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SEAGS Southeast Asian Geotechnical Society · AGSSEA Association of Geotechnical Societies in Southeast Asia








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## HONG KONG AND SINGAPORE SPECIAL ISSUE

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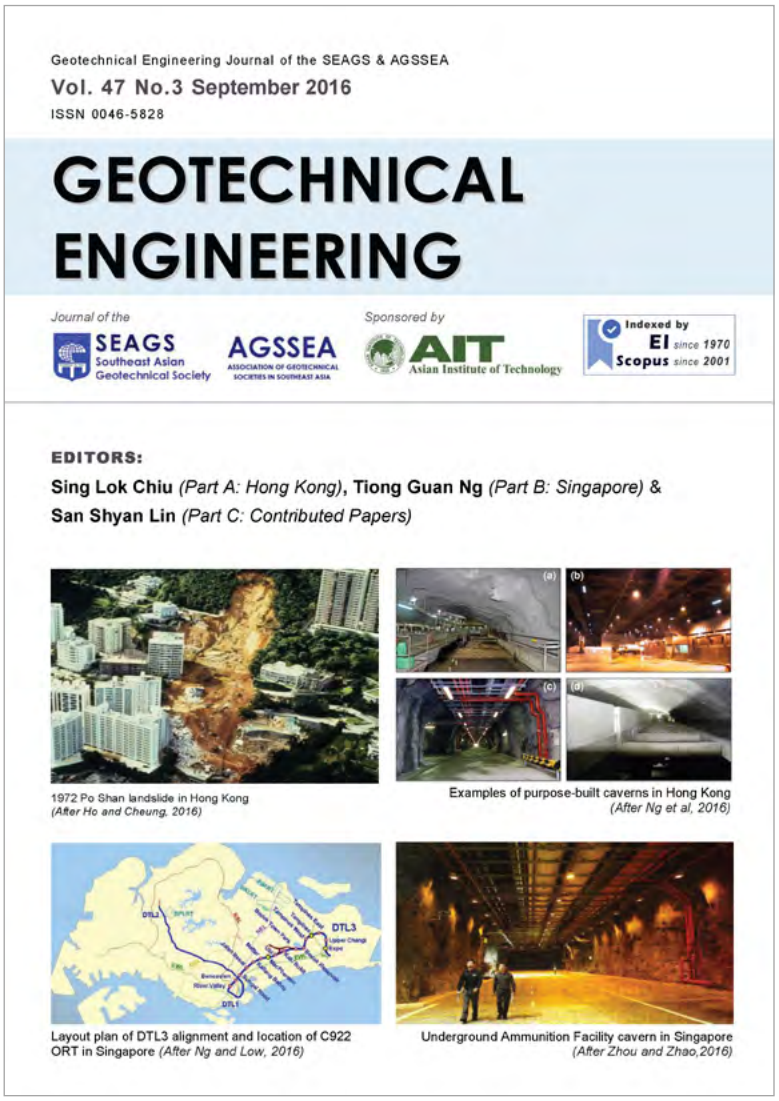
**Prof. San-Shyan Lin**
*(Part C: Contributed Papers)*




### PREFACE

This is a combined Issue of paper contributions from Hong Kong and Singapore; it contains eighteen excellent papers including four papers directly submitted to the SEAGS Secretariat.

The first paper by Ho & Cheung is on challenges in improving slope safety through the landslip prevention and mitigation program. In 1977, the Hong Kong Government embarked on a systematic retrofitting programme, known as the Landslip Preventive Measures (LPM) Programme, to systematically upgrade existing substandard man-made slopes to meet modern safety standards. By 2010, some 4,500 high-risk government man-made slopes have been upgraded through engineering works, and the overall landslide risk arising from man-made slopes has been reduced to less than 25% of the 1977 level. Over the years, the programme has evolved progressively in response to Government's continuous improvement initiatives and rising public expectations in respect of slope safety and slope appearance. In 2010, the Government launched the Landslip Prevention and Mitigation (LPMit) Programme to dovetail with the LPM Programme, with the focus being on retrofitting the remaining moderate-risk substandard man-made slopes and systematically mitigating natural terrain landslide risk. This paper presents the challenges, technical advances and achievements of the LPM and LPMit Programmes.

The second paper is by Ng et al on Rock caverns- Hong Kong's hidden land. The hilly terrain and underlying geology of Hong Kong offer an excellent opportunity for placing urban facilities underground. About two-thirds of Hong Kong's land is found to be suitable for rock cavern development. Given the potential for multi-layer cavern development, a substantial usable area could be created. In September 2012, the Civil Engineering and Development Department of the Government of the Hong Kong Special Admin-

istrative Region commenced a study on "Long-term Strategy for Cavern Development", to develop a holistic approach in planning and implementing cavern development and render it a sustainable means for expanding land resources. The study also places emphasis on private sector participation as facilities, such as storage, warehousing and data centres, can benefit from rock caverns' stable and secure setting. Implementation of a long-term strategy for cavern development could provide a sustainable approach in easing the pressure of land shortage. Developing a systematic relocation programme for suitable Government facilities could release surface sites for other uses including housing, and placing nuisance or potentially hazardous facilities in caverns could remove incompatible land uses. Reserving rock cavern space to accommodate future public and private sector facilities underground could further reduce the land take. The Hong Kong Government has also commenced an initiative to explore the potential of underground space development in the urban areas. Facilitating rock cavern development at the urban fringes and underground space development in the urban areas could enhance Hong Kong's utilisation of land resources in pursuit of sustainable development.

The third paper is on the first subsea TBM road tunnel in Hong Kong by Liu et al. Subsea tunnels for transportation are traditionally constructed in the form of Immersed Tunnel (IMT). With the technical advancement of mechanized Tunnel Boring Machine (TBM) construction, subsea TBM bored tunnels were successfully constructed in different parts of the World over the last decade. Using a TBM has benefits over the IMT when excavating beneath the sea, since it does not require dredging and marine access. This makes it particularly favourable when coping with environmental concerns and constraints within existing shipping passages. Since the first subsea tunnel across the Victoria Harbour in Hong Kong was constructed in 1972 by immersed tunnel method, four other additional subsea immersed tunnels were constructed across the same Victoria Harbour between 1979 and 1997. The subsea tunnel of Tuen Mun – Chek Lap Kok Link (TM-CLKL) was also originally proposed using immersed tunnel method in the feasibility study stage. However, the tunnel scheme was changed to TBM bored tunnel in the Investigation and Preliminary Design Stage. The TBM bored tunnel scheme was further developed in the Detailed Design Stage and the project is now under construction. This would be the first subsea TBM road tunnel in Hong Kong and this paper discusses the key considerations and rationales in changing the original IMT scheme to the TBM bored tunnel scheme for the subsea tunnel section of TM-CLKL.

The fourth paper is by Tam and Chang on achievements and challenges to the Hong Kong landslide risk management. Landslide is one of the common natural hazards in Hong Kong. With the Government and public's concerted efforts, landslide risk in Hong Kong has been drastically reduced since the establishment of a comprehensive slope safety system in 1977. However, given Hong Kong's climatic and geographical conditions and the current state of technology, occurrence of serious landslides that could potentially cause multiple fatalities remains a distinct possibility, particularly during extreme rainfall events.

The fifth paper by Tsang et al is on sub sea horizontal directions coring (HDC). The Tuen Mun – Chek Lap Kok Link comprises a 9 km long dual 2-lane carriageway between Tuen Mun and North Lantau, with approximately 5 km long sub-sea tunnel between Hong Kong Boundary Crossing Facilities and Tuen Mun. This is a major highway infrastructure constructed to alleviate the increase in cross boundary traffic due to projected developments in the Northwest New Territories and North Lantau in Hong Kong, including the Airport developments and the Hong Kong-Zhuhai-Macao Bridge. The proposed subsea tunnel is to be constructed by large diameter Tunnel Boring Machines (TBM) which will bore underneath two sets of existing submarine power cables providing power supply to the Hong Kong International Airport. Ground investigation using conventional vertical marine drill holes is not allowed within the cable protection zone with the considerations of the potential risk of damaging the power cables. To provide sufficient ground information for the design of the proposed TBM tunnel, Horizontal Directional Coring (HDC) with

a total length of 660m was proposed at the invert level along the tunnel alignment. It was anticipated that the HDC would go through rock, soil or soil/rock interface and terminate at interface of soft / mixed ground. The HDC works has been completed in mid-2013. This paper describes the design considerations and the trajectory planning of the HDC work, with construction of a marine platform (of size 15m x 20m to facilitate the installation of the HDC). The difficulties and problems encountered during the subsea horizontal drilling is also discussed.

The sixth paper from Hong Kong contribution is the seventh Lumb lecture by Endicott. The Lumb Lecture is held in Hong Kong biennially to celebrate the work and the legacy of a great Geotechnical Engineer, Professor Peter Lumb. This paper reviews changes in geotechnical practice, in and around Hong Kong, since his retirement and shows remarkable developments and some folly. What would he think of his legacy? Would he be disillusioned by folly or would he have taken satisfaction to see that, in many instances, his legacy lives on. There are a number of valid successors following in Peter's footsteps. This paper has drawn extensively upon the work of many good geotechnical engineers and is dedicated as a tribute to all of the geotechnical engineers, engineering geologists, geologists and other people who have made the name of Hong Kong synonymous with ground engineering. There are too many to single out individually.

The second part of this Issue is contributions from Singapore. The papers are numbered continuously. Thus the seventh paper is by Ng and Low on Singapore case histories for the circle line and down town line projects. The case history of Overrun Tunnel (ORT) of C922 is basically an underground facility building functions as both Railway Facility (Operation Control Centre) and Electrical Substation (ESS) which is to be built next the Expo Station. ORT is located in old alluvium (OA). The proposed underground overrun tunnel is a box structure with dimensions of approximately 23m wide, 25m deep and approximately 440m long. The proposed diaphragm wall function as the earth retaining system (ERSS), it designed for both temporary loading conditions during excavation and permanent load conditions in accordance with LTA Civil Design Criteria. Bottom-up construction sequence is adopted where lateral supports using four (S3 to S6) or six (S1 to S6) layers of steel strutting were installed as excavation progresses downward. The most challenging part is the omission of the last layer of strut S6 for the whole ORT by using observational approach. The case history of C824 Nicoll Highway Station demonstrates that Jet Mechanical Mixing (JMM), if properly installed, has major benefits in controlling the stability and movements induced by deep excavations in soft ground. The reasons can be attributed to the fact that the inner soil column is comprehensively mixed, combined with the attributes of the outer jet grouted column with sufficient overlapping. The whole process undergoes tight quality control and rigorous testing to ensure a continuous and comprehensive slab. In addition to the JMM slab, there is the major benefit of the discrete soil mixing columns formed above the JMM slab during the withdrawal of the auger.

The eighth paper is on an update of the vacuum preloading methods by Chu et al. It has been more than 60 years since the concept of vacuum preloading was proposed. The vacuum preloading method has been evolving. There have been considerable improvements in the techniques as well as new applications. In this paper, several vacuum preloading methods including some new variations are introduced. The advantages and disadvantages of each method are compared. Technical issues such as improvement depth, vacuum pressure distribution in soil, and evaluation of degree of consolidation for soil under vacuum consolidation are discussed. A case history using a combined vacuum and fill surcharge preloading method for soft soil improvement is also used to illustrate the changes in the pore pressure versus depth profiles and the application of the method to calculate degree of consolidation using pore water pressure distributions.

In the ninth paper a new lithostratigraphical framework is proposed for Singapore by Lat et al. A study was initiated in mid-2013 by Building & Construction Authority of Singapore (BCA) to review the existing stratigraphy framework of Singapore. The new lithostratigraphical framework follows the recommendations of International Commission of Stratigraphy (ICS) and it was developed based on geological fieldworks observations and rock cores examination obtained from new deep boreholes. This paper will only cover on the Jurong Formation, Fort Canning Boulder Bed and Old Alluvium. The Jurong Formation has been upgraded to Jurong group according to ICS stratigraphy guidelines and the Jurong group is sub-divided into three (3) formations, known as Tuas formation, Bukit Resam formation and Pasir Panjang formation. The Fort Canning Boulder Bed and Old Alluvium have been re-classified as Fort Canning formation and Bedok formation respectively.

The following paper tenth in the series is by Tan on economical design of non-negative skin friction piles in soft clays. Code based design of piles with NSF consider the NSF force as a dragload to be imposed on the pile as an unfavourable design action. These codes like Singapore CP4, UK BS 8004 and the recent EC7 would indirectly factor up the value of the dragload while at the same time factor down the positive shaft friction below the neutral plane. Thus the pile design in very deep soft clays typical of Singapore and Asean coastal plains will lead to very conservative pile lengths to meet the code requirements. The Unified pile design method of Fellenius recognized this deficiency and it allows for better pile design with NSF taking into account the need for both force and settlement equilibrium between pile and soil. Fortunately, EC7 also allows for interactive pile/soil analysis using modern FEM tools that can optimise pile design for NSF, particularly when the remaining consolidation settlements around the piles are relatively small. This paper will compare these methods and provide insights into the proper understanding of NSF effects on pile behaviour, and recommend the way forward for rational and economical pile design in settling soils.

The eleventh paper is by Liu et al on design framework for spatial variability in cement tratemenent for underground construction. The most common form of ground treatment used to facilitate underground construction in Singapore is cement treatment. However, there is currently no indication on how safe and how conservative this adopted strength is since the prescribed strength bears no relationship to the probability of failure or factor of safety. This paper examined several sources leading to non-uniformity and spatial variation in cement-treated soils, including curing time effect, influence of operating parameters on slurry concentration, in-situ water content and column positioning errors. A framework for design and monitoring of ground treatment by cement was proposed.

The twelfth paper by Zhou and Zhao is on advances and challenges in underground space utility in Singapore. Despite its promise and many benefits for sustainable urban development, the use of underground space has tended to be the last resort, due to high development cost and the complexities in the planning and development of underground space. In 2010, the Economic Strategies Committee of the Singapore government made developing underground space part of the government's long-term economic strategy with specific recommendations on master planning, geological investigations, investment in research and development, and various policy issues. With this, the use of underground space has been elevated to a strategic level and has become an economic imperative in land-scarce Singapore. The ESC report also recommended that the government should take the lead in catalysing the use of underground space. Based on these recommendations, the Singapore government has taken various initiatives and studies, and initiated various research projects in support of these initiatives. This top-down strategy has also made it possible to plan and coordinate the development of underground space in a holistic manner, and helps overcome of the key challenges at the systems. This paper gives a review of advances in underground space development, highlights some key challenges, and discusses the various recent studies

and planning issues, and examines possible strategies for future use of underground space in Singapore. Furthermore, another four papers are included as contributed directly to the Editorial Team in this issue.

The thirteenth paper by Shaia and Abuel-Naga investigated the ageing induced changes in Fiber-Reinforced Polymer (FRP)/Granular interface shear behaviour under different aging environments. The test results indicated that FRP-granular interface shear behaviour was improved after subjected to the adopted aging environments. This improvement in the FRP interface shear behaviour could be mainly attributed to the observed increase in surface roughness under aging process.

The fourteenth paper authored by Dassanayake, Phien-wej and Giao dealt with modeling the groundwater pressure effect and slope stability analysis of C1 pit on deep pit mining of Mae Moh open pit lignite mine, Thailand. Stability of the west wall of the C1 pit for 2017 pit slope was evaluated in terms of the safety factor by the limit equilibrium method. Results obtained in this study indicated that the west wall is susceptible to failure due to water pressure associated with it. To maintain a safe slope, potentiometric head within west wall of C1 pit should be maintained below 170m, MSL.

In the fifteenth paper, Chen, Lin, Lee and Chen developed a seepage flow direct shear test device to investigate the effects of internal erosion to non-plastic silty sand prior to shearing. Tested results revealed that fines contents had noticeable influence on soil behaviours, regardless of whether an internal erosion process was applied to the samples.

In the sixteenth paper the Influencing factors including the Poisson's ratio and the rock specimen thickness on Brazilian test results are investigated by Yang and Wang using PFC3D program based on a complex-shaped grain model which can capture all the characteristics of brittle rock in three-dimensional environment. Through investigating the stress-strain curves and crack developing processes of the Brazilian test specimens, it was concluded that the Brazilian tensile strength will increase with the specimen thickness due to the great loading increment.

In the seventeenth paper an attempt was made by Cheng, Chern, Wu, and Lin to investigate the shear behaviour of soft rock joints under Constant Normal Load conditions, with special reference to the influences of infill thickness and moisture content on shear behavior of planar and rough joints. The results of this study showed that infilled water content could influence shear strength of planar and rough rock joints, more significant than infill thickness.

The last paper, by T.G.Santhoshkumar, Benny Mathews Abraham, A, Sridharan, and Babu T Jose, investigated the effectiveness of bentonite in improving the lateral flow of cement grouts in a coarse sand. It was found in the paper that addition of small percentages of bentonite and detergent increases the lateral flow of cement grout in coarse sand. The results indicated that addition of even a small amount of bentonite to the cement grout increases the grouting efficiency in coarse sand.

This combined Issue of the papers from Hong Kong, Singapore and other submisions makes futher contributions in the development of Geotechnical Engineering in SE Asia. The editors are very pleased to have the opportunity in compiling the material presented herein.

**Sing Lok Chiu (Hong Kong Part)**
**Tiong Guan Ng (Singapore Part)**
**San Shyan Lin (Contributed Papers)**

**Dr. Sing Lok Chiu**
(Hong Kong Part)

Dr. SL Chiu , a registered geotechnical engineer to the Buildings Department of the government of the Hong Kong SAR, a geotechnical specialist. He graduated from Civil engineering department of National Taiwan University, MSc and DIC in "Soil Mechanics" at Imperial College of London University, UK, and PhD in "soil behaviours Mechanics" at Imperial College of London University, UK, and PhD in "soil behaviours at elevated temperature" at University of Sydney, Australia. He is a technical director (geotechnical) with AECOM Asia Company Limited, has been practising in geotechnical engineering field for more than 30 years. He has been DPM, PM, and special task team leader of various L andslip preventive Measures (LPM) Agreements with Geotechnical Engineering Office (GEO) of HKSAR Government as well as natural terrain hazard study agreements with Hong Kong Housing Authority (HKHA) over the past 15 years.

Besides, he has been actively involved in design and construction supervision of numerous prestigious site formation, foundation and deep basement construction works in urban areas, reclamations and ground improvement works in Hong Kong as well as throughout SE Asia and China. He recently led a team of foundation and bridge engineers undertaking design of the 2nd Penang Bridge – a cable-stayed bridge of total length of 26 km in Malaysia. At present, he is leading a team of geotechnical engineers undertaking tender design of KVMRT Line 2.

**Dr. Tiong Guan Ng**
(Singapore Part)

Dr. TG Ng is the immediate Past President of Geotechnical Society of Singapore (2014-2015). He graduated from the University Technology Malaysia (UTM) with first class honours degree in Bachelor of Civil Engineering in 1992. He obtained his PhD degree in the research of Spud Can Foundation on Sand in 1999 from the National University of Singapore (NUS). He left NUS to join a specialist ground engineering company as design engineer in 2000. In Feb 2002, he co-founded GeoEng Consultants, a consultancy firm specializing in civil and geotechnical works, which grows to become one of the largest geotechnical consultancy firms in Singapore in a few years. In Nov 2011 GeoEng Consultants was acquired and became part of Golder Associates, a global consultancy company specialists in ground engineering and environmental services.

At present, Dr. Ng is the Principal and Executive Director of Golder Associates in Singapore leading the local Geotechnical Business Unit. He specialises in analysis and design of earth retaining system, and has special interest in back-analysis and interpretation of instrumentation. He had involved in the design and supervision of earth retaining structures for several major projects in Singapore which include the world 1st underground MRT Depot (LTA Circle Line Contract 821), Geylang River Cross for Kallang Paya Lebar Expressway (LTA Contract 421), the deepest excavation within Marina Bay Sands Integrated Resort for MRT tunnels below Bayfront Avenue and Construction of Downtown Line 1 Promenade Station (LTA Contract 902). He also involved in the assessment and review of several geotechnical failure cases in Singapore which include excavation failure at Lengkong Empat, foundation failure at Church Street, the collapse of excavation at Nichol Highway Station and water leakage at Jalan Besar Station. He is currently leading the team for design and supervision of Changi Land Preparation Project.

**Prof. San-Shyan Lin**
(Contributed Papers)

Dr. 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 also served as TRB A2K03 Committee member on Foundations of Bridges and Other Structures between 1995 and 2004. He is also serving as committee member of TC-212 and ATC-1 of ISSMGE and as editorial board member of four major international journals in geotechnical engineering.

Prof. Lin's research and practical experiences have been dealt with static and dynamic behaviour of deep foundations, ground improvement and effects of scouring on bridge foundations. In the past decades, he was involved in many research projects such as interpretation of pile load testing results due to axial, lateral, or combined loading; effect of soil liquefaction on performance of pile foundation in sand; seismic effect of pile foundations; performance of suction pile in sand or in clay; and effect of scouring on performance of pile and caisson foundations etc. Prof. Lin has published more than 110 peer-reviewed journal papers and conference papers. One of his published Journal papers dealing with cyclic lateral loading effect on permanent strain of deep foundation due to cyclic lateral loading has been cited more than 66 times in Google academic website by many international researchers working on wind turbine foundations.

## ACKNOWLEDGEMENT

Eighteen paper contributions contained in this issue are from Hong Kong, Singapore and papers contributed directly to the Editorial Team. No doubt the material contained therein would be most valuable to our engineering profession. The editors have adequately described the contributions in the preface. They are to be congratulated for these contributions.

**Dr. Teik Aun Ooi**
**Prof. San Shyan Lin**
**Prof. Kwet Yew Yong**
**Dr. Noppodol Phienwej**
**Prof. A. S. Balasubramaniam**

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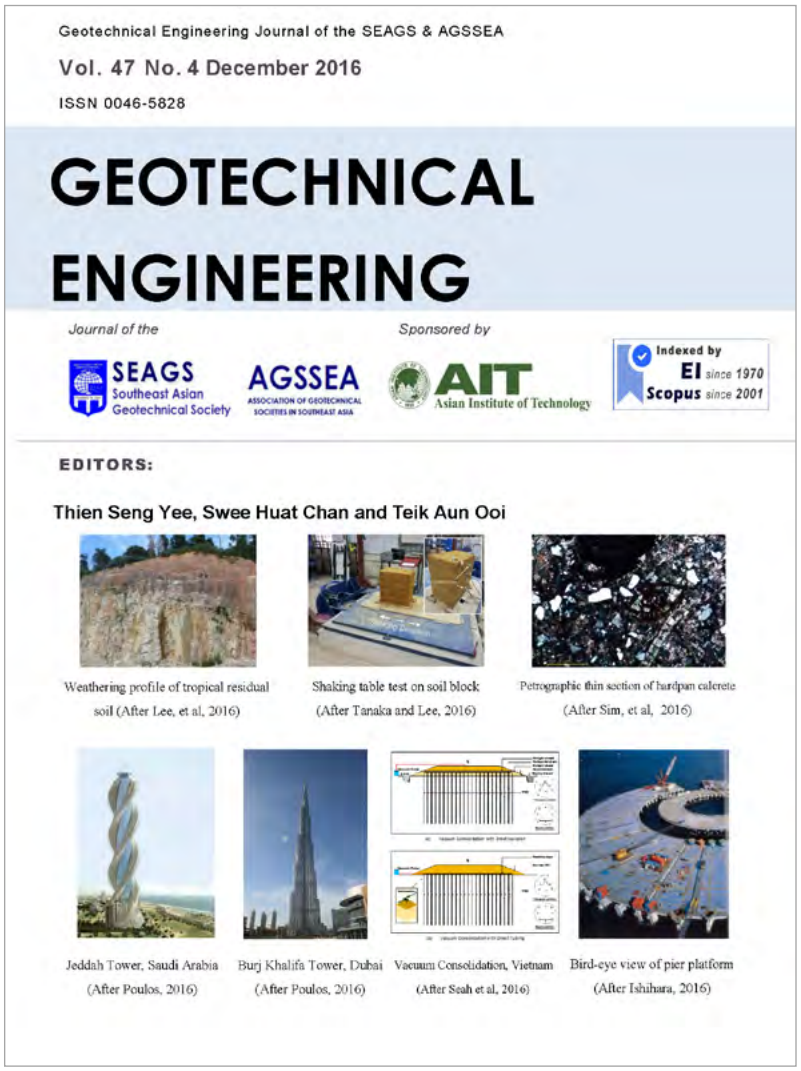
### PART A: HONG KONG

## MALAYSIA SPECIAL ISSUE

### EDITORS

**Thien Seng Yee,**
**Swee Huat Chan** and
**Teik Aun Ooi**




### PREFACE

The first paper is by Za Chieh Moh on Professionalism and ethics of geotechnical engineering. According to Moh, Ethics is the branch of philosophy that involves systematizing, defending, and recommending concepts of right and wrong conduct. Ethics is qualitative. It may change with time, circumstance and environment. Practice of ethics requires proper understanding of the time frame. Many professional engineering organizations have a set of Code of Ethics or Code of Practice to regulate or guide their members. Basically they all center around public welfare, sustainable development, professional competence, truthful and faithful, honourable, responsibly and lawfully. Success of engineering projects not only depends upon the engineering professional, but it also closely related to other non-engineering professionals. In the paper, discussions are presented about engineering ethics for non-engineering professionals. Ishihara in the Chin Fung Kee named lecture dealt with recent advances in pile testing and diaphragm wall constructions in Japan.

