鋼管排樁工法應用在土石流及崩塌地防治之實務探討
--以火炎山崩塌地為例

許聖富[1]*　施志鴻[2]

摘　要　火炎山屬更新世頭嵙山層，由礫岩、間夾薄層泥質粉砂岩組成，豪雨時容易發生山崩、岩屑滑移及土石流，經核定劃設為「自然保留區」。從 Google 地球之空照圖像可看見大量的下移土石(主要由 3 號坑溝產生)，已在大安溪北岸堆積成半圓形的聯合沖積扇(初估土石量超過 57.6 萬 m3)，影響到大安溪的流況，也將影響北側支流-景山溪之匯流。目前發現 1 號坑溝的崩移土石已堆積至 140 縣道之東隧道口，不久將危及人車安全。採用鋼管排樁工法進行整治應是可行的選項，一旦解決了土石崩移的來源，後續的土石流將可避免發生。本文亦將針對鋼管排樁配置、鋼管的長度及厚度、鋼樁出露部份處理、套管驅動設備選擇、成本分析方式等相關的設計及施工實務進行初步探討。

關鍵詞：土石流、崩塌地、鋼管排樁工法、全套管基樁。

The Practical Application of Steel Pipe-Wall Method to Control the Debris Flow and Landslide Area- A Case Study of Houyenshan Landslides

Sheng-Fu Sheu[1]*　Chih-Hung Shih[2]

ABSTRACT The geology of Houyenshan, Miaoli county, is Pleistocene Toukoshan formation, majorly gravel beds with thin layers of muddy sandstone. Landslides, detritus slides and debris flows are easily induced by heavy rainfall. It is announced as a natural conservation area. From Google's aerial photo, we can see a mass of united alluvial fan on north bank of Ta-an river, impacting the stream of water. Meanwhile, the gravel congeries mainly induced by No.1 gully is reaching the east entrance of the tunnel. However, using the steel pipe-wall method to control the landslide and debris flow would be a good solution. This will terminate the happening of debris flows. In this study, some practical considerations for design and construction, like allocation of the steel pipe-wall, length and thickness of the pipe, arrangement of the pipe emersion, determination of the casing driver, cost analysis are explored.

Key Words : Debris flow, Landslide area, Steel pipe-wall method, All-casing piles..

〔1〕華勝工程顧問有限公司負責人，比利時魯汶大學博士，土木技師、水土保持技師，逢甲大學兼任副教授(通訊作者)sanford877@yahoo.com.tw
President of hwa-sheng engineering consultants co., ltd., ph. d. of Leuven university, Belgium, part time associate professor in Feng-chia university, professional civil engineer, and professional soil and water conservation engineer.
〔2〕合豐技術顧問有限公司負責人，國立臺灣大學碩士，大地技師、結構技師，chaseshih@gmail.com
President of harvest engineering consultants, inc., master of National Taiwan University, professional geotechnical engineer and professional structural engineer.