عنوان مقاله:

Determination of Multilayer Soil Strength Parameters Using Genetic Algorithm

محل انتشار:

ژورنال مهندسی عمران, دوره 4, شماره 10 (سال: 1397)

تعداد صفحات اصل مقاله: 15

نویسندگان:

Seyyed Mohammad Hashemi - *Master of Geotechnical Engineering, Faculty of Engineering, Islamic Azad University Central Tehran Branch, Tehran, Iran*

Iraj Rahmani - *Assistant Professor, Department of Geotechnical Engineering, Road, Housing and Urban Development Research Center (BHRC), Tehran, Iran*

خلاصه مقاله:

This paper employs a back analysis method to determine soil strength parameters of the Mohr-Coulomb model from in situ geotechnical measurements. The lateral displacement of a soil nailed wall retaining an excavation in Tehran city used as a criterion for the back analysis. For this purpose, a genetic algorithm is applied as an optimization algorithm to minimize the error function, which can perform the back analysis process. When the accuracy of modeling is verified, the back analysis is performed automatically by creating a link between genetic algorithm in MATLAB and Abaqus software using Python programming language. This paper demonstrated that the genetic algorithm is a particularly suitable tool to determine ۹ soil strength parameters simultaneously for ۳ soil layers of the project site to decrease the difference of lateral displacement between the results of project monitoring and numerical analysis. The soil strength parameters have increased, with the most changes in Young's modulus of the first to third layers as the most effective parameter, ۴۹.۴۵%, ۶۱.۶۷% and ۶۴.۳۵% respectively. The results can be used in advanced engineering analyses and professional works.

کلمات کلیدی:

Excavation; Back Analysis; Parameters Determination; Mohr-Coulomb Model; Genetic Algorithm; Python Programming Language