

Description of Scour Gate and Geotechnical Investigative Works

SCOUR GATE REPLACEMENT

Background:

Currently, the existing scour gate is not fit for operational use and can not be relied on to operate in high flow situations. The scour gate functions as the main method of being able to lower the water levels in the reservoir during rainfall events, thereby being the main tool for reducing the significant risks of the dam failing due to rainfall events in the catchment.

This existing gate is a critical element in the regulation of high flows in and out of the reservoir by providing an additional 7 m³/s of outlet capacity in high flow situations.

As the scour gate is the main method of managing water levels and flooding risks in the dam, the installation of the new gate is absolutely required before any other works on the dam are able to proceed.

Purpose:

The purpose of these works is to replace the existing scour gate and convert it from a manually-controlled asset to one which can be managed remotely, enhancing Melbourne Water's ability to safely manage the dam in flood events.

Timing of Works:

Melbourne Water maintain a policy of "no net increase" to dam risk during construction. As a result, the works on critical appetencies such as the scour are reliant on managing the works during low risk windows of opportunity. The window of opportunity to undertake the scour works at this lower risk decreases by approximately 85% as we head towards early summer. Table 1 shows the exedence probability of a 1 in 100 AEP event as in summer as 0.00687 (1 in 145) as opposed to spring/autumn 0.00141, 1 in 710.

In terms of construction flood risk management during the upgrade, an operable scour is required to be completed prior to undertaking the remaining upgrade works.

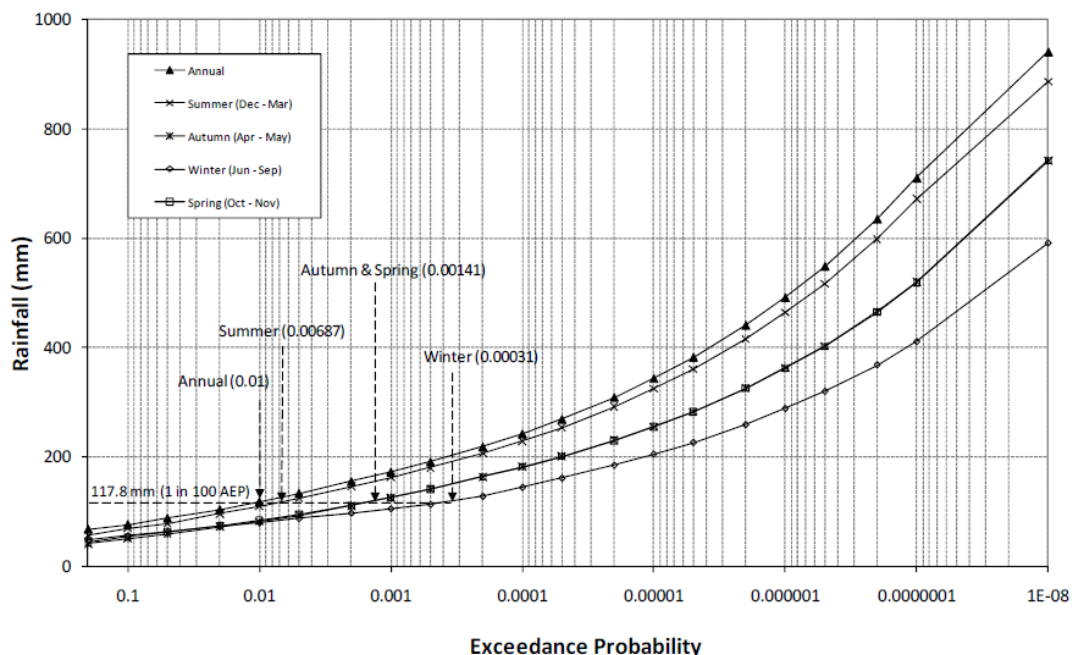


Table 1. Seasonal rainfall depth for 12 hour duration depth
(Toorourrong Construction Flood Risk Assessment, 2010)

In simple terms, the risks of flooding resulting in an overtopping of the dam, failure of the dam, and resultant risks to the lives of our workers and the immediate community are greatest from the unpredictable high-intensity rainfall events which occur most often in the summer months. As a result, we must complete works on the scour gate (and the rest of the upgrade works in sequence) while the risks to lives and property is at its lowest.

