The British Dam Society

BRITISH DAM SOCIETY SITE VISIT
SITE VISIT - Wednesday 8th of July 2026.

Canal & River Trust (the Trust) – Slaithwaite Reservoir

Background

Figure 1 Slaithwaite Reservoir looking north.

Hill Top (Slaithwaite) Reservoir was built between 1795 and 1799 by the famous canal engineers Benjamin Outram, George Binnie and Thomas Telford. It impounds the waters of Merry Dale Clough, a tributary of the River Colne.

At 25.1m high, the reservoir dam might have been the tallest of its time. It can hold over 273 million litres of water, which provides 1,500 lockfuls (180m^3) allowing one canal boat to travel up and over the Huddersfield Narrow Canal across England from east to west 1,517 times. The reservoir was first built to supply water to the Huddersfield Narrow Canal which was a busy route for boats carrying goods to the local mills during the 18th and 19th centuries. Today, it continues its vital role supplying water to the canal and is a much-loved place for the community to enjoy water-side leisure activities. This historic structure has played a key role in Slaithwaite for over two centuries and now requires essential upgrades to ensure it can continue supporting both the canal and the local community for generations to come.

The catchment consists mainly of agricultural land and open country with scattered hamlets and groups of houses. At the upstream end of the reservoir a small masonry weir diverts water into a mill leat, or bywash, along the left shore of the reservoir. 20 m upstream of the dam, flows in the bywash can be diverted around the left abutment into Millowner's Goyt, and then re-emerge at the top of the first drop shaft of the spillway.

The surface area of the reservoir is 46,000 m^2 at the normal top water level of 166.97 mOD. The capacity of the reservoir at the same level is estimated at 273,000m^3. The dam is aligned roughly north to south and is at the east end of the reservoir, which extends in a roughly triangular shape about 460 m westwards.

The 25.1 m high earthfill dam is reported to have a puddle clay core. The upstream slope is between 1 in 2.5 and 1 in 3 at lower levels, steepening to 1 in 2 over the top half of the dam. The top half of the slope is protected by riprap placed on geotextile filter. The upper part of the upstream face was steepened when the crest was widened and raised in the 1991 remedial works.

The 120 m long crest is curved in plan, convex upstream, and is 4.5 m wide. It carries a surfaced public footpath running between a 1.3 m high concrete wave wall and a fence along the downstream edge.

Numerous dam raising in the past resulted in complex overflow arrangement. At the left abutment there are two overflows with their sills set at the same level which is 166.97 mOD.

The original overflow comprises a 2.2 m diameter (7.53 m circular perimeter), 3 m deep, masonry bellmouth shaft discharging through a 35.2 m long oval shaped culvert 1.68 m high x 1.2 m wide. The culvert discharges into an unlined rock drop structure about 8 m deep below the invert of the culvert.

The second overflow comprises a 16.76 m long reinforced concrete weir discharging via a tapered concrete channel, constructed above the original culvert, to the same drop structure as the original culvert with an approximately 12 m deep drop.

The water flows through a deep rock cut to a second masonry lined drop shaft where it did fall 7.5 m to a 4.6 m wide by 2.6 m high masonry arched tunnel (keystone dated 1852). The tunnel discharged via a concrete lined channel and drop structure to the river.

Additional relief capacity was provided at the tunnel from the second drop shaft by means of a 3.75 m wide reinforced concrete channel constructed above it, a double decker spillway.

There is a single low-level outlet that passes through the dam at approximately its mid-point. A stone culvert under the upstream shoulder of the dam steps down to a 550 mm diameter polyethylene lined pipe though a plug in the core, tapering to a 300mm diameter pipe carried within the downstream masonry tunnel. At the downstream end, flow discharges into a channel across the downstream face of the dam which allows releases to be made either to the canal feeder or to the river.

Proposed asset improvement works

Following the Statutory Inspection under Section 10 of Reservoir Act 1974 Measures of Interest of Safety (MIOS) was raised to check the adequacy of the overflow arrangement for design safety check flow.

The existing spillway at Slaithwaite Reservoir was found to be able to pass a 1 in 3000 storm but insufficient in safely passing the Design Flood (1 in 10,000-year, 34.98 m^3/s) and the Probable Maximum Flood (PMF, 76.79 m^3/s). A CRM physical model of the existing spillway indicated significant overtopping during these flood events. Consequently, an optioneering assessment was conducted, leading to the Trust selecting an option to enlarge the existing spillway for full flow capacity.

The spillway arrangement was complex and very difficult to model. To model the proposed design, the CRM hydraulic model was adapted, followed by development of a CFD model. Both models provide a representation of the spillway operations, and both models showed good alignment between results. The final spillway arrangement is based on the CFD modelling outcomes for the PMF + 10% and 10,000-year storm including 0.25 air bulking coefficient.

Figure 2 Spillway physical model.

Figure 3 Netting in the Rocky Gorge.

Key design elements were:

The right-hand side wall of the existing upper chute will be raised by 300 mm to contain the PMF.

The upper rocky gorge is to be partially filled to reduce its overall depth.

The lower rocky gorge (the start of the reinforced concrete spillway structure) is filled with mass concrete (including a no fines concrete drainage layer at the base), and a new reinforced concrete U-shaped channel above.

The existing masonry tunnel and drop shaft will be filled with structural fill to mitigate risks associated with their stability.

A new U-shaped reinforced concrete channel is being constructed on top of the existing chute over the tunnel, widening at the upstream end to increase capacity but narrowing downstream to ensure the flow of water is directed into the downstream channel. A new U-shaped reinforced concrete channel is being constructed within the existing spillway footprint downstream of the existing tunnel. This new channel is designed to be within the existing channel walls.

The existing curved, masonry weir at the downstream end of the proposed spillway works is being refurbished.

The construction works commenced in January 2026 aiming to complete the MIOS element in January 2027.

Figure 4 View of the construction site June 2026.

Site visit

The visit will commence at the JN Bentley office compound located at New Street, Spa Fields, Slaithwaite, HD7 5BB (gate location https://maps.app.goo.gl/W2JyoHCcBXxFTLbL9, W3W: lately.ranked.bless). This is not at the main construction site because of site space constraints.

The site visit will commence with a visitor's induction and a brief presentation on the background and progress of the works.

The visitors will then walk in group (circa 15 minutes) to reach the main construction area at the dam access off Nabbs Lane at https://maps.app.goo.gl/Tc4BHu1bomhW2Lf9A (W3W: intervals.motorist.drilling), then walk under the railway viaduct, to meet at the compound adjacent to site and attend the site walkover.

Plan for the site visit:

10:00 – 10:30	Meet and greet
10:30 – 11:30	Safety briefing and introduction to the project
11:30 – 12:00	Walk to site
12:00 – 13:30	Site visit
13:30 – 14:00	Debrief and sign out

PPE requirements for the site visit:

- Hard hat
- Gloves
- Hi-Vis Vest
- Steel Toe Cap Boots (please no rigger boots)

Please register your attendance with:

- Kamila.Etienne@canalrivertrust.org.uk
- Grant.Maconachie@canalrivertrust.org.uk