**Inelastic Pile Behavior in Partially Liquefied Soils and Layered Soil Conditions**

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**Abstract**

Saturated soils, particularly cohesionless soils, may liquefy when subjected to earthquake excitation, resulting in reductions in strength and stiffness of the soil. The consequences have shown to be devastating to foundations in past earthquakes. For pile foundations, a reduction of vertical or lateral soil resistance may cause failure of the structure. To study this issue, two unique 1-g soil-pile tests were conducted at UCSD using a large-scale laminar soil box and fixed reaction loading setup. One experiment focused on characterizing the soil resistance of partially liquefied soil, while the other on multi-layered soil and the effect of its movement and load demands on the nonlinear behavior of piles. These two different experimental configurations illustrate scenarios commonly observed in the field, where the behavior of the soil and the pile merit further investigation. Results from these experiments will be discussed, with particular emphasis on understanding p-y resistance curves for partially liquefied soils and the plastic hinge evolution in the below ground region of the piles.

**Biography**

Hutchinson is a Professor in the Department of Structural Engineering at the University of California, San Diego with broad research interests in the area of geotechnical, structural and earthquake engineering. Much of her efforts involve full- or large-scale shake table and fixed reaction-type experimentation. She obtained her Ph.D. in 2001 at UC Davis and M.S. in 1995 at the University of Michigan, Ann Arbor. Prior to her current appointment, she served on the faculty at UC Irvine until 2007.