Editorial

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We are privileged to be invited by Prof Pedro Pinto (Editor-in-Chief) and Prof Dimitrios Zekkos (Founder and Managing Director) to edit a special issue for the ISSMGE International Journal of Geoengineering Case Histories (IJGCH).

The purpose of this special issue is to provide an overview of geotechnical challenges in Singapore through a range of representative projects involving piles, tunnelling, excavation and seawall construction. Project sites cover a wide range of geology such as residual soils derived from igneous rocks of granitic composition (Bukit Timah Granite), sedimentary rocks (Jurong Formation), semi-hardened quaternary alluvial deposits (Old Alluvium) and marine clays (Kallang Formation).

The invited papers appearing in this special issue were significantly expanded versions of short conference papers presented in recent bi-annual conferences organised by the Geotechnical Society of Singapore (GeoSS). They include the International Symposium on Advances in Foundation Engineering (ISAFE2013), 5-6 Dec 2013 and International Conference on Soft Ground Engineering (ICSGE2015), 3-4 Dec 2015. GeoSS has a membership consisting of 207 active individual members and 17 corporate members (http://www.geoss.sg). The society has been very active in engaging both practicing geotechnical engineers and academics with frequent workshops and seminars by invited local and overseas speakers including reprises of Rankine Lectures to keep the community well-informed of latest geotechnical know-hows. We are grateful to GeoSS and the organising committees of ISAFE2013 and ICSGE2015 for their support of this special issue.

The first paper by Cham WM discussed two comprehensive case histories on the performance of piles of 200 buildings located within the influence of tunnelling of 3 subway lines. More than 3600 building settlement markers and the resulting pile head settlements due to tunnelling were compared with the surrounding ground surface movements. Results of full-scale instrumented piles subjected to the effect of tunnelling were also presented. In addition, tunnel influence zone charts were developed to serve as useful guides for practising engineers undertaking similar tunnelling works in Singapore.

Goh KH et al. discussed the effects of bored tunnelling below existing buildings. Conventionally, subway tunnels are conveniently constructed below roadways to avoid deep foundations of buildings, however, as the subterranean space becomes congested, tunnels have been constructed directly below buildings. Such trends are increasingly prevalent in many urban cities worldwide. In this paper, case studies 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 would serve as useful references in the design of future bored tunnelling works and give greater confidence that tunnelling directly below buildings is feasible without affecting the buildings so long as appropriate tunnelling controls are in place to mitigate ground deformation.

Senthilnath GT and Velu D presented a paper on stacked tunnelling induced surface settlements in soft soil conditions. Although significant studies have been carried out to study settlements induced by side-by-side twin tunnels, settlement prediction of stacked tunnelling is relatively limited. With extensive data from instrumentation records, the stacked

Reference: Chian, S. C., and Phoon, K. K. (2016). Editorial. International Journal of Geoengineering Case Histories, http://casehistories.geoengineer.org, Vol.3, Issue 3, p. 126 - 127. doi: 10.4417/IJGCH-03-03-00.

tunnelling induced settlements were back-analysed with numerical simulation and compared with empirical equations. The outcome of this paper promises to be a useful reference for future settlement predictions in similar soil ground conditions.

Coastal engineering is also a key focus in Singapore's continual development as a port nation with the marine industry contributing about 7% to the nation's GDP. Soh KK et al. discussed a case study of high cantilever seawall constructed in soft clay with thickness between 15m to 32m. In view of the 44m rotating height of the seawall, an integrated strong box was proposed and constructed to resist the very high active force. The force and deflection records were presented with significant interpretation of the likely structural and geotechnical factors of safety.

In contrast to the earlier papers, Zhang W and Goh ATC's paper focused on the behaviour of braced deep excavation of a subway station in residual soils in Bukit Timah Granite. Information such as ground settlement profiles, wall deflection profiles, strut loads and ground water monitoring records were analysed with the timeframe of the construction activities and remedial measures undertaken which makes this paper extremely instructive. Moreover, the measured wall deflections and ground surface settlements were compared with empirical methods and charts from the literature to provide an insight of excavation challenges in similar residual soils.

We are grateful to the authors for their generous contributions and patience during the review process. Our heartfelt thanks also go to the dedicated reviewers for their useful comments. We would also like to acknowledge the immense support from the IJGCH journal office, Prof Pedro Pinto (Editor in Chief), Prof Dimitrios Zekkos (Founder and Managing Director) and Mr. Kostis Tsantilas (Administrator) who have made this issue possible.

