The British Dam Society

BRITISH DAM SOCIETY 23rd BIENNIAL CONFERENCE – KEELE UNIVERSITY

Conference Tour – Friday 11th September 2026

Canal & River Trust – Toddbrook & Combs Reservoirs

The group will visit two canal supply reservoir that are close to each other. At Toddbrook we will see the recent spillway works. At Combs we will see the historic stability works. There is a 10-minute drive between the two dams.

Toddbrook Reservoir

Figure 1 Toddbrook Reservoir - Post Incident

Toddbrook Reservoir was originally constructed in 1838 to supply water to the Peak Forest Canal. It is located above the town of Whaley Bridge and is used both for canal supply and as a local amenity, supporting activities such as sailing. The dam and surrounding land are accessible to the public and form part of a popular recreational area.

In 2019, damage to the spillway led to an emergency drawdown, evacuation of downstream residents and subsequent major rehabilitation works. The site has since undergone significant improvement works to enhance its resilience and safety, including reconstruction of the spillway and upgrades to drainage and monitoring systems.

The reservoir is approximately 1.5 million cubic metres in capacity and is impounded by an earthfill embankment dam with a puddle clay core. The dam is around 400m long and approximately 23m high. Toddbrook Reservoir remains an important asset both for water management within the canal network and as a valued local amenity.

Figure 2 New Auxiliary Spillway under low flow conditions

Figure 3 Toddbrook Reservoir – location plan – Google Earth image

Spillway & other safety works

Following the 2019 incident, a new spillway has been constructed to significantly improve the safety and resilience of the dam. The spillway has been designed to be integrated within a public park and wider landscaping. The spillway is of a side-channel configuration located on the left-hand side of the dam, adjacent to the main embankment. It includes a 72m long composite weir, designed to provide increased discharge capacity during extreme rainfall events and to reduce the risk of overtopping.

The reservoir is fed primarily by its local upland catchment, via the Todd Brook, with inflows managed to maintain reservoir levels and support supply to the Peak Forest Canal.

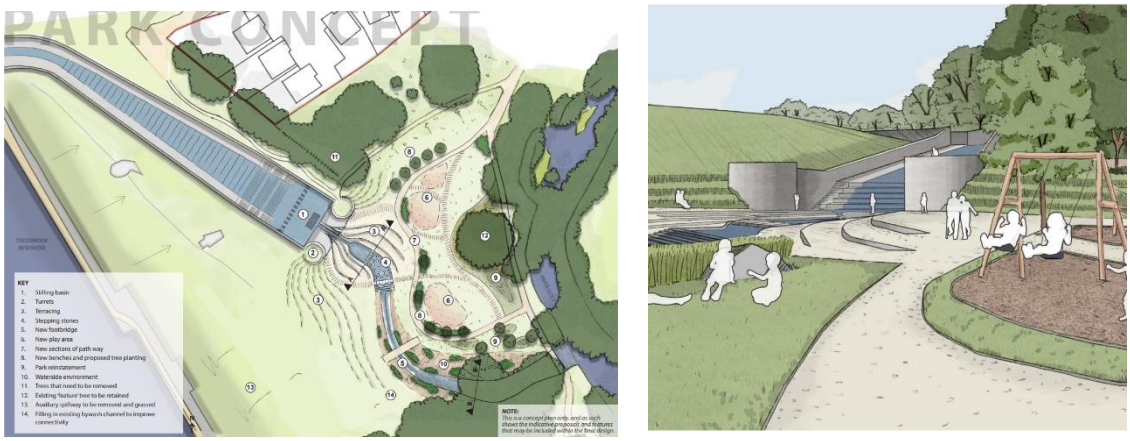

Figure 4 Toddbrook Reservoir – Visualisations of completed scheme

The Trust is undertaking a programme of works at Toddbrook Reservoir following recommendations from the 2020 Section 10 inspection report, aimed at improving the long-term condition, safety, and monitoring of the asset.

The works include:

- Construction of a new spillway to provide sufficient flood discharge capacity to safely and reliably pass a PMF inflow event
- Improve monitoring of the dam, including installation of a temperature sensing system within the downstream embankment.
- Increase the permanently installed drawdown provision
- Improvements to drainage measurement infrastructure
- Installation of upstream control valves on scour pipework

Combs Reservoir

Combs Reservoir was originally constructed in 1806 and raised in 1826 to a height of 18m to supply water to the Peak Forest Canal. The reservoir is a popular local amenity for sailing, fishing, permitted swimming and is popular with the public for general recreation. It is an impounding reservoir with an earth embankment dam retaining 1.4 million cubic metres of water. There is a primary swallow hole spillway centrally upstream of the crest with an auxiliary spillway to the left abutment. There is one draw off valve feeding the canal and four penstocks that can be used to remove the top water.

Slope stabilisation works

On the 29th January 1976 there was a local failure of the upper part of the downstream slope of the embankment at a point some 15m to the south of the inlet to the swallow hole overflow. Part of the crest dropped as the downstream slope slipped outwards, and as a consequence the slipped material blocked the road known as Tunstead Lane that ran along the toe of the embankment. The slip did not cause a catastrophic breach of the embankment, but emergency measures were put in hand to lower the reservoir water level by around 2m in order to reduce the hydrostatic load on the embankment. Extensive investigations were then undertaken into the cause of the failure and a remedial works project was initiated to increase the stability of the bank. As a result of these studies it was also determined that additional wave protection works were required to the crest. The remedial works were designed by Halcrow in the early 1980s and a contract for their construction was let in the summer of 1982. The works were duly completed in 1983. The main components of these extensive remedial works were as follows:

- Construction of a supporting buttress against the lower part of the downstream face comprising of 16,000m3 of rockfill.
- Extension of the draw-off and overflow culverts through the embankment in order to accommodate the new buttress.
- Raising of the control gear for the draw-off valve.
- Re-location of Tunstead Lane from the downstream toe of the old embankment so as to run along a berm that was formed on the new buttress.
- Wave protection to the upstream face and crest was improved by the addition of a reinforced concrete wave wall. This was combined with a sheet pile cut-off that extended down through the raised portion of the crest (added in 1826) so as to penetrate the fill of the original embankment beneath.

More recent modifications to the reservoir involved the provision of additional emergency drawdown capacity. Works are now proposed, at the investigation and detailed design stage, to replace the canal feed drawoff system.

Figure 4 Combs Reservoir – Concave wave wall and stability berm

Site visit to two reservoirs

The Toddbrook Reservoir visit will serve as an update to attendees, allowing viewing of recently completed elements of the upgrade works, including the new spillway, the downstream park and stilling basin area, and the low-flow channel works. The Trust, and staff from their design partner Arup, will be present to describe the scheme, explain the design and construction approach, and answer questions. Construction works will still be ongoing at the time of the visit. Welfare facilities will be available on site.

At the Combs Reservoir visit the Trust and their delivery partner JN Bentley will explain the safety works completed in the 1980's and the proposed new works. There are no welfare facilities at this site.

Visitors will arrive at a coach drop-off point a short distance from Toddbrook reservoir, followed by a walk to the dam and a guided tour around the key structures. Suitable sturdy footwear is required due to uneven ground and construction conditions. Appropriate wet weather clothing is recommended given the exposed nature of the site. The group will then travel by coach to Combs reservoir for the second visit.