

Numerical Investigation on the Effects of Deep Excavation on Adjacent Pile Groups Subjected to Inclined Loading

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Abstract : There is a growing demand for construction of high-rise buildings and infrastructures in large cities, which sometimes require deep excavations in the vicinity of pile foundations. In this study, a two-dimensional finite element analysis is used to gain insight into the response of pile groups adjacent to deep excavations in sand. The numerical code was verified by available experimental works, and a parametric study was performed on different working load combinations, excavation depth and supporting system. The results show that the simple two-dimensional plane strain model can accurately simulate the excavation induced changes on adjacent pile groups. It was found that further excavation than pile toe level and also inclined loading on adjacent pile group can severely affect the serviceability of the foundation.

Keywords : deep excavation, inclined loading, lateral deformation, pile group

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