
- A high likelihood for large sinkholes (HSC 8)

Rehabilitation

The methods used for rehabilitation includes:

- Dynamic compaction (DC): Accepted practice, requires that sinkholes are rehabilitated according to the inverted filter method using dynamic compaction which will in turn also reduce the permeability of near-surface materials.
- Compaction grouting – cavity filling: The primary borehole grid of 3.4m x 3.4m was designed to allow intersection of any cavity equal to or larger than 5m in plan dimension. Secondary boreholes were inserted on the diagonals of the original grid where significant grout takes occurred in primary boreholes, especially where the maximum volume criteria were achieved at less than the termination pressure.

The total grout area is 525m^2 in extent. With the average depth to bedrock of 18m, the volume of the grout space is 9 450m^3. Based on the total grout take to date of 295m^3, the percentage of the grout space that was filled by grout is about 3%.

Significant grout takes were recorded from about 10m, with the majority of high takes occurring from about 17m depth. Significantly, this level coincides approximately with the average depth to dolomite bedrock (18m). This reflects the reality that cavities are most common immediately above dolomite bedrock. High grout takes per meter occur uninterrupted for an interval of at least 10m in the boreholes with the highest grout takes.

The Gautrans–SANRAL-Aurecon collaboration on the rehabilitation was successful in meeting the rehabilitation challenges with appropriate actions. The actions were as follows:

- Sinkhole backfilling using the inverted filter method and DC (addresses mechanism of sinkhole formation),
- Compaction of the wider area using Dynamic Compaction,
- Cavity filling through compaction grouting (applicability validated by high grout intakes) and
- Improved drainage measures.

Drainage provision is a critical element in mitigating the risk of surface water ingress via trapezoidal concrete-lined side drains and a concrete inlet structure and spilling basin.

The editor-in-chief of the Bulletin expresses his deepest thanks to this wonderful contribution from the South African member society. For sure, this article was made through collaboration of many distinguished individual members.

TECHNICAL ARTICLE
ECOLOGICAL GEOTECHNICS

S. Sassa[1], Y. Watabe[1], S. Yang[2] and T. Kuwae[1]
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This technical article introduces a new cross-disciplinary research field which we call "Ecological Geotechnics" (Sassa and Watabe, 2007, 2008, 2009a,b; Kuwae et al., 2010; Watabe and Sassa, 2008, 2012; Sassa et al., 2011, 2013). Recent findings about the salient geophysics involved in intertidal sediments have made it possible to closely investigate the linkage between the waterfront geoenvironment and ecology of intertidal flats. The results of a comprehensive set of field observations, surveys and controlled laboratory experiments demonstrated that the waterfront suction, which has remained thus far unexplored in soil mechanics, and the associated geoenvironments govern the performances of the basic living activities of various representative creatures involving crabs, bivalves and birds. Furthermore, these results have been substantiated in light of a successful habitat restoration project showing that such waterfront geoenvironment plays a pivotal role in the habitat selection for the benthos diversity. These findings are expected to facilitate a new horizon of the performance-based geoenvironmental assessment, design and management for the conservation and restoration of habitats with rich natural ecosystems in intertidal zones.

Waterfront suction and related geoenvironments in intertidal flats

The suction in intertidal flat soil is unique and different from conventional suction as commonly dealt with in unsaturated soil mechanics. In fact, it is waterfront suction that develops and changes in essentially saturated states below the air-entry suction of the soil (Sassa and Watabe, 2007).

The dynamics of such waterfront suction in association with tide-induced groundwater level fluctuations bring about a significant cyclic elastoplastic contraction in repeatedly exposed, yet saturated soils. The effects of suction dynamics that represent suction development and suction dynamics-induced soil compaction give rise to distinct variations in the surface shear strengths of the soils, as typified in Fig. 1. Namely, the vane shear strengths (VSS) had strong correlations with suctions s at all four intertidal flats ($r^2 > 0.9$, $p < 0.0001$), showing 20- to 50-fold increases in the shear strengths due to suction.

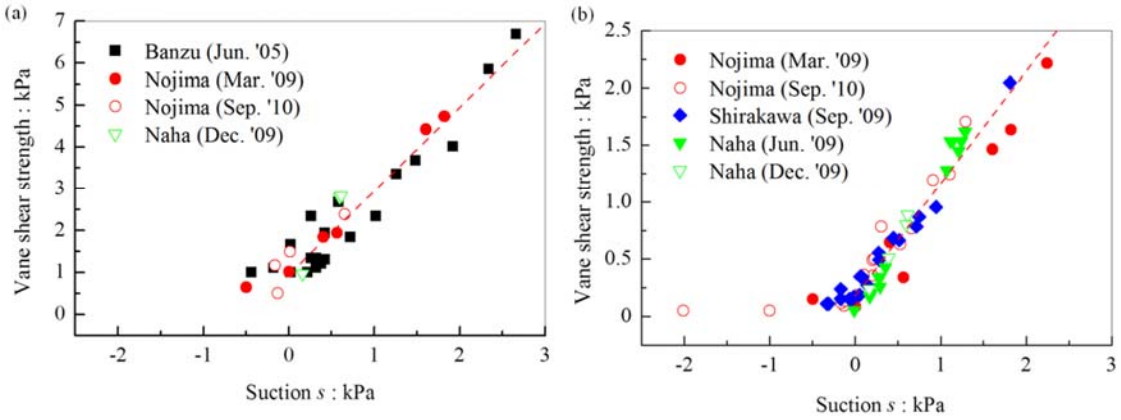

Figure 1. Measured relationships between suction s at the level of soil surface and vane shear strengths (VSS) at two different soil depths: (a) $0 \geq z \geq -0.04$m in the Banzu, Nojima and Naha intertidal flats ($VSS = 1.999s + 0.944$, $R^2 = 0.910$, $p < 0.0001$) and (b) $0 \geq z \geq -0.01$m in the Nojima, Shirakawa and Naha intertidal flats ($VSS = 0.985s + 0.177$, $R^2 = 0.925$, $p < 0.0001$).

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

The diverse roles of such waterfront suction and the associated geotechnical environmental conditions in the activities of crabs, bivalves, and birds as well as in biodiversity are illustrated below.

Role of geoenvironmental conditions in burrowing activity of crabs

The burrowing activities of sand-bubbler crabs were closely associated with the variation of suction in the soil. In fact, the results of the field observations, as shown in Fig. 2, demonstrated that the initial development of suction was the trigger responsible for the onset of burrowing activity. This means that the crab took advantage of the effective cohesion produced by the presence of suction, which enabled burrowing activity in the sandy soil that previously had no inherent cohesion. Indeed, the observed total collapse of the sand balls (Fig. 2) on the soil surface upon submergence indicates that the sandy soil cannot support itself in the absence of suction. In addition, there was a close link between the progress of the burrowing activity and the state of the suction in the soil.

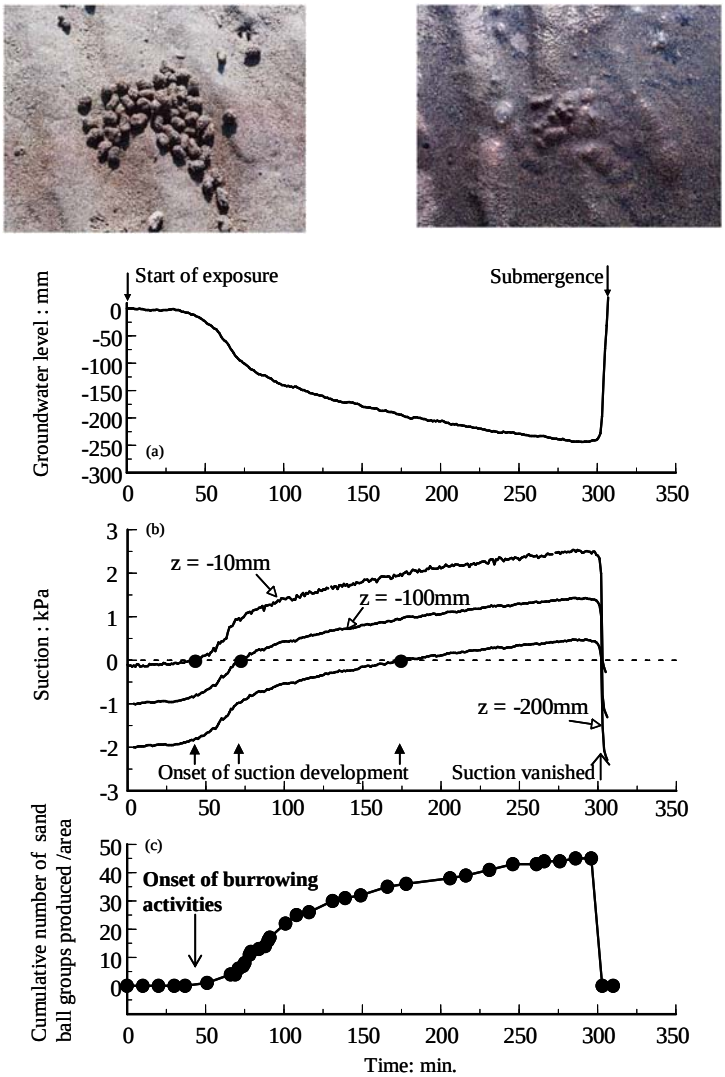

Figure 2. Results of the field observations showing the linkage between suction in association with groundwater level and burrowing activity of sand bubbler crabs, *Scopimera globosa*. The photographs show the sand balls produced by the crabs after the start of exposure (left) and their total collapse at the time of submergence due to the vanishment of suction (right).

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

The results of controlled laboratory experiments, as shown in Fig. 3, also demonstrate that the burrowing activity of the crabs depended strongly on the state of suction in association with the groundwater level. Notably, under a given soil relative density, the burrows started to develop once suction was present and reached peak depths, but declined rapidly with an increase in suction. This stemmed from the tradeoff relationship due to the contrasting effects of suction. Namely, the effective cohesion produced by the suction made burrowing physically possible, but the suction-induced enhanced shear strength made the burrowing more difficult, yielding an optimum state OP^A and a critical state CR for the burrow development above the groundwater level. With increasing soil relative density, the burrow depths became much shallower. Interestingly, there were two optimum states OP^A and OP^B for the burrow development, depending on two distinctive regions of burrowing activity above and below the groundwater level, as illustrated in Fig. 3. This means that once the burrowing reaches the groundwater level, the crab shifted its burrowing mode to a closed cavity containing entrapped air and the crab itself. Then, the crab further descended by an amount that depended on the shear strength in the absence of suction, namely, only on the soil relative density, thereby giving rise to the optimum state OP^B below the groundwater level, as shown in Fig. 3.

Notably, all of the optimum and critical geotechnical states for the burrow development occurred according to the state-particular shear strengths as functions of both suction and soil relative density according to the function VSS = VSS (s, D_r).

Overall, the above results demonstrated that the performance of the burrowing activities of the crabs was in fact governed by the suction, voids, and shear strength of the intertidal flat soils.

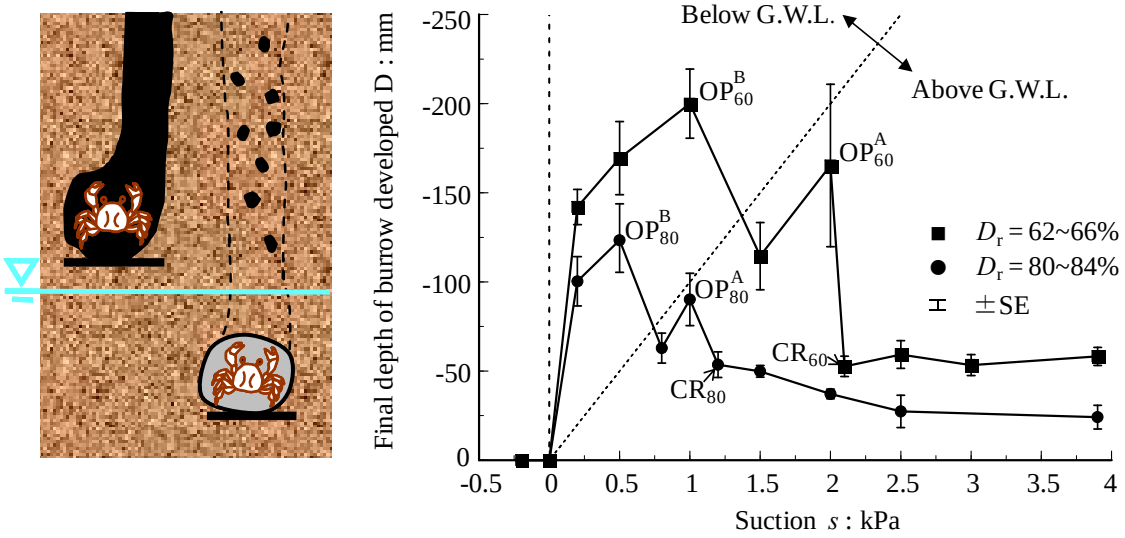

Figure 3. Results of the burrowing experiments of sand bubbler crabs, *Scopimera globosa*, showing the linkage between burrow development, suction and related geotechnical environments. The symbols OP^A and OP^B denote the optimum geotechnical states for the development of burrows above and below the groundwater level (G.W.L.), respectively. The symbol CR denotes the critical geotechnical state for the development of burrows.

