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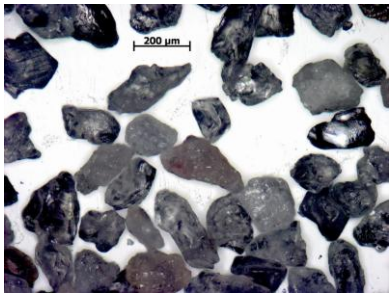
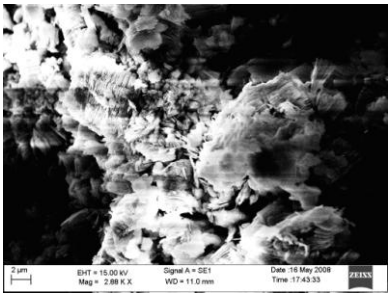
Guest Editor:
Dr. Dariusz Wanatowski



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)

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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.

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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.

Dariusz Wanatowski,
Guest Editor
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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.

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

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Special Issue on Soil Behaviour
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