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Guest Editor Prof. Jie Han

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GEOTECHNICAL ENGINEERING

March 2011 Issue: Geosynthetics
Edited by Prof. Jie Han

Prof. Jie Han, the Guest Editor is a Professor at Department of Civil, Environmental, and Architectural Engineering at the University of Kansas in the United States. He received his Ph.D. degree in Civil Engineering from the Georgia Institute of Technology in 1997 and has been a professional engineer in Georgia since 1998. Dr. Han was a senior engineer and manager of technology development at Tensar Earth Technologies, Inc., a leading geosynthetic manufacturer in the world, from 1997 to 2001. Prof. Han's research and practical experiences have dealt with geosynthetics-reinforced earth structures, ground improvement, pile foundations, and pavement applications Prof. Han has coauthored three technical books, edited two ASCE Geotechnical Special Publications, and published more than 150 peer-reviewed journal papers and conference papers (a large portion on geosynthetics). Prof. Han is currently serving as the Technical and Proceedings Co-chair for the GeoFrontiers 2011 Conference to be held in Dallas, Texas, USA from March 13 to 16, 2011, which is jointly organized by the ASCE Geo-Institute, the Industrial Fabrics Association International, the North American Geosynthetic Society, and the geosynthetic industry. Prof. Han serves as a member on the editorial boards for four major international journals in geotechnical engineering, the ASCE Geosynthetic and Ground Improvement Committees, and TRB A2K07 Committee on Geosynthetics.

GEOTECHNICAL ENGINEERING

Foreword

Since the early use of fabrics to reinforce roads by the South Carolina Highway Department in the USA in 1920s, geosynthetics have been successfully adopted as reinforcements in many civil engineering applications, ranging from slopes, earth retaining walls, embankments, foundations, landfills, roads, earth structures for river and coastal protection, etc. This special issue focusing on geosynthetic-reinforced earth structures contains several technical papers contributed by a combination of internationally well-known experts and young, energetic researchers and/or engineers in these areas from China, Japan, Malaysia, Singapore, and the United States. They present past successes, recent developments, and/or issues in the design, modeling/analysis, construction, and performance evaluation of geosynthetic-reinforced earth structures.

Prof. Dov Leshchinsky at the University of Delaware in the USA, an internationally well-known expert in geosynthetics, slopes, and walls, offers his broad and in-depth views on some issues related to the design of mechanically-stabilized earth walls and slopes. Issues include discussion on the artificial separation between reinforced walls and slopes, deficient seismic design of reinforced earth structures, and difficulties associated with feedback from field data and its implications on design of reinforced earth walls. Prof. Leshchinsky offers the solutions to these issues including the adoption of reinforced slope design method for reinforced walls and reduced seismic coefficients with limit equilibrium analysis for seismic design of reinforced earth structures. Prof. Leshchinsky emphasizes the importance of following the principles of statics in the development of design methods from field data.

Dr. Teik Aun Ooi at TAO Consultant and Mr. C.H. Tee at Mega Geoproducts and Services have many years' practical experience in design and construction of geosynthetic-reinforced earth walls and steep slopes in Malaysia. They share their rich experience and knowledge accumulated through years of practice in their technical paper. They present various case histories of slope repair and the role of geosynthetic reinforcement in the slope reconstruction and performance.

Prof. Jinchun Chai at Saga University in Japan has developed a number of design methods well adopted in practice for ground improvement. In his paper included in this special issue, Prof. Chai proposed a method for predicting undrained shear strength of saturated clayey backfill in an embankment reinforced by dual function (reinforcement and drainage) geocomposites, which is used to calculate the factor of safety of the reinforced embankment. The proposed method considers the effects of discharge capacity of the geocomposite, spacing between geocomposite layers, construction speed, and the coefficient of consolidation of the backfill.

Dr. Jie Huang, an assistant professor at the University of Texas at San Antonia, Dr. Anil Bhandari, a project manager at Terracon (a major geotechnical firm in the USA), and Dr. Xiaoming Yang, a research associate at Louisiana Transportation Research Center, are three active young researchers and engineers in geotechnical engineering. They jointly contribute a technical paper to review and summarize the numerical modeling techniques (FEM, FDM, and DEM) to model and analyze geosynthetic-reinforced earth structures including MSE walls, reinforced slopes and embankments, and reinforced unpaved and paved roads.

