

**BRITISH DAM SOCIETY 22<sup>nd</sup> BIENNIAL CONFERENCE – KEELE UNIVERSITY****Conference Tour – Friday 13th September 2024 United****Utilities – Macclesfield Reservoir Cascade**

This tour will visit the upper two reservoirs in the Macclesfield reservoir cascade and will provide an insight into the history and historical works for this cascade of reservoirs. There will also be an opportunity to view and discuss the current proposals for MIOS driven spillway works to ensure the reservoirs meet present day safety standards. The tour will leave the university at 13:00 and return by 17:30.



The upper two reservoirs in the cascade are still used to supply raw water to the local water treatment works, whilst the two lower reservoirs are used for compensation flows that eventually feed into the River Bollin.

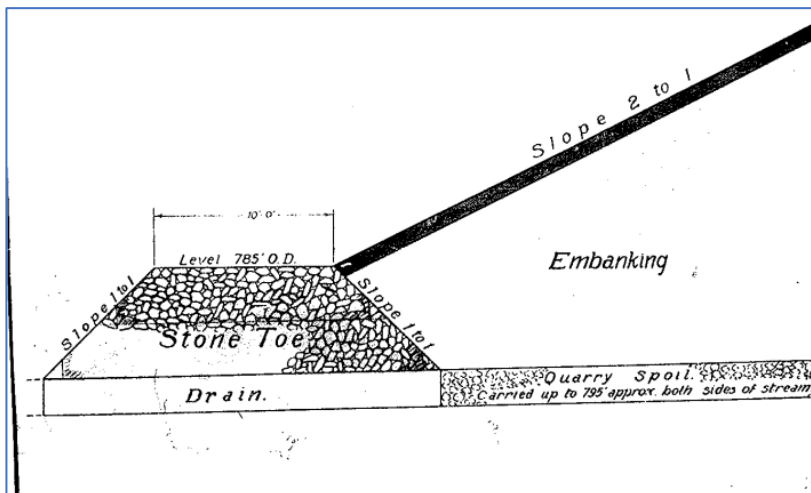
## Uppermost reservoir in the cascade

This reservoir was built for Macclesfield Corporation Water Works and completed in 1929 and is formed with an earthfill dam that spans across the River Bollin. The consulting engineer was Herbert Lapworth.

The dam comprises an earthfill embankment with a vertical central puddle clay core that is connected at its base to a concrete tongue that projects from a concrete filled cut-off trench. The core is 1.5m wide at the top and 4.4m wide at the base where the dam section is at its highest. Both the upstream and downstream include a 'stone toe', with the downstream detail showing a layer of 'quarry spoil' laid in a 2' thick layer. This connects into a drain beneath the downstream stone toe.

Recent modifications to this reservoir are as follows.

- 1993: The top of the clay core was raised to a minimum level of 259.15m AOD to compensate for consolidation settlement. A wave wall was constructed at the same time and a new stone track provided, that raised the finished level to a minimum of 260.00m AOD. The settlement monitoring points that are now in use were installed at the same time.
- 2005: New combined debris barrier and security barrier erected around the drop shaft spillway overflow.



## Second reservoir in the cascade

This dam was completed in 1852 to supply water to Macclesfield and originally designed by JF Bateman.

The reservoir is formed by an embankment dam across the Bollin Brook (**Short dam**) and a subsidiary embankment to the west of the reservoir (**long dam**).

The “Short” Dam is approximately 75 m long, straight on plan and stands 17 m above foundation level at its highest section over the centre of the valley. The upstream slope has a gradient of 1 (v) on 3 (h) with extensive puddle clay blanketing of the upstream as well as a central puddle clay core. The downstream face has a gradient of 1 (v) on 2 (h).

The “Long Dam” is a 200m long low saddle dam that stands 4.5m above natural ground level and is located across the western end of the reservoir. This earthfill embankment has a central puddle clay core that is thought to be keyed into a foundation comprising Glacial Till.

A recent MIOS action to undertake a new flood study has led to a flood study and physical model to understand the inflows and interaction between the other reservoirs which are in cascade. Following these studies United Utilities are currently developing a new spillway solution to accommodate the design flood event.

