

蘇花改隧道施工對地下水文影響評估

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摘 要

臺灣降雨量豐沛且地質破碎，山區蘊藏豐富的地下水資源，山岳隧道施工通過斷層破碎帶或高透性地層時常出現大量出水情形，除影響隧道施工安全及造成工程進度延宕外，亦引發地下水資源流失之疑慮。近年來氣候變遷劇烈，衝擊水資源供應之穩定性，地下水資源之保護與利用在臺灣日益受到重視，而隧道施工對於鄰近區域地下水資源之影響評估，實應以科學方法與實測數據來進行驗證探討，以免流於空談爭議。本文以開挖通過複雜變質岩區之蘇花改隧道鄰近地下水資源影響評估為例，說明案例隧道在施工期間所辦理之各種水文地質調查工作，包括隧道出水量觀測、地下水位量測及三維水文地質模式分析等，本文案例經驗可提供隧道施工與地下水資源保護溝通之參考。

關鍵字：隧道施工、地下水資源、水文地質調查、三維水文地質模式。

Assessment on Groundwater Variation during the Tunnel Construction of Suhua Highway Improvement Project

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Abstract

Taiwan has a plenty of groundwater storage in mountain area because of abundant rainfall and heavily fractured rocks. Large amount of groundwater inflow is often occurred when tunnel excavated through fracture zones or high permeability formations. It would not only endanger the tunneling safety and delay construction schedule but also lead to the concern of declination of groundwater resource. In addition to the climate change impacts, the protection and utilization of groundwater are, therefore, more and more important. For assessing the impacts of tunneling on groundwater resource, a proper method and adequate monitoring data are required to increase the credibility of the evaluation. The tunnels in the Suhua Highway Improvement Project penetrate through the metamorphic rocks. This paper demonstrates a valid assessment of groundwater resources impact during the construction of these tunnels. Various hydrogeological surveys, including tunnel inflow measurement, groundwater level observation, and three-dimensional hydrogeological modelling, were performed during tunnel construction. The assessment would provide a valuable experience for tunnel construction and groundwater resource protection. Moreover, the results can promote the communication between engineering construction and environment protection.

Key Words : tunnel, groundwater resource, hydrogeology survey, hydrogeological modelling.