Investigation of Stability of a Slope Subjected to Water Table and Seismic Load

Abstract

The stability of the slopes is the major concern in the field of Geotechnical Engineering. Usually three methods of analysis have been proposed for the evaluation of slopes response under seismic loads. These three methods are Pseudo-static method, Newmark’s displacement method and Dynamic finite element analysis method. In Pseudo-static method the earthquake’s inertial forces are simulated by the inclusion of static horizontal seismic acceleration co-efficient (kh) and vertical seismic acceleration co-efficient (kv) in limit equilibrium analysis. It is one of the most dangerous conditions of natural slope when it experiences a seismic vibration the countervailing water pressure has disappeared, it causes a danger to the slope. In this work, by applying the Morgenstern-Price presented by the computer program SLOPE/W was applied to define the potential slip surface and calculate the factor of safety of the defined slope for the maximum horizontal seismic acceleration co-efficient (kh). Calculation of relative lateral displacement of the slope surface and deformed shape of the defined slope due to the effects of horizontal seismic acceleration were done with the help of QUAKE/W software analysis. It was founded that the stability of the defined slope rapidly decreased.
References


Index Terms

Computer Science Information Sciences

Keywords

Pseudo-Static Method, Morgenstern-Price Method (LEM), Dynamic Finite Element Method (FEM), Horizontal seismic acceleration co-efficient (kh), Factor of safety, Relative lateral displacement.