

Editorial

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It is my great pleasure to welcome you to this August 2013 issue of *Ground Improvement*. Ground improvement plays an ever important role in the development of new and existing infrastructure, dealing with complex and challenging ground conditions and/or development issues. The essence of this was captured recently by Rogers (2012) who noted that the ground improvement process has desirable physical and chemical consequences spanning a number of aspects, including dealing with the risks associated with different ground conditions. The five papers in this issue highlight a number of these aspects, covering current challenges through to specific issues facing ground improvement techniques.

In the first paper Mitchell and Kelly (2013) provide a thought provoking assessment of the current challenges faced by the ground improvement industry, highlighting the key role of the more holistic and sustainable approaches needed to provide cost-effective sustainable ground improvement solutions under current economic conditions. This complements the February 2010 (volume 163, issue 1) themed issue of *Ground Improvement* which dealt with issues of sustainability and ground improvement. The authors draw attention to the role of the three 'r's (reduce, reuse and recycle) and their application to reducing carbon dioxide impacts and reuse of previously challenging development sites. The discussion of the key challenges in analysis and design is of particular interest and provides food for thought in future research as set out by the authors in their conclusions.

The second paper by Debats *et al.* (2013) provides details of ground improvement techniques associated with the treatment of oil tank foundations. The paper discusses the two approaches used, namely preloading with wick drains and preloading with stone columns, to treat a site underlain with loose soft soils. Using back analysis from in situ measured settlements and pore water pressures the authors provide a way to interpret the overall behaviour of the improved ground, and from this demonstrate how estimates of short term and long term settlements can be made. The authors provide a detailed presentation of their data and interpretative calculations in relation to preloading applied through an interesting case study.

The third paper by Chian and Madabhushi (2013) is an interesting laboratory-based study of improvements to potential liquefiable soils, used to reduce the risk of uplift of underground structures such as pipes or other buried infrastructure/utilities during earthquake events. The authors provide a brief review of the fundamentals underpinning uplift phenomena and give a detailed assessment through a series of centrifuge models of existing

remediation approaches (in this case soil densification and use of coarse backfill) aimed at reducing uplift risk. Soil densification was found to be effective, while the use of coarse backfill performed slightly less well, its effectiveness highly dependent on the type of coarse material used, requiring maintenance to prevent clogging. The authors use their results to provide further assessment of the various pros and cons associated with these two approaches when applied to uplift prevention.

For the fourth paper Pichan and O'Kelly (2013) provide an interesting approach to deal with the perpetual problems of treating highly organic soils and their propensity for very high secondary (creep) settlements. The authors describe a method that uses additives to stimulate decomposition of peats as a way to mitigate secondary compressions. This study supported by laboratory and field testing presents a feasibility trial to demonstrate how the proposed technique can be tailored to specific peat deposits, highlighting the key factors that limit decompositions, namely pH and carbon to nitrogen ratios.

In the last of the five papers included in the issue Markou and Droudakis (2013) investigate the impact on the short term shearing behaviour of sands treated with microfine cement grouts. Three different types of cement grouts were tested using single and multi-stage quick undrained triaxial compression tests. The results demonstrate that by using a water to cement ratio of 1, apparent cohesions of 2.6 MPa are achievable with microfine cement grouts.

Hopefully these papers will spark debate in and further development of the role of ground improvement. To echo the words of Mitchell and Kelly, it is important to note that any aspect of ground improvement which deals with current and future challenges must first be founded in sound engineering and scientific practice. I hope you find these papers stimulating, interesting and thought provoking, and I encourage you to discuss these papers to help shape our understanding and development of current and future ground improvement processes.

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