

Fermoy Weir Remediation and Fish Bypass Project

Outline Construction Methodology



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1. INTRODUCTION

This Outline Construction Methodology (OCM) has been prepared by T.J. O'Connor & Associates (TJOC) to accompany a planning application for the remediation of the weir on the river Blackwater in Fermoy and the associated construction of a Fish Bypass channel. The Fermoy Weir is a protected structure located in the river Blackwater at Fermoy Bridge. The Fish Bypass channel is proposed to be constructed around the weir on the north bank of the river.

This document sets out, on a preliminary basis, a framework of measures to address the implications of the construction works. The Contractor appointed to undertake the works will be required to prepare a developed Construction Management Plan (CMP) in line with their obligations under the Safety, Health and Welfare (Construction) Regulations 2013.

The Outline Construction Management Plan (OCMP) takes account of CIRIA Guidelines Control of Pollution from Construction Sites (C532), CIRIA UK 2001, in its preparation. The OCMP also takes account of CIRIA Environmental Good Practice on Sites (Third Edition C692), CIRIA UK 2010, and the mitigations identified in the Preliminary Construction Stage Environmental Management Plan (CEMP).

2. LOCATION AND DESCRIPTION OF THE PROPOSED DEVELOPMENT

The location of the proposed development is at the Fermoy Weir alongside Fermoy Bridge in the town of Fermoy, Co Cork. The location is shown at Fig 2-1 below.



Figure 2-1: Location of site at Fermoy Bridge

The proposed development comprises the remediation of the existing weir, which is a protected structure, in the river along with construction of a Fish Bypass channel in the field immediately adjacent to the northern end of the weir as shown at Fig 2-2 below.

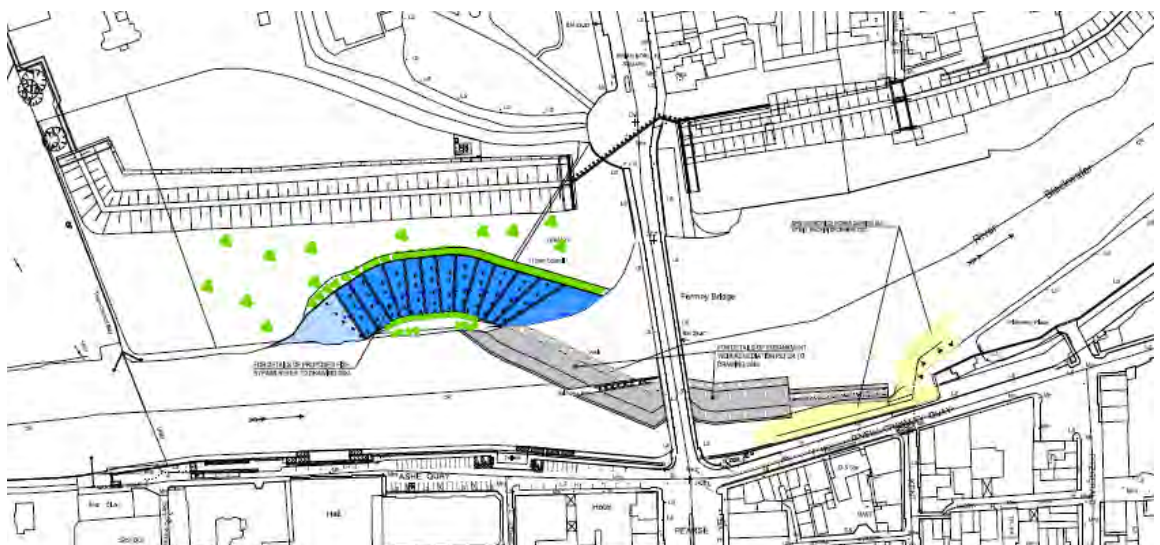


Figure 2-2: Location of site at Fermoy Bridge

The location is identified in further detail on the site plans accompanying the planning submission.

3. WORKS EXTENTS

The anticipated works extents will be contained within the site, as indicated by the 'red-line' on the planning submission drawings.

4. WORKS PROPOSALS

The proposed project comprises the remediation of the existing weir, including reconstruction of breached sections of the weir, and the construction of a rough channel pool bypass to provide for fish passage around the weir as detailed on drawings included with the planning submission.

