

## عنوان مقاله:

SEISMIC EFFECTIVE-STRESS ANALYSIS OF CAISSON QUAY WALL WITH LIQUEFIABLE BACKFILL

## محل انتشار:

هشتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1398)

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## خلاصه مقاله:

In the last 50 years, there have been many evidences of gravity quay walls seismic failures across the world. These failures are often associated with liquefaction of backfill soil in coastal areas. In this research, a series of two-dimensional finite difference effective-stress based analyses are performed in the prototype scale to investigate the seismic performance of caisson-type quay walls. In all simulations, the foundation soil beneath the caisson is assumed to be dense and non-liquefiable. However, the backfill is constructed with a relative density of 25% to reproduce a loose liquefiable soil. During dynamic analyses, excess pore water pressures are allowed to generate and dissipate in the backfill soil. For this purpose, a nonlinear elasto-plastic constitutive model is employed to simulate the seismic liquefaction behaviour of backfill materials. The obtained numerical results are validated against the corresponding observations of 1g shaking table tests. It is seen that the numerical results agree reasonably well with the actual observations in the physical model tests. In addition, the influences of caisson weight and liquefaction of backfill are investigated on the residual deformations of gravity quay walls. The results show that the wall horizontal displacement decreases as wall weight increases. On the other hand, the horizontal and vertical displacements of the wall significantly increase due to the liquefaction of backfill soil.

## کلمات کلیدی:

Caisson, gravity quay wall, seismic performance, non-linear dynamic analysis, liquefaction

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1022415>

