

عنوان مقاله:

Stochastic stability analysis of a shallow circular tunnel in 2-D spatially variable soils by mesh-free method

محل انتشار:

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نویسندگان:

r Rahmani - *MSc of geotechnical engineering, Research Fellow, Shiraz university of technology*

s.m Binesh - *Associate Professor, Department of civil and Environmental engineering, Shiraz university of technology, Shiraz, Iran*

gh Nejati Khashab - *PhD Student of Geotechnical Engineering, IAUKhorasgan, Isfahan, Iran*

خلاصه مقاله:

Inherent uncertainty of geo- materials involved in the engineering analyses or designs is an important subject between geotechnical and mining specialists that is the main aspect of current research. This paper investigates numerically the undrained stability of a plane strain circular tunnel in heterogeneous, Tresca media. In this regard, a general solution has been developed where soils characteristics are incorporated by employing random field theory and, the numerical deterministic tool are accomplished by lower-bound mesh-free limit analysis approach. To introduce the soil s undrained shear strength inherent heterogeneity into mesh-free limit analysis formulation, the K-L series expansion technique is adopted herein. The Monte Carlo (MC) simulation process were performed to evaluate statistical quantities, i.e. mean and standard deviation, relevant to each generated random fields. At the end of paper, according to the results obtained from solving several numerical mesh-free models, the probability of failure has been assessed .as a function of safety factor to quantify the geotechnical risks of tunnel design

کلمات کلیدی:

Tunnel, lower-bound, mesh-free limit analysis, Monte Carlo simulation, K-L expansion

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