Prof. Jian Chu at Nanyang Technological University in Singapore and Prof. Shuwang Yan at Tianjin University in China are internationally well-recognized for their research in ground improvement, coastal protection, and land reclamation. Together with Prof. Chu's student, Wei Guo, they contribute a technical paper on recent advances in the research and practice using geosynthetic tubes and geosynthetic mats for the construction of river and coastal structures.

Prof. Yunmin Chen at Zhejiang University is a leading geotechnical engineering researcher in China. Prof. Chen and his colleagues have been involved in the research and consulting of several major landfills in China. Their technical paper addresses the issues related to the performance-based design of geosynthetic liner systems in landfills, including the breakthrough time, interface sliding failure, and liner tensile failure.

Prof. Jie Han at the University of Kansas in the USA is the guest editor of this special issue. He, his former graduate student, Mr. Yuze Zhang, and his colleague, Prof. Robert L. Parsons contribute a technical paper on laboratory evaluation of geosynthetic-soil confinement using a wheel tracking device. Their paper discusses a newly-developed performance-based laboratory test method to evaluate geosynthetic-soil confinement and distinguish the benefits of rut reduction among different types of geosynthetics and base course materials.

Jie Han

Guest Editor

Acknowledgement

A number of theme oriented special issues are introduced in 2011and the first one is released in March 2011 on Geosynthetic –reinforced earth structures. The Guest Editor of this issue is Prof. Jie Han of the Department of Civil, Environmental, and Architectural Engineering at the University of Kansas in the United States. He received his Ph.D. degree in Civil Engineering from the Georgia Institute of Technology in 1997 and has been a professional engineer in Georgia since 1998. Dr. Han was a senior engineer and manager of technology development at Tensar Earth Technologies, Inc., a leading geosynthetic manufacturer in the world, from 1997 to 2001. Prof. Han's research and practical experiences have dealt with geosynthetic-reinforced earth structures, ground improvement, pile foundations, and pavement applications. Prof. Han has co-authored three technical books, edited two ASCE Geotechnical Special Publications, and published more than 150 peer-reviewed journal papers and conference papers (a large portion on geosynthetics). Prof. Han is currently serving as the Technical and Proceedings Co-chair for the GeoFrontiers 2011 Conference to be held in Dallas, Texas, USA from March 13 to 16, 2011, which is jointly organized by the ASCE Geo-Institute, the Industrial Fabrics Association International, the North American Geosynthetic Society, and the geosynthetic industry. Prof. Han serves as a member on the editorial boards for four major international journals in geotechnical engineering, the ASCE Geosynthetic and Ground Improvement Committees, and TRB A2K07 Committee on Geosynthetics.

The papers in this issue are authored by well known researchers and practioners: *D. Leshchinsky; T.A. Ooi and C.H. Tee; J.-C. Chai, T. Hino, Y. Igaya, and Y. Yamauch;, J. Huang, A. Bhandari, and X. Yang; J. Chu,W. Guo, and S.W. Yan; Y.M. Chen,W.A. Lin, B. Zhu, and L.T. Zhan; and J. Han, Y. Zhang, and R.L. Parsons*

The papers contained in this issue by the well known authors will undoubtedly be of great interest to engineers and scientists. On behalf of the Association of Geotechnical Societies in Southeast Asia, the Southeast Asian Geotechnical Society and the Editorial panel of the Geotechnical Engineering Journal we express our sincere gratitude to the Guest Editor Prof. Jie Han and the contributing authors.

K.Y. Yong
D. Bergado
Teik Aun Ooi
A. S. Balasubramaniam

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Special Issue on Geosynthetic-reinforced Earth Structures

Guest Editor: Jie Han

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Guest Editor

Prof. Tatsunori Matsumoto

Geotechnical Engineering Journal of the SEAGS & AGSSEA Vol. 42 No.2 June 2011 ISSN 0046-5828

GEOTECHNICAL ENGINEERING

June Issue: Guest Editors on Foundations
Edited by Prof. Tatsunori Matsumoto

A special issue on Deep Foundations is also planned and to be edited by Prof. Tatsunori Matsumoto with the assistance of Dr. Der Wen Chang and this is expected in June 2011. Professor Harry G. Poulos, Prof. Bengt Fellenius and several others are expected to contribute in this issue together with Prof. Tatsunori Matsuoka.

