

BEARING CAPACITY AND SETTLEMENT OF SHALLOW FOUNDATIONS ON REINFORCED SOIL

(A Bibliography of the Technical Literature)

prepared by

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SUMMARY

The use of geosynthetics to improve the bearing capacity and settlement performance of shallow foundations has proven to be a cost-effective foundation system. In marginal ground conditions, geosynthetics enhance the ability to use shallow foundations in lieu of most expensive deep foundations. A Reinforced Soil Foundation (RSF) consists of one or more layers of a geosynthetic reinforcement and controlled fill placed below a conventional spread footing to create a composite material with improved performance. A Composite Reinforced Soil Foundation (CRSF) is an RSF that also includes a geosynthetic fabric separating native soil from the fill used to construct the RSF.

Reinforced Soil Foundations may be used to construct shallow foundations on loose granular soils, soft fine-grained soils, or soft organic soils. Most RSF's are constructed with the reinforcement placed horizontally, however, there are cases in which vertical reinforcement may be used. The reinforcement may consist of geogrids, geofabrics, geocells or other geosynthetics. The fill placed between layers of reinforcement is usually a clean coarse road base material that is compacted to a minimum relative density of about 75%, but may also consist of compacted sand. There are a number of factors that may influence the performance of an RSF, including: 1) type of reinforcement; 2) number of reinforcing layers; 3) depth below the footing to the first layer of reinforcement; 4) spacing between reinforcing layers; 5) dimensions of the reinforcement beyond the dimensions of the footing; and 6) type and placement of the fill.

Over the past 20 years, considerable advances have been made into the understanding of the behavior of Reinforced Soil Foundations and on the applications and limitation of using geosynthetics to improve the performance of shallow foundations. Detailed investigations have been performed using small scale and large scale model footings to evaluate the performance of RSF's and to develop rational methods for design. This document provides a bibliographic reference library on the published geotechnical literature related to Reinforced Soil Foundations. It was prepared by the Shallow Foundations Committee of the Geo-Institute of ASCE with the expectation that the reference listing will serve as a guide to geotechnical engineers who wish to find more detailed information on this subject.

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