Editorial

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As member of the Editorial Panel of *Geotechnical Engineering*, it is a great pleasure to introduce this issue of the journal. Of course, this would have not been possible without the work of the authors, reviewers and Editorial team. I hope you enjoy reading all contributions as much as I have. They are all of significant practical value, as is customary for the articles in this journal.

The issue includes six articles. The first paper (Arshad *et al.*, 2020) presents the results of 20 permeability tests on compacted soil samples with varying gradations. As a result of statistical analyses, the authors showed that existing empirical correlations for the estimation of the coefficient of permeability (k) varied by up to 500% compared with measured values of k . The authors also showed that the gradation characteristics and void ratio are the most influential parameters on the prediction of k . Hence, a new and more effective model for estimation of k using the characteristic gradation parameter (G_C) was proposed, considering that G_C is a function of gradation characteristics (i.e. d_{10} , d_{30} , d_{50} and d_{60}). The significance of properly estimating the value of k is in many ways highlighted in the second paper by Xie *et al.* (2020). They discussed the use of air injection to create an artificial unsaturated zone with low(er) k with the aim of controlling rises in groundwater level. Their results are presented with reference to the interception ratio (λ), which is a function of the magnitude of decrease in k of the unsaturated and the length of the unsaturated zone. Physical tests (see Figure 1) were used to validate a simple theoretical model. Interestingly, the interception ratio is more influenced by the reducing k than by increasing the length of the unsaturated zone, a result with great practical application.

The next two articles deal with cyclic/seismic loads. The work by Amiri *et al.* (2020) aims to provide guidance to aid the selection filling and emptying rates for silos in order to reduce settlement. They experimentally study the behaviour of saturated clay subject to triangular cyclic loading on a modified oedometer. Their results showed that the magnitude of and time for consolidation settlement decreases are affected by surcharge and cyclic period, while the intensity of static and cyclic

loading only affected the magnitude of settlement, not the time. The work by Adampira *et al.* (2020) used advanced constitutive modelling validated by 1g shaking table tests to assess the seismic behaviour of liquefiable sub-layers and their effect

Figure 1. (a) Schematic illustration of experimental apparatus and (b) experimental flume used on the physical tests by Xie *et al.* (2020) (reproduced from Xie *et al.* (2020); Figure 3)

on ground response. Their results showed that the presence of a liquefied sub-layer can attenuate the resultant forces from the shear stress generated by seismic loads, provide high damping and reduce peak ground acceleration. The liquefied sub-layer provided high damping and caused significant reductions in peak ground accelerations.

The last two articles deal with two relatively common geotechnical structures; cutoff walls and rock-socketed drilled shafts. The paper by Wen *et al.* (2020) uses numerical analysis and in-situ measurements to investigate the behaviour of a concrete cutoff wall built on an alluvium foundation. Their study discussed that the deformation behaviour of a cutoff wall is related to its location and demonstrated that the inclusion of hydro-mechanical coupling and the incorporation of plastic behaviour in concrete significantly improved the results of numerical simulations of cutoff walls. The work by Xu *et al.* (2020) uses the results of 187 loading tests on rock-socketed shafts (mostly on soft rocks) to develop relationships between the ultimate shaft resistance and the compressive strength of rock. Empirical equations for both the compressive strength of the intact rock and the compressive strength of the rock mass are proposed. The introduction of the rock mass strength is made via the rock quality designation (RQD). The use of RQD to determine compressive strength of the rock mass provided better estimates of the ultimate shaft resistance. Despite these relationships being based on a large database, data are still limited. The authors recommend using their proposed relationships only for preliminary estimates of the shaft resistance of socketed shafts.

I would like to encourage prospective authors to consider writing discussion pieces on our published papers. I hope that all readers enjoy this issue of *Geotechnical Engineering*.

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