Editorial

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I welcome you to the last issue of 2016. At the end of the year it is appropriate for me, as honorary editor of *Geotechnical Engineering* and Chairman of its Editorial Advisory Panel, to review what has been achieved during the past year and look forward to what is planned for the coming year. During 2016, a total of 42 papers have been published together with four discussion contributions and four book reviews. The journal aims to publish high quality, topical and relevant technical papers covering all aspects of geotechnical research, design, construction and performance. It also aims to be of interest to those civil, structural or geotechnical engineering practitioners wishing to develop a greater understanding of the influence of geotechnics on the built environment. Looking at all the papers published in the journal this year, they certainly fulfil that aim. It is also interesting to note that, like last year, almost 50% of the papers were concerned with piles or retaining walls, reflecting the importance of these structures for geotechnical engineers.

As in recent years, a themed issue was published. This themed issue was on 'innovation in deep foundation design and construction' and was championed by Christopher Parks and John Gannon. It was published as a bumper issue with 11 papers in Issue 2 in April. The themed issue for 2017 is 'geotechnics in energy provision' and is being championed by Anh-Minh Nguyen Anthony Leung.

This issue contains six full papers, all of which have practical relevance, plus a discussion and a book review. The first four papers are concerned with aspects that are increasing in importance for geotechnical engineers. These are the monitoring of deformations and settlements to verify geotechnical designs and a design approach and an innovative device to control and limit total and differential foundation settlements.

In the first paper, Schwamb *et al.* (2016) describe a large-scale monitoring scheme involving inclinometers and extensometers installed in the diaphragm wall and boreholes around a deep shaft in London, UK, to measure ground movements. The very small ground movements measured around the shaft showed that empirical ground settlement prediction methods derived from different shaft construction methods significantly overestimate settlements for a diaphragm wall shaft. The authors anticipate the finding in this paper will help inform the designers of future projects in London and elsewhere with deep shafts constructed adjacent to existing superstructure.

It is significant that an earlier paper by Schwamb *et al.* (2014) describing the fibre optic monitoring of a deep circular excavation on the same project is currently one of the journal's most frequently downloaded articles.

The second paper by Nie *et al.* (2016) is also concerned with monitoring. It describes a monitoring method involving resistance-type strain gauges to study the behaviour of prestressed high-strength concrete pipe piles supporting a bridge subject to static loads and cyclic loads induced by high-speed trains. This method is shown to be inexpensive, reliable and promising for cyclic loading. The authors found that the bridge settlements due to dynamic loading were significantly lower than those due to working static loads and hence have concluded that the monitoring study provides important technical information for the design of pile foundations supporting high-speed railway bridges.

The third paper by Wu *et al.* (2016) is also concerned with the foundations of a bridge for a high-speed railway. In this paper, the authors present a novel foundation system consisting of rectangular closed diaphragm walls, which provides an efficient system for controlling the bridge settlement. The authors develop a model to predict the settlements of a bridge with such a foundation that are shown, by means of a case study, to agree with measured settlements.

The fourth paper by Zhou *et al.* (2016) introduces an innovative device, called a deformation adjuster, to improve the performance of piled raft foundations supporting high-rise buildings. This device, which is placed between the top of a pile and a raft foundation, consists of outer circular steel rings nested inside shorter circular rings with the spaces between the rings filled with nitrile rubber, as shown in Figure 1. This device allows the applied load to be taken up first by the taller rings and then by the shorter rings. By varying the length, thickness, spacing and material of the rings, this device provides a varying stiffness, deformation and load carrying capacity and hence can be used to control the differential settlement of a structure.

The paper by Mickovski *et al.* (2016) is also innovative as it describes the use of hollow bar self-drilled soil nails that have been developed recently as an alternative to the traditional solid steel tendons installed into a pre-drilled hole and then grouted. The advantage of this new system are that it allows

Figure 1. Internal configuration of a deformation adjuster (reproduced from Zhou *et al.* (2016))

these nails to be installed in most ground conditions using small, relatively lightweight rigs and much more quickly than with the traditional method. The authors state that current codes should be updated to include requirements for design and testing applicable for hollow bar self-drilled nails. This certainly should be considered by the relevant CEN committees preparing geotechnical testing standards and the revised version of Eurocode 7.

The last paper by Lee *et al.* (2016) examines the effect of sampler fixity conditions on the quality of the retrieved samples. This is an important issue as Part 2 of Eurocode 7 (CEN, 2007), the European standard for geotechnical design, specifies that samples should have a certain quality in order to determine particular geotechnical parameters. The authors have concluded from their research that the fixity of the samples is a minor factor influencing sample quality while soil fabric, including holes, nodules, roots and shells, was found to significantly affect sample quality.

Following the last paper there is an interesting discussion contribution by Blackmore, Bux and Smith (O'Leary *et al.*, 2016b) on the paper by O'Leary *et al.* (2016a). In this discussion, it is asked if the small measured deflections near the toe of a retaining wall were because the wall was much stiffer than assumed in the design and if the increased deflections at the top of the wall resulted from reduced anchor stiffness. The authors have replied stating that their analysis underestimated the soil stiffness and models typically used in industry assume a linear elastic stiffness. They suggest an improved model would sub-divide the soil into layers and assume an increase in stiffness with depth. With regard to the increased deflections at the top of the wall, they contend that there is no evidence due to reduction in the performance of the anchors, which they demonstrated were not overloaded. They also point out that such walls tend to be designed on the basis of moderately conservative design parameters rather than most-probable parameter values.

If you would like to raise any points regarding these papers, please consider contributing a discussion or briefing note.

Instructions on the preparation and submission of discussions, briefing notes and papers are included at the end of each paper. For up-to-date information on *Geotechnical Engineering* and to see articles already published Ahead of Print, please visit <http://www.icevirtuallibrary.com/content/serial/geng>.

I hope you enjoy reading the articles in this issue stimulating and wish you a happy and productive year in 2017.

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