This makes the scour gate works our highest priority, and means that we must complete its installation no later than 30 October. The remaining installation works would take 10 days to complete.

Scope:

The scour gate replacement works consist of:

- Removal of a 2m x 2.4 m zone of bluestone floor at the base of the scour (3 metres below operational water level within the reservoir).
- Removal of the existing penstock gate:
- Installation of a new concrete base (below water level).
- Drill in to existing upstream (below water level) walls, approximately 30 x 12mm anchor bars into the wing walls of the structure, to anchor the new concrete structure to the face of the scour.
- Installation of new actuated penstock gate.
- Installation of 5 deep vertical Reid bar anchors to secure the new concrete structure against the existing.
- Capping of the existing structure with a concrete capping slab.

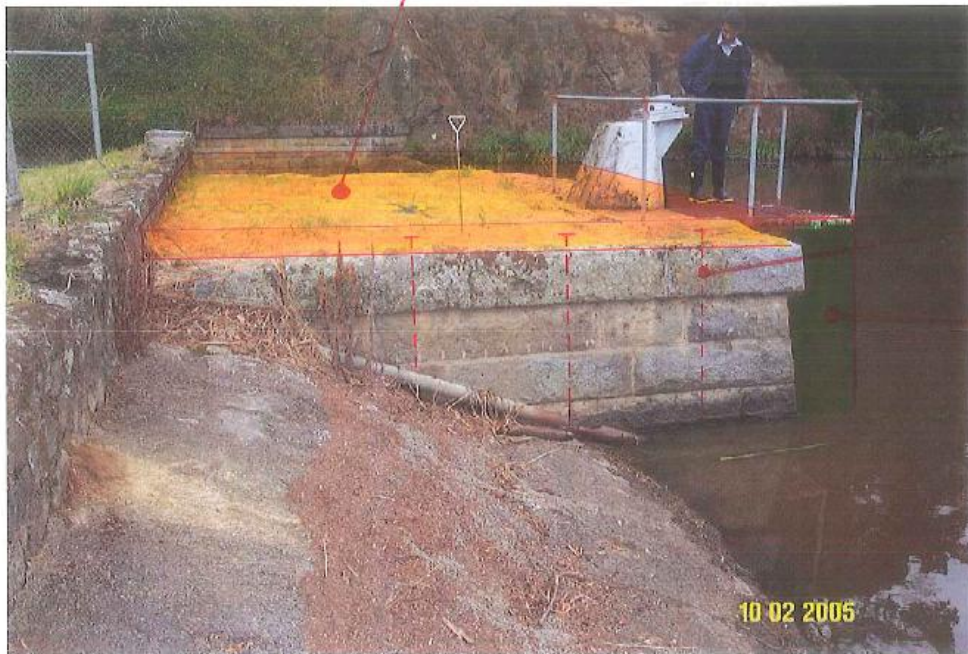
Heritage Impacts of Scour Gate Works:

The bulk of works are to take place 3 metres below the operational water line on the inside of the dam wall, and are limited to removal of a 2m x 2.4m section of bluestone to gain access to the metal gate, which is the original installed over 120 years ago.

This gate will be removed in as good a condition as practically and safely possible.

A concrete capping slab will be added on top of the existing bluestone and granite to tie the new scour structure in to the existing bluestone and granite gate housing. See Figures 2 and 3 for further detail. These works are all conducted on the inside of the dam wall.

NEW CONCRETE SLAB ABOVE TUNNEL & INTAKE



REIN BARS IN TOP SLAB & INTO BLUESTONE AROUND PERIMETER TO TIE THEM TOGETHER.

PROPOSED SCOUR OUTLET INTAKE STRUCTURE TIED INTO TOP SLAB & BLUESTONE AROUND EDGES

TOOROURRING RESERVOIR - SCOUR OUTLET

PRELIMINARY ONLY

Figure 2 shows the location of the new scour outlet on the upstream face of the existing structure.

