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## Comparison of Drilled Shaft Design Methods for Drilled Shafts in Sand, Coarse Gravel, and Cobble Soils

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### Abstract

The soils in the area of the Phoenix Sky Harbor International Airport (PSHIA) generally consist of alluvial sand, gravel, and cobbles (locally known as SGC) deposited by the Salt River. The conventional methods for axial capacity determination, which mostly come from experience with different types of soils, may not be appropriate for these ground conditions. An Osterberg cell load test was performed to obtain accurate site information on side shear and end bearing ultimate capacities of the drilled shafts. Comparisons were developed between predicted axial capacities of drilled shafts using several design methodologies, the axial capacity measured from static load testing, and the finite element method. Where high percentages of gravel and cobbles were encountered, the side friction was significantly underestimated by design equations commonly used. The load test results showed that underestimation of the side shear is evident; therefore design criteria, as well as the methods used for obtaining soil param., should be revisited.

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