FISHTEK CONSULTING	Health & Safety - Designer's Risk Assessment (DRA)			Project Code/Doc No: 02575/901	
	Project Title: **Ashford Weir**	Assessor (Name): James Blyth	Assessor (Signature): *James Blyth*	Date: May 2020	Revision: P01

Ref	Activity & Hazard	Level of Risk	RAG List reference	Design Input to Eliminate or Reduce Hazards, and Hazards Remaining	Level of Risk	RAG List reference	Residual Hazard?
Ashford Weir – Pre-barrage and eel pass – River Fowey							
C1	Managing flow & stage levels in River Aire	High		All works should be carried out behind temporary works cofferdams (of sheet pile, sand / dumpy bag or other construction, which is subject to design by the Contractor). Contractor to ensure that correct PPE (lifejackets) to be worn by contractors and operatives. The works are to be carried out within the River Fowey, which is susceptible to natural flooding. EA flood warnings can be monitored for prior notice along with weather conditions and water levels relative to cofferdam. In addition, there is a flow gauge on the Fowey with real time data accessible to all that should also be checked daily, but note this is downstream of the work sites. It is also recommended that a temporary gauge is used by the contractor on each cofferdam site to provide a simple check. Contractor to define safe access routes for plant, equipment, materials and construction operatives. A flooding evacuation plan, in the event of overland floodplain flow, should identify where plant & machinery may be temporarily stored.	High		Yes
C2	Managing seepage flows through porous weir	High		The risk of overtopping flows & seepage flows during construction of the Weir are mitigated by the Contractor's **upstream and downstream** cofferdams. The position, depth and width of the cofferdam is subject to design by the Contractor, taking due account of hydraulic gradient across the cofferdam and the site investigation information.	Medium		Yes
C3	Risk of falls from height	High		The risk of falls from height have been mitigated by minimising depths of excavations for the pre-barrage and weir excavations. Contractor to provide temporary works edge protection, where required, during construction of the pre-barrage and weir alterations.	Medium		Yes

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C4	Lifting	High		A modular form of pre-barrage construction has been adopted to restrict cranage lift requirements for construction of the works. The use of pre-cast concrete sections and cast in-situ concrete were considered. However, access to the site is limited, for concrete delivery and craneage. Site batching of mass concrete is anticipated to be feasible, and mass concrete is used in in place of reinforced concrete elements. While concrete works cannot be eliminated, further substitution of mass-poured elements, with modular elements, is possible if the contractor wishes. Please clarify with the engineer if required. The aluminium eel pass units will be designed in small modular elements to restrict cranage lift requirements. Acess arrangements are subject to the Contractor's method statement. Where possible measures have been taken to reduce lifting requirements by reducing element sizes and weights. Wheelbarrows or tracked mini-dumpers could be used to move bulk quantities of materials closer to where they are needed. Subject to considerations of tree roots.	Medium		Yes
C5	Interface with the public and adjoining site operations	High		Interfacing with the general public may occur on the access track. 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.	Low		Yes
C6	Services damage resulting in injury to operator.	High		Up to date accurate services information is to be obtained prior to commencement by the Contractor. The Contractor is to scan for buried services prior to commencement of works. Contractor should note that wet soils/silt/water can absorb some of the waves relating to Ground penetrating radar. This process would not therefore absolutely rule out the presence of buried services.	Medium		Yes

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C7	Stability of excavations and structures	High		The true left bank is thought to be comprised of end-tipped quarry waste and appears to have been stable since placement, but is loose in nature, and the contractor is to manage this feature of the site without disturbing or undermining this material. Appropriate temporary works may be required. **Concrete pitched rip-rap is included as part of the permanent case bank-erosion mitigation but it is anticipated this element will be installed prior to other works in order to contribute to management of this feature, i.e. bank protection and to prevent unintended excavation or disturbance that might compromise bank stability. The design has been considered to minimise or eliminate the need to excavate immediately beneath the existing bank. The contractor is to monitor this feature carefully.** Maintaining the integrity of the existing weir structure during construction is critical. The contractor to provide good water control on the site by the provision of effective cofferdams up and downstream, and to manage the water from the spring by over-pumping. Contractor to monitor weir condition carefully during works and act appropriately to maintain weir integrity.	High		Yes
C8	Installation - use of toxic or hazardous chemicals - resin anchor products and or grouts could be harmful to operatives and the environment.	High		The design has been prepared to avoid the specification of epoxy resin anchors, or similar chemical fixing products, where possible in favour of through bolts (expansive mechanical fixings). Where this is unavoidable styrene free anchor resin is detailed. All fixings will be undertaken within the dry within cofferdam areas, mitigating the risk of pollution to the environment. The Contractor must also ensure that appropriate PPE clothing is worn.	Low		Yes
C9	Installation - use of toxic or hazardous chemicals – pouring of concrete could be harmful to operatives and the environment.	High		All pours will be undertaken within a dry, cofferdam area, mitigating the risk of pollution to the environment. However there is still a risk that pours could leak or flood waters could overtop cofferdam. The Contractor is to determine appropriate working methods and ensure that appropriate PPE clothing is worn. Methods may include working within a suitably high cofferdam and undertaking concrete works during a period of low river flow and fine weather.	High		Yes
C10	Fabrication of the eel trays– risk to operatives of cutting and welding excessive amounts of metal work - associated manual handling and lifting hazards.	Medium		The complexity and fabrication requirements have been minimised by using standard extrusions and plate sizes to minimise cutting and welding requirements, and folding trays rather than welding. The use of repetitive and simplified connections to ease assembly has been considered but the small form and bespoke nature have limited this in places.	Low		Yes

