

Buildability Statement

To be read in conjunction with Drwg no.s 100-02900-P02 – 108-02900-P02



Background

Fishtek were commissioned by Westcountry Rivers Trust (WRT) to design and develop a fish pass, smolt screen and smolt chute on the Bridgetown Weir, on the River Exe. The site is located in the upper reaches of the Exe catchment and is approximately 6km North of the town of Dulverton, Somerset in the United Kingdom. The river passes over a curved weir, whose purpose was to retain water to feed the mill leat on the true left side. The weir already has a fish pass installed on the true right end; however, this does not function properly and so a fit for purpose fish pass has been designed. In addition, a screen and chute arrangement has been designed to prevent smolts from entering the leat channel. The weir is formed of mortared stone, with sections showing damage and stone missing. A segment of crest raising has also been specified in order to make the crest level more consistent.

To the true right, the site is bound by private fields which can be accessed via a lane off of Edbrooke Road, to the North. The true left side is bound by the retaining wall for the A396 and the Exe Valley Caravan Site.

Design Philosophy:

The design has been developed according to the following key assumptions:

- **The water level data accessible at the time was accurate and suitable for determining design levels:** The water design levels used were based on modelling using standardised equations and practices.
- **The existing weir will support the fish pass and smolt structures:** Geotechnical investigation were carried out that identified the thickness of the existing concrete fish pass and position of bed rock. It is assumed that these findings are consistent and representative of the site and will therefore be sufficient to support the works.
- **Dimensions and extent of the weir and surrounding structures match those captured in topographic surveys:** The design has assumed that the dimensions and levels captured during topographic surveys (supplied by WRT) have remained the same/are accurate.
- **Stakeholders have no objection to works taking place:** We have been in assisted WRT while they have carried out their stakeholder engagement and planning application but have not had any direct contact with stakeholders. Queries had been raised and addressed and we assume that no objections remain. We were not asked to apply for any permits, planning etc., and assume that WRT are aware of and have applied for the necessary permissions.
- **The site can be adequately coffer dammed and drained to allow construction to take place:** We assume that it is possible for the working area needed to complete the works can be dammed of and drained sufficiently to allow lifting, fixing, pouring, etc. to take place.
- **It is acceptable for maintenance personnel to access the river to maintain the pass:** Consideration was given to try and eliminate the need to enter the river to clean the pass. However, this was found to be unfeasible, and so an open-topped pass was designed that could primarily clean itself. If necessary, staff can enter the river and clear larger/troublesome debris.
- **The area will be kept clear of vegetation:** The section of riverbank above the eel pass is currently overgrown with vegetation and would make it difficult to inspect/maintain the pass. It is assumed the true right bank will be maintained and vegetation controlled, following completion of the works.
- **A permanent agreement for access will be in place with adjacent landowners for maintenance:** WRT or the final operator will gain a permanent access agreement with the landowners adjacent to the fish pass and smolt chute/screen to allow maintenance to take place.

Construction Sequence:

The design has been developed assuming the following construction sequence:

Site Clearance

1. The area for the site compound should be cleared of unwanted vegetation and have surfaces/turf protected to ensure possible damage due to plant movement is minimised.
2. Should any trees need to be removed, these should be removed intact, if possible, and replanted in a suitable position during demobilisation. If they cannot be removed intact, they should be replaced at the end of the project. It is advised the Contractor consult with an ecologist to determine the replacement ratio and species. Removal of trees should be minimised as much as possible.

3. Should any invasive species be encountered, these will be disposed of as a controlled substance by a certified contractor.

Setting up of the site

1. Works should take place during a period of likely low flows.
2. It is suggested that a main site compound is established as close to the site as possible. It is expected that the main site compound will be set up in the fields on the true right side and satellite compound established on the true left bank (within the caravan park)
3. The site compound/s should be secured using Heras fencing or similar. The working area must be suitably segregated from the public and suitable signage provided. If a compound is established on the true left side, public access will need to be maintained.
4. Any existing fencing within the working area that separates the river from the bank blocking access will be temporarily removed to allow plant access onto the riverbank.
5. Access onto the riverbed will be via existing sloped sections of riverbank, which we be reinforced using appropriate track matting or similar.
6. The Contractor will form an appropriate cofferdam around the two working areas, using dumpy bags, sheet piles or similar.
7. It is assumed that the Contractor will be able to form a cofferdam close enough to the A396 retaining wall to allow the remaining gaps to be properly sealed.
8. Any remaining water or seepage can be drained via over pumping.
9. Once the working area has been coffer-dammed and drained, work can take place.
10. Contractor to determine the top of pile level needed to provide a suitable level of flood protection for the working area.
11. The cofferdamming should be inspected at the start and end of each working day to ensure it is still functioning safely and adequately.

