Drainage (Northern Ireland) Order 1973 - Schedule 6

Application for consent to undertake works to a watercourse

RIVERS Agency

Application Details:-

Name:	[redacted]
Address:	[redacted]
Postcode:	[redacted]
Tel No:	[redacted]
E-mail:	[redacted]

Site Details (if different from Application Details):-

Name:	McCLURE'S WEIR, ISLANDREAGH MILL
Address:	ISLANDREAGH, SIX MILE WATER. INTAKE WEIR'. IGR 319372, 384800
Postcode:	AS ABOVE
Tel No:	AS ABOVE
E-mail:	AS ABOVE

I wish to apply for consent to:-

Please tick √ all that apply

(A) Discharge storm water to a watercourse	☐
(B) Construct a bridge across or culvert a watercourse	☐
(C) Divert a watercourse	☐
(D) Cross under / over a watercourse	☐
(E) Other works adjacent to or affecting a watercourse	☑

WEIR REPAIR AND INSTALLATION OF FISH PASS

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Applicants should note that:

In accordance with Paragraph 11 of Schedule 6 of the Drainage (NI) Order 1973, any consents/approvals given by Rivers Agency under Schedule 6 shall not affect the liability of any applicant to comply with other legislation relevant to works undertaken in pursuit of such consents/approvals

In accordance with Paragraph 3 of Schedule 6 of the Drainage (NI) Order 1973 any consents/approvals requested from Rivers Agency under Schedule 6 will be given or refused within 3 months from receiving the application.

Check List of Information
To be included with each application:-

(Please tick √ all that apply)

Location Map .... *(Scale 1: 2500)* ☑
Detailed Site Layout Map.... *(Scale 1: 500)* ☑

(A) For Discharge: Detailed drawings/specifications of proposed works with discharge location and outlet details. Include final discharge in Litres/second (L/s). ☐

(B) Bridge/Culvert construction: ***For Farmers and/or a Private single dwelling:***
Proposed pipe/culvert sizes, length, invert level and materials. ☐
All Others:
As above with detailed drawings/specifications of all proposed works including manhole details/locations and inlet/outlet details.

(C) Divert a watercourse: Detailed proposals with channel/culvert details. ☐

(D) Cross Under/Over a watercourse: Detailed drawings and specifications. ☐

For your information:

Crossing Under should be surrounded in concrete (under the bed and banks) with a minimum cover of 1.0m from the top of the concrete surround to existing solid bed level and/or culvert invert level. Permanent marker posts should be placed on each bank to indicate the position of the pipeline.

Crossing Over should include depth of foundations relative to existing solid bed or culvert invert levels and the method for bank protection at crossing points. The depth from existing solid bed level or culvert soffit level to invert level of crossing pipe should be clearly stated, and (***if applicable)*** indicate the method proposed to ensure no additional loading to existing culvert/s.

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(E)	**Other works:** Detailed drawings and specifications.	✓

Signed by [redacted] ~~plicant~~) * ent)*   Date: 5/8/21

(* delete as appropriate)

[redacted]