The second paper by Ishihara consists of brief introduction of the in-situ pile loading tests that have been conducted in Japan over the last two decades in connection with the design and construction of high-rise buildings in areas of soft soil deposits. In addition to the conventional types of tests in which the load is applied at the top and at the toe of the pile (O-cell test), what may be called “pile toe bearing test” and “skin friction test” is introduced. The results of these tests are described and compared with those from the conventional type of the pile loading tests. In-situ prototype tests are also introduced in which bearing power of Barrette type pile is compared with that of the circular type pile. A special case of in-situ pile loading tests conducted in Singapore is also introduced in which the friction between the circular ring-shaped concrete segment and the surrounding soil deposit was measured directly during excavation of the shaft by applying loads up and down by jacks installed between two adjacent segments in vertical direction. The latter part of this paper is a brief description on constructions of large-diameter

circular diaphragm walls that was carried out about 10 years ago for the LNG storage tank in the coastal site in Tokyo Bay. The construction of the large-scale Kawasaki Island in the middle of Tokyo Bay in Japan will also be introduced. The whole scheme and process of construction is for these two undertakings is introduced with some comments on observed behaviour of the walls and on special precaution taken during construction.

The third paper by Jian Chu dealt with innovations in soil improvement methods. These include the dynamic replacement and mixing method for the improvement of peaty soil, the layered clay-sand method for land reclamation using clayey fill, and the biodegradable fiberdrains. Other new soil improvement methods in the related areas are also presented to illustrate the role of innovation in the advance of soil improvement technologies. These include the drainage enhanced dynamic compaction method for the improvement of clay layers, the underwater dynamic replacement method for the treatment of seabed clayey soil, the use of the vacuum preloading with horizontal drains method, methods to form working platform on top of soft fill for land reclamation using soft fill materials, the NEUSpace method for land reclamation in deep water, and the new types of prefabricated vertical drains (PVDs). Methods for mitigation of liquefaction hazard, making water pond in sand, and prevention of dike failure from overtopping using biotechnologies are also introduced.

The fourth paper by Poulos dealt with lessions learned from designing high-rise building foundations. The design of tall building foundations involves a systematic process which incorporates ground investigation, ground characterization, preliminary design of the foundation system for the anticipated structural loads, detailed foundation design, load testing of the proposed foundations, modification of the foundation design, if appropriate, and monitoring of the foundation performance as construction proceeds.

This paper also described the process and some of the tools available for implementing it. It then set out a series of lessons learned during the design of such foundations, and illustrate these lessons with examples from projects in Asia and the Middle East.

The fifth Paper by Buddhima Indraratna and his co-authors is on the subject of the Advancements in Rail Track Geotechnology at Increased Speeds and Axle Loads . Ballasted railroads are designed to provide high speed commuter and heavy haul transportation. Ballast is one of most important load bearing components of the track substructure. However, it often experiences excessive settlement, lateral deformation and particle breakage when subjected to large dynamic (cyclic and impact) stresses. In addition, tracks constructed along coastal areas often undergo large settlements over soft compressible estuarine deposits, leading to frequent and costly track maintenance. The use of artificial inclusions such as geogrids, geocomposites, shock-mats (rubber) and prefabricated vertical drains (PVDs) are attractive options to maintain the vertical and horizontal alignment of tracks and to curtail excessive maintenance costs. This paper provides a deeper insight to the recent advancements in rail track geotechnology at increased in speeds and axle loads.

The sixth Paper by P.V. Long and his co-authors is on the subject of “Performance and Analyses of Thick Soft Clay Deposit Improved by PVD with Surcharge Preloading and Vacuum Consolidation – A Case Study at CMIT”. The authors discussed ground improvement using PVD for increasing foundation stability and controlling residual settlements of the container yard constructed on 35 m thick soft clay deposit at CMIT, Vietnam. The treated area is about 40 ha including vacuum consolidation combined with 6.3 m embankment surcharge for a strip of 57 m along the river bank (VCA) and conventional surcharge preloading using 9.1 m sand fill embankment for the remaining area. The monitored data indicated that PVD thickness of 3 mm arranged in spacing of 0.9 m to 1.2 m can be used successfully for improvement of thick soft clay

deposit in both methods of embankment preloading with and without vacuum pumping. Performance of reduced embankment combined with vacuum pumping is very much better than that of conventional embankment preloading in terms of shortening construction time, reducing lateral displacement, increasing stability, and minimizing residual settlement. Back calculated ch value is dependent on the assumptions of smear effects including smear zone ratio, ds/dm and permeability ratio, Rs = kh/ks. For ds/dm = 2 as commonly used, the back-calculated ch value is directly proportional to Rs and the value of Rs in vacuum consolidation seems smaller than that in embankment preloading. Using the back-calculated results of compressibility and flow parameters, the time-settlements re-calculated by 1-D method are in very good comparison with measured data for both conventional preloading and vacuum consolidation considering the vacuum pressure as an induced vertical stress distributed uniformly in the PVD zone. Analyses of factor of safety from observed pore pressures during embankment construction illustrated that the commonly used stability chart as given by Wakita & Matsuo (1994) is too conservative for PVD improved soft ground. Secondary compression behavior of thick soft ground improved by PVD including back calculation for coefficient of secondary compression and estimation of long term residual settlement are also provided.

The seventh paper is on the Characteristics of Hardpan calcrete of the Nyalau formation and impact on design of shallow foundations is by Sim et al. Nyalau Formation, found in Bintulu Division in Sarawak, Malaysia was formed by a thick array of shallow water marine and paralic sedimentary rocks. The formation is of predominantly sandstone origin and also the lesser known 'limestone' which is described as hardpan calcrete in this paper. Changes of sea levels during the mid-Pleistocene epoch resulting in the formation of raised terrace where marine deposits sedimented and subsequently followed by depositions of the coastal alluviums and inland peat swamps. Laboratory studies and design aspects of shallow foundations are described as well.

The eighth paper is by Seah et al is on ground improvement with vacuum consolidation method in Vietnam. In recent years, vacuum consolidation method has been extensively used in Vietnam on various types of infrastructural projects. The main reason for adopting this method is that the construction cost is relatively close to the conventional prefabricated vertical drain method with less surcharge fill and shorter construction time. Hauling or transporting large amount of fill has been a major problem in most infrastructure projects. With the stringent settlement requirements specified by the Vietnamese Government, ground improvement via vacuum consolidation has become very popular hence attracting various International vacuum consolidation specialists to participate in Vietnamese projects.

The ninth paper is by Tanaka & Lee deals with the dynamic properties of residual soils in Malaysia. The paper examines the dynamic deformation properties of a selected residual soil sample in Malaysia through a series of laboratory tests; including cyclic triaxial tests on the compacted residual soil with a measurement of deformation responses at small strains, and shaking table tests on a small soil block whereby the acceleration responses at different levels were analysed. The results showed that the dynamic deformation properties of the soil, namely the variation of shear modulus over a shear stain were ranging between 10-5 and 10-2.; the G values obtained were comparable to those published data.

The tenth paper is by Michael Dobie dealing with the pre-consolidation pressure of the Holocene marine clay of Malaysia. Prediction of the consolidation settlement of very soft alluvial clays in general requires knowledge of the compressibility characteristics of the deposit, but in particular it requires an accurate determination of the preconsolidation pressure. In the OC stress range settlements are likely to be relatively small, but once into the NC range, they can become very large. Therefore the accurate determination of the preconsolidation pressure is essential if reliable consolidation settlement predictions are to be

made. This is examined in detail by back-analysing settlement data from two trial embankments which were built over 13m of Holocene marine clay at Juru (south of Butterworth), as part of the geotechnical investigations carried out for the North-South Expressway project over the period 1990 to 1991, then making comparisons to settlement calculated from measured compressibility properties. The definitive determination of preconsolidation pressure is derived from the behaviour of the trial embankment itself, which is then compared with assessments based on undrained shear strength, oedometer test results and piezocone tests.

Eleventh paper by Boon & Ooi deals with FEM analyses and t-z load transfer analyses on critical structures in Kuala Lumpur during tunnelling works. Three case histories are presented: The first one is on a 15 storey tower building seated on a raft foundation. Two modelling approaches were adopted to model the tunnel using the 2-D finite element software PLAXIS, namely the contraction method and the internal pressure method. The second one is on a flyover bridge, of which the pile toes are at an elevation higher than the tunnel crown; and the third one is on the piles of a Light Rail Transit (LRT) bridge in the vicinity of a tunnel. For the latter two case histories, the load transfer t-z and Q-z method (Seed & Reese, 1967), which can be implemented easily into a spreadsheet, to estimate the pile settlements induced by tunnelling is found to be applicable. Finally, insights obtained from the t-z and Q-z analyses are used to explain and refine the influence zones previously proposed by Jacobsz et al. (2004) derived from centrifuge tests. The line joining the points of inflection of multiple subsurface Gaussian settlement profiles (Mair et al., 1993) at different depths was found to correspond to the maximum settlement along the vertical profile, above which the settlement is always increasing.

In the twelfth paper, Tan & Ooi presented top down and bottom up methods of deep excavation in Kenny Hill Formation. The deep excavations are for the Klang Valley MRT underground stations; namely the Bukit Bintang and Merdeka stations which have similar retained depth of 33.5m and 31m respectively and both having 1.2m thick Diaphragm walls. Both the stations are designed with the same design criteria and factor of safety. The selection of type of retention systems, strutting system, construction sequences and timing and instrumentations are discussed.
The predicted and measured diaphragm walls displacements and Strut forces at different stages are then compared and discussed.

In the thirteenth paper Liew & Ho described the problems of Jack-in piling system in Malaysia causing large soil displacement inducing lateral and vertical movements of earlier installed piles, premature refusal to penetration of pile due to intermittent obstruction and also inadequate pile embedment due to shallow end bearing stratum. Pre-boring technique with or without infill are used to overcome the obstruction problem and to ensure adequate pile embedment. The proof loading pile termination criteria appears to produce favourable pile performance and quality assurance.
There are inherent long-term performance deterioration associated with shallow end bearing piles and incomparable short-term and long-term toe resistances, particularly in meta-sedimentary formation, which is prone to stress relief due to softening effect.

The fourteenth paper is by Lee et al on rainfall induced landslides in Malaysia. Landslide constitutes one of the major geohazards in Malaysia. The frequent landslide occurrences are mainly attributed to rainfall (extrinsic factor) and tropical residual soil (intrinsic factor). This paper provides insights into the mechanisms of rainfall-induced landslides in the country and reviews efforts that have been taken to mitigate the hazard. Despite of the fact that local authorities, government agencies and practitioners have played their enormous roles in producing a better hillside development planning and control in the country, there are still areas for future improvement. The basic understanding of the unsaturated soil mechanics

among practitioners and the laboratory facilities to support the theories still need to be enhanced. Besides, the country can move towards a better landslide risk control and management by advancing the studies in run-out behaviours of landslide, establishing database for soil profiles particularly in landslide prone areas, and switching to risk-informed approach of slope stability assessment.

The fifteenth paper by Tan et al is on the "Considerations of Deep Excavation in Kenny Hill and Kuala Lumpur Limestone Formations at the KVMRT". The paper described the constraints in excavation works in urban environment in the construction of underground space development in the KVMRT stations in the Kuala Lumpur city centre.

The sixteenth paper by W. Mao, I. Towhata, S. Aoyama and S. Goto is on the subject of Grain crushing under pile tip explored by acoustic emission. They thought that the recent practice in design of pile foundations under vertical load relies significantly on either a classic plasticity framework or empiricism. Despite efforts to explore the real pile behavior mainly in 1960s and 1970s, research interest has decreased in the recent times. Accordingly, much is not known about the group pile behavior that is more complicated than that of a single pile. One of the possible reasons for this poor situation is the lack of novel research methodology. In this regard, the authors chose the behavior of both a single pile and group piles subjected to vertical load, and carried out model tests using several new research tools. One important finding was the significant vertical compression of sand under the pile tips which was accompanied by crushing of sand grains. To further investigate the process of grain crushing, the acoustic emission (AE) method was introduced so that "when" and "where" of grain crushing might be identified through the interpretation of micro noise that was generated by crushing. Being different from early studies on AE in geotechnical materials, the present study paid attention to the frequency components of the noise and found that noise by grain sliding is of lower frequency while that by crushing exhibits higher frequency. This finding enabled the authors to interpret more accurately the recorded noise, and the timing and location of grain crush during pile penetration were identified. These findings were verified against the independent graphic interpretation of grain movement (PIV). Consequently, a close correlation between AE intensity and yielding of sand were identified. It is important that grain crushing occurs slightly below the elevation of the pile tip and sand immediately below the tip is significantly compressed but less prone to crushing.

The seventeenth paper is on test embankment supported by vibro stone column related to the high-speed rail project in Malaysia by Yee et al. The Ipoh-Padang Besar Electrified Double Track project is a multibillion-dollar high-speed rail project that involves installation of double tracks, electrification work, construction of stations, bridges and tunnels. Stringent performance specifications governed all aspects of the project. Various ground improvement techniques were employed, among them Vibro stone columns. From 2008 to 2010, a low, instrumented test embankment supported by Vibro stone columns was built and monitored. The purpose was firstly to demonstrate that Vibro stone columns would not result in "hard points" at the surface even of a low embankment. The second purpose was to investigate the rest periods required for consolidation settlements to occur. Instrumentation and visual inspection show that no "hard points" were observed on the embankment surface, that Priebe's (1995) method adequately predicts the magnitude of settlements, and that Han & Ye's (2001) method adequately predicts the rate of settlements. The track has been operational since 2013, and settlement performance has been within the stringent specifications.

Editors:
**Thien Seng Yee,**
**Swee Huat Chan**
**and Teik Aun Ooi**

### Ir. Thien Seng Yee

Ir. Yee graduated in civil engineering from the University of Malaya in 1978 and has over the years worked on projects largely involving heavy plant and building foundations as well as large infrastructures. He had also carried out numerous works on distress evaluations and rehabilitation engineering. In 1994, Ir. Yee set up his own practice, Geo.Consult, to support the construction industry with both expert and specialist advice; in particular on geotechnical engineering aspects. His participation in recent projects of significance are the Kuching Deep Water Port, Shah Alam Expressway, North-South Expressway, Kuantan Port Inner Harbour Development, Kuantan-Kertih Railway and the Rawang-Ipoh Double Tracking Railway. He has authored/co-authored more than a dozen technical papers in local and international conferences. Ir. Yee is an expert witness and accredited checker registered with the Board of Engineers Malaysia for the design of geotechnical engineering works. Ir. Yee is the Chairman of the Geotechnical Engineering Technical Division of the Institution of Engineers Malaysia for Session 2015/2016.

### Ir. Dr. Swee Huat Chan

Ir. Dr. Swee Huat Chan is a registered Professional Engineer with the Board of Engineers, Malaysia since 2005. He graduated with a 1st Class Honors Degree in Civil & Structural Engineering from the Universiti Kebangsaan Malaysia in 1997. He obtained his Ph.D degree from the National University of Singapore in 2003. He worked as a Geotechnical Engineer in SSP Geotechnics Sdn. Bhd. for about 5 years before he joined Dr C.T. Toh Consultant as a Resident Engineer for about 2 years. He is one of the founders and directors of Geo-Excel Consultants Sdn. Bhd., a geotechnical engineering consulting firm. For the past 15 years, he has involved himself in analysis, design and construction of various geotechnical works and aspects including shallow & deep foundations, deep excavations & earth retaining structures, slope stability analyses & stabilization, landfill liner systems, seepage analyses, assessments of tunnelling methods, soil improvement techniques (highway, railway, airport, etc.), geotechnical failure investigations, 3-D finite element analyses, etc. He also served as an independent expert witness in several lawsuit cases in the High Court of Malaya at Kuala Lumpur. He is currently the Honorary Treasurer for Malaysian Geotechnical Society, Committee Member for the Geotechnical Engineering Technical Division in The Institution of Engineers, Malaysia and Member of Working Group on Drafting of Malaysia National Annex to Eurocode 7: Geotechnical Design - Part 2: Ground Investigation and Testing.

### Ir. Dr. Teik Aun Ooi

Ir. Dr. Teik Aun Ooi obtained his Bachelor of Civil Engineering and Master of Engineering from Auckland Universiity in 1966 and 1968 respectively. He obtained his PhD from University of Sheffield in 1980. He was the Co - Organizing Chairman of the recently concluded SEAGC2016. He is the immediate Past President of the Southeast Asian Geotechnical Society (SEAGS), Founder Chairman of the Association of Geotechnical Societies in Southeast Asia (AGSSEA). He is a Past President of the Malaysian Institute of Arbitrators (MIArb). He is the Immediate Past ICE Country Representative for Ma-

laysia (2000 - 2015), Founder Chairman of IEM Tunnelling and Underground Space Technical Division (TUSTD), Founder Chairman of IEM Consulting Engineering Special Interest Group (CESIG), He is an Honorary Fellow of The Institution of Engineers, Malaysia (Hon. FIEM), Fellow of the Institution of Civil Engineers (CEng FICE), Fellow of the MIArb (FMIArb), Fellow of Malaysian Society of Adjudicators (FMSA) and Fellow of Asean Academy of Engineering and Technology (FAAET). Dr. Ooi has fifty years of experience in the Construction Industry. He spent his initial fourteen years with the Public Works Department Malaysia before leaving to work in the private sector where he spent seventeen years working in the construction sector. He play major role in the Johore Baru Causeway widening and the design and construction of Senai Airport in 1970s. He was the Project manager for the Wisma Saberkas Building Project in Kuching in 1980s. He was Project Director for the Design and Construction supervision of the New Kuching Deep Water Port at Kampung Senari in 1990s. He started his consultancy practice in 2000 specialising in Civil and Geotechnical Engineering works. Dr. Ooi is a practicing Consulting Engineer, An Expert Witness in Court and in Arbitration, An Accredited Checker, An Arbitrator and An Adjudicator. He is a member of the Accredited Checker Committee of the Board of Engineers, Malaysia. Dr. Ooi devoted much of his time in honorable public service in continuing education of engineers and development of Malaysia Annexes for Eurocode 7 and 8. He is an independent executive director of IEM Training Centre Sdn Bhd since 1992. In 2013 he was appointed executive director of the IEM Academy Sdn Bhd. He has been Organizing Secretary and Chairman of numerous IEM Workshops, Seminars, and Conferences since 1970s. He was responsible for forming five active ICE Student Chapters in Universities in Kuala Lumpur. Dr Ooi conducted touring lectures in geotechnical engineering to Malaysia, Vietnam, Thailand, Cambodia, Laos, Myanmar and Philippines. In Malaysia he was invited to deliver the prestigous 19th Professor Chin Fung Kee Memorable Lecture in 2009. He frequently delivered lectures to the final year University engineering students.

## ACKNOWLEDGEMENT

Seventeen papers consisting of four Keynote and three Special Lectures from the recently completed 19th SEAGC and 2rd AGSSEAC which are upgraded together with ten contributed papers are contained in this Malaysia Special Issue. No doubt the material contained herein would be most valuable to our profession. The editors have adequately described the contributions in the preface. They are to be congratulated for these contributions.

**Dr. Teik Aun Ooi**
**Prof. San Shyan Lin**
**Prof. Kwet Yew Yong**
**Prof. A. S. Balasubramaniam**
**Dr. Noppadol Phienwej**

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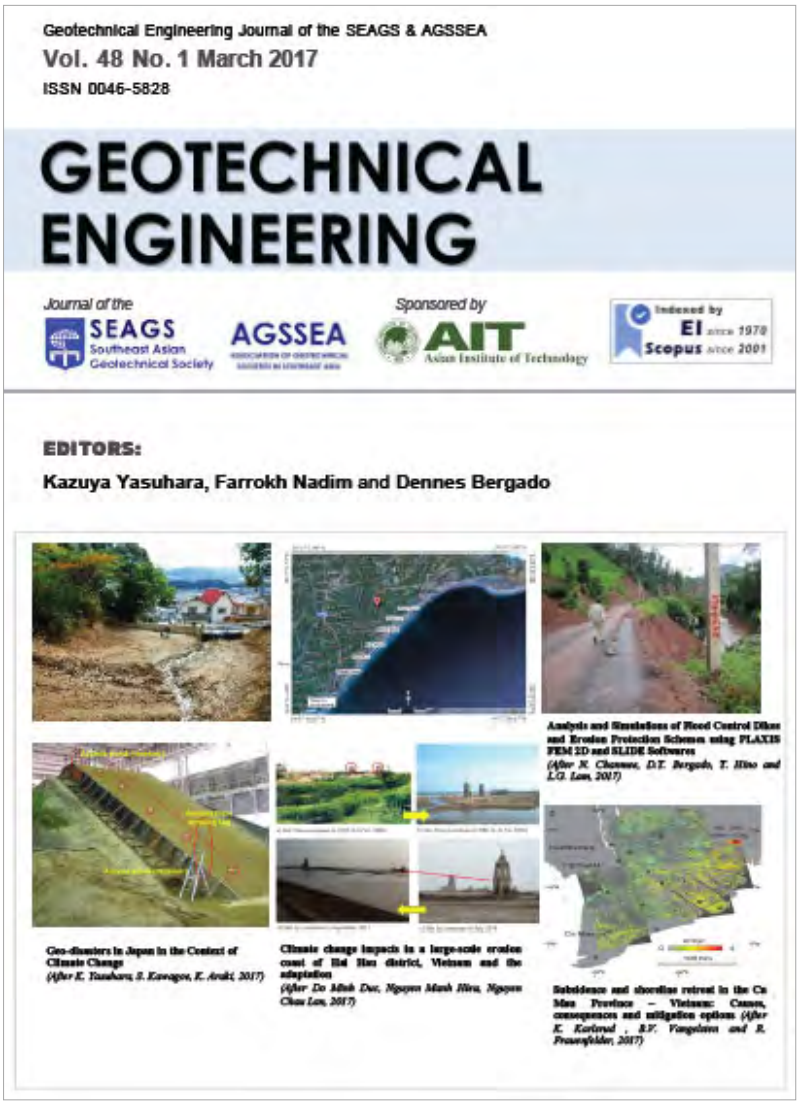
## EDITORS

**Kazuya Yasuhara, Farrokh Nadim and Dennes Bergado**




## PREFACE

There are fourteen papers in this Issue edited by Yasuhara, Nadim & Bergado. The first paper is by Yasuhara et al. on Geo-disasters in Japan in the Context of Climate Change. The authors say: Japan is an area affected strongly by land surface upheaval and by climate change instability. Background evidence of increasing and magnifying geo-disasters includes the following: (i) frequent and extremely severe torrential rainfall; (ii) high and increasing frequency of strong earthquakes (5+ and 6- as the Japan Meteorological Agency seismic intensity scale); and (iii) typhoons with magnified damage effects. Based on a review of that information stated above, an attempt has been made to overview the present situation and future trends of geo-disasters in the context of climate change and to present possible adaptive measures against disasters. Particularly, emphasis is assigned to the importance of the combined effects of plural events, which increases the probability of extreme events, sometimes triggering devastating consequences. Adaptive measures against climate change-associated geo-disasters are presented by classification into software and hardware. Special emphasis is devoted to the availability of information and communication technology (ICT) and information, communication and robot technology (ICRT) involving devices such as IC-sensors and un-crewed vehicles (UAV, drones), which are useful in early warning systems and in simple monitoring systems.

The second paper is by Do Minh Duc et al. on climate change impacts in a large-scale erosion coast of Hai Hau district, Vietnam and the adaptation. It seems among the effects of global warming, sea level rise (SLR) and severe typhoons pose the greatest threat to the stability of human settlements along coastlines. Therefore, countermeasures must be developed to mitigate the influences of strong typhoons and persistent SLR for coastal protection. This study assesses climate change impacts on coastal erosion, especially in two projected SLR scenarios of RCP2.6 and RCP8.5. The results show that SLR and severe typhoons lead to the increase of coastal erosion, beach lowering and scour. Moreover, as in projected SLR scenarios, average waves in high tide can cause severe soil erosion at inner slopes and lead to dyke failure by 2060. The paper highlights the need for additional geotechnical engineering measures to protect the coast of Hai Hau district against SLR and severe typhoons. Among the alternatives available for countering these threats, applying soil stabilization and soil improvement combined with geosynthetics

are promising strategies for coastal structures. Hybrid structures can be used with earth reinforcement and soil improvement. Additionally, the paper emphasizes the importance of multiple protective adaptations, including geosynthetics and ecological engineering measures against climate change-induced severe erosion on the coast of Hai Hau district.

