

降雨入滲對坡地穩定影響之研究

葉信富^[1] 陳進發^[2] 李振誥^[3]

摘 要 本研究主要目的為應用集水區水平衡之概念，探討降雨入滲補注對坡地崩塌之影響性。首先，利用兩種水平衡方法來推估其降雨時可能產生之地下水的入滲補注量。另外，亦使用海生法之機率點繪法來推估研究區域降雨頻率。其中，應用 STEDWIN 邊坡穩定軟體進行邊坡穩定敏感度分析，分別以不同邊坡坡度來探討降雨量對邊坡穩定之影響性，進而由降雨頻率機率圖探討其發生臨界崩塌之機率。最後，本研究採用兩種水平衡模式所推估之降雨補注係數平均值，利用 STEDWIN 邊坡穩定軟體進行邊坡穩定性分析，推估研究地區降雨量與安全係數關係圖，得知當坡度提昇至 35 度時，利用 Janbu 簡化法分析發現降雨量在 400 至 500 公厘時其安全係數即達到 1.0 而有達到臨界崩塌之虞。

關鍵詞：坡地穩定、水平衡模式、基流模式、安全係數。

The Influence of Rainfall Infiltration on Slope Stability

Hsin-Fu Yeh^[1] Jin-Fa Chen^[2] Cheng-Haw Lee^[3]

ABSTRACT The main purpose of this paper is to apply a water-balance conceptual model of the Ching-Shui watershed to describe the effect of groundwater recharge on the slope stability. Firstly, the groundwater recharge is estimated by two models, a base-flow model and a soil moisture budget model. Furthermore, the Hazen method with a probability plotting position formula is applied to describe the distribution of rainfall. The STEDWIN program is then to simulate the effect of various slope angles and precipitation on slope stability. Meanwhile, the STEDWIN program is used to estimate the relation between rainfall and safety factor. The results show that the coefficient of groundwater recharges by precipitation in the study area can be estimated from the soil moisture model and the base-flow model with these values being 8.70% and 7.95%, respectively. This simulation revealed that when the slope angle increases to 35° and rainfall is over 400 mm, the slope failure will occur.

Key Words: slope stability, water budget model, base-flow model, safety factor.

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- [1] 國立成功大學資源工程學系博士班研究生
Doctoral graduate student, Department of Resources Engineering, National Cheng Kung University, Tainan 701, Taiwan, R.O.C.
- [2] 高苑技術學院資訊管理學系助理教授
Assistant Professor, Department of Information Management, Kao Yuan Institute of Technology, Kaohsiung 821, Taiwan, R.O.C.
- [3] 國立成功大學資源工程學系教授(通訊作者)
Professor, Department of Resources Engineering, National Cheng Kung University, Tainan 701, Taiwan, R.O.C. (Corresponding Author)
E-mail: leech@mail.ncku.edu.tw