

Investigation of Soil Slopes Stability

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Abstract : In this paper, the seismic stability of reinforced soil slopes is studied using pseudo-dynamic analysis. Equilibrium equations that are applicable to the every kind of failure surface are written using Horizontal Slices Method. In written equations, the balance of the vertical and horizontal forces and moment equilibrium is fully satisfied. Failure surface is assumed to be log-spiral, and non-linear equilibrium equations obtained for the system are solved using Newton-Raphson Method. Earthquake effects are applied as horizontal and vertical pseudo-static coefficients to the problem. To solve this problem, a code was developed in MATLAB, and the critical failure surface is calculated using genetic algorithm. At the end, comparing the results obtained in this paper, effects of various parameters and the effect of using pseudo - dynamic analysis in seismic forces modeling is presented.

Keywords : soil slopes, pseudo-dynamic, genetic algorithm, optimization, limit equilibrium method, log-spiral failure surface

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