Karsrud et al. in the third paper described subsidence and shoreline retreat in the Ca Mau Province – Vietnam: Causes, consequences and mitigation options: The authors say in the past decades, the Ca Mau province located at the southern end of Vietnam, has experienced significant land-loss. Satellite data suggest that a loss of land, or a retreat of the shoreline, ranging from about 100 m to 1.4 km have occurred over the past 20 years or so. In addition to the retreating coastline, the Ca Mau coastline has experienced loss of mangrove forests and salt-water intrusion into canals and rivers in the region. A study undertaken in collaboration between Vietnamese and Norwegian institutions has tentatively concluded that the main cause of the land-loss is subsidence of the ground surface as a result of ongoing groundwater pumping. The experienced land-loss may be further enhanced by a climate change related sea-level rise. Large parts of the land area in Ca Mau lie less than 1.5 m above sea-level. The subsidence settlements may already have reached 40 to 80 cm in some places, and the present subsidence rates may correspond to 2-4 cm/year. Recent satellite based data using In SAR technology (Interferometry Synthetic Aperture Radar) confirm that significant subsidence is on-going in all provinces in Vietnam from Ho Chi Minh City and southwards. If no actions are taken soon, the implication will be that these provinces are lost to the sea within a time frame of a few decades.

The only realistic way to prevent such subsidence settlements is to greatly reduce groundwater pumping in the area, and replace it with water from other sources. Also in light predicted climate-change related sea-level rise, some physical barriers may also be required to protect the region against flooding. It is recommended to immediately initiate an observational program and supplementary analyses to verify the present and future subsidence of the ground surface in Ca Mau. This is to ensure that remedial actions are planned for and implemented before it is too late.

In their paper (fourth one) Yahaya et al. present rainfall erosivity variability for Penang Island in Malaysia. Rainfall erosivity considers the rainfall amount and its intensity. This is an important parameter for soil erosion risk assessment under future land use and climate change. Comparisons of all climatic parameters show that rainfall is directly involved in the loss of soil quality during torrential rain. The effect of rainfall erosivity in Northern part of Malaysia was considered for two stations, Bukit Berapit and Air Itam. Monthly as well as annual rainfall was obtained from the Department of Drainage and Irrigation, Malaysia for thirty years (1983-2012). Trends analysis of the rainfall data were obtained for 30 years that shows trends for mean annual rainfall. This was conducted using Mann-Kendall trend analysis and Sen's slope tests. Trend analysis shows that there is negative significant difference in mean annual rainfall for the studied period for Air Itam. The Fournier indexes were used to determine the effect of extreme rainfall events towards soil erosivity. Bukit Berapit recorded 3.33% cases of severe impact using Fournier index and 13.33% cases of high impact using modified Fournier index. The result shows that there is a relationship between rainfall trends and soil erosivity.

The fifth paper is on the influence of increased precipitation on the transient seepage through levees during flood events. This paper is by Scheurmann et al. The transient seepage through levees during a flood event depends on several factors, such as the initial water content condition within the levee as a result of former flood and precipitation events which is frequently neglected. Results of experimental and numerical investigations are presented which show the importance of the initial water content distribution on the resulting transient seepage. Analytical methods for calculating the transient seepage through levees are introduced. The modified method after Brauns (1999) allows for the determination of the seepage through levees under consideration of partly saturated conditions. The initial conditions for the transient seepage can be chosen based on simple considerations related to the field capacity or the effective infiltration of water due to precipitation.

Hazarika in his paper sixth in the series discuss the use of low carbon and low cost (LC2) Materials in climate change adaptation measures. Material recycling of waste tires, which reduces the release of greenhouse gases, for protecting coastal structures from potential natural hazards is proposed here. A new technique using waste tires behind sea walls to protect them from the damage due to impact force of tsunami is described. Cultivation of suitable plants inside the tires was proposed and field tests on planting trees that can grow in saline soil conditions were performed to see whether tire structures can preserve the greenery of the area. A physical model for tsunami impact force simulation was also developed to evaluate the reduction effect of tsunami impact force by the tire structures. Results of this research, if implemented, is not only expected to contribute towards economic countermeasures against natural hazards, but also will go a long way towards providing a sustainable solution for infrastructure development in the future.

Lee et al. are the authors of the seventh paper on performance monitoring of bridge foundations under multi-hazards. In an effort to proactively monitoring the safety of bridge foundations so as to probe the possible performance of bridge foundation during natural hazards such as floods, debris flows, rainstorms, and typhoons, an intelligent monitoring system was developed by the authors and had applied to several bridges. In this paper, theoretical background and development will be firstly described. Two case histories will then be presented to describe performance of bridge foundation during natural hazards. Such information will be also further discussed by integrating environment factors such as rainfall amount and flow velocity. Research progress presented in this paper is hoped to be helpful in understanding performance of bridge foundation during hazards so as to provide insights of pre-warning of bridge safety.

The eighth paper by Chanmee et al. is titled analysis and simulations of flood control dikes and erosion protection schemes using PLAXIS FEM 2D and SLIDE computer softwares. In 2011, Thailand has suffered from devastating flooding due to climate change. During this time, 2 typhoons from the Pacific area went straight across Vietnam to Northern Laos and Northern Thailand instead of the usual path to Taiwan and Japan. Subsequently, huge flooding damaged many infrastructures and overtopped flood protection dikes of many industrial estates and educational institutions in the Central Plain of Thailand such as at Hi-Tech Industrial Estate, Bang Pa-In Industrial Estate, Navanakorn Industrial Estate and Asian Institute of Technology. The same phenomenon also occurred in Laos PDR which caused unusually heavy rains and widespread river flooding in 2011.

Consequently, slope failures occurred along National Road 1B (NR 1B) in Pongsaly Province in Northern Laos due to undercutting erosions at the lower slopes by the adjacent flooded river. To evaluate the stability of these protection structures, finite element and limit equilibrium methods were utilized. PLAXIS 2D software was used to analyze the slope stability of improved flood protection dikes and erosion control schemes at low and high water levels incorporating the various supporting and reinforcing materials such as geosynthetics, concrete sheet pile and concrete slab. Moreover, the PLAXIS 2D software was also utilized to predict the vertical deformations (settlements) of improved flood protection dikes in cases of additional embankment height and at different cases of flood water levels. In addition, the SLIDE software was used to predict the value of the factor of safety by using limit equilibrium method for the improved flood protection dikes and erosion control schemes.

In the subsequent paper nine in the series Araki et al deal with arresting rainfall-induced red soil runoff in a farmland by inhibitory adaptation measures. Climate change-induced red soil erosion in Okinawa of Japan has become widely recognized due to the increased frequencies of heavy rainfall. Approximately 85% of runoff from farmland is accounted as a source of the red soil erosion. In this study, field experimental plots were conducted in Ginoza village in Okinawa to investigate the effectiveness of potential adaptation measures in arresting the red soil erosion. A physical model for estimating a sediment volume of soil erosion was derived based on grain size distribution. The maximum particle sizes were derived as a function of rainfall intensity, initial soil conditions and strength parameters of the surface soil. The

measured maximum particle sizes of the discharged red soil were agreed well with the model results and could offer the basis for determining an appropriate method of adaptation based on geotechnical aspect.

Umino et al. in the tenth paper deal with iron and steel slag properties and mechanisms for carbon dioxide fixation in a low-carbon society. The paper presents carbon dioxide (CO2) fixation properties of an iron and steel slag containing calcium, in order to contribute to a geotechnical application for the formation of a sound material-cycle society and a low-carbon society. To investigate the properties of CO2 fixation, CO2 fixation tests with constant flow were conducted. Results show that when the CO2 concentration 4500 □L- CO2/L was flowed in a specimen by 0.05 L/min, for a non-aged steelmaking slag, the amount of CO2 fixed was the maximum: 0.04 g- CO2/g-slag. The amount of CO2 fixed in the steelmaking slag resulted from about 20% of soluble calcium in the chemical reaction. Therefore, it is possible that the quantity of CO2 fixation can be evaluated from the viewpoint of the mechanism of CO2 fixation using the quantity of water soluble calcium.

Kusakabe et al. in the eleventh paper deal with the development of gross national safety index for natural disasters. After the Great East Japan Earthquake on March 11, 2011, it appeared that Japan was extremely vulnerable to natural disasters and lack of adequate social systems for mitigating natural disasters. The authors advocated a need for the development of safety index systems for natural disasters for policy makers and decision makers to prioritize mitigation measures to be implemented. The World Conference on Disaster Reduction in Kobe in 2005 adopted the Hyogo Framework for Action, which clearly states the urgent need for developing vulnerability index. An extensive literature survey was firstly conducted to find out the State of the Art regarding to the development of systems of indicators of disaster risk and vulnerability at national and sub-national scale. The survey indicates that the system of indicators such as World Risk Index (WRI) is widely accepted. By modifying the WRI index, a new index named GNS (Gross National Safety for natural disasters) was developed in this study. Risk in GNS is defined by Hazard x Exposure x Vulnerability. Five natural events are considered in 2015 version of GNS, including earthquake, tsunami, storm surge, sediment related disaster event, and volcanic activity. An initial calculation was carried out by using various big data available open to public. The results of disaster risk and vulnerability are presented in the prefectural scale in Japan. Our intension is not to provide the ranking of GNS but to offer the policy and decision makers a piece of scientific information for selecting highest priority measures for mitigation in a rational manner. A few commentary remarks are added to include the impact of climate change on natural disasters in the safety index system.

The twelfth paper by Yuan et al. describes the flooding hazards and potential risks due to heavy rain and sea level change in Shanghai, China. Current sea level change is mainly induced by global warming which is believed to increase the sea level if sustained for a sufficiently long period of time. Many coastal cities around the world have suffered adverse effects as a consequence of sea level change. Shanghai is a coastal city which is located on the estuary of the Yangtze River with an elevation ranging from 3 to 4 m. Its geological and climatic conditions make the city sensitive to flooding risk caused by heavy rain and sea level change. This paper analyses the recent sea level change and heavy rainfall in Shanghai. Regional rates of sea level change can be divided into i) the rate of eustatic sea level change; ii) tectonic movement of the continent; and iii) land subsidence in Shanghai. A correlation analysis shows that the number of local torrential rains and short duration torrential rains correlates with sea level change. Incidents including pluvial flooding, sea water intrusion and potential damage to coastal structures will be more serious if the rate of sea level change continues to rise. To protect the environment and to control economic losses, more countermeasures should be established to prevent the potential hazards.

The thirteenth paper by Soralump and Chaithong is on the modeling impact of future climate on stability of slope based on general circulation model. Slope failures are one of geo-hazard which are one of the most dangerous and occur very often. Climate is an important role in stability of slope. In many cases rainfalls induce slope instability and lead to slope failure or landslide whereas evaporation might stabilize slope. Climate change due to greenhouse effect and global warming might affect precipitation and evap-

oration patterns in the future and influence future slope failure. Therefore, the paper proposes a method for assessment impact of climate change on slope failure occurrences based on general circulation model (GCM). Methodology combines between climate scenarios as a result of general circulation model and modified critical antecedent precipitation index model. GCM results are downscaled with dynamical-statistical technique to derive local climate. Analysis found that trends of susceptibility of soil instability vary and depend on climate in each year period.

The fourteenth paper by Ghosh and Pal describes the geotechnical measures for Uttarakhand Flash Flood in 2013 in India. In many "Run of the River" hydro-electric projects in the four main states of northern India have been frequented by "Cloud Burst" induced flash flood since 2003, which is primarily attributed to climate variability and land use pattern changes. Given the ageing population of vulnerable constructions along the hilly terrains, safety issues require more attention in the form of technical auditing cum inspections, routine monitoring, emergency drills, surveillance systems, and regularly updated emergency action plans. In addition to these accelerated events of "cloud burst" induced flash flood in the hilly region has opened up Dam safety issues, which are debated in the court of law for which geo-professional intervention have to be looked into. The climatic and other geomorphological changes that might have caused Uttarakhand Flash Flood in 2013 are explained. Damages to the geotechnical structures in the form of excessive erosion, landslides, siltation of catchment area of several Dams in Uttarakhand state of India are described with some illustrations of landslide mitigation by indigenous bio-engineering solution as one the means of rehabilitation measures.

**Editors:**
**Kazuya Yasuhara,**
**Farrokh Nadim**
**and Dennes Bergado**

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**Modeling impact of future climate on stability of slope based on general circulation model**
*By S. Soralump and T. Chaithong*

**Geotechnical Measures for Uttarakhand Flash Flood-2013, India**
*By C. Ghosh and I. Pal*

## JUNE 2017 MASS TRANSIT PROJECTS & CONTRIBUTED PAPERS

**EDITORS** **Kok Hun Goh, Kumarasamy Jeyatharan, Richard Hwang & San Shyan Lin**

### PREFACE

There are 16 papers in this Issue; the first eleven are papers edited by the Guest Editors: Kok Hun Goh, Jeyatharan and Richard Hwang; additionally there are five contributed papers are processed by our in-house editors.

The first paper is by R. N. Hwang and Z. C. Moh on on Deep Excavations in Taipei Metro Construction: Discussed herein are the geological features of the Taipei Basin relevant to the construction of Taipei Metro and the deep excavations carried out with emphasis on back analyses of wall deflections. The excavation at the crossover next to G17 Station of the Green Line is adopted as an example to illustrate the applications of wall deflection paths and reference envelopes. The importance of calibrating inclinometer readings to account for the movements at the tips is confirmed by numerical analyses; and the assumption that movements at the joints between the struts at the first level and the diaphragm walls would be negligible in subsequent stages of excavation once these struts are preloaded is verified. Furthermore, it is proved that the concept of wall deflection path is very useful to quantify the influence of various factors, e.g., the depth and width of excavation, wall length, preloads of struts, and the thickness of soft deposits, on the performance of diaphragm walls.

The second paper is by darci wen on Development of Reinforced Concrete Segmental Lining Design for MRT Bored Tunnels in Singapore: Reinforced concrete segments are commonly used as tunnel linings for bored tunnels constructed by tunnel boring machines (TBM). They have been used from 1980s till today for the majority of the Singapore Mass Rapid Transit (MRT) bored tunnels constructed by TBM as permanent supports. This paper describes the development and evolution of the segmental lining design from the Phases I/II of the MRT construction in the 1980s to the current design for the MRT lines under construction. The topics include the general arrangement of the segmental linings, structural design requirements, durability requirements, fire resistance and selection of waterproofing materials of the linings. The design and construction of bored tunnels in close proximity is presented with the experience gained in the past projects. Fire tests conducted by the Land Transport Authority are also presented. The rational, experience and challenges of adopting steel fibre reinforced concrete segments in recent MRT projects are discussed in the paper. The paper also presents in detail the experience gained in Singapore MRT projects in selecting the gaskets for waterproofing of the joints between segments to achieve the durability requirements for the bored tunnels.

Kumarasamy Jeyatharan in the third paper describe Geology and its Impact on the Construction of Singapore MRT Circle Line: The Circle Line (CCL) is a fully underground railway line in Singapore connecting the inner suburban areas of the city. It is 39.5 km long with 34 stations and built in six separate packages. Site investigations comprising boreholes, CPTs and geophysical surveys for the project were carried out in various phases to reveal ground conditions along the route and decide on the construction methods.

Extensive field and laboratory testing were also carried out to establish geotechnical design parameters. This paper summarises geological conditions encountered along the CCL route and highlights the effect of geology on selected construction methods.

In their paper (fourth one) K.H. Goh and Y. Zhang, describe how to construct the cut-and-cover tunnels and bored tunnels of the Singapore Downtown Line: The Downtown Line (DTL) is a major MRT line under construction after the completion of the Circle Line in Singapore. This paper will review the ground conditions for the DTL and how the ground condition has influenced the decision on the selection of the support systems adopted for the excavation for the stations which are constructed using cut-and-cover method, and also the selection of tunnel boring machines for the bored tunnelling works. The key features of the temporary support systems will be presented in the paper and their performance will be reviewed in terms of ground movements and ground water table drawdown and its impacts. Issues encountered during the excavation, in particular for DTL Stage 2 in the soils and rocks of the Bukit Timah Granite Formation will be presented in the paper and the effectiveness of various measures implemented will be discussed based on the experience and observations during the construction. The key features and parameters of the TBM used in the projects will also be presented.

The fifth paper is on Bored tunnelling directly below buildings in Singapore Downtown Line by K.H Goh et al.: Other than basement construction of building complexes for parking and other functions, many cities in the world are also embarking on major construction projects to put roads, metro infrastructure, municipal services and utilities, under the ground. One of the specific challenges faced is the construction of bored tunnels directly below buildings. This paper reports the experiences of bored tunnelling directly below several buildings in the recently implemented Downtown Line project. These case studies would include details such as the structural system and foundation details of the buildings, ground condition, geometry and clearance between the building foundation and the tunnelling works, as well as instrumentation monitoring results of ground and building settlement during tunnelling. It is hoped that these cases could be used as references in the design of future bored tunnelling works, to give greater confidence that tunnelling directly below buildings can be carried out without affecting the buildings so long as appropriate tunnelling controls are taken to mitigate ground deformation issues.

Charles Im et al in their paper sixth in the series Application of Gravity Survey in Urbanized City Environment discuss subsurface information and geotechnical data are required during the planning, development and design stages of all construction projects particularly where major components are supported on or in the earth and underlying rock. An understanding of the basic site geology is also necessary for the proper planning of the ground investigation works. Consequently, the geological features that will affect the design and construction of the project must be investigated and evaluated as much as possible within the allowable project timeframe to ensure successful implementation of the project. This paper presents an overview of the authors' experiences in using Gravity Survey, as a reconnaissance ground investigation method to identify areas of enhanced ground risks, in the complex variable and unpredictable Kuala Lumpur Karstic Limestone formation during the underground reference design stage of the Klang Valley Mass Rapid Transit Line 2 (SSP Line) in Kuala Lumpur, Malaysia. This paper also presents some lessons learnt of the past in the region, and what were the specific measures that had been strictly implemented on this occasion to ensure quality results can be derived from the Gravity Survey within the urbanized city environment and meet the objectives of the survey.

M. Kawasaki et al are the authors of the seventh paper on Water Sealing by Wire Brush with Grease for Pneumatic Caisson Method at Great Depth Underground : Pneumatic caisson method can be widely applied to various ground and has high reliability, while its applicable depth is limited due to the work under high atmospheric pressure. To overcome the problem, the pneumatic caisson method employing an unmanned excavation method with helium mixed gas has been developed, which enables the work under pressure up to 0.7 MPa. However, the new technology of the pneumatic caisson method will be required to construct a vertical shaft for urban tunnels at great depth underground space. Therefore,

applying water-sealing technique at shield tail to friction cut space around pneumatic caisson wall, a method to reduce atmospheric pressure in a working chamber at the ground with low permeability has been proposed. This research carried out the element tests to examine the water-sealing performance of the proposed method, and discussed the influence of some properties on water-sealing performance and its mechanism. As a result, it was confirmed that the proposed method can keep the grease pressure of 1 MPa for one hour.

The eighth paper by N. Som and is titled Geotechnical Challenges of Kolkata Metro Construction: The paper gives an account of the Kolkata Metro construction which included the first underground railway for mass rapid transit system of an Indian city. Construction was started in 1975 and the first line of the metro covering a length of 17 km was opened in 1984. Thereafter construction had been taken up in phases. Currently Kolkata metro construction includes an ambitious package of 140 km of underground, at grade and viaduct stretches. Construction has to be done in very difficult condition through congested urban areas which includes a tunnel below the Ganga river. Resource crunch and construction through heavily built-up urban land extended the period of construction but modern design techniques and field instrumentation have helped to ensure high quality work in densely populated urban centre.

In the subsequent paper nine in the series Gerardo Agustin Pittaro deal with the use of pressure relief wells to optimise ground improvement layer thickness in deep excavations: Deep excavations in soft ground often need stabilization with ground improvement (GI). One of the methods to improve the ground is to use Jet Grouting Piles (JGP) or Deep Soil Mixing (DSM). JGP and DSM are achieved by mixing the soil with cement and water, generating a structure that performs well under compression forces but not under tension forces. These ground improvement blocks provide larger passive resistance thereby reducing wall displacements. Due to the above mentioned one of the necessary requirements for successful design is that no tension forces are allowed in any zone of the ground improvement block. This paper discussed how pressure relief wells inside the excavation are used in order to decrease the tension strains in the ground improvement block. In order to demonstrate this, 2D numerical analyses were performed.

C. Veeresh and K.H. Goh in the tenth paper deal with Bukit Timah Granite Formation - Engineering Properties and Construction Challenges: The Bukit Timah Granite Formation is one of the oldest geological formations in Singapore and is found mostly in the central and northern parts of Singapore. A major section of Singapore's underground metro construction passes through the Bukit Timah formation soils, and extensive field and laboratory testing has been carried out on the rock samples. Uniaxial Compressive Strength (UCS) tests have been carried out on hundreds of samples, test results have shown wide variation in the strength and the maximum strength is found to be much higher compared to the previously published data by Zhao et al 1995. This paper presents a review of UCS strength of the Bukit Timah Formation, Point Load index tests and correlations which were developed for site specific locations. This paper also reviews the abrasivity of Bukit Timah Granite and factors affecting it. Influence of UCS and other factors on the drilling, coring and excavation rates in Bukit Timah Granite are also presented.

L.J.Endicott is the eleventh paper and the last one as assembled by the guest editors deal experiences of 41 years of Mass Transit Underground Railways: In 1975 many cities in South East Asia were becoming congested and few had underground railways. Now several cities have underground railway systems comprising several lines and many stations, some extend above ground. Currently underground railways are being built or are being extended in many cities in South East Asia. Construction projects are often large including several sections of tunnels and stations in one contract. This paper reflects on the early days of pioneering and on some of the changes that have taken place in the planning, design, and construction of underground Mass Transit Systems during the last 41 years.

The 12th paper by describe by Badee Alshameri is the first of the contributed papers edited by San Shyan Lin on Comparison of the Effect of Fine Content and Density towards the Shear Strength Parameters: The

improvement of soil strength is very important in the engineering design for the civil and geotechnical projects. However, this improvement can be achieved by improving the shear strength parameters of soil (i.e. shear strength, friction angle and cohesion) by using different techniques (e.g. densify the soil and change the soil composition). This paper will compare between the effects of density and fine content towards the shear strength parameters. Numerous soil samples (i.e. 99 samples) from six soil mixtures of sand-kaolin mixtures were compacted and subjected to direct shear box test to evaluate the effect of density and fine content. The results showed some discordant effects between the density and fine content. While the cohesion increased by the increment of the fine content, it decreased by the increment of the density. However, both of shear strength and friction angle increased to the highest value with the increment of the fine content and density then by further increment in the fine content and density, the shear strength and friction decreased where this behaviour can be explained through the inter-granular void ratio issue. On the other side, even the results showed interface between the effect of density and fine content, but the fine content has more significant effect in the shear strength parameters and also in the soil density value itself.

The 13th paper (also contributed direct to the in-house editors) by T. G. Santhoshkumar et al is on the Role of Bentonite in Improving the Efficiency of Cement Grouting in Coarse Sand: Grouting generally is used to fill the voids in the ground (fissures and porous structures) with the aim of increasing resistance against deformation, to increase cohesion, shear strength and uniaxial compressive strength or finally (even more frequently) to reduce conductivity and interconnected porosity in an aquifer. In the case of loose sandy soils, the very low bearing capacity of the foundation bed causes shear failure and excessive settlements. Cement grouting technique is one of the possible solutions to the foundation problems for improving the properties of soil at shallow depths. Various authors have recommended a number of additives that can be used in cement grouting. Admixtures like antibleeder increases viscosity of the cement grouts, at the same time reducing sedimentation to a considerable extent. Bentonite can be considered as a cheap and effective admixture for cement grouts with regard to stability. This paper presents the results of experimental studies conducted in the laboratory, in this direction. It was found that addition of small percentages of bentonite and detergent increases the lateral flow of cement grout in coarse sand. The results clearly indicate that addition of even a small amount of bentonite to the cement grout increases the grouting efficiency in coarse sand.

The 14th Paper (also contributed direct to the in-house editors) by Xiao-long Zhou et al is on Shaft Resistances of Jacked Open-ended PHC Pipe Piles: The shaft resistance of open-ended pipe piles during installation and static loading test plays an important role in the design of pile foundation. One open-ended Pre-stressed High-strength Concrete (PHC) instrumented with sensors was jacked to investigate the performance of shaft resistance during installation and loading test. Test results indicated that the shaft resistances gradually transferred along depth during installation, and the magnitude is closely related to soil properties. The shaft resistance at the same depth decrease with jacked cycles. After five jacked cycles, the shaft resistances in sand silt at 6 m depth decreased about 58.8%. The decrement of silty clay at 10 m depth was about 12.1% after three jacked cycles. In the loading test, the shaft resistance of test pile were gradually mobilized from up to down.

