LECTURE SERIES AND WORKSHOPS ON GEOTECHNICAL ENGINEERING IN PRACTICE

Date: 2-6, July 2007

Building G30 Room 2.11

Griffith University Gold Coast Campus

Organised by: Centre for Infrastructure Engineering and Management and Griffith School of Engineering
Griffith University Gold Coast campus

Workshop 1: 2- 3 July 2007: Site Investigation – Laboratory & Field Testing

Lecturers: Tom Lunne, Don DeGroot & A.S.Balaubramaniam

(***Note-the book on Penetration Testing by Lunne et al can be given at a substantially reduced price to those who attend the Course***)

Workshop 2: 4-5 July 2007: Engineering Geology, Slope Stability & Engineering Geophysics

Lecturers: Peter Burgess & Bob Whiteley

Workshop 3: 6 July 2007: Soft Ground Tunnelling

Lecturer: Dr. Suchatvee Suwansawat, Sc.D

See "Registration form" for daily registration.

For additional information please contact

Prof. A. S. Balasubramaniam ,
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Griffith School of Engineering,
Griffith University Gold Coast Campus, PMB 50, Gold Coast Mail Centre,
Queensland 9726, Australia.

Introduction

The major workshops and lectures on Geotechnical Engineering practice in 2-6 July, 2007 is on site investigation practice including lectures are engineering geology and slope stability problems as well as applications of engineering geophysics. There are a large number of major projects in Queensland and Australia demand good knowledge in Site Investigation works. Dr. Tom Lunne from the Norwegian Geotechnical Institute has done excellent work on in-situ tests and NGI is a well known Leader in the development of laboratory and field tests and Tom Lunne has played a very active role. He was also the other of the excellent book on cone penetration testing. Both Tom Lunne and NGI has calibrated the vane tests, piezo-cone tests and dilatometer tests with good quality laboratory tests performed on high quality undisturbed samples of soils. Dr. Don DeGroot has excellent training from MIT having worked with Prof. Chuck Ladd on laboratory tests especially triaxial tests and also works very closely with NGI researchers. Both Tom and Don will be the main lecturers on July 2-3 on site investigation lectures. Prof. Bala will do a two hour lecture on large scale instrumented projects on soft clay embankments with and without ground improvement. Case histories will be presented from Bangkok, Muar flat site in Malaysia and southeast Queensland. ***Please note that those who attend the Monday and Tuesday course on Site Investigation by Lunne et al can get a copy of the book on cone penetration testing at an additional fee of A$ 100 (one hundred in addition to the registration fees).***

On Wednesday and Thursday 4-5 July, Mr. Peter Burgess and Dr. Bob Whiteley from Coffey Geotechnics will do excellent lectures on the role of Engineering Geology and Engineering Geophysics in Site Investigation works. Educated in Sydney University and University of Grenoble Peter Burgess is a distinguished Engineering Geologist who has over four decades of experience. Residual soils and slope stability problems are very common in Brisbane, Gold Coast and other parts of Queensland and Australia. Mr. Peter Burgess of Coffey Geotechnics has over four decades of experience in site investigation works in Australia, Thailand, Laos, Cambodia and Malaysia. He has carried out extensive geological mapping on tunnel routes, dam foundations, quarries and roads. Educated in Sydney University and at the University of Grenoble in France, Peter was responsible during the period 1971-1978 as a Senior Engineering Geologist with Coffeys on site investigation works in mining, commercial and industrial developments. His field of expertise covers design and construction of water supply dams, tailing dams, tunnels, slope stability investigations, construction materials and general site investigations. Dr. Bob Whiteley educated in Sydney University and University of New South Wales had a distinguished career in Engineering Geophysics and its applications and worked in Australia, Bangladesh, China, Hong Kong, India, Indonesia, Malaysia, The Netherlands, New Caledonia, New Zealand, Pakistan, Philippines, Singapore, Solomon Islands, Thailand, Vietnam, United Emirates and USA. He has worked in the area of Engineering, Ground Water and Environmental Geophysics.

