

عنوان مقاله:

Estimating groundwater inflow into Dorud-Khorramabad railway tunnel using analytical and numerical methods

محل انتشار:

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خلاصه مقاله:

The main objective of this study is to estimate the amount of groundwater inflow into Dorud-Khorramabad railway tunnel. To this end, in the first place, existing approaches of predicting groundwater inflow into tunnel was reviewed. According to the literature, up to now, a wide range of approaches have been proposed in order to predict the groundwater inflow into tunnel which can be classified into three distinct groups including, analytical solutions, empirical equations, and numerical modeling. Analytical solutions and empirical equations are mainly developed based on the given hypotheses and specific data sets, respectively, and should be applied in similar conditions. On the other hand, results obtained from numerical modeling are generally dependent on a wide range of parameters. Literature review revealed that one of the most effective parameters on the numerical modeling results is model extent, which controls not only final results but also numerical runtime. Hence, a sensitivity analysis is performed in order to investigate the effect of model extent on numerical results. The results demonstrated that increasing model extent decreases the groundwater inflow rate, and for a large model extent (greater than ۱۰۰۰), the amount of groundwater inflow tends to a constant value. In the second part, analytical solutions and finite element numerical modeling are applied for estimating the amount of groundwater inflow into Dorud-Khorramabad railway tunnel. The results indicate that the groundwater inflow into the tunnel, based on analytical methods, gives higher values than the numerical modeling. Assumptions and simplifications may justify this difference in analytical methods, accordingly, it can be inferred that if an appropriate model extent selected, the results of the numerical model based on the fact in the project .can be more reliable

کلمات کلیدی:

Groundwater Inflow, Numerical Modeling, analytical solution, Railway Tunnel

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