

Evaluation of Numerical Modeling of Jet Grouting Design Using in situ Loading Test

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Abstract : Jet grouting (JG) is one of the methods of improving and increasing the strength and bearing of soil in which the high pressure water or grout is injected through the nozzles into the soil. During this process, a part of the soil and grout particles comes out of the drill borehole, and the other part is mixed up with the grout in place, as a result of this process, a mass of modified soil is created. The purpose of this method is to change the soil into a mixture of soil and cement, commonly known as "soil-cement". In this paper, first, the principles of high pressure injection and then the effective parameters in the JG method are described. Then, the tests on the samples taken from the columns formed from the excavation around the soil-cement columns, as well as the static loading test on the created column, are discussed. In the other part of this paper, the soil behavior models for numerical modeling in PLAXIS software are mentioned. The purpose of this paper is to evaluate the results of numerical modeling based on in-situ static loading tests. The results indicate an acceptable agreement between the results of the tests mentioned and the modeling results. Also, modeling with this software as an appropriate option for technical feasibility can be used to soil improvement using JG.

Keywords : jet grouting column, soil improvement, numerical modeling, in-situ loading test

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