

Pile construction effects on adjacent shield tunnels

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The Phase I Circular Line of Taipei Rapid Transit System (TRTS) is mostly an elevated system that crosses the most populated region in New Taipei City and connects or intersects with other underground lines that are currently in operation or construction. In Banqiao District where the city hall is situated, the elevated line overlaps with an operating underground line for more than 800m. The piers are thus located in between the up- and down-track shield tunnels with the clearance between tunnels and pile foundations as close as less than 1.5m. To investigate the soil-pile-tunnel

interaction behind the case, a series of 3D simulations has been conducted during design stage to model the construction and loading effect of piles on the tunnels. Automatic monitoring instruments were implemented during construction stage and the results were confirmed by manual surveys to ensure the tunnels' safety. This paper first overviews the project and briefs the environmental constraints that are followed by summary from 3D numerical simulations. The monitoring results are then presented. Conclusions and suggestions are given at the end of the paper.