

Designers Risk Assessment

T07 – Version 01



Date:	23/10/2023
Project Code:	02925
Document Number:	901-02925-P01
Assessment Coverage:	Bolham Fish Pass – Detailed Design

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1. Background:

Activity: - To be read in conjunction with Drwg no. 02925_200 –214

Westcountry River Thrust wishes to improve fish passage at Bolham weir on the river Exe (Lat: 50.927908, Long: -3.4975979). The Bolham weir is currently a barrier to upstream migrating fish. It is proposed to construct a new larinier fish pass and eel pass bypassing the weir on true right bank, remove existing concrete baulk and creating pre-barrages at weir toe to improve attraction to the pass.

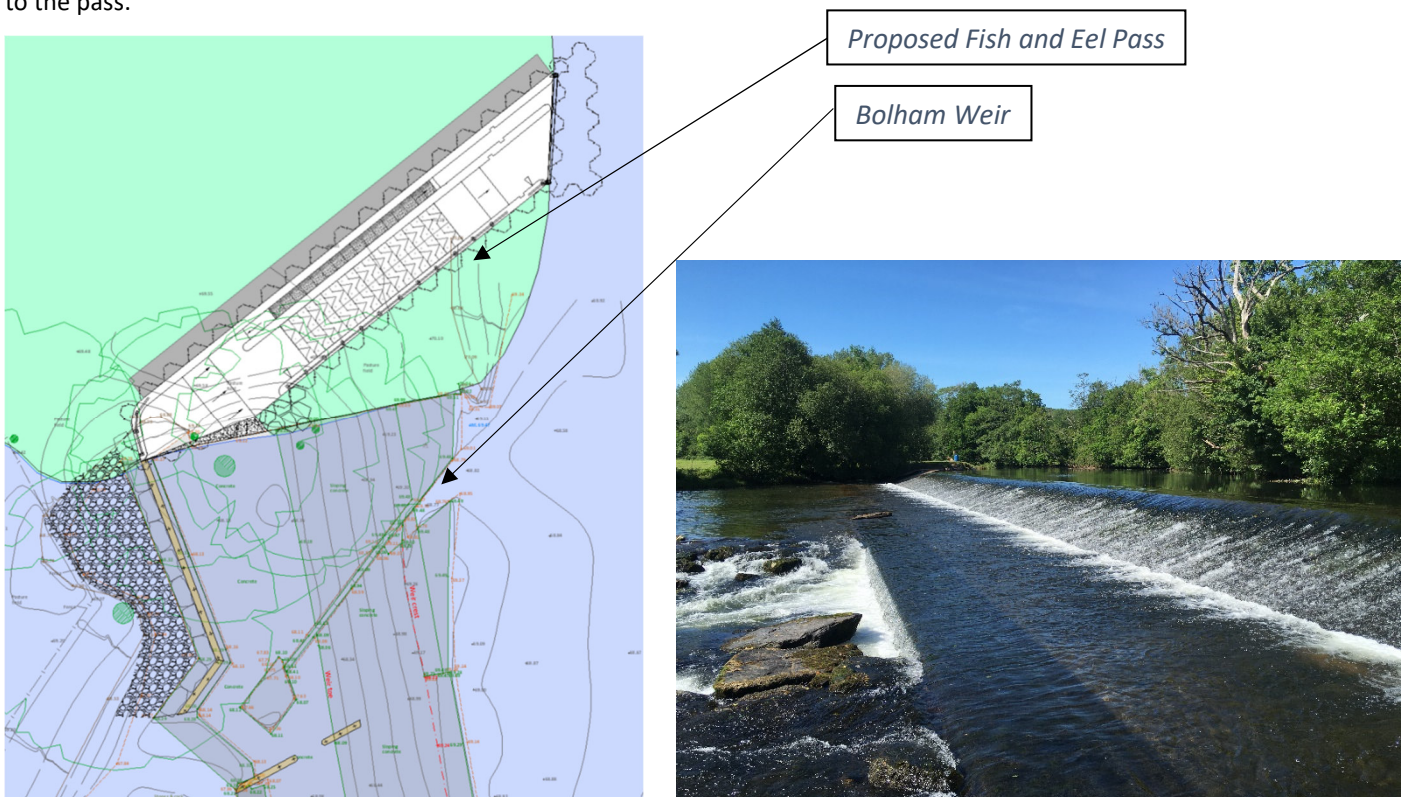


Figure 1. Plan view of proposed fish and eel pass at Bolham

Figure 2. Bolham Weir

2. Brief description of works

- A new fish and eel pass structure to be formed in RC concrete to ensure that the hydraulic controls are secure, durable, and robust.
- The fish pass to be off-line bypassing weir; constructed to achieve the necessary hydraulic characteristics for fish passage.

3. Key risk reduction measures

- The fish pass has been set inland and bypassing the weir which reduces work in water.
- Decking mounted on side mitigate risk of heavy lifting / use of crane.
- Where possible the extent, complexity and depth of the works has been rationalised to reduce the exposure to hazards.

