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Introduction to the Special Issue of Soils and Rocks entitled: “Thermal Applications in Geotechnical Engineering”

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EDITORIAL

This special issue of Soils and Rocks includes 8 state-of-the-art research studies, a case history, and 2 review papers on the behavior of energy geostructures and the thermo-hydro-mechanical behavior of soils. Energy geostructures are an emerging technology, which permit geotechnical engineering structures to be used as geothermal heat exchangers as well as structural support. This dual use not only permits cost-effective use of materials but also helps expand the portfolio of renewable energy technologies. Many types of energy geostructures are evaluated in this special issue, from conventional cast-in place energy piles, to energy tunnel linings, to steel offshore energy piles. Implementation of energy geostructures in countries like Brazil poses unique challenges due to the regional geological setting and the cooling dominated climate, which require careful site characterization, in-situ thermal assessment, and design considering thermo-mechanical effects. New infrastructure development in Brazil including retrofitting existing cooling systems for buildings and offshore oil exploration provides opportunities to develop new types of energy geostructures. It is critical to combine the development of energy geostructures with research on the thermo-hydro-mechanical behavior of soils, as recent research indicates that heat transfer can have potentially beneficial effects on soil-structure interaction in cooling dominated climates. Overall, this collection of papers from both Brazilian and international researchers provides an excellent contribution to the area of energy geotechnics that will hopefully form the basis of additional research studies in the future. The guest editors of this special issue would like to gratefully acknowledge the efforts of all the authors and peer reviewers of these papers, and the dedication of the Soils and Rocks publication staff in producing this special issue.

Guest Editors

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