

عنوان مقاله:

Calculation of tunnel behavior in viscoelastic rock mass

محل انتشار:

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خلاصه مقاله:

Wall displacements and ground pressure acting on the lining of a tunnel increase with time. These time-dependent deformations are both due to face advance effect and to the time-dependent behavior of the rock mass. Viscoelastic materials exhibit both viscous and elastic behaviors. Thorough this study, the effect of different linear viscoelastic models including Maxwell, Kelvin and Kelvin-Voigt bodies on the behavior of tunnel is studied and the interaction of rock mass with elastic lining is analyzed. The surrounding rock mass is assumed to be homogeneous, isotropic and continuous. Hydrostatic stress field is also considered. In this paper, a series of formula for the foregoing models is driven to predict the displacement of lined and unlined circular tunnel and the pressure on the lining. The effect of lining stiffness and delay in installation of lining is analyzed. The results of new analytical relations show good .correspondence with existing solutions

کلمات کلیدی:

Tunnel, Viscoelastic body, Displacement, Pressure, Kelvin model, Maxwell model, Generalized Kelvin model

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