The lectures on Friday 6th July are on Soft ground tunnelling. Tunnelling is becoming more

and more important with most Mass Transit Projects. Dr.Suchatvee Suwansawat (Vince) educated at the Massachusetts Institute of Technology on tunnelling and worked with Prof. Herbert Einstein at MIT will give lectures on Soft ground and other aspects of tunnelling.

These course and lectures will be beneficial to post-graduate students, engineers and those who are in the design and analysis side of Geotechnical Engineering and Practice. It is hope that there will be very active participation from all the various sectors of our catchments of interested parties; Practitioners to Academics to Researchers to Graduate students.

Registration Form / Tax Invoice

Griffith University ABN 78 106 094 461

Workshop & Lectures on Geotechnical Engineering

Griffith University, Gold Coast, July 2-6, 2007

TO REGISTER: email, fax, mail

Email: a.bala@griffith.edu.au | **Fax**: +61(0)7 5552 8065 | **mail**: Prof. A. S. Balasubramaniam, Griffith School of Engineering, Gold Coast Campus, Griffith University, PMB 50, Gold Coast Mail Centre Queensland 9726, Australia

DETAILS OF ATTENDEE

First Name:	**Last Name:**
Organisation:	
Email:	
Phone:	**Mobile:**
Fax:	
Post Address:	
State:	**Postcode:**

WORKSHOP FEES (July 2-6, 2007)

Please indicate day of participation and total amounts

☐ **AUD $ 390 (GST included) for Monday- July 2, 2007**

☐ **AUD $ 390 (GST included) for Tuesday- July 3, 2007**

Please note that those who attend the Monday and Tuesday course on Site Investigation by Lunne et al can get a copy of the book on cone penetration testing at an additional fee of A$ 100 (one hundred in addition to the registration fees).

☐ **AUD $ 390 (GST included) for Wednesday – July 4, 2007**

☐ **AUD $ 390 (GST included) for Thursday- July 5, 2007**

☐ **AUD $ 390 (GST included) for Friday- July 6, 2007**

TOTAL AMOUNT: [AU $]

PAYMENT METHODS

☐ **CHEQUE ENCLOSED**

All Cheques crossed and payable to Griffith University (Griffith University is GST registered, ABN 78 106 094 461) Mail cheques to Prof. A. S. Balasubramaniam, Griffith School of Engineering, Gold Coast Campus, Griffith University, PMB 50, Gold Coast Mail Centre, QLD 9726, Australia. Please enclose your registration form.

☐ **CREDIT CARD**

Please complete credit card payment form in below and mail or fax

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Card Holder's Name	
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Amount to be charged:	

☐ **PLEASE FORWARD ME AN INVOICE**

Purchase Order No.: _____

Please send your REGISTRATION / TAX INVOICE FORM as early as possible in order to help us to operate this workshop more efficiently.

***PLEASE NOTE*: THIS REGISTRATION FORM SERVES AS A TAX INVOICE WHEN COMPLETED. PLEASE RETAIN A COPY FOR YOUR RECORDS.**

PROGRAMME

July 2, 2007 (Monday) – Site investigation 1

Please note that those who attend the Monday and Tuesday course on Site Investigation by Lunne et al can get a copy of the book on cone penetration testing at an additional fee of A$ 100 (one hundred in addition to the registration fees).