Prof. Matsumoto is now with Kanazawa University in Japan for nearly 32 years. He was educated at the Kanazawa University and received his Doctoral Degree from Kyoto University for his work on steel pipe piles in 1989. He has extensive research and practical experience on piled foundations and piled raft foundations. Prof. Matsumoto has a Shake Table Facility for the study of dynamic and earthquake type of behaviour of piled foundations. He has also worked on the centrifuge with pile groups and piled raft foundations in collaboration with Taisei Corporation. His research work on piled raft foundations range from the simplified calculation methods of Poulos - Davis and Randolph (PDR Method), Burland's method to approximate computer based methods such as the strip on spring and plate on spring approaches and hybrid methods. He has also worked on more rigorous method using boundary elements and finite elements. Prof. Matsumoto also has wide experience in the seismic design of raft and piled raft foundations. Prof. Matsumoto is one of the authors of the computer software PRAB—Piled Raft Analysis with Batter Piles. With this software piled raft foundation can be analyzed with vertical and horizontal loads as well as moment.

GEOTECHNICAL ENGINEERING

FOREWORD

The Southeast Asian Geotechnical Society (SEAGS) was formed over 40 years ago and has been an important factor in the growth of geotechnical engineering in the Southeast Asian region. SEAGS has made a very important contribution to the dissemination of geotechnical knowledge by publishing the journal Geotechnical Engineering, which first appeared in 1970. A number of influential papers have appeared in this journal, generally dealing with regional issues and case histories but also with geotechnical problems on a global scale.

In recent years, several of the original countries comprising SEAGS have grown to such an extent that they have formed their own national geotechnical groups. A number of these countries have formed the Association of Geotechnical Societies of South East Asia (AGSSEA) which now interact and cooperate with SEAGS. Currently, the President of SEAGS and Chairman of AGSSEA are Dr. Ooi Teik Aun and Professor K.Y. Yong respectively, while the Secretaries General are Professor Dennes Bergado and Mr. Kenny Yee.

SEAGS and AGSSEA now cooperate in producing Geotechnical Engineering, and in order to respond to the growth of geotechnics in the region, the editors have decided to re-focus the journal and to produce a series of theme issues that deal with specific areas of geotechnical engineering.

This present issue deals with deep foundations, a subject that has been of abiding interest to engineering professionals in the region over many years. Indeed, with the remarkable growth in the number and height of structures, studies of deep foundations and their behaviour under various scenarios have become a matter not only of research interest, but also of intense practical and economic interest. It is being recognised increasingly that traditional methods of deep foundation design that may have been adequate in past times may not be suitable for today's circumstances, where much larger loads may be acting on the piles and where piles may be subjected not only to direct structural loads but to loads imposed by ground movements arising from such sources as earthquakes, excavations and tunnel construction. It is also being recognised that in such cases, the sources of movement may also change the stress state in the ground so that the ground conditions during and after construction may be different from those encountered during the site investigation. Such differences need to be recognised and allowed for in the design process. It must also be recognised that there may well be "side effects" that arise from construction-related ground movements that may adversely affect existing foundation

A further trend, and one that is to be applauded, is the increasing use of pile load testing, not only as a means of verifying the capacity and integrity of the as-constructed piles, but also as an adjunct to pile design. Many of the elements of uncertainty that are present in pile design may be reduced by carrying out tests on trial piles as part of the design process. However, in such cases, it is essential to understand the limitations of the test procedure being and to interpret the test results accordingly, taking into account the test configuration and test setup, the means of applying load and supplying reaction, and the means of measurement of the pile responses. In particular, care should be taken to allow for residual stresses that exist in the pile prior to testing, as failure to do so may lead to misinterpretation of the contributions to the pile resistance of the shaft and the base.

The nine papers in this issue cover a broad range of topics in deep foundations, including load testing (3 papers), analysis and design issues (2 papers), fundamental understanding of pipe pile behaviour (1 paper), piled raft foundations (2 papers), and two case histories, one involving the foundations for the Taipei 101 tower, formerly the world's tallest building, and the other a proposed 151 storey tower in South Korea.

Professor Tatsunori Matsumoto from Japan is the editor for this issue and has been instrumental in attracting the papers that appear here, and especially, in securing a number of papers from Japan. He has done a fine job in coaxing and encouraging the authors of the papers, arranging for the review of the papers, and editing the final manuscripts. He deserves the thanks of the journal readership for his untiring efforts. He has been assisted by

Professor Der-Wen Chang of Taiwan, and by Professor Balasubramaniam (Bala), from Australia, whose links with SEAGS extend over many years.