The weir remediation works can be divided into two different elements which comprise the remediation of the section of the weir, upstream of Fermoy Bridge, including the existing fish ladder incorporated in the weir, and the section of the weir downstream of the bridge. The weir is categorised as a rubble embankment (or Crump) type weir upstream of the bridge and extending for a distance of 37m east of Fermoy bridge. The remaining section of the weir, extending eastwards, is a gravity wall type weir (referred to as the Mill Race weir wall section). It is this section of the weir that has been breached.

The locations of the different sections of the weir are indicated on Drawing No. 19011-TJOC-PL-XX-DR-C-0058. A section of the gravity wall type weir has collapsed resulting in a breach in the weir.

Cross-section details of the existing weir, as well as proposed remedial works to each of these sections, are shown on drawings 19011-TJOC-PL-XX-DR-C-0059 and 19011-TJOC-PL-XX-DR-C-0060 and are described below. Proposed remedial details to the existing fish pass are included on Drawing No. 19011-TJOC-PL-XX-DR-C-0081.

4.1. Weir Remediation – Embankment Section

The remediation of the embankment (crump) section of the weir will involve the removal of the existing concrete apron and resetting of the limestone setts with the addition of random rubble fill (similar to the existing) where required. A high tensile geotextile will be incorporated to assist in reducing wash out of the fill in the embankment. At both the upstream heel and downstream toe of the crump weir section, the undercut / missing stonework will be reset on concrete heel and toe footings along with the addition of rock armour on both the upstream and downstream sides to prevent undercurrents undermining the embankment, in particular on the downstream section in the future.

4.2. Weir Remediation – Mill Race Weir Wall

The remediation of the Mill Race section of the weir, east of the Bridge, will involve reconstructing the breached sections with existing or new stonework to closely resemble

the existing masonry. Given the nature of this section of the weir, it is proposed to inject natural cement (also referred to as Prompt) into the fill sections and place mass concrete in the core of the new section of the weir. The stonework facing will then be pointed in natural cement and the downstream face of the weir protected by adding rock armour. The capping of the Mill Race wall will be removed, the wall raised and the capping reset to a remediated level of 21.55mOD.

4.3. Proposed Fish Bypass

The proposed bypass consists of constructing a curved rock (rough channel pool) ramp type of bypass in the northern bank of the river Blackwater, west of Fermoy bridge. The rock ramp will provide a ladder for fish migrating upstream and resting pools would be created by the varying levels of rock weir walls.

The Bypass Channel will have sheet piled masonry faced side walls, The bed of the channel will comprise a gravel bed on rockfill. Armourstone pitched vertically will create the intermediate pools (12 No in total) and steps in the bypass channel.

A drawing of the proposed fish bypass channel is presented on Drawing No. 19011-TJOC-PL-XX-DR-C-0053.

5. WORKS CONSTRAINTS

This section sets out the primary constraints for the Contractor to address as part of the Contractor's CMP to be developed in conjunction with the Contractor's Works Proposals. The constraints, which are not exhaustive, are listed hereunder:

5.1. Hours of work

The hours of construction work and site deliveries, unless otherwise amended by the Planning Authority, will be restricted to the following:

- Monday to Friday 0700hrs to 1900hrs
- Saturday 0700hrs to 1400hrs
- Sunday and Bank Holidays Works prohibited
- Deliveries (of materials, plant or machinery) 0800hrs to 1900hrs

There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times.

5.2. Traffic Management

Construction traffic to and from the site is discussed in Section 7 below.

No parking for construction workers will be allowed within the Site, apart from at the contractor's compound on the north side of the river and the satellite compound at the Mill Island carpark as shown at Figure 6-1 below. Areas, will be made allocated by the contractor within these compounds for staff car parking during the construction works.

5.3. Environment

The Contractor will be required to implement appropriate measures to ensure that unacceptable noise and dust levels do not occur.

To minimise nuisance caused by noise from the construction, excavation and demolition (C&D) works, the contractor will be required to implement noise control measures in accordance with the requirements of British Standard BS5228 'Noise Control on Construction on Open Sites, Part 1 – Code of Practice for basic information and procedures for noise control'. In this regard, the contractor will be required to ensure that noise levels from the C&D activities on site are within acceptable limits.

