

## **Experimental investigation on seismic behavior of single piles in sandy soil**

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**Abstract:** This paper describes a quasi-static test program featuring lateral cyclic loading on single piles in sandy soil. The tests were conducted on 18 aluminum model piles with different cross sections and lateral load eccentricity ratios,  $e/d$ , ( $e$  is the lateral load eccentricity and  $d$  is the diameter of pile) of 0,4 and 8, embedded in sand with a relative density of 30% and 70%. The experimental results include lateral load-displacement hysteresis loops, skeleton curves and energy dissipation curves. Lateral capacity, ductility and energy dissipation capacity of single piles under seismic load were evaluated in detail. The lateral capacities and the energy dissipation capacity of piles in dense sand were much higher than in loose sand. When embedded in loose sand, the maximum lateral load and the maximum lateral displacement of piles increased as  $e/d$  increased. On the contrary, when embedded in dense sand, the maximum lateral load of piles decreased as  $e/d$  increased. Piles with a higher load eccentricity ratio experienced higher energy dissipation capacity than piles with  $e/d$  of 0 in both dense and loose sand. At a given level of displacement, piles with circular cross sections provided the best energy dissipation capacity in both loose and dense sand.

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