階段式滯洪容積特性之試驗研究

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摘　　要　本研究探討之階段式滯洪池設計，係利用間隔滯洪區間的方式，期能在有效消減洪峰流量的安全要求下，降低滯洪池所需建置的滯洪容量。文中有關滯洪容積之水理計算，採用概念性模式方法進行理論分析，求算內滯洪容積 $\hat{S}_1$、外滯洪容積 $\hat{S}_2$ 與最小滯洪容積 $\hat{S}_p$ 之無因次參數，配合入流洪峰流量 Q_{ip} 與洪峰到達時間 T_{ip}，可得所需設置之滯洪容積參考值。於渠槽試驗中，由不同歷線特徵值 α 之入流歷線及不同條件之開口大小 b_c、內滯洪池寬度 b_1 與內滯洪池滿水高 H_1 進行試驗。研究結果顯示當 b_1、H_1 愈小則有較大之洪峰消減度，以及當 b_1/B（B =滯洪池渠底寬度）越小時，滯洪容積縮減效益比 δ 亦較小，可發揮較佳的滯洪容積縮減效益。

關鍵詞：階段式滯洪池、滯洪容積、渠槽試驗。

Experimental Study on Characteristics of Stepped Detention Volume

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ABSTRACT　　This paper illustrates the design of stepped detention ponds, to reduce the detention pond volume and to relieve the peak flood under the consideration of safety. In this study, the detention pond system contained a simplified model to calculate the minimum detention volume of the pond. This model can be handily used to calculate the dimensionless inside detention pond volume ($\hat{S}_1$), outside detention pond volume ($\hat{S}_2$) and the minimum detention volume ($\hat{S}_p$), the coordination input peak discharge (Q_{ip}) and the flood peak arrival time (T_{ip}), in order to obtain the reference value of detention volume. The results of the series of flume experiments use the different conditions with characteristic values of inflow hydrograph (α) and outlet width (b_c). The results show that the extent of peak reduction becomes more significant as the inside detention pond of width (b_1) and full depth (H_1) decrease. In addition, the detention volume reduction ratio (δ) becomes smaller as the value b_1/B (B is the width of detention pond) decreases.

Key Words:　stepped detention pond, detention volume, flume experiment.

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