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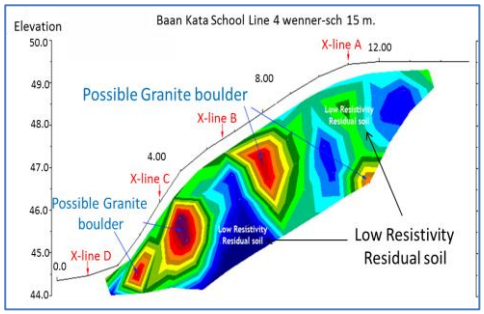
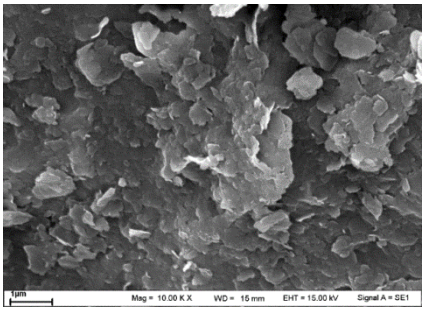
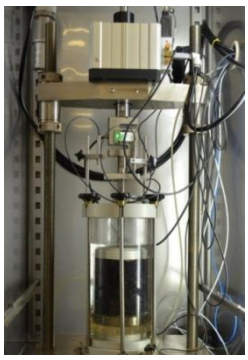
Embankment completed construction works at AIT (After Otha, 2015)



Results of electrical prospecting from resistivity test (After Ohtsu et al., 2015)



SEM photograph of Bangkok clay (After Por et al., 2015)



Dynamic creep test setup in wet condition (After Chompoorat and Likitlersuang, 2015)

GEOTECHNICAL ENGINEERING

March 2015 Issue: Special Country Issue of Thailand – Dr. Surachat Sambhadharaksa Memorial Issue Advances in Geotechnical Engineering for Infrastructure Developments in Thailand

Edited by : Suched Likitlersuang, Suksun Horpibulsuk, Suttisak Soralump, Tirawat Boonyatee Suchatvee Suwansawat, and Thanakorn Chompoorat

Suched Likitlersuang

Suched Likitlersuang graduated with a bachelor degree in civil engineering from Chulalongkorn University in 1998 and received a master in geotechnical engineering from Asian Institute of Technology in 2000. He attained a doctorate in civil engineering from the University of Oxford in 2004. Suched is currently a full professor at the Department of Civil Engineering, Chulalongkorn University. He is members of the Thai Geotechnical Society and the Engineering Institute of Thailand. He is also an Editorial Board member of Geotechnical Research and serves as a Guest Editor of the Southeast Asian Geotechnical Society Journal special issue for Thailand. Suched has published over 70 articles in international conference proceedings and international journals. His research interests include constitutive modelling for geomaterial and asphaltic concrete, stress-strain characteristic of soils, numerical analysis in geomechanics, geo-environments, geotechnical earthquake engineering and soil bioengineering.

Thanakorn Chompoorat

Thanakorn Chompoorat was born in Thailand in 1980. He graduated the Bachelor degree in Civil Engineering from Srinakharinwirot University in 2003. He also received the Master and the Doctoral degrees in Geotechnical Engineering from Chulalongkorn University in 2005 and 2009 respectively. He is currently an Assistant Professor and Assistant Dean for Research and Academic Service of the Department of Civil Engineering, University of Phayao. Thanakorn is a member of the Thai Geotechnical Society as well as the Engineering Institute of Thailand and presently also serves as an Editorial Secretary of the Southeast Asian Geotechnical Society Journal special issue for Thailand. His main research interests are soil behaviour and pavement material behaviour, numerical analysis for soil and pavement material, and constitutive modelling and plasticity.

GEOTECHNICAL ENGINEERING

PREFACE

Welcome to Geotechnical Engineering Journal of the Southeast Asian Geotechnical Society (SEAGS) and the Association of Geotechnical Societies in Southeast Asia (AGSSEA). It is our great pleasure to serve as the editors for the first issue of 2015 and also the special country issue of Thailand. Our editorial team consists of Prof. Suched Likitlersuang from Chulalongkorn University, Prof. Suksun Horpibulsuk from Suranaree University of Technology, Dr. Suttisak Soralump – President of Thai Geotechnical Society, Dr. Tirawat Boonyatee – Vice president of Thai Geotechnical Society, Prof. Suchatvee Suwansawat – President of Engineering Institute of Thailand, and Dr. Thanakorn Chompoorat from Univerisity of Phayao. We are also supported by Prof. A.S. Balasubramaniam as the editor-in-chief and Dr. Teik Aun Ooi as the president of SEAGS to launch this special issue. The rigorous blind peer-review process has been carried out by international reviewers, while every effort was carefully made to ensure the technical quality of the journal. We highly appreciate our reviewers for their time and effort.

The theme of this special issue is *Advances in Geotechnical Engineering for Infrastructure Developments in Thailand*. The articles cover a wide range of topics from theoretical soil mechanics to geotechnical applications for Thailand's infrastructure developments. This special issue of Geotechnical Engineering Journal of the SEAGS & AGSSEA is comprised of fourteen articles with a selection of authors from four countries including Australia, China, Japan and Thailand.

The first invited paper by Ohta (2015) presents consolidation settlement due to the embankment construction on soft Bangkok clay. The paper also acknowledges the technical communication with Dr. Surachat Sambhandaraksa related to consolidation settlement. Two papers (Ohtsu et al., 2015 and Jotisankasa et al., 2015) present field studies of slope stability due to rainfall in Thailand. The topics related to ground improvement for soft soil are still interested in this issue such as using chemical stabilisation (Horpibulsuk, et al., 2015, Fan, et al., 2015 and Julphunthong, 2015) and vacuum consolidation technique (Shibata et al., 2015). Two papers (Ukritchon and Boonyatee, 2015 and Horpibulsuk and Liu, 2015) related to soil modelling and its parameter calibration are included in this issue as well. Chompoorat and Likitlersuang (2015) summaries mechanical properties of hot mix asphalt for pavement design. Undrained shear strength of Bangkok clays from various laboratory techniques are discussed by Ratananikom et al. (2015). A review of pile foundation design on Bangkok subsoils is presented by Boonyatee et al. (2015). 3D finite element analysis of the potential use of piled raft foundation on Bangkok subsoils is proposed by Watcharasawe et al. (2015). Lastly, Por et al. (2015) presents a laboratory investigation of expansive soil behaviour.

We consider that this special issue summaries some recent advances in geotechnical engineering for infrastructure developments in Thailand. We also hope that it could make an important contribution to other countries in the Southeast Asia.

Suched Likitlersuang
Thanakorn Chompoorat

ACKNOWLEDGEMENT

At the very outset, we would like to acknowledge the skill of Prof. Suched Likitlersuang, who headed the team of Guest Editors in producing this excellent issue. This issue honours the late Dr. Surachat Sambhandaraksa a very long time friend of ours and a past president of the SEAGS. This is also the Thai country issue produced in such a short time, while some other country issues will only appear in 2016. The topics and the authors are adequately described in the Preface. The SEAGS and the AGSSEA as well as the Thai Geotechnical Society (TGS) are very grateful to the Editors, authors and reviewers for their excellent work.

A good teacher is often measured by the quality of his students. Dr. Surachat had graduated from Chulalongkorn University going to almost all the good universities to do doctoral studies. It is appropriate to have a brief biodata of Dr. Surachat.

Dr. Surachat Sambhandharaksa, a past president of the Southeast Asian Geotechnical Society (SEAGS) from 1996 to 1999. A modest and clever achiever, Surachat was the earlier colleague of late Dr. Chai Muktabhant and Prof. Vichien Tengamnuey at Chulalongkorn University. Surachat always had an international outlook with his early education at the University of New South Wales in Australia in 1967; then his master degree from the Asian Institute of Technology (AIT) in 1970; later Surachat went to the Northwestern University and finally obtained his Sc.D. degree from the Massachusetts Institute of Technology (MIT), the United States of America in 1977. When he returned to Chulalongkorn University, Surachat was also a lecturer much in demand at the AIT. He was actively involved in most of the major projects in Bangkok and Thailand. He has real world experience in geotechnical engineering practice with sound knowledge on the fundamentals of soil behaviour. His practice is in embankments and piled foundations. He was a much sort out consultant in Bangkok. At AIT, we needed a person like Surachat to teach our design courses. Surachat also taught a popular course for non-soil engineers and this is really popular. Surachat, received the Outstanding Award of the Teaching from Chulalongkorn University and was voted as the best Geotechnical Engineer in Thailand in 2006. He was also, the chairman of the organizing committee of the 15th Southeast Asian Geotechnical Conference held in Bangkok in November 2004. Popularly called as Sam at MIT, Surachat has a charming personality always joyful and friendly in nature. Surachat hails from a good family with his father as the professor of surgery at the Faculty of Medicine in Chulalongkorn University. We all miss him a lot and his premature death is a great loss to his family and friends.

Finally, Dr. Surachat is highly respected internationally, Prof. Harry Poulos made the comment as follows:

"Dr Surachat was a leading figure in Geotechnical engineering in Thailand for many years, and a person who was vastly experiencing in identifying and solving problems related to foundations in the often-challenging ground conditions in Bangkok. I first met him at one of the early Southeast Asian Geotechnical conferences, and it was quite clear that his knowledge of the characteristics of Bangkok soils was second to none, and that he was well-placed to advise clients on foundation design in these soils. He was also was a congenial host and dinner companion at a number of conferences held in Bangkok. Apart from his practical geotechnical skills, he was able to pass on his knowledge to many students who had the privilege of studying under him at Chulalongkorn University and at AIT. He was very proud of his educational background, first in Australia, and then at MIT, where he studied with some of the pioneers of soil mechanics such as Lambe, Ladd and Whitman. He achieved recognition for his expertise both in Thailand and in Southeast Asia more generally, and with his passing, the Southeast Asian region has lost one of its elder statesmen in the geotechnical profession."

