عنوان مقاله:

Effect of Hydrodynamic Pressure on Saturated Sand Supporting Liquid Storage Tank During the Earthquake

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خلاصه مقاله:

This paper aims to illuminate the influence of hydrodynamic pressure generated in a water storage tank on the behavior of saturated sand that its support. Experimental tests were performed on two cylindrical water tank models using a fabricated shaking table which consists of a flexible laminar shear box. The first model is a water storage tank partially full of water, and the second one is a tank model with an equivalent load of water pressure to simulate the water storage tank without hydrodynamic pressure. Three earthquake histories (Kobe, El-Centro, and Ali Al Gharbi) were implemented on models to study a varied range of acceleration. It was found that the settlement and lateral displacement directions in the water storage tank were significantly increased compared to the equivalent load resulted in the second model in all cases of the acceleration histories. Also, it was monitored the pore water pressure during the testing period, and it was noticed that the excess pore pressures were affected by the hydrodynamic pressure and increased compared to the results recorded at the condition of no hydrodynamic pressure.

کلمات کلیدی:

Hydrodynamic pressure, liquid storage tank, earthquake, acceleration range