It is to be hoped that the readers of this issue will benefit from the information and knowledge that is contained within the papers, and that they may find occasion to apply this knowledge in their own professional practice.

H.G. Poulos

GEOTECHNICAL ENGINEERING

ACKNOWLEDGEMENT

This Special Issue on Deep Foundations is edited by Prof. Tatsunori Matsumoto with the assistance of Prof. Der Wen Chang as co-editor. Prof. Matsumoto is with Kanazawa University for nearly 32 years and has made excellent contributions in Piled Foundations starting with his Doctoral Research at Kyoto University on steel pipe piles as early as 1989. He has extensive research and practical experience on piled foundations and piled raft foundations. Prof. Matsumoto has a Shake Table Facility for the study of dynamic and earthquake type of behaviour of piled foundations. He has also worked on the centrifuge with pile groups and piled raft foundations in collaboration with Taisei Corporation. His research work on piled raft foundations range from the simplified calculation methods of Poulos - Davis and Randolph (PDR Method), Burland's method to approximate computer based methods such as the strip on spring and plate on spring approaches and hybrid methods. He has also worked on more rigorous method using boundary elements and finite elements. Prof. Matsumoto also has wide experience in the seismic design of raft and piled raft foundations. Prof. Matsumoto is one of the authors of the computer software PRAB—Piled Raft Analysis with Batter Piles. With this software piled raft foundation can be analyzed with vertical and horizontal loads as well as moment. The co-editor Prof. Der Wen Chang is currently a Professor at the Tamkang University in Taiwan. Prof. Chang recerived his Doctoral Degree from University of Texas at Austin in 1991. His research interests are in soil-structure interaction, earthquake geotechnical engineering and soil dynamics. Prof. Chang is a valuable member of the Chinese Geotechnical Society in Taipei serving as Secretary General; he also played a key role in the 17th Southeast Asian Geotechnical Conference held in Taipei in May 2010.

The contributing authors in this issue are :Kiyoshi Yamashita**,** Junji Hamada and Takeshi Yamada; K. Watanabe**,** H. Sei, T. Nishiyama and Y. Ishii; N. Suzuki and T. Seki; K. Matsuzawa and T. Matsumoto; Suriyah Thongmunee**,** Shun-ichi Kobayashi and Tatsunori Matsumoto ; Ching-Han Yu; Bengt H. Fellenius ; H.G. Poulos, J.C. Small and H. Chow ; and Ahmad Abdelrazaq, Frances Badelow, Sung Ho-Kim, and Harry G. Poulos.

Special thanks are due to Prof. Harry G Poulos for his valuable advice and participation in the review of most of the papers; each paper is reviewed at least by two other reviewers. No doubt the papers contained in this issue will be of great interest to those in practices as well as in teaching and research. On behalf of the Association of Geotechnical Societies in Southeast Asia, the Southeast Asian Geotechnical Society and the Editorial Panel of the Geotechnical Engineering Journal, we express our sincere gratitude to the Editors Prof. Tatsunori Matsumoto, Prof. Der Wen Chang, Prof. Harry G. Poulos and the contributing authors and reviewers.

K.Y. Yong

D.T. Bergado

T.A.Ooi

A.S.Balasubramaniam

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Guest Editor: Tatsunori Matsumoto

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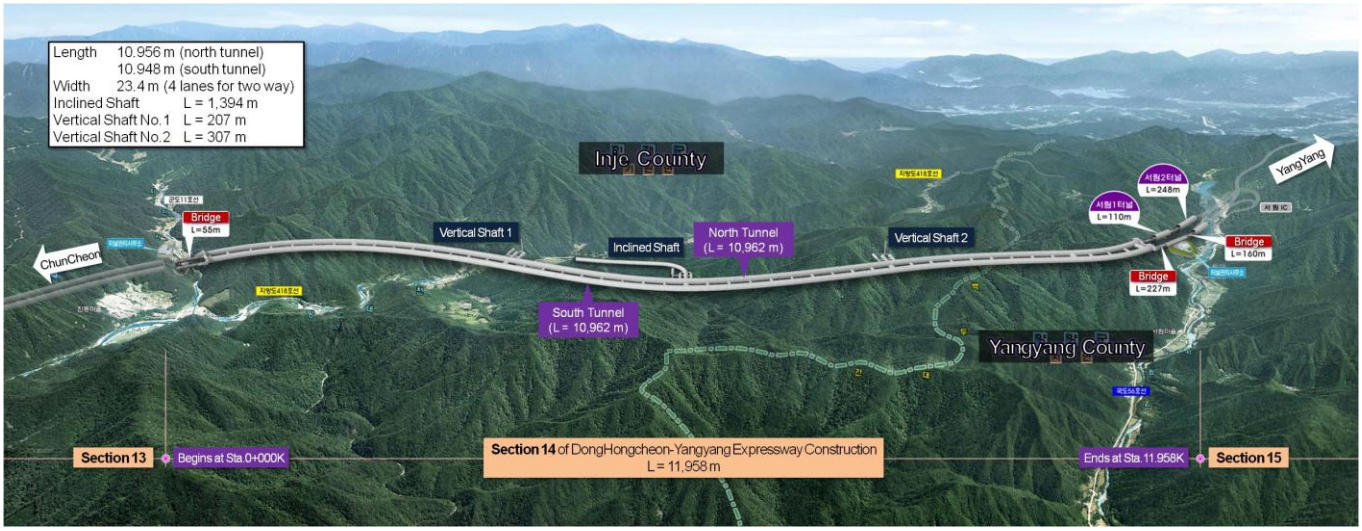
Guest Editor:
Prof. Chang Yu Ou



