

Shield Tunnel Excavation Simulation of a Case Study Using a So-Called 'Stress Relaxation' Method

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Abstract : Ground surface settlement induced by shield tunneling is addressing increasing attention as shield tunneling becomes a popular construction technique for tunnels in urban areas. This paper discusses a 2D longitudinal FEM simulation of a tunneling case study in Japan (Tokyo Metro Yurakucho Line). Tunneling-induced field data was already collected and is used here for comparison and evaluating purposes. In this model, earth pressure, face pressure, backfilling grouting, elastic tunnel lining, and Mohr-Coulomb failure criterion for soil elements are considered. A method called 'stress relaxation' is also exploited to simulate the gradual tunneling excavation. Ground surface settlements obtained from numerical results using the introduced method are then compared with the measurement data.

Keywords : 2D longitudinal FEM model, tunneling case study, stress relaxation, shield tunneling excavation

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