Finally, We thank the Guest Editors, the authors of the papers and the reviewers , who made the most valued contribution in making this Issue feasible.

K. Y. Yong
N . Phienwej
T. A. Ooi
A. S. Balasubramaniam

GEOTECHNICAL ENGINEERING

March 2015 Issue: Special Country Issue of Thailand – Dr. Surachat Sambhadharaksa Memorial Issue Advances in Geotechnical Engineering for Infrastructure Developments in Thailand

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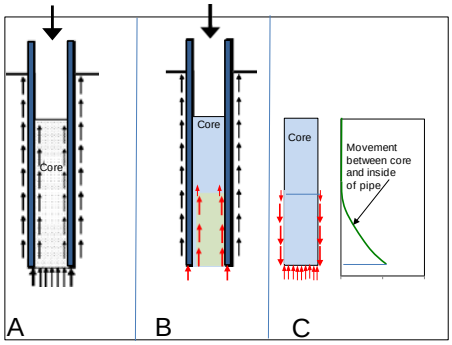
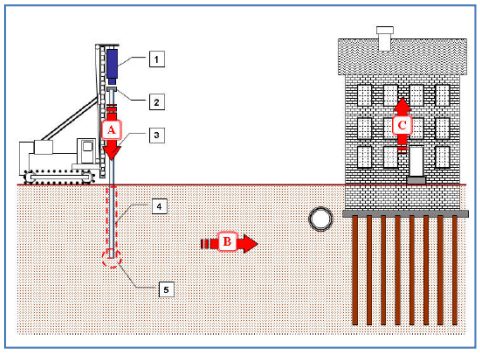
AIT Asian Institute of Technology

Editors: San-Shyan Lin, Charng Hsein Juang, and Robert Liang

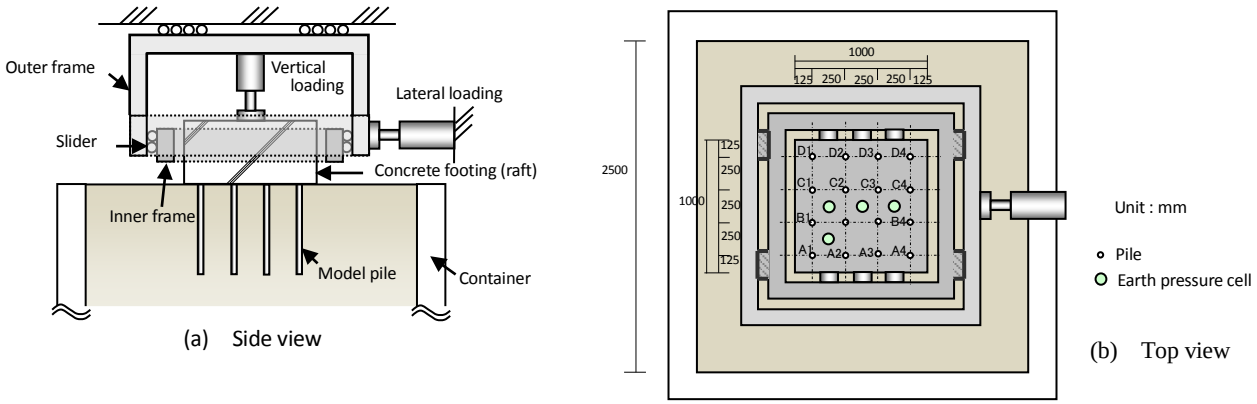


Advancing an open-toe pipe pile
(After Fellenius 2015)



Propagation of stress wave from impact hammer
(After Massarsch and Fellenius 2015)

75 MN pile loading test
(After Lin et al. 2015)



Model Pile Testing Setup (after Hamada et al. 2015)

GEOTECHNICAL ENGINEERING

June-2015 Issue: Pile Foundation
Edited By San-Shyan Lin, Charng Hsien Juang and Robert Liang

Prof. San-Shyan Lin

Professor Lin is a Professor at Department of Harbor and River Engineering of National Taiwan Ocean University in Taiwan. He received his Ph.D. degree in Civil Engineering from Washington University in St. Louis, Missouri USA in 1992. Dr. Lin was an engineer at Taiwan Area National Expressway Engineering Bureau from 1992 to 1994. Prof. Lin's research and practical experiences have dealt with drilled shaft foundations, earth reinforced structures and effects of scouring on bridge foundations. Prof. Lin has published more than 110 peer-reviewed journal papers and conference papers. In 2012, Prof. Lin served as chairman of organization committee of 5th Taiwan-Japan workshop of earthquake and heavy rainfall held in Tainan, Taiwan; member of international organizing committee of 7th Asian young geotechnical engineer conference held in Tokushima, Japan; and member of both international advisory committee and technical committee of Geosynthetics Asia 2012 in Bangkok, Thailand. Prof. Lin is currently serving as the member of conference advisory committee of 18th Southeast Asian Geotechnical Conference and member of international advisory committee of International Symposium on Advances in Foundation Engineering. In addition, Prof. Lin is serving as the President of Taiwan Geotechnical Society and the CEO of Sino-Geotechnics Research and Development Foundation in Taiwan. Prof. Lin also served TRB A2K03 Committee on Foundations of Bridges and Other Structures between 1995 and 2004 and serves as a member on the editorial boards for four major international journals in geotechnical engineering.

Prof. Charng Hsein Juang

Dr. Juang received his Ph.D. degree in Civil Engineering from Purdue University in 1981. He joined the faculty of Clemson University in 1982 and has been with Clemson University ever since. Dr. Juang has a broad research interest in the field of geotechnical engineering. His past research work dealt with slope stability, soil-buried pipes interaction, soil and rock properties, pile foundations, fuzzy sets and uncertainty modeling in geotechnical engineering. His current research work deals with liquefaction, site characterization, braced excavation, reliability and probabilistic methods in geotechnical engineering, and fuzzy and neural network applications in geotechnical engineering.
Dr. Juang has received a number of awards and honors. He was proud to be selected by his students through Chi Epsilon for Outstanding Teacher Award in 1985. Among his awards and honors are the Outstanding Research Paper Award by the Chinese Institute of Civil and Hydraulic Engineering (1976), the TK Hseih Award by the Institution of Civil Engineers of the United Kingdom (2001), the Clemson University Board of Trustees Award for Faculty Excellence (2002), election to ASCE Fellow (2007), and appointment to Chair Professor at National Central University, Taiwan.
His professional services include:

- Chair, ASCE/GI Committee on Risk Assessment and Management (2009-2012); Secretary, (2003-2009); Member (1993-present)
- Co-Editor in Chief, Engineering Geology (2012-present)
- Associate Editor & Editorial Board Member, ASCE Journal of Geotechnical and Geoenvironmental Engineering (2004-2012)
- Editorial Board, Journal of GeoEngineering (2006-present)
- Editorial Board, Georisk (2009-present)
- Conference Chair, ASCE Geo Institute Specialty Conference, GeoRisk 2011, Geotechnical Risk Assessment and Management, Atlanta, June 26-28, 2011.

Prof. Robert Liang

Dr. Robert Liang holds a title of University Distinguished Professor in the Department of Civil Engineering at the University of Akron. He also serves as the Director for the Center for Infrastructure Materials and Rehabilitation. Since receiving his Ph.D. in 1985 from the University of California in Berkeley, Dr. Liang has been with the University of Akron. From 1994 to 2000, he served as Civil Engineering Department Chair. Dr. Liang has conducted research in areas such as geotechnical engineering, pavement engineering, and infrastructure materials and rehabilitation technologies. His research has resulted in more than 300 journal and conference papers, with practical impacts on design and construction practices. Dr. Liang is active in ASCE (American Society of Civil Engineers), TRB (Transportation Research Board), and DFI (Deep Foundation Institute) committee works. He serves as associate editor for the ASCE's Journal of Engineering Mechanics and Journal of Geotechnical and Geoenvironmental Engineering. Currently, he is on the editorial board for several international journals, such as Georisk, and Journal of GeoEngineering. Dr. Liang received Wendell R. Ladue award from ASCE Akron-Canton Section for his outstanding contributions to the profession. He also received Louis Hill award from College of Engineering in recognition of his exemplary achievements in both research and teaching. He received outstanding service award from the Great Lakes Geotechnical and Geoenvironmental Engineering Organization for his service as the president of the organization. In recognition of his contributions to civil engineering, Dr. Liang was elected to Fellow of ASCE in 2009.

