Trews Weir Repairs

Project Update – December 2025

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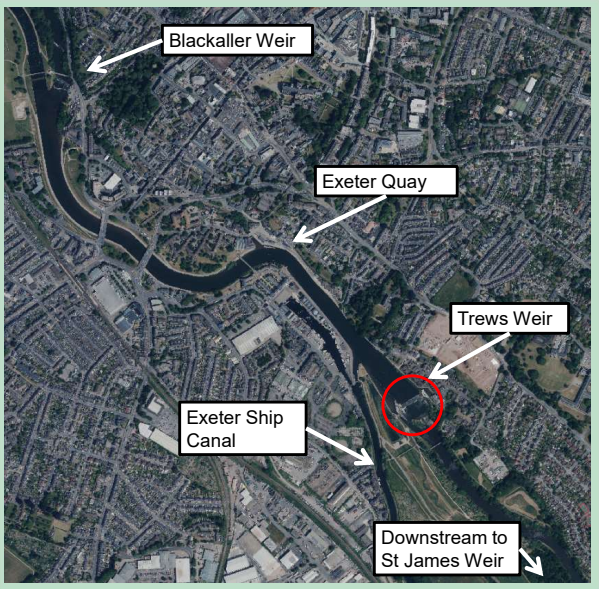
Trews Weir Repair Project

A joint project between Exeter City Council and the Environment Agency to secure the future of Trews Weir and improve migratory fish passage

Trews Weir lies on the River Exe, 500m downstream of Exeter Quay and just beyond the entrance to the Exeter Ship Canal as shown in Figure 1. The weir was originally built in the 17th Century to maintain a water level in the Canal and Quayside, and has undergone numerous modifications and repairs over the years. The weir is owned by Exeter City Council.

