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小集水區滯洪容積計算公式之研究

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摘　　要　大規模土地開發會導致地表覆蓋減少及不透水面積增加，使地表逕流量及泥砂產量增加，造成開發區下游水土環境災害，為降低開發區之出流洪峰流量與延後洪峰到達時間，水土保持技術規範規定開發區內需設置滯洪設施。規範中對流入與流出滯洪池之歷線均假設成三角形，未考量集水區洪水歷線型態可能的變化，及滯洪池與出流口型式對於流出滯洪池洪水歷線的影響。本研究收集前人研究與提出各種簡化概念之滯洪池設計方法，探討模式適用之條件，並發展滯洪容積計算公式，再以實例演算說明計算方式。經比較後發現，梯型入流與三角形出流之組合其滯洪容積最大，代表入流歷線延時變長會使得所需滯洪容積變大，而採用三角形入流與梯型出流滯洪容積最小，說明了洪水開始就進行大量排水等措施，可將大量滯洪池空間留給洪峰來臨時滯洪之用，有效降低所需滯洪容積。
關鍵詞：滯洪設施、滯洪容積、洪水歷線。

Calculation Equations of Detention Storage Volume for Small Catchment

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ABSTRACT　Massive land development reduces the plant-cover area and increases the impervious area of the watershed. These changes could induce a flood disaster downstream. For reducing the peak flow and delaying the peak flow time, the soil and water conservation norm set up the rule that detention facilities are necessary for hillslope development. The norm uses a triangle for the inflow/outflow hydrographs without considering the influence of the detention facilities shape, outflow device and possible inflow hydrograph. This study collects and develops various detention volume design models. The suitable hydrological condition and the calculation method of detention volume for various models are also developed, and an example is used to explain the design procedure. After comparison of various models, it was found that a combination of trapezoid inflow and triangular outflow will result in the maximum detention volume. It indicates that a longer duration time of inflow hydrograph will induce a bigger detention volume. The combination of triangular inflow and triangular outflow will result in the minimum detention volume. It shows that a large discharge capacity at the beginning of a flood hydrograph can release massive detention pond space for the peak flood and reduce the necessary detention volume.
Key Words:　detention facility, detention storage volume, flood hydrograph.

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