Editorial

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The third issue of Volume 172 of *Geotechnical Engineering* includes seven papers on a variety of topics and a discussion piece on one of them. As I read these papers, I was struck by how many deal with subjects of direct relevance to the practising engineer and it is great to read such industry-focussed output from around the world. Geotechnical engineers solve practical problems using a wide variety of techniques based on a significant body of knowledge, but no approach is so complete that further research is unwarranted. These papers each present new and interesting insights on established subjects, giving the engineer additional options next time a similar problem presents itself.

First up, Massarch and Fellenius (2019) provide a paper on the prediction of settlement of foundations on compacted sand. This really is an everyday problem and it is good to see that there is still fresh work being done on the subject. This paper revisits the tangent modulus method of settlement prediction with the benefit of a case study and presents a comparison between the use of cone penetration and flat dilatometer tests to determine the modulus number.

Another topic of frequent interest to the practising engineer is the chemical stabilisation of soft soils, which is addressed by Correia *et al.* (2019). They start with a series of experiments to determine the relationship between binder content, plasticity, moisture content and strength for Coimbra silt, a soft Portuguese soil. From this they derive an expression for the normalised strength of stabilised Coimbra silt, depending on binder content. Most interestingly they then look at data from a number of other soft soils from around the world from which they are able to derive a generalised equation.

Piling is the subject of the next paper, where Ling *et al.* (2019) study the shaft resistance of pre-bored precast piles in Shanghai clay. These piles are constructed using an auger with an under-reaming tool to give an expanded base, which is used to introduce a cement–soil slurry into the bore as it is withdrawn. The pile is completed by inserting a precast concrete pile into the cement slurry mix. The paper presents the results

of a number of load tests where the precast piles have been instrumented with strain gauges to investigate the distribution of load.

Jin-feng *et al.* (2019) then present an analysis for the assessment of face stability for shield-driven tunnels that can be run simply in a Matlab environment without the complexity of a finite-element or finite-difference approach. Their results are found to compare well with published results using more complex techniques.

The next two papers present the findings of finite-element models for two interesting situations. Yang *et al.* (2019) look at the development of soil arching in piled embankments without reinforcement, which is important in understanding the load transfer from the embankment to the foundation in such systems. A better understanding of the mechanics involved can be used to derive better designs. They use a three-dimensional finite-element model for this problem and conclude that the geometry of the problem, with respect to pile spacing and embankment height, is much more significant than the strength of the fills used for the embankment construction.

Pedro *et al.* (2019) then present a case study of the numerical modelling undertaken for the construction of the Ivens shaft in Lisbon, Portugal, which has some general findings that can be applied to future projects. The analysis includes a simulation of the site history to ensure appropriate ground conditions at the site prior to the shaft construction and also accounts for the effects of the stiffness of existing buildings at the site on the ground around the shaft. This attention to detail was found to be important in acceptably modelling the construction and therefore to predicting the effects of the construction on neighbouring buildings and buried infrastructure.

In the final paper (Torres-Cruz, 2019), which is also the subject of the discussion piece that follows it (Torres-Cruz *et al.*, 2019) presents a paper on critical-state soil mechanics. This paper, which is thorough in its collation of a significant database of soil behaviour, rigorous in its interpretation and

clear in its presentation, derives correlations between the steady-state line and soil index properties for non-plastic soils that are independent of fines content. While primarily of interest to the academic, this work, which tries to develop a method for estimating parameters that are difficult to measure, is likely to be of interest to a wide variety of geotechnical engineers.

These papers cover a range of subjects, but each has something interesting to offer. We hope you find something with which to engage and enjoy.

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