Editorial

Ian Jefferson BEng (Hons), DIS, PhD, FGS
Professor of Geotechnical Engineering, School of Civil Engineering,
University of Birmingham, Edgbaston, Birmingham, UK

It is with great pleasure that I welcome you to this, the May 2015 issue, of *Ground Improvement*. In recent years, infrastructure and the need for its development has been discussed in much depth, and increasingly governments across the world are waking up to the challenges this presents. An integral part of this is how we deal with and manage the ground, to which ground improvements play a vital, if not pivotal, role, especially when targeted at the development of new and existing infrastructure. In addition, new challenges are being faced globally as ever greater demands are placed on our infrastructure base and include the impact of future changes, such as climate change, so it is vital to ensure that our treatments are resilient to whatever the future may hold (Mitchell and Kelly, 2013). Thus, ground improvement techniques have to couple with a complex and challenging array of ground conditions and development issues, while achieving their core aims and objectives. This was captured in a recent review by Rogers (2012) when he stated that ground improvement is a process that has desirable physical and chemical consequences spanning a number of aspects, including dealing with the risks associated with different ground conditions. The seven papers in this issue highlight a number of these aspects, covering detailed reviews of ground improvement approaches, through analytical developments and experimental observations to numerical analysis, and so provide the full suite of tool available to enhance our understanding of the ground improvement process.

The first paper (Beetham *et al.*, 2015) provides a comprehensive review of lime stabilisation for earthworks, drawing from lessons learnt in the UK. This review paper provides an excellent overview of the key aspects and how current UK practice could be improved to prevent reoccurrence of a number of the problems that have been faced in the past, particularly with respect to sulfate-induced swell. Continuing the review theme, Craig *et al.* (2015) provide an interesting discussion of the use of prefabricated bituminous surfacing from the Second World War, highlighting its wider applications and usage.

Emphasising the role of analytical approaches for ground improvement, the third paper (Frikha and Bouassida, 2015) presents interesting developments of the prediction of the ultimate bearing capacity of columns using an expansion cavity model. This model aims to overcome the limitations with current analytical and empirical models. Continuing this approach, the fourth paper (Vinod *et al.*, 2015) examines the influence of compaction energy on compaction characteristics and CBR of soils from India. This work produced a quick empirical estimation of their compaction characteristics.

Experimental observational approaches used to investigate ground improvements have been demonstrated by two papers in this edition. The fifth paper (Granata *et al.*, 2015) examined different design mixes of environmentally friendly colloidal silica grout mixes, demonstrated on soft, fine-grained soils from Rome. This work was conducted as part of the soil improvement programme of new stations and tunnels that form an extension to the Rome Metro subway system. The sixth paper (Artidteang *et al.*, 2015) presents results from an assessment of a full scale test embankment consisting of a silty sand backfill reinforced with a geotextile, constructed on a silt clay soil. Full monitoring, (over the short term approximately 250 days) is presented supplemented with analysis using Slide 5.0 software. Close agreement was seen between measured datasets and a number of predictive approaches (e.g. Asaoka's method (Asaoka, 1978)).

The last and seventh paper (Venda Oliveira *et al.*, 2015) compares 2D and 3D numerical approaches used to predict the behaviour of an embankment built on soft soil with prefabricated vertical drains installed. The 2D analysis used a simplified approach (using an equivalent permeability), whereas the 3D approach considered field patterns used on site. Comparison between 2D/3D analyses with field data showed that the 2D approach was sufficiently accurate for practical applications.

I hope that you find these papers useful, stimulating and informative and that these papers spark debate on further developments of the role of ground improvement. As these papers show, ground improvement must first be founded in sound engineering and scientific practice. Can I, therefore, actively encourage you to discuss these papers to help further shape our understanding and development of the current and future ground improvement processes. If our readership has any issues or comments related to the journal more generally then the editorial panel is always pleased to receive feedback. In conclusion, on behalf of the editorial panel, we hope we can meet some of you at the XVI European Conference on Soil Mechanics and Geotechnical Engineering in Edinburgh, this September 2015; a conference whose theme is Geotechnical Engineering for Infrastructure and Development, something ground improvement is at the heart of in a whole host of ways.

REFERENCES

- Artidteang S, Bergado DT, Chaipayut S and Tanchaisawat T (2015) Embankment reinforced with limited geotextiles on soft clay. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 130–143, <http://dx.doi.org/10.1680/grim.13.00014>.

-
- Asaoka A (1978) Observation procedure of settlement prediction. *Soils and Foundations* **18**(4): 87–101.
- Beetham P, Dijkstra T, Dixon N, Fleming P, Hutchison R and Bateman J (2015) Lime stabilisation for earthworks: a UK perspective. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 81–95, <http://dx.doi.org/10.1680/grim.13.00030>.
- Craig WH, Gallagher EM and Wang X (2015) The use of prefabricated bituminous surfacing geosynthetic in World War II and beyond. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 96–105, <http://dx.doi.org/10.1680/grim.13.00039>
- Frikha W and Bouassida M (2015) Prediction of stone column ultimate bearing capacity using expansion cavity model. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 106–115, <http://dx.doi.org/10.1680/grim.13.00045>.
- Granata R, Vanni D and Mauro M (2015) New experience in ground treatment by permeation grouting. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 122–129, <http://dx.doi.org/10.1680/grim.13.00026>.
- Mitchell JK and Kelly R (2013) Addressing some current challenges in ground improvement. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **166**(3): 127–137, <http://dx.doi.org/10.1680/grim.12.00030>.
- Rogers CDF (2012) The role of ground improvement. In *ICE Manual of Geotechnical Engineering* (Burland J, Chapman T, Skinner H and Brown M (eds)). Thomas Telford, London, UK, vol.1, pp. 271–280.
- Venda Oliveira PJ, Cruz RFPML, Lemos LJJ and Almeida e Sousa JNV (2015) Numeric modelling of vertical drains: two- and three-dimensional analyses. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 144–156.
- Vinod PP, Sridharan A and Soumya RJ (2015) Effect of compaction energy on CBR and compaction behaviour. *Proceedings of the Institution of Civil Engineers – Ground Improvement* **168**(2): 116–121, <http://dx.doi.org/10.1680/grim.13.00059>.