

ABSTRACT

Presentation on

New Findings on Liquefaction Triggering of Sands During Earthquakes

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The presentation discusses recent findings on liquefaction triggering of clean and silty sands during earthquakes. Tools ranging from case history analysis to centrifuge tests were used in the studies. The findings are: (i) pore pressure ratio during earthquakes is more uniquely correlated to cyclic shear strain, γ_c , than to Cyclic Stress Ratio, CSR; (ii) current penetration and shear wave velocity (V_s) charts are associated with small cyclic strains that range from $\gamma_c \approx 0.03\%$ to $\gamma_c \approx 0.3-0.5\%$ depending on soil type and earthquake magnitude; (iii) for recent clean and silty uncompacted fills which have not been significantly preshaken such as those in the San Francisco Bay Area of California and a magnitude, $M_w = 7.5$, triggering occurs at $\gamma_c \approx 0.03\%$; (iv) for the heavily preshaken, geologically recent natural silty sands in the Imperial Valley of California, $\gamma_c \approx 0.1-0.2\%$ with a liquefaction resistance which is twice as big despite the fact that some of these sands were deposited as recently as the uncompacted fills in San Francisco; and (v) a clean sand CPT tip penetration resistance is more sensitive to preshaking than V_s , with the CPT capturing better the increased liquefaction resistance due to preshaking.