عنوان مقاله:

Numerical analysis of soil liquefaction induced failure of earth dams

محل انتشار:

چهارمین کنفرانس بین‌المللی رفتار بلندمدت و فن‌آوری‌های نوسازی سازگار با محیط زیست سدها (سال: 1396)

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خلاصه مقاله:

This study presents numerical modeling of the dynamic behavior of an earth dam rested on a liquefiable foundation. Numerical simulations are carried out using effective stress-based, fully coupled nonlineardynamic analysis approach. The Finn-Byme model with extended Masing rules is employed to model pore pressure generation in the liquefied soils. In this regard, Masing rules are implemented into the constitutive relations to precisely explain the nonlinear response of soil under general cyclic loading. As a result, the soil shear stifmess and hysteretic damping can change with loading history. Pore pressure is accumulated as a function of the cyclic shear strain amplitude. The procedure of calibrating the constructed numerical model with well-documented centrifuge test data is addressed. Acceptable agreements are shown between the results obtained Hom the current investigation and those of experimental observations available in the literature. Afterwards, the dynamic response of an earth dam founded on a liquefiable sandy soil foundation is evaluated and discussed. Special emphasis is given to the computed excess pore water pressures, deformations and accelerations dining dynamic loading. It is shown that the numerical model can predict the essential aspects of liquefaction phenomenon occurred in the earth dam-foundation system during dynamic loading.

کلمات کلیدی:

Numerical simulation, nonlinear dynamic response, liquefaction, earth dam