Geotechnical Engineering
Volume 168 Issue GE2

Editorial
Buttling

ice | proceedings

Proceedings of the Institution of Civil Engineers
Geotechnical Engineering 168 April 2015 Issue GE2
Pages 101–102 http://dx.doi.org/10.1680/geng.2015.168.2.101

ice
Institution of Civil Engineers
publishing

Editorial

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After a few years on the editorial advisory board, this is my first try at writing an editorial. I represent the minority on the panel, as a non-academic who struggles to make the time to write technical papers. Nevertheless we do our best to keep the content interesting to all of our readers, especially those engaged in industry, and we encourage your feedback. The peer-review process is intended to make sure that the content of papers is technically correct, but it does not mean that we all necessarily agree with the views expressed. It is often said that if you put three geotechnical engineers in a room you can get at least four opinions, so there will be times when you want to challenge what has been written. Please do so, as the authors will be given a right of reply, without challenge they may incorrectly feel that their views are universally held.

Having said that, I think we have an interesting selection of seven papers in this issue. They are arranged in some sort of progression, so start off with a paper related to ground investigation. Those of you familiar with soft cohesive soils, which cover large parts of the surface of the earth near the estuaries where we like to build our cities, will be aware of the development of full flow penetrometers, especially balls and T-bars, to enhance the data produced by the cone penetrometer test. The paper by Nguyen and Chung (2015) describes some very interesting tests in Busan Clay, carried out with a range of ball diameters, all mounted on the end of shafts of 43·7 mm diameter, which gave shaft to ball area ratios varying between 1 and 0·1. They compared their results with CPTu and field vane results, as well as with results from some Japanese clays and from numerical analyses, and carried out interesting cyclic load tests over multiple cycles. Their findings should enhance the understanding of this very useful test.

Cyclic response is also described in the second paper, by Chen *et al.* (2015), but this time the response of monopiles, which appear to be a common form of foundation for offshore wind turbines. Clearly these are subjected to many cycles of dynamic load in their lifetime, and it is essential to understand the progressive movement in order to produce safe yet economic designs. They applied different magnitudes of moment to a 1g model pile in two different densities of Qiantang River Silt, applying 5,000 to 10,000 cycles, and determined that for their model tests the elastic response steadily increased from about 50 to 95% of the total displacement.

Piling is also the subject of the paper by AbdelSalam *et al.* (2015), but this time large diameter bored piling in Egypt. The authors have collated a database of pile test results, over 300 in total from 19 different localities, and have applied statistical methods to determine appropriate resistance factors, for use in load and resistance factor design in the same manner that Paikovsky (2004) did for the National Transportation Research Board in the USA. It is a considerable extension of the type of database referred to by Galbraith *et al.* (2014), and it is assumed that this database, called EGYPT in which the final PT stands for pile test, is available to all who need to access it. I recall that, nearly 40 years ago, the late Dr Ken Fleming told me that studying results of test piles carried out by others was a waste of time, as so many tricks could be played if you were not there to see! I believe that, with modern systems applied to pile testing and instrumentation, there is less opportunity for distorted results, and a great deal of useful information in an instrumented pile test, such as the rate of mobilisation of shaft friction, or t-z curve, which can be extracted and used to enhance design.

The fourth paper involves a very common form of ground improvement, in which an embankment is built over rigid inclusions. The ability of the embankment to span between caps on the rigid inclusions is an integral part of the design, especially economical design, and the work of Zhuang and Cui (2015) to build on the earlier work of Hewlett and Randolph (1988) will be useful in advancing the design methods. The analyses involve consideration of 3D effects, which show the previous 2D analysis of Hewlett and Randolph to be conservative, as might be expected, and also provide interesting comparisons with filed and model studies, which show the new method to be very near the line.

Our fifth paper, by Melnikova *et al.* (2015), is about an instrumented trial embankment built to failure. This has been widely published elsewhere, but the current paper concentrates on the instrumentation, and its ability to predict the onset of stability. The use of the data in artificial intelligence, and of finite element modelling to test the software, is also interesting.

Finally, we have included a paper about embodied energy in underground railway construction (Hon *et al.*, 2015). This concept has had a slow take up generally, although it appears to be considered more in UK. The comparisons between different tunnel construction methods, between tunnels and bridges, and between tunnels and other buildings are thought provoking.

Please enjoy reading this issue, and write in a discussion piece about anything you disagree with or want to query further.

REFERENCES

AbdelSalam SS, Baligh FA and El-Naggar HM (2015) A database to ensure reliability of bored pile design in Egypt. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 131–143, http://dx.doi.org/10.1680/geng.14.00051.

Chen RP, Sun YX, Zhu B and Guo WD (2015) Lateral cyclic pile-soil interaction studies on a rigid model mono-pile. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 120–130, http://dx.doi.org/10.1680/geng.14.00028.

Galbraith AP, Farrell ER and Byrne JJ (2014) Uncertainty in pile resistance from static load tests database. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **167(5)**: 431–446, http://dx.doi.org/10.1680/geng.12.00132.

Hewlett WJ and Randolph MF (1988) Analysis of piled embankments. *Ground Engineering* **21(3)**: 12–18.

Hon RJ, Kwok CY and Lee THL (2015) Embodied energy evaluation for the Hong Kong MTR South Island line. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 172–186, http://dx.doi.org/10.1680/geng.13.00131.

Melnikova N, Jordan D, Krzhizhanovskaya V and Sloot P (2015) Numerical prediction of the IJkDijk trial embankment failure. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 158–171, http://dx.doi.org/10.1680/geng.14.00040.

Nguyen TD and Chung SG (2015) Effect of shaft area on ball resistances in soft clays. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 103–119, http://dx.doi.org/10.1680/geng.14.00023.

Paikovsky SGB (2004) *Load and Resistance Factor Design (LRFD) for Deep Foundations*. Transportation Research Board, Washington DC, USA, NCHRP-507.

Zhuang Y and Cui XY (2015) Analysis and modification of the Hewlett and Randolph method. *Proceedings of the Institution of Civil Engineers – Geotechnical Engineering* **168(2)**: 144–157, http://dx.doi.org/10.1680/geng.14.00014.