08:30 – 09:00 am		Registration
09:00 –	09:45 am	Introduction on Fundamentals of Soil Behaviour and advantages and disadvantages of in situ testing and laboratory testing (**Don DeGroot**)
09:45 –	**10:25 am**	**CPTU -** History, what do we measure, deployment systems, CPT probes, data acquisition (**Tom Lunne**)
10:25 –	11:00 am	CPTU- Profiling and soil identification (**Don DeGroot**)
11:00 –	11:20 am	Coffee break
11:20 -	12:00 am	CPTU - Processing of test results, sources of error, checks on data quality, available guidelines and standards (**Tom Lunne**)
12:00 –	01:00 pm	Lunch
01:00 –	**01:45 pm**	**CPTU -** Interpretation in terms of soil design parameters in sand (**Tom Lunne**)
01:45 –	**02:15 pm**	Interpretation of CPTU results in terms of soil design parameters in clay (**Don DeGroot**)
02:15 –	02:45 pm	Direct application for pile design, compaction control, liquefaction evaluation, Correlation to SPT N-value (**Tom Lunne**)

02:45	**-**	**03:15 pm**	Other sensors for geotechnical applications, seismic cone, electrical resistivity, cone pressuremeter, nuclear density probe (**Don DeGroot**)
03:15	–	03:30 pm	Coffee break
03:30	**–**	**04:10 pm**	Case studies with CPT and CPTU (**Don DeGroot and Tom Lunne**)
04:10	**–**	**04:40 pm**	Dilatometer tests (**Tom Lunne**)
04:40	**–**	**05:15 pm**	Field vane shear tests (**Don DeGroot**)

<u>July 3, 2007 (Tuesday)</u> – Site Investigation 2

Please note that those who attend the Monday and Tuesday course on Site Investigation by Lunne et al can get a copy of the book on cone penetration testing at an additional fee of A$ 100 (one hundred in addition to the registration fees).

08:30	–	09:00 am	Registration
09:00	–	09:30 am	Full flow tests: T-bar and ball (**Tom Lunne**)
09:30	**-**	**10:15 am**	Drilling and sampling for laboratory tests (**Don DeGroot**)
10:15	**–**	**11: 00 am**	Effects of sample disturbance in clay on measured soil parameters and how do we quantify it (**Tom Lunne**)
11:00	-	11:15 am	Coffee break
11:15	-	12: 00	Laboratory testing in clay I: Consolidation/Hydraulic conductivity (**Don DeGroot**)
12:00	-	01:00 pm	Lunch
01:00	–	01:15 pm	Laboratory testing in clay II: Strength testing (**Don DeGroot**)
01:15	**–**	**01:55 pm**	Laboratory testing in sands (**Tom Lunne**)
01:55	**–**	**02:45 pm**	Laboratory Instrumentation, Data Acquisition and Computer Control (**Don DeGroot**)
02:45	-	03:00 pm	Coffee break
03:00	-	03:30 pm	Contributions from participants, discussion

03:30 - 05: 00 pm Large scale Field tests on embankments with and without ground improvement
(Prof. Bala)

05:00 - 05:15 pm **Rounding off and closure**

July 4,_2007 (Wednesday) – Site Investigation 3— (Engineering Geology and Engineering Geophysics-1)

08:30	–	09:00 am	Registration
09:00	–	10:30 am	Fundamentals of Engineering Geology Understanding Geological Logs (**Peter Burgess**)
10:30	–	10:45 am	Coffee break
10:45	–	12:15 am	Geological Environments, Geological Models and Practical Applications (**Peter Burgess**)
12:15	–	01:00 pm	Lunch
01:00	–	03:00 pm	Engineering Geophysics and Site Characterization Physical Fields and Earth Material Properties (**Bob Whiteley**)
03:00	–	03:30 pm	Coffee break
03:30	–	05:00 pm	Geophysical Methods and Applications: Gravity, magnetic, electromagnetic and electrical methods, ground penetrating radar, seismic methods, borehole geophysics and marine geophysics (**Bob Whiteley**)

July 5, 2007 (Thursday) – Site Investigation 4 (Case Studies in Engineering Geology and Engineering Geophysics-2)

08:30 – 09:00 am Registration

09:00 – 10:30 am Engineering Geology: Selected Case Studies
Excavation
Grouting – Foundation and Special Applications
Slope Stability - NSW Risk Assessment
Tunnels and Tunnelling – (NSW)
Urban Land development (Sydney)
(**Peter Burgess**)