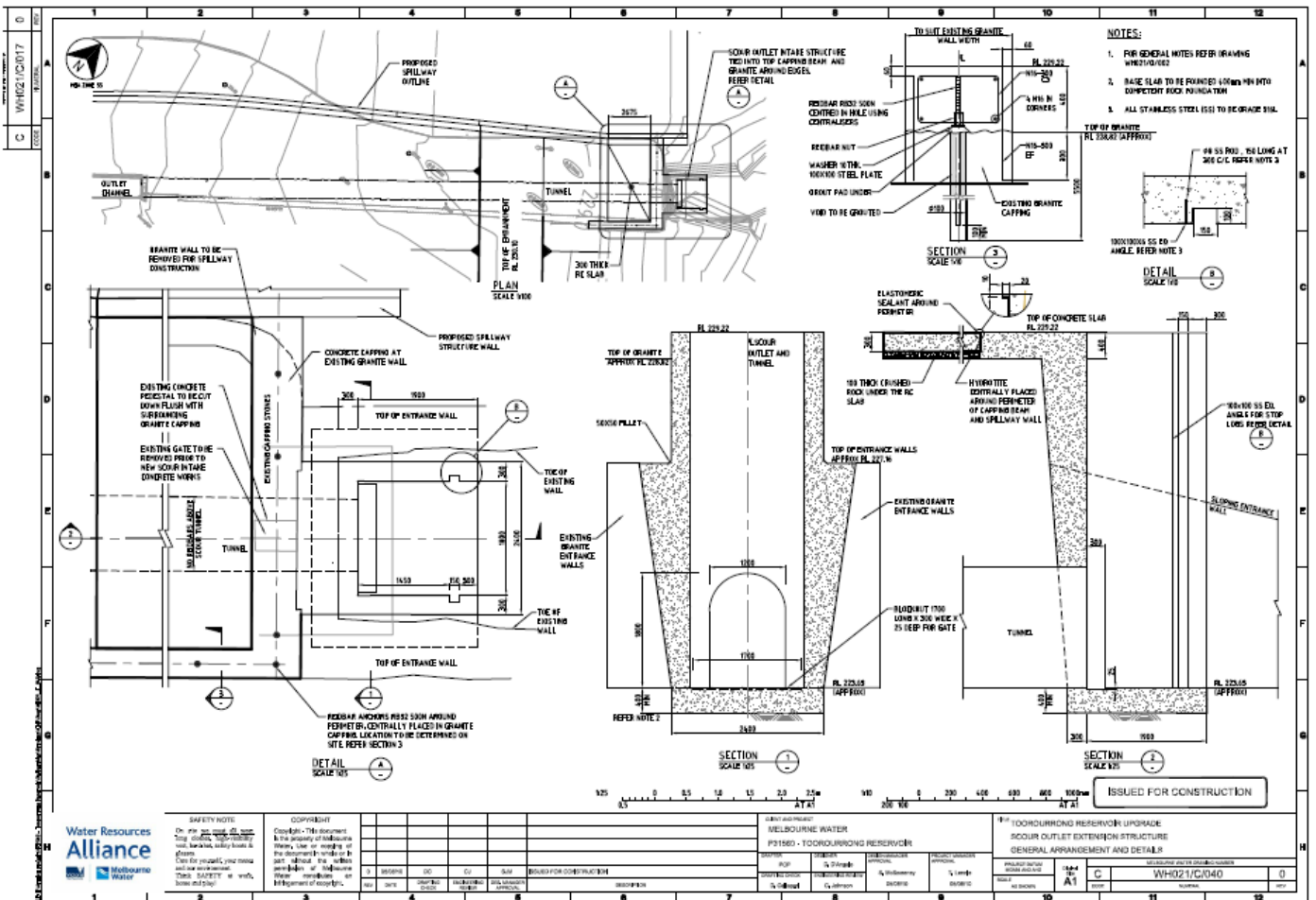


Figure 3 - Details of Scour Gate Works

Geotechnical Investigative Works:

Purpose:

We wish to undertake further geotechnical investigation on the embankment itself both upstream and downstream (Area A) to confirm design assumptions for the works, as outlined in Figure 4 below.

