

Physical Hydraulic Models

Lake Manchester Spillway, Brisbane, QLD

Background

Lake Manchester Dam is located on Cabbage Tree Creek, which is a tributary of the Brisbane River, near Brisbane, Queensland. The reservoir has recently been reactivated to provide additional water supply as part of Brisbane City Council's Drought Management Strategy. The dam is maintained and operated by Brisbane Water.

Manly Hydraulics Laboratory (MHL) was commissioned by GHD to conduct a 3D physical model study to evaluate the hydraulic performance of the proposed upgrade works.

Project Scope

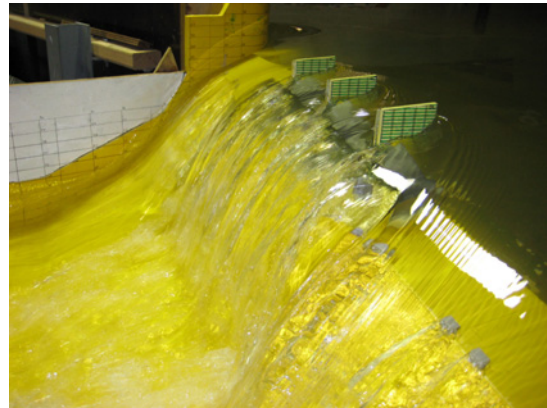
The aim of the study was to carry out physical model testing on the proposed Lake Manchester Dam spillway upgrade works to evaluate and verify the adequacy of the proposed alternative designs for upgrade works for a peak outflow event of 2350 m³/s.

Our Role

MHL constructed a 1:40 scale model of the Lake Manchester dam, proposed spillway and surrounds and tested the hydraulic behaviour for six discharges up to the PMF. The proposed spillway design was then optimised through a series of modifications and testing until a satisfactory design was achieved. Likely erosion patterns were then assessed using movable bed material in the plunge pool area. Proposed fusegates on the spillway crest were also modelled and tested.

Outcomes

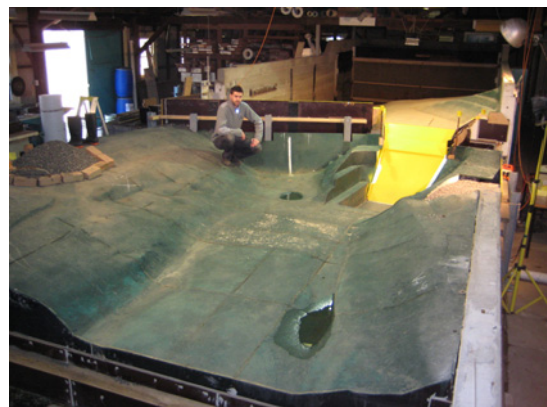
The proposed spillway design was tested and modified to achieve satisfactory performance for the peak flow of 2350m³/s. Results from the erosion testing were used in the design of the plunge pool and the tipping order of the crest fusegates was optimised.



Hydroplus fusegate testing



PMF Testing



Lake Manchester 1:40 scale physical model