10:30 – 10:45 am Coffee break

10:45 – 12: 15 Engineering Geophysics: Selected Case Studies
Seismic refraction & ripability assessment – various sites
Quantifying grouting effectiveness with seismic tomography – Mascot Sub-main
Asessing the extent of unstable ground with surface and borehole geophysics – various sites
Application of geophysics to major tunnelling projects in Sydney
Assessing the extent and nature of landfill using geophysics – various sites
(**Bob Whiteley**)

12:15 - 13:15 Lunch

!3:15 - 15:00 Engineering Geology- Tailing Dams
(**Peter Burgess**)

15:00 - 15:30 Coffee

1530 – 1700 Engineering Geophysics: Selected Case Studies

Application of geophysics to dam sites – various sites
Locating leakage zones with electrical & electromagnetic geophysics
Dredging assessments using marine geophysics – Port Phillip Bay
(**Bob Whiteley**)

July 6, 2007 (Friday) - Soft Ground Tunnelling

8:30-9:00 am	Registration
9:00-10:00 am	Introduction to Soft Ground Tunnelling - History - Development - Concerned problems
10:00-11:00 am	Tunnelling Methods - Classical method - Shield (TBM) tunnelling method - Conventional (NATM) method - Pipe jacking method - others
11:00-11.15 am	Coffee Break
11:15-12:30 am	Behaviour of Ground Movement induced by Tunnelling - Instrumentation and Monitoring - Longitudinal settlement - Transverse settlement - Lateral ground deformation - Twin-tunnel behaviour - Methods of settlement prediction
12:30-01:15 pm	Lunch
01:15-02:15 pm	Tunnel Design - Conceptual framework - Lining behaviour - Lining design method - Testing and field measurement
02:15-03:15 pm	Case Studies - The first and coming Bangkok MRTA projects - The main water tunnel in urban environment - The flood tunnel excavated within dense sand layer
03:15-03:30 pm	Coffee Break

03:30-04:15 pm Effects of Earthquake and Fire

- Case history of tunnels subjected to earthquake
- Effects of fire and prevention

04:15-05:15 pm Technology and Innovation

- AI Program for Settlement Prediction
- Real-Time Monitoring System
- Tunnelling Knowledge Management System
- Alignment and Influenced Zone Evaluation Program

Biodata:

Tom Lunne educated in Heriot-Watt University in UK and in University of California Berkeley, is currently Technical Advisor and Manager of the Offshore Soil Investigations at NGI. He has wide geotechnical engineering background from both consulting and research. Major fields of work relate to: Laboratory testing, In situ testing, Field observations, Evaluation of soil parameters; Planning, specifying and managing large offshore soil investigations. Tom has worked in major projects in Brazil, Benin, Denmark, Great Britain, India, Italy, Malaysia, Sweden, USA, Latvia, Mexico, Holland, Venezuela and Iceland. Among other projects, his activities have been with Duyong and Pulai Fields Shallow Gas Studies, Malaysia; Soil investigation Keilisnes, Harbour, Iceland; Zelazny Most Tailings Dam Poland; Tunu and SISI Shallow Gas Studies, Indonesia; and DeRuyter GBS soil investigation, Holland.

Tom has given invited lectures and presentations at conferences and courses in USA, Canada, Brazil, France, Poland, Italy, Norway, Sweden, India, Latvia, Lithuania, Iceland, Ireland, Holland, Japan, Great Britain, Australia, Vietnam, Malaysia, Thailand, Singapore, Indonesia, Portugal, and Venezuela. He is a Core Member of Committee on In Situ Testing, TC-16,; International Society of Soil Mechanics and Foundation Engineering (1982-todate); Member of Scandinavian Committee on Field Investigations, 1993-2004; Chairman of Norwegian Committee on Field Investigations, 1993-2004; Member of Committee of European Standard of CPT, (2001 to date).

