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Settlement Prediction for Tehran Subway Line-3 via FLAC3D and ANFIS

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Abstract : Nowadays, tunnels with different applications are developed, and most of them are related to subway tunnels. The excavation of shallow tunnels that pass under municipal utilities is very important, and the surface settlement control is an important factor in the design. The study sought to analyze the settlement and also to find an appropriate model in order to predict the behavior of the tunnel in Tehran subway line-3. The displacement in these sections is also determined by using numerical analyses and numerical modeling. In addition, the Adaptive Neuro-Fuzzy Inference System (ANFIS) method is utilized by Hybrid training algorithm. The database pertinent to the optimum network was obtained from 46 subway tunnels in Iran and Turkey which have been constructed by the new Austrian tunneling method (NATM) with similar parameters based on type of their soil. The surface settlement was measured, and the acquired results were compared to the predicted values. The results disclosed that computing intelligence is a good substitute for numerical modeling.

Keywords : settlement, Subway Line, FLAC3D, ANFIS Method
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