# 防砂壩過壩水流流量公式之研究

## 柴鈁武[1]

**摘　　要**　　當溢洪口斷面已知時，以堰流公式計算過壩水流流量是相當簡便的，惟堰流流量公式中水深參數之量測位置因隨著水深而改變，在實用時是很難掌握其適當的量測點位，加上堰流公式僅適用於平坡渠床，使得以堰流公式計算過壩水流流量存在一定的盲點。為此，本研究以堰流流量公式作為基礎，採用防砂壩溢洪口跌水緣水深為主要參數，通過渠槽試驗，建立了各種渠坡條件下之過壩水流流量公式。經試驗資料分析結果顯示，在不同渠床坡度下，以跌水緣水深為參數的堰流流量公式可表為 $Q=1.767B（H+a）^{1.5}（1\text{-}\tan\theta+\beta）^{-1.5464}$ 其中，

$$\alpha = 10.684\left(\frac{H}{B}\right)^{2} - 0.875\left(\frac{H}{B}\right) + 0.0208 ， \beta = 18.03\left[\left(\frac{b}{H}\right)^{1.8}\left(1-\frac{b}{B}\right)\right]^{-1.015}$$

式中，$Q$ 為水流流量(cms)；$B$ 為渠道寬度(m)；$b$ 為溢洪口寬度(m)；$H$ 為溢洪口跌水緣水深(m)；$\theta$ 為渠床傾角(度)。當坡降條件介於 0~7 度、跌水緣水深與渠道寬度比 H/B 值界於 0.04~0.131 倍之間、且渠寬比 b/B<1/2 條件時，可以本研究所提之流量公式計算出誤差小於 3%之流量。

**關鍵詞：**溢洪口、堰流、跌水緣水深。

# Overflow Discharge Formula for sabo-dam

## Fang-Wu Tsai[1]

**ABSTRACT**　　When the overflow section is known, using the weir flow formula to calculate overflow discharge of a river is convenient, but the measuring point of the flow depth character in this formula changes with discharge, and the field depth measuring point for weir flow formula seems quite fuzzy to apply. In addition, the weir flow formula is suitable for non sloping contraction channels. Therefore, the result of the discharge contains certain errors. Due to this issue, this study it based on the weir flow formula, but also uses the sabo-dam end brink water depth for the correction formula, and by flume test, establishes the formula with different channel slopes and section contraction. From the test regression result, the correction formula can be as shown:
$Q=1.767B（H+a）^{1.5}（1\text{-}\tan\theta+\beta）^{-1.5464}$

$$\text{and } \alpha = 10.684\left(\frac{H}{B}\right)^{2} - 0.875\left(\frac{H}{B}\right) + 0.0208 ， \beta = 18.03\left[\left(\frac{b}{H}\right)^{1.8}\left(1-\frac{b}{B}\right)\right]^{-1.015}$$

$Q$ is flow discharge(cms), $B$ is channel width(m), $b$ is the overflow section width(m),

〔1〕中州技術學院景觀設計系副教授兼系主任（通訊作者）

　　Associate Professor, Department of Landscape Architecture, ChungChou Institute of Technology, Changhua, Taiwan510, R.O.C.(Corresponding Author)

　　E-mail:pchsieh@dragon.nchu.edu.tw

$H$ is the sabo dam's end brink water depth (m), $\theta$ is the channel slope (degree). Restriction occurs when the bed slope is between 0~7 degree, brink water depth and channel width ratio(H/B) is between 0.04~0.131, and the ratio of the overflow section width and channel width (b/B)<1/2. There can be a 3% error in calculating discharge.

***Key Words:*** overflow section, weir flow, end brink water depth.