

INSTRUMENTATION UPGRADE AT UPPER YARRA DAM, VICTORIA

BACKGROUND

Constructed in 1957 Upper Yarra dam is located 23km Northeast of Warburton, Victoria.

In 2017 Melbourne Water announced that upgrades of the dam wall and surrounds were necessary.

In 2019 the first stage of upgrades began with the second stage commencing in 2020.

HMA Geotechnical became involved with the upgrades mostly through improved logging equipment, Instrument cable extensions and Weir monitor calibrations.

Re-routing instrument cables and preserving them during construction was a major undertaking.



Figure 1 Upper Yarra Dam after crest upgrade

OBJECTIVE

- Cable splice for 36 vw piezometers
- Weir Calibration (spillway v-notch weirs)
- Set-up temporary loggers at the two seepage weirs
- Weir calibration (seepage v-notch weirs)

CHALLENGES

- Instrument access.
- Poor weather conditions
- High flow rates through weirs



Figure 2 – Cables spliced in access pit

SOLUTION AND OUTCOME

Cable splicing was carried out using Geokon cable splice kits. The kits had to be reworked to allow two cables at different diameters to be connected. Before and after readings were taken on each splice, before potting, to ensure continuity and stable readings.

Sufficient new cable was spliced onto the existing cable to reach the two new logging systems installed at the southwest end of the dam.

Weir Calibration. HMA technicians were contracted to calibrate four V Notch weir monitors, two either side of the spillway and two seepage monitors at the embankment toe.

Achieving accurate reading at the spillway was a challenge owing to the very high flow rates.

The seepage V-Notch weirs consisted of a large concrete chamber, two weir monitors and a single V-Notch plate. A gate valve was used to control the weir flow. Access to the V-Notch plate and weir monitor was hindered by a heavy steel grating, which could not be removed.

A temporary logger was installed to enable calibration of the seepage weir monitors.

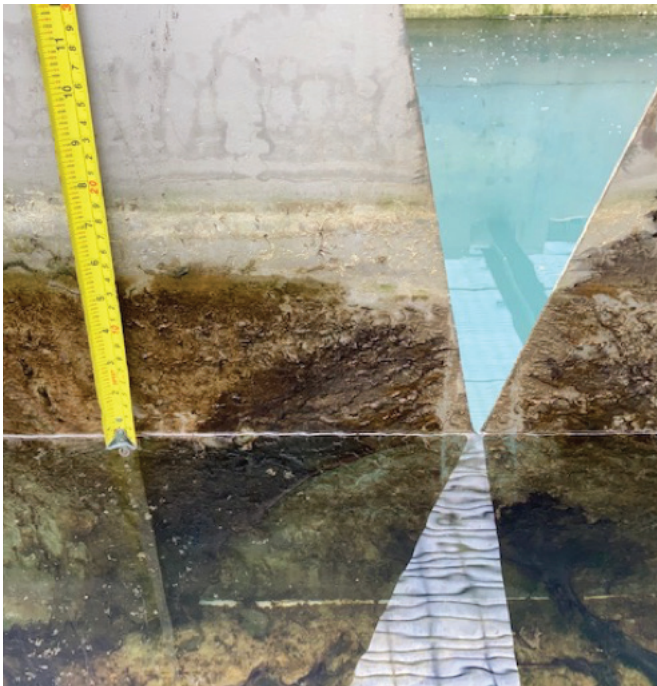


Figure 3- V Notch at zero flow

HMA Geotechnical was contracted to commission the large data logging systems at the southwest end of the dam.

The Campbells Scientific data logging systems were built by an external contractor but were programmed and commissioned by HMA.

Assistance was also sought in connecting them to Melbourne Water's CITEC system.



Figure 4 – One of three Campbell's logging systems

HMA GEOTECHNICAL STATEMENT

HMA Geotechnical have supplied bespoke monitoring systems and instrumentation to Water Authorities across Australia, combining over 120 years of accumulated experience and operating for nearly 40 years to deliver the right solution for our customers.

As an Australian employee-owned company, we take pride in our work.

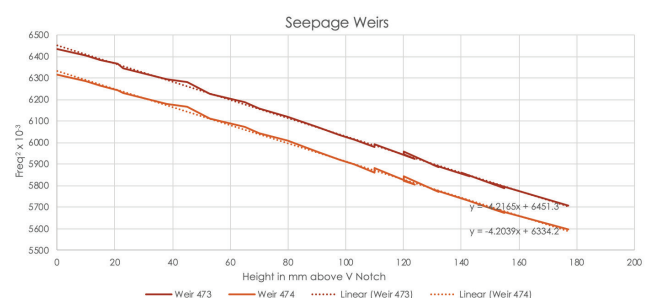


Figure 5- Typical V Notch weir calibration plot