

Influence of Overburden Pressure on Soil–Nail Pullout Resistance in a Compacted Fill

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Abstract

Soil nailing has been widely used in many places in the world in the last two decades because of its technical and economical advantages. The nail–soil interface shear strength is an important parameter in soil nail design. This parameter is governed by a number of factors, among which the influence of the overburden pressure (or soil depth) is the most controversial. There are differing views concerning the effect of overburden on the nail–soil interface shear strength. In order to examine the influence of the overburden pressure, a series of laboratory pullout tests on soil nails installed in compacted completely decomposed granite fill have been conducted using two pullout boxes. Numerical simulations have also been carried out and the results are compared with the pullout test data. The procedures of the pullout tests and new features of the pullout boxes used are briefly described. Changes of the vertical stress in soil close to the nail throughout the course of soil nail installation and pullout are presented and discussed in detail. It is observed from the results of this study that the installation process of soil nail induced significant vertical stress changes in soil around the soil nails, and that the soil nail pullout shear resistance is independent of the overburden pressure (or soil depth).

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