Author or co-author of more than 100 papers, publications and technical notes to professional journals and conferences, Tom is the main author of the popular textbook on Cone Penetration Tests

Don DeGroot: Dr. Don J. DeGroot is an associate professor in the Department of Civil and Environmental Engineering at the University of Massachusetts Amherst. He received his Doctor of Science degree in geotechnical engineering at the Massachusetts Institute of Technology in 1989. His teaching, research and consultancy experience is primarily in the area of soil behaviour and environmental geotechnics with an emphasis on laboratory and field measurements for site characterization programs. He has served on the editorial boards of the Journal of Geotechnical and Geoenvironmental Engineering and the Geotechnical Testing Journal, and is currently serving as Chair of the Geo-Institute Soil Properties and Modelling Committee. Dr. DeGroot's teaching and research awards include: the James L. Tighe Civil Engineering Distinguished Teaching Award, United Technologies Corporation Outstanding Laboratory Teaching Award, Research Council of Norway Guest Researcher Fellowship, and the University of Western Australia Gledden Visiting Senior Fellowship.
Don has given invited lectures in soil sampling, laboratory testing, soil behaviour, site characterization and environmental geotechnics in Australia, Canada, India, Ireland, Latvia, Norway, Poland, Singapore, Taiwan, Thailand, UK and USA. Don has also worked on major research projects funded by U.S. National Science Foundation, National Cooperative Highway Research Program, FHWA, U.S. DOD, U.S. Naval Research Laboratories and (6) Massachusetts Highways and Vermont Transportation Agency. He has supervised a large number of Doctoral and Masters students in the area of laboratory investigation and soft clay behaviour, sampling and in-situ testing, characterization and in-situ properties of natural soils, state of the art aspect of automated laboratory tests on stress-strain behaviour and strength characteristics of soils.

Peter Burgess

Senior Principal, Coffey Geotechnics

Mr Burgess graduated from Sydney University in 1961 with 1st Class Honours in Geology, specialising in Engineering Geology. After graduation he worked for the Snowy Mountains Hydro-Electric Authority as a Scientific Officer where he carried out geological mapping along proposed tunnel routes, dam foundations, quarries and roads. The site investigations involved overseas work in Thailand, Laos, Malaysia and Cambodia. In these countries the projects involved a major dam site on the Mekong River, and Major Irrigation projects in Cambodia. In 1967 - 1968 he was awarded a Rotary Foundation Fellowship for International Understanding which allowed post graduate study at Grenoble University in France. In 1969 Mr Burgess was engaged as site engineering geological consultant for the construction of Ord River Dam in WA. From 1971 to 1978 Mr Burgess was Senior Engineering Geologist with Coffeys and was responsible for a large number of site investigations in Australia and Overseas including mining, commercial and Industrial Developments. Between 1978 and

1994 Mr Burgess ran his own geotechnical consultancy, specialising in dam engineering, tailings dam design and construction. Notable projects during this period were the Ranger Uranium Mine Tailings Dam in the NT and the Rum Jungle Mine Rehabilitation project. Both of these projects involved design specification and supervision of construction of environmentally sensitive works in areas of National Park and World Heritage values. A number of other mining and tailings projects were also taken into the Peter J. Burgess & Associates practice. Mr Burgess rejoined Coffeys in 1994 as Senior Principal Engineering Geologist. He is currently primarily engaged in Water Supply, Waste Storage and Tailings Dam design construction projects in Australia and overseas. Peter Burgess is a former chairman of the Sydney Geomechanics Society, and former mining company representative on OECD and IAEA committees on the Long Term Storage of Uranium Mill Tailings. He has worked as an engineering geologist for the Snowy Mountains Hydroelectric Authority and the Western Australian PWD, and subsequently Principal in the following firms of consulting engineers: Coffey Partners, McMahon Burgess and Yeates, and Peter J Burgess and Associates. Peter has been involved in a very large number of major projects as listed below.