P.R. Stott and E. Theron in the 15th paper (also contributed direct to the in-house editors) is on the Estimation of Shrink/Swell Potential and Variability of Clays by Small-Scale Suction Tests: The relationship between suction and water content gives crucial information about a soil. Small projects like economic housing do not warrant the time and cost of determining the full soil water suction curve. A considerable range of soil suctions can easily be achieved within a reasonably short time by using small samples, simple suction control and a high precision balance. It appears that in this way it may be possible to estimate heave potential and variability of soil properties at reasonable cost in an acceptable time. Variability assessment appears to offer significant potential for improving the reliability of foundation design on shrink/swell soils.

The last paper of this Issue  the 16th one ((also contributed direct to the in-house editors) by M. R. Selamat et al is on Pullout Tests on Strips with Anchorage Elements under Low Stresses: The lack of pullout capacity of reinforcement strips often compromised the finishing quality of the mechanically stabilized earth (MSE) structure. In this research, three strips were each attached with 6 anchorage elements of 1cm, 2cm, and 3cm deep respectively in order to enhance the pullout capacities, while another strip was plain. Each strip was subjected to pullout tests under low normal stresses ranging from 1.61kPa to 13.20kPa to simulate shallow embedment in the field. Under the low normal stress of 1.61kPa, the pullout capacities of strips with anchorage elements were enhanced up to 366% of the plain strip capacity; under the higher normal stress of 13.2kPa however, the pullout capacity enhancements were only up to 163% of the plain strip capacity. The results indicate the merit of attaching anchorage elements to strips under shallow overburden in a MSE structure and the significant increase in pullout capacity achievable by such strips.

**Editors:**
**Kok Hun Goh**
**Kumarasamy Jeyatharan**
**Richard Hwang**
**San Shyan Lin**

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## SEPTEMBER 2017 SOIL BEHAVIOUR & APPLICATIONS

**EDITOR** **Akira Murakami**

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**Numerical Study on the Design of Reinforced Soil by Vertically Arranged Micropiles**
*By A. Kamura, J. Kim, T. Kawai, M. Kazama, N. Hikita and S. Konishi*

**Change of Soil Properties in the Bengawan Solo River Embankment due to Drying–Wetting Cycles**
*By T. R. Satrya, R. A. A. Soemitro, and T. Mukunoki*

**Loading and Dynamic Response Considerations for the Design of Wind Turbine Foundations on South African Soils** *By B. Mawer, D. Kalumba & C. W. Codrington*

**Ground Response Based Preliminary Microzonation of Kathmandu Valley**
*By D. Gautam, H. Chaulagain, H. Rodrigues and H. R. Shahi*

**Comparison of Numerical Analyses of Behaviour of Column-Reinforced Foundations**
*By M. Bouassida, M. Klai, S. Tabchouche and M. Mellas*

**The Change Laws of Strength and Selection of Cement-sand Ratio of Cemented Backfill**
*By W. Xiaoming, L. Changhong, Z. Xiaolong, H.Baowen, L. Wanling*

**Numerical Simulation Analysis and In-situ Monitoring of Long and Narrow Deep Foundation Pit**
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## DECEMBER 2017 DEEP FOUNDATIONS

**EDITORS** **Tatsunori Matsumoto, Der Wen Chang & San Shyan Lin**

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**Challenges and recommendations for steel H-piles driven in soft rock**
*By K. Ng and T. Sullivan*

**Experimental study on pile foundations having batter piles subjected to combination of vertical and horizontal loading at 1-g field**
*By A. Vu, T. Matsumoto, S. Kobayashi and S. Shimono*

**Fundamental experiments on a reinforcement method using sheet pile wall for bridge pile foundations subjected to pile embedment reduction and numerical validation**
*By T. Tikanta, T. Matsumoto, A.T. Vu, S. Kobayashi, S. Shimono and C. Bamrungwong*

**Numerical studies on performance of offshore wind turbine composite suction pile in sand subjected to combined lading**
*By S.S. Lin, Y.C. Chiang, X.H. Lin, H.Y. Wang and S.S. Hsiao*

**Consideration of effects of pile group interaction in piled raft system based on field monitoring and single pile load tests**
*By K. Yamashita, S. Wakai, J. Hamada and T. Tanikawa*

**In-situ full scale load tests and reliability evaluation of bearing capacity for nodular cast-in-place concrete pile** *By K. Watanabe, A. Mitsumori, H. Nishioka and M. Koda*

**Development of steel pipe pile combined with ground improvement in narrow spaces**
*By K. Watanabe, T. Yamamoto and T. Sudo*

**Design and analysis of composite foundation for high-rise buildings**
*By K. Watanabe, N. Suzuki and M. Sahara*

**Pervious backfill material made from landslide debris for road base construction**
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**Load sharing mechanism of combined pile-raft foundation (CPRF) under seismic loads**
*By A. Kumar and D. Choudhury*

## MARCH 2018 CALL FOR ABSTRACTS/PAPERS

### Announcement on call-for-paper of Research and Practice in Geotechnical Earthquake Engineering special issue in Geotechnical Engineering, J. of SEAGS and AGSSEA

Subject: Announcement and invitation of call for abstracts and papers on Geotechnical Earthquake Engineering Issue of the SEAGS-AGSSEA Journal published in March, 2018.

Theme: **Research & Practice in Geotechnical Earthquake Engineering**

**Topics:**

01 Soil dynamics: field and laboratory testing;

02 Soil-site characterization and dynamic soil modeling;

03 Soil liquefaction and lateral spreading;

04 Shallow and deep foundations;

05 Slope and retaining structures;

06 Lifeline earthquake engineering;

07 Soil-structure-foundation interaction;

08 Case histories, observations and lessons from recent and past earthquakes;

09 Codes, policy issues, insurance and standard of practice;

10 Findings and lessons learnt from recent earthquakes;

11 Engineering issues of seismic fault;

12 Performance-based design in earthquake geotechnical engineering.

For this Research & Practice in Geotechnical Earthquake Engineering Issue about 15 papers are envisaged with consideration of balances among topics, expertise and countries. The following is the tentative schedule for this issue:

(1) Due date of Abstract: July 31, 2016

(2) Acceptance of Abstract: September 30, 2016

(3) Due date of full paper: March 31, 2017

(4) Notice of Review Comments: June 30, 2017

(5) Due date of final manuscript: August 31, 2017

The SEAGS & AGSSEA Journal is an open access, specialized, peer-reviewed Journal that focuses on research, development and application within the fields of geotechnical engineering and technology. Published four times per year, it tries to give its contribution for enhancement of research studies. Contributions must be original, not previously or simultaneously published elsewhere.

Accepted papers are available freely with full-text content upon receiving the final versions, and will be indexed at major academic databases.
- Papers should be written in English.
- Submitted papers should follow the format of the sample article attached.
- Submissions are accepted via e-mail: towhata.ikuo.ikuo@gmail.com; dwchang@mail.tku.edu.tw

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## JUNE 2018 CALL FOR ABSTRACTS/PAPERS

### Announcement on call-for-papers June 2018 - Kusakabe Issue

Announcement and invitation of call for abstracts and papers for June 2018 Issue of SEAGS-AGSSEA Journal

Theme: **Development and Future Plan of Infrastructures in Asia**

Asia is the region where infrastructure development has rapidly progressed and this trend will continue for many years to come. Thus it seems appropriate from the view of SEAGS-AGSSEA Journal to gather and publish important case histories of development of infrastructures in the Asian region.

Case histories may include,
(1) Airport project
(2) Underground project
(3) Highway project
(4) Railway project
(5) Port and harbor project
(6) Disaster prevention project
(7) Building project
(8) Future plan

Along with the scope of SEAGS-AGSSEA journal, all the case histories must have geotechnical challenges. It should be noted that this issue does not necessarily focus on big or mega projects. A wide variety of case histories are welcome.

For this Issue about 15 papers are envisaged. The following is the tentative schedule for this issue:
(1) Call for paper abstracts (August 2016 – December 2016)
(2) Full paper submission (on or before September 2017)
(3) Revision to and finalization of papers (before December 2017)
(4) Manuscripts ready for publication (February 2018)
(5) This special Issue appears in June 2018

The Journal is an open access, specialized, peer-reviewed, Journal for SEAGS: (Southeast Asian Geotechnical Society) & AGSSEA. (Association of Geotechnical Societies in South East Asia) that focuses on research, development and application within the fields of geotechnical engineering and technology. Published four times per year. Contributions must be original, not previously or simultaneously published elsewhere.

Accepted papers are available freely with full-text content upon receiving the final versions, and will be indexed at major academic databases.
• Papers should be written in English.
• The number of papers accepted is generally 15 but can be more depending on the quality.

- All articles are sent for blind peer review, with a fast and without delay review procedure (within approximately one month of submission).
- Submitted papers should follow the format of the sample article attached.
- Submissions are accepted via e-mail: please contact
  Masaki Kitazume: masaki_k@msj.biglobe.ne.jp
  Jiro Takemura: takemura.j.aa@m.titech.ac.jp jtakemur@cv.titech.ac.jp
  Yoichi Watabe: Yoichi Watabe (Home) watabe@ipc.pari.go.jp

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## SEPTEMBER 2018 CALL FOR ABSTRACTS/PAPERS

### Fellenius Issue: Announcement on call-for-papers September 2018

Announcement and invitation of call for abstracts and papers contributed to the September 2018 Issue of SEAGS-AGSSEA Journal

**Theme: Deep Foundation Practice and Interpretation of Load Test Data**

1. Interpretation of Pile load test data
2. New pile testing techniques
3. Design and analysis of piled foundations
4. Design and Analysis of Pile-Raft Foundations
5. Construction aspects of deep Foundations
6. Field monitoring of Deep Foundations
7. Others in Deep Foundation Engineering

For this Issue about 15 papers are envisaged The following is the tentative schedule for this issue:
(1) Call for paper abstracts (March - June 2017)
(2) Full paper submission (on or before November 2017)
(3) Revision to and finalization of papers (before March 2018)
(4) Manuscripts ready for publication (June 2018)
(5) This special Issue appears in September 2018

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- All articles are sent for blind peer review, with a fast and without delay review procedure (within approximately one month of submission).
- Submitted papers should follow the format of the sample article attached.
- Submissions are accepted via e-mail: please contact
  P. D. Long phung.long@gmail.com
  Der-Wen Chang dwchang@mail.tku.edu.tw
  Harry G Poulos: Harry Poulos Harry.Poulos@coffey.com

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## Announcement on Call-For-Paper For SEAGS-AGSSEA Journal December 2018 Issue Honouring Professor Jian-Hua Yin

Theme: **Fundamental Behavior of Soils and Soil-structural Interfaces and Applications to Soft Soil and Slope Engineering**

**Topics:**

- Laboratory Tests and Constitutive Modeling of the Behavior Of Soils and Soil-Structural Interfaces
- Physical and Numerical Modeling of Geotechnical Structures
- Landslides, Debris Flows, and Slope Stabilization
- Ground Improvement
- Optical Fibre Sensors and Field Monitoring
- Geotechnical History and Case Studies
- Others

Tentative schedule:

- Call for paper abstracts (June 2016 – June 2017)
- Full paper submission (before September 2017)
- Finalization of papers (before March 2018)
- Manuscripts ready for publication (June 2018)
- This Issue appears in December 2018

Guest Editors:
Professor Guofu Zhu, Wuhan University of Technology, China
A/ProfessorWan-Huan Zhou, University of Macau, Macau SAR, China
A/Professor M. A. Hossai, Rajshahi University of Engineering & Technology, Bangladesh

SEAGS-AGSSEA Journal is an open access, specialized, peer-reviewed, Journal for SEAGS (Southeast Asian Geotechnical Society) & AGSSEA (Association of Geotechnical Societies in South East Asia) that focuses on research, development and application within the fields of geotechnical engineering and technology. Published four times per year, it tries to give its contribution for enhancement of research studies.

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- All articles are sent for blind peer review,with a fast and without delay review procedure.
- Submitted papers should follow the format of the sample article attached.
- Submissions are accepted via e-mail.

To submit an abstract or to request further information, please contact:
Dr. W.H. Zhou by email: hannahzhou@umac.mo

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## JOURNAL ISSUES - 2011 to 2016

### 2011 MARCH Vol. 42 No. 1

http://seags.ait.asia/journals/seags-agssea-journal-march-2011/

**Part I General papers**

**Some Issues in Geosynthetic Reinforced Walls and Slopes**
*by D. Leshchinsky*

**Advance in Geogrid Reinforced Slopes in Malaysia**
*by T.A. Ooi and C.H. Tee*

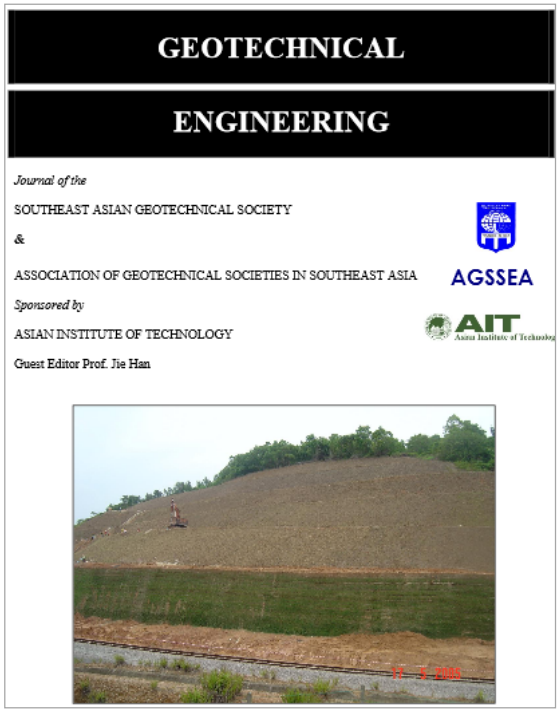
**Embankment Construction with Saturated Clayey Fill Material Using Geocomposites** *by J.-C. Chai, T. Hino, Y. Igaya, and Y. Yamauchi*

**Numerical Modeling of Geosynthetic-Reinforced Earth Structures and Geosynthetic-Soil Interactions**
*by J. Huang, A. Bhandari, and X. Yang*

**Geosynthetic Tubes and Geosynthetic Mats: Analyses and Applications** *by J. Chu, W. Guo, and S.W. Yan*

**Performance-based Design for Geosynthetic Liner Systems in Landfills**
*by Y.M. Chen,W.A. Lin, B. Zhu, and L.T. Zhan*

**Quantifying the Influence of Geosynthetics on Performance of Reinforced Granular Bases in Laboratory**
*by J. Han, Y. Zhang, and R.L. Parsons*

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**Static Axial Reciprocal Load Test of Cast-in-place Nodular Concrete Pile and Nodular Diaphragm Wall**
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**Vertical Load Test and Settlement Analysis of Cast-in-place Concrete Nodular Piles Supporting a High-Rise Building**
*by N. Suzuki and T. Seki*

**Extended Use of Spring Hammer Rapid Load Testing**
*by K. Matsuzawa and T. Matsumoto*

**Push-up Load Tests Using Uncrushable Particles and Its DEM Analyses**
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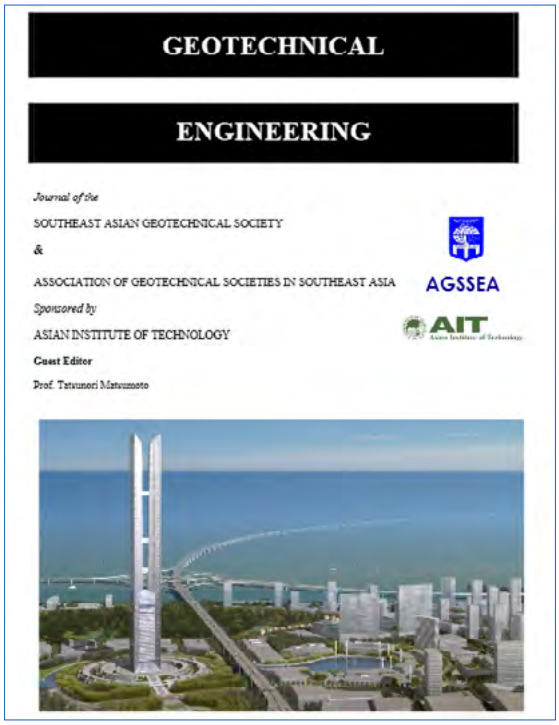
**Capacity versus Deformation Analysis for Design of Footings and Pile Foundations**
*by Bengt H. Fellenius*

**Pile Raft Foundations for Tall Buildings**
*by H.G. Poulos, J.C. Small and H. Chow*

**Foundation Design of the 151 Story Incheon Tower in a Reclamation Area**
*by Ahmad Abdelrazaq, Frances Badelow, Sung Ho-Kim, Harry G. Poulos*



## 2011 SEPTEMBER Vol. 42 No. 3

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**Research Papers:**

**Building Damage Assessment for Deep Excavations in Singapore and the Influence of Building Stiffness**
*by K.H. Goh and R.J. Mair*

**Concept and Design Methodology of Redundancy in Braced Excavation and Case Histories**
*by G. Zheng, X.S. Cheng, Y. Diao, and H.X. Wang*

**Three-Dimensional Deformation Behavior of an Over-sized Excavation in Shanghai Clay**
*by Y. M. Hou, J. H. Wang and D-S. Jeng*

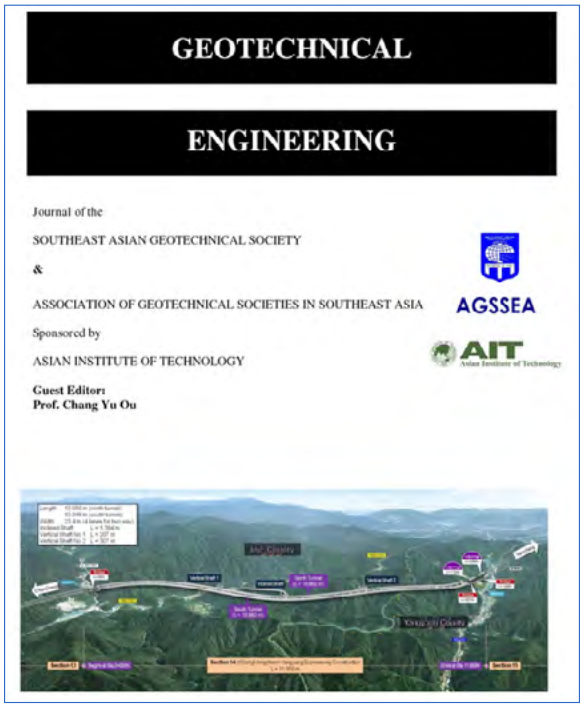
**Numerical Study on the Movement of Existing Tunnel Due to Deep Excavation in Shanghai**
*by J. J. Chen, J. H. Wang, G. W. Xiang, S. L. Wen, and Y. Du*

**Observed Performance of Diaphragm Wall Construction**
by *C.Y. Ou and L.L. Yang*

**Performance of Construction with New Pneumatic Caisson Method in Shanghai Soft Ground** *by F.L. Peng and H.L. Wang*

**Technologies of Micro-disturbance Construction of Pipe-Jacking**
*by W. Q. Ding, B. Li, S. L. Yuan and J. K. Ge*

**Design and Construction of InJe Tunnel, the Longest Road Tunnel of Korea** *by S. M. Cho, S. D. Lee, and Y. J. Kwon*




## 2011 DECEMBER Vol. 42 No. 4

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**Research Papers:**

**Dilation and Stability of Sand in Triaxial Tests**
*by A. Sawicki*

**The Strength Anisotropy of a Residual Soil in Singapore**
*by G. Meng and J. Chu*

**Effect of Boundary Conditions on Shear Banding in True Triaxial Tests on Sand** *by P.V. Lade and Q. Wang*

**Behavioural Patterns of Fine Sands** *by V.N. Georgiannou*

**Simulating Shear Rate-Dependent Undrained Stress-Strain Behaviour of Natural Sedimentary Clay at Kobe Airport**
*by M.-S. Jung and S. Shibuya*

**Experimental Investigation on Settling Behavior of Hong Kong Marine Deposits in Settling Column Condition**
*by F. Tong J.H.Yin and G.F. Zhun*

**Development of a Hollow Cylinder Torsional Apparatus for Pre-failure Deformation and Large Strains Behaviour of Sand**
*by E. Ibraim, P. Christiaens and M. Pope*

**Effect of High Confining Pressure on the Behaviour of Fibre Reinforced Sand** *by S. Ud-din, A. Marri and D. Wanatowski*

**TECHNICAL NOTE**

**A Comment on the Ratio of the Maximum and Minimum Dry Density for Sand**
*by E. Imre, S. Fityus, E. Keszeyne and T. Schanz*

**2012 MARCH Vol. 43 No. 1** ▸ *http://seags.ait.asia/journals/seags-agssea-journal-march-2012/*

**Some Applications Of Unsaturated Soil Mechanics In Thailand: An Appropriate Technology Approach**
*by W. Mairaing, A. Jotisankasa and S. Soralump*

**Calculation Of Heave Of Deep Pier Foundations**
*by J.D. Nelson, K.C. Chao, D.D. Overton and R.W. Schaut*

**In-Situ And Laboratory Investigations Of Stress-Dependent Permeability Function And SDSWCC From An Unsaturated Soil Slope**
*by C. W. W. Ng and A. K. Leung*

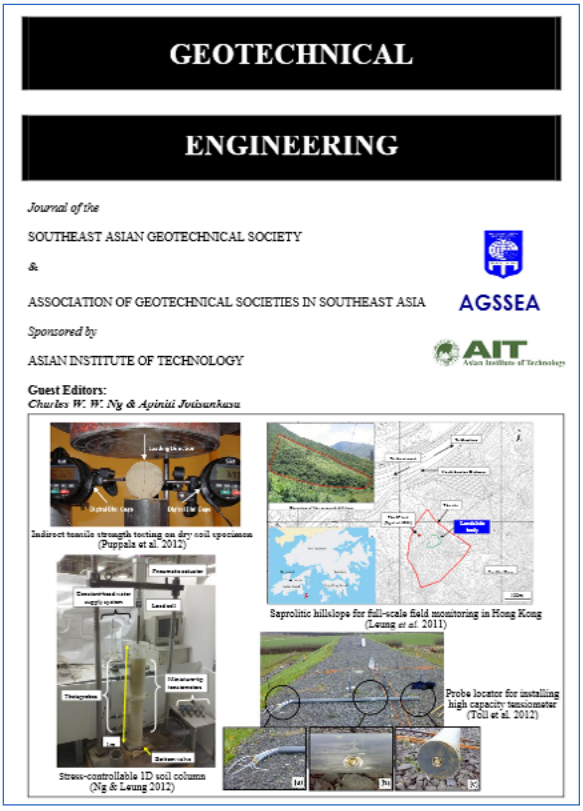
**Measurements Of Shrinkage Induced Pressure (Sip) In Unsaturated Expansive Clays**
*by A.J. Puppala, T. Wejrungsikul, V. Puljan and T. Manosuthikij*

**Unsaturated Soil Mechanics For Slope Stabilization**
*by H. Rahardjo, A. Satyanaga, E. C. Leong*

**The Development Of Unsaturated Soil Mechanics At Imperial College, London**
*by J.R. Standing*

**Climate Change And The Role Of Unsaturated Soil Mechanics**
*by D.G. Toll, J. Mendes, P.N. Hughes, S. Glendinning and D. Gallipoli*

**Some Mining Applications Of Unsaturated Soil Mechanics**
*by D.J. Williams*

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**Papers:**

**Proposed Changes to the Geotechnical Earthquake Engineering Provisions of the Bangladesh National Building Code**
*by Tahmeed M. Al-Hussaini, Tahsin R. Hossain and M. Hayeem Al-Noman*

**Analysis of Soil Liquefaction during the Recent Canterbury (New Zealand) Earthquakes**
*by RP Orense, MJ Pender and LM Wotherspoon*

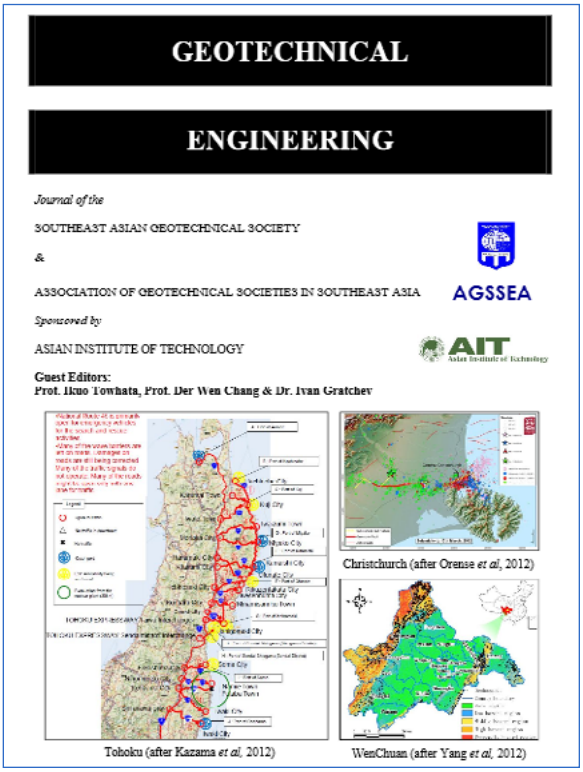
**Numerical Simulation of Seismic Slope Stability Analysis based on Tension-Shear Failure Mechanism**
*by Yingbin Zhang, Guangqi Chen, Jian Wu, Lu Zheng, Xiaoying Zhuang*