GEOTECHNICAL ENGINEERING

SEPTEMBER 2011 ISSUE ON DEEP EXCAVATIONS

Prof. Chang-Yu Ou
Guest Editor

This special issue has papers from China, Taiwan, Bangkok, Hong Kong, Singapore etc.

Prof. Chang-Yu Ou received his Bachelor's Degree in Engineering in 1977 from National Cheng-Kung University in Taiwan and his Masters and Doctoral Degrees from Stanford University in 1984 and 1987 respectively. He has focused on studies of soil behaviour and excavation problems since beginning to teach in a university and has published many journal and conference papers concerning the subjects. At the same time, working with industrial builders, he has also taken part in many large-scale excavation projects and accumulated experience in analysis and design. Supported by study results and analysis experience, he has opened a course on deep excavation at the university.

He is currently the Dean of engineering at the National Taiwan University of Science and Technology, Taipei, Taiwan. He was also the Director of Ecological and Hazard Mitigation Engineering Research Center of the National Taiwan University of Science and Technology, Taipei, Taiwan. He was also a Visiting Professor at University of California, Berkeley. His areas of interest are deep excavations, soil behaviour, soft ground tunnelling and ground improvement.

GEOTECHNICAL ENGINEERING

PREFACE

Asia currently is the most fast growing area in economy. Many high rise buildings and infrastructures including subway tunnels in urban areas and mountain tunnels connecting cities are under construction. Some of them are extraordinary in terms of scale and construction difficulty. The strength and stress-strain behavior of soils are seriously considered and monitoring systems are comprehensively implemented in projects. Therefore, as a guest editor of this special issue featuring the urban geotechnical construction, I am very happy to have the papers from distinguished investigators from China, Korea, Singapore and Taiwan. Many thanks for their contribution.

This special issue covers some important aspects of urban geotechnical construction. One of the biggest issues for underground construction in a densely built-up urban environment is the potentially adverse impact on buildings adjacent to deep excavations. Thanks for Mr. Goh and Prof. Mair who present the influence of building stiffness in the assessment of adjacent building safety. Excavation instability sometimes causes catastrophic collapse of the projects. Prof. Zheng and his group introduce the concept of redundancy into the design of retaining structure and develop a design methodology based on the concept of redundancy. Prof. Jeng and his colleagues give a very interesting case study of the largest excavation in Shanghai soft clay. In urban areas, excavations may have a significant impact on the stress and deformation of existing tunnels. Several construction techniques have been developed to reduce the movement of excavations in soft clay. Prof. Wang and his group made a comprehensive study of the effectiveness of these different methods and the interactive impact of the two adjacent excavations in Shanghai soft clay on the crossing tunnel using the numerical method. In the past studies of ground movement induced by deep excavations mostly focus on those due to main excavation, for example, excavation of soil, dewatering, strut installation and demolish and so on. Ground movement induced by diaphragm wall construction is seldom taken into account. Prof. Ou and his group present the behavior of ground movement induced by construction of diaphragm wall based on the monitoring results of the construction of the Taipei metro system. The envelope due to diaphragm wall construction is established in the paper. In the traditional pneumatic caissons, workers have to conduct excavation inside the working chamber under high pressure, temperature, and humidity while in the new pneumatic caissons, soil excavation and removal are completed by remotely controlled equipments. Prof. Peng and his colleagues report the monitored results for the new pneumatic caisson conducted in Shanghai soft clay and numerical approach considering the soil disturbance during construction. The agreement between field monitoring and numerical analysis results are discussed. In densely popular cities, construction of underground tunnels should be kept minimal impact on existing buildings. Instead of shield machines, use of hydraulic jacks to push pipes through the ground is an economic and minimal impact on the existing buildings. Prof. Ding and his coworkers introduce the technologies of pipe-jacking methods to reach micro disturbance to existing buildings. Inje Tunnel, an 11 km-long twin-tunnel, still under construction, will be the longest road tunnel in Korea. Director Cho introduces the details of the tunnel design, including geotechnical consideration, cross-section of the excavation, reinforcement, drainage, ventilation operation, safety facility corresponding with a tunnel fire, and portal planning.

