

Model study on the Hydraulic Behavior during the tunnel excavation

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ABSTRACT

The principle of tunnel formation is generally described by the Mechanical Convergence-Confinement theory. As the tunnel is excavated, the relationship between displacement and ground pressure is represented by the ground reaction curve, while the relationship between ground pressure and support is depicted by the support reaction curve. The intersection of these curves defines the equilibrium state, where tunnel displacement is effectively constrained. While studies on the mechanical behavior induced by tunneling are well-established in tunneling mechanics, research on hydraulic behavior in tunnel design has just primarily focused on hydraulic boundary conditions.

Jeong et al. (2024) attempted to identify the hydraulic equilibrium process due to tunneling. Although their study contributed to explaining the hydraulic equilibrium process influencing, it did not fully consider all tunneling activities related to hydraulic behavior. This model study identifies the hydraulic behavior during tunnel excavation, considering various hydraulic conditions.

REFERENCES

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