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Settlement Analysis of Axially Loaded Bored Piles: A Case History

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Abstract : Pile load tests should be applied to check the bearing capacity calculations and to determine the settlement of the pile corresponding to test load. Strain gauges can be installed into pile in order to determine the shaft resistance of the piles for every soil layer respectively. Detailed results can be obtained by means of strain gauges placed at certain levels into test piles. In the scope of this study, pile load test data obtained from two different projects are examined. Instrumented static pile load tests were applied on totally 7 test bored piles of different diameters (80 cm, 150 cm, and 200 cm) and different lengths (between 30-76 m) in two different project site. Settlement analysis of test piles is done by using some of load transfer methods and finite element method. Plaxis 3D which is a three-dimensional finite element program is also used for settlement analysis of the test piles. In this study, firstly bearing capacity of test piles are determined and compared with strain gauge data which is required for settlement analysis. Then, settlement values of the test piles are estimated by using load transfer methods developed in recent years and finite element method. The aim of this study is to show similarities and differences between the results obtained from settlement analysis methods and instrumented pile load tests.

Keywords : failure, finite element method, monitoring and instrumentation, pile, settlement
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