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Geothermal Energy and Performance of Energy Pile Systems

Fatemeh Sheshparia [1], Masoud Amelsakhi [2]*

[1] M.Sc of Geotechnical Engineering, Dept. of Civil Engineering, Qom University of Technology, Iran. (F_sheshpari@yahoo.com)*

[2] Assistant Professor, Dept. of Civil Engineering, Faculty of Engineering, Qom University of Technology, Iran.

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ABSTRACT

Geothermal energy is one of the most environmental-friendly and cost effective energy sources with potential to replace fossil fuels and help mitigate global warming. Recent technological progress, energy price variability, difficulty of oil and gas supply from foreign countries and the need to reduce fossil fuel deployment have made the exploitation of geothermal energy, especially for heating and cooling purposes, an attractive and viable energy alternative. The choice of the proper geothermal system (for heating or cooling) is essentially based on the need of cost containment and environmental constraints. Energy pile provides a mean to reduce energy consumption for space heating and cooling, while functioning as a support for superstructure. Despite of the environmental benefits of energy pile, some countries are still reluctant in implementing energy pile. This is because of knowledge gap on the influence of temperature cycles on energy pile ultimate and serviceability limit states. This paper reviews the geo exchanger and energy pile systems and highlights their applicability and efficiency as well as advantages and limits.

Keywords:

Geothermal energy; Energy pile; Heat exchanger; Fossil fuels