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GEOTECHNICAL ENGINEERING

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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.

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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

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Cover Photograph: Rehabilitation of Railway Line Cut Slope Failure Using Geosynthetics, Malaysia.

Paper Contributions

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