TECHNICAL ARTICLE
ECOLOGICAL GEOTECHNICS (Continued)

Role of geoenvironmental conditions in burrowing activity of bivalves

The juvenile to adult bivalves, *Ruditapes philippinarum,* showed more acute sensitivities in their responses to a range of geotechnical environmental conditions. The bivalve *Ruditapes philippinarum,* the Manila clam, inhabits intertidal sandy flats and is commercially important to the fishery industry not only in Japan, but also in other countries. The observed typical characteristics of the burrowing activities are illustrated in Fig. 4. One can see in Fig. 4(b) that in the successful cases, the bivalve inserted its foot and then burrowed essentially vertically and buried itself underneath the soil surface. By contrast, Fig. 4(c) represents the situation where the bivalve exhibited inclined and partial burrowing. Finally, Fig. 4(d) corresponds to the situation where burrowing was physically impossible. Under such a situation, the bivalves often bent their feet and rebounded from the soil surface.

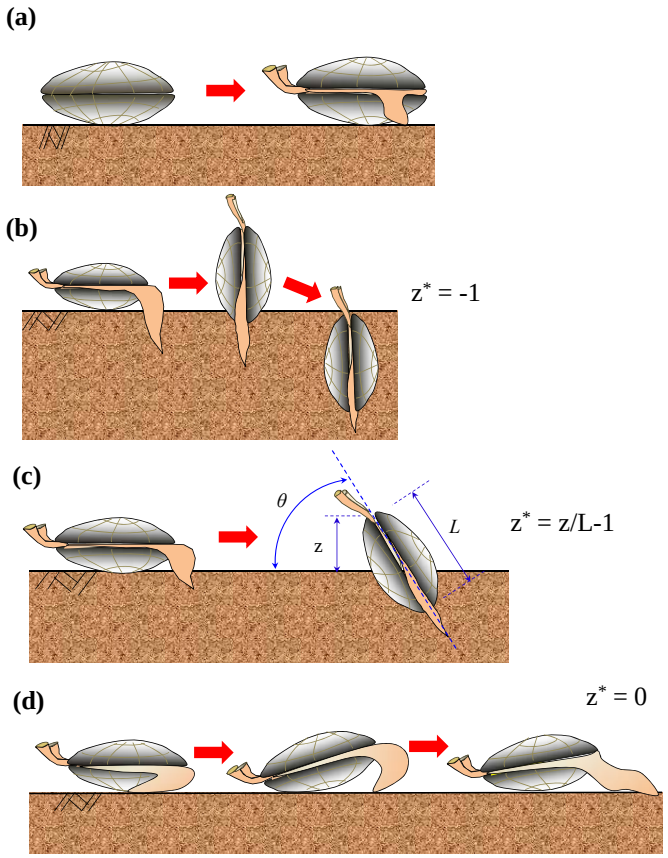

Figure 4. (a) Starting condition for each individual in the burrowing experiments of the bivalve, *Ruditapes philippinarum*. (b) Observed typical processes of complete vertical burrowing. (c) Definition of normalized burrowing depth z^* and burrowing angle θ, showing the state of inclined and partial burrowing. (d) Observed typical processes where burrowing was impossible, showing bending of foot and rebounding from soil surface.

TECHNICAL ARTICLE
ECOLOGICAL GEOTECHNICS (Continued)

Figure 5 shows the observed burrowing responses of the juvenile to adult *R. philippinarum* to varying surface shear strengths of intertidal flat soils. In Fig. 5(a), all of the juvenile bivalves completed vertical burrowing, at a low surface shear strength. However, with increasing surface shear strength, the bivalves started to shift their burrowing modes, showing inclined complete burrowing, and then inclined partial burrowing. Indeed, the burrowing depth and the burrowing angle decreased significantly with increasing surface shear strength. Eventually, when the shear strength reached a certain value, all of the juvenile bivalves reached the non-burrowing state.

The results that was described above indicate that there exist two burrowing criteria below or above which the bivalves accomplished vertical burrowing or failed to burrow, respectively. Such burrowing criteria and burrowing mode shift can also be confirmed from the observed bivalve responses at different stages of growth (Fig. 5(b)-(e)).

The observed continuous decrease in the burrowing angle and depth with increasing shear strength can be explained in such a way that the bivalves consistently shifted their burrowing modes in order to compensate for an excessive burrowing energy above their capacity, since the inclined insertion with decreasing angle and depth requires less energy under given shear strength of the soil. A notable difference in the observed bivalve responses with different growth stages was that both the burrowing depth and burrowing angle were different depending on the shell length. In fact, the adult bivalves did not exhibit the vertical burrowing regime even under the lowest surface shear strength corresponding to loosely packed submerged soils. This indicates decreasing burrowing capability toward adult stages with increasing shell lengths.

Overall, the above results clearly indicate that the performance of the burrowing activities of the bivalves depended strongly on the surface shear strengths as functions of suctions and relative densities of the intertidal flat soils.

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

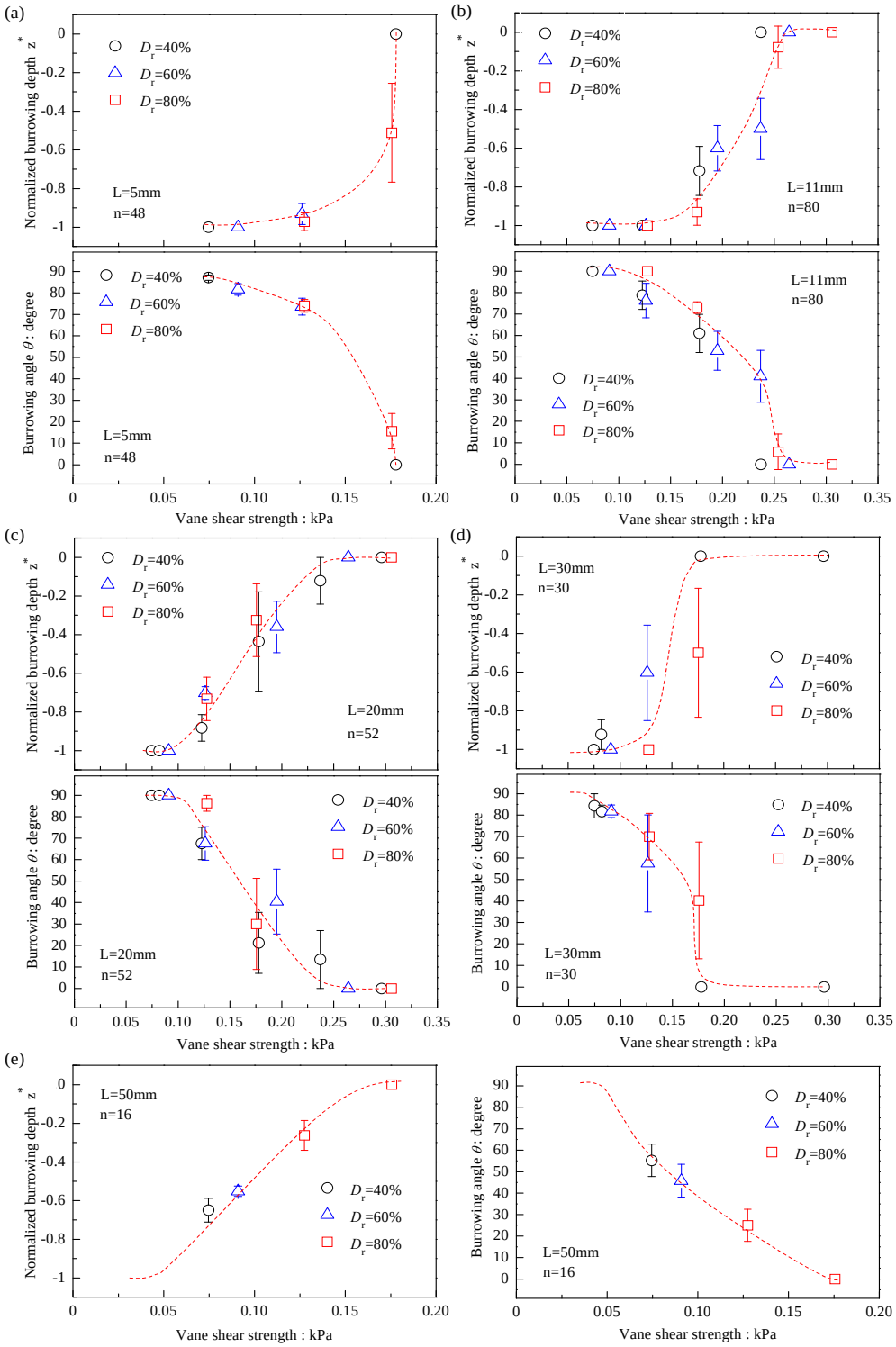

Figure 5. Results of the burrowing experiments of *Ruditapes philippinarum*, showing the burrowing criteria and burrowing mode adjustment for the five different stages of growth: (a) L = 5 mm, (b) L = 11 mm, (c) L = 20 mm, (d) L = 30 mm, and (e) L = 50 mm. The data represent mean values ± SE.

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

Role of geoenvironmental conditions in foraging activity of birds

Birds constitute an important element of coastal ecosystems and biodiversity. The foraging actions of birds can be classified as “pecking” (a single touch of the bill tip to the soil surface) or “probing” (a single insertion of the bill tip into the soil and retraction, or rapid multiple movements with the bill tip below the soil surface), as shown in Fig. 6. Probing typically achieves more successful intake rates and energetically and nutritionally richer food sources than pecking.

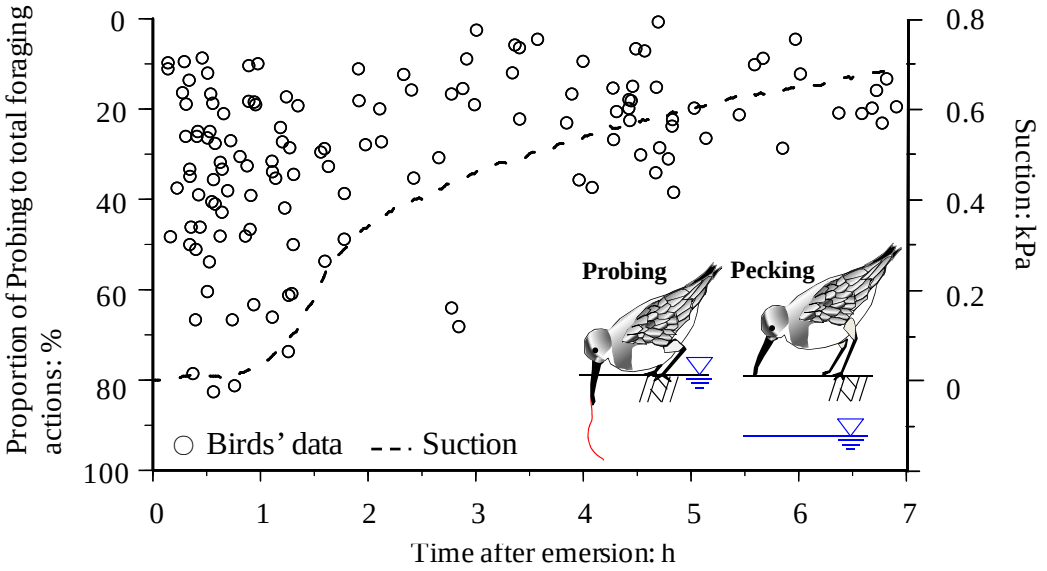

Figure 6. Results of the field observations showing the linkage between suction and foraging activity of shorebirds, *Calidris alpina*.

Filed observations showed that the foraging activities were closely associated with the variation of suction in the soil. Namely, the proportion of probing to total foraging actions decreased markedly with increasing suction after emersion. In fact, the proportion of probing declined to as low as 20%, when suction developed to 0.7kPa at the level of the soil surface. This magnitude of suction development brought about the three-fold increase of the shear strength in the soil depth equivalent with the bill length, i.e. 40mm, and more than ten-fold increase in the soil surface layer, in view of Fig. 1. This indicates that the birds shifted their foraging modes to pecking in response to the increasing shear strengths due to suction, which exerted constrains or limits for probing, thus giving rise to the suitable and critical conditions for the foraging activities of birds.

Overall, the above results demonstrate that the performance of the foraging activities of the shorebirds was closely linked with the waterfront suction and associated shear strengths of the intertidal flat soils.

TECHNICAL ARTICLE
ECOLOGICAL GEOTECHNICS (Continued)

Discussion: a successful habitat restoration project

The above-described results indicate that for a given species of creatures, there exist suitable geoenvironmental conditions favorable to their basic living activities. Indeed, the waterfront suction and the associated geotechnical environments have been shown to be responsible for the manifestations of the suitable and critical conditions for the burrowing activities of crabs and bivalves and the foraging activities of birds. Their implications for the species survival, distributions and biodiversity are discussed below.

Burrows need to be sufficiently deep in order to fulfill their functions. If the burrows are limited to the level of the uppermost sediment, say $z \geq -50$ mm, the crabs would be readily exposed to risks such as surface transport, predators, and direct rays of the sun. In fact, summer temperatures in such shallow depths may exceed the upper lethal limits of the crabs. The critical geotechnical state (CR) could generate such fatal situations, or the crabs would simply not select the soils in that state. By contrast, the optimum geotechnical states (OP) can facilitate the development of burrows. Such well-developed burrows are particularly important for some female crabs in their breeding cycle.

