Postprint: Research on Construction Monitoring and Analysis Technology for Deep and Large Foundation Pit Engineering in Soft Soil Areas

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Date: 2017-12-21T00:00:00+00:00

Abstract

The influence mechanism of deep and large foundation pit construction on the surrounding environment in soft soil areas is extremely complex. Against the background of deep and large foundation pit engineering in soft soil areas, this study employs field monitoring methods to explore the disturbance effects of such construction on the surrounding environment of the pit, and investigates the variation patterns of pit deformation, support axial forces, and pore water pressure around the pit during excavation. The research indicates that: due to stress release induced by pit excavation, the soil at the pit bottom heaves, triggering loosening of the surrounding soil towards the pit; the superposition effect of ground surface vertical displacement decreases with increasing excavation depth, with the location of maximum vertical displacement occurring at the midpoint between two pits, and as construction progresses, its influence on the diaphragm wall essentially disappears; pore water pressure decreases sharply over time and thereafter remains stable. The research findings can provide theoretical basis and preliminary guidance for similar construction projects in the future.

Full Text

Preamble

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Note: Figure translations are in progress. See original paper for figures.