To minimise nuisance caused by dust, the following methods are recommended to prevent conditions conducive to dust generation and to suppress dust should it occur:

- Provision shall be made for cleaning by a road sweeper during the course of the works. Road sweeping shall be undertaken as required during and on completion of the works. Exposed stockpiled demolition debris, excavated material, and disturbed ground surfaces will be dampened down as necessary.
- During non-working hours, the site will be left in a condition that will prevent dust from being generated.
- Every effort will be made to minimise the dust created by the demolition process. Dust generated during these activities will be suppressed by use of water mister.
- All excavation and demolition activities and loading of C&D waste on site will be conducted using methods that minimise dust generation.

To minimise the potential negative impact of dust and silt from C&D waste entering the Blackwater, silt curtains will be placed along the bank of the river during the construction period in accordance with the mitigations identified in the Preliminary Construction Stage Environmental Management Plan (PCEMP).

The Contractor shall also be required to comply with all other mitigations identified in the PCEMP which address inter alia:

- Hydrocarbons and waste management
- Silt control
- Species and habitats
- Tree protection
- Invasive species
- Biosecurity
- Noise
- Lighting

5.4. Protection of public area from construction activity:

The Perimeter Fencing will be provided around the accessible boundaries to the site to provide a barrier against unauthorized access from public areas. Controlled access points to the site in the form of gates which will be kept locked for any time these areas are not monitored (e.g., outside working hours). The fencing will be well maintained and will be regularly inspected by the Contractor.

6. POTENTIAL METHODOLOGY AND SEQUENCE OF WORKS

The construction of the project will involve conventional construction methodologies and so will require the use of typical construction plant and vehicles. The anticipated phasing of construction will generally be as follows.

6.1. Site Set-up

- Establish site hoarding, signage on north bank of river
- Establish site offices, welfare facilities and construction deliveries set-down area adjacent the site as shown at Drawing 19011-TJOC- PL-XX-DR-C-0085 (see Fig. 6-1 below)
- The main compound will be located on the north bank of the Blackwater and a satellite compound will be located in the council carpark at Mill Island.
- All site accommodation and welfare facilities at the main compound will be located above the 1% AEP flood level at this location, based on the OPW's flood maps of the area.