Similarly, under conditions where burrowing fails to take place, the bivalves become exposed at the soil surface. Hence, they can be easily transported away offshore or onshore by waves and currents and are exposed to fatal risks from predators and also from direct sunlight, all of which reduce the chances of survival.

Figure 7. A typical scene of people gathering the shellfish *Ruditapes philippinarum* at the Nojima intertidal flat. The flat has repeated bar/trough regions where the bars are exposed and the troughs are submerged during low tide. The shellfish gathering took place at the vicinity of the water's edge.

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

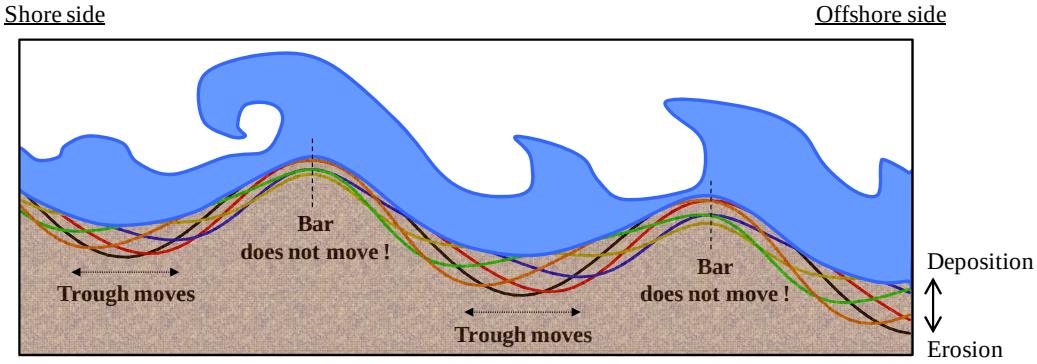

Figure 8. Bar-trough intertidal sediments showing the persistence of habitats due to the feedback between sediment transport and suction-dynamics effects

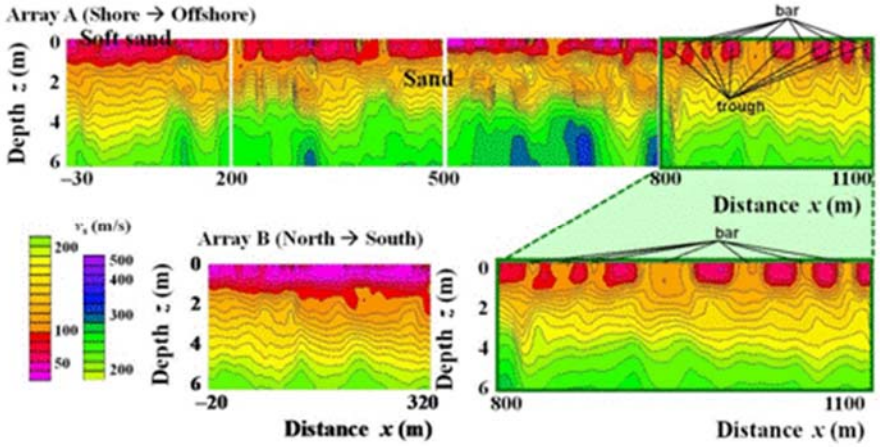

Figure 9. Bar-trough stratigraphy at Banzu intertidal sandflat identified by the MASW (Multichannel Analysis of Surface Waves). The suction dynamics-induced soil compaction yield high shear wave velocities at the bars.

In view of their distributions, the above results demonstrate that the presence of suction is an essential threshold condition for a burrow to be formed. Since whether or not suction may develop strongly depends on the local topographical features, the distributions of suction are closely linked with the distributions of *S. globosa.*, which shows particular preference in space. For the bivalves with specific siphon lengths, vertical burrowing, which has a deeper center of gravity than any inclined or partial burrowing, can assure the stability of bivalves in soils, thus minimizing the fatal risks stated above. Such suitable conditions represented looser states of submerged soils with D_r < 40% for the adult *R. philippinarum*. This accounts for their popular concentrated distributions at the water's edge of bar-trough intertidal sediments (Figs. 7-9) or the lower intertidal zone, where the soils remain loose since suction does not develop during the course of the tides. Such waterfront geoenvironment was also particularly favorable for the foraging activity of shorebirds.

TECHNICAL ARTICLE

ECOLOGICAL GEOTECHNICS (Continued)

Since the suitable and critical geoenvironmental conditions varied markedly among species and by their growth stage, this significantly contributes to the patterns of zonation and community structure in the intertidal zones. That is to say, after a successful habitat restoration project in the Onomichi Itozaki artificial intertidal flat (Fig. 10, MLIT, 2006), among other known environmental factors, suction is found to have highest correlation with the diversity of benthic fauna, with the value of its correlation coefficient reaching 0.91. This illustrates that the waterfront suction, which governs the geotechnical environments of habitats as well as the performances of the diverse biological activities, plays a pivotal role in the habitat selection for the benthos diversity in the intertidal flat soils.

Finally, it is important to note that the habitat geomorphology can change in association with sediment transport due to waves and currents. Since the interplay between sediment transport and the effects of suction dynamics has also been shown to play a key role for the persistence of habitats (Fig. 8, Sassa and Watabe, 2009a), the above results and discussions could facilitate a new horizon of habitat design and management for achieving both biodiversity and habitat stability in a changing global environment in the future.

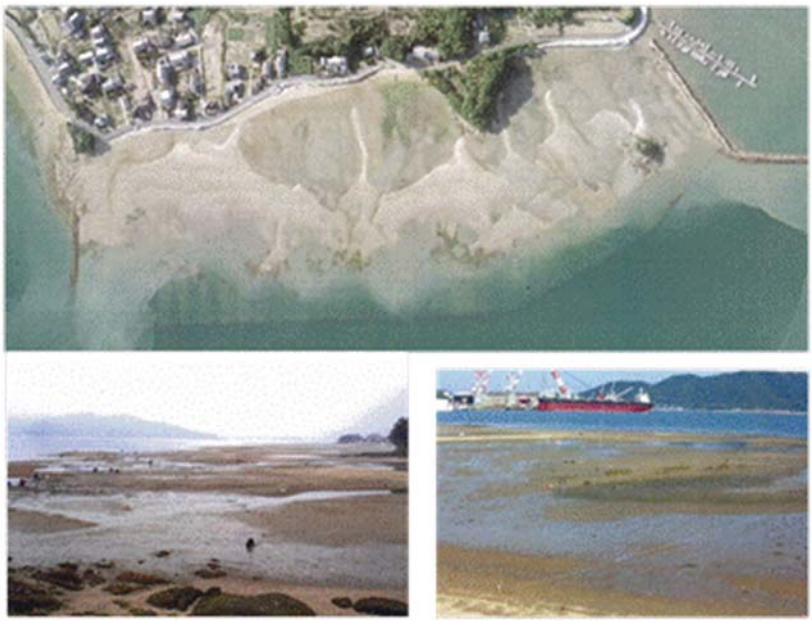

Figure 10. The Onomichi Itozaki artificial intertidal flat.

Conclusions

A comprehensive set of field observations, surveys, controlled laboratory experiments and analyses were performed to investigate the geotechnical environmental characteristics of intertidal flat soils, and to closely examine their linkage with the biological activities of three representative creatures of crabs, bivalves and birds, as well as benthos diversity. The principal findings and conclusions may be summarized as follows.

(a) The waterfront suction, which changed with topography and groundwater level, was found to play a substantial role in the formation of voids and shear strengths of intertidal flat soils. Indeed, the shear strengths varied by a factor of 20 to 50 due to suction development and suction dynamics-induced soil compaction in the essentially saturated states of the intertidal flats.

TECHNICAL ARTICLE
ECOLOGICAL GEOTECHNICS (Continued)

(b) The basic living activities of crabs, bivalves, and birds were closely associated with the varying geotechnical environmental conditions. Notably, the suction, voids, and shear strengths were found to be responsible for the suitable and critical conditions for the performances of the burrowing activities of two representative benthos, namely sand bubbler crabs, *Scopimera globosa*, and the juvenile to adult bivalves, *Ruditapes philippinarum*, and the foraging activities of the shorebirds, *Calidris alpine*. The interspecific comparison has also revealed that such suitable and critical geoenvironmental conditions varied markedly among species and by their growth stage.

(c) Under a certain range of the varying geoenvironmental conditions, all of the species exhibited the shifts in the burrowing or foraging modes, showing their behavioral adaptations to changing geoenvironment in space and time.

(d) In light of a successful habitat restoration project at the Onomichi Itozaki artificial intertidal flat, the waterfront suction, which has been shown to govern not only the geotechnical environments of habitats but also their linkage with the performances of diverse biological activities, is found to play a pivotal role in the survival and distribution of species, namely, in the habitat selection for the biodiversity there.

(e) These findings are therefore expected to contribute to realization of the performance-based geoenvironmental assessment, design and management for conservation and restoration of habitats with rich natural ecosystems, and herald the new field of “Ecological Geotechnics”.

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TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE

Ramon Verdugo, Ph.D. and Principal of CMGI – Chile rverdugo@cmgi.cl

1.- THE 2010 CHILE EARTHQUAKE

On February 27, 2010, at 3:34 a.m. local time, a large earthquake of Magnitude 8.8 hit the Central-South region of Chile. A significant number of aftershocks followed the initial quake, among which the most important one of Magnitude 6.2 occurred 20 minutes after the main shock. The earthquake triggered a tsunami that struck off the Chilean coast, devastating many towns located onshore, causing additional deaths and widespread damages.

The 2010 Chile earthquake is associated with the subductive seismic environment generated by the collision between the Nazca and South American tectonic plates, which are converging at an estimated rate of 65 to 80 mm per year. The Nazca plate is subducting below the South American plate, moving down and landward. The 2010 Chile Earthquake has been identified as a thrust-faulting type that occurred on the interface between both two plates, at an average depth of 30 km. The involved rupture zone covered a rectangular area of approximately 450 km by 170 km (see rectangle in Fig. 1). The earthquake together with the tsunami caused nearly 600 casualties and an estimated economic loss of 30 billion US dollars.

Horizontal peak ground accelerations (PGA) recorded on rock outcrop and soil deposits are presented in Fig. 1. It is interesting to observe that horizontal PGA recorded on rock outcrop are surprisingly moderate; none of the available data being greater than 0.32g. Nevertheless, it is important to mention that in the coast line, immediately in front of the epicentral zone, no instruments were available. Therefore, for this area it would be possible to presume the occurrence of higher PGA values than the ones reported. On the other hand, as expected, higher values of horizontal PGA were recorded on soil deposits, the maximum one being 0.94g, which was recorded in the city of Angol, located to the south of the rupture zone. To the north of the rupture zone, the maximum horizontal PGA was recorded in the City of Melipilla, reaching a value of 0.78g.

It is important to mention that several of the available records show a ground motion that exceeds 2 minutes of duration. Two examples can be observed in the acceleration time histories recorded in the cities of Talca and Constitucion (Fig. 2). The long duration of the ground motions seems to be characteristic of earthquakes of large magnitude that definitely increases their potential destructiveness.

On the other hand, according to the reported rupture zone (a rectangular area of approximately 450 km by 170 km), the usual concept of epicenter associated with a single point does not adequately represent the actual phenomenon of seismic energy generation-propagation. From an engineering point of view, the epicenter should be replaced, for instance, by the fault trace, corresponding to the locus of the projection at the surface of the probable initiation of the rupture.