Scope:

This work will consist of drilling boreholes on the upstream and downstream faces of the embankment. It will be non destructive (small bore holes max 200mm diameter). A truck-mounted drill rig would be used to conduct these bore holes.

Further geotechnical investigation needs to occur downstream of the embankment in the borrow pit areas (areas B1 and B2) to confirm both quantity and quality of fill material for new embankment. This will require excavation of up to 12 test pits, roughly 3m x3m to a maximum depth of 2m, which will be backfilled immediately after excavation.

A maximum of a 12 tonne excavator would be used to excavate the test pits.

Heritage Impacts of Geotechnical Works:

There are no direct impacts to any of the European heritage materials on site, and we are conducting our geotechnical works in areas identified in the Cultural Heritage Management Plan for the site as having no likely Indigenous heritage impacts.

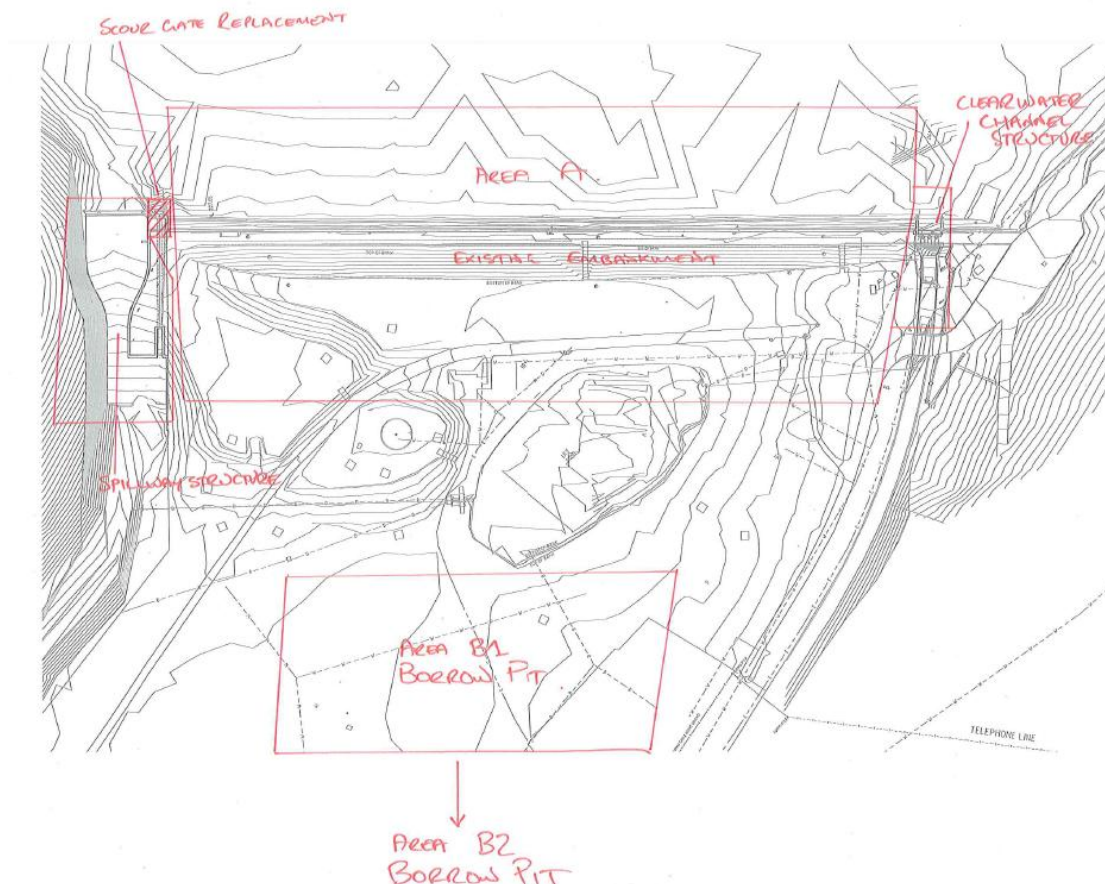


Figure 4 – Areas for Geotechnical investigative works are marked Area A, Area B1 and Area B2. The Scour Gate works area is also marked.