**A Real-time Prediction Method for Regional Rainfall-induced Geohazards in Post-earthquake Region of Wenchuan Earthquake**
*by Z. Yang, J. Qiao, H. Tian, D. Huang, M. Wang and H. Meng*

**Effects of Anisotropic Consolidation and Stress Reversal on the Liquefaction Resistance of Sands and Silty Sands**
*by Abbas Galandarzadeh and Alireza Ahmadi*

**Characteristics of Slope Failures During Natural Disasters Considering Geographical Features and Groundwater Level: Case Study of the Chuetsu Region of Niigata, Japan**
*by H. Toyota*

**Overview of the Geotechnical Damages and the Technical Problems Posed after the 2011 off the Pacific Coast of Tohoku Earthquake**
*by M. Kazama, T. Noda, T. Mori and J. Kim*



**Development of Potential Map for Landslides Induced by the Chi-Chi Earthquake Using Instability Index**
*by Meei-Ling Lin and Yu-Hung Shu*

**Technical Notes:**

**Geotechnical Hazards with Emphasis on Seismically-Combined Effects on Slopes** *by Ikuo Towhata*

**Monitoring on Earthquake Induced Landslide – A Case Study in Northwest Chengdu, China**
*by Hongling Tian, Jianping Qiao., Taro Uchimura and Lin Wang*

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**Waste/Lining System Interaction: Implications for Landfill Design and Performance** *by N. Dixon, K. Zamara1, D.R.V. Jones and G. Fowmes*

**Wrinkling of a Geomembrane on a Compacted Clay Liner on a Slope**
*by R. K. Rowe, P. Yang, M.J. Chappel, R.W.I. Brachman , W.A. Take*

**Diffusion of phenolic compounds through an HDPE geomembrane** *by N.Touze-Foltz, M.Ahari, M.Mendes, C.Barral, M.Gardoni and L. Mazeas*

**Shear-Induced Geomembrane Damage due to Gravel in Underlying Compacted Clay**
*by P. J. Fox, C. Athanassopoulos, S. S. Thielmann, and A. N. Stern*

**Evaluation of mineral barriers against acid rock drainage**
*by A. Naka, T. Katsumi, G. Flores, T. Inui, T. Ohta, T. Urakoshi, and T. Ishihara*

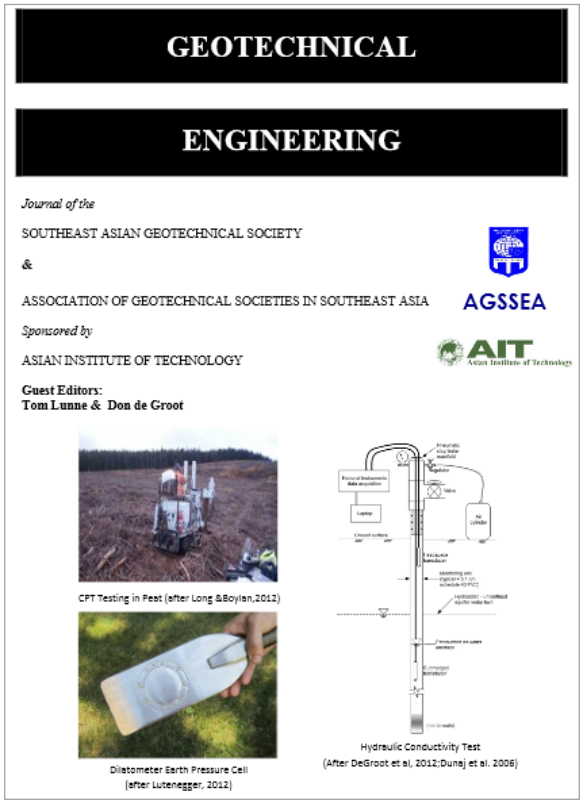
**Improvement on the Performance of Geosynthetic Clay Liners Using Polymer Modified Bentonite**
*by Y. Liu, W. P. Gates and A. Bouazza*

**Effect of Settlement rate and Geogrid reinforcement on the Deformation Behaviour of Soil barriers of Landfill Covers: Centrifuge Study**
*by S. Rajesh and B.V.S. Viswanadham*

**Effect of differential settlements on the sealing efficiency of GCLs compared to CCLs: Centrifuge Study**
*by B.V.S. Viswanadham, S. Rajesh and A. Bouazza*

**Geosynthetic Lining System for Modern Waste Facilities – Experiences in Developing Asia** *by H. B. Ng and B. Ramsey*

**The Use of Geosynthetics in Major Metropolitan Landfills in Perth, WA – Two Case Studies**
*by L. Du Preez, R. Beaman and I. Watkins*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**Evaluation of existing CPT correlations in silt**
*by A. S. Bradshaw, A. C. Morales-Velez and C.D.P. Baxter*

**Characterisation of quick clay at Dragvoll, Trondheim, Norway**
*by A. Emdal, M. Long, A. Bihs, A. Gylland and N. Boylan*

**Field response of push-in earth pressure cells for instrumentation and site characterization of soils**
*by Alan J. Lutenegger*

**Frequent-interval SDMT and continuous SCPTu for detailed shear wave velocity profiling in soils**
*by T. Ku and P.W. Mayne*

**In situ testing of peat – a review and update on recent developments** *by M. Long and N. Boylan*

**Understanding the stiffness of soils in Singapore from pressuremeter testing**
*by K.H. Goh, K. Jeyatharan and D. Wen*

**In situ measurement of hydraulic conductivity of saturated soils**
*by D.J. DeGroot, D.W. Ostendorf and A.I. Judge*

**Rate effect on cone penetration test in sand** *by F. A. B. Danziger and T. Lunne*

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**Some factors affecting deep excavation in clay over gassy bedrock**
*By Ahmed B Mabrouk and R Kerry Rowe*

**Effects of Consolidation and Specimen Disturbance on Strengths of Taipei Clays** *By Richard N Hwang, Za-Chieh Moh and I-Chou Hu*

**Lime Stabilisation of Organic Clay and the Effects of Humic Acid Content** *By NZ Mohd Yunus, D Wanatowski and LR Stace*

**Estimating Wetting-induced Settlement of Compacted Soils using Oedometer Test** *By EC Leong, S Widiastuti and H Rahardjo*

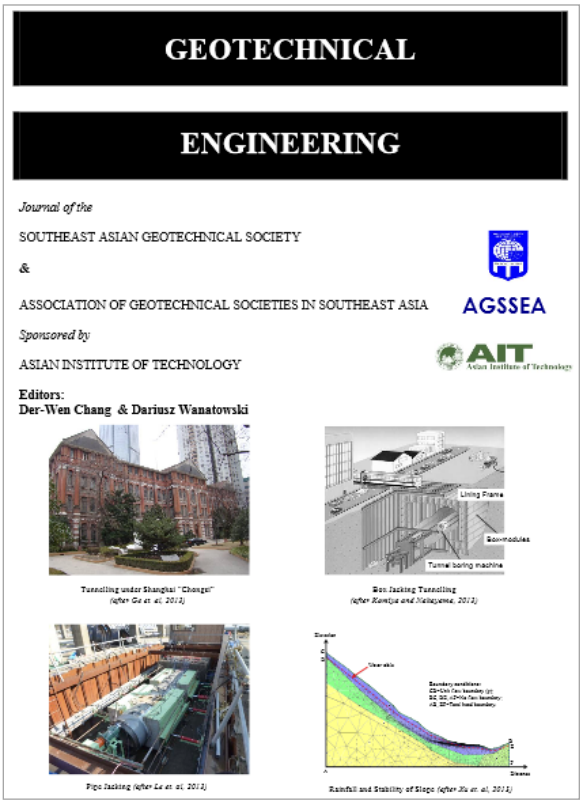
**Compaction Curve with Consideration of Time and Temperature Effects for Mudstones**
*By A Puttiwongrak, H Honda, T Matsuoka and Y Yamada*

**Small strain behavior of sand under various stress paths considering anisotropic initial stress state**
*By Lai Yong, Shi Jian-yong, Yu Xiao-jun and Cao Qiu-rong*

**Study of Joint Effect on Pipe in Pipe Jacking Method**
*By L G Le, M Takise, M Sugimoto and K Nakamura*

**Finite Element Analysis of Ground Behaviour due to Box-jacking Tunnel Work** *By K Komiya and T Nakayama*

**Tunneling Induced Deformation of a Historic Building in Shanghai**
*By Shi-ping Gea, Dong-wu Xied, Wen-qi Dinga, Ya-fei Qiao and Jin-chun Chai*




**In-situ monitoring of internal displacements by FBG sensors and slope stability analysis under rainfall infiltration**
*By Dongsheng Xu, Fei Tong, Huahu Pei, and Jianhua Yin*

**Mechanistic-Empirical Pavement Design: A Brief Overview** *By A T Papagiannakis*

## 2013 JUNE Vol. 44 No. 2

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**Soil-water-air coupled finite element analysis of model test on slope failure in unsaturated soil**
*By Y.L. Xiong, X.H. Bao and F. Zhang*

**Relation between seepage force and velocity of sand particles during sand boiling**
*By K. Fujisawa, A. Murakami, S. Nishimura and T. Shuku*

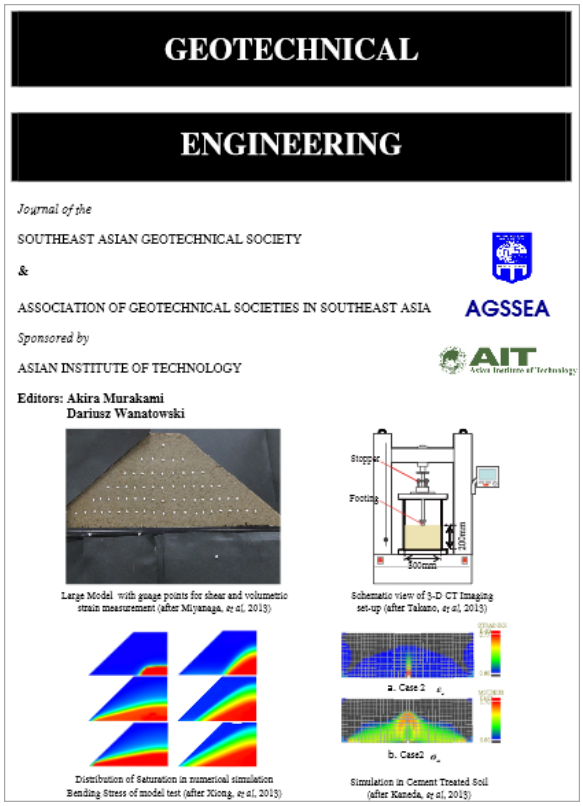
**A density-and stress-dependent elasto-plastic model for sands subjected to monotonic undrained torsional shear loading** *By G. Chiaro, J. Koseki and L.I. Nalin De Silva*

**1-G model test with digital image analysis for seismic behavior of earth dam** *By Y. Miyanaga, A. Kobayashi and A. Murakami*

**X-ray CT imaging of 3-D bearing capacity mechanism for vertically loaded shallow foundations**
*By D. Takano, J. Otani, M. Nakamura, and R. Mokwa*

**Modeling and bending test simulations of cement treated soil**
*By K. Kaneda, T. Tanikawa and S. Onimaru*

**Modelling viscous effects during and after construction in London Clay** *By S. D. Clarke and C. C. Hird*

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**Numerical Simulation of the Rainfall Infiltration on Unsaturated Soil Slope Considering a Seepage Flow**
*By S.Kimoto, F.Oka and E.Garcia*

**Seismic Response of Gravity-Cantilever Retaining Wall Backfilled with Shredded Tire**
*By N. Ravichandran and E. L. Huggins*

**Numerical modeling of lateral response of long flexible piles in sand**
*By Md. Iftekharuzzaman and Bipul C Hawlader*

**A New Sampling Algorithm in Particle Fileter for Geotechnical Analysis** *By T. Shuku, S. Nishimura, K. Fujisawa and A. Murakami*

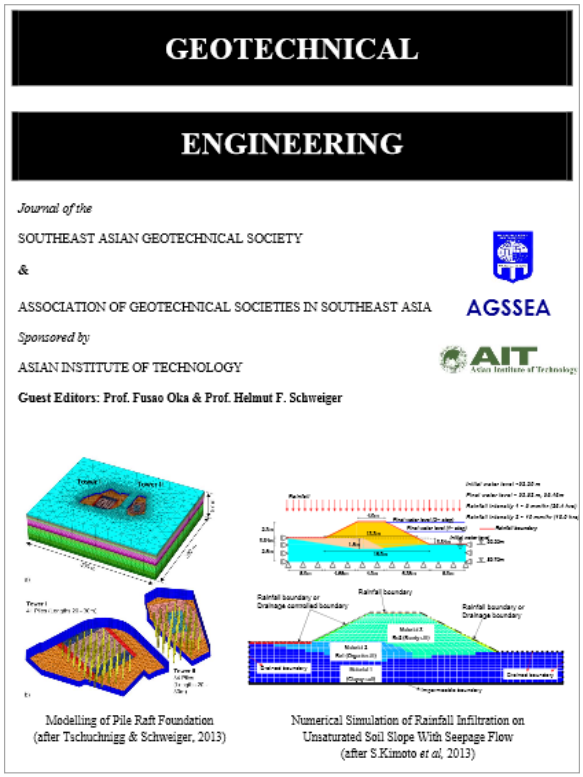
**Comparison of deep foundation systems using 3D finite element analysis employing different modeling techniques**
*By F. Tschuchnigg & H.F. Schweiger*

**Application of a constitutive model for swelling rock to tunnelling**
*By B. Schadlich, T. Marcher and H.F. Schweiger*

**Finite element modelling of seismic liquefaction in soils**
*By V. Galavi, A. Petalas and R.B.J. Brinkgreve*

**Random Wave-Induced Seabed Responses around Breakwater Heads**
*By Y Zhang, D-S Jeng, Z-W Fu and J Ou*

**Influence of brittle property of cement treated soil on undrained bearing capacity characteristics of the ground**
*By S. Yamada, T. Noda, A. Asaoka and T. Shina*

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### Part I General papers

**Behaviour of Clay Subjecting to Vacuum and Surcharge Loading in an Oedometer**
*By J.-C. Chai, J. P. Carter, A. Saito and T. Hino*

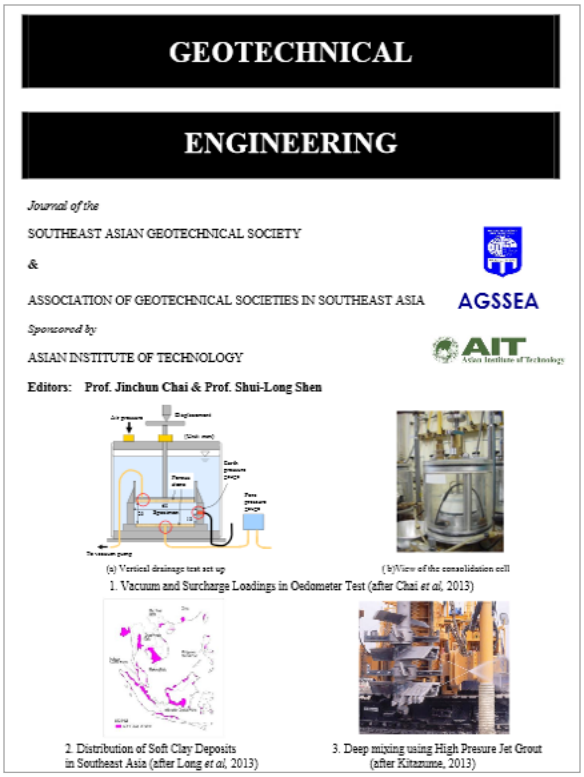
**Behaviour of Geogrid Reinforced Abutments on Soft Soil** *By Ennio M. Palmeira, André R.S. Fahel and Gregório. L. S. Araújo*

**Geocell-Reinforced Granular Fill under Static and Cyclic Loading: A Synthesis of Analysis** *By X. Yang and J. Han*

**Electrical Vertical Drains in Geotechnical Engineering Applications**
*By J. K. Lee and J.Q. Shang*

**Design and Performance of Soft Ground Improvement Using PVD with and without Vacuum Consolidation**
*By P.V. Long, D.T. Bergado, L.V. Nguyen and A.S. Balasubramaniam*

**Reassessment of Long-Term Performance of Geogrids by Considering Mutual Interaction among Reduction Factors**
*By Han-Yong Jeon and Yuan Chun Jin*




## Part II State-of-the-art (review type) papers

**Simulations of PVD Improved Reconstituted Specimens with Surcharge, Vacuum and Heat Preloading using Axisymmetric and Equivalent Vertical Flow Conditions**
*By P. Voottipruex and D.T. Bergado, and W. Wongprasan*

**Reinforced Embankments on Soft Deposits: Behaviour, Analysis and Design** *By C. Taechakumthorn and R.K. Rowe*

**Current State of the Art in Vacuum Preloading for Stabilising Soft Soil**
*By C. Rujikiatkamjorn and B. Indraratna*

**Jet Grouting Practice: an Overview** *By Z.F. Wang, S.L. Shen, C.E. Ho and Y.H. Kim*

**Deep Mixing Method in Japan** *By Masaki Kitazume*

**Recent Studies of Geosynthetic Tubes and Mattress: an overview** *By Wei Guo, Jian Chu and Shuwang Yan*

**Design Method for Bearing Reinforcement Earth Wall** *By S. Horpibulsuk, C. Suksiripattanapong and A. Chinkulkijniwat*

**Current State of Knowledge on Thermal Consolidation using Prefabricated Vertical Drains**
*By H. M. Abuel-Naga, G. A. Lorenzo and D. T. Bergado*

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## Part I General papers

**Geosynthetic-Reinforced Soil Structures for Railways: Twenty Five Year Experiences in Japan**
*by F. Tatsuoka, M. Tateyama, J. Koseki and T. Yonezawa*

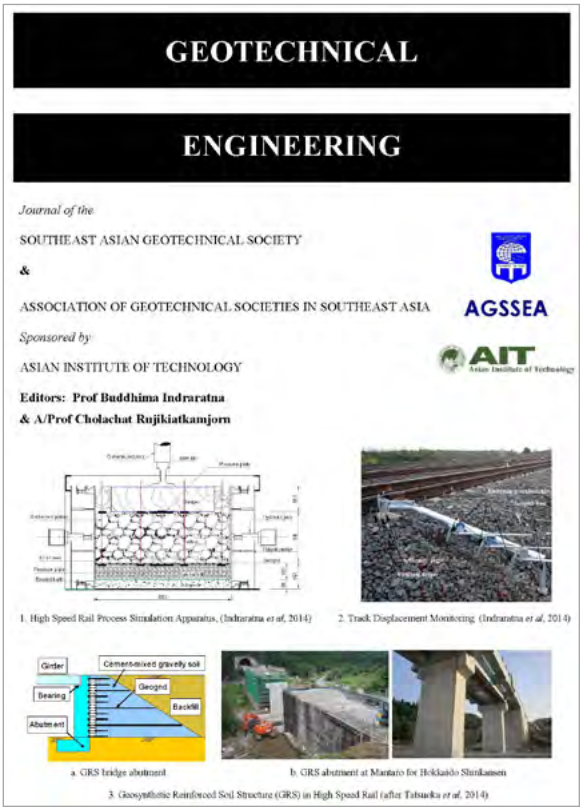
**Enhancement of Rail Track Performance through Utilisation of Geosynthetic Inclusion** *by Buddhima Indraratna, Sanjay Nimbalkar, and Cholachat Rujikiatkamjorn*

**Railway Track Transition Dynamics and Reinforcement Using Polyurethane GeoComposites**
*by P. Woodward, O. Laghrouche and A. El-Kacimi*

**How to Overcome Geotechnical Challenges in Implementing High Speed Rail Systems in Australia** by H. Khabbaz and B. Fatahi

**Maintenance Model for Railway Substructure**
by Ali Ebrahimi, James M. Tinjum, and Tuncer B. Edil

**Dynamic Behaviour of Railway Ballasted Track Structures in Shaking Table Tests and Seismic Resistant Performance Evaluation in Japan**
*by T. Ishikawa, S. Miura and E. Sekine*



**Mechanical Properties of Polyurethane-Stabilized Ballast** *by A. Keene, J.M. Tinjum, and T.B. Edil*

**Dependency of Cyclic Plastic Deformation Characteristics of Unsaturated Recycled Base Course Material on Principal Stress Axis Rotation** *by A. Inam, T. Ishikawa, and S. Miura*

**Quickness Test Approach for Assessment of Flow Slide Potentials** *by V. Thakur and S. A. Degago*

**Cement Stabilization for Pavement Material in Thailand**
*by S. Horpibulsuk, A. Chinkulkijniwat, A. Suddeepong, and A. Neramitkornburee*

**Stone Columns Field Test: Monitoring Data and Numerical Analyses**
*by Marcio Almeida, Bruno Lima, Mario Riccio, Holger Jud, Maria Cascão, Felipe Roza*

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

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**Numerical Investigation of Passive Loads on Piles in Soft Soils**
*by C. Moormann and J. Aschrafi*

**Numerical Simulation of an Energy Pile Using Thermo-Hydro-Mechanical Coupling and a Visco-Hypoplastic Model**
*by Xiaolong Ma, Gang Qiu, Jürgen Grabe*

**Numerical Studies on Dynamic Load Testing of an Open-ended Pipe Pile and a Case Study**
*by L. Phan Ta, T. Matsumoto and H. Nguyen Hoang*

**Performance of Piled Raft Foundation Subjected to Strong Seismic Motion** *by K. Yamashita, T. Hashiba, H. Ito and T. Tanikaw*

**Static Cyclic Load Tests on Model Foundations in Dry Sand**
**by Y.S. Unsever, T. Matsumoto, S. Shimono and M.Y. Özkan**

**Axial Bearing Behaviour of a Model Pile in Sand Under Multiple Static Cycles** *by J. H. Hwang, Z. X. Fu, P. Y. Yeh, D. W. Chang*

**Seismic PBD of Piles from Monte Carlo Simulation Using EQWEAP Analysis with Weighted Intensities**
*by D.W. Chang, Y.H. Lin, H.C. Chao, S.C. Chu and C.H. Liu*

**Case Studies on Response of Laterally Loaded Nonlinear Piles**
*by Wei Dong Guo*

**Numerical Analysis of the Effect of Pile Tip Shape on Soil Behaviour Around Pile** *by Y. Wu and H. Yamamoto*


**Shaking Table Test on Superstructure-foundation-Ground System in Liquefiable Soil and Its Numerical Verification**
*by F. Zhang, R. Oka, Y. Morikawa, Y. Mitsui, T. Osada, M. Kato and Y. Wabi*

**Model Loading Tests on Bearing Behaviour of a Group Pile and Ground Deformation in Sand**
*by S. Aoyama, B. Liu, L. Danardi, W. Mao, S. Goto and I. Towhata*

**Numerical Study on the Bearing Behaviour of Pile Groups Subjected to Lateral Pressure due to Soil Movements**
*by O. Reul, J. Bauer and C. Niemann*

**Deep Foundation Systems for High-rise Buildings in Difficult Soil Conditions**
*by R. Katzenbach and S. Leppla*

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**Part I: Centrifuge-based Physical Modeling**

**Centrifuge Modelling of Improved Ground**
*By M. Kitazume, Y. Morikawa and S. Nishimura*

**Simulation of Soil Movement in Geotechnical Centrifuge Testing – Deep Excavations, Tunnelling, Deposit**
*By D. König, O. Detert and T. Schanz*

**Run-out of Sensitive Clay Debris: Significance of the Flow Behavior of Sensitive Clays** *By V. Thakur and D. Nigussie*

**Verification of the Generalized Scaling Law for Flat Layered Sand Deposit** *By T. Tobita, S. Escoffier, J. L. Chazelas and S. Iai*

**Performance of Rail Embankments Constructed with Coal Ash as a Structural Fill Material: Centrifuge Study**
*By B.V.S. Viswanadham and V.K. Mathur*

**Field Scale Tests for Determination of Pullout Capacity of Suction Pile Anchors Under Varying Loading Conditions**
*By Vijaya Ravichandran, R. Ramesh, S. Muthukrishna Babu, G.A. Ramadass, .M.V.Ramanamoorthy and M.A. Atmanand*

**Part 2: Contributed Papers**

**A Novel Mobile Information System for Risk Management of Adjacent Buildings in Urban Underground Construction**
*By Hanh Quang Le and Bin-Chen Benson Hsiung*