Finally, I would like thank all of the reviewers, who gave excellent and in-depth reviews on the papers. Thanks to the editor-in-chief, Prof. Balasubramaniam, for his gracious invitation as the guest editor of this special issue.

Prof. Chang Yu Ou
Guest Editor

GEOTECHNICAL ENGINEERING

ACKNOWLEDGEMENT

This September Issue of the Journal is on Urban Geotechnical Construction. This Issue has papers from China, Korea, Singapore and Taiwan. The Guest Editor of this Issue is Prof. Chang Yu Ou, who received his Bachelor's Degree in Engineering in 1977 from National Cheng-Kung University in Taiwan and his Masters and Doctoral Degrees from Stanford University in 1984 and 1987 respectively. Prof. Ou has focused on studies of soil behaviour and excavation problems since beginning to teach in a university and has published many journal and conference papers concerning the subjects. At the same time, working with industrial builders, he has also taken part in many large-scale excavation projects and accumulated experience in analysis and design. Supported by study results and analysis experience, he has opened a course on deep excavation at the university. He is currently the Dean of engineering at the National Taiwan University of Science and Technology, Taipei, Taiwan. He was also the Director of Ecological and Hazard Mitigation Engineering Research Centre of the National Taiwan University of Science and Technology, Taipei, Taiwan. He was also a Visiting Professor at University of California, Berkeley. His areas of interest are deep excavations, soil behaviour, and soft ground tunnelling and ground improvement. We are most grateful to have such an eminent person as Prof. Ou to be the Guest Editor of this Issue.

There are eight technical papers from: K.H. Goh and R.J. Mair; G. Zheng, X.S. Cheng, Y. Diao, and H.X. Wang; Y. M. Hou, J. H. Wang and D-S. Jeng; J. J. Chen, J. H. Wang, G. W. Xiang, S. L. Wen, and Y. Du ; C.Y. Ou and L.L. Yang; F.L. Peng and H.L. Wang; W. Q. Ding, B. Li, S. L. Yuan and J. K. Ge; S. M. Cho, S. D. Lee, and Y. J. Kwon. We are confident that this special issue would be of great interest to all those who are interested in urban geotechnical construction. The most valued help and the untiring efforts and meticulous work of the Guest Editor Prof. Chang Yu Ou and the authors are gratefully acknowledged.

K.Y. Yong
D.T. Bergado
T.A.Ooi
A.S.Balasubramaniam

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GEOTECHNICAL ENGINEERING

Special Issue on DEEP EXCAVATIONS

Guest Editor: Prof. Chang-Yu Ou

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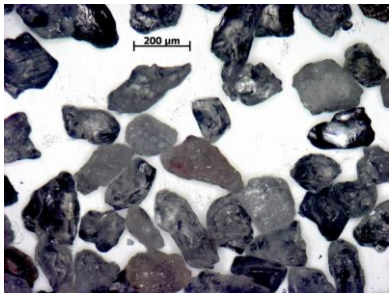
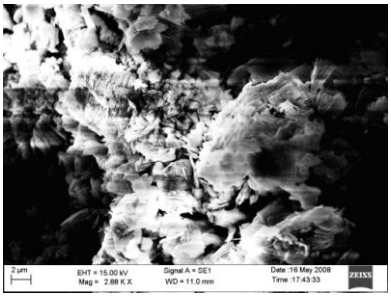
Dr. Dariusz Wanatowski



50 x SEM Image of a Sand (after Georgiannou, 2011)



SEM Image of Residual Soil of Singapore Bukit Timah Granite, (after Meng & Chu, 2011)

Local small strain measurement systems (after Ibraim *et al*, 2011)

Hollow Cylindrical Torsional Apparatus (after Ibraim *et al*, 2011)

GEOTECHNICAL ENGINEERING

DECEMBER 2011 ISSUE ON SOIL BEHAVIOUR

Dr. Dariusz Wanatowski
Guest Editor

Dr Dariusz Wanatowski is currently a lecturer in the Nottingham Centre for Gemechanics at the University of Nottingham in the United Kingdom.

