

Evolution of Foundation Design for Expansive Soils

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ABSTRACT

Over 200 geotechnical reports that provided recommendations for design of foundations on expansive soils were reviewed and pertinent data was compiled into a database. These reports were prepared for single family residences from the years of 1978 to 2005. This database was used to evaluate the depth of exploratory borings, maximum depth of testing of laboratory samples, pier length, and floor type versus time. This data represents the standard of practice based on reports from a wide range of different geotechnical engineers. It was used to quantify the changes in foundation design practices on expansive soils over the last 27 years.

The depth of exploratory borings has not increased significantly from 1978 to 2005. However, the maximum depth of testing of laboratory samples has generally increased from 10 ft (3.0 m) in 1995 to 28 ft (8.5 m) in 2005. The length of piers has generally increased from 10 ft (3.0 m) in 1979 to 36 ft (11.0 m) in 2005. The floor types were nearly all slab-on-grade from 1979 to 1988. However, since 1988, there has been an increase in the use of structural floors and slab-on-grade floors with overexcavation. In 2000, about 20% of the floors were slab-on-grade floors with overexcavation and about 70% of the floors were structural floors.

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