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隧道盾构施工对临近桩基影响的数值模拟

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Numerical Simulation of Influence of Pile Foundation Due to Shield Construction

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摘要

以上海轨道交通7号线隧道盾构施工为工程背景，将隧道盾构施工过程简化为4个典型阶段.采用岩土工程数值分析软件，侧重于隧道衬砌完成后短期内软土不排水的状态，通过应力释放系数法与注浆等代层变刚度法相结合,实现盾构施工的二维动态仿真模拟，分析盾构施工对临近桩基的轴力、剪力、弯矩和位移的影响.该简化较真实地反映隧道盾构施工的实际情况，并可以得到比较真实的数据.

关键词： 隧道盾构施工；桩基础；有限差分法；二维动态仿真模拟

Abstract:

Based on the tunnel shield construction of Shanghai’ s No.7 Metro line, the tunnel shield construction was divided into four typical construction stages. The two-dimensional dynamical simulation of the influence of building pile foundation induced by adjacent tunnel shield construction is implemented. By combining a stress release factor method with a method of variable rigid body to simulate the grouting, an elasto-plastic finite difference method is used to analyze the impact of building pile foundation induced by adjacent tunnel shield construction. The axial force, shear force, bending moment and displacement of the building pile are analyzed. Conclusions drawn provide reference to the construction of shield tunnel.

Keywords:

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