**Comparison Between Design Methods Applied to Segmental Tunnel Linings**
*By N.A. Do, D. Dias, P.P. Oreste, I. Djeran-Maigre*

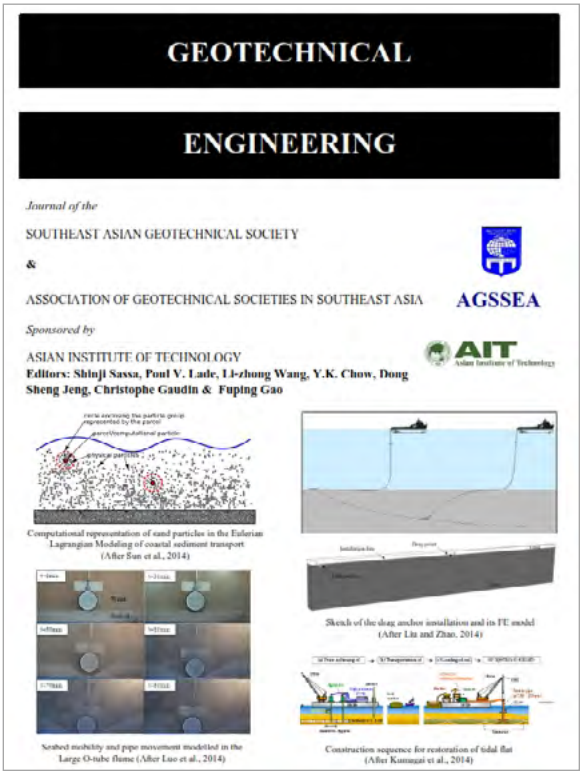
**Challenging Construction Projects Related to Urban Tunnels** *By R. Katzenbach and S. Leppla*

**Bulk Compression of Dredged Soils by Vacuum Consolidation Method Using Horizontal Drains** *By Hiroshi Shinsha and Takahiro Kumagai*

**Mechanical Behavior of Energy Piles in Dry Sand**
*By A.M. Tang, J.M. Pereira, G. Hassen, N. Yavari*

**Estimating Side Resistance of Bored Pile in Residual Soils**
*By Mutiasani Dianmarti Kusuma and Eng-Choon Leong*

**Seismic Response of Geosynthetic Reinforced Earth Embankment by Centrifuge Shaking Table Tests** *by W.Y. Hung , J.H. Hwang , C.J. Lee*




## 2014 DECEMBER Vol. 45 No. 4

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**Recent Advances in Seabed Liquefaction and Its Implications for Marine Structures** *By B. Mutlu Sumer*

**Eulerian–Lagrangian Modeling of Current-Induced Coastal Sand Dune Migration** *By R. Sun, J. Wang, Y. Sakai and H. Xiao*

**Numerical Study of the Penetration Mechanism and Kinematic Behaviour of Drag Anchors Using a Coupled Eulerian-Lagrangian Approach** *By Haixiao Liu and Yanbing Zhao*

**Cyclic Pore Pressure Generation in Silty Soils under the Action of Combined Waves and Current**
*By Yi-Fa Wang, Fu-Ping Gao, and Wen-Gang Qi*

**A Model for Predicting Pipeline Sinkage Induced by Tunnel Scour**
*By Chengcai Luo, Hongwei An, Liang Cheng and David White*

**Predicting Spudcan Extraction Resistance in Soft Clay**
*By Omid Kohan, Christophe Gaudin, Mark J. Cassidy, and Britta Bienen*

**FE Procedure for Foundation design of Offshore Structures – Applied to Study a Potential OWT Monopile Foundation in the Korean Western Sea** *By H.P. Jostad, G. Grimstad, K.H. Andersen, M. Saue, Y. Shin, and D. You*

**Compressibility as an Indicator of Liquefaction Potential** *By M. Murat Monkul, Poul V. Lade, Ehsan Etminan, Aykut Senol*

**Centrifuge Modelling of the Seismic Responses of a Gently Sloped Liquefiable Sand Deposit Confined within Parallel Walls** *By C.J. Lee, W.Y. Chung, and W.Y. Hung*

**Eulerian Finite Element Analysis for Uplift Capacity of Circular Plate Anchors in Normally Consolidated Clay**
*By Z. Chen, K. K. Tho, C. F. Leung and Y. K. Chow*

**Restoration Method of Artificial Tidal Flat by Use of Pressure Injection of Slurry Dredge Clay**
*By Takahiro Kumagai, Takashi Tsuchida, Changjin Ko and Hiroaki*

**Tsunami-Seabed-Structure Interaction from Geotechnical and Hydrodynamic Perspectives** *By S. Sassa*

**Feature Storey on "Challenges in the Design of Tall Building Foundations"** *By Harry G. Poulos*

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**Settlement due to Consolidation** *By H. Ohta*

**A Simulation of Surface Runoff and Infiltration due to Torrential Rainfall Based on Field Monitoring Results at a Slope Comprising Weathered Granite** *By H. Ohtsu, H. Masuda, T. Kitaoka, K. Takahashi, M. Yabe, S. Soralump and Y. Maeda*

**Calcium Carbide Residue – A Cementing Agent for Sustainable Soil Stabilization** *By S. Horpibulsuk, A. Kampala, C. Phetchuay, A. Udomchai and A. Arulrajah*

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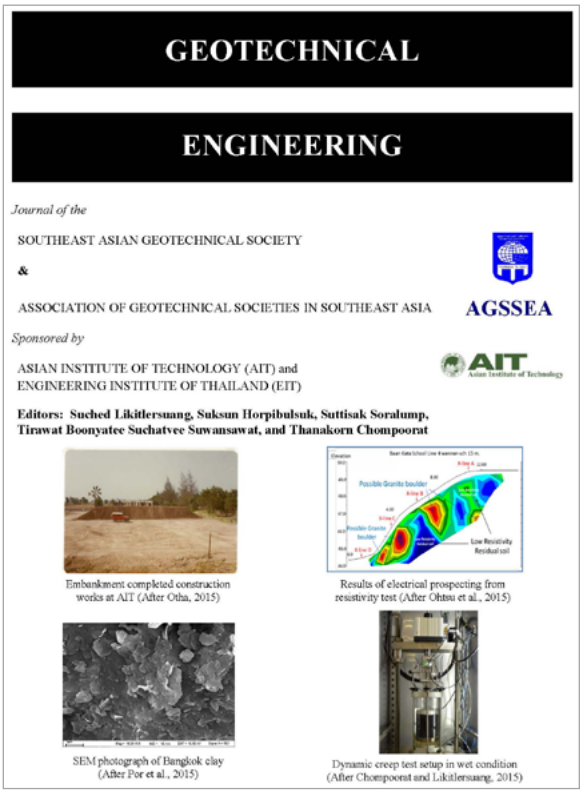
**Laboratory Investigation of Hot Mix Asphalt Behaviour for Mechanistic-Empirical Pavement Design in Tropical Countries**
*By T. Chompoorat and S. Likitlersuang*

**Slope Stability and Pore-Water Pressure Regime in Response to Rainfall: A Case Study of Granitic Fill Slope in Northern Thailand**
*By A. Jotisankasa, K. Mahannopkul and A. Sawangsuriya*

**Evaluation of the Hydraulic Conductivity of Clayey Soil Mixed with Calcium-Bentonite Using Odeometer Tests**
*By R.D. Fan, Y.J. Du, S.Y. Liu and Y.L. Yang*




**Undrained Shear Strength of Very Soft to Medium Stiff Bangkok Clay from Various Laboratory Tests** *By W. Ratananikom, S. Yimsiri and S. Likitlersuang*

**A Review on Design of Pile Foundations in Bangkok** *By T. Boonyatee, J. Tongjarukae, T. Uaworakunchai and B. Ukritchon*

**Structured Cam Clay Model with Cementation Effect** *By S. Horpibulsuk and M.D. Liu*

**Evaluation of Strength of Soft Ground Improved by Vacuum Consolidation**
*By T. Shibata, S. Nishimura, M. Fujii and A. Murakami*

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**Numerical Analyses of Piled Raft Foundation in Soft Soil Using 3D-FEM**
*By K. Watcharasawe, P. Kitiyodom and P. Jongpradist*

**Investigation of Shrinkage and Swelling Behaviour of Expansive/Non-Expansive Clay Mixtures**
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**Operational Soil Stiffness From Back-Analysis of Pile Load Tests Within Elastic Continuum Framework**
*By Fawad S. Niazi and Paul W. Mayne*

**Elastic Continuum Solution of Stacked Pile Model For Axial Load-Displacement Analysis** *By Fawad S. Niazi and Paul W. Mayne*

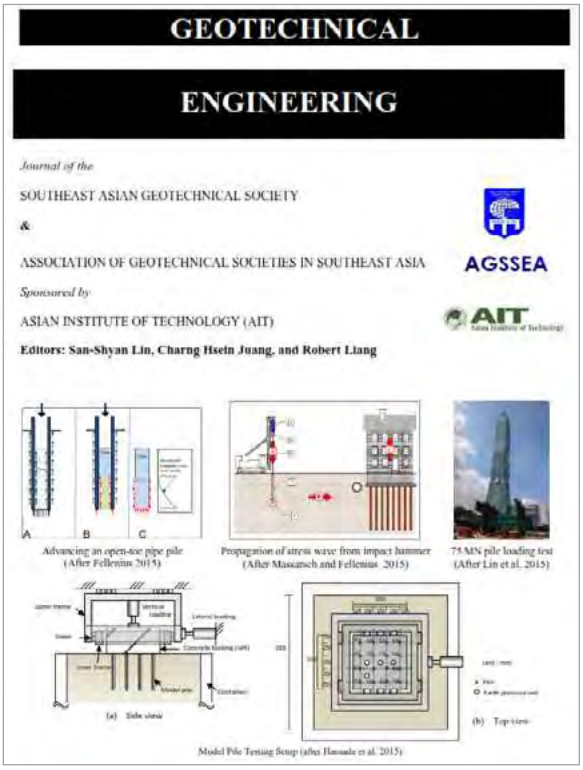
**Lateral Loading Tests on Piled Rafts and Simplified Method to Evaluate Sectional Forces of Piles**
*By J. Hamada, T. Tsuchiya, T. Tanikawa and K. Yamashita*

**Applicability of Simple Method to Piled Raft Analysis in Comparison With Field Measurements** *By K.Yamashita, T.Tanikawa, and J. Hamada*

**Engineering Assessment of Ground Vibrations Caused by Impact Pile Driving** *By K. Rainer Massarsch and Bengt H. Fellenius*

**Analysis of Results of an Instrumented Bidirectional-Cell Test**
*By Bengt H. Fellenius*

**Deep Barrette Pile Capacity with Aging Effect** *By W. Teparaksa*




**Case Study of Dynamic Responses of a Single Pile Foundation Installed in Coal Ash Landfills using Effective Stress Analysis and EQWEAP** *By C. W. Lu and D. W. Chang*

**The Response of A "Plug" in An Open-Toe Pipe Pile** By Bengt H. Fellenius

**Effects of Toe Grouting on Axial Performance of Drilled Shafts Socket in Intermediate Geomaterial**
*By S.S. Lin, Y.L. Yin, K.C. Fu, Y.K. Lin, C.J. Kuo, and Y.H. Chang*

**Reliability-Based Design of Proof Load Test Programs for Foundations** *By Y. Abdallah, S.S. Najjar and G. Saad*

**Probabilistic Approaches for Ultimate Resistance of Drilled Shafts in Sands Considering Spatial Variability**
*By Z. Luo, L. Wang, W. Gong, and C. Hsein Juang*

**SPECIAL FEATURE STORY ON "Liquefaction Problems in the 21st Century"** *By I. Towhata*

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**Overview and Interpretation of Rate-Dependency of the Behaviour of Soft Clays** *By Z. X. Wu , Q. Y. Zhu, Z. Y. Yin*

**Overview and Interpretation of Stress-Relaxation of Soft Clay**
*By L. Ye, Q.Y. Zhu, J.X. Liu, P.P. Sun and Z.Y. Yin*

**Modeling Undrained Shear Behavior of Reconstituted Clays considering the Effects of Initial Water Contents**
*By X. Bian , L. L. Zeng, J. W. Ding and Z. S. Hong*

**Statistical Analysis on Physical Properties of Shanghai Soft Clay**
*By Y. M. Lu, Y. F. Jin, S. L. Shen, F. Yu and J. Zhang*

**A Review of the Dynamic Behaviour of Frozen Soils**
*By S. Wang, J. Qi and Z. Yin*

**Influence of Mineral Constituents on One-dimensional Compression Behaviour of Clayey Soils** By L. Ye, Y.F. Jin, Q.Y. Zhu and P.P. Sun

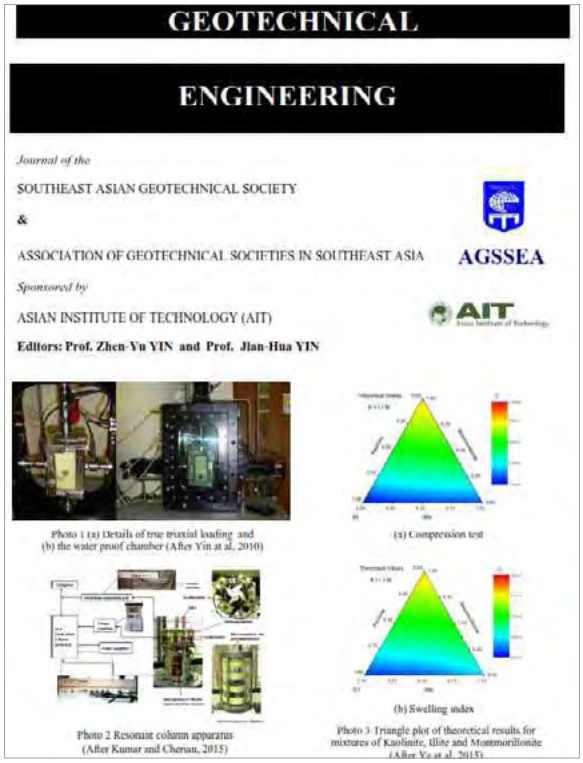
**Effects of Addition of Fine-grained Zeolite on the Compressibility and Hydraulic Conductivity of Clayey Soil/ Calcium-Bentonite Backfills for Vertical Cutoff Walls** *By R.D. Fan, Y.J. Du and S.Y. Liu*

**Effect of Long-term Aggressive Environments on the Porosity and Permeability of Granular Materials Reinforced by Nanosilica and Sodium Silicate** *By M. Cheng and N. Saiyour*

**Strength of Lime-Treated Fly Ash Using Bentonite** *By S. Deka, S.K. Dash and S Sreedeep*

**Soil Deformation Induced by Underground Tunnel Construction** *By L. Wang, R. Liu and G. G. Wang*

**Full-Scale Field Tests on Soil Arching Triggered during Construction of Shallowly Buried HDPE Pipes** *By M. Zhou,Y. J. Du and F. Wang*




**A Pollutant Migration Model Considering Solute Decay in Layered Soil** *By C. Yu and X.Q. Cai*

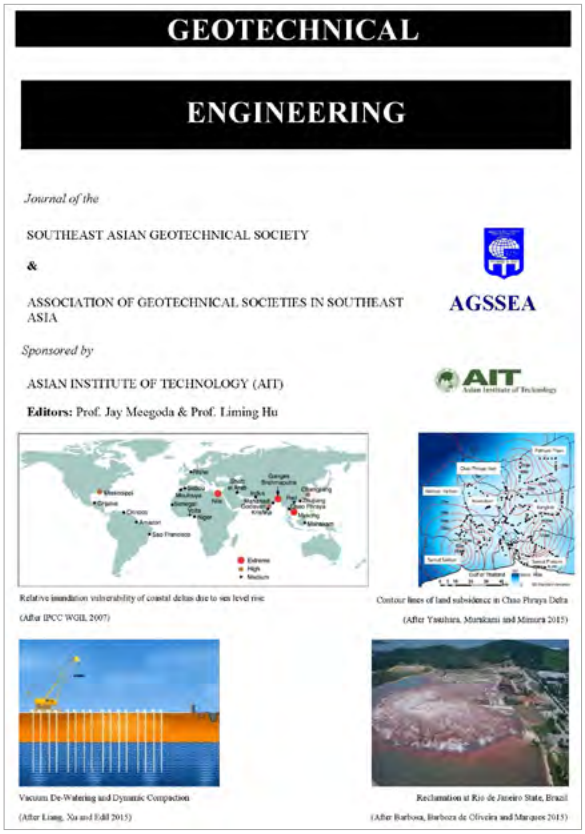
**Effect of Cyclic Strain History on Shear Modulus of Dry Sand using Resonant Column Tests** *By J. Kumar and C. C. Achu*

**Vertical Uplift Capacity of Circular Anchor Plates** *By P. Bhattacharya and J. Kumar*

**Prediction of Ground Surface Settlements Caused by Deep Excavations in Sands** *By B. C. B. Hsiung and S. D. Dao*

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

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

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**Geochemistry in Geotechnical Engineering Problems: Ettringite as Case Study** *By M. Chrysochoou*

**Engineering Properties of Chromium Contaminated Soils**
*By Wiwat Kamolpornwijit, Jay N. Meegoda, Janitha H. Batagoda*

**Study on factors affecting heavy metal sorption characteristics of two geomaterials** *By K.M.Nithya, D.N.Arnepalli and S.R.Gandhi*

**Reduction of Chromium in Water and Soil Using a Rhamnolipid Biosurfactant** *By I. Ara and C.N. Mulligan*

**Reclamation project of a Brownfield site at Rio de Janeiro State, Brazil** *By M.C. Barbosa, A.R.M. Barboza de Oliveira and M.E.S. Marques*

**A Review of Acidic Groundwater Remediation in the Shoalhaven Floodplain in Australia**
*By Buddhima Indraratna, Udeshini Pathirage and Laura Banasiak*

**Experimental and numerical study of electro-osmosis on kaolinite under intermittent current**
*By Liming Hu, Hui Wu, Jay N. Meegoda, and Qingbo Wen*

**Electro-osmosis drainage effect of a new type of EKG electrode** *By Yang Shen and Yande Li*

**Innovative Soft Soil Improvement Method through Intelligent Use of Vacuum De-Watering and Dynamic Compaction Techniques** *By R. Liang, S. Xu and T. Edil*

**Some Studies on Engineering Properties, Problems, Stabilization and Ground Improvement of Lithomargic Clays**
*By R. Shivashankar, A. U. Ravi*

**Stone column reinforcement of a soft South African clay: A laboratory investigation** *By L. Sobhee-Beetul and D. Kalumba*

**Numerical modelling of Tunis soft clay** *By Mnaouar Klai, Mounir Bouassida and Seifeddine Tabchouche*

**A Framework for the Destructuring of Clays During Compression** *By M. D. Liu, S. Horpibulsuk, and Y. J. Du*

**Inundation Caused by Sea-Level Rise Combined with Land Subsidence** *By K. Yasuhara, S. Murakami and N. Mimura*

**Levels of what and how in the Education of Geo-engineering on Problematic Soils** *By R. Ray, P. Scharle, R. Szepesházi*

**Characteristics and Consequence of Nepal Earthquake 2015: A Review**
*By A S M Fahad Hossain, Tuk Lal Adhikari, Mehedi Ahmed Ansary and Quazi Hamidul Bari*

**SPECIAL FEATURE STORY ON "Challenges in Going Underground in Big Cities"** *By L. J. Endicott*

**HISTORIC NOTE: Underexcavating the Tower of Pisa: Back to Future** *By J. B. Burland, M. B.Jamiolkowski, and C. Viggiani*

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*By Phung Duc Long*

**Geotechnical Adaptation to the Vietnamese Coastal and Riverine Erosion in the Context of Climate Change**
*By K. Yasuhara, M. Tamura, Trinh Cong Van and Do Minh Duc*

**Bidirectional Tests on Two Shaft-Grouted Barrette Piles in Mekong Delta, Vietnam**
*By H. M. Nguyen, B. H. Fellenius, A. J. Puppala, P. Aravind, and Q. T. Tran*

**Soil Characterization and Land Subsidence Prediction for the First MRT Line in HCM City** *By Pham Huy Giao and Ta Thi Thoang*

**Soft Ground Improvement by Deep Cement-Mixing Technique in Southern Vietnam** *By Dinesh Raj Shiwakoti and Ryuji Manai*

**Over Consolidation Feature of Clayey Soils in Southern Vietnam According to Piezocone** *By Bui Truong Son, Le Hong Quang, Lam Ngoc Qui*

**Ground Improvement Using Soil-Cement Method: A Case Study with Laboratory Testing and In-Situ Verification for a Highway Project in Southern Vietnam** *By Phan To Anh Vu*


**Wide Storage Tanks on Piled Foundations** *By Bengt H. Fellenius and Mauricio Ochoa*

**Discrete Modelling of Excavation in Fractured Rock by NSCD Method** *By Tran Thi Thu Hang and Frederic Dubois*

**A Method for Estimating Pile Group Settlement Considering Distribution of Pile Shaft Friction (SDF) – Application for Pile Groups in Vietnam** *By Duong Diep Thuy, Pham Quang Hung, and Le Thiet Trung*

**Mechanical behaviour of Hai Duong Medium Sand in Triaxial Test and its DEM Simulations**
*By Nguyen Quang Tuan and Heinz Konietzky*

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**Evaluation of Performance of Diaphragm Walls by Wall Deflection Paths for Deep Excavations in Central Ha Noi**
*By Benson Hsiung, Dao Sy Dan, and William Cheang*

**Effect of Vacuum Pressure Distribution on Settlement Analysis Results for an Improved Thick Soft Clay Deposit at Sai Gon-Hiep Phuoc Terminal Port, South of Vietnam** *By Hoang Hiep and Pham Huy Giao*

**Characteristic of Unsaturated Soil of Earth Fill Dams in Vietnam** *By Nguyen Thi Ngoc Huong and Trinh Minh Thu*

**Settlement management for urban tunnels: an example from France** *By Alain Guilloux and Hervé Le Bissonnais*

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**Rock Tunneling Applied to Steady Water Resources Supply in Taiwan: Challenges and Examples**
*By Chia-Han Lee, Tai-Tien Wang, Shih-Hsien Chang, Shang-Yao Lien and Shih-Wei Huang*

**State-of-the Art of the Tunnel Maintenance in Taiwan and Challenges to Sustainable Development**
*By Ya-Chu Chiu, Tai-Tien Wang, Tsan-Hwei Huang*

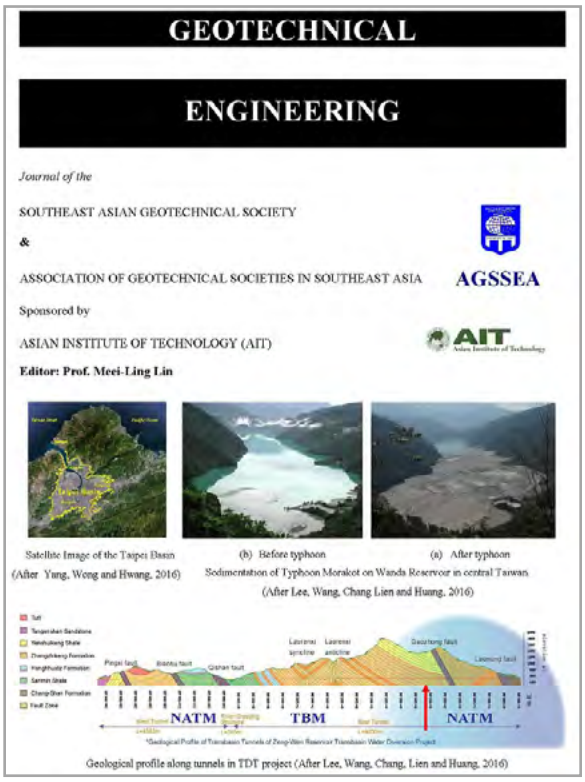
**Tunneling Issues Regarding the Rock Tunnel-Shaft Intersection in Taiwan**
*By Tai-Tien. Wang, Tzu-Tung. Lee, Shun-Min. Lee, Kwei-Shr. Li and Cheng-Hsun Chen*

**Assessment of Hard Rock Tunnel Stability: A Note on the Influence of Post-peak Strength Degradation** *By F. Y. Hsiao, H. C. Kao and S. Y. Chi*

**Deep Excavations in Taipei Basin and Performance of Diaphragm Walls** *By R. N. Hwang, C. H. Wang, C. R. Chou and L. W. Wong*

**Hydraulic Characteristics of Jingmei Formation and Dewatering for Deep Excavations in Taipei Basin**
*By G. R. Yang, L. W. Wong and R. N. Hwang*

**Forensic Investigation of A Subway Tunnel Construction Failure**
*By W. F. Lee, C. C. Wang, K. Ishihara, R. N. Hwang*




**Case Study of Renovation on Alishan Route 18 after Typhoon Morakot**
*By Kung-Tai Chou, Wen-Long Wu, Chiao-An Hsiao, Kun-Hsien Chou*