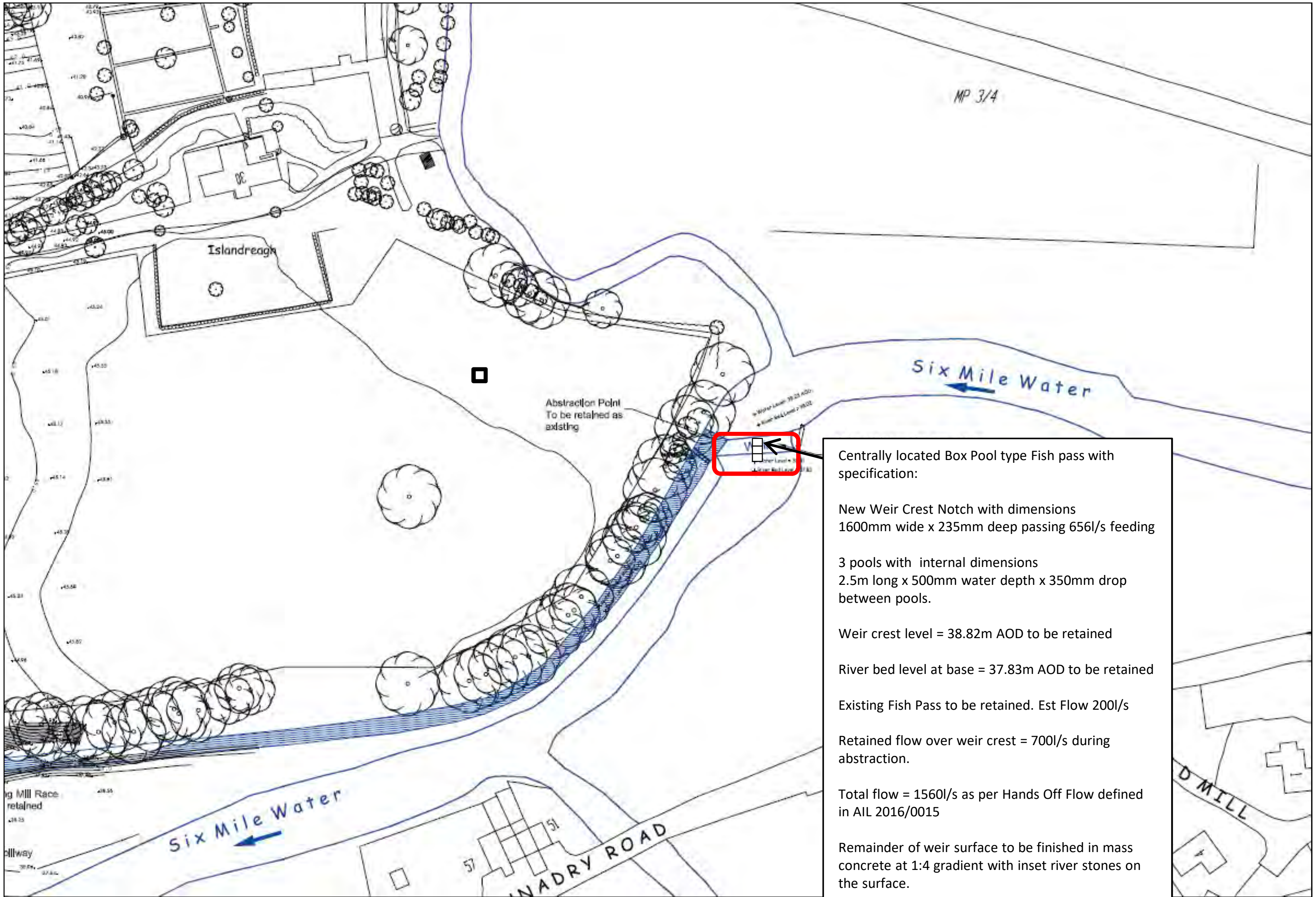
MOB : [redacted]   Email : [redacted]

For Office Use Only   Date Received ___/___/___ Trim Ref ____/___/_____

Existing Damaged weir at McClure’s Mill, Six Mile Water

Image taken 9th July 2020

Proposed Weir repair and Fish Pass at McClure's Weir on the Six Mile Water



Centrally located Box Pool type Fish pass with specification:

New Weir Crest Notch with dimensions
1600mm wide x 235mm deep passing 656l/s feeding

3 pools with internal dimensions
2.5m long x 500mm water depth x 350mm drop between pools.

Weir crest level = 38.82m AOD to be retained

River bed level at base = 37.83m AOD to be retained

Existing Fish Pass to be retained. Est Flow 200l/s

Retained flow over weir crest = 700l/s during abstraction.

Total flow = 1560l/s as per Hands Off Flow defined in AIL 2016/0015

Remainder of weir surface to be finished in mass concrete at 1:4 gradient with inset river stones on the surface.

Images of similar completed weir repair and fish pass at Hunters Mill, Agivey River

Box pool in construction

Operating Fish Pass on completion at rated flow

Planning Ref: LA03/2019/120/F **HydroNI Ref: HNI0CAA**

Background

Hydro NI are a company specialising in the construction of Hydro Electric systems in UK and Ireland. We have completed over 50 new build projects in the last 10 years and have incorporated that experience and understanding into our Construction Methods.

We are proud that our sites have all been completed to a high standard of environmental protection without issues arising. It is our policy to comply with and exceed standards of excellence in the construction of these projects.

1) Construction Method Statement

1.1 General Description

This proposed hydroelectric scheme will consist of

- Clearing of existing millrace channel
- Reinforcement and repair works to existing bridge structure
- Installation of pipes into existing channel and within existing bridge.
- Connecting new pipes to the existing underground culvert
- Installation of an actuated sluice gate structure at the turbine house.
- Installation of 100mm spaced bar screen.
- Constructing a new power house and installing a turbine and controls
- Installation of a new fish pass in the lower weir
- Removal of a short bank section at the turbine to optimize fish passage

The objective of this method statement is to ensure that the construction works are completed in a controlled manner, which will protect any sensitive habitats within the locality. These include specifically otters, Freshwater Crowfoot, bats and nursery and spawning habitats for fisheries within and downstream of the construction site.