Prof Ikuo Towhata
President, Japanese Geotechnical Society (2014-2016)
Vice President for Asia, International Society for Soil Mechanics and Geotechnical Engineering (2009-2017)

SPECIAL FEATURE STORY ON "Liquefaction Problems in the 21st Century"

by Prof Ikuo Towhata

Prof Ikuo Towhata

Prof Ikuo Towhata obtained his Bachelor of Engineering degree from the University of Tokyo in 1977. He obtained his Master of Engineering and Doctor of Engineering in 1979 and 1982 respectively from the same university. In 1985 he was Assistant Professor at the Asian Institute of Technology in Bangkok and in 1986 as Associate Professor at Chulalongkorn University in Bangkok. He returned to work in Tokyo University as an Associate Professor in 1987. In 1989 he was Associate research fellow at PWRI Ministry of Construction. He was Professor at Tokyo University from 1994 to 2014 and since 2015 he is Visiting Professor at Kanto Gakuin University, Department of Civil Engineering Yokohama Tokyo Japan. Professor Towhata has 32 years of research experience and his special areas of interest are Deformation characteristics of cohesionless soils; Dynamic analysis of earth structures during earthquakes; Permanent displacement of ground caused by seismic liquefaction; Soil improvement by densification and grouting; Stability of seabed in static and dynamic manners; Thermal effects on mechanical behavior of clays; Microscopic Observation of Granular Behavior of Sand Subjected to Shear; Dynamics of landslide and debris flow. Professor Towhata is active in public service and was Board member of Japanese Geotechnical Society for two terms; Board member of Japan Association for Earthquake Engineering for one term; Board member of Japan Landslide Society for two terms; Chairman of Editing Committee of Soils and Foundations Journal, the Japanese Geotechnical Society in 2005-2008; Chairman of Geotechnical Committee, Japan Society for Civil Engineers in 2007-2008; Vice President, Japan Association for Earthquake Engineering in June 2009-May 2011; President, Japanese Geotechnical Society in 2014-2016; Appointed Board Member and then Vice President for Asia, International Society for Soil Mechanics and Geotechnical Engineering in 2009-2017; Associate Member of Science Council Japan in 2014-2020. He is currently Member of the Japanese Geotechnical Society; Member of the Southeast Asian Geotechnical Society; Member of the International Society of Soil Mechanics and Geotechnical Engineering; Fellow member of the Japan Society of Civil Engineers and Member of the Japan Association for Earthquake Engineering. Professor Towhata has been invited to deliver Keynote Lectures and Special Lectures in many international conferences. He has published more than 600 papers and has published many books notably:

Towhata, I. (1999). Air photographs of the Niigata city immediately after the earthquake in 1964, Japanese Geotechnical Society, ISBN4-88644-054-1.

Towhata, I. (2008) Geotechnical Earthquake Engineering, ISBN 978-3-540-35782-7, pringer Verlag-Berlin Heidelberg.

Towhata, I. and Jiang, Y.-J., 2010. Geotechnical Aspects of 2008 Wenchuan earthquake, China, Chapter 8, Advances in Earthquake Geotechnical Engineering, Springer.

Professor Towhata has won many awards and among them the Japanese Geotechnical Society; Technological Development Award in 2015; Japan Society of Civil Engineers; Best book publication award in 2009; Japanese Geotechnical Society, Award for the Best Paper of the Year 2003; 2004 and the best twelve papers out of 600 at GeoEng2000 Conference at Melbourne in 2000

GEOTECHNICAL ENGINEERING

PREFACE

The theme of the 2015 June issue is Pile Foundations. The guest editors for this special issue are Professor San-Shyan Lin at National Taiwan Ocean University, Taiwan, Prof. Charng Hsein Juang at Clemson University, USA, and Prof. Robert Liang at Akron University, USA contributed to the editorial management. Prof. A.S. Balasubramaniam as the Editor-in-Chief and Dr. Teik Aun Ooi as the President of SEAGS strongly supported the launch of this special issue on Pile Foundations.

The topics and scope covered in this special issue are comprehensive and interdisciplinary, ranging from back-analysis of pile load test, piled-raft analysis, ground vibration caused by impact pile driving, analysis of bi-direction-cell test, effect of aging on barrette pile, comparison on dynamic response of a single pile using different approaches, response of "plug" in open-toe pipe pile, effect of toe grouting of IGM socketed drilled shaft, reliability-based design on foundation and ultimate resistance of drilled shaft by probabilistic approach. The issue is comprised of twelve papers with a selection of the authors from seven countries involving Canada, Japan, Lebanon, Sweden, Taiwan, Thailand and USA.

Niazi and Mayne develops new sets of shear stiffness reduction curves from the back-analyses of 299 static axial pile load tests from 61 sites towards the implementation of a non-linear load-displacement response method for pile foundations. Subsequently, the elastic continuum solution is exploited by them to present a methodology for drawing the stiffness reduction curves as functions of depth. These curves are further utilized in modeling the pile as a stack of smaller shaft segments embedded in multi-layered soils. Hamada et al. presents static cyclic lateral loading tests on large-scale piled raft foundations carried out to investigate the influence of vertical load and pile spacing ratios during earthquakes. Yamashita et al. applies and modifies the simple method proposed by Clancy and Randolph (1996) on piled raft analysis. Four case histories in Japan are examined through comparisons with the field monitoring results. Massarsch and Fellenius describe the application of the Swedish standard which regulates permissible ground vibrations caused by driving of piles, sheet piles, or ground compaction. Fellenius explains how to use the bidirectional-cell test data on a pile to establish the load distribution for the pile, which enabled determining the distribution of the effective-stress beta-coefficients for the pile response Teparaksa presents testing process and discusses the result of different barrette pile static load tests, especially on aging effect on pile capacity. Lu and Chang presents a case study on dynamic behaviors of coal ash soils obtained in a landfilled field in north Taiwan and also the dynamic interaction of a single pile foundation sitting in the landfills. Fellenius recommends how to analyze the response of an open-toe pile. A comparison is also provided between the results of a simulated static loading test on a closed-toe and an open-toe pipe pile. Lin et al. presents the axial performance of two heavily instrumented drilled shafts, with and without toe grouting, socket in intermediate geomaterials in Taipei city. Abdallah et al. presents the results of a comprehensive investigation that is conducted to study the effect of choosing different proof-load test programs on the reliability of piles. Luo et al. evaluates and compares existing probabilistic approaches for determining the ultimate resistance of drilled shafts in sands considering the spatial variability of soil properties.

We consider that this special issue presents and illustrates the outcome of some of the state-of-the-art research on pile foundations, and hope that it will make an important contribution to this growing field in the years to come.

San-Shyan Lin
Charng Hsein Juang
Robert Liang

ACKNOWLEDGEMENT

The lead editor of the June 2015 Issue on Piled Foundation is Prof. San Shyan Lin with team members Prof. Charng Hsein Juang and Prof. Robert Liang. Prof. San Shyan Lin is of immense help to the SEAGS-AGSSEA Journal as a Member of the Team of Editor in Chief. It is worthy to mention that the Taiwan Geotechnical Society is the most active supporter of all SEAGS-AGSSEA activities including the Journal. There were many Issues of the Journal editted by members of CTGS (Chinese Taipei Geotechnical Society). They also contribute many articles and this is a most welcome culture which should be a model example to follow by other AGSSEA member countries. Gradually, we have been very successful in engaging members of AGSSEA to contribute to the journal and take much of the responsibility in contributing articles, engaged in reviewing and other aspects related to the journal. The country issues in 2016 and the Anniversary Issues in 2017 will further enhance the success in the active participation of AGSSEA members in the journal.

In the preface , Prof. San Shyan Lin and his team has already covered adequately the contents of the papers from an international set of prestigious authors and all articles were also reviewed by experts in the field. Details of the reviewers will be assembled in the December Issue for all the articles published in 2015. SEAGS-AGSSEA Journal is always very practice oriented and this well reflected in the contributions contained in this issue as well.

There are twelve excellent papers written by well known authors from : USA, Japan, Sweden, Canada, Thailand, Taiwan and other countries. No doubt, this Issue will be most useful to our Profession and all those who are engaged in Pile Foundation Research and Practice. Sincere thanks to all who have contributed to the success of this issue of our journal under the able leadership of Prof. San Shyan Lin

We are grateful to Professor Ikuo Towhata for his contribution of Special Feature Story on “Liquefaction Problems in the 21st Century” in this issue**.**

K. Y. Yong
N . Phienwej
T. A. Ooi
A. S. Balasubramaniam

GEOTECHNICAL ENGINEERING

JUNE 2015: SPECIAL ISSUE ON PILE FOUNDATIONS

Editors: San-Shyan Lin, Charng Hsein Juang, and Robert Liang

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Editors: Prof. Zhen-Yu YIN and Prof. Jian-Hua YIN

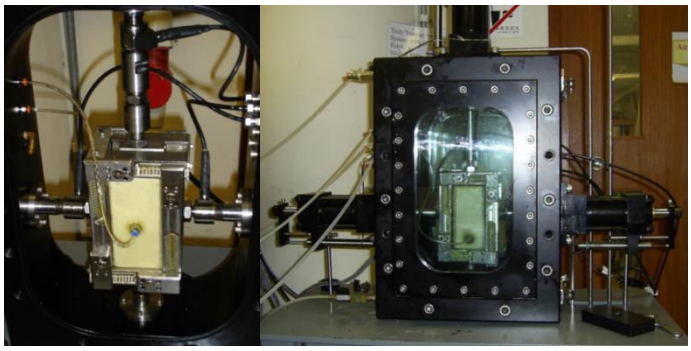


Photo 1 (a) Details of true triaxial loading and
(b) the water proof chamber (After Yin at al, 2010)