**Combining rainfall parameter and landslide susceptibility to forecast shallow landslide in Taiwan**
*By C.F. Lee, C.M. Huang, T.C. Tsao, L.W. Wei, W.K. Huang, C.T. Cheng, and C.C. Chi*

**Dynamic Analyses for Performance-Based Seismic Design of Geotechnical Structures with Examples in Deep Foundations** *By D.W. Chang, C.W. Lu, S.S. Lin and J.R. Lai*

**Time-Dependent Dynamic Characteristics of Model Pile in Saturated Sand during Soil Liquefaction**
*By Chia-Han Chen, Yung-Yen Ko, Cheng-Hsing Chen and Tzou-Shin Ueng*

**Geological Investigation and Sliding Mitigation in Jiufen Area**
*By Lee-Ping Shi, Jen-Cheng Liao, Sheng-Hsiung Hung and Chien-Shui Huang*

**Interpretation and Analysis of Potential Fluidized Landslide Slope**
*By H. M. Shu, T. C. Chen, W.C. Yang and Y.X. Luo*

**SPECIAL FEATURE STORY ON "Recent Diaphragm Wall Technologies and Future Challenge"**
*By Hosoi Takeshi and Matsushita Shinya*

**HISTORICAL NOTE ON "Experiences of Geotechnical Development in Japan and Future Directions"**
*By Masami Fukuoka*

**OBITUARY of Masami Fukuoka** *By Fumio Tatsuoka*

## » 2011

**MARCH** 2011
Geosynthetics

**Prof. Jie Han**
EDITOR

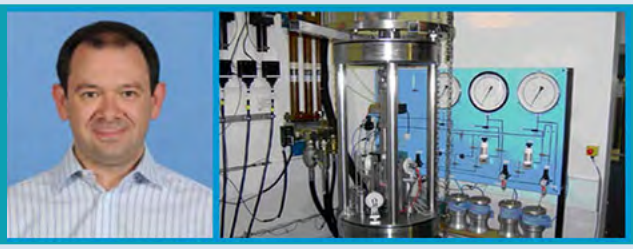
**JUNE** 2011
Deep Foundations

**Prof. Tatsunori Matsumoto**
EDITOR

**SEPTEMBER** 2011
Deep Excavations

**Prof. Chang Yu Ou**
EDITOR

**DECEMBER** 2011
Soil Behaviour



**Dr. Dariusz Wanatowski**
EDITOR

## » 2012

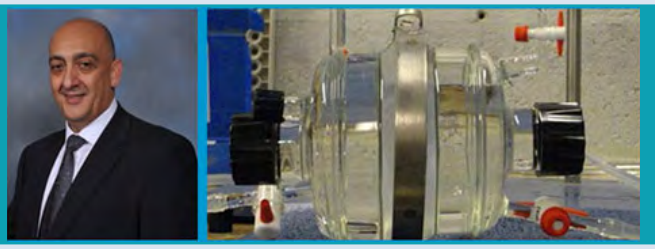
**MARCH** 2012
Unsaturated Soil Mechanics and Engineering


**Prof. Charles W.W. Ng**
EDITOR

**JUNE** 2012
Geotechnical Earthquake Engineering

**Prof. Ikuo Towhata & Prof. Der-Wen Chang**
EDITORS

**SEPTEMBER** 2012
Geosynthetics and Sanitary Landfills



**Prof. Abdelmalek Bouazza**
EDITOR

**DECEMBER** 2012
In-situ Testing of Soils

**Tom Lunne**
EDITOR

## » 2013

**MARCH** 2013
Contributed Papers

**Prof. Der-Wen Chang & Dr. Dariusz Wanatowski** ▸ EDITORS

**JUNE** 2013
Modelling Aspects of Soil Behaviours

**Prof. Akira Murakami & Dr. Dariusz Wanatowski** ▸ EDITORS

**SEPTEMBER** 2013
Numerical Analyses

**Prof. Fusao Oka & Prof. Helmut F. Schweiger** ▸ EDITORS

**DECEMBER** 2013
Ground Improvement

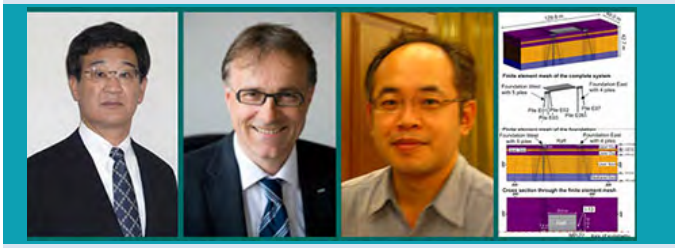
**Prof. Jinchun Chai & Prof. Shui-Long Shen** ▸ EDITORS

## » 2014

**MARCH** 2014 ▸ Geotechnics for Advancing Transport Infrastructure

**Prof. Buddhima Indraratna & A/Prof. Cholachat Rujikiatkamjorn** ▸ EDITORS

**JUNE** 2014
Deep Foundations

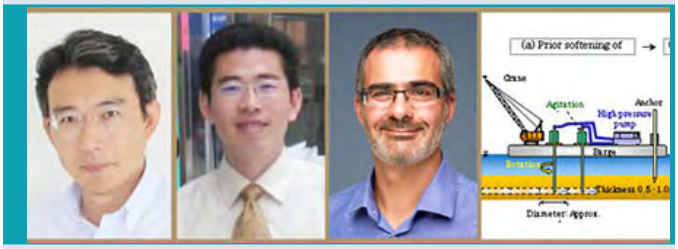


**Prof. Tatsunori Matsumoto, Prof. Jürgen Grabe & Prof. Der-Wen Chang** ▸ EDITORS

**SEPTEMBER** 2014
Centrifuge-based Physical Modeling

**Prof. B.V.S. Viswanadham & Dr. Hanh Quang Le** ▸ EDITORS

**DECEMBER** 2014
Offshore and Coastal Geotechnics




**Dr. Shinji Sassa, Dr. Fuping Gao & Dr. Christophe Gaudin** ▸ EDITORS

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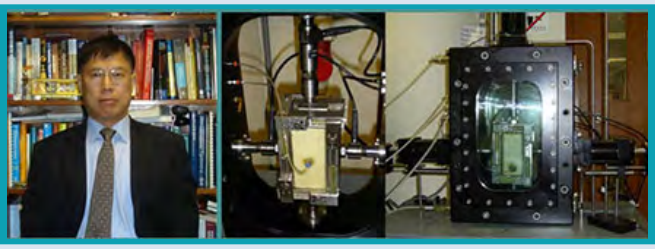
### MARCH 2015
**Advances in Geotechnical Engineering for Infrastructure Developments in Thailand**

**Suched Likitlersuang, Suksun Horpibulsuk & Suttisak Soralump**
EDITORS

### JUNE 2015
**Special Issue on Pile Foundations**

**San-Shyan Lin, Charng Hsein Juang, and Robert Liang**
EDITORS

### SEPTEMBER 2015
**Soil Behaviour and Modelling**



**Prof. Zhen-Yu Yin and Prof. Jian-Hua Yin**
EDITORS

### DECEMBER 2015
**Problematic Soils including Contaminated Soils**

**Prof. Jay N. Meegoda and Prof. Liming Hu**
EDITORS

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### MARCH 2016
**VIETNAM SPECIAL ISSUE**

**Phung Duc Long & San Shyan Lin**
EDITORS

### JUNE 2016
**CHINESE TAIPEI SPECIAL ISSUE**


**Prof. Meei-Ling Lin**
EDITOR

### SEPTEMBER 2016
**HONG KONG AND SINGAPORE SPECIAL ISSUE**

**Sing Lok Chiu, Tiong Guan Ng & San Shyan Lin** ▸ EDITORS

### DECEMBER 2016
**MALAYSIA SPECIAL ISSSUE**

**Thien Seng Yee, Swee Huat Chan and Teik Aun Ooi** ▸ EDITORS

## GEOTEC HANOI 2016 ▸ Hanoi, 24 - 25 November 2016

### 3rd International Conference GEOTEC HANOI 2013, on Geotechnics for Sustainable Infrastructure Development, in Hanoi, 24 – 25 November 2016.

GEOTEC HANOI 2016 was successfully organized on 24-25 November 2016 in Hanoi, with 600 attendees, of which 235 international, from 31 countries. The conference proceeding consists of 145 papers. 88 were presented in two parallel conference halls.

The First and Second GEOTEC HANOI conferences were successfully organized in 2011 and 2013. The conference's main purpose was to provide a forum to interchange ideas, experience, and knowledge in the interest areas. Continuing from the success of the two previous event, the conference was decided to be held every third year in Hanoi.

Hosting the Third Conference are FECON Corporation, a leading geotechnical/infrastructure contractor in Vietnam and the Vietnamese Society for Soil Mechanics and Geotechnical Engineering (VSSMGE). We are grateful for the Japanese Geotechnical Society (JGS) having accepted to serve as international co-organizer.


*Dr. Phung Duc Long, VSSMGE president, co-chairman of the conference, made opening speech*

This year conference is held in a context of Vietnam experiencing the strongest development period ever. During the last five years, since the 2011 conference, numerous new large infrastructure projects have been constructed in Vietnam. Thousand kilometers of highway has been built. Construction of the first metro lines in Vietnam has been started in Hanoi and Ho Chi Minh City. Vietnam is one of the countries most impacted by climate change; our country is threatened by flooding and soil salinity, which problems call for geotechnical expertise. The conference organisers believe that much experience and knowledge will be shared and learnt in the five conference technical sessions:

1) Deep Foundations,

2) Underground Construction and Tunneling,

3) Ground Improvement for Infrastructure Projects,

4) Coastal Geotechnics for Climate Change, and

5) Monitoring, Inspection and Maintenance.


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


*Conference Co-chairman, Prof. Towhata (Japan)*

Five keynote lectures were given by five speakers from four continents:

1) “The Unified Design of Piled Foundations”, Prof. Bengt Fellenius (Canada);

2) “Evaluation of different measures in reducing movements induced by deep excavation”, Prof. Chang-Yu Ou (Taiwan)

3) “Drains and Vacuum for Soft Soil Stabilization – Recent Advances in Experimental and Numerical Modelling”, Prof. Buddhima Indraratna (Australia);

4) “Geotechnical response to natural disasters in the context of climate change”, Prof. Kazuya Yasuhara (Japan);

5) “Ground and structural response to tunneling – lessons learnt from three major projects in London”, Dr. Jamie Standing (United Kingdom).


***Photos:***

***1.*** *Hansbo Lecture Ceremony*

***2.*** *Video clip Professor Sven Hansbo in Vietnam*

***3.*** *Hansbo Lecture Ceremony – Prof. Hansbo talking with the conference audience from Stockholm, Sweden*


GEOTEC HANOI 2016 instigates a special honor lecture named Sven Hansbo Lecture. Professor Hansbo, a giant figure in the geotechnical world, has contributed significantly to the development of geotechnics in Vietnam by direct advice, by taking Vietnamese students into his teaching programme in Sweden, and by his contributions to the first two conferences. The First Sven Hansbo Lecture will be presented by Prof. Bengt Fellenius.

**Dr. Phung Duc Long**,
President of Vietnamese Society for Soil Mechanics & Geotechnical Engineering
Co-Chairman, Geotec Hanoi 2016 International Conference
Chairman of Scientific Committee

*1st Hansbo Lecture, given by Prof. Bengt Fellenius (Canada)*

*Keynote Lecture, Prof. Chang-Yu Ou (Taiwan)*


*Keynote Lecture, Prof. Buddhima Indraratna (Australia)*


*Keynote Lecture, Prof. Kazuya Yasuhara (Japan)*


*Keynote Lecture, Dr Jamie Standing (UK)*

*Part of conference audience*

*Conference Advisers, Prof. Rolf Katzenbach (Germany) and Dr. Bo Berggren (Sweden)*


*Conference key persons*

*Conference banquet*


*Conference banquet*

## The proceeding

The proceeding, with international registration number ISBN 978 604 82 1821 8, is very well-edited with international high-quality printing and hard-covered.

The proceeding consists of approximately 1200 pages and includes 145 papers in English. A CD Rom is also provided with all the papers in colored pdf files.

The proceeding can be ordered through the conference website http://www.geotechn.vn/, or the conference secretarial mail address secretariat@geotechn.vn

# SYMPOSIUM
# SEAGS 50th ANNIVERSARY 14-15 September 2017
### Asian Institute of Technology, THAILAND

## Invitation

Invitation to all Geotechnical Specialists from the President of the **Thai Geotechnical Society** and **SEAGS** President to attend the **SEAGS 50th Anniversary Symposium** on 14-15 September 2017 at the **Asian Institute of Technology** Campus in Bangkok.

On behalf of the Chairman & Co-chairmen of the above conference, the Organizing Committee & the Advisory Committee, it is a pleasure to invite Geotechnical Specialists for the **SEAGS 50th Anniversary Symposium** on 14-15 September 2017 at the Asian Institute of Technology Campus in Bangkok.

The Symposium is jointly organized by the Thai Geotechnical Society and Southeast Asian Geotechnical Society of **ISSMGE**. The Advisory Committee is very prestigious and chaired by **Prof. Roger Franks**, President of ISSMGE. **Dr. Suttisak Soralump** is the President of the Thai Geotechnical Society and **Dr. Noppodol Phienwej** is the President of SEAGS.

The format of the Symposium is only with invited lectures. There are about 35 prestigious invited lecturers. More details can be found on the Advisory Committee, the Lecture topics, biographies of the lecturers, opening ceremony, Session Chairmen etc as contained in the web. The Histories of SEAGS and AGSSEA are also contained in the web.

We invite participants from everywhere to the beautiful AIT Campus and the scenic city of Bangkok and Thailand.

***Dr. Suttisak Soralump & Dr. Noppodol Phienwej***

## Opening Ceremony

**Master of Ceremony: Dr. Geoff Chao**
**Chairmen: Prof. K.Y. Yong & Dr. Ooi Teik Aun (Past Chairmen AGSSEA)**
**Honoured Guests: Dr. Subin Pinkayan, Dr. John D. Nelson, Dr. Edward W. Brand, Prof. Prinya Nutalaya & Prof. Seng Lip Lee**

**Welcome Addresses: Prof. Worsak Kanokkulchai, AIT President**
**Dr. Noppodol Phienwej, President SEAGS**
**Dr. Suttisak, President Thai Geotechnical Society**

**Address by: Dr. Za Chieh Moh: Founder President SEAGS**

**Presidential Address:** **Prof. Roger Franks, ISSMGE President**
**Address by:** **Prof. Ikuo Towhata, VP for Asia ISSMGE**
**Address by:** **Prof. San Shyan Lin, Chairman AGSSEA**

- **List of Advisory Committee** (pdf)
- **Chairmen** (pdf)
- **Tentative Programme** (pdf)
- **History of SEAGS**
- **History of AGSSEA** (pdf)
- **President and Past President of the Southeast Asian Geotechnical Society (SEAGS)** (pdf)
- **Chairman and Past Chairman – AGSSEA** (pdf)
- **General Committee Members 2016 – 2019**
- **AGSSEA Council Session 2016 – 2019**

## Biodata of Lecturers

### Prof. Roger Frank

Prof. Roger Frank was born in 1949 at Roslyn, New York (USA). He was then raised in the UK, in Switzerland and in France. He received his Diploma of Engineering... *Read more*

### Prof. Kazuya Yasuhara

Kazuya Yasuhara is Professor Emeritus of Ibaraki University in Japan; His academic career started in Kyushu University where he was from 1968 to 1978, earning a Doctoral ... *Read more*

### Prof. Jian Hua Yin

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... *Read more*

### Prof. Dennes Bergado

Prof. Bergado obtained his B.S. in Civil Engineering Degree from MSU in 1974, Master in Soil Engineering from the Asian Institute of Technology in 1976 and Ph.D. in Civil... *Read more*

### Prof. Ikuo Towhata

Prof. Ikuo Towhata had his engineering education at the prestigious Tokyo University in Japan and is currently a Professor in the Department of Civil Engineering... *Read more*

### Dr. Noppodol Phienwej

Dr. Noppadol was an Associate Professor in Geotechnical and Earth Resources Engineering in AIT's School of Engineering and Technology (SET). He became SEAGS President... *Read more*

### Prof. Pedro Simão Sêco e Pinto

Prof. Pedro Simão Sêco e Pinto is Full Professor of Geotechnical Engineering of University of Coimbra. Invited Professor of Master Courses "Soil... *Read more*

### Prof. Paulus P. Rahardjo

Prof. Paulus P. Rahardjo completed undergraduate study at Universitas Katolik Parahyangan (Unpar) and since then has been faculty members at the university. He pursued... *Read more*

### Dr. Suttisak Soralump

Dr. Suttisak Soralump is currently an Associate Professor at Kasetsart University in Bangkok, Thailand. He is also the President of the Thai Geotechnical Society. An Alumnus of... ⏩ *Read more*

### Prof. Tahmeed Al- Hussaini

Tahmeed Al – Hussaini is Professor in Civil Engineering at Bangladesh University of Engineering and Technology (BUET). He graduated from BUET in 1994, an Alumnus of AIT... ⏩ *Read more*

### Dr. Thian Ho Seah

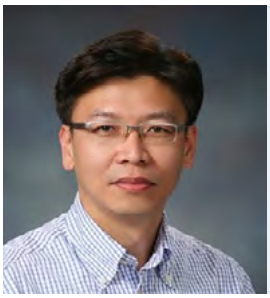
Dr. Thian Ho Seah had his engineering education at Kings College London and Massachusetts Institute of Technology. He was a Faculty Member at the Asian Institute of... ⏩ *Read more*

### Dr. John Endicott

Dr. John Endicott has been an Adjunct Professor at Hong Kong University of Science and Technology and at the University of Hong Kong. He has been practicing in Hong Kong... ⏩ *Read more*

### Prof. Mitsutaka Sugimoto

Prof. Sugimoto is currently a Professor in the Department of civil Engineering at the Nagaoka University of Technology in Japan; he is the Head of the Graduate School in... ⏩ *Read more*



### Dr. Dong-Hyun, Kim

As a PhD and a published researcher, engineering award recipient Dong-Hyun boasts a career of exceptional achievement in civil engineering spanning over 20 years... ⏩ *Read more*

### Prof. Fauziah Ahmad

Prof. Dr. Fauziah Ahmad is a Professor in Geotechnical engineering also serves as a Geotechnical Engineer and a Researcher at School of Civil Engineering, Universiti Sains... ⏩ *Read more*

### Dr. Chia-Weng Boon

Dr. Boon is now in the Mass Rapid Transit (MRT) industry in the construction of underground stations and tunnels. Prior to this, Dr. Boon obtained his D.Phil. from... ⏩ *Read more*

### Dr. V. Balakumar

Dr. V. Balakumar is the whole time retainer consultant for M/S Simplex Infrastructure Limited at Chennai office. He heads the research and designs division of the organization... ⏩ *Read more*

### Dr. Erwin Oh

Dr. Oh is the Associate Dean (International) for Griffith School of Engineering and a Senior Lecturer in Geotechnical Engineering at Griffith University. He received his... ⏩ *Read more*

### Prof. Yong Kwet Yew

Er Professor Yong Kwet Yew is Vice President at the National University of Singapore and oversees the planning and sustainable development of campus infrastructure... ⏩ *Read more*

### Distinguished Professor Buddhima Indraratna, PhD, FTSE

Buddhima Indraratna has earned the highest Australian professorial title as Distinguished Professor at the University of Wollongong. He is also a... ⏩ *Read more*

### Prof. Chu Jian

Dr. Chu is Professor in Geotechnical Engineering at Nanyang Technological University (NTU), Singapore. He is the Director of Centre for Usable Space and Interim Co-Director... *Read more*

### Prof. Suched Likitlersuang

Suched Likitlersuang is currently a full professor at the Department of Civil Engineering, Faculty of Engineering, Chulalongkorn University. He joined the Department of... *Read more*

### Ir. Tjie Liong Gouw

Mr. Gouw is a senior geotechnical consultant practicing particularly in Indonesia. He graduated from Parahyangan Catholic University, Bandung, Indonesia, with a Master... *Read more*

### Prof. Suksun Horpibulsuk

Prof. Suksun Horpibulsuk obtained a B.Eng. (Civil Engineering) with Honors Award from Khon Kaen University, Thailand in 1996. Prof. Suksun was subsequently granted... *Read more*

### Dr. Siau Chen Chian (Darren)

Dr. Chian is an Assistant Professor at the Department of Civil and Environmental Engineering, National University of Singapore. He received his PhD and BEng with gold... *Read more*

### Prof. Charles Ng

Professor Charles W.W. Ng is the Associate Vice-President for Research and Graduate Studies and a Chair Professor in Civil and Environmental Engineering at the Hong Kong... *Read more*

### Dr. Richard Hwang

Dr. Hwang received his bachelor degree from the National Taiwan University, master degree from North Dakota State University and doctor degree from the University of... *Read more*

### Dr. Cholachat Rujikiatkamjorn

Dr. Cholachat is an Associate Professor at the Centre for Geomechanics and Railway engineering, School of Civil, Mining and Environmental Engineering, University of... *Read more*

### Prof. San Shyan Lin

Prof. San-Shyan Lin graduated from Chung Yuan University with a BSCE degree in 1981. He then obtained his master degree from Utah State University, Logan, Utah in 1985... *Read more*

### Dr. Geoff Chao

Dr. Chao has over 20 years of experience in the area of geotechnical engineering and construction. He received his Master and Ph.D. degrees from Colorado State University... *Read more*

# Awards to Dr. Za Chieh Moh
## Founder President of SEAGS & Founder Chairman of AGSSEA

### 1. ACECC Achievement Award by the Asian Civil Engineering Coordinating Council

On 01 September, 2016, Dr. Moh was awarded the **ACECC Achievement Award** at its 7th conference in Honolulu, Hawaii, USA. ACECC is the **Asian Civil Engineering Coordinating Council** which is formed in 1999. At the present, there are 13 member societies (institutions), including ASCE, and civil societies from Australia, Bangladesh, India, Indonesia, Japan, Korea, Mongolia, Nepal, Pakistan, Philippines, ROC, and Vietnam. The conference is held triennially.


According to the bylaws of the ACEAA:

"The ACECC Civil Engineering Award shall be granted to a person belonging to a member society of ACEAA who has made a significant contribution to the advancement of international civil engineering or to the development of social infrastructure in Asia or in ACECC member economies, and who has gained recognition for that contribution from the community for which he/she worked"

### 2. Life Achievement Award by the China Road Federation

On 30 November, 2016, Dr. Za Chieh Moh received the **Life Achievement Award** by the **China Road Federation**. The CRF is a 55 years old association of academias, professionals and government officials who are engaged in or interested in Transportation related fields (including roads, highways, railways etc.) The CRF is a member of the International Road Federation and the Road Engineering Association of Asia and Australasia. This is the second time that the CRF made the award.

**Vice President for Asia**

**Professor Ikuo Towhata**

Department of Civil Engineering University of Tokyo

7-3-1, Hongo Bunkyo-Ku

Tokyo 113-8656, Japan

Tel: +81-3-5841-6121 / Email: towhata@geot.t.u-tokyo.ac.jp

| | |
|---|---|
| **Hong Kong Geotechnical Society** | **Hong Kong** |
| **Bangladesh Society for Geotechnical Engineering** | **Bangladesh** |
| **CISMGE-CCES** | **China** |
| **Chinese Taipei Geotechnical Society** | **Chinese Taipei** |
| **Indian Geotechnical Society** | **India** |
| **Indonesia Society for Geotechnical Engineering** | **Indonesia** |
| **Iranian Geotechnical Society** | **Iran** |
| **Iraqi Scientific Society for Soil Mechanics and Foundation Engineering** | **Iraq** |
| **Japanese Geotechnical Society** | **Japan** |
| **Kazakhstan Geotechnical Society** | **Kazakhstan** |
| **Kyrgyzstan Geotechnical Association** | **Kyrgyzstan** |
| **Lebanese Geotechnical Engineering Society** | **Lebanon** |
| **Malaysian Geotechnical Society** | **Malaysia** |
| **Nepal Geotechnical Society** | **Nepal** |
| **Pakistan Geotechnical Engineering Society** | **Pakistan** |
| **Geotechnical Society of Singapore** | **Singapore** |
| **Southeast Asian Geotechnical Society** | **South East Asia** |
| **Korean Geotechnical Society** | **South Korea** |
| **Sri Lankan Geotechnical Society** | **Sri Lanka** |
| **Order of Syrian Engineers and Architects** | **Syria** |
| **Tajikistan Geotechnical Society** | **Tajikistan** |
| **Thai Geotechnical Society** | **Thailand** |
| **Uzbekistan Geotechnical Society** | **Uzbekistan** |
| **Vietnam Society for Soil Mechanics and Geotechnical Engineering** | **Vietnam** |

# SEACETUS2017: Southeast Asian Conference And Exhibition In Tunnelling And Underground Space 2017

**Innovation and Sustainable Underground Space Development (18 - 19 April 2017)**

Dorsett Grand Subang Hotel, Subang Jaya, Selangor, Malaysia

## INTRODUCTION

The Tunnelling & Underground Space Technical Division of The Institution of Engineers, Malaysia (IEM TUSTD) is hosting for the first time the Southeast Asian Conference and Exhibition in Tunnelling and Underground Space (SEACETUS2017) in Subang Jaya, which is approximately 27 km from Kuala Lumpur City Centre. The conference will offer case studies and strategies that demonstrate innovation, skills and best practices, and help delegates understand the technologies and techniques guiding the Tunnelling and Underground Space Development Industry.