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

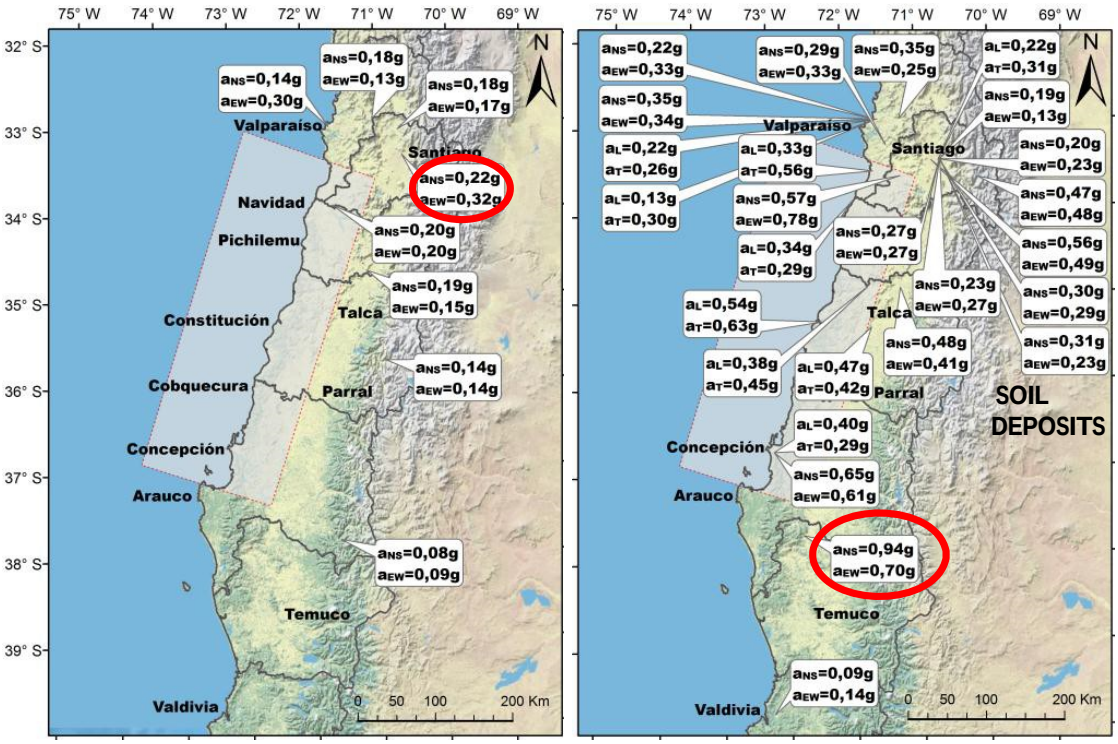

Fig. 1.- Horizontal PGA recorded on rock outcrops and soil deposits

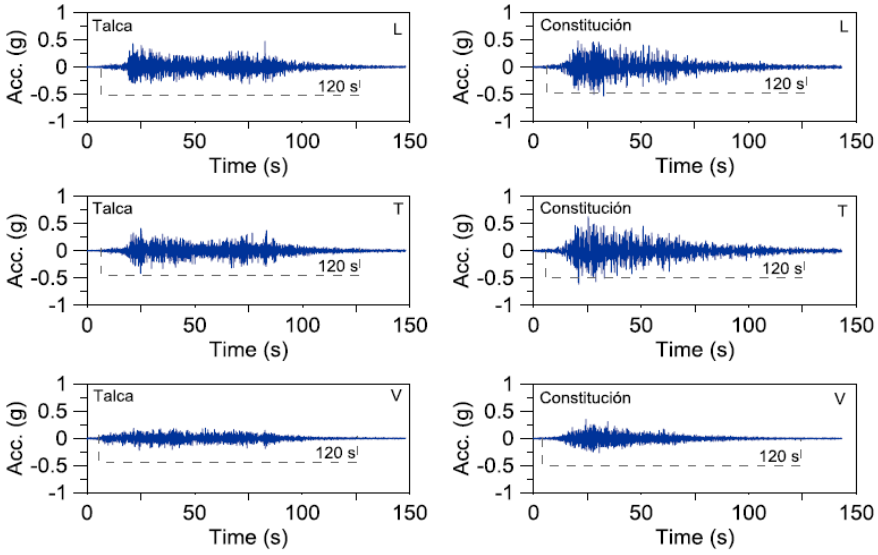

Fig. 2.- Acceleration time histories recorded in Talca and Constitucion (Renadic)

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

2.- CLIMATOLOGICAL FACTOR

Most of the area that was strongly affected by the earthquake presents a high rate of rainfall during winter time (June to August), which controls the stability of the natural terrain. However, the summer season (December to March) is pretty dry, so at the time of the earthquake, most of the slopes were either dry, or at most, partially saturated, having consequently an extra cohesive resistance. This climatological factor may explain the reduced number of slope failures, although the intensity and duration of strong ground motion were severe.

3.- FAILURES OF HIGHWAY EMBANKMNT

There were several failures of highway embankments of well compacted fill (structural fill). The failures were caused by the existence of weak natural ground, which was neither appropriately investigated nor treated. Three typical examples of this type of geotechnical failure are shown in the photographs of Figs. 3 to 6.

Fig. 3.- Failure of a fill triggered by foundation failure. Cruce Villaseca, Km37-Ruta5

Fig. 4.- Failure of Paso Superior Copihue

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

Fig. 5.- Failure of a fill triggered by foundation failure, Sector Polvorín, Ruta P160

Fig. 6.- Failure of the access at bridge Tubul

In all these cases, due to the abundance of native vegetation, the presence of a shallow water table was undoubtedly identified. Obviously, the well compacted gravelly materials that constituted the structural fills were not able to maintain the global stability, which was controlled by inappropriate foundation condition.

TECHNICAL ARTICLE
OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

4.- FAILURES OF TAILINGS DAMS

The waste products resulting from mining operations are called tailings. Typically, in copper mines, the extracted ore is crushed to the size of fine sand to clay from which the minerals are recovered. In the case of Chilean copper mines, around one percent in weight corresponds to the valuable mineral, so a huge amount of tailings is produced, which are usually deposited in the so-called tailings dams.

In the area affected by the strong motion, there are eight major tailings dams that seismically performed well. However, out of more than 50 small to medium tailings dams, five developed seismic failures. Limited seismic displacements were experienced by four tailings dams, without major problems. Unfortunately, one tailings dam underwent flow failure (liquefaction) that resulted in four fatalities (Verdugo et al, 2012). In the photographs presented in Fig. 7 the mass of tailings remaining after the flow can be observed. Therefore, considering the significant number of tailings dams existing in the area, it is possible to indicate that in general the seismic behavior was almost optimum with only one catastrophic failure.

Fig. 7.- Mass of tailings remaining after flow failure

5.- DAMAGES INDUCED BY SOIL LIQUEFACTION

Field observations have shown that the earthquake triggered liquefaction in more than 100 different sites, whose distribution is presented in Fig. 8. The northernmost site with evidence of liquefaction corresponds to the deformation experienced by the slope of Veta del Agua tailings dam (located approximately 13 km north-east of La Calera), while the southernmost liquefied site occurred in Calafquén Lakes (located 250 km to the south of the rupture zone) and the city of Valdivia. Consequently, the area with evidence of liquefaction covers a north-south distance of about 800 km, which corresponds to an area close to twice the rupture zone.

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

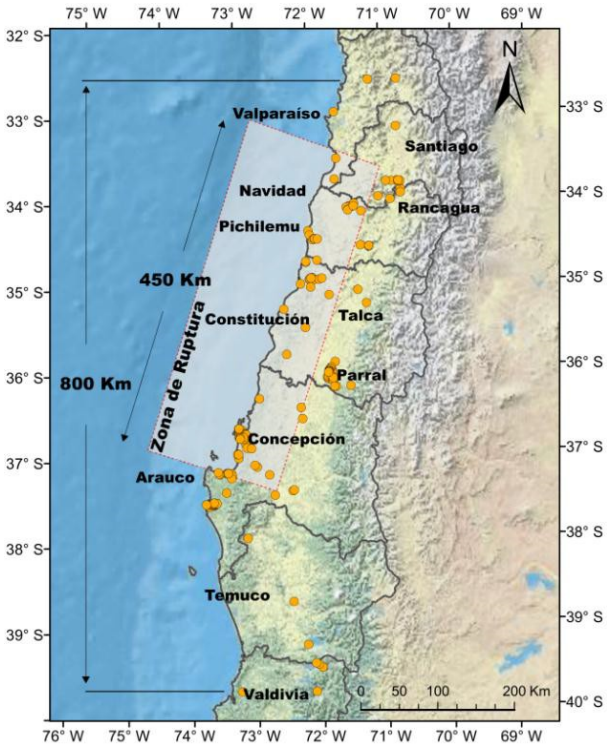

Fig. 8.- Site where liquefaction was observed

The phenomenon of lateral spreading was extensively observed in the vicinity of rivers and lakes, as shown in Fig. 9. In the area of Licanten, Mataquito River, the length of the cracks associated with this mechanism reached about 2000 m, involving displacements and settlements to a distance that exceeded 100 m from the border of the river.

Fig. 9.- Lateral spreading observed in Calafquén Lake and Nancagua

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

Significant settlements developed after liquefaction was observed at many places along the railway system as shown in Fig 10. Because of this type of failures the transport by this system was stopped for several weeks after the earthquake, with an additional impact on the post seismic recovery of the country.

Fig. 10.- Settlements after liquefaction, near city of Concepcion (courtesy of EFE)

The city of Concepcion is founded on deep sandy soil deposits, with a water table at 3 m to 7 m below the natural surface. Although most of the deposits consist of dense sandy materials, some of them are loose enough to have experienced liquefaction, affecting routes, bridges, houses and buildings. Examples of these failures associated with the phenomenon of liquefaction are presented in Figs. 11 to 14. The large displacements observed in the failure of Fig. 12 occurred in the city of Constitucion.

Fig. 11.- Route Costanera Norte BioBio

Fig. 12.- House in Talcahuano

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

Fig. 13.- Differential settlements observed along Juan Pablo II Bridge, Concepcion

Fig. 14.- Failure observed in Constitucion city

The damages caused by liquefaction in port facilities were especially important because of their economic impact. The most typical failure was the lateral displacement experienced by piles embedded in laterally spreading ground. Some of these failures are shown in Figs. 15 to 18.

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

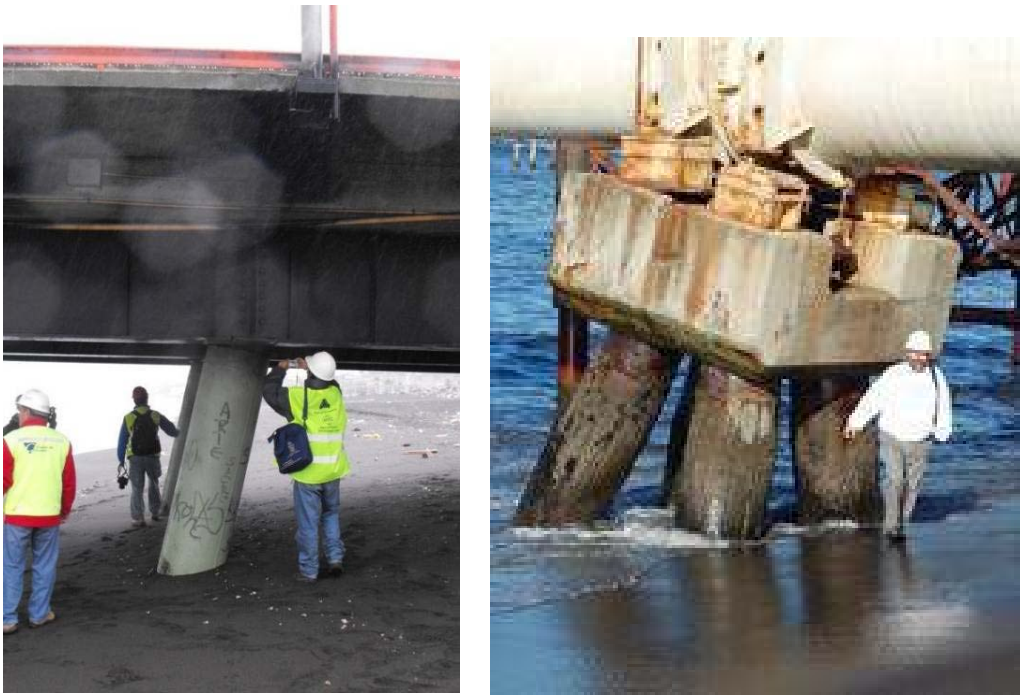

Fig. 15.- Pile tilted by the lateral movements of liquefied soil, Coronel, Bocamina

Fig. 16.- Large displacements experienced by a pier of local fishers

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

Fig. 17.- Evidence of the lateral displacements experienced by the liquefied ground

Fig. 18.- Quay wall in La Poza, Talcahuano

In San Vicente Bay a fishing industry made its facilities on a platform built on reclaimed land. The platform sank dozens of centimeters and moved towards the sea, destroying most of the facilities (Figs. 19 and 20). The limited available information indicates that the natural ground consists of loose sandy soil deposits and mud (materials that would not have been removed or improved) and this is an undesirable condition that may explain the observed failure.

Another clear evidence of liquefaction was the uplift of buried structures such as tanks and manholes, as shown in Fig. 21.