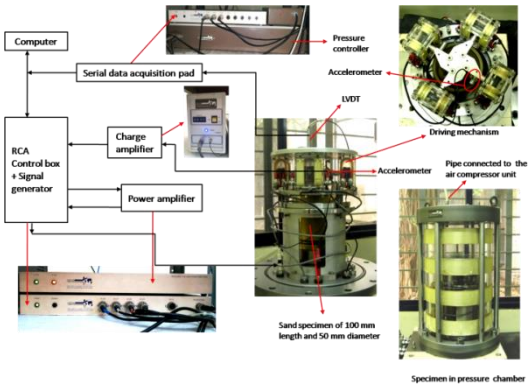
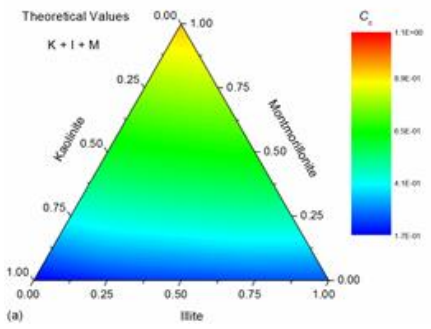
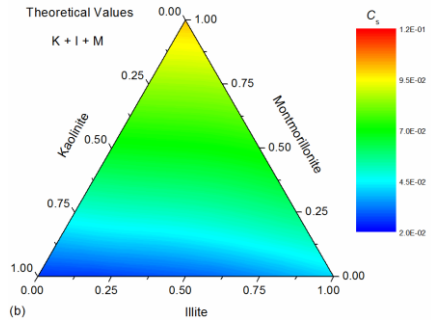


Photo 2 Resonant column apparatus
(After Kumar and Cherian, 2015)



(a) Compression test



(b) Swelling index

Photo 3 Triangle plot of theoretical results for mixtures of Kaolinite, Illite and Montmorillonite
(After Ye et al, 2015)

GEOTECHNICAL ENGINEERING

September-2015 Issue: Soil Behaviour and Modelling

Edited By Prof. Zhen-Yu Yin and Prof. Jian-Hua Yin

Prof. Zhen-Yu Yin

Prof. Yin graduated from Zhejiang University, China in 1997 for his bachelor degree and from Ecole Centrale de Nantes, France in 2003 for his master degree. He got PhD from Ecole Centrale de Nantes, France in 2006 in the field of geotechnical engineering. He was promoted as professor in 2010 at Shanghai Jiao Tong University in China. Prof. Yin's research topics include: (1) constitutive modeling for saturated soils; (2) microstructure and micromechanics for soils; (3) improvement technology for soft soils; (4) finite element analysis for geotechnical engineering. He has authored more than **50** papers in peer review journals such as Geotechnique, ASCE journals, IJSS, Nag etc.

In 2011, Prof. Yin was awarded "Professor of Exceptional Rank of Shanghai-Dongfang Scholar" by Shanghai Education Committee. Prof. Yin is now serving as committee member for both national and international associations (granular materials committee ASCE, Constitutive Relation and Strength Theory Committee of Chinese Society of Soil Mechanics and Geotechnical Engineering, Soil Mechanics Committee of Chinese Society of Theoretical and Applied Mechanics, Underground Engineering Committee of Shanghai Society of Civil Engineers). From 2010 up to 2012, Prof. Yin has received 8 research grants as main investigator, financed by European Union, Chinese National Science Foundation, Minister of Education of China, Shanghai Science and Technology Committee etc.

Prof. Jian-Hua Yin

Dr Jian-Hua Yin is currently a professor in the Department of Civil and Structural Engineering of The Hong Kong Polytechnic University. Professor Yin received a BEng degree in 1983 in Chinese Mainland, an MSc degree from Institute of Rock and Soil Mechanics of the Chinese Academy of Sciences in 1984, and a PhD from The University of Manitoba, Canada in 1990. Dr Yin has a mix of industrial and academic experiences. He joined Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University in 1995 as an Assistant Professor. He was promoted to an Associate Professor position in 1999, to a Professor position in 2002, and recently to the position of Chair Professor of Soil Mechanics in 2014. Professor Yin has a good track record in research and has played a leading role in development of advanced soil testing equipment, innovative fiber optical sensors, establishing a large-scale multi-purpose physical modeling facility for studying geo-hazards, organization of regional and international conferences. His research interests include (i) testing study of properties and behaviour of soils, (ii) elastic visco-plastic modeling, (iii) soft soil improvement, (iv) soil nails and slope analysis, (v) development and applications fiber optical sensors, (vi) soil-structure interface, and (vii) development of advanced/special lab test apparatus. Currently, Professor Yin serves as a Vice-President of International Association for Computer Methods and Advances in Geomechanics (IACMAG), Co-Editor of International Journal of Geomechanics, Co-Editor of Geomechanics and Geoengineering, and Associate Editor of Canadian Geotechnical Journal. He has received the honours of the prestigious "JOHN BOOKER Medal" in 2008, "Chandra S. Desai Excellence Award" in 2011 from IACMAG, and delivering the high-status 2011 "Huang Wenxi Lecture" in Chinese Mainland.

SPECIAL FEATURE STORY ON
"Soil Mechanics at Emmanuel College –Elegant, Rigorous and Relevant"
By John Burland

Professor John Burland

Born in the UK, Professor Burland was educated in South Africa and studied Civil Engineering at the University of the Witwatersrand. He returned to England in 1961 and worked with Ove Arup and Partners for a few years.

After studying for his PhD at Cambridge University, John Burland joined the UK Building Research Station in 1966, became Head of the Geotechnics Division in 1972 and Assistant Director in 1979. In 1980 he was appointed to the Chair of Soil Mechanics at the Imperial College London. He is now Emeritus Professor and Senior Research Investigator at Imperial College.

In addition to being very active in teaching (which he loves) and research, John Burland has been responsible for advising on the design of many large ground engineering projects world-wide including the underground car park at the Palace of Westminster and the foundations of the Queen Elizabeth II Conference Centre in London. He specialises in problems relating to the interaction between the ground and masonry buildings. He was London Underground's expert witness for the Parliamentary Select Committees on the Jubilee Line Extension underground railway and has advised on many geotechnical aspects of that project, including ensuring the stability of the Big Ben Clock Tower. He was a member of the international board of consultants advising on the stabilisation of the Metropolitan Cathedral of Mexico City and was a member of the Italian Prime Minister's Commission for stabilising the Leaning Tower of Pisa.

He has received many awards and medals including the Gold Medal for engineering excellence of the World Federation of Engineering Organisations and the Gold Medals of the UK Institution of Structural Engineers and of the UK Institution of Civil Engineers. In 1994 he was awarded the Kevin Nash Gold Medal of the International Society of Soil Mechanics and Geotechnical Engineering 'In recognition of outstanding services to ISSMGE, to International Goodwill and to International Geotechnical Practice and Education'. In 1996 he was awarded the Harry Seed Memorial Medal of the American Society of Civil Engineers 'for distinguished contributions as an engineer, scientist and teacher in soil mechanics'. He is a Fellow of both the UK Royal Academy of Engineering and of the Royal Society of London and was appointed Commander of the Most Excellent Order of the British Empire in 2005.

SPECIAL FEATURE STORY ON
"Ground Improvement Methods for Port Infrastructure Expansion"
By Indraratna B., Heitor, A and Rujikiatkamjorn, C.

Prof. Buddhima Indraratna, PhD

Buddhima Indraratna is a Civil Engineering graduate from Imperial College, London, and obtained his PhD from the University of Alberta in 1987. He has worked in industry in several countries before becoming an academic at AIT during the period 1988-1991, in which he was an Assistant Professor and then Associate Professor. He was involved in a number of major infrastructure projects in Thailand and Southeast Asia during that time. Subsequently, his contributions to the analysis of 2nd Bangkok International Airport (Suvarnabhumi) are well-known and published in major international journals.

Prof Indraratna's significant contributions to geotechnical and railway engineering have been acknowledged through numerous national and international awards, including the 2016 Inaugural Ralph Proctor Lecture by the International Society of Soil Mechanics and Geotechnical Engineering, the most prestigious award in Transport Geotechnics. In 2009, he delivered the prestigious E.H. Davis Memorial Lecture of Australian Geomechanics Society for distinguished contributions to theory and practice of geomechanics. In 2014, he received the C.S. Desai Medal from the International Association for Computer Methods and Advances in Geomechanics (IACMAG) for outstanding contribution to geotechnical research and education. For his pioneering contributions to Australian railway innovations, he was honoured with the prestigious Business and Higher Education award by the Australian Government in 2009, Engineers Australia Transport Medal in 2011 and 2015 Australasian Railway Society's Outstanding Individual Award. Over the past two decades, he has also received numerous best paper awards, for example Thomas Telford Premium Award by the Institution of Civil Engineers, UK amd Robert Quigley Award by the Canadian Geotechnical Society. He was instrumental in changing the Australian standards the use of vertical drains in soft foundations soils and for revising the standards for railway ballast.

Prof Indraratna currently leads numerous projects funded by the Australian Research Council with over $15 million dollars over the past decade, and he has been a geotechnical consultant worldwide, and a United Nations consultant. He was also an Advisor to the Ministry of Science and Technology (Thailand) for new railway network planning and design, and an Advisor to the Government of Sri Lanka on Post-tsunami rehabilitation of railways. He has more than 550 publications including over 230 reputed journal papers, 9 Books and over 45 invited keynote papers. He has supervised over 50 PhD graduates and 30 Postdoctoral Fellows.

Professor Indraratna is a Fellow of the most prestigious Australian Academy of Technological Sciences and Engineering (FTSE), as well as a Fellow of several professional organisations including the Institution of Engineers, Australia (FIEAust), American Society of Civil Engineers (FASCE), Australasian Institute of Mining & Metallurgy (FAusIMM) and the Geological Society of UK (FGS).