Dr Wanatowski obtained his Master's Degree in Civil Engineering in 1999 from the Poznan University of Technology (PUT) in Poland and his Doctoral Degree in Geotechnical Engineering in 2006 from Nanyang Technological University (NTU) in Singapore. Prior to joining the University of Nottingham in February 2006, he worked as a lecturer and researcher in PUT in Poland and NTU in Singapore, respectively. In 2010, he was a Visiting Fellow at the University of New South Wales at Australian Defence Force Academy in Canberra and a Visiting Lecturer at NTU in Singapore. Most recently, in October 2011, he was also a Visiting Professor at University of Bologna in Italy.

Dr Wanatowski's general research interests are focused on experimental geomechanics, particularly strain softening and instability behaviour of granular soils, strain localization in sands, strength and stiffness anisotropy of geomaterials, and effects of intermediate principal stress on the strength and deformation characteristics of soils. He has published several journal and conference papers on these subjects. He has also consulting experience in the areas of advanced laboratory and in situ testing of soils.

Dr Wanatowski is a Member of two Technical Committees of the International Society for Soil Mechanics and Geotechnical Engineering, TC-208 on Stability of Natural Slopes and TC-303 Coastal and River Disaster Mitigation and Rehabilitation. He is a Member of American Society of Civil Engineers, Institution of Civil Engineering, Southeast Asian Geotechnical Society and Polish Geotechnical Society. He also serves as an Honorary Secretary for the East Midlands Geotechnical Group in the British Geotechnical Association.

GEOTECHNICAL ENGINEERING

PREFACE

Despite a remarkable research progress made in the last few decades in various aspects of geomechanics, understanding of soil as an engineering material is still a very challenging task. Consequently, our ability to model and predict the behaviour of geomeaterials in slopes, foundations, and earth structures is still limited. On the other hand, an enormous improvement in technical capabilities of soil mechanics laboratories in last few years allows researchers and engineers to investigate soil behaviour with greatest ever accuracy. As a result, advanced laboratory soil testing is more frequently used in geotechnical practice. For example, an accurate measurement of small strain stiffness is essential in the analysis of many geotechnical problems.

This Special Issue covers some very interesting aspects of soil behaviour and includes papers from Poland, Singapore, United States, Greece, Japan, Hong Kong, United Kingdom and Hungary. The Issue starts with the contribution of Prof. Sawicki from the Institute of Hydro-Engineering in Poland. His paper discusses possible links between pre-failure instability behaviour of sand and plastic dilation. The analysis presented by Prof. Sawicki is supported by high-quality experimental data obtained from triaxial compression tests. The second paper is written by Dr Meng from the University of Wollollong in Australia and Prof. Chu from Nanyang Technological University, who has recently taken up the Chair in Geotechnical Engineering at the Iowa State University in the United States. The authors present an experimental study on strength anisotropy of the intact residual soil of Bukit Timah granite in Singapore. The results obtained from K_0 consolidated undrained triaxial and simple shear tests carried out on specimens cut from large blocks of undisturbed samples are used to discuss the effects of inherent and induced anisotropy on the strength parameters of the residual soil in Singapore. Prof. Lade from the Catholic University of America in the United States and Dr Wang, his former PhD student at the Johns Hopkins University, present their work on shear banding in sand. The authors discuss several series of true triaxial tests performed on cubical and rectangular prismatic specimens of Santa Monica Beach sand. The analysis carried out by Prof. Lade and Dr Wang indicates that the occurrence of the critical conditions for shear banding in sand may be delayed in short specimens. The authors suggest that true triaxial experiments should be performed on tall specimens in which the shear banding occurs freely and strain softening behaviour is more pronounced. A very interesting study on behavioural patterns of fine sands is presented by Prof. Georgiannou from the National Technical University of Athens in Greece. In her paper, Prof. Georgiannou presents several series of hollow cylinder, triaxial compression and extension tests. She discusses the influence of various parameters such as particle shape, grading, addition of fines, consolidation history, stress level and loading conditions on the undrained behaviour of sand. Next paper of the Issue is written by Prof. Shibuya from Kobe University in Japan and his former researcher, Dr Jung, currently with the Korean Institute of Construction Technology. They discuss the effects of strain rate on undrained shear behaviour of seabed Holocene clay from the Kobe airport based on a few series of triaxial compression and extension tests carried out with different shearing rates. Prof. Yin and Mr Tong from the Hong Kong Polytechnic University together with Prof. Zhu from Wuhan University of Technology in China present an experimental investigation on sedimentation and self-weight consolidation behaviour of marine deposits from Hong Kong carried out in settling columns. Dr Ibraim and his colleagues from the Bristol University in the United Kingdom present their new hollow cylinder torsional apparatus equipped with an accurate strain measurement system. The authors demonstrate that their hollow cylinder apparatus is capable of measuring soil's stiffness in a wide range of strains and stresses. Two of my PhD students at the University of Nottingham and I contribute to the Special Issue with a paper on laboratory investigation of fibre reinforced sand at high pressures. We discuss results of drained compressions tests carried out in a high pressure triaxial cell and demonstrate that the effectiveness of fibre reinforcement at high confining pressures is very limited. Finally, Prof. Imre from Szent Istvan University and Budapest University of Technology and Economics in Hungary with her colleagues presents a technical note discussing the ratio of the maximum and minimum dry density for sands.

