

# Laboratory Load Tests of Side Shear for Axially Loaded Piles

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## ABSTRACT

Steel H-piles are small displacement deep foundation elements. Typically, H-piles are driven to/into a hard stratum and the axial capacity of the pile is derived from the end bearing of the pile tip on the hard stratum. However, H-piles can be and are used as friction piles. Presumably, if the side shear capacity of a given H-pile can be increased, the use and applicability of H-piles will also increase. Conventional H-piles have smooth flanges. The objective of the research presented was to evaluate the effect that texturing of pile flanges has on the side shear capacity of an H-pile. The objective was addressed by performing a series of laboratory load tests on full-scale sections of smooth (HP) and textured (HPX) piles to assess differences in load transfer via side shear.

Results from the laboratory testing program suggest that HPX-piles have approximately 10 percent greater side shear capacity than conventional HP-piles, on average. Unit side shear and the side shear parameter  $\beta$  for both smooth and textured piles generally increased with increasing effective stress and increasing over consolidation ratio. HPX-piles were found to exhibit slightly greater settlement at failure than HP-piles, although scatter in the settlement data was significant.