TECHNICAL ARTICLE

OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

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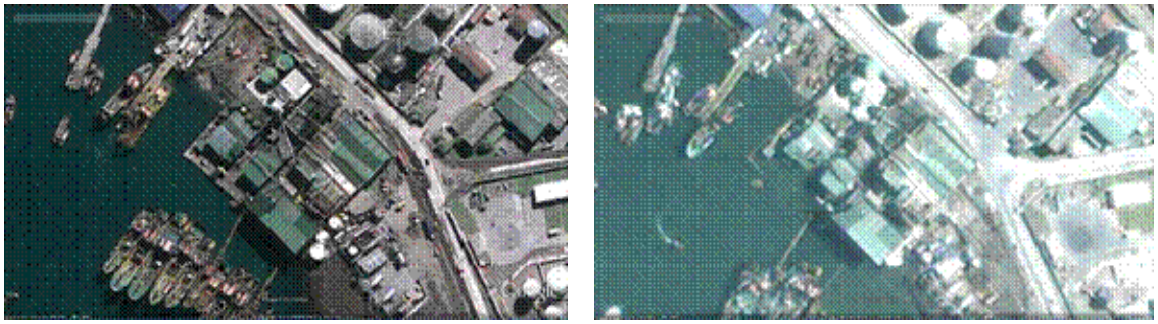

Fig. 19.- Liquefaction failure of a reclaimed land (before and after failure)

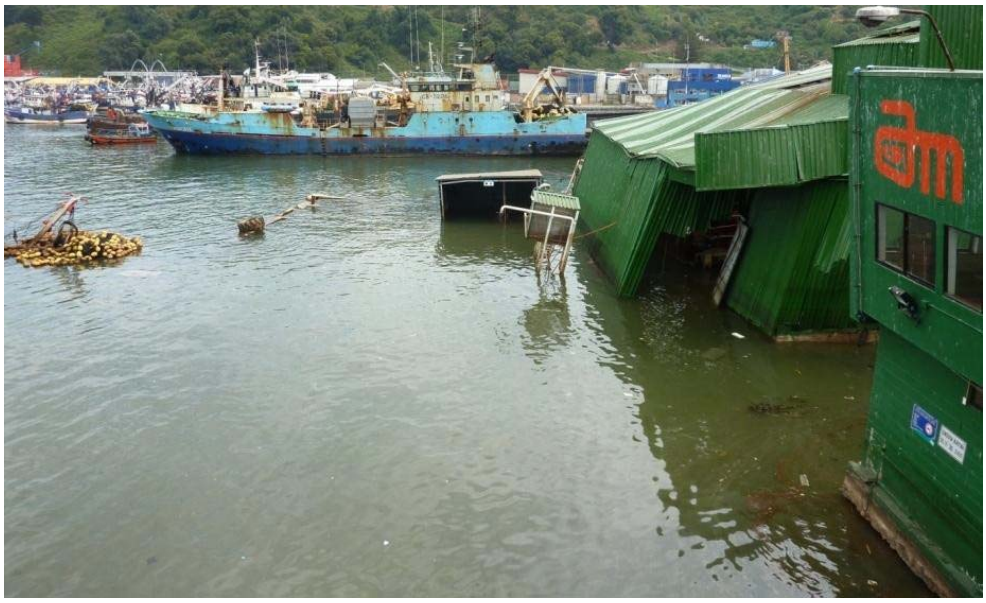

Fig. 20.- Sinking of the reclaimed land under the sea

Fig.- 21.- Uplift of buried structures (Chillán and Arauco)

TECHNICAL ARTICLE
OVERVIEW OF GEOTECHNICAL DAMAGE CAUSED BY THE 2010 CHILE EARTHQUAKE (Continued)

6.- CONCLUDING REMARKS

The February 27, 2010 Chile earthquake, of Magnitude 8.8, had a rectangular rupture zone of approximately 450 km by 170 km, whose effects covered more than 800 km of the central-south part of Chile. The seismic records show that the shaking lasted close to two minutes. After the earthquake a tsunami devastated parts of the coast killing and destroying towns. The official reports indicate less than 600 victims and the estimated economic loss would be near 30 billion US dollars.

Structural damages observed in some building were attributed to site effects. In this regard, the official Chilean seismic code at the time of the earthquake classified the sites, investigating the upper 20 m of the ground, according to soil parameters mainly associated with their resistance, such as RQD, unconfined strength, SPT-N, and undrained strength. This approach resulted in several sites that were incorrectly classified, underestimating their response spectra, especially in cases of deep soil deposits of sandy or clayey materials.

The geotechnical failures caused by the 2010 Chile Earthquake are in the framework of the present engineering knowledge and, in general, are associated with a poor investigation and inadequate design.

Concrete, earth and tailings dams performed well, except a catastrophic collapse of one tailings dam that caused four casualties. The occurrence of landslides was minor, which is explained by the extra cohesive resistance of the soils. The earthquake hit the area at the end of the dry season.

Following the experience left by large earthquakes, liquefaction phenomenon occurred at many sites, causing damage to the road infrastructure, railroads system, ports, buildings and houses. Liquefaction-induced ground failure displaced and distorted pile foundations of piers impacting seriously the operation of some ports.

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NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC

Dr. Ooi Teik Aun, President of the Southeast Asian Geotechnical Society

The Southeast Asian Geotechnical Society (SEAGS) successfully held its most important conference (18SEAGC & 1AGSSEAC; the 18th Southeast Asian Geotechnical Conference cum Inaugural AGSSEA Conference) on 29 – 31 May 2013 in Singapore with more than 350 participants. The conference was organized by the Geotechnical Society of Singapore (GeoSS) under the auspices of the Southeast Asian Geotechnical Society and the Association of Geotechnical Societies in Southeast Asia (AGSSEA) and co-organized by the Society for Rock Mechanics & Engineering Geology (Singapore) (SRMEG) and supported by the SIMSG and ISSMGE.

The Organizing Chairman Prof C. F. Leung with S. H. Goh as Secretary and R. F. Shen as the Treasurer and other committee members did an excellent job to bring about a very successful conference.

There were 7 Keynote Lectures namely:-

Keynote 1 (ZC Moh Lecture) "Use of Numerical Analysis with Eurocode 7" delivered by Prof Brian Simpson,

Keynote 2 (Chin Fung Kee Lecture) "Drafting a National Annex to Eurocode 7 – The Malaysia Experience" delivered by Mr. Tan Yang Kheng,

Keynote 3 (S L Lee Lecture) "Is Site Investigation an Investment or Expense? – A Reliability Perspective" delivered by Prof K. K. Phoon,

Keynote 4 "Study of Negative Skin Friction on Pile Subject to Surcharge and Ground Subsidence" delivered by Dr. S. M. Woo,

Keynote 5 "Strength and Durability of Calcium Carbide Residue Stabilized Clay in Pavement Applications" delivered by Prof. S. Horpibulsuk,

Keynote 6 "Spatial Variations in Groundwater Response during Deep Tunnelling" delivered by Dr. L. J. Endicott, and

Keynote 7 "The Application of Ground Improvement Techniques in Indonesia" delivered by T. L. Gouw.

The 3-day conference also attracted 145 technical papers which were all presented by the presenters in parallel sessions. Hard bound and soft copies of the proceedings of over 1000 pages were produced and given to the participants.

The conference was made possible by the generous financial support of the sponsors and exhibitors. Their efforts to make this conference a success are greatly appreciated and acknowledged.

To the participants, I thank you for your support and I have no doubt that you have greatly benefited from the exchange of ideas during the conference.

In conjunction with the conference, the respective council meeting of SEAGS & AGSSEA and the General meeting of SEAGS members were also held to bring about the following conclusions;

- Dr. T. A. Ooi and Prof K. Y. Yong were re-elected as President and Chairman of the SEAGS and AGSSEA, respectively.
- Dr. Noppadol Phienwej was elected as the Honorary Secretary General Cum Treasurer of SEAGS.
- Ir. Kenny Yee was re-elected Honorary Secretary General and Prof Charles Ng as Treasurer respectively of the AGSSEA.
- Prof A. S. Balasubramaniam and Prof D. T. Bergado were elected as honorary member of the SEAGS in recognition of their services to SEAGS.
- The meetings also confirmed Prof A. S. Balasubramaniam as the Editor-in-Chief of the SEAGS-AGSSEA Journal.

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

The meetings also confirmed that the 19SEAGC-2AGSSEAC will be held in Hanoi, Vietnam in 2016. This conference will be organized by the Vietnamese Society for Soil Mechanics and Geotechnical Engineering under the auspices of the Southeast Asian Geotechnical Society (SEAGS) and the Association of Geotechnical Societies in Southeast Asia (AGSSEA).

The SEAGS & AGSSEA also produced and distributed complimentary copies of CD on the collection of past journal papers for 1970 – 2012 during the conference. The CD will be useful to practitioners and researchers alike.

On 28th May 2013, a one day conference was held successfully for the young geotechnical engineers (see report by Dr. Victor Ong Chee Wee). Its report is available in the latter part of this article.

The following photos show some record of the proceedings of the events.

President GeoSS, Mr. Chua Tong Seng delivering his welcoming Speech

Dr. Ooi Teik Aun, President SEAGS delivering his welcome message

Prof. K. Y. Yong, Chairman of AGSSEA, delivering his welcome speech

Prof. Askar Zhussupbekov, Vice President of ISSMGE for Asia, delivering his message

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Presenting memento to Prof. Askar Zhussupbekov, Vice President of ISSMGE for Asia

Ceremony of Awarding of Prof. C.F. Leung by Honorable Medal by the name of Academic Aytaliev

In appreciation of Dr. Za-Chieh Moh for his services to SEAGS & AGSSEA

Prof. Brian Simpson delivering his Z C Moh Lecture

Prof. K Y Yong presenting memento to Prof. Brian Simpson

SEAGS & AGSSEA Council Meetings in progress

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Organizing Committee Dinner

Prof. K K Phoon delivering SL Lee Lecture

Group Photo of Organizing Committee with Council Members of SEAGS, AGSSEA and ISSMGE present at the Conference

Prof. K Y Yong with Dr. Victor Ong and a student helper

Prof. & Mrs. J D Nelson at Conference Banquet

At the Conference Banquet (Left to Right Dr. T A Ooi, Prof. S L Lee and Dr. Z C Moh)

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Photo taken after General Meeting of members of SEAGS

The 18SEAGC-1AGSSEA Young People Session Report

The 18SEAGC-1AGSSEA Young People Session was held on 28th May, 2013 at the Faculty of Engineering, Engineering Auditorium, National University of Singapore.

The objective of the 18SEAGC-1AGSSEA Young People Session is to promote the development of professional careers for young geotechnical engineers (less than 35 years old) and to enhance international liaison and cooperation between them. Young geotechnical engineers will share their experience, results of work and research, and perspectives on future advancement of the geotechnical profession. There were in total 50 young delegates from 7 countries who attended the session.

Keynote Lectures were presented during the session. The Keynote speakers were Prof. Yong Kwet Yew (*Chairman AGSSEA, Vice President NUS)* and Er. Chua Tong Seng (*President of GeoSS)* with topics focusing on "Planning, Design and Construction of Underground MRT System in Singapore" and "Changes in Geotechnical Engineering," respectively.

11 contributions from the delegates (Singapore-3 papers, Taiwan-2 papers, Hong Kong-2 papers, Indonesia-1 paper, and SEAGS (Malaysia-1 paper) were received on various geotechnical topics.

Roundtable Discussion

The 18SEAGC-1AGSSEA Young People Session hopes to encourage young geotechnical engineer to pursue advanced research works in their field of interest. Suggestions and feedbacks were discussed during the roundtable session. This is the 'seniors interact with juniors event' for sharing vital experience and advice by the seniors to the juniors. The following respected and reputable mentors have attended the roundtable discussion with the young delegates:-

Prof. Yong Kwet Yew, Prof. Wong Kai Sin, Dr. John Endicott, Dr. Brian Simpson, Er. Chua Tong Seng, and Ir. Gouw Tjie-Liong.

The 18SEAGC-1AGSSEA Young People Session wishes to thank all the delegates for their presentations & enthusiasm, mentors for the time & feedback, and finally to our generous sponsors. Thank You.

Reported by Dr. Ong Chee Wee, Victor, Organizing Committee Ong@kimaro.com.sg
KIMARO Geotechnical Engineering (S'pore & M'sia) Pte Ltd
J. Pro Consulting Engineers (S'pore & M'sia) LLP

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Keynote speakers Prof. Yong KY (*Chairman AGSSEA, Vice President NUS)* and Er. Chua Tong Seng (*President of GeoSS)*

Our young and dynamic delegates

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Group photo of Young delegates with invited Speakers, Chairman and Organizing Committee of the 18SEAGC-1AGSSEA Young People Session

Roundtable discussion between the reputable mentors and the young delegates

NEWS ON RECENT CONFERENCE

Report on 18SEAGC & 1AGSSEAC (Continued)

Friendship during the conference

NEWS ON RECENT CONFERENCE

5TH CHINA-JAPAN GEOTECHNICAL SYMPOSIUM

Yangping Yao
Wei Hu

The Chinese Institution of Soil Mechanics and Geotechnical Engineering organized the 5th joint symposium on May 18 and 19, 2013, at the famous Emei-Shan Mountain near Chengdu, Sichuan Province, China. It attracted 79 participants from 5 countries, not being limited to China and Japan, and about 50 papers were presented. Seventy seven papers were included in the proceedings of New Advances in Geotechnical Engineering, with 37 papers from China and 40 papers from Japan. This series of symposium has been organized as a collaborative program of the Chinese Institute and the Japanese Geotechnical Society alternately.

The invited lectures were delivered as what follows;

Prof. Runqiu Huang	Five years on: What have we learned from the Wenchuan earthquake?
Dr. Yoichi Watabe	Site Investigation for D-runway project at Tokyo Haneda Airport
Prof. Yangping Yao	UH model for soils and its extension
Prof. Feng Zhang	Mechanism of liquefaction in repeated earthquake vibration
Prof. Pierre-Yves Hicher	A multi-scale approach for modeling the mechanical behavior of granular materials
Prof. Chunfai Leung	Centrifuge modeling of onshore, marine and offshore geotechnical problems

After the conference, a post-conference tour was organized to visit the Emei Mountain. The next conference of this series is planned to take place in Japan in 2015.

Photographs taken during the conference are shown in what follows.

