

Design and Construction Validation of Pile Performance through High Strain Pile Dynamic Tests for both Contiguous Flight Auger and Drilled Displacement Piles

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Abstract : Sydney's booming real estate market has pushed property developers to invest in historically "no-go" areas, which were previously too expensive to develop. These areas are usually near rivers where the sites are underlain by deep alluvial and estuarine sediments. In these ground conditions, conventional bored pile techniques are often not competitive. Contiguous Flight Auger (CFA) and Drilled Displacement (DD) Piles techniques are on the other hand suitable for these ground conditions. This paper deals with the design and construction challenges encountered with these piling techniques for a series of high-rise towers in Sydney's West. The advantages of DD over CFA piles such as reduced overall spoil with substantial cost savings and achievable rock sockets in medium strength bedrock are discussed. Design performances were assessed with PIGLET. Pile performances are validated in two stages, during constructions with the interpretation of real-time data from the piling rigs' on-board computer data, and after construction with analyses of results from high strain pile dynamic testing (PDA). Results are then presented and discussed. High Strain testing data are presented as Case Pile Wave Analysis Program (CAPWAP) analyses.

Keywords : contiguous flight auger (CFA) , DEFPIG, case pile wave analysis program (CAPWAP), drilled displacement piles (DD), pile dynamic testing (PDA), PIGLET, PLAXIS, repute, pile performance

Conference Title : ICGE 2017 : International Conference on Geotechnical Engineering

Conference Location : Rome, Italy

Conference Dates : September 18-19, 2017