

坡地社區減災營造與智慧防災系統整合研發— 預力地錨破壞監測及整體系統穩定性之強化

Enhancement of Monitoring Pre-stressed Ground-anchors and Integrated Safety Monitoring System for Hillside Residential Communities

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摘要

台灣由於地狹人稠，都會區提供居住用地有限，因此山坡地社區比例極高。然而由於地質條件不良且面臨日益頻仍之極端降雨，坡地社區中的邊坡監測自動化為提供在地化預警的重要方法之一。由於預警所需的管理值建立需要長期的觀測以取得相關數據，因此監測儀器的耐久性與穩定性相當重要。社區中除了自然邊坡外，人工擋土設施中，地錨是常見提供穩固的方法，其工作荷重的變化相當重要，但相關之監測並不常見於坡地社區。建研所近年以坡地社區智慧防災系統研發為中心，已陸續完成自然邊坡與整合型一般人工邊坡智能感測器，本年度計畫除再加入預力地錨監測功能外，亦宜針對選定之坡面進行數值分析，以了解監測坡面可能之破壞機制，而為了強化自動化坡地社區邊坡監測系統之完整性與針對傳輸穩定性及設備耐候性進行研究，擬將進行下列之研究項目，未來長期維運或可參考 IOTA 的 Tangle 概念建立以租代買的區塊鍊支付機制，以全面推動山坡地社區監測。

關鍵詞： 坡地社區、整合性監測、地錨擋土牆

ABSTRACT

Hillside residential communities in Taiwan are threaten by landslide disasters caused by extreme rainfall events, thus the forecasting and warning system based on automation monitoring system on slopes is crucial for the communities. To accumulate huge amount of monitoring data to establish the Slope Management Forewarning Value, the durability and stability of monitoring devices is the key components. Most of slopes with artificial retaining structures are protected by anchors, however the working load of the anchors are rarely monitored. This study aims to integrate a monitoring unit for pre-stressed anchors into the intelligent monitoring system for artificial slopes developed by ABRI. Numerical simulations on the selected slope will be conducted to investigate possible failure mechanism. A complete monitoring package for landslide disaster forecasting and warning system is developed and used in promoting the automation monitoring services for hillside residential communities.

Keywords : Hillside residential communities, Integrated Safety Monitoring System, Retaining Wall with Pre-stressed Ground-anchors