Editorial

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Environmental Geotechnics

Environmental geotechnics has evolved dramatically over the past two decades. Previously, the focus was on addressing problems related to contaminated sites as well as hazardous and non-hazardous waste management. Nowadays, it deals also with a vast array of issues including emerging contaminants, energy geotechnology, oil and gas resources, mining, the effect of climate change on built structures, and biogeotechnical engineering, attracting new challenges and a new set of skills to the profession. These had the effect of bringing the different disciplines even closer than before. This is no better reflected than in the quality and range of the papers published in this issue, which includes one briefing paper and four papers on a variety of topics.

The briefing paper by Leong (2017) highlights the need to provide diversified and innovative approaches to address these modern environmental problems; in particular, the need to use our knowledge and ingenuity to find solutions to create a safer and better environment in a changing world.

The paper by Qian and Koerner (2017) addresses the stability of landfill liners on a side slope. The paper presents an investigation of the effect of geometrical dimensions caused by waste placement on the changes of the failure interfaces in multilayered liner systems. It is indicated that the critical liner interface with the minimum factor of safety can change from one interface to another with changes of geometric dimensions of the waste mass. The paper highlights the fact that a waste filling sequence needs to be generated to maintain the factor of safety above a stipulated value during the filling operation.

The paper by Kikumoto and Nakamura (2017) presents a numerical method for modelling water–NAPL–air three-phase seepage behaviour in soils, based on a novel capillary pressure-saturation model for water–NAPL–air three-phase in soils. The methodology developed was applied to some initial value problems of NAPL leakage into the vadose zone. A one-dimensional leakage simulation of NAPL that is less dense than water (LNAPL) validated the prediction by the proposed method of the penetration behaviour of NAPLs into an unsaturated subsurface. Furthermore, two-dimensional simulations on leakage of LNAPL and NAPLs that are denser than water (DNAPL) into an unsaturated ground containing impermeable layers confirmed that the proposed method is capable of representing the contamination process in shallow ground, including differences in the penetration mechanisms of LNAPL and DNAPL.

The paper by Fasihnikoutalab *et al.* (2017) explores the potential use of olivine for soil stabilisation. Use of 20% olivine decreased the plasticity index and optimum moisture content while increasing the maximum dry density of the soil used in their investigation. They concluded that this is a more environmentally friendly method of stabilising soils compared with alternative methods using high embodied energy binders such as cement.

Rao *et al.* (2017) analyse the impulse performance of a typical soft soil under the action of lightning. Novel empirical relationships between the impulse current characteristics of soil and soil temperature are proposed, with the aim of providing useful practical references for the design of a grounding system for lightning strikes.

The final paper (Fei *et al.*, 2017) presents geotechnical in situ and laboratory studies conducted on lime sludge generated from a drinking water-softening process and disposed of in a sedimentation lagoon. It highlights the potential engineering sludge reuse options, which include stabilising material for ground improvement, conditioning material for sewage sludge, buffer for acidic soil, cover and liner material for landfills and brownfields, and impermeable engineering fill.

The content of this issue will constitute a reference in the years to come and hopefully will also inspire more innovative developments for the benefit of the environmental geotechnics industry

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