Post-Construction Settlement of Super-Large Cross-Section Rectangular Pipe Jacking in Silt Soil Layers

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Abstract

This paper presents the settlement control technology for super-large cross-section rectangular pipe jacking construction in muddy soil layers, using as a case study the construction of the rectangular pipe jacking section between Provincial Hospital Station and Dongmen Station on Fuzhou Metro Line 4, which represents the largest-span super-large cross-section pipe jacking tunnel in a subway interval. In response to the characteristics of muddy soil layers—namely, their softness, poor bearing capacity, and high susceptibility to deformation upon disturbance—construction quality is rigorously controlled through aspects such as cutterhead configuration, jacking parameters, and friction-reduction grouting to minimize surface settlement. This approach provides effective protection for buildings and structures in urban central areas and offers valuable guidance for future similar engineering practices.

Full Text

Construction of Large-Section Rectangular Pipe Jacking in Silty Soil Layers

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Abstract: This paper presents a case study of the rectangular pipe jacking section between Shengli Hospital Station and Dongmen Station on Fuzhou Metro Line 4, which represents the largest-span extra-large section pipe jacking tunnel in a metro interval. The study elaborates on settlement control technologies for large-section rectangular pipe jacking construction in silty soil layers. Given that silty soil is characterized by its soft nature, poor bearing capacity, and high susceptibility to deformation when disturbed, the construction quality is strictly controlled through optimized cutter head configuration, jacking parameters, and

friction-reducing grouting to minimize surface settlement. This approach provides effective protection for buildings and structures in urban city centers and offers valuable guidance for subsequent similar engineering projects.

Keywords: large-section; silty soil; cutter head configuration; jacking parameters; settlement control

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