TESTING FORUM

Louis, Mo., 26 April-2 May 1981. The conference is sponsored by the University of Missouri at Rolla, with the International Association of Earthquake Engineering, the Earthquake Engineering Research Institute, and the Seismological Society of America acting as cosponsors. Issues to be addressed at the conference include load deformation and strength behavior under dynamic loads, liquefaction of soils, dynamic earth pressures and design of earth retaining structures in seismic zones, soil structure interaction under dynamic loads, earthquake geotechnology in offshore structures, centrifugal testing under cyclic loading, case histories in geotechnical earthquake engineering, and numerical methods for earthquake geotechnology.

The conference will feature a number of state-of-the-art speakers, including H. B. Seed, P. W. Rowe, W. D. Liam Finn, T. Iwasaki, Per Selnes, M. L. Silver, C. S. Desai, and Shamsher Prakash. Abstracts of about 400 words will be accepted through 30 June 1980. The contact for submission of abstracts and obtaining further information on the conference is Shamsher Prakash, Conference Chairman, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Mo. 65401 (314/341-4498 or 4461).

LETTER

Soil Bearing Tests at Footings

To the editor:

In reference to the request on the part of Mr. Gay D. Jones[1] as to how geotechnical engineers are routinely examining excavations for suitability for placing footings, we offer the following comments.

Our firm has been called upon to perform these verification "tests" for many years. Where possible, we perform in-place field density tests and attempt to relate this density to laboratory compaction tests as a percentage of compaction. However, frequently there is no time to perform these test, because of the schedule of construction.

For many years it has been a standard routine at Warzyn Engineering to perform a simple rod probe penetration test by hand in connection with each field density test. This rod is constructed of 1/2-in. minimum, 3/4-in. maximum diameter steel rod, rounded at the end. It is approximately 30 in. long with a handle welded crosswise on the top in the form of a "T." The person using this rod merely pushes it into the soil and observes the resistance to hand penetration. We have found that when one can push the rod in full length with one hand and minimal effort, it generally means that no compaction has been applied to a fill, or the natural soil is very loose. On the other hand, where the rod cannot be pushed into the soil more than 1 in. with a person's full weight, then we usually find the field density testing will show more than 95% compaction compared to modified proctor method.

These rough indicators are usually verified by the field density test procedure. For conditions between the two extremes mentioned, some judgment is required. As a general rule, we find that where the rod penetration exceeds approximately 6 to 8 in. in most glacial soils, the usual specification for 95% compaction also has not been achieved. Thus, the rod serves as a quick, relatively reliable guide for the inspector in evaluating broad areas of compacted fill to help establish the most representative location for a field density test. Then, when one is evaluating an area for footing bearing, one can think in the same general terms used for evaluating a compacted fill job.

We hasten to add that the quick rod penetration test is perhaps only a step above heel stomping, but surprisingly has been found to be quite reliable for many soils. The exceptions are quite few. We have found that the rod penetration procedure is not reliable with uniform rounded-grain sands. In these cases, the range of density from loose to dense is relatively small, and potential bearing problems are quite minimal. If one were to believe the deep rod penetration tests, one might describe the soil as much lower bearing than it actually is.

In stony soil, most qualified persons recognize the limiting caused by the presence of the obstructions to penetration.

The use of the pocket penetrometer in clay soils is also a part of our practice, but the pocket penetrometer is not capable of penetrating below the surface, whereas the 30-in. rod does achieve considerable penetration, even through dense layers, by working it up and down.

Obviously, the visual correlation of the soil texture and the estimated density with available test borings data is a part of the field verification procedure. The use of the hand rod probe in the hands of an experienced individual is a somewhat better evaluating technique than heel stomping. In 20 years of use of this rod technique at our firm, we have had good luck and we see no current reason to change our methods.

We make no claim for the accuracy of the above-described device, but merely mention it as a method we have used to help evaluate soils during construction, in connection with slower test methods that are available.

Very truly yours,
Clifton E. R. Lawson, P.E.
Principal,
Warzyn Engineering Inc.
Madison, Wis.

[1] See letter entitled "Soil Bearing Footing Area Tests" in the *Geotechnical Testing Journal* of June 1979, Vol. 2, No. 2, p. 127.