

102 年度大梨山地區地滑地 監測管理及系統維護資料分析

摘要

今年度大梨山地區地滑地監測管理及系統維護資料分析計畫，考量梨山及其週遭範圍在歷經 921 地震及後續颱風影響，尤其自敏督利颱風過後，原治理區外圍，包括台 7 甲線上的松茂部落及台 8 線上的老部落、新舊佳陽部落等地，都有新的崩塌地產生，危及居民居家及耕作的安全。雖經緊急處理，仍有長期治理的需求及安全監測預警的必要，因此擴大工作的範圍，包括了松茂地區、老部落、新佳陽部落安全的監測，並可加強保護德基水庫上游集水區的安定。

本年度監測系統維護工作，包括故障換新、維持監測品質與維護周圍環境，維持各自動監測站功能，確保監測正常運轉與資料正確性，提供平日及颱風警報期間即時之各項監測數據，供主辦單位參考依據。因地滑現象導致兩孔水位觀測井受損，於今年工作期間恢復正常監測水位之功能。計畫方向針對全面化即時地表變位監測之目標，今年度已完成更換梨山精華區東北區一處固定站之衛星定位儀。梨山賓館後方邊坡與松茂部落新站今年度亦納入大梨山地滑地即時監測網，保障現地人員生命財產安全。

監測資料的彙整評估，今年度影響大梨山地區安全之強降雨，皆已針對事件彙整監測資料，以供主辦單位了解現地降雨反映；監測成果僅一處監測站達注意階段之水位高程，但經由綜合所有觀測資料成果，並未產生立即危險之情況；松茂南北區(S1 與 S2 監測站)與梨山精華區東北區(C2 監測站)，地下水水位甚高，該處常發生地層滑動導致路基下陷之情況，建議該地區增設地下排水工程，針對警戒值作適度之調整，以符現地之情況。梨山地滑經整治至今監測管理，整體整治成效尚佳，排水工程功非常重要，發揮工程設施之現況應持續進行檢視評估並給予後續建議。因應時空背景差異而調查技術提升，重新針對松茂與新佳陽調查，掌握時空變遷植升變化情形，亦重新繪製滑動區域。

地層與地表變位測量，經歷 527 梅雨鋒面與天兔颱風皆有發生地表變位跡象，兩次事件最大變位地區分別為松茂南區 15.4 公分與老部落齡思路下線 12.7 公

分；梨山東南區與松茂部落地面下 22.3 公尺與 8.7 公尺處有新生成滑動面，持續監測變位情形。

ABSTRACT

Landslide area in Li-Shan village is located at the intersection between the east-west cross-island highway route 8 and route 7A heading to I-Lan in central Taiwan. In April 1990, an intense and spectacular landslide hazard occurred in this area following a prolonged torrential rain. The catastrophe lead to destroy the pavement foundation on route 7A, disrupted the transportation facilities, and triggered the nearby buildings such as Li-Shan Grand Hotel to severe settlement and deteriorated crack. After the disaster, the provincial government adapted a series of emergency remediation measures to mitigate the spread extent of the landslide.

After the 921 earthquake and MORAKOT typhoon, especially after MINDULLE typhoon, Li-Shan and surrounding regions, including Song-Mao area and the east-west cross-island highway route 8, Old Tribal area, New Jia-Yang area had generated new landslides. Long-term remediation and security monitoring and prewarning is necessary for the safety of the residents of the home and farming. The original remediation and management zone were expanded according to the field conditions so as to protect the the aboriginal tribes security and enhance the protection of the De-Ji Reservoir upstream catchment.

Monitoring system maintenance work, including replacement of fault instruments, to keep monitoring quality and maintenance of the surrounding environment. Maintenance of automatic monitoring stations for each function are proceeded to ensure the normal operation of the monitoring and data accuracy, providing real-time monitoring data in regular time and during the period of the disaster prevention preparation to provide the government agency for reference. Two groundwater level observation wells damaged because of landslide phenomenon, were fixed to resume normal monitoring function. Plan targets for this comprehensive monitoring of real-time surface displacement, this year located in the northeast area of Li-Shan satellite tracking station has completed the replacement satellite positioning device. New automatic monitoring stations of slope behind of the Lishan Grand Hotel and Song-Mao Horde included Lishan Area Landslide Monitoring System were set to protect

life and property safety of field personnel.

Assessment of monitoring data collection, this year the impact of prolonged torrential rain Li-Shan regional security, monitoring data compiled for each event, provided Government agency to understand the impact of rainfall conditions. Only one of the monitoring stations has reached a stage of attention groundwater elevation, but all through the consolidated results of observational data, did not produce immediate danger of the situation. Song-Mao north and south zones (S1 and S2 stations) and Li-Shan digest northeast zone (C2 stations), the groundwater level is very high, where phenomenon often occurs with landslide and embankment subsidence. It's recommended that the creation of underground drainage works in the area, and for the warning value adjusted to conform to the present situation. Li-Shan landslide after remediation time, so far monitoring and management, the overall effectiveness of remediation comparatively good, drainage projects contributed, the status of their works follow-up to assess and give recommendations. Due to investigation technology upgrading, once again investigation for vegetation cover changes situation at Song-Mao and New-Ga-Yang, also redraw the landslide zoning.

Formation and surface displacement measurements, experienced 527 Mei-Yu and typhoon USAGI have displacement situations. These two events caused maximum displacement respectively 15.4 cm at south zones of Song-Mao and 12.7 cm at Ling-En Road down-line of Old-Tribe. Li-Shan Southeast and Song-Mao tribes, under the ground 22.3 and 8.7 meters of new generated sliding surfaces. The site should keep continuous monitoring of displacement situations constantly.