Photo 1 Opening ceremony

NEWS ON RECENT CONFERENCE

5TH CHINA-JAPAN GEOTECHNICAL SYMPOSIUM (Continued)

Photo 2 Group photograph of participants

Photo 3 Discussion during the conference

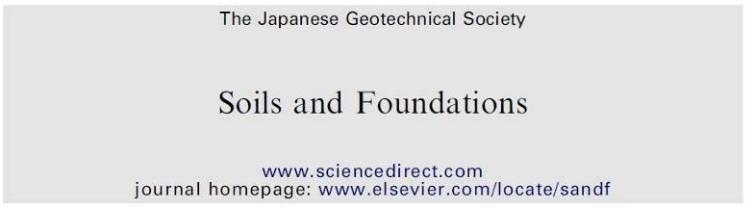
NEWS ON RECENT CONFERENCE

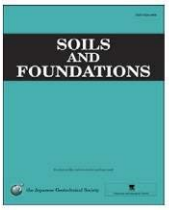
5TH CHINA-JAPAN GEOTECHNICAL SYMPOSIUM (Continued)

Photo 4 At the closing ceremony

Photo 5 Visiting of the 3099-meter summit of Emei Mountain which is a famous holy place of Bhuddism

Call for Papers
Special Issue on Recent Advances in Computational Geomechanics in Soils and Foundations





Japanese Geotechnical Society

Geomechanics is a multidisciplinary research area dealing with geomaterials where computational modeling approaches have been playing a unique and indispensible role in its recent advances. Being one of the largest technical committees within the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), TC103 entitled 'Numerical Methods in Geomechanics' provides a global forum for both academics and practitioners in promoting the development and use of advanced numerical methods to solve geomechanics-related problems. In conjunction with the 18th ICSMGE to be held in Paris in September, 2013, TC103 will organize a special workshop to encourage researchers to present their latest research in numerical modeling of geomaterials and geotechnics. To materialize the workshop and enhance its influence, TC103 has made a proposal to *Soils and Foundations* to publish a special issue on 'Recent Advances in Computational Geomechanics' which has been approved by the editorial committee of the journal. *Soils and Foundations* is a prestigious journal in disseminating high-quality and original research in geomechanics and geotechnical engineering, and has attracted a wide spectrum of readership over the past decades. Its recent partnership with Elsevier further enhances its global impact in the community.

We hereby have the pleasure to invite you to contribute your recent research to this TC103 special issue. You are encouraged to follow the journal requirements provided at the website (http://www.journals.elsevier.com/soils-and-foundations/) in preparing your manuscript. In revising and extending your paper for consideration for Soils and Foundations publication, you should follow the requirements of the journal. Each paper should go through the standard procedures set by the journal: rigorous peer review based on anonymous refereeing by independent experts. Therefore, there is a chance your paper will require revision and may also be declined based on the above peer reviews. Please refer to the proposed schedules for the special issue listed below:

- July 20, 2013 Confirmation of the contributors
- September 30, 2013 Submission of the full manuscript
- October, 2014 Publication of the special issue

Please kindly express your interest by email by July 18, 2013. We appreciate your support and look forward to your reply. Thank you.

Prof. K.T. Chau
Hong Kong Polytechnic University
Chair of TC103, ISSMGE
Email: cektchau@polyu.edu.hk

Prof. Akira Murakami
Kyoto University
Editor of Soils and Foundations
Email: akiram@kais.kyoto-u.ac.jp

REMINISCENCE

Prof. A.S. Balasubramaniam (Bala)

This interview was made in December, 2012, in Prof. Balasubramaniam's office in the Gold Coast Campus of Griffith University, Queensland, Australia. After that, he prepared the first draft of this article in which he is talking to me. I made minor modifications in his draft with his permission. For readers' convenience, it should be stated that Prof. Bala worked for 27 years at the Asian Institute of Technology (AIT) in Thailand and educated many promising people from many countries of Asia.

Ikuo Towhata, Editor of BULLETIN

1: Prof. Bala, tell us a bit about your family background and schooling

Yes, Ikuo, before that; let me say a few words of when you joined AIT in early 1980; Prof. Nishino was our Vice President and he told me that you are rather unique—In Japanese academic system, the Age counts a lot and in the Tokyo University Departmental meeting, when the Chairman said in a formal meeting, Does anybody have any questions. Everyone was surprised, when you raised your hands.

I was born for Sri Lankan Parents in Malaya and returned to Sri Lanka in late 1940's. I am really a village boy; in the northern part of Sri Lanka. I must say we are all proud of our School education in Sri Lanka.

2: So, Prof. Bala, what made you in this Journey to select Geotechnical Engineering?

Oh, that is interesting Ikuo, I was given a Scholarship to do Doctoral Studies. I had no idea what to do; as up to then, I was merely dependent on my lecture notes and hardly any research experience. But I must say, our lecturers are all Cambridge and Imperial College educated ones. They are truly remarkable. You must know Thurairajah, Ikuo. We call him Thurai, who just returned from Cambridge and taught us about 20 hours of Soil Mechanics. At that time, Soil Mechanics go with Structures. Earlier, Soil Mechanics was taught by our Dean Prof. Pereira who used to teach old earth pressure theories.

So, I went to Thurai and said, I like to do research work in Soil Mechanics on this scholarship. Thurai said, he can recommend me to Cambridge, but be sure not to change your mind later. I only understood the weight age of this statement, when I met Roscoe at Cambridge; it told me a lot of how Thurai appreciated the sentiments and temperament of the late Prof. Roscoe.

In any case Thurai gave three papers to read; one written by Roscoe, Schofield and Wroth in 1958, the other by Roscoe & Poorooshasb in 1963 and the third by Roscoe Schofield and Thurairajah in 1963. All three published in Geotechnique.

3: So, how do you find them reading, Prof. Bala?

It was frankly very tough going, more like torturing. No wonder, Thurai warned me about changing my mind. I read them over and over again. I may have done that more or less over thirty or forty times. Thurai also asked me to read the sections on Shear Strength by D.W. Taylor in his book on Fundamentals of Soil Mechanics. I had some time the feeling, I understood some of them and also a feeling, I did not understand anything.

4: So, when did you go to Cambridge?

Ikuo, at that time the Sri Lankan Scholars took Boats to go to UK. I was on a P&O liner which took about twenty two days to reach London. To be frank, at that time, I only knew Jaffna my home place and Colombo where I was in the University. So, going outside of Sri Lanka was a great learning curve and the Boat trip made my transition a bit easier.

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

5: *Prof. Bala, how was your meeting with Roscoe and others?*

I was briefed very well that Roscoe is pretty strict and I need to be very careful. Thurai advised me; perhaps I should take a bottle of Arrack (Sri Lankan equivalent of Whisky) from Sri Lanka and some tea. So, I took these and went to see Ken Roscoe in his Office which was in the third floor of a four storey building. Maybe knowing that I am rather nervous, Ken Roscoe was polite with me.

He asked whether I know any Soil Mechanics. I replied very little, but added I read his three papers. He then asked me how my English is. At Cambridge, I got into some X ray business first. I must thank god for getting out of that and settled later on the experimental work related to the Critical State soil Mechanics.

I also met Prof. Schofield and late Peter Wroth. Andrew was looking for some students to work on Centrifuge and also Cavity Expansion. I did not touch them. Peter Avgherinos in our group of four went into Centrifuge. My advisor was Jimmy James as based on my initial interest in X rays. Jimmy was a remarkable person, interested very much in gliding and flying. I certainly did not want to risk my life. I used to upset Jimmy. Roscoe advised me Jimmy is a nice guy and do not rub Jimmy on the wrong side.

At Cambridge I was very friendly with Dr. Ting Wen Hui from Malaysia and Demetri Coumulos. John Burland was also most helpful; all of them are. I even ran into Arthur Penman who gave a lecture on Dams. Roscoe had many visitors: Gudehus, Leonards, Ron Scott, etc etc.

6: So, how did you went to NGI, Prof. Bala?

It was also an accident Ikuo. When I was in the beginning of my third year, I applied for some job in Sri Lanka. I did not get it. Roscoe used to jokingly say, I was the first person whom he wrote a letter of recommendation and did not get a job. He then added, Laurits Bjerrum the President of the International Society will give the Rankine Lecture and will visit Cambridge also and give a Lecture. Actually, I attended the previous Rankine Lecture by Prof. Bishop and got lost in London. I am not used to big cities. The idea of working with the President of the International Society really appealed to me. That is how I developed my interest with ISSMGE.

7: Tell us a little bit Prof. Bala about NGI and your work

My doctoral thesis at Cambridge was a bit delayed. I got it vetted by Roscoe. It is remarkable Roscoe can sit with a student and read word by word a thesis and ask what you mean by that and correct it and say, then why don't you express that way. Roscoe was a remarkable person. He not only did that, but also took us to his home for lunches and dinners. I had four Christmas breaks with Roscoe, Mrs Roscoe and their children.

In any case, I landed in Fornebu Airport in February 1969; my flight was a bit delayed. I was really shocked by the vast amount of snow. Next day morning, I was picked up by a person to see Bjerrum. This person took me to see Bjerrum and said, finally Mr B has arrived. They have abbreviated my name. Then Bjerrum looked at the person who picked me up and said, you will work with Elmo. That was a great surprise for me. Such a simple and modest person. Elmo was a fantastic Instrumentalist, while I knew nothing about it. Bjerrum always knew how to open the eyes of us. I learned a lot from Elmo and was involved in many important projects.

I met two persons at NGI and it seemed their friendly discussion was a great help. One is Prachit Chiruppapa from Chulalongkorn University, who talked a lot about AIT and Dr. Moh, and the other was David Nash, son of Kevin Nash.

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

8: We remember you were also teaching at Peradeniya in Sri Lanka

Yes, I returned to Sri Lanka in March 1970 and with great difficulty got a lecturer position in the University mainly through the most valued help of Thurai. It was very nice working with Thurai. We revised the Civil Engineering Curriculum and introduced a Masters Degree. I remember writing world wide to prominent people asking for their advice, their syllabus and also publications and possible old equipment. Among the people replied were Casagrande with his question papers in Harvard. Prof. Harry Seed from Berkeley, Prof. Gerry Leonards from Purdue, Prof. Bengt Broms from SGI and Prof. Dinesh Mohan from Central Building Research Institute India. I used my own money in mailing expenses. We got a large amount of publications. Kevin Nash was invited to give a lecture; Kevin also thought Ralph Peck would be more prestigious.

I remember sleeping in the Soils Lab to take readings in our triaxial apparatus around the clock. No automatic data logging. This work was published in the Tokyo Conference in 1977. I used to get AIT News Letter and was really impressed with their activities and their presence in an international scene. In one issue of the newsletter, I saw advertisements for opening Geotechnical Engineering. I applied for it. Nothing was happening for a year or so, all of a sudden, there was an interest and a letter from Dr. Moh. I remember Ted Brand visiting us as well. Dr. Moh made an offer in May 1972 as an Assistant Professor with a salary of about 800 Dollars per month. I accepted it; even though I was enjoying my work at Peradeniya.

9: Was your movement to AIT was a turning point, Prof. Bala?

Yes Ikuo it was. Dr. Moh was a remarkable and tough administrator. Also very kind. I had full support from him. My early Colleagues were Ted Brand, Peter Brenner and Prinya Nutalaya. I am sure you know all about them.

At AIT, Dr. Moh asked me to become the Secretary General of the Southeast Asian Geotechnical Society (SEAGS). There you are, I became and as the SG since I retired in July 2001. Through SEAGS, I was very much involved in ISSMGE and initially Kevin Nash

10: How was AIT in terms of Research?

Oh, Dr. Moh must really be very proud of his contributions to AIT. He was only given an Honorary Doctorate Degree. The research and teaching facilities were excellent. We had about 300 hours of lectures to our Masters Students. Most of them ended up doing Doctoral studies in USA, Japan, Canada and other countries. Also many became excellent engineers here in Australia, USA, Canada and Asia. We later recruited Dennes Bergado and Sarvesh Chandra. Dennes had a remarkable career. Even Indraratna had his first appointment with us, before he moved to Wollongong. AIT was involved in almost all the major projects in Bangkok and also in Thailand. Prinya is a fantastic Engineering Geologist. His work on Bangkok Subsidence will live forever. We had Yudhbir, Onodera, Akagi, Ohta, Yamada, yourself, Kuwano, Prinzl, Tomiolo, Rantucci, Honjo, Sugimoto, Noppodol, Takemura and many others; all very able and prominent persons.

One of the memorable moments of Prof. Bala at AIT

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

11: Southeast Asian Geotechnical Society & activities: what can you tell us?

Ikuo, AIT and Southeast Asian Geotechnical Society are both part of my life. I worked with SEAGS Presidents: Prof. Chin, Peter Lumb, Tan Swan Beng, Ted Brand, Ting Wen Hui, Prof. Lee, Ou Chin Der, Surachat, Dr. Ooi and John Li; all excellent people. The fifth Southeast Asian Conference had Nordi Morgenstern, Prof. Chin, Dr. Arthur Penman and Dr. Ian Donald as guest lecturers. Also, the back to back, International Symposium on Soft Clays arranged by Ted Brand and Peter Brenner was a huge success with Nils Flodin, Bengt Broms, Harry Poulos, Mike Duncan, Andresen Elmo Dibiagio, Peter Wroth, Dick Parry and many others.

Also, the Ninth Southeast Asian Regional Conference was held in 1987.

We had Asian Regional Conferences in Singapore in 1979 and in Bangkok in 1991. These were indeed some of the finest conferences we had. Always with international participation

General Committee of South Eastern Asian Geotechnical Society during the 9th SEAGC in Bangkok (1987)

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

Group photo during the 9th Asian Regional Conference on Soil Mechanics and Foundation Engineering in Bangkok (1991)

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

During the 13th Southeast Asian Geotechnical Conference with attendance of many international giants

12: At AIT you were also running a large number of conferences and Courses: what are your memories?

Yes, these truly made a mark. The one on Large Dams, Coastal and Offshore Structures, Ground Improvement, Laboratory tests, etc etc. They were all published by Balkema Printers as books. The Short Courses were so large, I lost count. We had the best available people in our Geotechnical Community participating in these events. I always believed in quality. Maybe about a few hundred well known persons would have lectured. The Geotech Year 2000 had the most remarkable persons in Geotech making excellent historical accounts of the development in our subject

13: International Conferences you have participated: what are your memories?

