عنوان مقاله:

Numerical modeling of tunneling induced ground deformation and its control

محل انتشار:

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نویسندگان:

V B Maji - *Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India*

Abite Adugna - *Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India*

خلاصه مقاله:

Tunnelling through cities underlain by soft soil, commonly associated with soil movement around the tunnels and subsequent surface settlement. The predication of ground movement during the tunnelling and optimum support pressure could be based on analytical, empirical or the numerical methods. The commonly used Earth pressure balance (EPB) tunneling machines, uses the excavated soil in a pressurised head chamber to apply a support pressure to the tunnel face during excavation. This face pressure is a critical responsibility in EPB tunnelling because as the varying pressure can lead to collapse of the face. The objective of the present study is to evalute the critical supporting face pressure and grout pressure by observing the vertical deformation and horizontal displacement of soil body during tunneling. The face pressure and grout pressures were varied to see how they might influence the magnitude of surface settlements/heave. A numerical model using PLAXIS-3D tunnel has been developed to analyse the soil movement around the tunnel that includes various geotechnical conditions. The ground surrounding the tunnel found to be very sensitive to the face pressure and grout pressure in terms of surface settlement and collapse of the soil body.

کلمات کلیدی:

Earth pressure balance (EPB), face pressure, ground movement, critical support pressure, surface settlement