Sincerely,

Guest Editors for Special Issue on Geotechnical Challenges in Singapore
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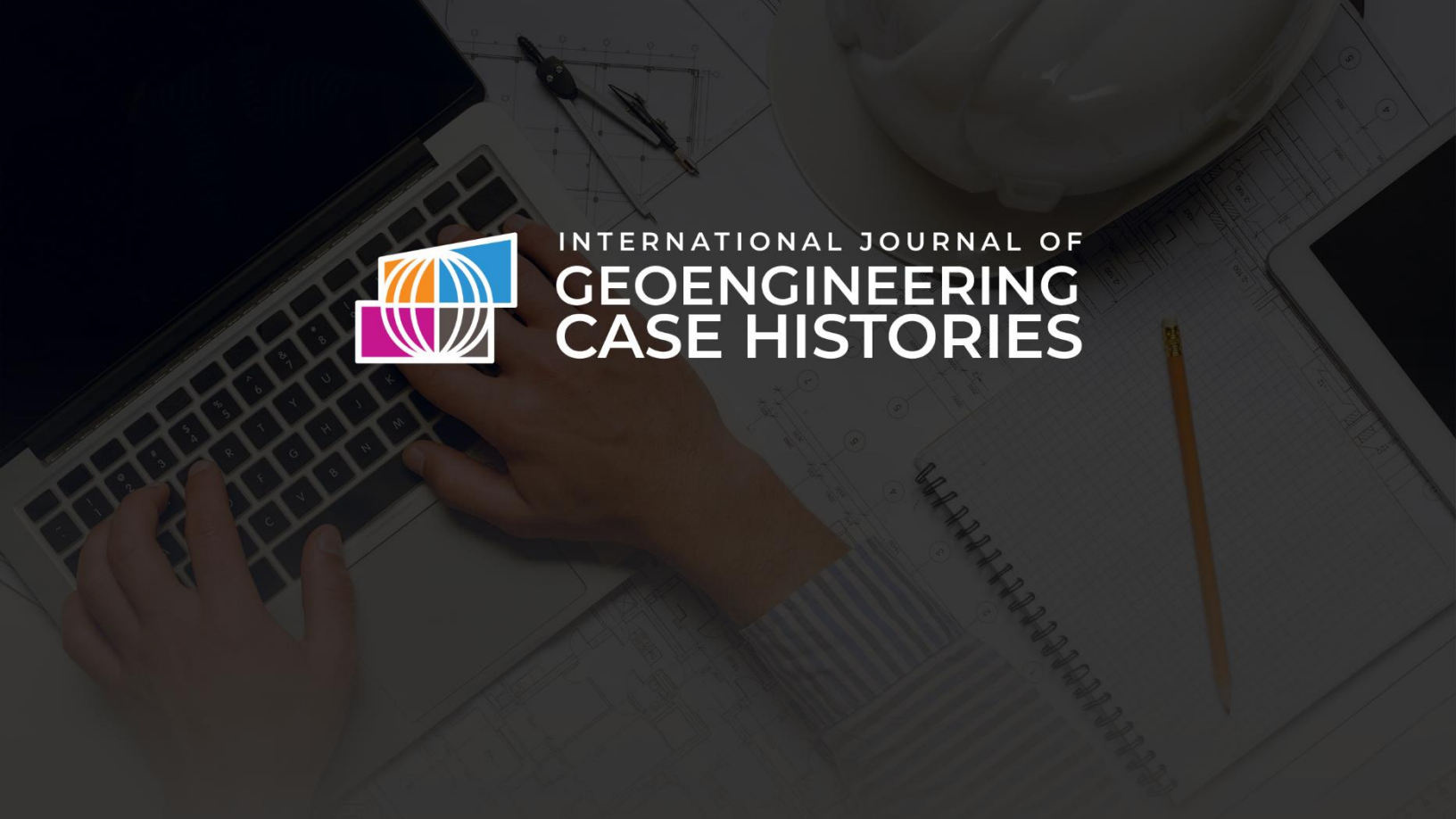
Cham, W. M. (2016). Singapore Case Histories on Performance of Piles Subjected to Tunnelling-Induced Soil Movement. International Journal of Geoengineering Case Histories, Volume 3, Issue3, pp. 128-148, Paper ID: IJGCH_3_3_1

Goh, K. H., Ng, S. S. G., and Wong, K. C. (2016). Case Histories of Bored Tunnelling Below Buildings in Singapore Downtown Line. International Journal of Geoengineering Case Histories, Volume 3, Issue 3, pp. 149-161, Paper ID: IJGCH_3_3_2

Senthilnath, G. T., and Velu, D. (2016). Stacked Tunnelling Induced Surface Settlements in Soft Soil. International Journal of Geoengineering Case Histories, Volume 3, Issue 3, pp. 162-175, Paper ID: IJGCH_3_3_3

Soh, K. K., Wai, T.T., Yeo, L., and Lim, P. K. (2016). Reclamation and Safety of High Cantilever Strong Box Pipe Pile Seawall in Marine Clay. International Journal of Geoengineering Case Histories, Volume 3, Issue 3, pp. 176-189, Paper ID: IJGCH_3_3_4

Zhang, W., and Goh, A. T. C. (2016). General Behaviour of Braced Excavation in Bukit Timah Granite Residual Soils. International Journal of Geoengineering Case Histories, Volume 3, Issue 3, pp. 190-202, Paper ID: IJGCH_3_3_5



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