

營運中捷運車站旁深開挖與下方潛盾 穿越影響分析及評估

賴建名 黃繼鋒 黃啟修 蘇福來 胡庭豪
中興工程顧問股份有限公司

陳俊宏
臺北市政府捷運工程局

摘 要

近年來由於臺北捷運第一階段路網已完成(木柵線、淡水線、新店線、中和線、南港線、板橋線、土城線及小南門線)，第二階段路網亦將陸續完工(內湖線、新莊線、蘆洲線、信義線、松山線及桃園機場捷運、南港東延段、土城延伸頂埔段)，後續路網目前正於規劃設計階段(環狀線第一階段、萬大線、南北線及信義東延等)。因後續路網路線或車站與已營運中的捷運設施，多有交會重疊之情形，於設計分析上已不像過去來的單純，而地工方面所採用的分析工具亦有必要提昇。但因為土壤與水的變異性，地工數值分析軟體雖然程式功能日益強大，但卻難以掌握，如何能導入過去的經驗，並使分析的結果具有合理性，進而能「駕馭」分析軟體，是為今日大地工程師必須面對的課題。本文即以一營運中捷運車站旁深開挖和潛盾隧道穿越此車站下方的案例，說明如何於既有經驗架構下，運用一維、二維及三維分析軟體，並比對不同軟體所分析的成果，期能於未來施工時對營運中車站所受到的影響有較高的掌握度，並供未來類似案例設計上之參考。

關鍵字：深開挖、潛盾隧道、捷運車站。

The Evaluation of the Impact on Adjacent MRT Station from Deep Excavation and Shield Tunnel

Chien-Ming Lai Chi-Feng Huang Chi-Hsiu Huang Fu-Lai Su Tyng-Haur Hu
Sinotech Engineering Consultants, Ltd.

Chun-Hung Chen

Department of Rapid Transit Systems, Taipei City Government

Abstract

Taipei Mass Rapid Transit Corporation has recently completed the first phase of their network, and the second phase will also be completed in the near future. Besides that, there are several additional routes currently in the planning stage. The continuous increase in the mass rapid transit network expands the complexity in the designing process due to the overlapping in both the stations and routes. Therefore, in terms of geotechnical analysis, the finite element analysis must be more complex to tackle this intricate problem (from 1-dimensional analysis, 2-dimensional analysis to 3-dimensional analysis). Because of the variability in soil and water, the numerical analysis software for geotechnical engineering is not as straightforward as those being used in structural analysis. The key to a successful geotechnical analysis relies on the experiences of the user. In this research, we used a case study to demonstrate how to incorporate experiences to conduct analysis in all the analytical software and compare their results. The information will be highly useful to evaluate the impact on the existing stations from nearby construction.

Key Words : Deep excavation, shield tunnel, MRT station.