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- Site won material has been chosen to backfill and re-profile area disturbed by construction, in preference to importing material to site.

4. Significant residual risks

- Site may be prone to out of bank river flooding.
- Constructing the fish and eel pass will entail working near water – a residual risk that the contractor will need to address with a suitable RAMS.
- Cofferdam - the contractor might decide to use a cofferdam and dewatering to complete the works. The contractor must ensure that the cofferdam is adequate to the task and is inspected prior every shift.
- Pollution of the watercourse - The works are located in the proximity to watercourses. The contractor should take measures to control the disturbance of silts and capture material from entering watercourses ensure that an incident response plan in place.
- Lifting - heavy elements have been reduced where possible.

5. Means by which significant hazards are conveyed

Detailed design – SHE boxes on drawings

Prepared by:	Joanna Czyrw	23/10/2023
Assessed by:	Stuart Pudwell	23/10/2023

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Construction Hazards					
Item no.	Nature of hazard	Level of risk	Designers' measures to mitigate risk	Level of Risk After Mitigation	Residual Hazard and Controls
C01	Managing Flow & Stage Levels in River Exe	Moderate	<ul style="list-style-type: none"> Where possible the works have been minimised to reduce the in-river construction complexity and construction time. The design is such that the contractor will be able to stage the works, allowing the creation of a suitable working area. The Larinier is designed effectively offline, which enables flows to be diverted away from the works by use of a cofferdam. The fish pass is aligned offline to balance the needs of access and maintaining stability of the weir. Design includes water levels on the drawings, where possible, to warn the contractor of potential water level on site during construction. 	Low	<ul style="list-style-type: none"> Monitor flood warnings and flows Ensure any cofferdams are suitable for purpose and are properly maintained Ensure the cofferdam is inspected by a competent person at the start of every shift, or when an event may have affected its suitability Ensure any operatives can gain shelter or escape if water enters the cofferdam Operatives to wear appropriate PPE for working near water Establish a safe control zone for machinery to operate near the watercourse Consider the height of the cofferdam such that a likelihood of a breach of the embankment / cofferdam is not increased during the works Consider redundancy of the cofferdam
C02	Managing seepage flow	Moderate	<ul style="list-style-type: none"> All works should be carried out behind a temporary works cofferdam (e.g. sand bags or sheet piles). Contractor to design temporary pumping requirements and pollution control measures to 	Low	<ul style="list-style-type: none"> Design the cofferdam to account for transverse seepage of water (parallel to the embankment) that may navigate around the cofferdam. Assess the permeability of the cut face / formation material Monitor rate of seepage through the cut face.

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			<i>prevent disturbed silts passing downstream if necessary.</i>		
C03	Working Near Water	Moderate	<ul style="list-style-type: none"> Works have been minimised to reduce the in-river construction complexity and time as is designed off water line, however the location of the Larinier does require material and workers transportation Across the river. Notes included on drawings of water levels where possible. Designed prefabricated modules reduces working time near / in water. 	Low	<ul style="list-style-type: none"> - Produce suitable RAMS. - Avoid working near water where possible - Conduct an adequate and sufficient Risk Assessment - Establish a control zone for machinery operating near the water course (see Appendix C of EA's SHEW CoP) - Install provision of fixed edge protection to eliminate falls into water - Provision of systems for work positioning and fall arrest - Provide suitable means of recovery should a person fall into water - Wear appropriate PPE the activity and environment - An emergency exercise / drill for water rescue should be carried out and recorded whenever the activity includes a significant risk of drowning.
C04	Risk of Falls from Height	Low	<ul style="list-style-type: none"> The risk of falls from height have been mitigated by minimising depths of excavations. 	Low	<ul style="list-style-type: none"> - Contractor should check depths of any excavations or locations where falls are possible. - Ensure adequate edge protection is installed and provide safe access routes to the works areas.
C05	Access & Lifting	Moderate	<ul style="list-style-type: none"> Larinier channel designed to be constructed in-situ. The aluminium baffle plates have been designed to minimise the no. of fixings, but the size is limited to avoid onerously heavy units. Decking designed to be mounted in-situ. 	Low	<ul style="list-style-type: none"> - High ground water levels. Possible instability of ground. Plant access routes to be carefully chosen and assessed prior works commence. - Check crane lifting facilities & constraints. - Check / agree an access through the land with the Land Owner.