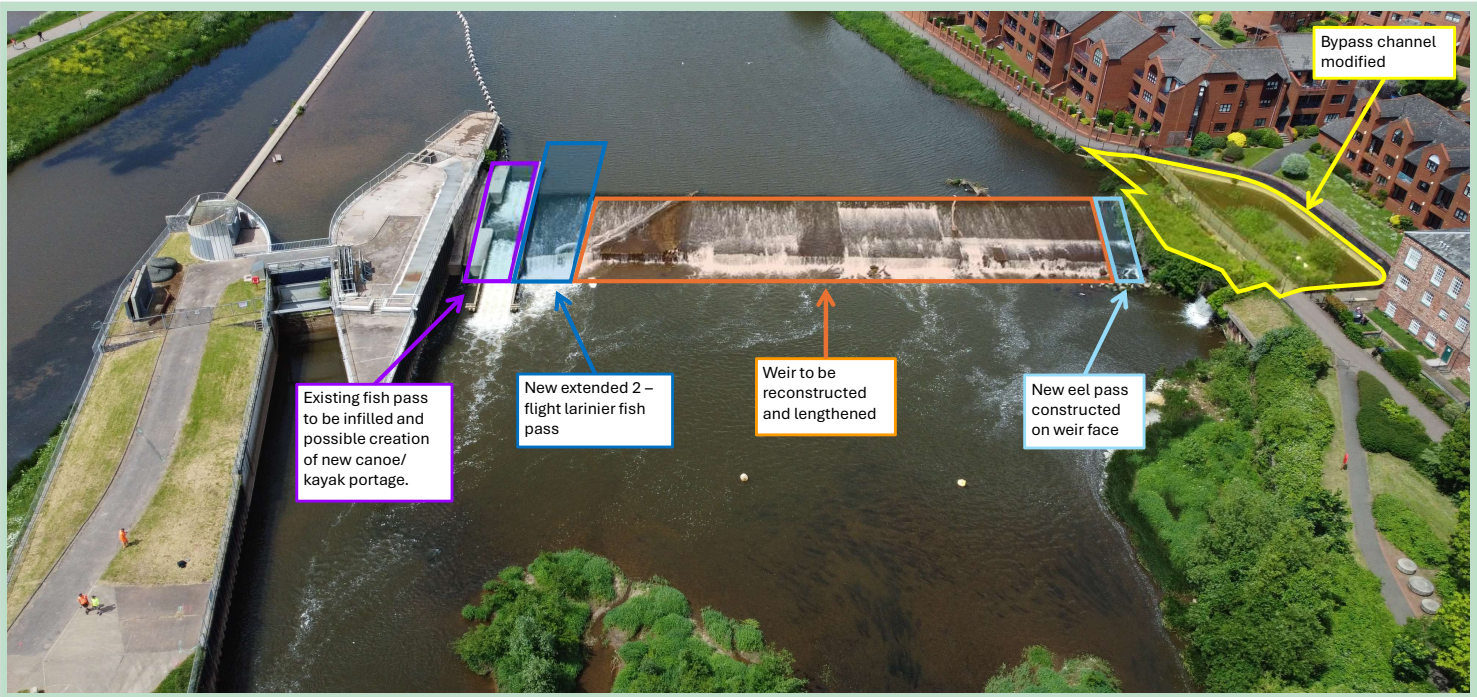


The modern weir is approximately 72m in length and 13m wide, built from block stone over a clay and gravel infill, with a concrete crest and with patchwork concrete repairs along the downstream slope. On the western side of the weir are a fish pass and eel pass, which were installed by the Environment Agency in 2010. On the eastern side is a bypass channel, a modern structure marking the location of a former mill offtake.

The weir has several areas of damage to its surface and evidence of water flowing through its core, leaving it vulnerable to further washout and collapse. If the weir were to collapse, the canal would cease to function and it would threaten the structure of the quayside and the integrity of underwater power cables supplying the city centre, so we are planning major refurbishments 2026 and 2027 to safeguard this critical structure long into the future.

The planned works will include rebuilding much of the weir, installing sheet piles and a new concrete surface to minimise water flowing through the structure and extending the weir downstream below the water level. We will also be taking these works as an opportunity to improve fish migration by replacing the current fish pass with an extended pass, modifying the bypass channel to remove distraction flows, and constructing a new eel pass on the eastern side of the weir. We are also investigating options to improve access for river users by building a new portage over the weir for canoes and kayaks.

The works to refurbish the weir will be funded by Exeter City Council and the Environment Agency through the Flood Defence Grant in Aid Programme.



Why are repairs needed?

What's Wrong with the Weir?

Following the collapse of the downstream St James Weir in early 2019, water levels below Trews Weir dropped by around 1.5 metres. The drop in water levels revealed the poor condition of the previously submerged weir surface, which raised concerns of a potential future failure through similar mechanisms to St James Weir.

Intrusive investigations into the weir were commissioned, which found that the construction of the weir is primarily river-bed material (Gravel, sand and silt) retained by timber stakes and covered with a layer of block stone on the upstream and downstream slopes. The weir is not watertight, and there are voids in the weir allowing water to flow through the core material which is highly susceptible to wash-out. An asset condition review of Trews Weir carried out in 2024 estimates that, whilst there have been a number of repairs carried out since the weir was built ,designed to extend its lifespan, the current structure is now reaching the end of its serviceable life. The residual lifespan of the structure is estimated to be 1-5 years.

The drop in water levels also created a dangerous situation for river users, as there is now a significant drop off the end of the weir onto rocks and other debris below. Whilst the weir is not designed for passage of people or vessels, we know that some choose to descend the weir in canoes and kayaks, and as owner of the asset ECC has a duty to potential users who may be put at risk.

As well as exposing damaged parts of the structure, the drop in water levels also caused the base of the fish pass to be exposed, making it difficult or impossible for migrating fish to use and trapping hundreds of salmon downstream of Trews Weir unable to reach their upstream spawning points and vulnerable to predation. A temporary extension to the pass was installed the EA in 2019 as an emergency measure, but migrating fish are still being delayed below Trews Weir due to difficulties passing this obstacle caused by the change in water levels.

What would happen if the weir was left to fail?

The weir was originally built to feed the Exeter Ship Canal, and through its history has been raised and reinforced to increase the water level to keep a reliable water level in the canal and Quayside and to permit larger ships to navigate from the Estuary up to the City.