Fabrication & Installation of Fish Pass

1. It is assumed that the fish pass will be fabricated in 6 separate units off site and delivered to site.
2. The units can be individually lifted and fixed into place or connected into larger units and then lifted into place.
3. Contractor to determine what their preferred working method is and how the units are to be lifted.
4. It is suggested that the Contractor check the location and levels of the support structure elements against the fish pass units and where they should be installed on the weir, prior to drilling and holes or inserting any fixings.
5. Where there is currently no concrete, the bed is to be excavated to the formation level and a blinding layer poured.
6. Formwork may then be erected and the mass concrete infill poured.
7. Once the relevant support elements have been set out, installed, and any poured concrete has sufficiently cured the fish pass units can then be lifted and fixed in place.

Landscaped bank and scour protection.

1. Once the relevant areas have been cofferdammed and drained, the areas of scour protection excavated down to the formation level.
2. It is suggested that the rip rap is placed around the support infill before the fish pass and under/around the smolt chute are lifted into place, to avoid damaging them.
3. Material to be placed via excavator or craned hopper, ensuring proper interlocking, as necessary.

4. Once all lifts for the fish pass units have been carried out, the area of landscaped bank can be excavated to the foundation level.
5. Material to be placed via excavator or craned hopper, ensuring proper interlocking as necessary with a minimum of 3 points of contact between block stone pieces.
6. Levels to be checked as material is placed and levelled using excavators.

Fabrication & Installation of Smolt Chute

1. It is assumed that the smolt chute pass will be fabricated in 1 unit off site and delivered to site.
2. Contractor to determine what their preferred working method is and how the unit is to be lifted.
3. The concrete support elements are to be excavated and poured, as necessary.
4. Where the concrete is being poured on the riverbed, a layer of concrete blinding should be poured prior to the main pour to provide a level surface to start from.
5. Formwork may then be erected and the mass concrete infill poured.
6. It is suggested that the Contractor check the location and levels of the support concrete against the unit and where they should be installed, prior to drilling and holes or inserting any fixings.
7. Once the relevant support elements have been set out, installed, and any poured concrete has sufficiently cured the smolt chute can then be lifted and fixed in place.
8. Finally, the remaining rocks may be placed against the sides of the smolt chute, being careful to not dent it.

Fabrication & Installation of Smolt Screen and Maintenance Platform.

1. It is assumed that the platform will be fabricated as a single unit off site and delivered to site and that the handrailing will not be installed until after the platform is lifted in place.
2. It is also assumed that the smolt screens will be fabricated off site and then delivered to site.
3. Contractor to determine what their preferred working method is and how the unit is to be lifted.
4. The area for the concrete support slab is to be excavated, with the contractor taking care to monitor and support the existing retaining wall, as necessary.
5. A layer of concrete blinding should be poured prior to the main pour to provide a level surface to start from.
6. Formwork and the reinforcement cage may then be erected and the concrete poured.
7. It is suggested that the Contractor check the location and levels of the concrete against the stanchions and platform and where they should be installed, prior to drilling and holes or inserting any fixings.
8. Once the relevant support elements have been set out, and any poured concrete has sufficiently cured the stanchions may be installed and the platform lifted into place.
9. The handrailing may then be installed into the sockets.

Demobilisation/Site Egress

1. Once all works have been completed:
2. Remove any rubbish from site and dispose of appropriately.
3. Remove cofferdam in a controlled manner so as not to shock-load new structures.
4. Remove and off-hire plant & equipment when possible.
5. Reinststate working areas and site compounds as necessary, including reinstatement of any existing fencing.
6. Once all tasks are finished and all equipment removed, staff may leave site.

Operation & Maintenance

Below are how we assume the eel pass may be accessed and maintained. However, this is not exhaustive and operators may have alternative means or policies that could affect this.