GEOTECHNICAL ENGINEERING

PREFACE

This September 2015 issue of the journal contains fifteen interesting research papers and the details are described below. The time-dependency of the soft clay behaviour is studied in two papers by Wu *et al* and Ye *et al* as overview and interpretation of rate dependency and stress relaxation in soft clays respectively. In these papers, the strain rate dependent behaviour and under 1D and 3D stress conditions under complex loading conditions is studied through triaxial compression and extension tests under different OCR by Wu *et al* and the pore pressure development during stress relaxation by Ye *et al*. The latter paper also used stress relaxation curves in double logarithmic plane resulting in the development of a stress relaxation coefficient useful in analytical solutions for the 1D stress relaxation. A third paper by Bian *et al* proposes a new stress strain model based on CSSM for re-constituted clays which considers the effects of initial water contents. The model describes the undrained shear behaviour. With the decrease of initial water contents, the reconstituted clays experience enhanced strength, stiffness and dilation, which are not involved in the Modified Cam Clay model. These features can be captured by introducing a new hardening parameter ('quasi-structure' strength) into the conventional critical state model. The 'quasi-structure' strength increases with the decrease of initial water contents. The available test data on the undrained shear behaviour of reconstituted clays at different initial water contents are used to verify the proposed model, and the comparisons between computed and measured results show that the proposed model is able to predict the overall pattern of stress-strain curves, pore pressure variations and effective stress paths reasonably well, especially the ultimate undrained strength and pore pressure response at large strain.

The fourth paper is on the engineering behaviour of Shanghai soft clay by Lu *et al* by statistical analyses of the test data. The goodness-of-fits of normal distribution, log-normal distribution, exponential distribution and uniform distribution are assessed for each parameter using the Kolmogorov-Smirnov (K-S) method. The results show that the normal distribution is suitable for initial water content, specific gravity, plasticity index, liquidity index and unit weight, the log-normal distribution is suitable for initial void ratio and plastic limit, the exponential distribution is suitable only for liquid limit, and the uniform distribution is not recommended.

Wang *et al* in the fifth paper deal with the dynamic behaviour of frozen soils. The dynamic response of frozen soils is one of the significant factors that should be taken into account when designing and constructing infrastructures in cold regions. This paper firstly reviews the state-of-the-art of dynamic testing techniques including dynamic uniaxial/triaxial test, resonant column test, wave velocity test and the SHPB test. Then the correlations of dynamic indexes for frozen soils with test conditions are analyzed i.e., dynamic modulus, dynamic strength, damping ratio as well as dynamic Poisson's ratio. The typical stress-strain relationships for frozen soils under dynamic loading are summarized such as empirical models, creep modelling and strength criterion for frozen soils. Finally promising prospects of the study in this paper is suggested.

Ye *et al* (in sixth paper) is on the mineral constituents of one dimensional compression behaviour of clayey soils. Only few data are available concerning the effect of the four main clay minerals, kaolinite (K), illite (I), montmorillonite (M) and chlorite (C), on the mechanical properties of clayey soils. This paper discusses the effect of different mineral contents on the compression and swelling indexes of clay mixtures in order to provide correlations between the mineralogical content of a clayey soil and its compressive properties. Four pure clay powders were used to prepare 34 clay mixtures (different proportions of K+I, K+I+M, K+I+C). Conventional oedometer tests were conducted on all the prepared samples. Based on the test results, the evolution of the compressive properties with the proportions of pure clays was estimated and relevant correlations are suggested. All the results demonstrate that the compression and swelling indexes are reasonably well correlated to the proportion of clay minerals. The content in montmorillonite influences significantly the compressive properties of clayey soils, and the contents of illite and chlorite are less influential when added to kaolinite based clayey soils. Moreover, 15 samples with different proportions of K+I+M+C were prepared and tested, and the proposed correlations were validated in light of the results obtained on these materials.

The seventh paper by Fan *et al*, investigates the addition of fine grained Zeolite on the compressibility and hydraulic conductivity of clayey soil treated with calcium bentonite and used as backfills for vertical cut off walls. Vertical cutoff walls, using backfill consisting of on-site sandy soil and Na-bentonite are widely used as engineering barriers for the purpose of achieving relatively low hydraulic conductivity and high contaminant sorption capacity. At some sites, locally available clayey soil, Ca-bentonite and natural zeolite may be considered as an alternate backfill. However, studies on the compressibility and hydraulic conductivity of zeolite-amended clayey soil/Ca-bentonite backfills for vertical cutoff walls are very limited. A series of one-dimensional consolidation tests is performed to evaluate the compressibility and hydraulic conductivity of fine-grained zeolite-amended clayey soil/Ca-bentonite backfills. Kaolin is used as the control clayey soil, and it is amended with various amounts of Ca-bentonite (5, 10, and 15%) and zeolite (2 - 40%) to prepare zeolite-amended kaolin-bentonite backfills. The results indicate that the addition of fine-grained zeolite has insignificant influence on the compressibility and hydraulic conductivity of clayey soil/Ca-bentonite and sandy soil/Na-bentonite backfills. The hydraulic conductivity of the zeolite-amended clayey soil/Ca-bentonite backfills is generally lower than the typical regulatory limit of 10-9 m/s. Two empirical methods, based on the Nagaraj's generalized void ratio (e/eL) and Sivapullaiah *et al*.'s method are assessed to predict the hydraulic conductivity of the backfills. The proposed method based on the Sivapullaiah *et al*.'s method is shown to estimate the hydraulic conductivity for the fine-grained zeolite-amended clayey soil/Ca-bentonite backfills with reasonable accuracy.

The eighth paper by Cheng and Saiyouri is titled effect of long term aggressive environments on the porosity and permeability of granular materials reinforced by nano-silica and sodium silicate. Colloidal nanosilica is a kind of new chemical grout materials for filling small pores of fine-grained soil. Compared to traditional sodium silicate material, the advantages and disadvantages of colloidal nanosilica are studied under laboratory conditions for pure gels and sand-gel mixtures for long-term volume stability. Samples of Fontainebleau sand injected by nanosilica and sodium silicate were conserved in dry air, water, salt solution and acid solution for 8 different time periods. The results show that pure gel of nanosilica is much more stable than pure gel of silicate sodium in all environments studied; from results of porosity, nanosilica does not has manifest advantages compared with sodium silicate; from results of permeability, nanosilica sand has more stable capacity of water-blocking in all environments.

The ninth paper by Deka *et al* is on strength of lime treated flyash using bentonite. The class "F" type Fly ash is non-cohesive and is normally strengthened or reinforced when used in structural fills. This paper deals with strength increase in unconfined compressive tests by pozzolanic reactions with lime and also bentonite.

The tenth paper is by Wang *et al* on soil deformation induced by underground tunnel construction. Development and utilization of underground railways can effectively ease the problem of urban traffic congestion. However, surrounding soil disturbance during tunnel excavation is likely to cause serious accidents. Thus, analyzing soil deformation during tunnel excavation is important. Through numerical simulation, this paper analyzes the influence of the step distance of a single-bore tunnel on the disturbance of the surrounding soil. Based on research on a single-bore tunnel, this paper further examines the effects of various spacing, locations, and excavation methods on the deformation of surrounding soils during parallel tunnel excavation. The results show that longer excavation steps lead to more intense disturbance to the surrounding soils. The most intense disturbance occurs at the ends of the tunnel. During new tunnel excavation, the tunnel crossing angle has stronger influence than the tunnel spacing on the original tunnel. Among the four excavation methods, single-bore advanced through is the most secure, whereas simultaneous excavation from opposite directions can cause the most intense disturbance to the surrounding soils. In practical operations, corresponding excavation methods can be employed according to specific conditions. Moreover, in-situ monitoring at key positions should be enhanced to avoid accidents.

The eleventh paper by Zhou *et al* is on full scale field tests on soil arching triggered during the construction of shallowly buried HDPE pipes. Soil arching significantly affects earth pressures around and above high-density polyethylene (HDPE) pipes in the construction phase. However, few studies have systematically addressed the change of soil arching with respect to soil cover thickness during the installation of HDPE pipes. This paper presents full-scale field investigations on the soil arching above and around three HDPE pipes buried shallowly in trenches. The results demonstrate that the soil arching developed in the backfill above the pipes is getting significant with increasing soil cover thickness. At a given soil cover thickness, more notable soil arching is found at a position closer to the pipe crown. The measured earth pressures acting on the pipe crown are compared with those estimated by the Marston load theory. It is found that the crown earth pressures estimated by the Marston's trench equation and embankment equation are 8% to 32% and 2% to 14% respectively higher than those obtained

from the field tests. The results suggest that a threshold trench width is likely to exist when the Marston load theory is used for calculating the earth pressures on the top of HDPE pipes buried in the trench.

The twelfth paper is on a pollutant migration model considering solute decay in layered soil by Yu and Cai. Organic pollutant solute undergoes significant decay during the migration process in clay liner systems and foundation clay. Liner and foundation soil have layered properties. A one-dimensional computational model is established to calculate pollutant migration by considering the decay in layered soil medium. The separation of variable method is used to obtain the analytical solution. To verify the capability of the developed method, a typical example is illustrated by applying this model. The calculated results are compared with the results obtained from the GAEA Pollute v7. Consistent results demonstrate the reliability and validity of the proposed migration model, which can be a promising tool for landfill liner design when considering the organic pollutant decay.