Specific reports have been completed in respect of each of these and each of these detail appropriate mitigations and considerations. All of these will be complied with.

All construction will be carried out in daylight hours during periods of low flows and in a manner which will avoid detrimental impacts. The natural river flow will remain unchanged during all construction works. This project will not require any construction equipment to enter the river channel at any time.

The total project construction is expected to take approximately six months and will comprise of the following elements:

- Preliminary site preparation and access works.
- Arrival of construction equipment on to site
- Use of the existing access from Islandreagh Drive.
- Main construction works to install the screen at the intake point, pipe in the race, turbine house, fish pass and water return.
- Turbine Installation, testing and commissioning.
- Reinstatement of site.
- Removal of Equipment.

Site preparation and access works.

Preliminary site preparation will require the allocation of a construction compound in the existing upper yard area. Access to the site will be via the existing entrance from Islandreagh Drive just off the Belfast Road and the existing lane.

A site inspection will be carried out to ensure that no badger or otter activity has commenced within the development area between planning and construction phase. If this has taken place these will be reported to the appropriate departments and addressed by following the guidelines of those agencies in that unlikely event.

The bridge structure which is the subject of the OCSC structural engineering report will not be used to convey site equipment or deliveries at any time. For the construction phase a link lane will be installed beside this bridge by infilling the race with clean stone to allow vehicular access past this without damage. This will be removed on completion of the construction phase and the site finished as per the planning drawings.

Isolation of the development area from the river is essential to prevent contamination of the working area and the escape of silts or sediments into the river with potential damage to sensitive habitats. Our experience in construction of over 50 of these projects has taught us that it is essential to plan for the worst case flood scenario.

The upstream end of the site will be shut off from the river by closing the existing inlet sluice gates and draining down the race through the existing sluice gate at the overspill weir. This will drain down the top of the site as is normal during existing maintenance works on site. On completion of the draining of the upper section of the race the sluice gate at the spill way will also be closed for the duration of the project. This will prevent the possibility of backflow of water through this point in the event of a major flood during the construction phase.

A small amount of leakage of water into the site is normal through these structures and also collection of surface water from rain. Pumps will be installed to remove this water through a sediment trap compliant with Pollution Prevention Guidelines.

It is possible in the event of a major flood overtopping the upstream sluice gates that water will enter the upper race section. In order to prevent this from flowing through under the building and into the area of the construction works it will be necessary to sheet off the grill at the entrance to the mill fully with marine grade plywood and secure it to the existing steel structure.

The above measures will prevent inflow of water from upstream into the working area in all circumstances.

The downstream end of the site will also require to be isolated from the river.

These works will be isolated from the flow of water in the river by a temporary coffer dam consisting of sealed bags filled with 10mm gravel. These will be covered in an impermeable membrane of polythene sheeting to provide a double seal and avoid any possibility of silt pollution. Once the coffer dam has been created the channel will be dewatered using pumps.

This coffer dam will be installed at the outlet of the existing mill race and will extend fully from bank to bank along the edge of the river. It will be approximately 8m long and installed to a height of 1m above normal water level.

The water trapped in the mill race will then be pumped into one or more large metal silt traps to allow any silt to settle before the water is released back into the river. This will allow the working area to be dried out in a controlled way.

During the pumping down of the Mill race it is normal to expect some fish in this area. The race will be inspected for any fish and they will be captured into nets and transferred into the river.

These pumps and sediment traps will remain in situ for the duration of the construction works and will be used to maintain a dry working area at all times.

In the absence of toiletry and sanitary provision on site this will be addressed by the provision of Portaloo facilities operating under a weekly removal and maintenance contract.

These techniques will be compliant with NIEA and SEPA guidelines for working in or near rivers.

Reinforcement and repair works to existing bridge structure

A structural Engineering report has been completed by OSCS at the planning phase. This has detailed the works and methods to be used to stabilize and strengthen this structure to ensure its integrity.

The methods and guidelines detailed in this report will be followed and OSCS will be retained to provide structural engineering input as required through the construction phase.

A final structural engineering report will be submitted to NIEA on completion of the works to certify that they have been completed to the specified standard.

Installation of pipes into existing channel and within existing bridge

The existing mill race will be cleared of vegetation and any silt deposits in its bed. It does not require to be deepened or widened so there will be minimal excavation. The bed will be levelled and if necessary infilled with clean stone to create a level pipe bed where required.

