

The Influence Analysis Method of a Shield Tunnel under Construction Extremely Close to an Existing Tunnel

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This paper proposes a new numerical analysis method for neighboring construction where a new shield tunnel is excavated under an existing tunnel with a short distance. These tunnels are mathematically modeled using detail 3D shell elements and the ground between the tunnels is modeled using interaction springs. The strength of the interaction springs is determined using stability calculations of the ground above the new shield tunnel. We conducted the trapdoor test that reproduces this neighboring construction and measured the interaction between the intersecting tunnels. The results confirmed that the proposed analysis method can simulate the test result of ground reaction forces and tunnel deformation.