The weir now holds an upstream water level some 3 metres higher than the natural level downstream. If the weir collapses, upstream water levels would drop substantially which would have wide-ranging impacts:

- Scouring of riverbed around Trews weir, damaging High Voltage cables on the river bed which provide power to thousands of residents and businesses in the city centre.
- Loss of water in the canal and lowering of water levels at the quayside, leading to destabilisation of canal banks and river walls, and grounding of boats on the canal causing damage to property and the environment.
- Exeter City Council has a legal duty as required by the 1829 Exeter Canal Act, to maintain navigation in its current form from the Estuary to the Quay.
- Loss of business and tourism associated with the canal and quay maintaining high water levels, such as canoe and kayak hire, boat trips, Butts Ferry etc.
- Increased flows upstream and downstream of Trews Weir, causing scour and erosion of the bed and banks as far as St James Weir downstream and Mill on the Exe upstream, impacting local ecology and damage to river banks and structures.
- Reduction in the functionality of the fish pass at Mill on the Exe weir due to reduction in river levels at the toe, resulting in migrating fish not being able to migrate to their upstream spawning sites.
- Substantial release of sediment from the impounded area upstream of Trews Weir, affecting downstream fish spawning sites and releasing historic contaminants from the previous industrial uses around the quay.

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Reinforcing the Weir

The main objective of these proposed works is to secure the long-term future of Trews Weir, the Canal and Quayside, whilst minimising significant adverse impacts both during the works and in the future. The design of the scheme was therefore developed on the following principles to ensure the new structure will:

- have a design life of at least 100 years
- not significantly alter water levels upstream of the weir at their current levels, for any given flow
- be low-maintenance, and will be designed to make future maintenance as easy as possible where it may be required
- be designed to complement the new fish pass, and reduce barriers to fish migration
- be safe for passage by canoes and kayaks, and should consider opportunities to provide portage up the weir to improve river access.
- have the ability to carry cable ducting for future National Grid High Voltage cable crossings
- be buildable whilst maintaining fish migration routes and river and canal operations, and without significantly impacting flood risk during the works.

A range of options for the new weir design was initially considered, with each being assessed against a range of criteria to determine the preferred option. These options were reviewed by key stakeholders, with a preferred option selected and developed in more detail leading to this proposed option.

The key features of the proposed weir design are:

- Sheet piling at the upstream and downstream end of the weir to create a robust, water-tight supporting boundary to the weir
- Remove blockstone surface and upper layers of weir, constructing a new concrete surface to make the weir watertight
- The downslope of the weir will be modified to have a single gradient from top to bottom, making the weir safer for river users and easier for migrating fish to pass if they do not use the fish pass
- The downslope will be extended downstream below water level to remove the current drop, making the structure safer for river users and migrating fish.
- The weir crest will gently slope from East to West, to keep the dominant flow nearest to the fish pass, improving the function of the fish pass by attracting migrating fish to that part of the weir and removing distraction flows from the east side.
- A textured surface will be formed to create niches and surface roughness which helps algae to colonise and aids migration of eels as well as reducing visual impact by encouraging more ‘whitewater’ aesthetic similar to existing.
- Options are being investigated to use pigmented concrete to better match the colour of the existing structure.
- A strip on the eastern side of the weir will be designed to function as an eel pass, with a small notch and embedded gravels in the concrete surface to create a preferable migration route.
- At the request of National Grid, ducting may be laid through the weir to allow for future river crossings of high voltage cables, which currently run on the river bed.

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Improving Fish & Eel Passage

Why does the fish pass need replacing?

The River Exe is a nationally important river for spawning Salmon and Trout, both of which migrate from their upland spawning grounds on Exmoor to the sea during their early life, and back from the sea to these spawning grounds to reproduce. The habitats upstream of Trews Weir are highly productive and key spawning ground for Exe salmon, with the River Barle being designated as a SSSI for its value to Salmon and other fish species. In recent times, Salmon numbers have declined dramatically, and the Environment Agency has classified the river as “Probably at risk” of the salmon population falling below a sustainable level.

Obstacles to migration is identified as a significant pressure on fish populations, and a major constraint on recovery of fish numbers. Trews Weir stands at the top end of the tidal River Exe, and following the collapse of St James Weir now forms the first major obstacle to fish migration. Large obstacles such as Trews Weir cause fish to be delayed on their migration whilst they replenish energy reserves to try and jump the weir, leaving them open to predation below the weir, and each failed attempt can cause injury making future attempts harder. Fish are regularly seen in large numbers congregating below the weir, jumping but ultimately failing to climb the weir surface itself or at the bypass channel outlet following the flow here. There is a legal duty under the Salmon and Freshwater Fisheries Act for weir owners to provide functional fish passes over large barriers when they are substantially modified or rebuilt.