Its aims are to promote the sharing of knowledge, experience, skills, ideas and achievements in the designing, financing and contracting as well as construction, operation and maintenance of tunnels and other underground facilities among the ASEAN Countries on an organised basis and with agreed aims. International paper contributions are also welcomed.


*Download SEACETUS2017 Bulletin No. 2*

*Organized by:*

IEM
The Institution of Engineers, Malaysia
TUNNELLING AND UNDERGROUND SPACE TECHNICAL DIVISION

*An event endorsed by:*

ITA AITES
ASSOCIATION INTERNATIONALE DES TUNNELS ET DE L'ESPACE SOUTERRAIN
INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION

*Managed by:*

IEMTC
IEM TRAINING CENTRE SDN. BHD

### The Conference covers:

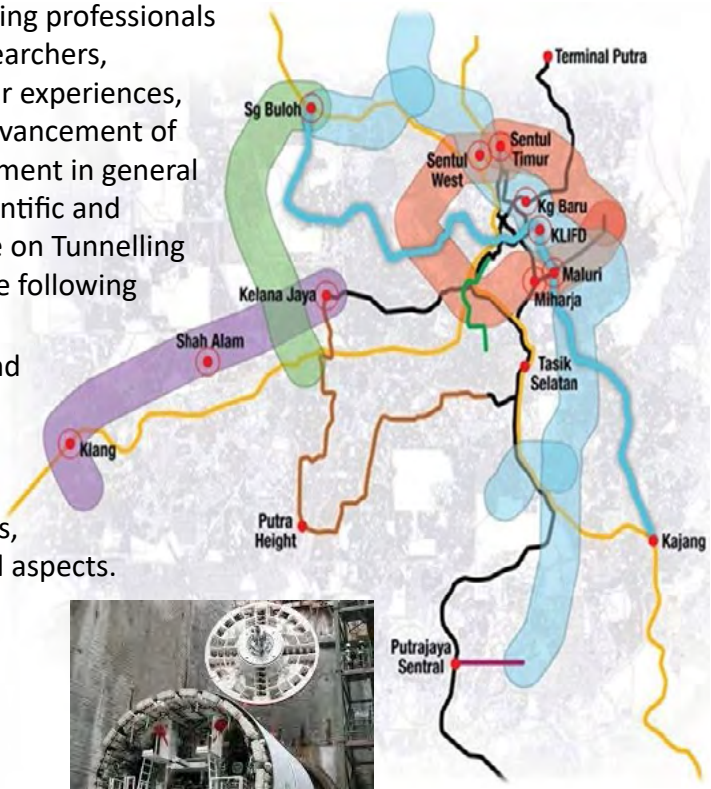
- Tunnelling projects – this includes past and present projects;
- Collaboration among researchers, governments, developers, consultants, contractors and specialists tunnel & trenchless contractors;
- Standards, legal, social, economic, safety & risk management and related topics on the use of underground space.

**CONFERENCE THEME**:

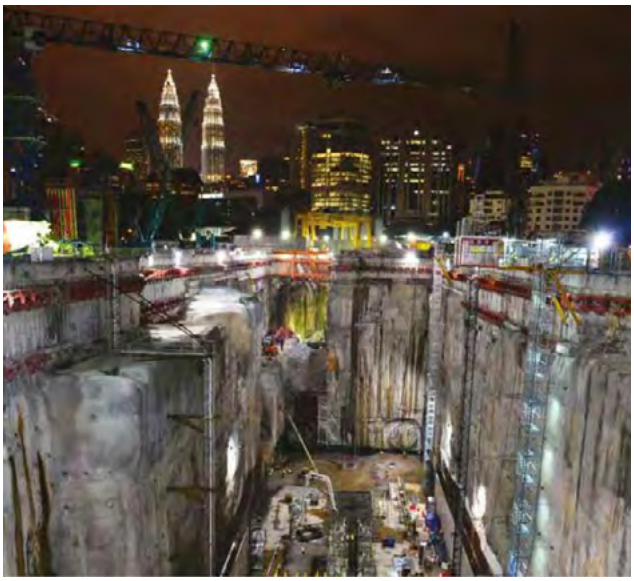
**Innovation and Sustainable Underground Space Development**

This conference is aimed at providing a forum for practising professionals – engineers, consultants, contractors, technologists, researchers, academicians, manufacturers and suppliers to share their experiences, research, studies and views so as to contribute to the advancement of Sustainable Tunnelling and Underground Space Development in general and particularly in Asia. A wide range of high quality scientific and technical papers of International or Regional significance on Tunnelling and Underground Space Development is expected on the following topics:

- Tunnelling to include process, operation, ventilation and maintenance.
- Trenchless Technology such as micro-tunnelling, pipe-jacking, directional drilling and rehabilitation.
- Related areas such as detection and inspection services, robotic development, sewerage services and structural aspects.
- Safety health environmental quality and legal aspects.
- Machine development and designs, latest models presentation from manufacturers of tunnelling and related machines.
- Geotechnical aspects with particular references to tunnelling and underground space development.
- Research and recent development and progress related to tunnelling & the use of underground space.





## CONTACT DETAILS

**SEACETUS2017 Secretariat**
c/o IEM Training Centre Sdn. Bhd.
No. 33-1A (1st floor), Jalan 52/18,
P.O. Box 224 (Jalan Sultan)
46720 Petaling Jaya, Selangor Darul Ehsan,
MALAYSIA

## INVITED SPEAKERS

### Opening Keynote Address:

**Prof. Jingxiu Yan** (Vice President, ITA)

### Keynote Lectures:

**Prof. Kwet Yew Yong** (National University of Singapore)
**Prof. Charles W.W. Ng**
(Hong Kong University of Science and Technology)
**Er. Seng Tiok Poh** (MRT Corporation)
**Ir. Dato' Paul Ha** (Gamuda)

### Special Lectures:

**Dr. Benson Hsiung**
(National Kaohsiung University of Applied Sciences)
**Prof. Noppadol Phien-wej**
(Asian Institute of Technology)
**Dr. Davorin Kolic** (ITA Croatia)
**Dr. Harald Wagner** (ITA Thailand)
**Mr. Gus Klados** (MMC-Gamuda KVMRT)
**Mr. Zaw Zaw Aye** (SEAFCO)
**Mr. John Davies** (Jururunding Arup)
**Mr. Alexander (Sandy) Mackay** (HSS Intergrated)
**Mr. Andreas Raedle** (Arup Singapore)

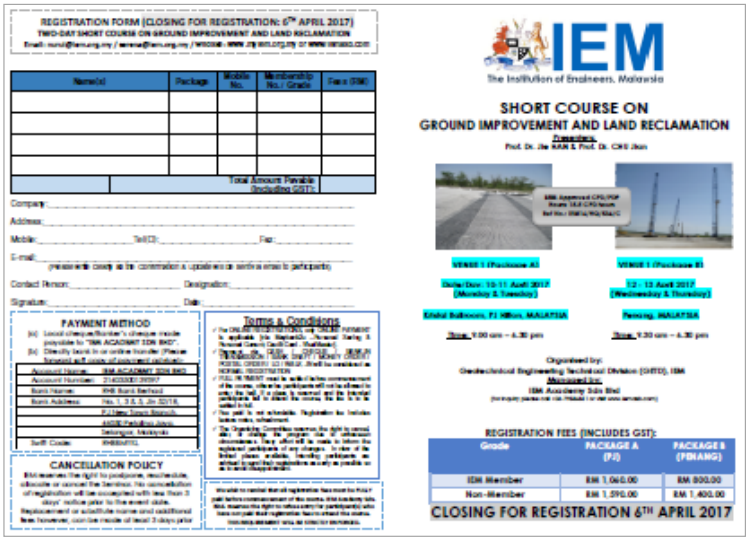
## *SHORT COURSE ON*
# *GROUND IMPROVEMENT AND LAND RECLAMATION*
### *MALAYSIA*

The Institution of Engineers, Malaysia

Presenters:
**Prof. Dr. Jie HAN** & **Prof. Dr. CHU Jian**

*Organised by:*
**Geotechnical Engineering Technical Division (GETD), IEM**

*Managed by:*
**IEM Academy Sdn Bhd**




*Download Seminar Flyer*

**VENUE 1** (Package A)
10-11 April 2017 (Monday & Tuesday)
Kristal Ballroom, PJ Hilton, MALAYSIA
Time: 9.00 am – 6.30 pm

**VENUE 2** (Package B)
12-13 April 2017 (Wednesday & Thursday)
Penang, MALAYSIA
Time: 9.30 am – 6.30 pm

## ABOUT THE SHORT COURSE

This two day course will be conducted in day one by Prof Jie Han and day 2 by Prof Chu Jian respectively. In day one Prof Jie Han will cover the recent development of various ground improvement methods. Intelligent and rapid compaction technology will be introduced and explained. Site preparation methods including the use of geosynthetics in stabilized roads and construction platform will be covered. Sustainable and environmentally friendly green ground improvement methods such as column technologies; their design, construction and quality control will be explained. Prof Jie Han will also deal with the design and recent advances of column supported high embankments in the high speed railway and expressway. In day 2 Prof Chu Jian will give an update on the advances in land reclamation techniques including recent development in prefabricated vertical drains (PVDs) and fill surcharge methods. Specific issues related to new PVDs materials, design methods, design parameters, construction methods, and quality control methods will be discussed. Case histories on use of PVDs and preloading for land reclamation projects will be presented. The latest development in vacuum preloading methods will be introduced. The advantages and disadvantages of different methods will be compared.

Technical issues such as mechanisms of vacuum preloading and dewatering, improvement depth, vacuum pressure distribution in soil, and evaluation of the degree of consolidation will be discussed. Existing and new methods for assessing the effectiveness of vacuum preloading methods will be introduced. Case histories on the use of vacuum preloading for soft soil improvement projects including the use of clay slurry in land reclamation will be presented. The densification of granular fill such as hydraulic fill, its placement methods and assessments will be discussed with case histories presented. A new approach, the microbial soil improvement method and its applications will be introduced. Some recent development in land reclamation methods in particular in the use of soft or excavated soil as fill materials for land reclamation will be presented.

## CONTACT US:

☎ +03-79586851 ✉ nurul@iem.org.my / serena@iem.org.my 💻 www.myiem.org.my / www.iemasb.com

# SEAGC 2019

## *20TH Southeast Asian Geotechnical Conference*
## *3rd AGSSEA Conference*
## *23rd Annual National Conference HATTI*
## Indonesia

Date: 5-7 February 2019 (tentative)
Venue: Bidakara Hotel Jakarta (tentative)

Hosted by:
Indonesian Society for Geotechnical Engineering
Association of Geotechnical Societies in Southeast Asia
Southeast Asian Geotechnical Society

**2016 Council Meeting** of **Southeast Asian Geotechnical Society** and **Association of Geotechnical Societies in Southeast Asia**

31 May 2016, Subang Jaya, Malaysia

Next SEAGC 2019 will be conducted in Indonesia and hosted by HATTI

**HIMPUNAN AHLI TEKNIK TANAH INDONESIA (HATTI)**
INDONESIAN SOCIETY FOR GEOTECHNICAL ENGINEERING (ISGE)

HATTI was established in 1976
Became a member of ISSMGE since 1977


Combine the 20TH Southeast Asian Geotechnical Conference and 3rd AGSSEA Conference with 23rd Annual National Conference HATTI

***Download***
ANNOUNCEMENT (pdf format)

# ICSMGE 2017

## 19th International Conference on
## SOIL MECHANICS AND GEOTECHNICAL ENGINEERING

***17 – 22 September 2017***
***Seoul, Korea***

### Theme: *'Unearth the Future, Connect beyond [ ]'*

Five colours of the Olympic Flag are conceptualised with stratum to demonstrate harmonious contribution the 19th ICSMGE-Seoul 2017 may bring to life. The five colours are representing living organisms, ground waters and stratum, mirrors the role of soil, the foundation of life. Arched stratum, too, embodies the flowing image of the Han River, which has been perceived as the heart of Korea's Economic Miracle for nationals. The logo of the 19th ICSMGE-Seoul 2017 presents our commitment of sharing and bridging knowledge, experience and friendship with participants from all over the world.

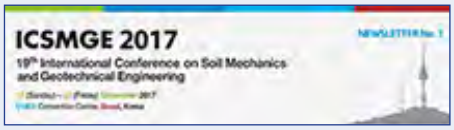
The theme of 'Unearth the Future, Connect beyond [ ]' can be differentiated with indefinite variable last word. The bid committee of the 19th ICSMGE-Seoul 2017 shall offer you a vision with unique interpretation of past, present and future, bridging young and senior engineers as well as developed and developing nations.

### Conference Objectives

- To pursue mutual understanding and collaboration between experts and interested parties.
- To create an opportunities of sharing and learning up-to-date knowledge and offer a platform where experts, researchers and students could be re-assembled to discuss present and prospective pertinent issues.
- To arouse a positive momentum in achieving the convergence of Korea's advanced civil construction technology and high technology, with the application of renewable energies, IT, BT and Nano technologies.
- To establish an environment where transforming research is implemented to improve science and social structure.

***Download***

NEWSLETTER No. 1 (pdf format)




## Invitation

*Honorable Members of the ISSMGE,*

*On behalf of the Local Organizing Committee for the 19th International Conference on Soil Mechanics and Geotechnical Engineering (19th ICSMGE), I am pleased to welcome you all to the 19th ICSMGE to be held in Seoul, Republic of Korea, from September 17 to 22, 2017.*

*The theme of the 19th ICSMGE is "Unearth the Future, Connect Beyond [ ]." It is about bridging the gaps between past and future, between young and senior engineers, and between developing and developed nations among others. Making these connections is the key to greater innovations. The logo for the 19th ICSMGE symbolizes our vision where the colours represent how well and harmoniously living organisms, groundwater and strata coexist- the way we hope different regions can coexist in harmony- while the waves represent the Han River, which is the heart of Korea's economic growth.*

*The 19th ICSMGE will prepare various programs, including a Plenary Session, Parallel Sessions, ISSMGE Honour Lectures, iYGEC, Technical visits, and exhibitions. The Local Organizing Committee would like to invite you all and share our experiences with member societies. We are ready to reach out and listen to various and valuable voices from member societies and are willing to reflect their wishes into the program, serving as a rainbow bridge between member societies in ISSMGE and beyond.* ▸▸*Read more*

### 19th ICSMGE Secretariat

T. +82-2-6288-6347 F. +82-2-6288-6398
E. secretariat@icsmge2017.org
W. http://www.icsmge2017.org

# 16ARC 2019

## 16th Asian Regional Conference on

## SOIL MECHANICS AND GEOTECHNICAL ENGINEERING

***October 14-18, 2019***

***Taipei International Convention Center (TICC), Taipei, Taiwan***

**Theme: '*Geotechnique for Sustainable Development and Emerging Market Regions*'**


Organized by: **Chinese Taipei Geotechnical Society (Taiwan Geotechnical Society, TGS)**

Auspices by: **International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)**

### Welcome Message:

*Dear Colleagues,*

*It is my great happiness to inform you that The 16th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering (16ARC) will be held on October 14-18 in 2019 in Taipei International Convention Center (TICC), Taipei, Taiwan. The main theme of the 16ARC is Geotechnique for Sustainable Development and Emerging Market Regions. A number of subjects on modern geotechnical technologies and activities will be covered up to match up the main theme. In a roll of 60 years, we sincerely hope that the 16ARC will continue to bring great success following the glories of past ARCs (New Delhi 1960, Tokyo 1963, Haifa 1967, Bangkok 1971, Banglore 1975, Singapore 1979, Haifa 1983, Kyoto 1987, Bangkok 1991, Beijing 1995, Seoul 1999, Singapore 2003, Kolkata 2007, Hong Kong 2011, Fukuoka 2015).*

*Read more*

### Contact:

**16th ARC Secretariat**
Tel: +886-2-2798-8329 ext. 35
Fax: +886-2-2798-6225
Email: secretariat@16arc.org

### Topics:

1. Soil characteristics and properties
2. Underground and deep excavations
3. Tunneling
4. Slope, debris flow and embankment
5. Dam
6. Shallow and deep foundation
7. Soil dynamics and geotechnical earthquake engineering
8. Soil improvement
9. Geoenvironmental engineering
10. Geotechnical reliability, risk assessment and management
11. Geosynthetics and geo-products
12. Engineering geology and rock engineering
13. Forensic engineering
14. Offshore and harbor geotechnics
15. Geotechnical training and education
16. In-situ testing and monitoring
17. GeoEnergy
18. Case history

## The advantages in joining the SEAGS, AGSSEA and ISSMGE are as follows:

Southeast Asian Geotechnical Society

**1** Receive updated activities, current events and important information regarding geotechnical engineering around the world through the bi-annual SEAGS / AGSSEA Newsletter and 4 issues of Journals annually.

**2** The opportunity to submit papers for publication and to read up-to-date technical papers through the 4 issues of Geotechnical Engineering Journal annually.

ISSMGE & ARC

**3** The ability to attend, participate, and avail of state-of-the-art lectures and papers in the local, regional, and international geotechnical conferences at discounted registration fees.

**4** The chance to network with other geotechnical engineers, academics, and practitioners around the world as SEAGS member automatically becomes member of ISSMGE.

**5** The opportunity to fraternize with professionals of related fields of geology, geophysics, and rock mechanics through the association of ISSMGE with the International Society for Rock Mechanics (ISRM) and International Association of Engineering geology (IAEG).

# INTERESTING WEBSITES

## SGI - Line


- http://www.swedgeo.se/templates/SGIStandardPage____184.aspx?epslanguage=EN
- http://www.swedgeo.se/templates/SGIStandardPage____186.aspx?epslanguage=EN

The SGI-Line is a literature database containing references to international geotechnical and geoenvironmental literature in a broad context, from practical solutions to theoretical analysis. The database is one of a small number in the world specialized in geotechnical and goenvironmental engineering. The database contains some 70,000 references from 1976 up to present. The database is continuously updated and expanded with about 2,000 references a year. Several references added during the recent years links to further information, full-text documents or abstracts/table of contents.

SGI-Line is produced by the Swedish Geotechnical Institute, Sweden. Most of the documents, books, articles in journals, papers in conference proceedings, reports, theses, ets, referred to in the database are available in the SGI Library.

Link to more information on the Database (Information sheet):

- http://www.swedgeo.se/upload/SGI-tjanster/pdf/SGILine-english-2007.pdf

## QuadSearch


- http://delab.csd.auth.gr/~lakritid/index.php?lan=1&s=2

QuadSearch are metasearch engines that are web services designed to transfer the user's queries to multiple existing search engines. A metasearch engine does not maintain its own index of documents.

It collects and reorganizes the result lists (top-k lists), then it returns the processed data to the user. Compared to a classic single search engine, a metasearch engine offers increased web coverage, improved retrieval effectiveness, effortless invocation of multiple search engines.

## ICE Virtual Library


The ICE Virtual Library hosts all the content from ICE Publishing, the publishing division of the Institution of Civil Engineers (ICE).

This site is an online journal service. It provides the opportunity to stay on top of cutting-edge issues in all aspects of civil engineering with papers and articles. It contains large amount of civil engineering journals. All Proceedings of the Institution of Civil Engineering journals are listed on this site. Abstracts and table of contents are freely available to all.

- http://www.icevirtuallibrary.com/content/journals

# Geotechnical software sites

The following sites contain geotechnical software's indispensable to geotechnical engineers.

### http://www.usucger.org

This site's mission is to provide advocacy for the continued development and expansion of high quality geomechanical, geotechnical and geo-environmental engineering research and education which will enhance the welfare of humankind.

### http://alert.epfl.ch

The Alliance of Laboratories in Europe for Research and Technology (ALERT) "Geomaterials" has been created to develop a European School of Thinking in the field of the Mechanics of Geomaterials. The generic name "Geomaterials" is viewed as gathering together materials, whose mechanical behaviour depends on the pressure level, which can be dilatant under shearing and which are multiphase because of their porous structure.

### http://www.geoengineer.org

The site started as a personal effort to provide useful information for engineers, students, and academia by taking advantage of the opportunities provided by the internet. Consecutively, it provides a cost-free resource for the engineers to learn about the latest news in their field and keep up with the progress of research.

### http://www.ascelibrary.org

In this site you can find and download full-text civil engineering research and applications-oriented articles. You can choose only the content you need from across a universe of 260,000 pages of content; journal papers from 1993 to present, proceedings papers from 2003 to present, 28,000 articles-4,000 new articles added each year. You can quickly have the information thru Research Library gold Card.

## Other Links:

**The Engineer Explains** http://engineerexplained.com/VincentChuColumn/#T1

**Ask An Expert** http://engineeringcivil.com/ask-an-expert

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**TAGAsoft** http://www.tagasoft.com/TAGAsoft

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| 6. | | Proceedings of the Malaysian Geotechnical Conference 2004, The Institute of Engineering Malaysia, 16-18 March 2004 (524 pages) | 100 | 14 | 21 |
| 7. | | Proceedings of the 14th Asian Regional Conference on Geotechnical Engineering Meeting Society's Needs, Hong Kong, 10-14 December 2001 (2 Volumes) | 100 | 10 | 15 |
| 8. | | Proceedings of the GEOTECH-YEAR 2000, Developments in Geotechnical Engineering, Bangkok, Thailand, November 2000. All Volumes. | 100 | 16 | 22 |
| | | Volume I (452 pages) Hard Bound | 55 | 10 | 15 |
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| 13. | | Proceedings of the 11th Southeast Asian Geotechnical Conference, Singapore, March 1993. Hard bound (864 pages). | 80 | 16 | 22 |
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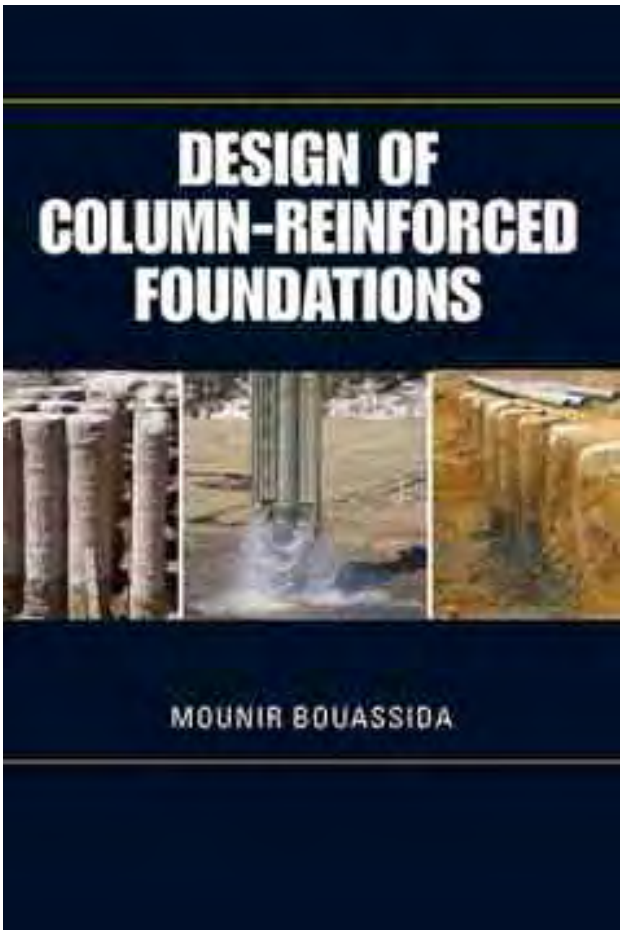


**Prof. Mounir Bouassida** (University of Tunis El Manar, Tunisia), member of the editorial committee of the SEAGS journal published the book referenced:

**Bouassida M. (2016). Design of Column-Reinforced Foundations. J. Ross Publishing (FL, USA), August. 224 pages. ISBN: 978-1-60427-072-3.**

This book addresses the design of foundations on reinforced soil by columns within a general framework where several aspects are taken into consideration: modeling of reinforced soil, bearing capacity, settlement, acceleration of consolidation, and improvement of soil characteristics with selected case histories. Unlike existing books on unique improvement techniques (deep soil mixing, stone columns, sand compaction piles) that focus on installation and equipment issues, this one-of-a-kind guide details design purpose. It is an important work for all in the geotechnical field, including practitioners, academics, and students.

Key features of this book and authors information are available via the link:
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# SOUTHEAST ASIAN GEOTECHNICAL SOCIETY (SEAGS)

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**Secretary-General:** *Dr. Noppadol Phienwej*

**Editor-in-Chief of**
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