Proceedings of the 9th World Congress on Civil, Structural, and Environmental Engineering (CSEE 2024)
London, United Kingdom – April 14-16, 2024
Paper No. ICGRE 131
DOI: 10.11159/icgre24.131

Axial and Lateral Performance of Micropiles in Till

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Extended Abstract

A flood barrier is planned for construction to resist expected extreme load events. Given the challenging subsurface stratigraphy at the subject site, a number of cased micropiles of different configurations were proposed to support the wall. The micropiles have been designed using the available guidelines in literature. The piles were installed with different injection pressures to evaluate the effects on the piles' load-carrying capacity. A number of sacrificial piles were then instrumented and field-tested in compression, tension, and lateral loads. The results of the tests were analyzed, interpreted, and compared to the available theoretical design methodologies in the literature. As well, the tests were simulated using some of the available Geotechnical design software packages.

The results showed that some of the available design methodologies in the literature may overestimate the axial stiffness of micropiles. On the other hand, the results showed that the p-y curve methodology provided a reasonable representation of the piles' lateral behavior.

Examining the installation records showed the significant impact of the grouting pressure on the grout-to-ground bond strength and ultimately the piles' axial resistance. The results of the load tests of piles installed with a wide range of pressures are discussed. The possible interaction between the piles during installation was also noted. Finally, the contribution of the end bearing on the piles' resistance was also quantified, the former being typically ignored in the design of micropiles.