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PDA TEST AS A METHOD OF PILE TESTING FOR BORED AND CAST IN-SITU R.C. PILES END BEARING ON ROCK

Thesis submitted in partial fulfillment of the requirements for the Degree of Master of Science in Geotechnical Engineering

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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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ABSTRACT

The Pile Driving Analyzer (PDA) is a powerful tool to assess pile driving and High Strain Dynamic Pile (HSDP) load testing which may supplement or replace static testing. The PDA is seeing increasing usage in the testing of the various types of cast-in-place piles. In some parts of the world, this type of testing is the most common use for the PDA. This solution is particularly attractive for very large, high capacity piles where the large capacity makes a static test extremely costly.

The rapidly increased use of pile foundations and the appearance of the new driving techniques, as well as stress wave measurement equipment have led researchers to look for better understanding of the dynamic and static behavior of the hammer-pile –soil system and to develop more reliable methods of pile analysis. The reliability of the pile driving analysis is primarily a function of the accuracy of the soil parameters and the theological model of the soil. The application of stress wave theory on piles is critically revived in literature.

The scope of this study is an attempt to find a reliable range for dynamic soil parameters for end bearing bored piles in residual formation and to improve the accuracy of the wave equation analysis methods. The investigation has been focused on the comparison of the soil parameters used in practice from those used in conventional soil mechanics and soil dynamics. The solution of the stress wave equation is based on Smith's approach. Dynamic analysis of the field-recorded data was performed using CAPWAP (Case Pile Wave Analysis Program) and based on the Case Method. Ground investigation is done for evaluation of static soil properties before installation of piles. Static pile load tests were also performed on the same pile which were subjected to dynamic load test to study the load settlement behavior of the bored cast insitu piles. Further more, the static piles capacity variation of driven piles with time termed set-up effect was studied in details for piles driven in residual formations.

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