It was my great fortune to have attended the Ninth, Tenth, Eleventh, Twelfth and 14th ones in Tokyo, Stockholm, San Francisco, Rio de Janeiro and Hamburg. They were all excellent. Also, the first one held in Harvard in 1936. I enjoyed reading the Minutes of the ISSMGE and former ISSMFE Minutes. Oh, one can learn a lot from them. The Tokyo Conference was really well organised; We as Kids had the opportunity to meet Skempton, Peck, Kerisel, Fukuoka, Broms, de Mello, Morgenstern, Meyerhof, Lambe, you name who is who in Geotechnics.

Also, the San Francisco one in 1985. The Lectures by Kerisel, Skempton and Peck were great; also the General Reports. They were all good. The Stockholm and the Hamburg ones, too.

14: *I am not sure whether this is something you like to answer: The Kevin Nash Award !*

Yes of course. It was initiated by Prof. Fukuoka. It is very kind of them to have done so. Many would have thought how come I was picked. I am sure this must have went through the mind of many including Mike Jamiolkowski. That was the only time; I gave my name and was very concerned. I am sure Prof. Morgenstern must have enjoyed that exercise. It is all great fun. Ikuo.

REMINISCENCE (Continued)

Prof. A.S. Balasubramaniam (Bala)

15: Any thoughts on the future of ISSMGE?!

Yes from 1936, the world has changed a lot. ISSMGE should also evolve, a new set of devoted young generation should take the lead as Poulos, Jamiolkowski, Ishihara and many many others did in 1977 or so when they were 40 or more years younger. The vision they had. The amount of work they have to do. More so, a broader view. Perhaps the Statutes can also be looked upon. More decentralization. This must be done by the ISSMGE Board in consultation with a broader spectrum of persons as drawn from our ever growing community with more than 20,000 members.
Ikuo, we must wind off now; many thanks.

From the editor: probably some more issues should be added to Prof. Bala's draft. He also made during the interview the following points:
- Senior people should support the development of younger generations. However, too much support is not necessarily good for younger people.
- Natural disasters always pose new problems to be tackled by geotechnical engineers.
- Development of natural resources is another issue of interest.
- Asia has become much better than before. Now efforts are needed for the sake of Africa.
- AIT was able to invite many people from all over the world. This stimulated AIT people significantly.

Find below some more photographs that show Prof. Bala's world-wide friendships.

NEWS ON RECENT CONFERENCE
7TH INTERNATIONAL CONFERENCE ON
CASE HISTORIES IN GEOTECHNICAL ENGINEERING

The seventh international conference on case histories in geotechnical engineering was held in Chicago, Illinois from May 1 through May 04, 2013 to commemorate the legacy of Professor Ralph B. Peck for introducing Observational Methods in Geotechnical Engineering. In a special session on this subject, six world renowned leaders who had worked with Professor Peck made technical and non-technical presentations. These included Gholamreza Mesri, Edward Cording, Elmo Di Biagio, Shamsher Prakash, Nancy Peck Young, and David Rogers.

A symposium was also held to honor Dr. Clyde N. Baker, Jr., for his contributions on the design of foundations for high-rise buildings in Chicago, Kuala Lumpur, Taiwan, Dubai, and other countries. Six speakers, Tony Kiefer, Bernie Hertlein, Robert Lukas, William Walton, William Baker, and Robert Schock, delivered special presentations outlining Dr. Baker's work.

Keynote Lecture for the conference was delivered by Prof. W D Liam Finn, Professor Emeritus, University of British Columbia, Canada, and Guoxi Wu, BC Hydro, Burnaby, Canada.

Ten State of the Art and Practice Lectures were delivered: Clyde Baker (USA), Jonathan Bray (USA), George Gazetas (Greece), Buddhima Indraratna (Australia), Ed Kavazanjian (USA), Suzanne Lacasse (Norway), Pedro Pinto (Portugal), Harry Poulos (Australia), Rodrigo Salgado (USA), and Ikuo Towhata (Japan).

A luncheon was held to recognize Dr. Shamsher Prakash for his achievements and to thank him for the direction he has provided for the Geotechnical Case Histories and Earthquake conference series over the past four decades. After serving the profession for more than fifty five years, Dr. Prakash has decided to retire and this conference was his last major professional activity on behalf of Missouri University of Science and Technology.

Proceedings for this conference consist of a Printed Abstract Volume and CD-ROM containing eleven SOAP Lectures, 8-General Reports, and 315 papers contributed from 58 countries. The proceedings are available for purchase online at http://7icchge.mst.edu/proceedings/. The cost of the proceedings is $250. Papers published in the proceedings of the first four Case Histories conferences can be downloaded free of charge from the MST website dedicated to the Case Histories conferences at: https://ICCHGE1984-2013.mst.edu/.

NEWS ON RECENT CONFERENCE
7TH INTERNATIONAL CONFERENCE ON
CASE HISTORIES IN GEOTECHNICAL ENGINEERING (Continued)

Group photo during the conference

Prof. Shamsher Prakash during the conference banquet

REPORT TO ISSMGE FOUNDATION
3rd International Conference on Geotechnical Engineering

Mohammed Elbyhagi Elfadil
Building and Road Research Institute – University of Khartoum, Khartoum, Sudan

This conference took place in *Hammamet, Tunisia from 21-23 February, 2013*. I benefitted immensely from the presentations made by professional geotechnical engineers who were present at the conference. Specifically, I learnt a lot on the chemical stabilization of problematic soils, structural formation of transportation infrastructure in China, micromechanical modeling and analysis of saturated granular soils, centrifugal modeling of soil contamination and remediation, and analysis of dynamic loading and penetration of soils - applications to site investigation and ground improvement. The paper sessions covered a whole lot of areas in research in Geotechnical Engineering.

I visited the geotechnical research laboratory in National Engineering School and discussed with the professor in charge about collaboration between us in the area of unsaturated soil mechanic as well as to find contact to Barcelona in Spain.

People I met:

1. Prof. Anand J. Puppala (USA)
2. Prof. Samuel U. Ejezie (China)
3. Prof. M. Zeghal (USA)
4. Prof. J.N. Meegoda (USA)
5. Prof. J.P. Carter (Australia)
6. Many professors from Tunisia, and young geotechnical engineers from Tunisia, Algeria, France, Turkey, Netherland, Australia, Sweden, Morocco, Iraq, Yemen, UAE and Egypt.

The conference was well organized and successful. The organizing committee was very hospitable. The volunteers, most of whom were young graduate engineers, did a very good job. I was impressed by the large number of lady participants. I particularly liked the opening ceremony and Gala dinner – it was done in a traditional fashion. I really thank the ISSMGE foundation for the kind gesture.

The 3rd International Geotechnical Engineers Conference which took place in Hammamet, Tunisia, was the best of its kind. The three-day conference started with registration of the participants on the 21st of February, 2013 and ended on 23rd. The conference was flawlessly organised and relatively well attended.

The 3rd ICGE2013 has founded to me a deep-seated interest in geotechnical engineering research activities. I had the opportunity to engage in discussions with both young researchers and our enviable senior colleagues. It was a well-organized conference and the best of its kind. I believe continual hosting of this event will always ignite the already existing passion in young engineers for research and practice of geotechnical engineering. This will lead to enhanced future activities of our dear profession especially in Africa and the entire globe.

Many thanks to the *ISSMGE Foundation* for sponsorship.

Some photographs were taken during the conference and are shown below.

REPORT TO ISSMGE FOUNDATION

3rd International Conference on Geotechnical Engineering (Continued)

Myself and my colleagues from Sudan and Prof. Anand and Prof. Megooda from USA

Myself with organizing committee and participants

REPORT TO ISSMGE FOUNDATION

3rd International Conference on Geotechnical Engineering (Continued)

Myself with undergraduate student from Algeria and Chad

Myself with undergraduate student from Tunisia

NEWS

Donald M. Burmister's Soil Mechanics Laboratory Designated as Historical Geotechnical Heritage Laboratory

The Board of ISSMGE discussed during its meeting in Melbourne in 2012 a proposal to acknowledge the existence of some laboratories where significant contributions to geotechnical engineering had been made. As the first example to practice that decision, a plaque of recognition of Burmister Laboratory as a Historical Geotechnical Heritage Laboratory was made with the ISSMGE and Member Society logos inscribed on it.

The Donald M. Burmister Laboratory at Columbia University (New York, USA) has been recognized for its contributions to the advancement of soil mechanics by the ISSMGE and ASCE Geo-Institute. The current laboratory was constructed with the aid of an endowment by Prof. Burmister upon his retirement.

Prof. Askar Zhussupbekov, the Vice President of ISSMGE for Asia, during his occasion of delivering the 13th Burmister Lecture in the Department of Civil Engineering and Engineering Mechanics of Columbia University on April 22, 2013, presented the plaque to Prof. Hoe I. Ling, who is the Geotechnical Professor at Columbia University.

The late Prof. Donald M. Burmister (1895-1981) is one of the pioneers in the field of soil mechanics and geotechnical engineering. He received his B.A., B.S., C.E. and Ph.D. degrees from Columbia University. He joined the faculty as an instructor of civil engineering in 1929 and soon became involved in the field of soil mechanics. He established one of the first soil mechanics laboratories in the United States in 1933. He became world famous as a teacher, researcher and consultant in this area. He was on the faculty for 34 years before retiring in 1963. During his tenure at Columbia University, he investigated earthworks and foundations for over 400 projects. Most notably among these were the Brookhaven National Laboratory, the Throgs Neck, Tappan Zee and Verrazano Narrows Bridges, the First New York World Fairs at Flushing Meadows, and the reconstruction of the White House in 1950. Many of his graduate students gained important experiences through working with him on these projects and he provided financial supports to many of them from his own funds. He was a pioneer in the development of tests to determine the engineering properties of soil, and his soil classification system is still widely used. He also contributed to the first use of digital computer in conjunction with his theory of the layered pavement systems.

Photographs in this article show the detail of the plaque and its presentation ceremony.

NEWS

Donald M. Burmister's Soil Mechanics Laboratory Designated as Historical Geotechnical Heritage Laboratory (Continued)

Detail of the plaque

From left: Prof. Emeritus Frank L. DiMaggio, Prof. Hoe I. Ling, and Prof. Askar Zhussupbekov

EVENT DIARY

ISSMGE EVENTS

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

2013

International Conference on State of The Art of Pile Foundation and Pile Case Histories " Pile 2013"
Date: Sunday 02 June 2013 - Tuesday 04 June 2013
Location: Savoy Homann Bidakara Hotel, Bandung, West Java, Indonesia
Language: English
Organizer: Deep Foundation Research Institute - Parahyangan Catholic University
Contact person: Deep Foundation Research Institute - Parahyangan Catholic University
Address: JL. Ciumbuleuit 94, 40142,Bandung, West Java, Indonesia
Fax: +62 22 2060278
E-mail: pile2013@gmail.com
Website: http://www.pile2013.com

The first international conference on Foundation and Soft Ground Engineering Challenges in MeKong Delta
Date: Wednesday 05 June 2013 - Thursday 06 June 2013
Location: Thu Dau Mot University, Binh Duong, Binh Duong, Vietnam
Language: English
Organizer: Dr. Nguyen Ke Tuong and M. Eng. Nguyen Minh Hai
Contact person: Nguyen Minh Hai
Address: 06 Tran Van On Street,650,Binh Duong, Binh Duong, Viet Nam
Phone: 84-650-3.822.518.
Fax: 84-650-3.837.150
E-mail: haitdmu@gmail.com
Website: http://www.ictdmu.com/

TC 215 ISSMGE International Symposium on "Coupled Phenomena in Environmental Geotechnics (CPEG) - from theoretical and experimental research to practical applications"
Date: Monday 01 July 2013 - Wednesday 03 July 2013
Location: Politecnico di Torino, Torino, Italy
Language: English
Organizer: TC 215 ISSMGE and Italian Geotechnical Association (AGI)
Contact person: Guido Musso, Andrea Dominijanni
Phone: +39 011 0904837
E-mail: guido.musso@polito.it; andrea.dominijanni@polito.it
Website: www.tc215-cpeg-torino.org

Fifth International Young Geotechnical Engineers' Conference (5iYGEC'13)
Date: Saturday 31 August 2013 - Sunday 01 September 2013
Location: École des Ponts ParisTech,Paris,,France
Language: English/French
Contact person: Prof. Yu-Jun Cui
Address: Paris, France
E-mail: yujun.cui@enpc.fr
Website:
http://www.lepublicsystemepco.com/EN/events.php?IDManif=696&IDModule=21&PPAGE=&PAGE=&TEMPLATE=&CSS=&IDRub=

EVENT DIARY

ISSMGE EVENTS (Continued)

18th International Conference on Soil Mechanics and Geotechnical Engineering, Paris,
Date: Monday 02 September 2013 - Friday 06 September 2013
Location: Palais des congrès de Paris, Porte Maillot, Paris, France
Language: English, French
Organizer: Le Public Système, 38, rue Anatole France-Levallois-Perret Cedex, 92594 France
Contact person: Violaine Gauthier, Valérie Métral
Address: 38 rue Anatole France, 92594 Levallois-Perret Cedex, France
Phone: +33 1 70 94 65 04
Fax: +33 1 70 94 65 01
E-mail: vgauthier@le-public-systeme.fr, vmetral@le-public-systeme.fr,
Website: http://www.issmge2013.org/EN/events.php?IDManif=561&IDModule=71&IDRub=79
More info: Organizer Phone: 33 1 70 94 65 04 Contact persons: Violaine Gauthier: vgauthier@le-public-systeme.fr Valérie Métral: vmetral@le-public-systeme.fr