The thirteenth paper is on effect of cyclic strain history on shear modulus of dry sand using resonant column tests by Jyant Kumar and Achu Catherine Cherian. A number of resonant column tests were performed on dry sand specimens to examine the effect of cyclic shear strain history, by including both increasing and decreasing strain paths, on the shear modulus (G) for different relative densities (Dr) and confining pressures (σ_3). The specimen was subjected to a series of cycles of increasing and decreasing shear strain paths approximately in a range of 0.001-0.1%. For a particular cycle, with a given strain amplitude, the shear modulus during the increasing strain path becomes always greater than that during the decreasing strain path. For a given cycle, irrespective of relative density of sand, the difference between the values of G associated with the increasing and decreasing strain paths becomes always the maximum corresponding to a certain shear strain level. The maximum reduction in the shear modulus, due to the cyclic variation of the shear strain, was noted to be around one fourth of the maximum shear modulus (G_0). This reduction in the shear modulus on account of the cyclic variation of shear strain increases generally with decreases in the values of both relative density and confining pressure. The study will be useful to examine the response of sand media subjected to earthquake excitation.

Bhattacharya and Kumar are the authors of the fourteenth paper on vertical uplift capacity of circular anchor plates. Experimental and numerical investigations have been carried out to determine the vertical uplift resistance of circular anchor plates embedded in cohesionless soil media. Experimental studies are performed on model circular anchor plates placed at different depths in loose to medium dry sand deposit for two different relative densities, namely, 25% and 65%, respectively. The numerical work has been done by using an axisymmetric lower bound limit analysis in conjunction with finite elements and linear programming to compute the uplift resistance offered by circular anchor plates embedded horizontally in sand. In the case of numerical studies, the internal frictional angle of sand was varied from 20° to 45°. Both experimental and numerical studies clearly reveal that the uplift resistance of the circular plate increases considerably with increases in embedment ratio (H/D), and soil frictional angle (ϕ). The deformation of the anchor plate, corresponding to the failure load, increases with an increase in the values of H/D and relative density of sand. The values of the failure loads obtained from the computational analysis match well with the present experimental results as well with the available data from literature.

In this fifteenth paper by Benson Hsiung and Sy-Dan Dao, a simple method for predicting movements, especially the ground surface settlements, caused by deep excavations in sands is presented. The case history of deep excavation in thick layers of sand is adopted from Kaohsiung, Taiwan as the basis for numerical analyses. In order to improve the inconsistence in prediction of ground surface settlements induced by the deep excavation, the analysis using the simple constitutive model but with additional two factors, α and β is applied. The factor α defines the width of primary strain zone behind the retaining wall, and β indicates the difference of soil stiffness in two zones of the primary strain zone and small strain zone. It is concluded that changing α seems not to induce significant change, and values of β from 3 to 5 shall be taken once such approach intends to be adopted for predicting ground surface settlements caused by deep excavations in sands.

The editors are grateful to the authors and reviewers and are very pleased with the significant contributions made by them in making this Issue feasible to our SE Asian Geotechnical Community and others.

Zhen-Yu Yin
Jian-Hua Yin

ACKNOWLEDGEMENT

This September 2015 Issue is edited by Profs. Zhen-Yu Yin and Jian-Hua Yin. They are to be congratulated for acquiring fifteen excellent papers, which covers a wide range of topics which will be of great value to researchers and practitioners. Details of the contents are in the Preface as compiled by the editors. They cover strain rate effects and stress relaxation with a new Stress strain Model as based on CSSM; the engineering behaviour of Shanghai soft clay is statistically analyzed; the dynamic behavior of frozen soils is studied using dynamic uniaxial/triaxial test, resonant column test, wave velocity test and the SHPB test. The addition of fine grained Zeolite on the compressibility and hydraulic conductivity of clayey soil treated with calcium bentonite and used as backfills for vertical cut off walls is also presented. Additionally, effect of long term aggressive environments on the porosity and permeability of granular materials reinforced by nano-silica and sodium silicate is also presented. The strength of lime treated flyash using bentonite is also studied in detail; the class "F" type Fly ash is non-cohesive and is normally strengthened or reinforced when used in structural fills. Soil deformation induced by underground tunnel construction is of importance. Among the four excavation methods, single-bore advanced through is the most secure, whereas simultaneous excavation from opposite directions can cause the most intense disturbance to the surrounding soils. In practical operations, corresponding excavation methods can be employed according to specific conditions. Moreover, in-situ monitoring at key positions should be enhanced to avoid accidents.

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Bhattacharya and Kumar are the authors of the fourteenth paper on vertical uplift capacity of circular anchor plates. Experimental and numerical investigations have been carried out to determine the vertical uplift resistance of circular anchor plates embedded in cohesionless soil media. The numerical work has been done by using an axi-symmetric lower bound limit analysis in conjunction with finite elements and linear programming to compute the uplift resistance offered by circular anchor plates embedded horizontally in sand. Finally, Benson Hsiung and Sy-Dan Dao presented a simple method for predicting movements, especially the ground surface settlements, caused by deep excavations in sands. The case history of deep excavation in thick layers of sand is adopted from Kaohsiung, Taiwan.

No doubt, this Issue will be most useful to our Profession and all those who are engaged in Pile Foundation Research and Practice. Sincere thanks to all who have contributed to the success of this issue of our journal under the able leadership of Profs. Zhen-Yu Yin and Jian-Hua Yin

K. Y. Yong
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GEOTECHNICAL ENGINEERING

SEPTEMBER 2015: SPECIAL ISSUE ON SOIL BEHAVIOUR AND MODELLING

Editors: Prof. Zhen-Yu Yin and Prof. Jian-Hua Yin

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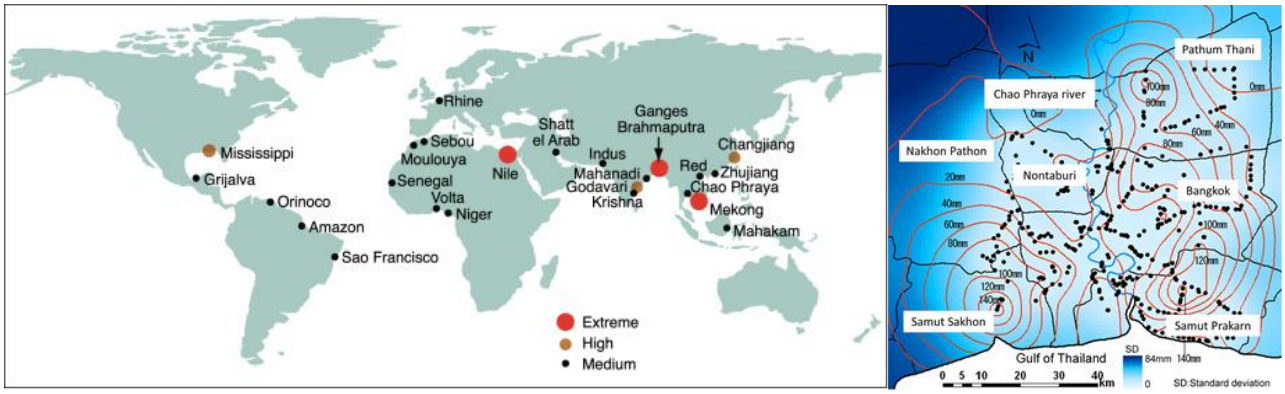
Editors: Prof. Jay Meegoda & Prof. Liming Hu



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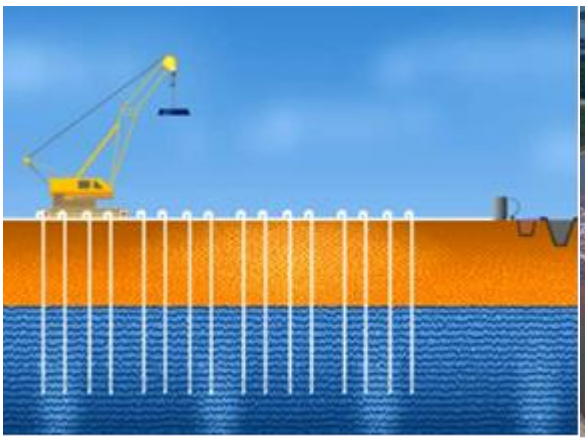

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GEOTECHNICAL ENGINEERING

December-2015 Issue: Problematic Soils including Contaminated Soils
Edited By Prof. Jay N. Meegoda and Prof. Liming Hu

Prof. Jay N. Meegoda

Dr. Meegoda is the director of Geotechnical Program and a Professor of Civil and Environmental Engineering at New Jersey Institute of Technology. He received his BS (Honors) from University of Sri Lanka and his M.S. and his Ph.D. from the University of California at Davis. He has been working as educator, consultant and researcher in engineering for over 35 years. He utilizes scientific concepts and engineering technologies in his research to provide solutions to real world problems. Dr. Meegoda has worked with state and local governments, and foreign governments to provide technical input for broad range of problems.

Dr Meegoda has worked on three major research areas. His primary research is in Mechanics of Geo-Environmental Engineering, which includes Engineering Properties of Contaminated Soils, Centrifugal Modeling of Contaminant Movement in Soils and Remediation of Contaminated Soils, Micro-mechanics of Soils, Reuse of Contaminated Soils, and Ultrasound. His second major research area is sustainable use of waste, which is still under the broad area of Geo-environmental Engineering. It includes Modeling of Bio-reactor Landfill performance, Sustainable Waste Management and Construction use of waste. Recently Dr. Meegoda initiated his third research area, the sustainable infrastructure initiative, which includes Performance of pipes and development of next generation of pipes, Management of underground infrastructure and Pavement texture and snow/ice management to limit accidents. He has offered numerous short courses worldwide, and teaches graduate and undergraduate courses at New Jersey Institute of Technology on Geotechnical and Geo-environmental Engineering.

