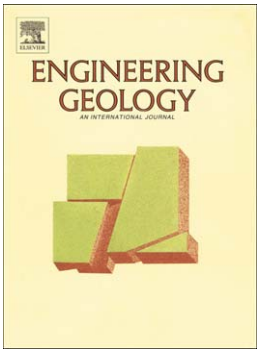

Stability analysis of slopes with ground water during earthquakes

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Stability analysis of slopes with ground water during earthquakes

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Abstract: Heavy seismic damage tends to occur in embankments when groundwater is present. This paper proposes and applies a numerical procedure to evaluate slope stability during seismic loading. Seismic failure is herein defined to occur when a cumulative plastic deformation exceeds a critical value of deformation determined by static slope stability analysis. The numerical procedure relies on finite-element analysis of dynamic stress and deformation in slopes to assess their stability during earthquakes considering the effect of groundwater level. The performance of the proposed numerical procedure is assessed by applying it to evaluate the seismic slope stability of hypothetical and actual slopes affected by high groundwater levels.

Keywords: slope stability; ground water; static stability analysis; dynamic response analysis; buoyancy

1. Introduction

Heavy damages to buildings and infrastructure and endangerment to human lives in specific areas