Concrete pipes will be delivered on flat bed 40 foot lorries to site. They will be transported down the lane and set into the race using a 30T digger. They will be jacked into position through the bridge arches as per the OSCS recommendations. This will ensure the safe installation without damaging the heritage structure of the mill building, arches or bridge.

The channel around the pipes will be infilled with stone to half way up the pipe body to stabilize them and secure them in position.

Connecting new pipes to the existing underground culvert

Prior to installation of the pipes the vertical wall section at the end of the culvert will be cut away to allow the flow of water into the twin pipes. Non vibrating techniques will be used to remove this wall section as per the methods outlined in the OSCS report.. The contractor will be responsible to provide detailed RAMS for this taking account of working in a confined space with the need for ventilation and material removal.

The joint between the existing culvert and the new pipes will be made in reinforced, shuttered concrete complying with UKWIR standards. This concrete will be brought up to the bottom of the existing floors to ensure structural support is retained.

OSCS will be retained to provide detail engineering oversight of this work to ensure it is completed to a satisfactory standard.

Construction of the turbine house structure will be carried out in stages. All of this will be carried out in weather with low flow conditions in the river.

These works will be completed within the area isolated from the flow of water in the river. Water ingressing to the site will be pumped to a settling tank prior to return to the river.

Construction shall conform to the current edition of the Civil Engineering specification for the Water Industry as prepared by UKWIR. All shuttering / formwork will be checked prior to pouring concrete to ensure that there is no potential for concrete to leak into the river. Premixed concrete prepared off site will be used. Wheeled or tracked equipment will not enter the water. A minimum of 96 hours curing time will be allowed before the channel is flooded.

Turbine installation

The turbine will be delivered to site using a flat bed lorry. No special road transport arrangements will be necessary as it is within standard load size.

On arrival the Archimedes screw will be transferred to a 20 foot flat bed trailer. This trailer will be drawn along the lane to the turbine house using a tractor.

A 50Tonne crane will be used to hoist the screw from the trailer and set it into position in the turbine structure. The contractor will be responsible for the preparation of a detailed transportation and Lift Plan.

Grid connection

NIE will be responsible for the provision of a supply to the site. This has already been approved by NIE.

An underground supply cable will be installed running from the NIE supply point alongside the new pipes running to the turbine house.

On completion the electricity produced will be available for use on site and also export of surplus to the grid.

Installation of Fish pass in the lower weir.

Access to the weir will be achieved from the northern bank directly adjacent to it so there will be no requirement for equipment to enter the river.

The works will be carried out in summer time in a period of low flows with good weather forecast. This should be completed within 5 days.

These works will be isolated from the flow of water in the river by a temporary coffer dam consisting of sealed bags filled with 10mm gravel. These will be covered in an impermeable membrane of polythene sheeting to provide a double seal and avoid any possibility of silt pollution. Once the coffer dam has been created the area contained within it will be dewatered using pumps. The water will be pumped into a silt trap before returning to the river.

The coffer dam will be placed immediately adjacent to the upstream and downstream parts of the weir and will extend across the top of the weir running tight into the river bank. This will provide a dried out section of the weir to enable the works to be carried out.

The main box sections of the fish pass will be made off site in precast concrete. This will minimize the construction time on site. The precast sections will be installed and infilled around with premix concrete. This will make good the joint to the original weir.

On completion of the concreting works all concrete will be allowed to set for at least 72 hours before removal of the coffer dam and flooding of the fish pass.

Upper weir repair and Installation of Fish pass.

Access to the weir will be achieved from the Southern bank directly adjacent to it so there will be no requirement for equipment to enter the river.

Phase 1: Temporary weir repair

Completion timing: ASAP during first available suitable weather window.

Objective: stabilize the weir structure to survive until spring 2021

The works will be carried out in a period of low flows with good weather forecast. This should be completed within 2 days.

These works will be isolated from the flow of water in the river by a temporary coffer dam placed along part of the weir crest immediately above the damaged sections. This will consist of sealed sand bags covered in an impermeable membrane of polythene sheeting to provide a double seal and avoid any possibility of silt pollution. Once the coffer dam has been created the area contained within it will be dewatered using pumps. The water will be pumped into a silt trap before returning to the river.

The coffer dam will be placed immediately upstream of the damaged parts of the weir. The river flow will be diverted over the undamaged section of weir on the north side. This will provide a dried out section of the weir to enable the repair works to be carried out while retaining the natural flow over a section of the weir crest and through the existing fish pass.

The washed out sections of the weir will have all loose material removed and will be infilled with mass concrete to form a weir face as per the design detail.