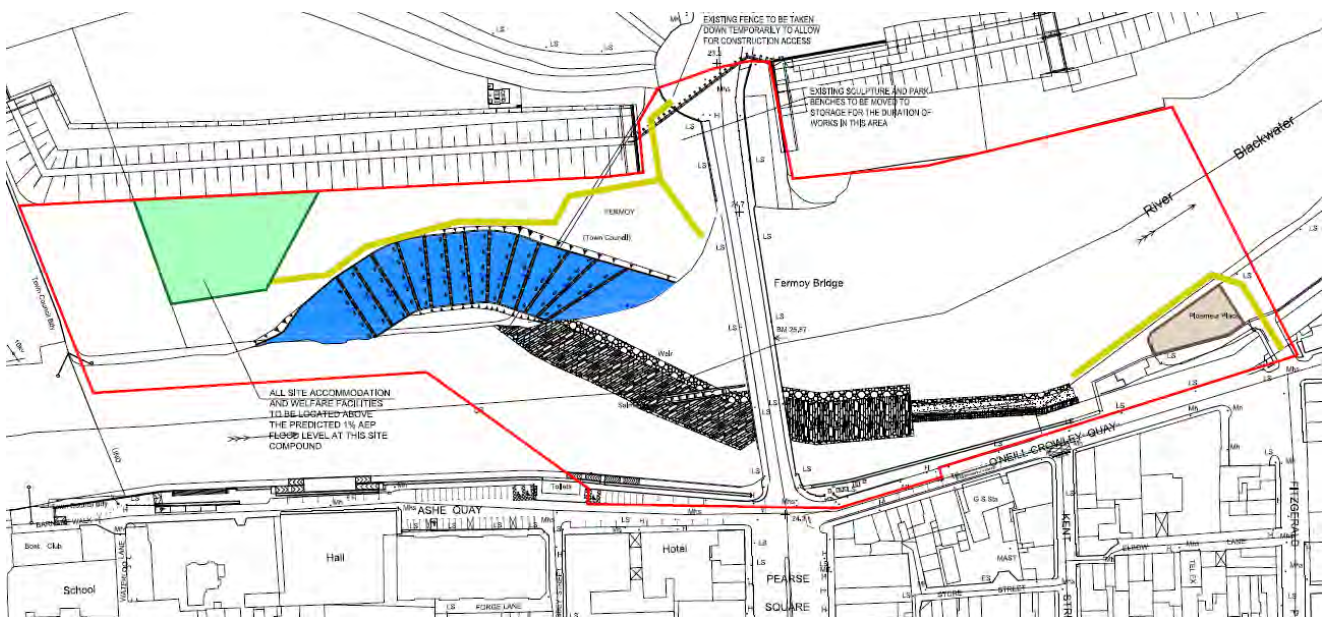


Figure 6-1: Site Set-Up Identifying Site Compound & Satellite Compound

6.2. Construction Works Sequence

The anticipated sequence of construction works will entail:

1. The remediation of the weir upstream (west) of Fermoy Bridge initially;

2. Followed by (or possibly concurrent with) the construction of the fish bypass channel on the north bank of the river.
3. On completion of the bypass channel works, flow from the river will be directed through the bypass channel, at which stage to flow to the Mill race will be dammed at the southernmost arches of Fermoy bridge facilitation the remediation and reinstatement of the weir downstream (east) of the bridge.

These stages are shown at Drawing 19011-TJOC- PL-XX-DR-C-0086. Construction works during Stages 1 and 2 will be accessed and serviced from the compound at the north side of the river. Works for Stage 3 will be accessed and serviced from a satellite compound at the Mill Island carpark.

6.1.1. Stage 1

There are constraints in respect of when in stream works can be carried out within the river Blackwater in accordance with the “Guidelines on the Protection of Fisheries during Construction Works in or Adjacent to Waters”, IFI,2016.

The construction methods used within the River Blackwater will take into account the preservation of stream flows for movement of fish by ensuring a minimum depth of water shall be maintained within the river.

A temporary sheet piled dam will be erected upstream of the works to facilitate the weir remediation works, comprising removal of the existing concrete apron, the excavation of the trench for placement of the new toe protection material and to allow the placement of geotextile fabric and resetting of limestone setts to the embankment section of the weir.

Downstream of the embankment section of the weir, a trench will be excavated for the placement of heel protection materials and, in order to undertake this excavation, a bund will be placed in the river bed to divert the flow away from the area of works. The location of the upstream sheet piled dam and the downstream bund, on either side of the weir, will be located so as to accommodate access routes alongside the embankment.

Bed levels between the end of the bypass channel and the northernmost arches of Fermoy Bridge will be excavated to the levels proposed for the project.

The existing salmon leap will be reinstated and infilled as per the drawings.

6.1.2. Stage 2

Depending on the contractor's programme, in parallel with or following on from Stage 1 activities, the contractor will undertake the following activities for the construction of the Fish Bypass channel.

The bypass channel will be constructed offline without the excavated channel being extended into the river channel until the majority of the bypass works are completed. Therefore, the upstream and down stream ends of the bypass channel will be closed off with temporary sheet piles which will be cut back or extracted when the flow is to be directed into the bypass channel.

The activities required for this stage will include:

- Tree felling;
- Topsoil stripping, stockpiling and disposal of excess;
- Sheet piling for side walls and temporary end walls;
- Bulk excavation, stockpiling of gravels for re use and off-site disposal of excess materials associated;
- Concrete placement for walls and capping beams;
- Construction of masonry faced walls
- Placement of rock fill to bed of channel
- Placement of armourstone and perturbation stones
- Placement of gravels
- Profiling of banks, topsoiling and landscaping;
- Removal of temporary end walls and diversion of flow into channel

6.1.3. Stage 3

Stage 3 construction activities cannot commence until the fish bypass channel is completed and flows are diverted from the river Blackwater to the Bypass channel. The activities required for this stage will include:

- Erection of temporary dam across southernmost arches of Fermoy Bridge to stop flow to Mill Race Channel;
- Provision of construction access from Mill Island carpark;
- Erection of temporary bund downstream of Mill Race weir wall;
- Excavation and filling of toe and heel protection trenches alongside embankment section weir;