Slope Stability: Nearly 20 or more projects in NSW; PLB Malaysia, Malaysia Singapore Second Crossing, Senai North Toll Plaza; Transfield, Malaysia

Dams: Nearly sixty projects in all States of Australia, Cambodia, Indonesia, Philippines and Malaysia

Tunnels: Sixteen or more projects in Australia, Malaysia and Singapore

Dredging & Reclamation: More than six projects

Wharf & Bridge: Six projects

Roads & Highways: Five projects

Foundations: 26 projects

Grouting: Nine projects

Quarry Blasting, Vibration and Excavation: Eight projects

Rock Erodibility: Four projects

Quarry Backfilling & Quarry Remediation: Three projects.

Dr Robert J Whiteley

Senior Principal, Coffey Geotechnics

Dr. Bob Whiteley, a Senior Principal at Coffey Geotechnics started his earl work in Engineering Geophysics with the Bureau of Mineral Resources (now the Australian Geological Survey Organisation). He then worked in the mineral industry as a general manager and senior exploration geophysicist/geologist. Earlier an Academic staff at UNSW, Bob established and directed two consulting and contracting companies specialising in engineering, marine and groundwater geophysics. From 1984 to 1986 he was Associate

Professor in the Division of Geotechnical Engineering, Asian Institute of Technology, Bangkok and Senior Lecturer at the University of New South Wales until 1988. Dr. Whiteley has an extensive consulting and research background in engineering, groundwater and environmental geophysics with over 100 published scientific papers and one book. He is recognised as one of Australia's leading Engineering and Environmental Geophysicist. In 1990 he gave the Keynote address on Remote Sensing and Geophysical Techniques to the 6th Congress of the International Association of Engineering Geology in Amsterdam. In 1991 he received a best paper award at the 8th International Conference of the Australian Society of Exploration Geophysicists in Sydney. In 1994, 1997 and 2004 he presented the Keynote addresses on Engineering and Environmental Geophysics at the 10th, 13th and 17th International Conferences of this Society. He was second vice president of the ASEG from 1974 to 1976 and from 1995-2005 he was a core member of Technical Committee TC10 (Geophysical Site Characterisation) of the International Society of Soil Mechanics and Foundation Engineering. Dr. Whiteley has worked on and managed projects throughout Australia and in Bangladesh, China, Hong Kong, India, Indonesia, Malaysia, The Netherlands, New Caledonia, New Zealand, Pakistan, Philippines, PNG, Singapore, Solomon Islands, Thailand, Vietnam, United Emirates and USA. He has been a consultant to Ausaid, the United Nations and the Asian Development Bank in the Natural Resources Sector.

Dr. Suchatvee Suwansawat (Vince) , Sc.D

Dr. Suchatvee Suwansawat (Vince) obtained his doctoral Degree from Massachusetts Institute of Technology (MIT) in USA. He also has Masters Degree from MIT and University of Wisconsin and Batchelor's Degree from King Mongut Institute of Technology Thailand. Vince worked with Prof. Herbert Einstein at MIT on tunnelling research. His expertise is in Soil & Rock Mechanics, tunnelling and underground construction and instrumentation and monitoring systems. President of the Thai Chapter of the International Association of Tunnelling. Vince is very active with the Bangkok MRTA which is in sedimentary soils with soft clays overlying sand and in the Bangkok Plain where subsidence is a major problem due to deep well pumping. Vince is also involved with the flood protection tunnel in the Chaophraya river in Bangkok and several Water Main tunnels for water supply. Vince was a Visiting Professor at Kyoto University and has presented papers on tunnelling in numerous conferences. He recently has a paper in ASCE, Geotechnical Engineering Journal on the MRTA Project completed in Bangkok co-authored with Prof. Einstein. At his university in Bangkok, Vince leads a very dynamic group on tunnelling research. Vince has travelled very widely and participated in the ITA activities in Amsterdam (2003) Singapore (2004) Seoul (2006) and Prague (2007).