台北捷運遮斷防護工法選擇之探討

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摘要

In order to improve the quality of life, urban development in metropolitan areas has gone towards the sky or under the ground. The Taipei Metropolitan Rapid Transit (MRT) underground system is one of such examples. Since the MRT demand has been increased drastically, there is a sharp increase of rapid transit routes. However, a lot of structures have been existed along the planned routes. It is generally required to protect the safety of the nearby existing structures when the routes are constructed. Also, the MRT construction is mainly shield tunneling and deep excavation. Thus, it is important to select proper cutting off method to prevent the impact of existing structures on the MRT construction and vice versa. The purpose of this research is to select the proper cutting-off method to be used along the MRT lines to ensure the safety of existing structures and tunneling excavation.

This research first investigates the cutting-off methods to be considered in the Taipei Metropolitan Rapid Transit construction and determines the criteria and sub-criteria to be used in the initial assessing framework for the protection of the existing structures and tunneling excavation, and then it establishes the final assessing framework by using Delphi method. Furthermore, the Analytic Hierarchical Process is used to determine the relative weights of elements of each level in the hierarchical structure of assessed framework. Finally, the selection process is presented and verified by using three study cases respectively in the Nei-Hu line, the Hsin-Chung line and the Nan-Gang line of the Taipei Metropolitan Rapid Transit system.

關鍵字：Shield Tunneling Excavation, Metropolitan Rapid Transit, Analytic Hierarchical Process, Cutting-Off Method