

عنوان مقاله:

Scale Effects of Footings on Geocell Reinforced Sand Using Large-Scale Tests

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نویسندگان:

A Shadmand - *Ph.D. Candidate, Department of civil Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*

M Ghazavi - *Professor, Department of Civil Engineering, K.N. Toosi University of Technology, Tehran, Iran*

N Ganjian - *Assistant Professor, Department of civil Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*

خلاصه مقاله:

The scale effect on bearing capacity of shallow footings supported by unreinforced granular soils has been evaluated extensively. However, the subject has not been addressed for shallow footings on geocell-reinforced granular soils. In this study, load-settlement characteristic of large square footings is investigated by performing large-scale loading tests on unreinforced and geocell-reinforced granular soils. The effects of footing width (B), soil relative density of soil (D_r), and reinforcement depth (u) have been investigated. The test results show that the scale effects exist in geocell-reinforced soils, like unreinforced soils, and the behavior of small-scale models of footings cannot be directly related to the behavior of full-scale footings due to the difference between initial conditions of tests and the initial state of mean stresses in the soil beneath the footings having different dimensions. Large footings create higher mean stresses in the soil, resulting in low soil friction angle and initial conditions of the test approach to the critical state lines. The results of tests indicate that model experiments should be conducted on low-density soil for better prediction of the behavior of full-scale footings, otherwise, the predicted behavior of full-scale footings does not seem conservative.

کلمات کلیدی:

Scale Effect; Geocell; Shallow Footing; Large-Scale; Sand

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