Dr. Meegoda as PI has successfully concluded several multidisciplinary research projects worth over $7M from agencies such as NSF, USEPA, US Army, FHWA, NJDOT and NJDEP that provided broader impact to the society. Some of those technologies are now extensively used while others are to be commercialized. He has published over 150 papers. He has one patent and applied for one provisional patent. He received the research implementation award from the New Jersey Department of Transportation in 2011 for his Culvert Information Management Research, the best theoretical paper award from the Environmental and Water Resources Institute of ASCE in May 2012 for his research collaboration with China and the best practice paper award from the Environmental and Water Resources Institute of ASCE in May 2001 for the paper describing the results of one USEPA SITE demonstration project.

Dr. Meegoda currently serves Associate Editor of the ASCE Journal of Hazardous, Toxic, and Radioactive Waste Management, Editorial Board Member ASTM Geotechnical Testing Journal, Journal of Traffic and Transportation Engineering, Springer Journal on Waste and Biomass Valorization and The Scientific World Journal, Guest editor, Journal of Hazardous Materials, special issue on Contaminated Dredged Sediments and Associate Editor of the 4th International Symposium on Environmental Geotechnology and Global Sustainable Development. He is a guest/research/visiting professor/scholar of six different universities. He has research collaborations spanning all six continents. He was invited to deliver keynote lectures and invited lectures at numerous events around the world. At NJIT, he was instrumental in setting up the NJIT chapter of Engineers without Borders and is currently serving as the faculty advisor.

Prof. Liming Hu

Dr. Hu is an Associate Professor of Geo-environmental Engineering, and the Deputy Director of Institute of Geotechnical Engineering of Tsinghua University in China. He is also the senior Research Scientist at State Key Laboratory of Hydro-Science and Engineering (SKLHSE), and the director of the Geo-environmental Research Centre. He obtained double Bachelors in both Hydraulic Engineering and Environmental Engineering from Tsinghua University in 1995, and MEng and Ph.D. in Geotechnical Engineering from the same university in 2000. Then he worked as post-doctoral Research Associate at the Department of Civil Engineering of Hong Kong University of Science and Technology (HKUST) from 2000 to 2002. Since April 2002, Dr. Hu joined in Tsinghua University. He has supervised 15 Master students and 6 Ph.D. students.

Dr. Hu's research interests focuses on contaminant transport, soil/groundwater remediation, valorization of solid waste, and landfill design in field of Geo-environmental Engineering, as well as soft ground improvement and soil-structure interaction in field of Geotechnical Engineering. He has more than one hundred publications in peer-reviewed journals, and owns 12 invention patents and 3 software packages.
Dr. Hu obtained numerous notable honors and awards due to his outstanding research achievements, such as 2013 First-Class State Award for Inventions by Chinese Central Government, 2013 Outstanding Young Scholar at Tsinghua University, 2013 Scientific Research Award from Hubei Province, 2012 Best Theoretical-Oriented Paper by ASCE Environment and Water Resources Institute, and 2012 Outstanding Young Scholar by Chinese Society for Rock Mechanics and Engineering, 2007 New Century Excellent Talents in Chinese Universities by Ministry of Education, 2005 New Star in Science and Technology by Beijing Municipal Government, and so on.

Now Dr. Hu serves as Chair of Committee for Chinese Young Geotechnical Engineers; Chair of Technical Committee on Soil Contamination and Remediation, and Core Member of the Institution of Geo-Environmental Engineering under Chinese Society for Rock Mechanics and Engineering; and Vice-Chairman of Committee for Geo-Environmental Engineering under Chinese Institution of Soil Mechanics

and Geotechnical Engineering. He is also the life member of Southeast Asian Geotechnical Society (SEAGS), member of American Society of Civil Engineers (ASCE), Member of International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), and Member of International Society for Rock Mechanics (ISRM), Member of American Chemistry Society (ACS), etc. Dr. Hu also serves as a member of TC215 (Environmental Geotechnics) of ISSMGE.

GEOTECHNICAL ENGINEERING

L. John Endicott

As a professional engineer and adjunct professor, Dr. John Endicott is a recognized thought leader in geotechnics and tunneling.

Inspired by the research work of a professor, he converted from studying mechanical engineering to soils. Later, John received his Ph.D. and master's degree from Cambridge University in the United Kingdom.

He began working with AECOM (then Maunsell) in 1970 and moved to Hong Kong in 1975 to aid in the development of an extensive global network throughout the AECOM geotechnical and tunneling leaders in other geographies. In 1990, John was elected chief executive officer for the geotechnical and tunneling business in Hong Kong, serving 10 years and then served as chairman until 2009.

With more than 41 years of experience, he has worked on numerous iconic projects such as Hong Kong's Chek Lap Kok International Airport platform and the Lai Chi Kok Transfer Scheme project. He has been involved with more than 100 underground railway stations and a variety of tunnel assignments. As a guru in the industry, he has been recognized globally by several industry organizations and academia such as the 1971 Cooling Prize from United Kingdom's Institution of Civil Engineers and Adjunct Professor at Hong Kong's University of Science and Technology.

As an iconic symbol and pillar of excellence within the geotechnical group, he persistently seeks out opportunities to promote and nurture collaboration. It is this passion that has defined him in the field as a global leader.

He was recently appointed as technical expert for the Hong Kong government among other organizations. John is a member of the Academy of Experts – U.K., Fellow of the Institution of Civil Engineers, founding member of the Hong Kong Institution of Engineers' geotechnical division, and has served as adjunct professor at the Hong Kong University of Science and Technology since 2003. He is an avid and dedicated mentor and sought out by many young engineers for his insight, advice and guidance.

Burland

Professor Michele Jamiolkowski

Professor Michele Jamiolkowski has been the Emeritus Professor of C.E., Technical University of Torino since 2008. In addition, he has also been the Founder and Chairman of the Engineering Consultant Company, Studio Geotecnico Italiano; Foreign Member of the Polish Academy of Science; Member of the Lagrangian Academy of Science, Torino; and Editor in Chief of the International Journal Geomechanics and Geoengineering.

In addition to his outstanding academic record, Professor Jamiolkowski has also been involving in many world famous mega-projects such as Geotechnical Consultant for the Suspension Bridge over Messina Straits, Geotechnical Consultant for the Engineering Company Technital designer of the MOSE Project in Venice for Safeguarding Venice from high tides etc. He was also the President of the International Society for Soil Mechanics and Geotechnical Engineering between 1994 and 1997, and also the Chairman of the International Committee for Safeguard of the Leaning Tower of Pisa between 1999 and 2000. Currently, he is still serving as the Member of the International Advisory Group of the European Bank for Reconstruction and Development for the design and construction of the New Safe Confinement of the reactor in Chernobyl Nuclear Power Plant; the Chairman of the International Board Expert for Development of the Second World Largest Copper Mine Tailings Depository Zelazny Most in Poland; the Geotechnical Consultant for the Venice Defence System against Water; the Chairman of the Technical Committee for Safeguard of Rome Monuments During Construction of the New Subway Line C Underpassing Historical Town Centre; and the Foreign Associate US National Academy of Engineering.

For his outstanding achievement, Prof. Jamiolkowski is the recipient of numerous awards or honors, such as K. Terzaghi and R.B. Peck Awards from the ASCE; E. De Beer Awards from the Belgian Geotechnical Society; Honorary International Member of the Japanese Geotechnical Society; Doctor Honoris Causa: University of Bucharest, University of Ghent, SGGW, Life University (Warsaw); Recipient of the Italian Prize “Savior of the Art”; Honorable International Member of the Japanese Geotechnical Society since 1998; Honorary Professor Academia Sinica of Guangzhou, China; and Commendatore of the Italian Republic bestowed by the President of Italy.

Other distinctions of Professor Jamiolkowski include 1985 Theme Lecturer at the XI International

Conference SMFE, San Francisco, US; 1986 James Forrest Lecture, ICE, London, UK ; 1991 Cross Canada Lecture Tour. Canadian Geotechnical Society ; 1994 John Buchanan Lecturter, University of Texas at Austin ; 1997 Manuel Rocha Lecture in Lisbon; 2000 George Hendris Memorial Lecturer, University of Western Australia, Perth; 2001 Terzaghi Oration at the XV ICSMGE in Istanbul; 2002 Szechy Memorial Lecture in Budapest; 2002 Kersten Lecture. University of Minnesota US; 2004 Keynote Lecturer at the Skempton Conference at Imperial College in London; 2004 Keynote Lecturer 15th SEAGC, Bangkok; 2006 R.B. Peck Lecturer at the ASCE Geo-Institute in Atlanta; 2006 4th G.A. Leonards Lecture, University of Purdue, US; 2007 XIV ECSMFE, Madrid, Special Lecture; 2009 XVII ICSMGE, Great Project Lecturer, Alexandria; 2010 1st Za-Chieh Moh Lecturer, in Taipei, Taiwan; 2011 3rd V. De Mello Lecturer, in Lisbon; 2013 53rd Rankine Lecturer, in London;
2014 1st Tchebotarioff Lecturer in St. Petersburg; and 2014 6th J. K. Mitchell Lecture.

Professor Jamiolkowski is the author and co-author of more than 250 publications, journal with referee & international conference.

