



EXTRAPOLATION OF PLATE LOAD TEST RESULTS TO FOUNDATIONS ON SAND

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Abstract

Estimation of the settlement of shallow foundations in sand is generally carried out using the settlement estimation equations, empirical correlations based on insitu tests or by extrapolation of plate load test results. Plate load test is a common field test used to estimate allowable bearing capacity, expected settlement and/or the modulus of subgrade reaction of soil. The results obtained from a plate load test are extrapolated to prototype foundation using different extrapolation methods with unknown accuracy levels. There is no standard way to extrapolate the plate load test results and Terzaghi and Peck method is very widely used for most engineering applications.

In most practical cases, layered soil mediums are present below foundations. In such situations the effective zone of test plate lies within the top layer whereas that of the prototype foundations is spread to the underlying layers. The behaviour of the plate is based on the properties of the top most layers while the stiffness of the layers below may affect the behaviour of the prototype foundation. In such situations, the reliability of the extrapolation techniques becomes highly questionable. Due to the uncertainties associated with the estimation of the settlement of shallow foundations in sand, this research is aimed at investigation of the settlement estimation methods of shallow foundations in sand using the finite element method. , A special attention is paid to investigate the reliability of the extrapolation of plate load test results.

The scope of the study:

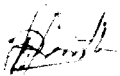
1. To investigate the reliability of settlement estimation methods in relation to the finite element method.
2. To study the effect of foundation width, foundation depth, elastic parameters (E , ν) and plastic parameters (c , ϕ) of homogeneous soil on the estimated settlement of shallow foundations.



3. Investigation of the accuracy of the extrapolation of the plate load test results in homogeneous and layered soil mediums, compared to the same estimated from the finite element method.
4. To develop a reliable method to estimate the settlement of a foundation on layered soil using plate load test results.

DECLARATION

The work included in this thesis in part or whole has not been submitted for any other academic qualification at any institute.



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