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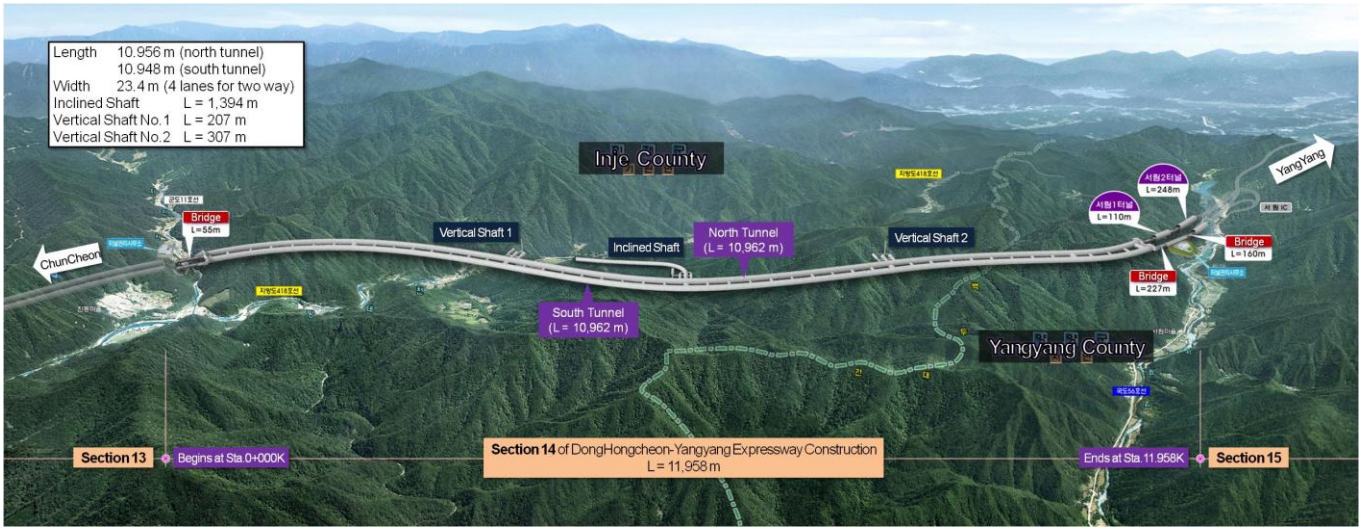

GEOTECHNICAL ENGINEERING

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.

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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

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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.

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