As a Guest Editor of this Issue I would like to thank all the authors for their valuable contributions. I would also like to thank the Editorial Team of the Journal for inviting me to edit this Special Issue. Last but not least, I would like to thank all the reviewers for assessing the papers in a timely and thorough manner. Their excellent assistance is greatly appreciated.

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Guest Editor
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GEOTECHNICAL ENGINEERING

ACKNOWLEDGEMENT

This December Issue of the Journal is on Soil Behaviour and include papers from well known researchers as drawn from Poland, Singapore, United States, Greece, Japan, Hong Kong, United Kingdom and Hungary.

The Guest Editor of this Issue is Dr. Dariusz Wanatowski from the Nottingham Centre for Gemechanics at the University of Nottingham in the United Kingdom. Dr Wanatowski's general research interests are focused on experimental geomechanics; particularly strain softening and instability behaviour of granular soils, strain localization in sands, strength and stiffness anisotropy of geomaterials, and effects of intermediate principal stress on the strength and deformation characteristics of soils. He has published very widely in most well known journals in Geotechnics and the major conferences held on soil behaviour and its role in geotechnical engineering research and practice. Dr Wanatowski obtained his Master's Degree in Civil Engineering in 1999 from the Poznan University of Technology (PUT) in Poland and his Doctoral Degree in Geotechnical Engineering in 2006 from Nanyang Technological University (NTU) in Singapore. Prior to joining the University of Nottingham in February 2006, he worked as a lecturer and researcher in PUT in Poland and NTU in Singapore, respectively. In 2010, he was a Visiting Fellow at the University of New South Wales at Australian Defence Force Academy in Canberra and a Visiting Lecturer at NTU in Singapore. Most recently, in October 2011, he was also a Visiting Professor at University of Bologna in Italy.

Dr Wanatowski is a Member of two Technical Committees of the International Society for Soil Mechanics and Geotechnical Engineering, TC-208 on Stability of Natural Slopes and TC-303 Coastal and River Disaster Mitigation and Rehabilitation. He also serves as an Honorary Secretary for the East Midlands Geotechnical Group in the British Geotechnical Association. Dr Wanatowski is a Member of American Society of Civil Engineers, the Institution of Civil Engineers London, and the Southeast Asian Geotechnical Society and the Polish Geotechnical Society.

The nine technical contributions in this issue are from: A. Sawicki G. Meng and J. Chu ;P.V. Lade and Q. Wang V.N. Georgiannou M.-S. Jung and S. Shibuya; F. Tong, J.H.Yin and G.F. Zhu ; E. Ibraim, P. Christiaens and M. Pope ;S. Ud-din, A. Marri and D. Wanatowski ; and E. Imre, S. Fityus, E. Keszeyne and T. Schanz. Soil Behaviour is a most important topic in Geotechnical Engineering and the material contained here from these authors would be of great value to all those who are engaged in geotechnical engineering practice and research. Dr. Dariusz Wanatowski, the guest editor is thanked for his untiring efforts and meticulous work which made this special issue to be possible and released well in time.

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