

# 攔河堰高流速高沖刷大地工程設計與施工 挑戰之論述~以桶頭攔河堰為例

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## 摘要

湖山水庫為離槽水庫，於清水溪流域建置桶頭攔河堰越域引水以為挹注，因規劃堰址處河床屬軟弱岩盤，且近年沖刷嚴重，攔河堰設計與施工最大挑戰為克服高流速高沖刷課題，經評估後採用直落式自由溢流堰型式，於堰址處配置消能池方式，依據水理分析可能沖刷影響範圍及深度，於消能池四周以基樁基礎形式，確保消能過程設施安全，導引高沖刷水流能量於此處安全消滅。

**關鍵詞：**湖山水庫、桶頭攔河堰、軟弱岩盤。

## Geotechnical Design and Construction Challenge of Weir for High-Speed Erosion Problem: a Case study of Tongtou Weir.

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## Abstract

Hushan Reservoir is an off-site reservoir which diverting water from Tongtou weir on Chingshui watershed. Due to the nature of soft bedrock and the problem of erosion on the weir site, the most difficult challenge for the designing and construction process is to resolve the high-speed water erosion problem. After the assessment through hydraulic analysis, the area and depth affected by erosion were determined. As a result, a free weir, a stilling pool and piles were designed to mitigate the influence of erosion.

**Key Words :** hushan reservoir, tongtou weir, soft bedrock.

## 一、前言

攔河堰設計之分析項目、方法、步驟等均與當地河川環境條件息息相關，並無一定準則，其成效亦各不同，依據國內外相關設計經驗，攔河堰設計必須考量6大重點課題，包括

(1)堰體結構安定課題(2)排洪與消能課題(3)排砂課題(4)取水功能課題(5)環境、生態課題(6)其他泥砂課題，本工程堰址所在清水溪河段坡陡水急，河槽遷徙頗大，經比較，歷年主槽流路變化頻仍，流路不甚穩定，又岩層單軸壓縮強度低於 $50\text{kg/cm}^2$ ，屬於弱岩，此類岩體應可提供足夠之承載力，但由於強度較低不