

# ANALYSIS AND DESIGN OF DEEP FOUNDATIONS USING HIGH STRAIN DYNAMIC PILE TESTS AND A HYPERBOLIC MODEL.

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## Abstract

The analysis and design of the deep foundation of five towers having heights ranging between six (6) and twenty two (22) floors in the city of Bogota, Colombia was done by means of an extensive Geocharacterization of a soil profile composed by some 20 m of very soft lacustrine clay over a sequence of weathered claystones with coal and sandstone layers. The geocharacterization included geophysical exploration using conventional boreholes with laboratory, MASW tests, six (6) high strain dynamic pile load tests and a geological study. The extensive geocharacterization was motivated the variation of the rock and the thickness of the soft soils and the building loads, leading to different pile lengths. With the aim to correlate the results of the high strain dynamic pile test with the results of the other tests, a hyperbolic model based on the p-y criterion was used to calculate the shaft resistance of the bored piles. Parameters for the model were obtained from in-situ tests and the geophysical exploration. Results of the shaft friction calculated from the model and the shaft friction obtained from the high strain dynamic pile tests are compared and discussed. Finally the load- displacement curve obtained from the high strain dynamic test is compared with the results of the analytical closed-form elastic pile solution and with the settlement measurements conducted during the construction of three towers.

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