Visual Inspection Fish Pass & Removal of Debris

1. It is assumed staff will only attempt to access the pass during low flows and that staff will not enter the water course if alone.
2. Operatives to wear appropriate PPE (dry suits, life jackets), according to operator's working practises, when carrying out any maintenance.
3. The fish pass is to be accessed through the field on the true right bank, from the lane off Edbrooke Road to the North of the site.
4. Staff are to stand on the bank and check for visible debris.
5. If necessary, staff can walk down the existing sloped areas of bank, downstream of the pass, to look at the pass from a lower level.
6. If small debris (within manual handling limits) is seen and can be removed safely with available equipment and transportation, staff may do so:
 - a. Arrange adequate fencing and signage to segregate the public from the working area.
 - b. If possible, use pole or long handled rake to nudge debris or blockage out of pass.
 - c. Access the river via the existing sloped areas of bank.
 - d. Approach blockage and remove from pass or river.
 - e. Remove blockage from site and dispose of in an appropriate manner.
 - f. Remove fencing and signage.
7. If larger debris (exceeding manual handling limit) is seen:
 - a. Arrange adequate fencing and signage to segregate the public from the working area.
 - b. Access river as described above.
 - c. If possible, break blockage into smaller pieces (if it is a tree or other natural object) that can be lifted out manually. Staff may need to return to site with a chainsaw or similar tool, provided that have sufficient permission and training to use power tools within watercourses.
 - d. If blockage cannot be broken down safely within the river, an excavator or other lifting apparatus will be required to remove the blockage from the bridge.
 - e. Staff will be required to fit appropriate lifting strops, from within the river.
 - f. Lifts should only be carried out with appropriate supervision and by adequately trained staff.
 - g. Debris is then to be removed from site and disposed of appropriately.
 - h. Remove fencing and signage.
8. Once work is complete, staff may then leave site.

Visual Inspection Fish Pass & Removal of Debris

1. It is assumed staff will only attempt to access the pass during low flows and that staff will not enter the water course if alone.
2. Operatives to wear appropriate PPE (dry suits, life jackets), according to operator's working practises, when carrying out any maintenance.
3. The smolt chute/screen is to be accessed through the caravan site on the true left bank, from Week Lane to the South of the site.
4. Staff are to stand on the bank and check for visible debris.
5. For the Chute:

- a. If necessary, staff can walk down the existing sloped areas of bank, downstream of the chute, to look at the pass from a lower level.
 - b. If small debris (within manual handling limits) is seen and can be removed safely with available equipment and transportation, staff may do so:
 - i. Arrange adequate fencing and signage to segregate the public from the working area.
 - ii. If possible, use pole or long handled rake to nudge debris or blockage out of pass.
 - iii. Access the river via the existing sloped areas of bank.
 - iv. Approach blockage and remove from pass or river.
 - v. Remove blockage from site and dispose of in an appropriate manner.
 - vi. Remove fencing and signage.
 - c. If larger debris (exceeding manual handling limit) is seen:
 - i. Arrange adequate fencing and signage to segregate the public from the working area.
 - ii. Access river as described above.
 - iii. If possible, break blockage into smaller pieces (if it is a tree or other natural object) that can be lifted out manually. Staff may need to return to site with a chainsaw or similar tool, provided that have sufficient permission and training to use power tools within watercourses.
 - iv. If the blockage cannot broken down safely within the river, an excavator or other lifting apparatus will be required to remove the blockage from the bridge.
 - v. Staff will be required to fit appropriate lifting strops, from within the river.
 - vi. Lifts should only be carried out with appropriate supervision and by adequately trained staff.
 - vii. Debris is then to be removed from site and disposed of appropriately.
 - viii. Remove fencing and signage.
6. For the Smolt screen:
- i. Arrange adequate fencing and signage to segregate the public from the working area.
 - ii. If debris has built up on the screens, attempt to clean them using rakes or brushes.
 - iii. If necessary, the screens can be removed and cleaned on the bank.
 - iv. If larger debris is trapped across the screen, staff will need to enter the watercourse and approach the upstream side of the weir.
 - v. Follow the process of debris removal as described for the chute.
 - vi. Debris is then to be removed from site and disposed of appropriately.
 - vii. Remove fencing and signage.
7. Once work is complete, staff may then leave site.

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