The existing Environment Agency fish pass on Trews Weir provides a safer route for fish to ascend the weir, removing the need for a large jump at the bottom and providing a resting pool halfway up. However, following the collapse of St James Weir the water level below the weir dropped by more than 1.5 metres so a temporary extension to bottom half of the pass was added as an emergency measure to maintain a fish migration route. This extension provided significant benefit, but remains sub-optimal due to the long lower flight. Furthermore, the uneven crest of the existing weir and the bypass channel on the eastern side present distraction flows away from the fish pass, towards areas where injury is much more likely.

What are the plans to improve fish passage?

In the development of the weir repair scheme, options to improve fish passage were considered. Due to funding restrictions it is not possible to deliver an all-species pass such as a vertical-slot pass, however it is possible to provide a new two-flight Larinier Pass (similar to the existing) optimised for larger migrating fish such as Salmon and Trout, which can be fully complaint with best design practice and will take into account the new downstream water levels. The new pass will be longer than the existing structure, and due to the location of a High Voltage Cable the existing cannot be extended upstream, so will be moved around 8 metres in towards the middle of the river. The design of the pass will include the facility to install a fish counter at the top of the weir, to allow future monitoring of migratory fish populations.

The new weir will incorporate a gentle cross-slope from east to west, meaning the dominant, deeper flow will be alongside the new fish pass helping to attract migrating fish to the entrance of the pass. In the surface of the weir a new eel pass will be created on the eastern side to aid migration of eels and elvers over the weir. This will take the form of a shallow channel around 1.5 metre wide with a raised hump in the crest and downslope, with gravel embedded in the concrete surface which slows down flow and creates lots of routes for eels to wriggle along.

The bypass channel on the eastern side of the weir will be modified, with the intention to remove the major distraction flow from the eastern bank away from the fish pass. Having focussed a lot of their efforts on the weir and fish pass to date, Our designers are currently exploring this element of the scheme and the best way to address these distraction flows.

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How will the works be done?

Phasing of Works

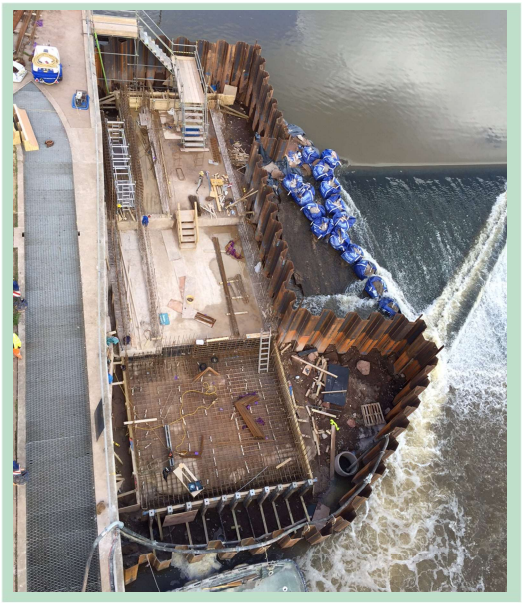
With much of the planned works needing to take place in the river channel, the works will be affected by weather conditions and river flows. To minimise the possibility of weather-related delays, to maximise the quality of works, and for the safety of those delivering the works, we are planning to carry these works out from Spring to Autumn, when river flows are typically lower.

The works will be delivered in two phases, across two years:

- Phase one is planned to start in May 2026 and complete in September 2026. Works will involve rebuilding the eastern half of weir, constructing the new eel pass and modifying the bypass channel.
- Phase two is planned to start in April 2027 and complete in September 2027. Works will involve rebuilding western half of the weir, the new fish pass, and infilling the existing fish pass to create new canoe portage.

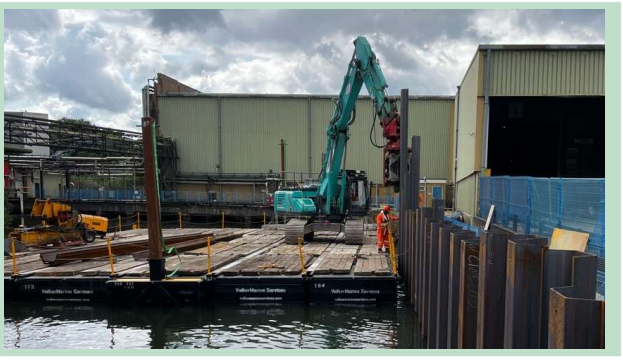
Construction Method

Our contractor has worked to develop a methodology which can minimise the risk of weather disruption, delays and environmental impacts, whilst working safely throughout the project. This method will require all materials, machinery and people to arrive at the weir from upstream, where water levels are much less sensitive to river flows and flow velocities are lower.