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			<ul style="list-style-type: none"> Access limited; Possibility of a longer route through private land or route in river on pontoons. 		<ul style="list-style-type: none"> Sheet piles and shutterbox installation and extraction to be carried out by crawler crane positioned off crane pad. Check crane pad has been signed-off prior to use. Larrier baffles to be lifted by excavator. Strictly observe lifting plans.
C06	Risk of Services Strike	Moderate	<ul style="list-style-type: none"> Check for utility services within construction site has been completed. Known services marked on the drawing. Any additional service details to be conveyed on the drawings or given to the contractor. Overhead power lines and BT lines are present in the area. 	Low	<ul style="list-style-type: none"> A new full services search should be completed within 3 months of start of construction. These should cover the access route. Any ground penetrating activities must be carried out in accordance with HSE guidance document HSG47 A services survey compliant to PAS 128 stages A-D should be carried out by a competent supplier. The requirement for Survey type B using GPR can be risk assessed out where this is deemed not reasonably practicable Clearly highlight any services that may affect the works site or access routes. Checks for known / unknown services must be carried out before ground penetration occurs
C07	Interface with Public & other site operations	High	<ul style="list-style-type: none"> The construction site is located private land. It is assumed that the Contractor will position suitable fencing (e.g. Herras) & signage to exclude the general public from the works and to define temporary access. Access route and compound are located on private land and public access to be controlled by the Landowner. 	Moderate	<ul style="list-style-type: none"> Risk to the public must be assessed on site. Erect suitable fencing to secure the site boundary (e.g., Herras fencing) if required Erect suitable warning signage to highlight the construction site and warn of associated hazards. Divert footpath where necessary

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C08	Installation - use of toxic or hazardous chemicals - resin anchor products and or grouts could be harmful to operatives & environment	Moderate	<ul style="list-style-type: none"> Potentially hazardous chemicals have been replaced with mechanical fixings where possible Use of cementitious grout or other hazardous materials to be contained to dry working areas, outside of the watercourse where possible. Use of natural cement is recommended. Any works to the weir crest to be contained within the cofferdam and left to set. 	Low	<p>Where hazardous chemicals have been specified the contractor should:</p> <ul style="list-style-type: none"> - Purchase product from reputable supplier - Store and dispose of product in accordance with manufacturers / supplier's guidance and SWMP - Complete a COSHH assessment with reference to the Material Safety Data Sheet. Both should be readily available at the job site. - Refer to 'Guidance for Pollution Prevention 2018' - Have a suitable Incident Response Plan in place
C09	Drilling - risk of operatives experiencing hand arm vibration.	High	<ul style="list-style-type: none"> The number of fixings has been minimised where possible. Proposed pre-barrages require creation of notch in the existing concrete sill. Existing concrete baulk to be removed. 	Moderate	<p>The contractor should:</p> <ul style="list-style-type: none"> - Monitor and limit trigger time - Ensure equipment is from a reputable supplier - Wear suitable PPE

Operational Hazards

M01	Access for debris clearance	Moderate	<ul style="list-style-type: none"> Liftable GRP panels on decking over stop-logs provided for ease of access. Stop-logs can be employed to close off the passes when seeking to remove trapped debris within the passes. Deck positioned for ease of raking the hydraulic control points (fish pass apex) which is most prone to 	Low	<ul style="list-style-type: none"> - To be carried out by competent persons working to an appropriate RAMS and with correct PPE.
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			<p>blockage. The resting pool is offset to the side of the access platform to abrupt changes in direction.</p> <ul style="list-style-type: none"> • A bankside rail is provided to facilitate access, and handrailing avoid where possible to prevent debris snagging during river in spate conditions. • Weir to be cleared from bank side with a debris rake and/or powered jet, or via boated access as per current O&M methods, subject to an approved risk assessment and method statement. 		
M02	Unauthorised access by the public	Moderate	<ul style="list-style-type: none"> • Balustrade system with access safety gates to the larinier has been designed. • Warning signage will be required. Fishtek deem PSRA is not required. 	Low	

Decommissioning Hazards

D01	Decommission / Demolition	Moderate	<ul style="list-style-type: none"> • Larinier constructed in-situ with removable baffles. • Weir crest can be unbolted and removed – risk of working near water. • Limited access for decommissioning, requirement for long route through private or river crossing. 	Low	
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Environmental Hazards

E01	Pollution of Watercourse	Moderate	<ul style="list-style-type: none"> • Earthworks requirements have been minimised, by minimising the depth of excavation required. Fish pass slope gradient and hydraulic control level, thus 	Low	<p>The contractor should:</p> <ul style="list-style-type: none"> - Create a suitable dry working areas for the casting of concrete and channel works
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			<p><i>minimising the risk of groundwater seepage. Concreting requirements have been minimised to mitigate the risk of cementitious material entering watercourses.</i></p>		<ul style="list-style-type: none"> - Complete a COSHH assessment with reference to the Material Safety Data Sheet. Both should be readily available at the job site. - Refer to ‘Guidance for Pollution Prevention 2018’ - Have a suitable Incident Response Plan in place - Create a Site Environmental Emergency Plan (following Environment Agency Pollution Prevention Guidance Note 21) <p><i>Consider the use of silt busters to control the release of excavated silt material</i></p>
E02	Ecology	Moderate	<ul style="list-style-type: none"> • Ecology survey required of proposed access route before works commence, to confirm the presence of invasive species, ground nesting birds, or any other ecological risk and appropriate mitigation. 	Low	