- Placement of geotextile layer and limestone setts for surface of embankment section of weir;
- Removal of capping stone from Weir wall:
- Recovery of stonework from collapsed sections of weir wall:
- Natural cement and grout injection to both faces existing masonry weir:
- Construction of concrete core for replacement section of weir wall:
- Masonry facing to replacement sections of weir wall and pointing of masonry to remaining sections of weir wall
- Raising of sections of weir wall to uniform level and placement/replacement of capping stones to mill race weir wall
- Dressing of rock armour at Mill Island to reinstated weir wall and associated profiling of river bed;
- Removal of access and associated bund;
- Removal of temporary dam upstream of bridge;
- Removal of site compounds and demobilisation.

The listed sequence of works is indicative only. In practice, the actual approach taken by the Contractor will be subject to a range of factors, including the following;

- Conditions of planning;
- Contractors proposed works methodology;
- Weather;
- Seasonal constraints;
- Ecological constraints (crayfish relocation, fish relocation, turbidity monitoring, etc.);
- Resources;
- Subcontractors;
- Lead in times.

Options for methods of construction will be further explored with the contractor appointed to undertake the work prior to commencement on site.

7. ACCESS

The construction site will be principally accessed from N72 at the north side of Fermoy Bridge. The Stage 3 works will be accessed through the Mill Island carpark from O'Neill Crowley Quay and Mill Road.

The Stage 1 works will generate limited traffic volumes associated primarily with mobilisation activities, plant set up, delivery of sheet piles or other system for the upstream cut-off dam, delivery of stone for remediation of weir, disposal of surplus material generated by the excavation of the toe and heel trenches and the removal of the concrete apron,

The greatest volume of construction traffic will be associated with Stage 2 works where bulk excavation for the bypass channel will generate approximately 14,500m³ of spoil and will require the importation of 3,750 m³ of gravel and rockfill for the bed of the channel along with 95m³ of large armourstone. The volume of gravel required to be imported for the bed of the bypass channel will be reduced by the surplus material generated by the bed profiling between the outlet of the fish bypass and Fermoy Bridge and by the reuse of excavated materials for the works.

Other deliveries for this stage will include 2500m² of steel sheet piles (for both temporary and permanent works) and 350m³ of concrete for the sidewalls and inlet weir to the bypass channel along with associated reinforcement.

As the haulage activities will be evenly spread throughout the day, it will have little or no impact on existing traffic on the local road network at peak times. The haulage trucks departing the site will dispose of C&D materials at licensed waste facilities, likely to be located off the M8. Therefore, the likely route for the haulage trucks will be to travel from the site via Oliver Plunkett Hill and the R639 to J14 on the M8 and make their way on to most appropriate road, as determined by the Contractor at the time of the works, taking account of other activities in the area.

8. SITE COMPOUND

A site compound will be required for the duration of the works for the storage of materials, plant and equipment, and for a site office(s). It is envisaged that the location of the site compound will be to the west of the proposed Bypass channel (see Fig 6-1). Access to the works on the north bank of the river will require the temporary removal of a section of the railing at the entrance to the triangle (Circus) field. The compound area is identified as being adjacent to the Stage 1 and Stage 2 works areas. A satellite compound/ storage area for the site may be provided for the stage 3 works in the Mill Island carpark with a construction access from there leading to the Stage 3 works area which is located alongside O'Neill Crowley Quay. The Mill Island carpark is in the ownership of the applicant, Cork Co Co.

The works will be undertaken within flood defence walls and embankments which comprise the Munster Blackwater Fermoy Drainage Scheme. Therefore, site offices located on a compound within the site on the north bank of the river could be at risk of flooding and would be inaccessible when the flood defence demountable barriers are erected. Therefore, site offices and welfare facilities will be located above the 1% AEP flood level at this location, based on the OPW's flood maps of the area.

9. CONCLUSIONS

This document is prepared on a preliminary basis for the purpose of the planning submission. It sets out a preliminary framework of measures to be developed by the appointed Contractor as part of their obligation to properly manage the site and control all related activities so that any related impact on people, property, and the environment is reduced, insofar as is possible, to an acceptable level.