



A STUDY OF GROUT PROPERTIES IN SOIL NAILS PULLOUT TESTS

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Soil nailing is the technique where in-situ ground is reinforced by the insertion of tension-carrying soil nail. The soil-nail interface shear resistance plays an important role in determining the stability of nailed cut. The effect of grout properties is investigated to evaluate the pullout resistance of soil nail. A series of pullout tests were performed at four different construction sites. Three-dimensional (3-D) finite element (FE) model using the ABAQUS code was developed and non-associated elastic-plastic soil constitutive model using the Mohr-Coulomb failure criterion was employed to simulate the behavior of soil and grout in pullout test procedure. The Mohr-Coulomb failure criterion parameters of grout were determined by comparing the simulated results with pull-out test measured datas, and then the influence of these parameters were studied on the pull-out resistance of soil nails.

Keywords : soil nailing , shear resistance , grout , Mohr-Coulomb

Introduction

Soil-nailing is an in situ reinforcement technique that has been widely used in soil excavations and slopes in many countries. Cost effectiveness, rapid construction are the most advantages of this technique. The interface shear resistance between a soil nail and surrounding soil is an important parameter in design of soil nailing . Many factors have influences on the pullout resistance of the soil nails , such as the soil dilation , grout property , grout pressure , shear strenght of the soil and ...etc.[3,4] Some of these influencing factors have been studied by previous researcher . In this paper the finite element method used to simulation of the soil-nail intrection .After the verification of the simulation result with the in-situ pullout test , the finite element model is more reliable to study the influence of the parameters on the pullout resistance . First a three-dimensional finite element model using the ABAQUS code was developed for simulating soil nail in-situ tests and then this model was verified by measured data from some of the in-situ pullout tests and in the final step of this research , the influence of the grout property on the soil nail pullout resistance was investigated .