At the beginning of each works phase, a sheet piled cofferdam will be installed at the upstream and downstream end of the weir to create a dry working area on the weir. These piles will also form part of the permanent structure, being cut down to size at the end of the phase. Piles will be installed using a large excavator with a “Movax” attachment, sat on the weir, and served by barges bringing piles to the weir as they are needed.

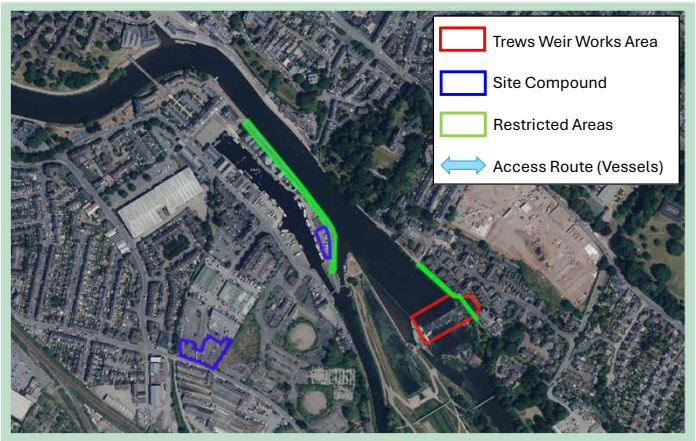
Once the cofferdam is secure and watertight, the upper surface of the weir will be dismantled to a depth of around 1 metre below existing, and removed material will be taken away in large skips and recycled off-site. A new base material will then be laid on the weir, before the new weir surface is cast on-site using concrete brought to the weir by barge. These will be lifted onto the weir by a large crane resting on a floating platform moored upstream of the weir.



The new fish pass will be built in much the same way as the weir rebuild, within a sheet piled cofferdam, but will require deep excavations within the footprint of the existing weir to create the resting pool, and the construction of new reinforced concrete walls to support the structure and form the inside surface of the pass. Only when the new fish pass is completed will the existing pass be closed to flow and the new canoe portage steps poured.

Site Compound and Access Routes

To support the delivery of the works, two site compounds will be required. ECC’s East Quay will be used as a lay-down site for materials to be loaded onto barges at the riverside, which will then be steered to the works site. Part of the roadway along the riverside will be closed to keep the public safe during the works, with a diversion via Haven Road. The road will be open to the public at weekends throughout the works.



Haven Banks (2 & 3) Car Park is proposed for use as the main works compound, where site offices, materials deliveries and machinery storage will take place. The Coach Park and Haven Banks 1 car park will remain open for the duration of the works.

During Phase 1, the riverside path on the eastern side of the site will be closed to allow the safe completion of works to modify the bypass channel. Diversions will be in place, and the path will be re-opened to the public as soon as possible.

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Estimated Programme

Please note, that whilst this is the current estimated programme for delivery of the scheme, the project programme is still being developed with our Contractor so is liable to change, and some of the key tasks will be susceptible to weather conditions or other potential risks.

January 2026	Public Consultation Commence Detailed Design of scheme
February 2026	Site Preparation works – de-vegetation etc.
May 2026	Site Preparation works – set up of site compounds / access routes etc
June 2026	Phase 1 – Installation of Sheet-piling Cofferdam to weir
July 2026	Phase 1 – dismantling of existing weir, modification of bypass channel
August 2026	Phase 1 – Construction of new weir surface
September 2026	Phase 1 – cut-off sheet piles and open Phase 1. Demobilise
March 2027	Remobilise to site
April 2027	Phase 1 – Installation of Sheet-piling Cofferdam to weir
May 2027	Phase 2 – dismantling of existing weir, piling of new fish pass
June 2027	Phase 2 – Construction of new weir surface and Fish Pass concreting works
August 2027	Phase 3 – close former fish pass, infill and create new canoe portage
September 2027	Phase 3 – open canoe portage, demobilise from site

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Any Questions?