International Symposium on Design and Practice of Geosynthetic-Reinforced Soil Structures
Date: Sunday 13 October 2013 - Wednesday 16 October 2013
Location: Faculty of Engineering, Bologna, Italy
Language: English
Organizer: Tatsuoka, Gottardi, Ling, Han
Contact person: Hoe I. Ling
Address: 500 West 120th Street, Columbia University,10027,New York, NY,USA
Phone: 12128541203
Fax: 12128546267
E-mail: ling@civil.columbia.edu
Website: http://www.civil.columbia.edu/bologna2013/

The third Italian Workshop on Landslides (The 3rd IWL) - "Hydrological response of slopes through physical experiments, numerical investigations and field monitoring"
Date: Wednesday 23 October 2013 - Thursday 24 October 2013
Location: Partenope Conference Centre,Naples,,Italy
Language: English
Organizer: Seconda Università di Napoli, Università di Napoli Federico II, Universitat Politechnica de Catalunya
Contact person:Emilia Damiano
Address: Dipartimento di Ingegneria Civile, Design, Edilizia e Ambiente - Via Roma 29 ,81031,Aversa (CE),,Italy
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Fax: +39 081 5037370
E-mail: info@iwl.unina2.it
Website: http://www.iwl.unina2.it/

International Conference Geotechnics in Belarus: Science and Practice
Date: Wednesday 23 October 2013 - Friday 25 October 2013
Location: Belarussian National Technical University, Minsk, Belarus
Language: Russian and English
Organizer: Belorussian Geotechnical Society
Contact person: Ulasik T., Sernov V., Ignatov S.
Address: Republic of Belarus, prospectus Nezavicimocti, Building 65, 220013 Minsk, Belarus
Phone: +37517 2659769
E-mail: geotechnika2013@gmail.com belgeotech@tut.by

EVENT DIARY

ISSMGE EVENTS (Continued)

The 19th NZGS Symposium "Hanging by a Thread – Lifelines, Infrastructure and Natural Disasters
Date: Wednesday 20 November 2013 - Saturday 23 November 2013
Location: Millennium Hotel, Queenstown, New Zealand
Language: English
Organizer: New Zealand Geotechnical Society
Contact person: Amanda Blakey
Address: Auckland, New Zealand
Phone: +64 9 575 2744 or +64 21 025 11 628
E-mail: secretary@nzgs.org
Website: http://www.nzgs13.co.nz/

10th International Symposium of Structures, Geotechnics and Construction Materials
Date: Tuesday 26 November 2013 - Friday 29 November 2013
Location: International Convention Center, Santa Clara, Villa Clara, Cuba
Language: English, Spanish
Organizer: Facultad de Construcciones, Universidad Central de Las Villas
Contact person: Dra. Ana Virginia González - Cueto Vila
Address: Facultad Construcciones, UCLV, Carretera a Camajuani, km 5.5, 54830, Santa Clara, Villa Clara, Cuba
Phone: (53) 42 281655, 42 281065, 42 28 1561
Fax: (53) 42 281655
E-mail: ana@uclv.edu.cu , quevedo@uclv.edu.cu
Website: www.uclv.edu.cu

GEOTEC HANOI 2013 "Geotechnics for Sustainable Development"
Date: Thursday 28 November 2013 - Friday 29 November 2013
Location: Melia Hotel, 44B Ly Thuong Kiet Street, Hoan Kiem District ,Hanoi, Vietnam
Language: English
Organizer: FECON (Vietnam), VSSMGE (Vietnam) and AIT (Thailand)
Contact person: Dr. Le Quang Hanh, Ms Vu Thuy Dung
Address: FECON Foundation Engineering & Underground Construction JSC.15F, CEO Building, HH2-1 Plot, Pham Hung Road, Tu Liem District, Hanoi, Vietnam
Phone (+ 84) 46.269.0481 or 46.269.0482, Ext: 335
Fax: (+ 84) 46.269.0484
E-mail: secretariat@geotechn2013.vn
Website: http://www.geotechn2013.vn

EVENT DIARY

ISSMGE EVENTS (Continued)

2014

8th International Conference on Physical Modelling in Geotechnics 2014 (ICPMG)
Date: Tuesday 14 January 2014 - Friday 17 January 2014
Location: University Club, The University of Western Australia, Perth, Western Australia, Australia
Language: English
Organizer: Centre for Offshore Foundation Systems, The University of Western Australia
Contact person: Arinex Pty Limited
Address: GPO Box 316, Belmont WA 6984 Australia,
Phone: +61 2 9265 0890
Fax: + 61 2 9265 0880
E-mail: icpmg2014@arinex.com.au
Website: http://icpmg2014.com.au/

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

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

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,Kyoung-Gi Do, Korea
Phone: +82-32-290-7518
Fax: +82-32-290-7549
E-mail: csyoo@skku.edu

EVENT DIARY

ISSMGE EVENTS (Continued)

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, UK
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 Pfleger
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

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
Website: http://www.10icg-berlin.com

2015

XVI African 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: mehrez.khemakhem@gmail.com
Website: www.16cramsg.org

EVENT DIARY

ISSMGE EVENTS (Continued)

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/

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

NON-ISSMGE EVENTS

2013

The 1st International Symposium on Transportation Soil Engineering in Cold Regions
Date: Thursday 10 October 2013 - Saturday 12 October 2013
Location: Qinghai Hotel, Xining, Qinghai Province, China
Language: English
Organizer: Beijing Jiaotong University, Qinghai Research Institute of Transportation
Contact person: Prof. Jiankun LIU
Address: School of Civil Engineering, Beijing Jiaotong University,100044, Beijing, China
Phone: 86-13581986007
Fax: 86-10-51684096
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EVENT DIARY

NON-ISSMGE EVENTS (Continued)

The Mediterranean Workshop on Landslides (MWL) - "Landslides in hard soils and weak rocks - an open problem for Mediterranean countries"
Date: Monday 21 October 2013 - Tuesday 22 October 2013
Location: Partenope Conference Centre,Naples,,Italy
Language: English
Organizer: Seconda Università di Napoli, Università di Napoli Federico II, Universitat Politechnica de Catalunya
Contact person: Emilia Damiano
Address: Dipartimento di Ingegneria Civile, Design, Edilizia e Ambiente - Via Roma 29 ,81031, Aversa (CE), Italy
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Fax: +39 081 5037370
E-mail: info@iwl.unina2.it
Website: http://www.mwl.unina2.it

International Symposium on Advances in Foundation Engineering
Date: Thursday 05 December 2013 - Friday 06 December 2013
Location: Furama Riverfront Hotel, Singapore
Language: English
Organizer: Geotechnical Society of Singapore
Contact person: Phoon Kok Kwang (Chair)
Address: Block E1A, #07-03, 1 Engineering Drive 2,Singapore 117576, Singapore
Phone: 65-65166783
Fax: 65-67791635
E-mail: kkphoon@nus.edu.sg
Website: http://rpsonline.com.sg/isafe2013/

2014

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

EVENT DIARY

NON-ISSMGE EVENTS (Continued)

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 Institute
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

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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towhata@geot.t.u-tokyo.ac.jp

f. Chinese Taipei Geotechnical Society www.tgs.org.tw

g. Prof. Zuyu Chen
http://www.iwhr.com/zswwenglish/index.htm

h. East China Architectural Design and Research Institute

http://www.ecadi.com/en/

i. TC 211 of ISSMGE for Ground Improvement
www.bbri.be/go/tc211

j. Prof. Askar Zhussupbekov www.enu.kz/en/ www.kgs-astana.kz

k. TC302 of ISSMGE for Forensic Geotechnical Engineering
http://www.issmge.org/en/technical-committees/impact-on-society/163-forensic-geotechnical-engineering

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ISSMGE's International Journal of Geoengineering Case Histories

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/issue3/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.

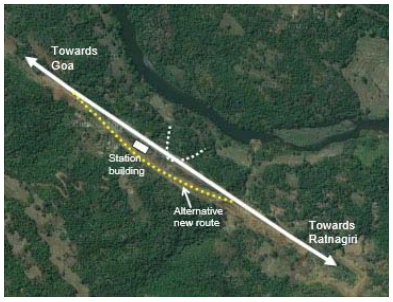
Download here: http://casehistories.geoengineer.org/volume/volume2/issue3/IJGCH_2_3_2.html

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.
Download here: http://casehistories.geoengineer.org/volume/volume2/issue3/IJGCH_2_3_3.html

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.
Download here: http://casehistories.geoengineer.org/volume/volume2/issue3/IJGCH_2_3_4.html

About the Journal:

ISSMGE's International Journal of Geoengineering Case Histories (IJGCH) is the only international refereed journal that focuses on case histories and geoengineering practice. The papers published in IJGCH are freely available in color and are accompanied by databases that include the electronic data presented in the paper as well as additional figures. The locations of the case histories are also positioned in a downloadable Google Earth database, and are also available in GeoMap (http://www.mygeoworld.info/map).

To submit a paper to the journal visit the journal's website: http://casehistories.geoengineer.org

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

Topics of Interest:

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The Case Histories journal is funded by our sponsors GEI Consultants, Inc. & Zetaş Zemin Teknolojisi A.Ş..

To learn more about ISSMGE's Case Histories Journal and submission guidelines, visit:
http://casehistories.geoengineer.org.

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.

NEWS ON RECENT CONFERENCE

BALTIC GEOTECHNICAL ROUNDTABLE in Pärnu, Estonia

by Prof. Mait Mets of Estonian Geotechnical Society

Baltic Geotechnical Roundtable was held in May, 9-11 May, 2013 in Jõulumäe Recreational Sports Centre which is located between the Pärnu City (Estonia) and Latvian-Estonian border in Estonia. The Roundtable tradition began in 1967 and in 1973 – roundtables have been held mainly in Lithuania and Estonia in different intervals.

Since the year 1973 roundtables are held each year in a different Baltic countries (Estonia, Lithuania, Latvia). In addition to delegates from Baltic countries, there were also participation of specialists from other countries, who are familiar with the problem under discussion with excellence.

The topic of the roundtable in this year was "Soft rock – hard soil". There were covered problems with moraine, over consolidated clay, weak sandstone and gypsum.

In the Baltic countries, moraine is a widespread difficult soil, whose characteristics change to a great extent and, after the density, depend on the hudrodynamic influences, are slightly soaking soils and often difficult to assess the capacity of the piles.

Palaeozoic clays (Cambrian, Ordoricium and Devonian) are overconsolidated clays, whose characteristics depend on the micro-fissures which are formed during weathering and weather influences. In-depth discussion was made of problems concerning the strength of these clays and the pile capacity in these clays.

In the rocky soils the main focus was on the weak sandstone and gypsums. Weak sandstone is a problem in natural and artificial slopes in Estonia and Latvia. Gypsum, however, is a serious problem in Latvian and Lithuanian borders and is related to the rapid spread of karst and pile bearing capacity in Riga (Latvia).

One of the world's leading geotechnician, Vice –President of ISSMGE for Asia, Prof. Askar Zhussupbekov, attended the Baltic Geotechnical Roundtable in May, 2013, and participated actively in the discussions and gave vivid examples of similar problems in Kazakhstan.

The most active participants of the discussions were Profs. K. Dundulis, L. Furmanavičius, J. Šešnjulavičius from Lithuania, Profs. R. Bodrovs and W. Celmins from Latvia, and Profs. M. Mets, J. Mussatova and P. Talviste from Estonia. Roundtable on Geotechnical Engineering was chaired by the President of EGS – P. Ilves.

The following photographs demonstrate more about this event.

Presenting the commemorial plague of KGS (President of Kazakhstan Geotechnical Society Prof. Askar Zhussupbekov) to President of Latvian Geotechnical Society Mr. R. Bodrovs.

NEWS ON RECENT CONFERENCE

BALTIC GEOTECHNICAL ROUNDTABLE in Pärnu, Estonia

(Continued)

Keynote lecturers of Baltic Roundtable: Prof. Askar Zhussupbekov (Vice-President of ISSMGE), Prof. Mait Mets (Estonian Geotechnical Society), Prof. L. Furmanavichus and Mr. J. Šešnjulavičius (Lithuanian Geotechnical Society)

General Discussioner of Baltic Roundtable Prof. Mait Mets (Estonian Geotechnical Society)

Farewell dinner of Baltic Roundtable participants

NEWS ON RECENT CONFERENCE

BALTIC GEOTECHNICAL ROUNDTABLE in Pärnu, Estonia

(Continued)

Discussion about case studies of weak rock in Estonia by Prof. Mait Mets (Estonian Geotechnical Society)

Presenting the Honorable Award of Eurasian National University (by Prof. Askar Zhussupbekov, Vice-President of ISSMGE for Asia) to Prof. L. Furmanavichus (Lithuania Geotechnical Society)

Oral presentation about soil grounds of Estonia by Ms. Jevgenia Mussatova (Geotechnical Engineering Buro, Tallin, Estonian Geotechnical Society)