This will be allowed to set for a minimum of 48 hours prior to removal of the coffer dam from the weir crest.

Phase 2 : Installation of Fish Pass

The fish pass will require a 2m section of the weir crest to be removed so would ideally be completed by temporarily diverting the river flow down the

Mill race channel and lowering the water level in the weir pool upstream. This type of diversion would be best carried out in low flows in May/June which would be the least sensitive period for fish passage.

This phase of work will require a complete drying out of the weir so we will undertake this in a less sensitive period during May-June.

A coffer dam will be installed at the base of the weir as per the methods described previously.

The main box sections of the fish pass will be made off site in precast concrete. This will minimize the construction time on site. The precast sections will be installed and infilled around with premix concrete. This will make good the joint to the original weir.

On completion of the concreting works all concrete will be allowed to set for at least 48 hours before removal of the coffer dam and flooding of the fish pass.

Site reinstatement

On completion of all construction works the coffer dams will be removed. All construction equipment and materials will be removed from site.

In low flow conditions where the water has receded from the river bank the section of bank at the water return point will be removed as per the planning drawings to provide an attractive flow for fish. This will not at any time require construction equipment to enter the river.

Some of the work will be dependent on low water levels in the river and work may have to stop temporarily in periods of heavy rain or when the river is in flood.

1.2 Risk Assessments & Methodology Statement

The contractor will be required, under contract, to strictly adhere to all relevant anti pollution guidelines, specifically DOE Standing Advice Note No. 4.
Pollution Prevention Guidance, 5. CIRIA C753 (2015) The SuDS Manual, PPG 01, PPG05, PPG06, PPG021 and PPG23, the Control of Pollution (Oil storage) Regulations (Northern Ireland)
2010 and the Water (Northern Ireland) Order 1999.

They will also be required to make themselves familiar with the SEPA publication “Engineering in the Water Environment Good Practice Guide Temporary Construction Methods, First Edition March 2009”. The contractor will be required to provide an environmental risk assessment and a health and safety risk assessment, before mobilising on to the site.

1.3 Environmental Risk Assessment

Within the environmental risk assessment, the contractor will be expected to address as a minimum:

- Storage of fuel oils in bunded tanks.
- Location of the fuel store away from the river catchment area.
- Arrangements for refuelling vehicles.
- The quantity and location of pollution control spill kits.
- The recording of daily vehicle checks for fuel, hydraulic or lubricant leaks.
- The overnight parking of vehicles away from the water course.
- Sewage arising from construction activities.

1.4 Health and Safety Risk Assessment

Within the health and safety risk assessment the contractor will be expected to address as a minimum:

- First Aid Provision.
- Issue and wearing of Personal Protective Equipment (PPE), including replacement dry clothing and wet weather gear.
- Induction of contractor’s employees and sub contractors to the site.
- Instruction of employees and sub contractors regarding the dangers of working in close proximity to water and the possibility of rapidly rising water levels.
- All employees and sub contractors will be made aware of Lyme’s disease and on-site washing and preventative measures.
- Signage
- All employees and sub contractors will be required to have evidence of having completed a CITB safety awareness course. Any plant operator must have evidence of holding the relevant CITB certificate.
- Test Certificates for any lifting equipment to be used.
- Confined space working certificate

1.5 Methodology Statement

The contractor will also be required to provide a detailed methodology statement that should include as a minimum:

- A schedule of equipment to be used on site.
- Cleaning of all equipment prior to arrival on site to prevent the introduction of a biohazard
- Performance of a basic site survey following arrival on site
- Construction of temporary dams.
- Lifting of heavy equipment into place e.g. screens, turbine, generator and control panel.

- Signage.
- Reinstatement of the site.
- Detail methods to ensure compliance with all standards listed in Sec 1.2 above

1.6 Main Equipment to be used

Digger

Dumper

Project Drawings

- **Drawing No. Ex01: Existing site plan**
- **Drawing No. PL01: Site Location Map**
- **Drawing No. PL02a: Site Plan**
- **Drawing No. PL03a: Works to Open Channel**
- **Drawing No. PL04a: Turbine House**
- **Drawing No. PL05: Proposed Fish Pass to redundant weir**
- **Drawing No. PL06: Long section and Elevation**
- **Drawing No. PL07: Turbine House detail and elevations**

Associated reports

- **Biodiversity statement and mitigation plan ATEC NI**
- **Assement of Otter & Badger Activity Jul 19, ATEC NI**
- **Structural Engineering Survey, by OSCS**
- **Freshwater Crowfoot Assessment, WM Associates**