

Liquefaction characteristics of San Francisco bayshore fills

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RESUMEN

After the 1989 Loma Prieta earthquake, we initiated a study to evaluate the liquefaction potential of fill soils in San Francisco. We conducted field investigations at several sites along the San Francisco waterfront where preearthquake data were available and (or) the field performance during the earthquake was well documented. From the interpretation of cone-penetration-test data, several areas with dune sand fills appear to have densified. Preearthquake data indicate that these fill sands were in a loose to medium-dense state before the earthquake. Although several steps in this interpretation require assumptions, the liquefaction assessments for Loma Prieta-type conditions correlate well with the observed performance of the different sites. We show that the damage at several sites would be severe during a postulated $M=7.5$ event occurring close to San Francisco and that many other sites would be affected to a lesser degree. Even engineered fills may be susceptible to some distress because of zones of looser material at shallow depths.

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