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C11	Presence of Himalayan balsam, giant hogweed and Japanese knotweed are all present within the surrounding area. In the case of giant hogweed, allergic reactions are had by many when contact is made with the sap.	Medium		An environmental assessment of the area should be made before establishing the site compound to identify any species. If encountered, these are to be removed as a controlled substance by a certified contractor. If Giant Hogweed is found, arms and legs are to be covered and masks worn during removal.	Low		Yes
C12	Access to river bed level	High		Access to bed level is possible if a temporary causeway is created, or scaffold access erected. A scaffold ramp may be need to move the modular materials to the installation location. Use of the weir as access should be avoided as this risks damage to the structure.	Medium		Yes
O1	Access for 'light debris' clearance	High		The structures can be inspected from the banks, The notches are relatively wide and therefore minor blockages are less likely. The weir may be accessible at low flows if minor debris needs clearing from the upstream notch, the bank alongside the pre-barrage is relatively narrow and if the pre-barrage notch needs clearing a small boat may be required Lone working for maintenance should not be permitted and all appropriate PPE in relation to working near water should be used, e.g. dry-suits, life-jackets, throw ropes, waders, boats etc. This work should only be undertaken during low flows ((i.e. when flow is not overtopping the fish pass walls) to reduce risk to operatives. At low flows main weir is likely to be dry or have only very limited discharge, for minor maintenance of the eel pass, access of the weir at low flows from the true right bank may be adequate. If the maintenance task cannot be completed from the access it should be carried out from a boat.	Medium		Yes
O2	Access for 'significant blockage' clearance	High		Clearance of significant blockage from all structures will require a boat.	Medium		
O3	Interface with the public and adjoining site operations	High		The public may stray across structures if using the access track. However, access to the site is by the general public is limited.	Medium		Yes
O4	Lifting	High		It is unlikely any significant lifting of items would be necessary during routine maintenance. If damaged eel tiles may need to be replaced, and these while not heavy are awkward to handle, and therefore, should not be replaced alone and the use of boat or floating pontoon as a working platform is recommended.	Medium		Yes
O5	Stability of excavations and structures	High		The contractor is to monitor excavations to maintain stability, taking particular care were flowing water might cause erosion leading to instability or undermining. Suitable temporary protection should be used.	Low		No

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O6	Managing seepage flows through porous weir	High		Excavations / working areas adjacent to the structure have been shown with a mass concrete backfill. This provides a much more robust barrier to flow paths through structures than typical free draining backfills, whilst providing structural stability.	Low		No
O7	Flood Risk	High		Any maintenance work is to be undertaken during low flows only to avoid personal or equipment being at risk. The intake of the structure is generally parallel with the flow, and occupies, only a 1/5th of the length of the existing weir. Therefore, any blockage of the new works, is unlikely to constitute a flood risk.	Medium		Yes
O8	Presence of Himalayan balsam, giant hogweed and Japanese knotweed are all present within the surrounding area. In the case of giant hogweed, allergic reactions are had by many when contact is made with the sap.	Medium		If encountered, these are to be removed as a controlled substance by a certified contractor. If Giant Hogweed is found, arms and legs are to be covered and masks worn during removal.	Low		Yes
O9	Risk of falls from height	High		Signage will be installed along the fish pass to warn of the sharp drop down to the fish pass. Operative are protected via being attach to a safety line.	Medium		Yes

*Refer to EA Operational Instruction 300_10_SD14 Designers' safety, health and environmental Red, Amber Green (RAG) list Issued 13/08/2015

Guidance

1. List all activities and hazards
2. Assign High / Medium / Low – Level of Risk
3. Check against EA-RAG List and assign colour
4. Describe design inputs to Eliminate, Reduce, Isolate and Control risks.
5. Review level of risk
6. Assign EA-RAG list colour code to residual risk
7. Confirm if there is residual hazard
8. Include significant or unusual residual hazards in SHE boxes on drawings