Professor Carlo Viggiani

Professor Carlo Viggiani graduated in Civil Engineering in 1960 at the University of Napoli; he got his PhD in Geotechnical En gineering in Napoli in 1969. He has been teaching in the Universities of Pavia, Cosenza, Potenza; from 1974 to 2011 he has been full Professor of Foundation Engineering at the University of Napoli Federico II. He is at present Emeritus Professor.

Professor Carlo Viggiani has lectured in a number of Universities in Europe, North and South America, Australia and Asia. He has been State of the Art Reporter at the ICSMFE in New Delhi, 1994 (Mitigation of Natural Hazards: Landslides and Subsidence) and at the ICSMGE in Osaka, 2005 (Pile foundations).

He has been Editor of the Italian Geotechnical Journal; component of the Editorial Board of the Journal of Numerical and Analytical Methods in Geomechanics; at present he is editor of the series “Argomenti di Geotecnica” (Issues in Geotechnics) of the publisher Hevelius.

Professor Carlo Viggiani is Author or Co-Author of 4 books and more than 200 technical papers; some of his papers have been awarded by journals as Géotechnique, Soils and Foundations, Case Histories of Geotechnical Engineering. His research topics include Theory of Consolidation, Soil-Structure Interaction for Shallow and Deep Foundations, Applications of Geotechnics to the Conservation of Monuments and Historic Sites. He is Chairman of TC19 (later TC301) (Preservation of Monuments and Historic Sites) of the ISSMGE, and has been involved in the conservation of a number of monuments affected by geotechnical problems.

From 1990 to 2002 he has been member of the International Committee for the Safeguard of the Leaning Tower of Pisa, and is presently member of the Monitoring and Surveillance Committee of the Tower. In fact, his interest to the Tower dates back to 1963.

Professor Carlo Viggiani has been involved, as geotechnical consultant, in the design and construction of a number of civil engineering structures; among them earth dams, civil and industrial buildings, bridges, tunnels and underground constructions, stabilisation of landslides. He acted as consultant for Italian Railways, Underground Transportation Systems in Rome, Napoli,Torino, Bologna, Firenze. He participated in the design of the foundations of the suspension bridge over the Messina Straits.

GEOTECHNICAL ENGINEERING

PREFACE

Welcome to Geotechnical Engineering Journal of the Southeast Asian Geotechnical Society (SEAGS) and the Association of Geotechnical Societies in Southeast Asia (AGSSEA). It is our great pleasure to serve as the guest editors for the last issue of 2015. It is also a special issue dedicated to on Problematic Soils including Contaminated Soils. This December 2015 issue of the journal contains fifteen interesting research papers and the details are described below.

First six papers are on contaminated soils or groundwater and their remediation. Next two papers are on electro-osmosis drainage. Next three are on ground improvement. Last four are on interesting or emerging topics such as education, impact of rise in sea level, numerical analysis and theoretical analysis.

We specifically requested Professor Chrysochoou to describe Geochemistry in Geotechnical Engineering Problems and set the tone for the issue. In this paper Professor Chrysochoou uses Ettringite, which is a problematic mineral found in soils as well as concrete, as case study to elaborate Geochemistry and how that is related to Geotechnical Engineering.

In the second paper Professor Meegoda and his team describes the Engineering Properties of Chromium Contaminated Soils. The chromite ore processing activities have over 2 million tons of processed chromium ore residue in Hudson County, New Jersey. This is a hazardous waste needing proper disposal. Professor Meegoda and his team explored the feasibility of using as construction material or to be used as brownfield type remediation.

Dr. Nithya and his team explored heavy metal sorption characteristics of two geo-materials in the third paper. The mobility of heavy metals into the environment as a result of mining, industrial and agricultural activities such as that described in the second paper is of major concern and engineers are exploring ways to absorb those heavy metals. Dr. Nithya and his team performed batch sorption experiments to evaluate suitability of two soils found in India as sorbents for heavy metals.

In the fourth paper Professor Mulligan and her student explored reduction of Chromium in water and soil using a biosurfactant "Rhamnolipid." Rhamnolipid is readily biodegradable biosurfactant with a very low environmental impact. Professor Mulligan and her student performed batch experiments to evaluate the feasibility of using Rhamnolipid for the removal and reduction of hexavalent chromium from contaminated soil and water.

Professor Barbosa and her team describe details of a reclamation project of a brownfield site containing 1.2 million cubic meters of mineral waste pile inside a 260,000 m^2 liquid waste pond in Rio de Janeiro State, Brazil, the fifth paper of this issue. Professor Barbosa and her team proposed technical solution that included the complete draining of the liquid pond, accompanied by on site treatment, a hydraulic barrier of pump & treat wells and the construction of an engineered waste containment facility using the mineral solid waste as compacted earth fill material combined with geosynthetics.

A review of acidic groundwater remediation in the Shoalhaven floodplain in Australia, is given by Professor Indraratna and his team in the sixth paper. Acidic groundwater generated from acid sulfate soils create

unfavorable environmental conditions. Professor Indraratna and his team installed a pilot-scale permeable reactive barrier showing that it is a promising technology for long-term remediation acidic groundwater.

Electro-osmosis is an effective technique for soft ground improvement. However with the continuous application of electrical energy the effectiveness of electro-osmosis decreases with increase in soil resistance. The intermittent application of the current is one way to overcome this problem. Hence Professor Hu and his team describe an experimental and a numerical study of electro-osmosis on kaolinite under intermittent current in the seventh paper.

A new type of electro-kinetic geo-synthetics (EKG) electrode to avoid the electrode corrosion and provide an effective drainage channel was developed for electro-osmosis drainage, and its performance was evaluated by Professor Shen and his coworker in the eighth paper.

The title of the ninth paper is innovative soft soil improvement method through intelligent use of vacuum dewatering and dynamic compaction. This research was performed by Professor Liang and his team.

Professor Shivashankar and his team provide the tenth paper entitled "Some Studies on Engineering Properties, Problems, Stabilization and Ground Improvement of Lithomargic Clays." They performed laboratory studies to determine engineering and strength properties of these lithomargic clays and stabilized soils. Then they reported ways to improve sites containing Lithomargic Clays.

The eleventh paper describes laboratory investigation of stone column reinforcement of a soft South African clay by Professor Kalumba and his coworker.

Professor Bouassida and his team describe the results of a numerical modelling study of Tunis soft clay in the twelfth paper.

A framework for the de-structuring of clays during compression, is the title of thirteenth paper and it is a theoretical study performed by Professor Horpibulsuk and his colleagues.

In the fourteenth paper Professor Yasuhara and his colleagues describe impact of inundation caused by sea-level rise combined with land subsidence, a modern day problem.

Last but not least is the fifteenth paper by Professor Scharle and his colleague. This is an invited paper on challenges of educating our younger generation in Geotechnical Engineering.

The guest editors are grateful to the authors and reviewers for their contributions. We are very pleased with the significant contributions made by authors in making this Issue feasible to our SE Asian Geotechnical Community and others.

Jay N. Meegoda
Liming Hu

ACKNOWLEDGEMENT

The December 2015 Issue of the Journal on problematic soils on problematic and contaminated soils is edited by Prof. Jay Meegoda and Prof. Liming Hu. They did an excellent job within a sort time and also forwarded all the completed documents well in time for the Journal Production team under the Leadership of DR. Ooi at IEM , Malaysia.

There are 15 papers in this Issue and a Feature story by Dr. John Endicott on Challenges in going underground in transportation and other utilities.

The guest editors have adequately covered the important aspects of the papers: First six papers are on contaminated soils or groundwater and their remediation. Next two papers are on electro-osmosis drainage. Next three are on ground improvement. Last four are on interesting or emerging topics such as education, impact of rise in sea level, numerical analysis and theoretical analysis. It is rewarding to note the authors of the papers cover all continents. It is a clear indication of the International nature of the Journal.

There were numerous Guest editors from 2011 to 2015; each and every one of them brought innovation and scholarly contribution both in research and practice. The journal continues to have page lengths suitable for the authors to comprehensively present their contributions. As a cost cutting measure the hard copy of the journal is only produced after all the soft copies are produced and this is a bound volume made available to all in the middle of the subsequent year. The soft copies are released spot on time in March, June, September and December each year. All articles are reviewed by more than two reviewers; Prof. Jay Meegoda and Prof. Liming Hu used an excellent set of reviewers.

The Issues in 2016 are devoted to AGSSEA country contributions and will be released by Taiwan Geotechnical society editors in March 2016, followed by the editors in Singapore, Hong Kong and Malaysia for the June, September and December Issues respectively. This will be followed by the Anniversary Issues in 2017. It is anticipated that the journal will also have a higher level of standard from the 51st year of the formation of SEAGS in 1967.

It is a genuine pleasure to have the excellent contributions in this December 2015 Issue and to record our vote of thanks to the Guest Editors Prof. Jay Meegoda and Prof. Liming Hu, the authors of the articles, the reviewers and all those who have contributed to the success in this Issues as well as the previous such Issues from 2011. It is important to thank Prof. San Shyan Lin for his varied contribution to SEAGS-AGSSEA in addition to his duties in the editorial team as a most valued member

No doubt the contribution of the articles in Issue and the Feature story will further add prestige to the success story of the journal.

K. Y. Yong
N . Phienwej
T. A. Ooi
A. S. Balasubramaniam

GEOTECHNICAL ENGINEERING

DECEMBER 2015: SPECIAL ISSUE ON PROBLEMATIC SOILS INCLUDING CONTAMINATED SOILS

Editors: Prof. Jay N. Meegoda and Prof. Liming Hu

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